USER WORKSHOPS:
A PROCEDURE FOR ELICITING USER NEEDS AND USER DEFINED
PROBLEMS

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GÜLŞEN TÖRE

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_____

Prof. Dr. Canan Özgen
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

_____

Asst. Prof. Dr. Fatma Korkut
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

_____

Assoc. Prof. Dr. Gülay Hasdoğan
Supervisor

Examining Committee Members

Asst. Prof. Dr. Fatma Korkut   (METU, ID) ———————————————

Assoc. Prof. Dr. Gülay Hasdoğan   (METU, ID) ———————————————

Assoc. Prof. Dr. Mehmet Asatekin   (METU, ID) ———————————————

Inst. Dr. Aren Kurtgözü   (BİLKENT, COMD) ———————————————

Gün Acar   (M.Sc.) ———————————————

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Name, Last name : Gülşen Töre

Signature   :

ABSTRACT

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Töre, Gülşen

M.Sc., Department of Industrial Design

Supervisor: Assoc. Prof. Dr. Gülay Hasdoğan

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Not in every case, the designer is knowledgeable about the potential user. Users can be consulted, in order to obtain knowledge, which is required for the design process. However such a consultation process can be problematic, since users may have difficulty in expressing their needs and problems or they may not be aware of them. The study is devised originating from the idea that if appropriate tools are provided for users, they can express their needs and design related problems. The thesis involves a literature review on the necessity of user knowledge as an input for the design process, and methods, techniques and tools, which provide this knowledge. Based on the findings from the literature review, three fictional case studies were planned and performed by employing two techniques, namely mood boards and drawing and shaping ideal products. These two techniques are developed into a procedure step by step by carrying out the case studies. The thesis proposes guidelines for the procedure of "user

workshops" as a way to elicit users' tangible and intangible needs, and user defined problems by directing them to imagine and express a usage context and conceptualize solutions considering their design related problems through a concept development activity and additional creative activities.

ÖZ

KULLANICI ÇALIŞTAYLARI:
KULLANICI İHTİYAÇLARINI VE KULLANICI TARAFINDAN TANIMLANAN PROBLEMLERİ ORTAYA ÇIKARMAK İÇİN BİR PROSEDÜR

Töre, Gülşen

Yüksek Lisans, Endüstri Ürünleri Tasarımı Bölümü

Tez Yöneticisi: Doç. Dr. Gülay Hasdoğan

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Tasarımcı çoğu zaman tasarladığı ürünün potansiyel kullanıcısı hakkında yeterli bilgiye sahip olamamaktadır. Tasarım süreci içinde ürünle ilgili ihtiyaç ve problemlerin bilgisini kullanıcılara danışarak almaya yönelik yöntemlerin belirli zorlukları vardır: kullanıcılar, ihtiyaçlarını ve problemlerini ifade etmekte güçlük çekebileceği veya bunların farkında olmayabilecekleri için böyle bir danışma süreci problemli olabilir. Bu çalışma, kullanıcılara uygun araçlar sağlanırsa ihtiyaçlarını ve tasarıma dair problemlerini tanımlayabilecekleri fikrinden yola çıkılarak planlanmıştır. Tez, tasarım süreci için kullanıcı bilgisi sağlanmasının önemi ve bu bilgiyi sağlayan yöntemler, teknikler ve araçlar üzerine bir literatür taraması içermektedir. Literatür taramasından elde edilen sonuçlar doğrultusunda, *mood board* ve kullanıcılar tarafından ideal ürünün çizilmesi veya şekillendirilmesi teknikleri kullanılarak, bu çalışma için kurgulanmış olan üç adet vaka çalışması gerçekleştirilmiştir. Bu iki teknik, vaka çalışmalarının adım adım uygulanması ve geliştirilmesi yoluyla bir

prosedür haline getirilmiştir. Çalışma "kullanıcı çalıştayları" olarak adlandırılan bu prosedürün uygulanmasında gerekli olan önemli noktaları sunmaktadır. "Kullanıcı çalıştayları", kullanıcı ihtiyaçlarını ve kullanıcı tarafından tanımlanan problemleri ortaya çıkarmaya yönelik bir prosedür olarak önerilmektedir. Prosedür, kullanıcıları bir kullanım senaryosu hayal ve ifade etmeye, kavram geliştirme çalışması ve ilave yaratıcı çalışmalar yoluyla, tasarım ile ilişkili problemleri için çözümler kavramsallaştırmaya yönlendirerek gerçekleştirilmektedir.

Anahtar Kelimeler: Katılımcı tasarım, kullanıcı çalıştayları, kullanıcı tarafından tanımlanan problemler, kullanıcı ile empati kurmak

To My Father

Selçuk Töre

ACKNOWLEDGMENTS

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CHAPTER 1

INTRODUCTION

1.1 Background of the problem

The role of designer has been changing with the developments in design practice. Valtonen (2005) characterizes the changing role of designer in the past five decades together with the recent developments in design. Once in the 50's the designer was practicing like an artist as the creator of the product, and in the 60's he became a member of the product development team and involved in industry. In the 70's with the rise of ergonomics, the designer became an end-user expert, and in the 80's the role of the designer was perceived as a coordinator between different units of the company, then in the 90's creating experiences for users and brand building became the designer's duty. Now the role is shifted to the member of the product development team, who has a significant role in taking strategic decisions of the company, and a creative force pushing innovation and raising competitive capacity of the company (Valtonen, 2005). This new role also assigns the designer the duty of identifying user needs and considering them while designing. The concept of user satisfaction is changing in addition to these developments. Not only should the performance of the product satisfy the user, but also giving pleasure with experience of product use is becoming a central issue in product design practice. Therefore obtaining knowledge about user experience and the context of use becomes an important focus of user research.

The designer's knowledge about the user group is limited in many of the design cases. In order to be able to design and innovate products that meet users' needs and expectations the designer needs to obtain knowledge about users, and in order to propose pleasurable experiences he needs to empathize with the user. Traditional user research techniques generally evaluate an outcome of a design activity or an existing product; therefore they are not suitable for obtaining knowledge input to earlier phases of the design process. In addition to this, research for identifying customer needs, which is carried out by marketing departments, have lack of information about the user's actual needs that are required for the design process (Bruseberg and McDonagh, 2005). Having lack of information related with users and not being able to empathize with them can lead designers to design on the basis of their intuitive judgments and stereotypes. Thus the outcome of such a design activity is a failure in satisfying user's needs.

Since users become experts in using products, they can provide knowledge related with their problems and they can be helpful in identifying their needs. In order to elicit user needs and to be able to empathize with them, users can be the main source of required knowledge. However there are some complications related with this consultation process. For research activities, which aim to provide input for the design process, users may have difficulties in expressing their experiences related with the product use and their emotional needs, or they may misinterpret their problems in relation with the context of use (Bruseberg and McDonagh-Philp, 2001). In the field of participatory design, several tools, techniques and methods are developed in order to address these research problems. Among these, there are (1) *cultural probes* (Gaver *et al.*, 1999) for exploring user experience and the usage context remote from usage environment during the course of usage experience; (2) *generative tools* (Sanders, 2000; 2001) for providing tools for users to express their experiences; (3) *visual evaluation tools*, such as mood boards, product personality profiling, and creative activities with users for

incorporating with focus groups (McDonagh *et al.*, 2002). All these research tools are developed considering that if appropriate tools are provided for users, they can express their tangible and emotional needs and provide the knowledge required for understanding their experiences and the context of use.

Besides providing knowledge about their needs, users may propose solutions for their design related problems, which are certainly beneficial for designers to observe. Thus, by observing those solutions, designers can obtain a better understanding of users' needs and problems. However as users may have difficulty in expressing their ideas or they may not be conscious of their problems, a procedure should be followed in order to elicit the problems of users through directing them to express their design related solutions. This study focuses on development of guidelines for such a procedure, which aims to investigate users' tangible and emotional needs and user defined problems, by directing them to experience creative activities and by letting them express the context of use and problems related to the product usage.

1.2 Aim of the study

The aim of the study is to provide means for designers to empathize with users in order to prepare a ground for design by considering user defined problems related to the product as well as the user's intangible needs and visual preferences. It also aims to investigate the ways by which industrial design process is informed with those aspects. In order to achieve this aim, a procedure is proposed in this study, and therefore the goal of this thesis is to develop the guidelines of this procedure, which is planned to help product designers to understand tangible and intangible needs of users by letting them express a context of use and a design problem, and experience a concept development process.

1.3 Research questions

Initially, in order to (1) examine the reasons of the need for user knowledge in design process; (2) investigate the ways, by which design process is informed about this knowledge; and (3) search for methods, techniques and tools for eliciting user needs and questioning their suitability, a literature review is conducted by seeking answers to the following questions:

- Why is it important to elicit user needs? Which factors necessitate the user information in the design process?

- How can the designer obtain the knowledge of the user?

- Which methods, tools and techniques do designers use to understand the user and elicit his needs and preferences in relation with products? What are their advantages and disadvantages?

- What are the methods, techniques and tools, which include the user in the design process? What are the difficulties in involving them in the design process?

To be able to achieve the aim of the study, three case studies were carried out. By performing these case studies, guidelines were developed for performing "user workshops", which are designed to elicit user needs and user-defined problems, by directing users to experience creative activities. While performing these case studies, the following questions were considered:

- How can users express their intangible needs?

- How can they define design problems in relation to their needs?

- How can users conceptualize design ideas and how can they express their design solutions without restricting themselves to conventional design solutions?

- Which specific techniques can be used to involve the user in the design process? What are the advantages and disadvantages of available techniques? What can be recommended to designers when combining these techniques?

- Which strategies should be adopted to devise a procedure for designers, which can enable them to elicit user's needs by involving them in the design process?

- In what ways and by which methods can these needs and problems be analyzed to constitute the knowledge related with user needs in order to prepare a ground for design?

1.4 Structure of the thesis

In the following chapter, the reasons of the need for the knowledge of user in the design process will be examined by pointing out the external pressures, which oblige the designer to consider user needs; by stating the dimensions that necessitate the user information in the design process; and by highlighting the gap between the user and the designer. Finally the ways by which the designer can obtain this knowledge will be examined.

In Chapter 3 methods, techniques and tools, which are identified in the literature, for eliciting user needs will be presented.

In Chapter 4, three fictional case studies, which were performed in order to develop the guidelines for the procedure of "user workshops" will be reviewed by presenting their processes and outcomes.

In Chapter 5, the guidelines will be expressed as a procedure for eliciting user needs and user-defined problems.

Finally, conclusions will be stated in Chapter 6 with recommendations for further studies.

CHAPTER 2

THE KNOWLEDGE OF USER IN THE DESIGN PROCESS

2.1 The need for the knowledge of user in the design process

Design activity involves problem defining and finding solutions to those problems. As these are related with the usage of the product and the interaction between the user and the product, the main source of knowledge, which enables the designer to understand and define the problems, is the user. Therefore, the designer needs to obtain user information and utilize it in the design process. In this section, the reasons why the designer needs user information will be examined.

2.1.1 External pressures

Several factors in relation with users necessitate the user information in the design process such as factors related with operational, social, emotional, inventive dimensions. Besides these factors, there are external pressures, which oblige the designer consider user needs. Product liability legislation, health and safety standards related to specific products and usability standards are among these pressures, which force the producers to foresee the problems concerning product usage.

ISO 9241-11 "Ergonomic Requirements for Office Work With Visual Display Terminals (VDTs) – Part 11: Guidance on usability" defines usability as: "the extent to which a product can be used by specified user to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use" (ISO 9241-11:1998). This standard is developed for interfaces of computer systems. For the standardization of everyday products, by adopting this definition of usability, -ISO/CD 20282 "Ease of operation of everyday products" is developed. ISO/CD 20282 aims to bring standards for design of everyday products that are, "consumer products, or equipment used by general public". The standard proposes a method to evaluate and test the product, in order to develop a product that enables users to conceive its function and operate it in the first use, and to measure its successfulness in managing this (Schoeffel, 2003).

The new standards and laws concerning user-centered design affected the design practice and design process in the firms, and the knowledge of user has become important in the design process to practice in accordance with the legislations. Besides this fact, companies are becoming more user-centered. Identifying customer needs and measuring the satisfaction of customers are gradually being recognized as the major steps of the product development cycle. Ulrich and Eppinger (2003) point out that if the new product development team is incapable of identifying customer needs, the new product will fail in the market, no matter how the product works well. Therefore "the process of identifying customer needs is an integral part of the larger product development process" (p.54).

According to Valtonen (2005), today the role of designer is shifted from the artist, who is the creator of the product to the team member, who acts a significant role in taking strategic decisions of the company and as a creative force pushing innovation and raising competitive capacity of the company. In her article "Six decades – and six different roles for the industrial designer" she examines the changes in the role of the industrial designer in Finland.

Today in the competitive international area, pushing innovation is perceived as a proper way to have successful products for companies. As referred by Valtonen (2005), this situation leads to create a national innovation system for Finland and Finnish design policy. In creating the design policy, The National Technology Agency of Finland (TEKES) took part by publishing their Industrial Design Technology Program, and one of the aims of this program is to develop standards for design research. As quoted in by the Valtonen, the aims of the program is described as follows:

> Recognizing the end user's needs and expectations and generating innovations based on them are becoming increasingly important parameters for success. […]By using design more effectively it will be possible to give Finnish industry a competitive edge that can respond better to the latest global challenges. Harnessing new areas of design expertise, such as user experience, for business operations and for generating new types of business is of crucial importance here. The most successful major international companies integrate social and cultural expertise into global product development. (TEKES, 2005. qtd. in Valtonen, 2005)

As it can be realized from this statement, satisfying user needs and expectations is one of the central issues in becoming a successful industry. By pointing out their design policy, Vantolen (2005) demonstrates the latest situation of Finnish design. According to her, this kind of evolution path for industrial design is seen in other design aware countries. Therefore their national standards for design research can constitute a guide, internationally. From this point of view, user-oriented and strategic design expertise had to be main strategy of companies in order to overcome competitive challenges.

These are the external pressures that necessitate the user information in the design process. For a user-centered practice, designers need to consider many dimensions in relation with the user. These will be mentioned in the following part.

2.1.2 The dimensions that necessitate user information in the design process

Knowing the user is important from various aspects. Margolin (1997), categorizes the reasons of the importance of this relation between designers and users into four dimensions:

- *The social dimension*, "what users do with products", that is the actions of users, adds social dimension to the product, and designer may be responsible from these actions. Availability of some products, such as firearms or products that emits chemical substances, may cause unhealthy and destructive behavior.

- *The inventive dimension*, since designers may be the inventors of new products or the new elements of the existing products, they should have an ability to conceive new properties for a product or new products, which will be value to the users.

- *The operational dimension*, users may have difficulties in operating a product. Therefore, designers should understand how users learn to operate devices.

- *The aesthetic dimension*, users' aesthetical judgments may be different from designers. In order to design a product that satisfies customer needs designer should aware of users' aesthetical expectations.

This categorization addresses different aspects of the designer's responsibilities. However it does not address the importance of emotions that products elicit. Desmet (2002) states that products can elicit strong emotional responses and designers may find it important to consider emotions while designing. In addition to that, in the current design literature there is a common acceptance that users have emotional, aspirational and spiritual

needs (McDonagh, Bruseberg and Haslam, 2002). Thus Margolin's aesthetic dimension could be broadened under the term of *emotional dimension*. This study mainly focuses on emotional aspects of user product relation and intangible needs of users, thus a comprehensive review about the emotional dimension will be made in Section 2.1.2.3.

Originated from the categorization that Margolin (1997) proposes, the dimensions that necessitate the user information in the design process will be examined further in the following sections.

2.1.2.1   The operational dimension

A product should be usable in order to perform its function. If the user is not able to use the product and he cannot understand how to use it, that means the product is not functioning. Therefore the operational dimension is crucial for product use.

Norman (1988) points out that there are enormous number of devices and their parts, which people encounter in their daily life and need to learn how to use. According to him, it is the part of the designer's duty to ease the user's process of learning and conceiving how to use the devices and their parts by making the operation comprehensible, projecting a "good image of the operation", and "taking advantage of other things people might be expected to know". While designing the product, the designer should anticipate the user's behavior during performance of the usage task, and he should design the task according to these anticipations. In order to be able to anticipate the user behavior he should learn the user's capabilities, knowledge level, and what he might be "expected to know".

The term "tangible needs" referred in this study is generally related to the operational dimension, because operational aspects of product and

operational problems regarding the product use are generally related to tactual attributes of the product. In addition to that the term "intangible needs" is referred as the needs, which can be difficult to be identified and are not related with the tactual attributes. Therefore intangible needs are related to social or emotional dimensions of user product relation.

2.1.2.2   The social dimension

In his categorization, for the social dimension, Margolin (1997) emphasizes the fact that some products can contribute to social and environmental problems. "What users do with products" can affect the social environment; likewise the social environment can affect the user's behavior and preferences in relation with the product. Asatekin (1997) argues that the product becomes a social sign as well as being a functional sign. The product signals messages not only to its owner, but also to the members of the community, which the owner lives in.

According to Asatekin (1997), while choosing and using a product, an individual also considers whether or not he will be psycho-socially safe. Therefore the designer should consider the appropriateness of the product's formal and functional attributes to the social values. Since the user is inseparable from the society, the social information is the part of user knowledge that the designer needs to know.

In the social dimension, *vandalism* is another issue that affects the product's design. According to Asatekin (1997), design activity handles the user-product relationship in the conditions of "positive" consequences. However in certain conditions of social life, it can be prevented to have "positive" consequences. He states that it is possible to examine the user's "negative" approach to product as *vandalism*. In this situation the user is the vandal, in

order to prevent the vandalism, the designer should know the vandal behavior, and he may need to search for it.

2.1.2.3 The emotional dimension

Such attributes like functionality, safety, affordability, are normally expected to exist in products by consumers, however recent designs are expected to meet the needs beyond those attributes (Demirbilek and Şener, 2003). Consumers attach importance to visual appearance of products, they want products, which have decorative, emotional and symbolic attributes, they buy value in the form of entertainment, experience and identity with the product (Crilly et al., 2004). Emotional dimension is becoming the central concern in user centered product design. Many has been stated about the importance of emotional domain in product design, and how objects can arouse emotions that play essential role in the user – product relation, in terms of attachment or detachment (Savaş, 2002).

Visual appearance of a product is one of the most critical factors that evoke emotions. Aesthetic dimension as defined by Margolin (1997) is important in terms of the emotions that aesthetic aspects of the product arouse. Therefore in the present study this dimension will be considered under the title of emotional dimension. Norman (1988) in his book "The psychology of everyday things" claims that in product design if aesthetics is put first, the product might not be useful and vice versa. Usability and aesthetics should be balanced in the design of products; otherwise the product can be a failure. In his book "Emotional design", instead of the balance between aesthetics and usability, he brings a different approach for successful products. He emphasizes that "attractive things work better"; a product is more usable, if it is aesthetically pleasing to its user. He explains this statement as follows:

Emotions, we now know, change the way the human mind solves the problems – the emotional system changes how the cognitive system operates. So if aesthetics would change our emotional state, that would explain the mystery [of "attractive things work better"] …attractive things make people feel good, which in turn make them think more creatively. How does that make something easier to use? Simple, by making it easier for people to find solutions to the problems they encounter. (Norman, 2004. p.19)

He posits that if a product has an aesthetical value for its user, it can elicit positive emotions, and these positive emotions make the users feel more enthusiastic about using the product, thus they make it more usable.

While explaining aesthetical product emotions, Desmet (2002) claims that people have innate attitudes to visual properties of products as well as they can develop attitudes for them, such as generating attitudes for certain styles (Japanese interior decoration style). This situation can be perceived as a social consideration. Corresponding to this situation, for aesthetical considerations, Asatekin (1997) recommends that they can be categorized as socio-cultural considerations, because they change from culture to culture and time to time. Therefore there is no certain boundary between dimensions of the user product relation. Besides visual appearance, usage of the product, or social considerations may cause arousal of emotions towards the product. The product can elicit emotions in relation with many aspects of the user product relation.

Desmet (1999, 2002) explains how products elicit emotions by appraisal theory, which states that emotions are aroused not by the events, but by interpretation and evaluation of events. In the case of products, an individual appraise a product with a concern in his mind, then he responds with an emotion, which can be negative or positive depending on the situation whether the product matches or mismatches his concern. For example, one may find a pair of shoes *desiring*, because he or she has a concern of "being attractive"; or *dissatisfied* with the shoes, because he or she has a concern

of "comfortable walking". In order to explain emotional concerns related with products, Desmet (1999) adopted a structure, which is developed by Ortony, Clore and Colins (1988). In this structure they define three types of concerns namely: *goals*, *standards*, and *attitudes*. He explains this structure of concerns as follows:

> First, goals are the things one wants to see happen (e.g., I want to publish a book). Second, standards are the things one believes ought to happen (e.g., I shouldn't disrespect my parents). And third, attitudes are one's dispositional likings or dislikings such as tastes (e.g., I love cheesecake). (Desmet, 1999. p.71)

According to appraisal and concern types, Desmet (2002) categorizes emotions elicited by products as: instrumental, aesthetic, social, surprise, and interest emotions.

- Instrumental product emotions are related with the goal type of concerns that are expected to match the product attributes in relation with the user's wills. Some of the instrumental emotions elicited from products might be satisfaction and dissatisfaction.
- Aesthetic product emotions are elicited with the attitudes. Attitudes are the concerns, which are "one's dispositional likings or dislikings" for certain objects. Emotions like attraction and dislike can be elicited with these concerns.
- Social product emotions are in relation with the standards. Standards are the concerns that are "how we believe 'things should be', and how 'people should act'". Admiration and indignation are some of the social emotions.
- Surprise product emotions can be elicited with any of the concern types. "Any product (feature) that is appraised as 'novel', i.e. sudden and unexpected, will elicit a surprise response." (p.11) Pleasant surprise and unpleasant surprise can be elicited from products as surprise emotions.

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- Interest product emotions are emotions like fascination, boredom, and inspiration. This type of emotions is elicited by "an appraisal of *challenge combined with promise*". Level of arousal is important for responding with positive or negative interest emotions. If the stimulus is lover the product might elicit emotions like boredom.

In order to design a product that arouse positive emotions, the designer needs to know user concerns, which generates the arousal of positive emotions, as well as he needs to know those emotions.

Desmet's categorization of emotions is based on the appraisal and concern types of users, whereas Norman (2004), categorizes the designs that evokes emotions into three types, according to their processing levels in the human brain: visceral, behavioral and reflective designs. Visceral design is about appearances. Judgments related with products are dominated by physical features (look, feel, and sound), and this level of design brings gut and initial reactions. Behavioral design is about performance and usability. The user can take pleasure in using the product and find it effective to use or the opposite of this situation can be possible in this level. Reflective design is about the meaning of a product or its usage. Cultural messages and intellectualization of the product are the important issues in this level of design. Norman (2005) categorizes even people, according to these levels:

> Visceral level people will be strongly biased toward appearance, behavioral people towards function, usability, and how much the feel in control during use. And Reflective level people (who would seldom admit to be one), are heavily biased by brand name, by prestige, and by the value a product brings to their self-image – hence the sale of high-priced whiskey, watches,, automobiles, and home furnishings. (Norman, 2005)

Similar to Norman's perspective of design levels, Cupchik (1999) states three kinds of "meanings attached to industrial design objects", which play roles in the process of arousing emotional responses: cognitive/behavioral, sensory

aesthetic, and personal/symbolic meanings. Cognitive/behavioral meanings are attached to objects in relation with its utilization and performance. These meanings relate the functional and structural attributes of the product to the users knowledge and expectations. Sensory/aesthetic meanings are attached to objects related to its perceived physical qualities (visual, auditory, tactile, taste, or scent). These meanings can have "an immediate and direct effect on experience through brain activity". Personal/symbolic meanings are attached to objects related with additional meanings given to objects relevant to the self-concept. When the object has a social value, these meanings are central.

These three types of meanings, which are attached to objects, are similar to Norman's design levels. However Norman separates the products according to these levels, and he considers these levels as different product types. On the other hand Cupchik (1999) proposes that the successful design can be achieved by merging these three meanings into the product coherently. About this successful product, he states: "Its sensory qualities imply the function of the object and engage the user in a person[al] way both consciously and unconsciously." (p.77). In this way it can be possible to built user attachment to the product. For this reason the designer needs to know how to objectify the meanings into products so that the user can understand them and feel attached to them.

Similar to Cupchik's perspective Savaş (2002) claims that attachment and detachment are the positive and negative emotional states of the user product relation. Emotions that cause attachment or detachment are evoked by the meanings attached to the product. Experience and the meanings attached to things through experience are the outcome of this relationship between the user and the product (Savaş, 2002). Therefore the designer needs to examine the user experience so that he can understand meanings attached to products by users and their emotional responses.

Experience is becoming a central issue in user research rather than the operational performance and usability. Hasdoğan, Evyapan and Korkut (2006) point out that today in ergonomics the interest is shifted from performance modeling, which focuses on accomplishment of the human task of operation, to experience modeling, which searches for user satisfaction and pleasurability.

In order to relate emotion to experience, Di Salvo, Hannington and Forlizzi (2002) specify two kinds of emotional responses: short and reflexive and sustained and reflective. Short and reflexive emotions are momentary and unconsciously aroused feelings towards products, which Di Salvo *et al*. (2002) define as *emotion*. In contrast, sustained and reflective emotions are referred to previous experiences and long term feelings, which they define as *mood*. To relate these terms to emotional experience, they refer to Carlson's experienced cognition theory, which states that short and reflective responses are more related to the self than the environment, and sustained and reflective responses are more related to the environment and the objects surrounding the self. These two emotional responses together shape the environmental information, which is received by the user. However, since "a short and reflexive response is not dependent on the environment but instead *singular elements or objects*" (p.252), it is not an emotional experience. Only mood or sustained and reflective response can constitute emotional experience (Di Salvo et al., 2002). The environment referred in this statement can be considered as the context of user product interaction. Sleeswijk Visser, Stappers, Van der Lugt and Sanders (2005-b) defined the term 'context' as "all factors that influence the experience of a product use. The way in which a product is used depends on its user and a variety of factors in the environment." (p.121). This definition slightly relates the existing product to the context. In order to be able to serve a pleasurable experience to the user, the designer needs to focus on the user's experience set in the context of use, rather than the existing products and their components (Buchenau and Fulton Suri, 2000). Studying the context of

product use is beneficial for designers to understand user experience and empathize with the user, and empathizing is helpful in conceiving their emotional needs (Sleeswijk Visser *et al*., 2005-b).

According to Margolin (1997) the product is meaningful if it is in relation to its user, and experience is the key term that helps us to understand this relation, and who a user is. He states that experience is more related with the action that is the usage of the product, rather than functions, which are in relation with the mechanical operation of the product. Without experience, functions of a product can be meaningless and useless. He illustrates this with an example by quoting from Bürdek about his experience of telephone set buttons.

> The telephone set in my office has 30 push buttons, the system is so intelligent that I can use just some two or three basic functions. I don't want to remember all [the] other[s] and I really don't want to read the user instruction during a telephone call (Bürdek, 1994. qtd. in Margolin, 1997. p.229).

Although he has an intellectual capacity to learn them, he didn't need to gain such kind of an experience, so the functions are outside of the user experience and useless. In order to prevent this situation, designers must be knowledgeable about the user experience for designing a product.

The designer cannot design experiences, however by examining users' "past, current, and potential experiences" he can design situations and conditions for pleasurable experiences (Forlizzi and Ford, 2000; Sanders and Dandavate, 1999). Understanding user experience can lead designers to create products that may help users' to generate their own pleasurable experiences, and this can provide arousal of positive emotions and product attachment.

2.1.2.4   The inventive dimension

According to McDonagh *et al.* (2002) carrying out user research may enable the designers to create new ideas and solutions. They state that designers should be involved in the user data collection stage, especially when the qualitative data about users' needs is an issue. This may help the designers in their creative processes. Similarly, in their book "Product Design and Development" Ulrich and Eppinger (2003) state that designers should participate in the identifying customer needs stage of new product development, since they are known as skilled professionals "in recognizing issues involving user interactions".

2.1.3   The gap between designers and users

Designers communicate with users through the medium of a product, and the meanings that are objectified in the form created by the designer may not be the same as the meaning the user understands (Crilly et al., 2004; Krippendorff, 1995). This situation brings the discrepancies between the user and the designer. Norman (1988) postulates that these discrepancies depend on several reasons.

> First, the reward structure of the design community tends to put aesthetics first. Design collections feature prize-winning clocks that are unreadable, alarms that cannot easily be set, can openers that mystify. Second, designers are not typical users. They become so expert in using the object they have designed that they cannot believe that anyone else might have problems; only interaction and testing with actual users throughout the design process can forestall that. Third, designers must please their clients, and the clients may not be the users. (p.151)

He states that while designing, designers become an expert on the *device,* which they are designing and users are generally expert in the *task*, which

they are performing while using the device. Therefore the designer needs to learn the *task* and the users' behaviors and habits while performing the task. He also underlines the fact that the designer's interaction with the potential user of the product is very important, it has to take place from the very beginning of the design process, "for it soon becomes too late to make fundamental changes." (p.156)

According to Margolin (1997), the area, where the least communication between designers and users exists is the aesthetical needs of users, because generally designers think that their aesthetical judgments have priority over the users'. However this kind of subjective approach is not possible in industrial design profession, since every product should serve user needs and need to be sold. Moreover, there may be discrepancies between designers and users preferences related with the visual appearance of the product. Hsu *et al.* (2000) state that in general "users do not appreciate the artistic style of some design award winners". The reason of this situation may be the discrepancies mentioned above, and they may also bring failure to high-toned designs. The study about users' and designers' form perceptions, done by Hsu *et al.* (2000), also proves this mismatch between designers' and users' form perceptions. In this study several telephone set designs and several image-words for these designs presented to the same numbers of designers and users. The results revealed that for the same product they have different impressions and the same "image-word" (e.g. traditional – modern, hard – soft etc.) have different meanings to them. Thus the designer should consider users' preferences related with the visual appearance.

2.2 Obtaining the knowledge of user

As mentioned in the previous part there is a certain need for the knowledge of users, the main question is how and where can designer gain this

information. According to Margolin (1997), there are three ways to obtain this knowledge: firstly designers, in many cases, are users themselves, they intuitively place themselves in users' position and reflect their own satisfactions and ideas to the products. Secondly, designers sometimes form subcultures with users. They shape a community with users, where they can share the thoughts about a certain product, they are again both user and designer in this situation, they can easily gain feedback from users and their own experiences. Examples of this situation can be seen in software development and cycling. Thirdly designers may employ marketing research about user motives and behavior, this kind of information different from direct experience, as it's reached through second hand observations about user-product relation.

Similarly Hasdoğan states that designers start to design process with some presumptions about the potential user, and she mentions about the sources of these presumptions:

> Such presumptions may be based on: the designer's previous experience of his job and of his everyday life, in relation to similar kinds of products; on the expertise of other practitioners; on some well-proven information provided by the human sciences; or on some opinions obtained directly from the potential users or their representatives (Hasdoğan, 1996. p.20).

She states that these presumptions are built into *user models*. "A *user model* is: any representation of the potential user, created by or available to the designer, to assist him making predictions about the actual user." (Hasdoğan, 1993. p.12). In order to model the user, the designer needs to employ user research methods by himself, or he can take advantage of the information provided by ergonomics, marketing research, and related human sciences. In the traditional product development process, the user information is provided by marketing research.

2.2.1 The knowledge of user in the product development process

Margolin states that product development is a combination of methods rather than a method alone, and it needs to be qualified by user experience (Margolin, 1997). Besides that it is an interdisciplinary activity that involves all the functions of a firm, but especially marketing, design and manufacturing are central to the product development process. According to Ulrich and Eppinger (2003) an ideal product development team consists of a core and extended teams, for an electromechanical product that have modest complexity, the core team is composed of *a team leader, a marketing professional, a manufacturing engineer, a purchasing specialist, an electronics designer, a mechanical designer and an industrial designer.* In this structure it is the marketing department's duty to gather customer information, to identify customer needs and represent it to the team members. Before designing a product, the organization must have knowledge about potential users, to identify the customer needs, and there are three commonly used methods in industry. These are interviewing with potential customers, using focus groups, and observation of product usage. The marketing department employs these methods to assess the customer needs and compose the information related with customers. It mediates the interactions between the firm and the customers in several stages of product development. Ulrich and Eppinger (2003) recommend that designers should participate in the studies related with customer information. Their product development approach is a team-based approach. Besides from this, there are other approaches, which assign different roles to design.

Perks, Cooper and Jones (2005) identified three different roles of design in the product development process: design as functional specialism, design as part of multifunctional team, and design as product development process leader. The role of "design as functional specialism" includes the basic task of design, which is designing the product. In this category, user information is

provided by the marketing function. Assessing the user needs and formulation of the brief is the marketing function's task; therefore the designer is restricted by the commercial considerations. In the category of "design as part of multifunctional team", the designer is considered as a key member of the product development team. The designer's duty is broadened to the whole development process from the identification of needs to the manufacturing and testing. The designer is required to communicate other functions and play an active role in all phases of the product development process. The category of "design as product development process leader" necessitates design as a force for innovation. The designer takes active part in making strategic decisions, from formulation of the project brief, assessing the needs of users, and specifying product features to developing strategies for selling the product. The designer has close relation with customers and he may employ specific research techniques to understand and observe customers. The last role is closely related with recent design research approaches, which propose the active participation of the designer in the process of user information research, and suggest that user can be the source of information to producing innovative products and solutions.

2.2.2 Recent approaches to user research

Hasdoğan (1996) posits that in order to model the user in the design process, designers tend to use less formal methods, such as scenario building, rather than the empirical models, which ergonomics, marketing research, and related human sciences provide. She claims that ergonomic data is related with the workplace situations and trained users, and it is delivered in the form that is more suitable to ergonomists' use rather than designers'. Thus designers are reluctant to employ these methods in the design process. However this is valid for traditional ergonomics, the focus of ergonomics is shifting from measuring the performance of the usage task to modeling the user experience (Hasdoğan *et al.*, 2006).

Many references address the discrepancy between the marketing department and the design department in companies, although their relationship is crucial for successful product development (Perks *et al*., 2005). Marketing research considers people as "purchasers" (Hasdoğan, 1993). This consideration leads marketing research information restricted by commercial concerns, which may not address the real needs of users. Furthermore, the original data, which might have critical details about users or usage, collected by marketing researchers often cannot be reachable by the designer (Bruseberg and McDonagh-Philp, 2000). Also, responses to questions raised by traditional market researchers may not have been considered by the average user before (Bruseberg and McDonagh, 2005). Therefore he may give inadequate or irrelevant information related with the question, or he may misinform about his needs and expectations. Bruseberg and McDonagh-Philp (2000) suggest that designers can raise more suitable questions to the potential users related with the product use.

It is claimed that designers are isolated from design research activity in traditional design research, and requirements about the project brief are generally composed by market researchers and ergonomists, then they are filtered through clients or 'managers' (Bruseberg and McDonagh, 2005). It may be difficult for designers to employ marketing research analysis in the design activity, since they are not directly involved with the user. Thus it is argued that designers should employ user research and directly interface with users. This can provide profound understanding of both tangible and intangible needs of users. Figure 2.1 demonstrates the traditional and new roles of designers in the design research activity.
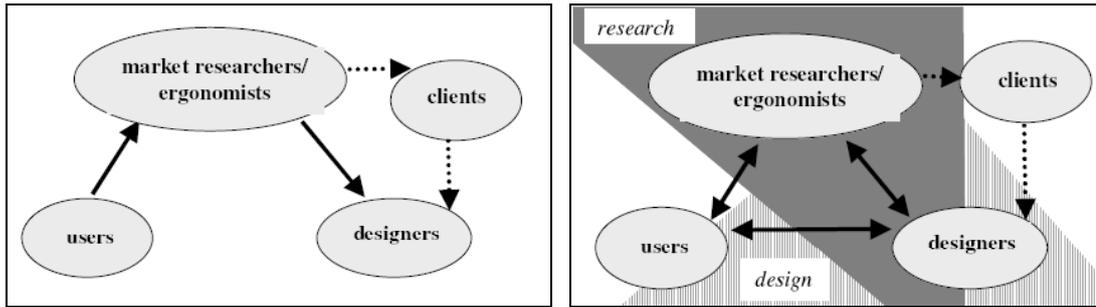
Figure 2.1 Traditional and new roles of designers in the design research activity (Bruseberg and McDonagh, 2005. p: 2).

Sanders (2000) claims that traditionally in product focused design people are seen as consumers or users, but rarely considered as "people". People-centered design rather than user-centered design becoming central to product design activity, since providing pleasurable experiences to people, and satisfying their aspirational and emotional needs have become the priorities. As a result, besides the participation of designer in the user research, user participation in the design process is becoming a focus of user research. To understand people's experiences Sanders and Dandavate (1999) proposes a model and tools (See Figure 2.2).

> Traditional design research methods were focused primarily on observational
> research (i.e., looking at what people do and use). Traditional market research
> methods, on the other hand, have focused more on what people say and think
> (through focus groups, interviews, and questionnaires). The new tools are
> focused on what people make, i.e., what they create from toolkits we provide
> them to use in expressing their thoughts, feelings and dreams (Sanders and
> Dandavate, 1999. p.89).
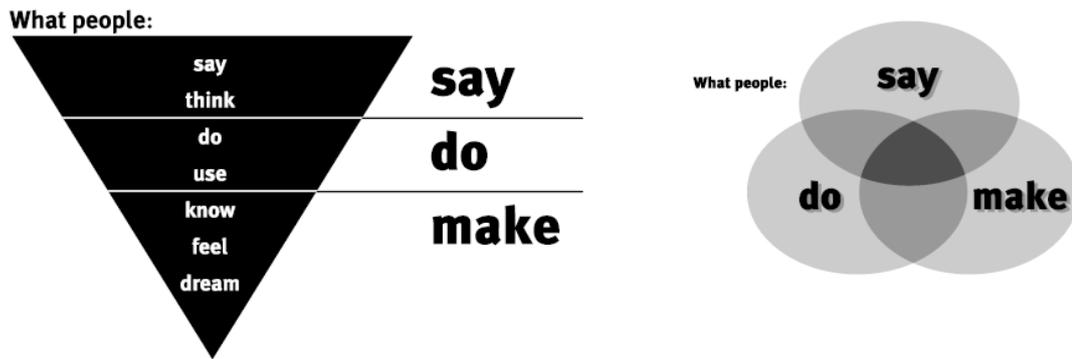
Figure 2.2 Sanders and Dandavate's model for accessing people's experiences (Sanders and Dandavate, 1999. p: 89).

Users may have difficulty in expressing their thoughts about products and their needs, or they may not be aware of them (McDonagh *et al*, 2002), However, it is asserted by many researchers that if people are given appropriate tools, they can provide useful information about their experiences, the context of use, and their intangible needs as well as tangible needs; and the outcome of such a study can provide inspiring resource for designers (Sanders, 2000; Sleeswijk Visser *et al.*, 2005-b; Bruseberg and McDonagh-Philp, 2001). In order to obtain this knowledge, Dandavate and Sanders (1999) propose "make tools". In their model for accessing people's experiences (Figure 2.2) they suggest that studying what people "make" provides information about their knowledge, feelings and dreams.

> Discovering what people know helps us to communicate with them. Understanding what they feel gives us the ability to empathize with them. This way of knowing provides *tacit knowledge*, i.e., knowledge that can't readily be expressed in words (Polanyi, 1983). Evoking people's dreams will show us how their future could change for the better. It can reveal *latent needs*, i.e., needs not recognizable until the future. When we bring ordinary people through a guided discovery process and put them in touch with their feelings and dreams, we have established in them the conditions for creative thought and expression. (Sanders, 2001. p. 3)

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Bruseberg and McDonagh's (2000) study about designers' perspective on user-centered design research methods reveals that some designers have concerns about such research activity. They are uncertain about whether the designer's skills are sufficient enough to moderate the research activity, and they claim "designers are good with *things* – not necessarily with people". They are also concerned about consulting users about their needs may seem inappropriate to design profession, and they question the role of the designer in this situation (Bruseberg and McDonagh's, 2000; Bruseberg and McDonagh's, 2002). It can be stated that there will be a shift in the designer's responsibilities, but this does not mean that users are taking the task of creativity in the design process. Additionally, Greenbaum (1998) points out that in focus groups, which are commonly used methods in user-centered design, participants cannot be expected to generate solutions or products, these should be created with interpretations of their comments by designers. Users' creativity in the outcomes of the participatory research is helpful in defining their needs and understanding their experiences. Therefore the designer's responsibility is broadened to using research strategies "to access and understand the experiences and dreams of ordinary people." (Sanders, 2001)

2.3   Discussion

The knowledge of the user is required in the design process because of many reasons. There are external pressures, which oblige the designer to consider user needs. They are legislations concerning the protection of the user from defective products; standards aiming to bring usability as a standardization issue; and concerns of companies, which are targeting the satisfaction of users in order to overcome competitive challenges. Moreover there are different dimensions, which necessitate the user information, related with user product relation and design process. The product should be

usable and comprehensible by its user, thus knowledge of user is important in the *operational dimension*. The product has socially attributed meanings and also the designer needs to anticipate the user behavior to prevent the misuses that may also affect the society in the *social dimension*. Knowing the user can help to create innovative solutions, which addresses the needs of users in the *innovative dimension*. In the *emotional dimension*, the user has intangible needs and satisfying them is becoming central to the design activity.

Many different theories are raised related with emotions that are caused by products. Desmet (2002) states that the user appraises the product with a concern in his mind, and this appraisal directs him to respond with an emotion.

Cupchik (1999) posits that there are three types of meanings attached to products: *sensory/aesthetic* meanings related with physical attributes, *cognitive/behavioral* meanings related with utilization and performance, and *personal/ symbolic* meanings related with additional meanings in relation to the self-concept. By embodying all of these meanings in the product, the successful product can be created, and this can provide user attachment to the product.

Meanings are attached to products through experience. Therefore user experience should be examined and understood by the designer, in order to comprehend how meanings attached to products and create meanings that provide user attachment.

According to Di Salvo *et al*. (2002) sustained and reflective emotions cause experience rather than short and reflexive ones, because the former is more related with environment of product usage, which may also considered as context of user-product relation. Thus the context of use should be examined, in order to serve meaningful and pleasurable experiences to the

user. Furthermore, designers cannot create experiences. However by researching about user experience they can conceive user needs, and design products that may help users to create their own pleasurable experiences.

Moreover in order to prevent mismatches between the designer's intentions in relation to meanings, which are objectified in the form of the product and the user's perceptions about those meanings, and to overcome the discrepancy between designers and users visual preferences, the designer has to consider user needs and preferences.

In order to obtain user knowledge the designer generally puts himself into the user's position, and he tries to empathize with the user. He also uses the knowledge from his previous experiences; he may consult the information provided by the human sciences; or he may consult the potential users. Participation of the designer to all product design phases is becoming central to product development activity in companies, especially when conducting user research. However research outcomes provided by human sciences are not suitable to the designer's usage, or they may be inadequate for covering designers' need of user information. Many references addresses the benefits of designers' participation in the user research, in addition to that participation of user in the design activity is becoming an important issue in product design. It has been stated that if people are given suitable tools they can provide valuable information about their needs, experiences, and the context of use.

CHAPTER 3

METHODS, TECHNIQUES AND TOOLS FOR ELICITING USER NEEDS

In this chapter, methods, techniques and tools, which are identified in the literature, for eliciting user needs will be examined. Before this, the definitions of these terms should be stated. Based on the definitions by Britannica Online, (1) the term "method" expressed in this study is " a systematic procedure […] or mode of inquiry employed by or proper to a particular discipline or art"; (2) the term "technique" is a specific approach to doing something or "the manner in which technical details are treated"; and (3) the term "tool" is "something (as an instrument or apparatus) used in performing an operation or necessary in the practice of a vocation or profession" (Britannica Online, 2006).

The methods, techniques and tools examined in this study involve user participation to some extent, and many of them adopt participatory approach for the design process. Carmel, Whitaker, and George (1993) classify user centered design methods according to the degree of user participation and the amount of control given to the users. They defined three levels of this participation:

- *Consultative design:* users are simply the source of knowledge, but they have little or no influence or control.

- *Representative design:* there are selected user representatives to participate in decision making and actual design formulation.
- *Consensus design:* development responsibility is assigned to the users with the product development team.

Carmel et al. (1993) make this classification for system design. In product design, consultative design has generally been the focus of design research. Naturally, generation of product solutions and designs are not expected from users. However their participation is commonly accepted as crucial in order to get their opinions about the products and their usage, and to obtain inspirational data, in-depth information about them and their experiences.

In order to obtain information about users' experiences and intangible needs qualitative research should be carried out (McDonagh *et al.*, 2002). Methods, techniques and tools identified in the literature review generally provide qualitative data, which is required for eliciting user needs. The outcome of such a qualitative research activity is employed in the design process by interpretations of the designer. Thus many sources state that the designer should participate in the research activity (Bruseberg and McDonagh, 2001) with all product development team members, in order to understand user's needs and experiences (Stappers and Sanders, 2005).

Although qualitative research methods and techniques like interviewing or focus group discussions with users can also provide knowledge about them, in the recent literature there are studies searching ways to enhance this knowledge by employing different tools for engaging with users, because information provided by users is not only required in order to meet their needs, it can also inspire the designer. In order to enhance the knowledge provided by users, new methods, techniques and tools are targeting to elicit their needs by making them easier to express their ideas and by directing them to express their needs considering their experiences and the context of use. In these research activities, generally, tangible and visual tools are

given to users to express their ideas or they are given them in order to constitute a subject for discussion. These activities are helpful for expressing ideas beyond linguistic restrictions (McDonagh *et al.,* 2002). Furthermore visual tools are beneficial in the design process since they ease the communication in the design team and constitute a channel for expressing ideas (Stappers and Sanders, 2005). Sleeswijk Visser *et al.* (2005-a) claim that written reports are not suitable for designers to be used in the design process, and do not match their visual thinking process, therefore these new tools can be suitable while communicating the results of the research with designers.

Methods, techniques and tools identified in the literature review are various regarding their character. Some of them are used for obtaining information about users' experiences related with a task, their tangible and intangible needs, in order to form required knowledge for *generating* ideas and developing products, which address users' needs. Some are used for *evaluating* a product or a design concept in terms of its suitability of user needs and expectations. In addition to these, some of them are *scenario based* that are performed to represent experiences of users and can be applied with both generative and evaluative purposes. Therefore in this study these methods, techniques and tools are classified as (1) generative methods, techniques and tools for exploring users' experiences, tangible and emotional needs; (2) evaluative methods, techniques and tools for examining responses of users towards products; and (3) scenario based methods, techniques and tools for representing experiences of users.

3.1 Generative methods, techniques and tools: exploring experiences, tangible and emotional needs

3.1.1 Probes: Exploring people's lives through probe packages

The method 'Cultural Probes' is developed by Gaver and his colleagues (Gaver, Dunne and Pancetti, 1999). Probes are packages that contain tools for accomplishing intentionally designed tasks, which are assigned to selected participants, in order to get inspirational data and information about individuals and their lives. These packages composed of tasks, which are designed and planned according to the aim of the research. These packages with assigned tasks are left with individuals, in order to lead them to record their experiences, ideas, and feelings related with their domestic life (Domestic Probes of Equator – Interdisciplinary Research Collaboration); their experiences of certain tasks (experiences of waking up, Wensveen, 1999); or their communications and relations with family members (interLiving Project, Westerlund, Lindqvist, Mackay and Sundblad, 2003). Gaver *et al.* (1999) claim that probe packages are similar to surgical or space probes, which are planned to return with data after a period of time.

Figure 3.1 A probe package containing tools for designed tasks (Equator – Interdisciplinary Research Collaboration Website).

Figure 3.2 A disposable camera, which has different assignments written on the back (Equator – Interdisciplinary Research Collaboration Website).
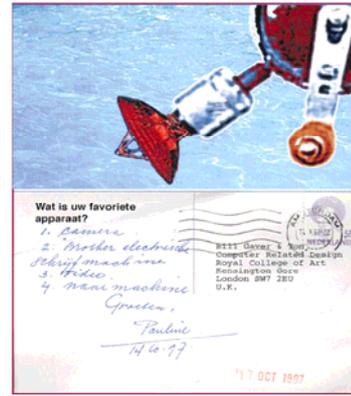
Figure 3.3 A postcard with visuals and questions aiming to communicate with the individual (Gaver *et al.*, 1999. p.23).

Ingredients of the probe package vary from disposable cameras, which has different assignments written on the back (Figure 3.2), probe diaries, postcards with visuals and questions aiming to communicate with the individual (Figure 3.3); to more case-specific tools like portraits, which are planned to be selected for representing the family tree of the individual's alarm clock (Figure 3.4).

Figure 3.4 Portraits, which are planned to be selected for representing the family tree of the individual's alarm clock (Wensveen, 1999. p. 25)

Probes are for environments and users that are difficult to observe. Hemmings *et al.* (2002) point out that this method is useful especially for "sensitive settings", like sheltered housing residents and their staff, as well as it is helpful for reaching profound information about people's everyday experiences. Entering people's houses for observation of their daily tasks can be disturbing for them, thus this method proposes a way to explore their lives and experiences in a remote way. Furthermore the participants can record required information during or after the event that causes experience, therefore useful details about individuals and their lives would not be lost (Wensveen, 1999).

According to Hemmings *et al.* (2002), designing and planning probes requires certain skills that can be managed with existence of a designer in the research group. The tools in the packages are designed in a way that they can be found enjoyable by participants, in order to "reduce the distance between the designers and the participants through the probe packages" (p: 190). Since the designer is required to participate in the research activity, he can empathize with users; and without any dealer, he can directly gain the inspirational data about the users to be used in the design process. Gaver *et al.* (1999) suggest that when designing probes, individuals, who are the subjects of the study, should be considered different from stereotypes. In their study with elders, they rejected the thought that elders are "needy" or "nice", and in return they found out a range of non-stereotypical profiles for elders, such as they can serve as local information resources for history or current situations of their communities for guiding tourists.

Hemmings *et al.* (2002) define a schedule for probe design activity, which contain several stages.

1. Planning
2. Recruiting Participants.
3. Selecting Volunteers.

4. Assembling Domestic Probes.

5. Deploying Domestic Probes.

6. Retrieving and Analysing Probes.

7. Speculative Design. (p. 189)

Through these stages, probes are designed peculiar to cases. The design activity is considered as the extension of the whole process, and as it can be seen in the schedule specified by Hemming *et al.* (2002) after "retrieving and analysing probes", "speculative design" is defined as the last stage of the probe activity. In order to inform the design process, Gaver *et al.* (1999) acknowledge that the outcome of probe packages are not analyzed, instead they are documented to be used as inspirational data.

Although this method has many advantages and it provides in-depth understanding of users, their lives, and experiences, it can be seen as time consuming in design process. The time allocated for planning, designing, employing and analyzing the probes may be conceived considerably long for designing an individual product.

3.1.2 Mood boards and collages: Use of images to represent emotions and needs

Mood boards are generally defined as purposefully assembled images to represent or communicate a mood. Generally they are used in the product design process with different purposes by the designer. They are used for communicating intangible and abstract emotions evoked by the brief *with the product design team* (Garner and McDonagh-Philp, 2001; Bruseberg and McDonagh, 2005); inspiring the designer and the design team; helping them to define the context, generate ideas, and structure the mental representations related with the context (McDonagh and Denton, 2005); and assisting in problem finding and solving in the design process (Garner and

McDonagh-Philp, 2001). Besides these purposes, mood boards can be performed *with users* as a tool for communicating their intangible needs, abstract relations with the product and context of use, and their experiences in relation with usage (McDonagh-Philp *et al*., 2002; Bruseberg and McDonagh, 2005; Bruseberg, McDonagh and Wormald, 2002).

Collages and mood boards are both collections of images for a certain purpose, however *collage* is a more broad term than *mood board*. *Collage* is simply composition of images. Actually, mood boards can be considered as collages for representing and communicating a mood or emotional responses. Although these two terms differ slightly in terms of their content, their usage are the same in user research practice. Collages are used for user research with the same purpose as mood boards, i.e. eliciting emotional responses, understanding their past experiences and their feelings about those experiences (Stappers and Sanders, 2005). In this study the term *mood board* is adopted, since the purposes of the case studies, which will be presented in Chapter 4 are closer to the aims of mood boards.

Van Rompay and Hekkert (2002) claim that collages can reveal how people experience emotions, since they involve metaphorical expressions. For the term metaphor they adopt the definition given by Lakoff and Johnson (1999): 'understanding one thing in terms of another'. As for communicating emotions through collages or mood boards, this means an emotion expressed in terms of an image of a tangible thing, such as *anger* expressed in terms of *fire*. Therefore images can be used as metaphors to express intangible emotions and needs, which are difficult to be verbalized by the user.

In mood board and collage activities, participants are given a set of images, a poster board, glue, scissors, colored pens, and sometimes a set of words. Sometimes computer is used as a medium for composing collages by providing diverse range of images and easing the process of selecting images and words. In these activities participants are given open

instructions, in order to make them feel comfortable with the activity, which may seem difficult to them (Stappers and Sanders, 2005). McDonagh *et al.* (2002) suggest that before performing the activity with users, it would be beneficial, if the research team test it with the selected image set, in order to check its appropriateness to the activity. When employing mood boards with users, it is important to select suitable images, which will be given to the participants. Sleeswijk Visser *et al*. (2005-b) assert that it may seem appropriate to give participants magazines for offering wide range of images to them, however they can confuse or distract participants. In order to compose an image set for the collage activity, Sleeswijk Visser *et al*. (2005-b) propose certain guidelines:

- The image content is diverse (e.g. nature, people, animals, interactions, fantasy, objects) and has different contexts (work, home, holiday, emotion, thoughts, etc).
- People in the images reflect diversity in age, gender and race.
- There is a balance between positive and negative images and between concrete and abstract images.
- Over-aesthetic images or print-quality images are avoided. [...] it [the image set] needs to show diversity in order to stimulate the participants while gazing through the set of images.
- Subject-related images (e.g. an image of a shaving man for the experience of shaving) may be necessary but should be kept to a minimum. These images may help the participants to get started, but the participants must be able to create their own shaving context on the collage.
- Many, but not necessary all, of the images are open to interpretation since participants have to tell their own stories with the images and words. Ambiguous images are interpreted in many different ways, which is useful for helping the different participants express their feelings and dreams. (p. 130)

After the preparation of mood boards or collages, participants are asked to present outcomes verbally. Explanation of images can provide insight about their experiences and feelings, which may be otherwise ambiguous and difficult to analyze (Stappers and Sanders, 2005; McDonagh *et al*., 2002).

Descriptive words, which are written or glued to poster boards, are also helpful in interpreting the outcomes (Bruseberg and McDonagh, 2005).
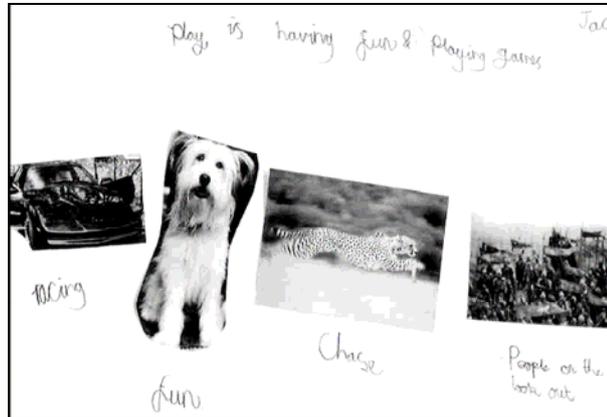
Figure 3.5 A mood board with descriptive words prepared by a child about "What is play to you?" (Bruseberg and McDonagh, 2005. p. 4).

For a more formalized research and easing the process of scanning images, the choice of images for mood boards are restricted by asking questions to choose images among image sets (See Figure 3.6), (McDonagh *et al*., 2002). These images may not provide in-depth information about the participants' feelings or needs as in mood boards composed by themselves, however McDonagh *et al*. (2002) acknowledge that expressing reasons of choosing images as response to questions may prepare the participants for focus group discussions.

Questions	Mood Board Used	Questions	Mood Board Used
Which image resembles your mood whilst ironing?		Which image best resembles the environment that you iron in?	
Which image would you like to resemble your mood whilst ironing?		Which image best represents the environment that you want to iron in?	
Which image represents your current iron?		Which image represents the future of ironing?	
Which image would you like to represent your current iron?			

Figure 3.6 A mood board with questions and restricted choices (McDonagh *et al*., 2002. p. 238).

It has been stated that mood boards are suitable tools for incorporating in other research activities, such as focus groups (McDonagh *et al*., 2002). Furthermore, Stappers and Sanders (2005) suggest that collage activity can be combined with many research techniques such as 3-D Velcro – modeling which will be mentioned in Section.3.1.4.

Mood board activity provides both visual and verbal outcome, which has profound information about users' feelings and past experiences in order to conduct with the design process.

3.1.3 Mind mapping

Mind mapping (Buzan and Buzan, 2000) is a specialized way of taking notes about a topic, which includes all the relevant issues regarding the subject of the study in a structured graphical representation. In this graphic, the topic is placed at the center and related issues with the topic are categorized around the center. Sleeswijk Visser *et al.* (2005-b) use this technique for brainstorming about all the issues related with the research topic prior to the research activity (exploring shaving experiences of men, see Figure 3.7).

Figure 3.7 A mind map about a research subject prior to the research activity (Sleeswijk Visser *et al.*, 2005-b. p. 141).

Also, mind mapping can be performed with users in generative research activities, in order to investigate their experiences related with a product or system (Stappers and Sanders, 2005, Stappers and Sanders, 2002, Sleeswijk Visser *et al.*, 2005-b, and Sanders 2001). Representative users are given a mind mapping tool kit, which is composed of colored shapes, which range from simple to abstract forms, glues, colored pens, descriptive words, glue, scissors, and a poster board. With the given material, they are asked to represent their past experiences or future expectations related with the subject of the research. For example, they are asked to express "one of the routines they often do in the kitchen" (Sleeswijk Visser *et al.*, 2005-b) or they are asked to compose mind maps with given instructions like "use these shapes and words to show how you would like to work in your ideal world" (Stappers and sanders, 2005).
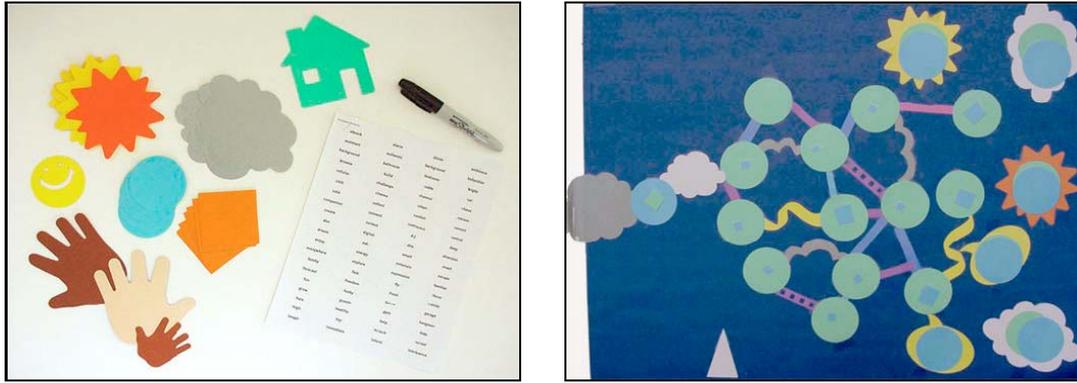
Figure 3.8 Mind mapping tool kit for users and an outcome of a mind mapping activity crafted by a user (Stappers and Sanders, 2005. p. 7).

3.1.4 Drawing or shaping the ideal product: Eliciting user defined problems through conceptualization activity

As it is stated previously, in order to learn their needs and problems related with products, users can be consulted. Since they become experts in using the product and on the usage context, they may have ideas about how the product should be so as to get better performance. While trying to elicit their needs and opinions, directly asking them what they think or what they expect is not an appropriate way to learn their needs, because users may have difficulty in explaining them. Thus, they are given tools and tasks to express their thoughts. Drawing or shaping the ideal product is one of them, and by conceptualizing a product, they can explain their ideas and expectations related with the usage and the product. Since it is hard for users to conceptualize a product and its usage, they are given instructions in order to direct them to form mental images of the usage context and their experiences. These instructions are generally expressed within additional stages prior to the drawing or shaping the ideal product activity.

Figure 3.9 An example of a drawing made by a participant of "drawing the ideal product" activity (Bruseberg and McDonagh, 2005. p. 4).

Bruseberg and McDonagh (2001, 2005) employ "drawing the ideal product" activity in focus group research as a way to understand users' aspirations. Since the expression is both visual and verbal, they claim that it provides a different way to communicate users' ideas and constitutes "excellent visual stimuli for designers."

Figure 3.10 Velcro modeling tool kit composed of simple shapes and sizes (Stappers and Sanders, 2005. p. 7).

Figure 3.11 A low-tech prototype done by a child in the workshop of interLiving project (Westerlund *et al.*, 2003. p. 8).

Drawing activity can be a difficult task for users. Although they are not asked to create high quality drawings, they may be concerned about the outcome (Bruseberg and McDonagh, 2001). It may be easier to express their ideas three-dimensionally with materials such as modeling clay. There are also Velcro modeling tools, which are composed of simple shapes and sizes. By combining shapes and composing artifacts with these shapes, users can communicate their ideas easily in a short period of time. Furthermore the sources indicate that users can generally conceptualize and express the function of each part used in the final artifact (Stappers and Sanders, 2005).

The generative methods, techniques and tools, which are mentioned so far in Section 3.1.1 to 3.1.4 are used for eliciting emotional needs of users, and provides profound knowledge about them with both verbal and visual outcomes. However few sources address how to analyze these methods, techniques and tools. Sleeswijk Visser *et al.* (2005-b) name them as contextmapping activities. These generative tools have visual outcomes, which are produced by participants in order to express their experiences. The verbal expressions of these visual outcomes are important, while analyzing the studies. In SonicRim, which is a design research firm experienced in such generative research activities, there are experts specialized for each activity to document, summarize, and analyze the outcome of each one, then they share their analysis and insights to constitute the knowledge gathered from the study (Sleeswijk Visser *et al.*, 2005-b). In order to communicate the data with the design team, Sleeswijk Visser *et al.* (2005-a) propose a tool – the personal card set, which allows the design team to interpret the data obtained from the studies. In these card sets, outcomes of the activities are presented in a structured format, in which the subjects of the study are introduced with an identity; their comments, explanations of the subject of the study and the artifacts they made; and related visuals.

3.1.5 Visual databases for designer's use

Pasman and Stappers (1999) note that in the concept generation stage of product development process, designers explore the existing designs, in order to gather information and to constitute a resource for inspiration. While doing this, classifying the existing products based on their attributes would be helpful in communicating this knowledge. Moreover, Wu and Johnston (2004) argue that building a visual database including visuals, which are categorized according to keywords related to specifications, properties, and characteristics concerning the visual references, may be helpful in conceiving the product language, and thus it can help designers to generate comprehensive visual references while designing products.

In order to create such a database, Pasman and Stappers (1999) propose a tool called Multidimensional Scaling (MDS)-Interactive. It is a system by which the researcher or the designer can create his product databases composed of different designs of a particular product and he can modify it. With MDS-Interactive Software (See Figure 3.12), sample products, which the user of the software inputs the system, are arranged by positioning the similar products closer concerning the selected similarity criterion in the interface. For example, if "form" is selected as the similarity criterion, sample products should be arranged considering this criterion. After the arrangement of all sample products for each similarity criterion, the user of the software can view the final graphic representations, and study the relations of product samples according to their similarity of visual references.

Figure 3.12 MDS-Interactive Software interface and its features (Pasman and Stappers, 1999. p. 417).

Another example of a visual database is RealPeople (Porter, Chhibber, Porter and Healey, 20005), which is a database composed of user profiles and characteristics, and can be browsed by entering keywords related to the research subject and user profiles. By this way, range of user profiles can be reached together with the in-depth data about their favorite products, lifestyle information, and product style choices, including written descriptions, images and videos. This data is gathered through interviews done with a range of real people. Chhibber, Porter, Porter and Healey (2004) claim that although designers are aware of the importance of identifying users' needs in order to satisfy them, they have generally limited time and budget to accomplish such a user centered practice. Therefore RealPeople is introduced as a tool for covering this need by presenting easily available data about range of people (Porter *et al.*, 2005).
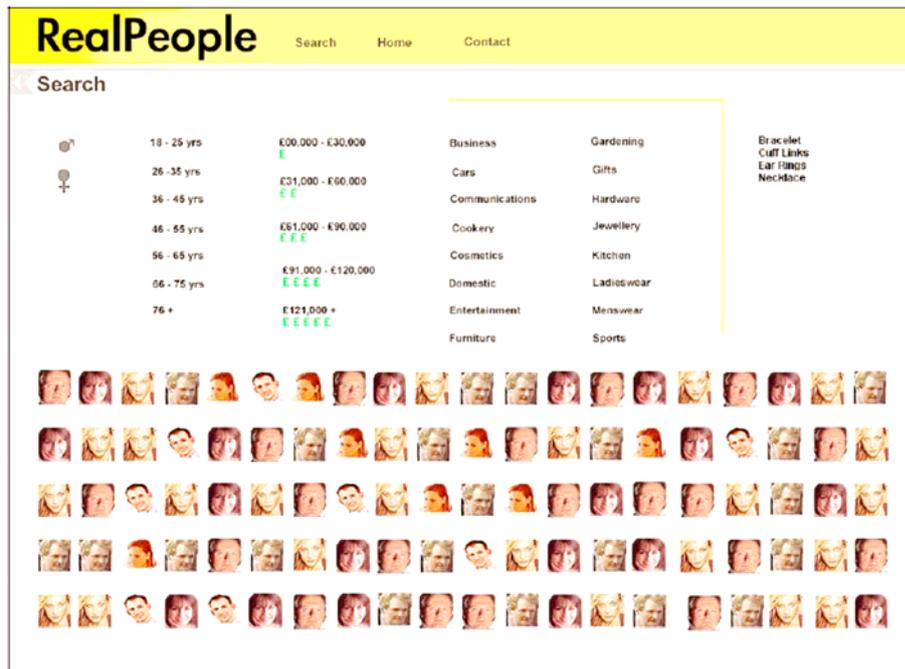
Figure 3.13 Search page of RealPeople indicating categories and photographs of people in the database (Porter *et al.*, 2005. p. 5).
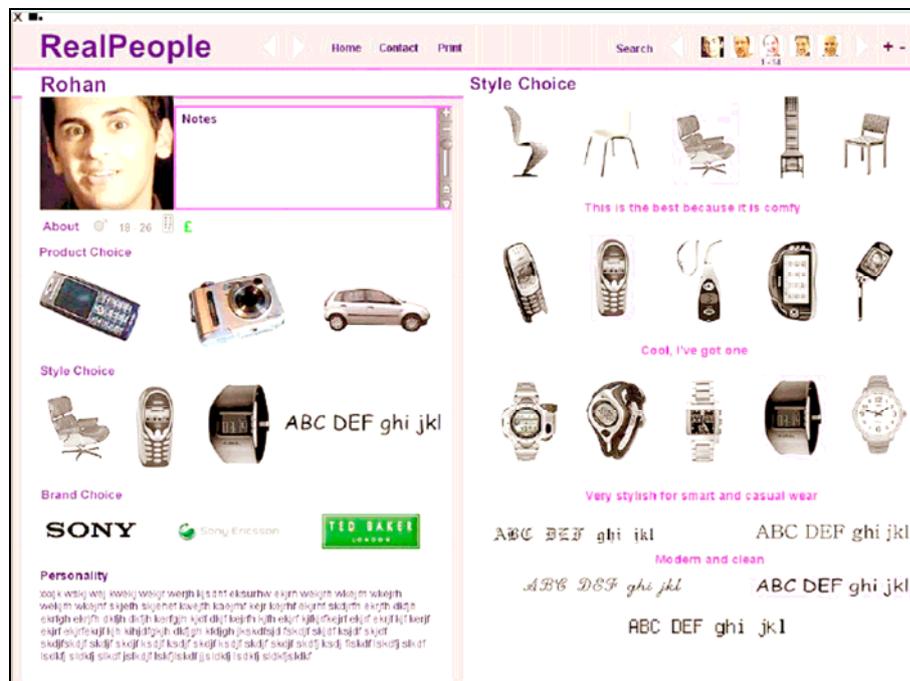
Figure 3.14 A home page for a subject in RealPeople (Porter *et al.*, 2005. p. 7).

3.2 Evaluative methods, techniques and tools: examining responses towards products

3.2.1 Product evaluation questionnaires

Initial visual impression of products is an important factor that may directly affect purchasing decisions of customers. People generally decide to buy a product considering the visual references, which it denotes. Therefore analyzing those initial visual impressions is crucial, before placing the product in the market. In order to evaluate the product in a quantitative manner, some questionnaire-based tools are developed for obtaining responses about products, generally for conducting with focus group discussions (Bruseberg and McDonagh, 2002; Bruseberg and McDonagh-Philp, 2001; and McDonagh *et al.*, 2002). Product handling (Bruseberg and McDonagh, 2002) is one of these tools. Participants of the product handling questionnaires are asked to evaluate some product samples based on a retail showroom scenario, where there is a limited time to consider which product to buy. By this way, "gut" reactions and initial impressions can be elicited. In these exercises, participants are given three-dimensional product samples and limited time to test the product usage and to consider the suitability of the product to its intended usage.

Visual product evaluation questionnaires (Bruseberg and McDonagh, 2002) are similar to product handling questionnaires. They involve almost same criteria for evaluating products, except only two-dimensional representations of products are available in these ones, like when purchasing from a catalog or internet (See Figure 3.15).

Figure 3.15 A visual product evaluation questionnaire (McDonagh *et al.*, 2002. p. 239).

Another form of product evaluation questionnaires is product personality profiling (PPP) (McDonagh et al., 2002), which is a technique that proposes means to learn, to which segment the user assigns the product. In these activities, the participants are asked to consider the product as a real person, and assign the attributes of this person concerning the visual appearance of the product (See Figure 3.16). This technique is used especially evaluating the suitability of the developed concepts to the targeted user group.

Figure 3.16 A product personality profiling questionnaire with user responses (Bruseberg and McDonagh-Philp, 2001. p. 442).

3.2.2 Measuring emotions

Desmet (2003) points out that an emotion, which a product arouses, is generally caused by a range of emotional responses; that is, products elicit combination of emotions, which can be named as mixed emotions. For example, in order to arouse an emotion, like "fun", the person may experience a range of emotions, such as desire, surprise, curiosity, amusement etc.

Desmet (2003) refers non-verbal (objective) and verbal (subjective) instruments for measuring emotions ranging from "simple pen-and-paper rating scales to dazzling high-tech equipment that measures brain waves or eye movements". Non-verbal instruments are generally based on measuring physiological changes in human body. Therefore they are language-independent and objective, however they can only assess basic emotions,

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and they are not suitable for evaluating mixed emotions. The verbal protocols used with verbal instruments are suitable for measuring mixed emotions and they can elicit "the participants' own assessment of the emotional experience", however the verbal expression of emotions may differ from culture to culture, and one verbal expression may not have one-to-one corresponding meaning in another language.
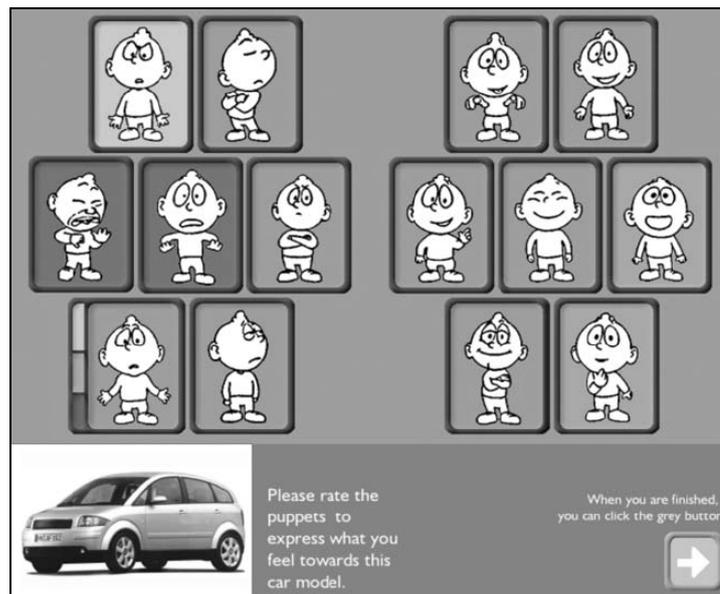
Figure 3.17 PrEmo interface (Desmet, 2003. p. 115).

In order to measure emotions, which are evoked by products, a tool called Product Emotion Measurement Instrument (PrEmo) is developed by Desmet (2003). PrEmo is generated based on the thought that facial expressions and gestures can represent emotions better than verbal expressions, and since the tool uses visual representations to evaluate the product, it is language-independent. Desmet (2003) explain the tool as follows:

PrEmo is a non-verbal self-report instrument that measures 14 emotions that are often elicited by product design. Of these 14 emotions, seven are pleasant (i.e. desire, pleasant surprise, inspiration, amusement, admiration, satisfaction,

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fascination), and seven are unpleasant (i.e. indignation, contempt, disgust, unpleasant surprise, dissatisfaction, disappointment, and boredom). Instead of relying on the use of words, respondents can report their emotions with the use of expressive cartoon animations. In the instrument, each of the 14 measured emotions is portrayed by an animation by means of dynamic facial, bodily, and vocal expressions. (p.115).

Each animation has three ratings representing "I do feel the emotion," "to some extent I feel the emotion," and "I do not feel the emotion expressed by this animation." After the evaluation by participants, selected emotional representations are calculated for each product sample, and the outcome is illustrated with graphic-charts.

3.3   Scenario based techniques: Representing experiences

3.3.1   Scenario Building

Scenarios are widely used in product development activity by design practitioners. Designers intuitively place themselves in the user's position and try to forecast possible situations, in which the user has problems or needs related to the usage context; then they aim to come up with solutions that can be positioned in those situations, in order to cover the needs and to solve the problems of users. While offering solutions, the scenarios, in which benefits of proposed solutions are expressed, are built. Such scenarios are instinctively produced by the designer in the product development process. As a design research method, scenarios are more systematically produced in the product development process, in order to "visualize, or in some way "make real" the quality of people's experiences in interaction with potential products or systems, to support interdisciplinary team learning about use and contextual issues, before committing substantial resources to development." (Suri and Marsh, 2000. p.152).

Scenarios are basically "fictional" stories, which involve "users, activities, events and environment", and make possible to conceive needs of potential users and to evaluate product concepts set in a context of use, generally in the initial stages of product development (Hasdoğan *et al.*, 2006; Suri and Marsh, 2000). Scenarios are used in "need identification, concept generation, design and communication" phases of the product development process (Hasdoğan *et al.*, 2006). They are used for conceiving and communicating present or future conditions, needs and expectations of potential users with regard to the context of product use; personification of the user in order to be able to empathize with him; and evaluating and communicating the proposed design solutions with the design team (Suri and Marsh, 2000).

Moggridge (1993) defines four stages for user centered design process, which involves scenario building activities. These stages are *understand*, *observe*, *visualize*, and *evaluate*. First the design team needs to *understand* user experience in relation with the products or the context of use, then real people – potential users of the product – should be *observed*. Observation is the essential step for getting to know the user and to understand him. After that, with the observed situations and characters in mind, different scenarios – and the product – are *visualized*. Finally, the product is *evaluated* with the real users. Suri and Marsh (2000) describe a similar process for building scenarios. They define the first stage as "identifying the range of users, goals, tasks and activities" based on observation and research about users and the context of use. Then considering the knowledge available and future trends related to users' lifestyles and the context, the elements that are required for developing a strategy and plan for building scenarios can be extracted and organized. These elements are "set of specific individual users, detailed with respect to personal characteristics, lifestyle, motivations and circumstances, […] assigned issues, tasks and situations, derived from research [to these individual characters], […] well-defined proposition [or] […] loosely defined concept [of the product]" (Suri and Marsh, 2000. p. 152). Finally according to these strategies and plans, the story can be made.

Moggridge (1993) claims that scenarios can be developed focusing on design objectives and proposals or a particular character and his/her specialties regarding the aim of the scenario. While building scenarios, the characters have the main importance. As he points out designers can reach anthropometric and demographic data about users, however there might be no existing data about psychological characteristics. Therefore he suggests that knowing range of people's characteristics would be helpful, while making scenarios.

3.3.2 Personas

Personas are basically detailed descriptions of fictional characters generated for representing potential users that might be also used in scenarios. As stated earlier, since the characters have the main importance while building scenarios, creating personas are helpful in the process of building scenarios. Grudin and Pruitt (2002) defines personas, and their relation with scenarios as:

> Personas are fictional people. They have names, likenesses, clothes, occupations, families, friends, pets, possessions, and so forth. They have age, gender, ethnicity, educational achievement, and socioeconomic status. They have life stories, goals and tasks. Scenarios can be constructed around personas, but the personas come first. They are not 'agents' or 'actors' in a script, they are people. (p.3)

They argue that scenarios with personas are more engaging and much easier to remember compared with the scenarios without personas. Such detailed description is made in order to create a persona just like a real person. Therefore the design team can consider this persona as a real user of the product. Because of this description, they can get to know the

persona; and they are able to predict persona's behavior, thus they can create meaningful scenarios related to him/her.

Usage of personas is beneficial especially when the user's emotions, feelings and frustrations towards the product are important and user representatives are not available to consult. In situations like this, personas can be created, in order to present observed and forecasted behavior of users (McQuaid, Goel and McManus, 2003). Furthermore, personas can be used in order to start the discussions related to the features of the products and their relations with the personas, such as questions like "Would Dave use this feature?" could help design team to improve and generate design ideas (Grudin and Pruitt, 2002).

3.3.3 Play-acting and Performances

Sometimes building scenarios or creating personas to personify the users may be insufficient to represent and explore experiences of users especially when the interactive systems and products are the issue (Iacucci, Iacucci, and Kuutti, 2002). Buchenau and Fulton Suri (2000) acknowledge that designers and researchers are searching methods, techniques and tools to enhance the ways to conceive how the potential user of the product will experience the designed product and how he will interact with it. In order to do that, experiences can be prototyped or modeled by active participation of users, clients or designers. This may be achieved by play-acting and performance activities with these groups of people by creating circumstances and situations to produce experiences related to the product and the context of use (Buchenau and Fulton Suri, 2000). In their study about the train journey Buchenau and Fulton Suri (2000) aim to prototype experience of a train journey, in order to investigate and conceive the needs and expectations of passengers related to a new rail service. In this study the product development team are given cards, on which there are written

instructions of tasks, like "Be hungry – Try to find something to eat", and members of the team try to role-play the instructions with improvisation. This activity aims to *explore* experiences, needs and expectations of users related to a service. Besides *exploring*, Iacucci *et al.* (2002) assert that play-acting and performances can be helpful in *communicating scenarios* and *testing scenarios and concepts* with or without users. Communicating scenarios with play-acting is helpful especially in presenting brand-new products, which are unfamiliar with the potential users. For evaluating such products, Sato and Salvador (1999) propose a technique – focus troupes to engage in focus group sessions. They explain the challenge of evaluating a brand new product as follows:

> Generally researchers are responsible for characterizing the product […] and creating a shared context of use […] to focus the participant's wants, needs, and perceptions. Providing a shared context is relatively easy if the product is an improvement on an existing object, for example a cloths washer, since subjects have some previous understanding about how they used clothes washers. The researcher's challenge comes when a new product with no precursor is introduced. (p.36)

Focus troupes are basically presentation of the brand-new product by play-acting a scenario with actors or players, in order to make the representative users in the focus group session conceive the product usage. Focus troupes are like science fiction movies, in which the fictional products are presented in a fictional context, which makes the product coherent for the audience (Sato and Salvador, 1999).

CHAPTER 4

CASE STUDIES

Importance of user knowledge as an input for the design process was stated in Chapter 2, and methods, techniques and tools for eliciting user needs and user information were reviewed in Chapter 3. Based on the findings from the literature, two techniques are selected to be employed in the fictional cases, in order to answer the key questions of the study. By performing these fictional cases, these two techniques are developed into a procedure with additional activities. In this chapter, development of this procedure will be described by presenting these three fictional cases with their planning, organizing and analyzing processes.

4.1 Aim of the case studies

The general aim of these case studies is to investigate the ways by which users can be directed to express their problems, ideas and needs in relation with the context of product use and the product itself, so as to provide user information input for the design process. In order to achieve this aim, users are lead to experience creative activities, so that they can state their problems and needs by revealing their past experiences and future expectations regarding the context of use.

The aims of the case studies are modified to some degree from Case study 1 to Case study 3 by considering the processes and the outcomes of the studies. Case study 1 constitutes the pilot study of this research activity, and its aim is more focused on visual considerations and intangible needs of the user, however outcomes of the study revealed that there are different important aspects in relation with the user's needs and experiences, which should be also considered while performing these studies. Therefore in Case study 2 and Case study 3, the aim is broadened by considering these aspects.

4.2   Selection of techniques for the case studies

Two techniques are selected for performing case studies, namely mood board and drawing or shaping a product by users. Shaping a product activity is chosen as the major activity, since one of the main purposes of the study is to direct participants to conceptualize a product by considering their needs, experiences, and problems related to the context of use. While conceptualizing products and shaping them in 3D or 2D form, participants can express solutions to their design related problems, and this can be helpful in conceiving their problems and needs.

In order to lead the participants to conceptualize a product, they need to be prepared by directing them to consider the context of use. Performing mood boards with users is a suitable technique for this aim, since it can provide knowledge about their past experiences and feelings towards products (McDonagh *et al.*, 2002; Stappers and Sanders, 2005), and in order to compose mood boards they need to consider those aspects together with the context of product use.

These fictional case studies are composed basically of two stages, which are preparation stage and concept development activity. In Case study 2 and

Case study 3, in addition to mood boards, the preparation stage was broadened by including additional preparatory activities. In the following sections, these case studies are presented in detail, and the activities of the case studies are demonstrated in Table 4.1.

Table 4.1 Case studies

Case Study 1: Workshop performed with young educated people

    Part 1: Conceptualizing and drawing a beverage or drink container for personal use

    Part 2: Conceptualizing a "Device for listening to music"

- Mood board activity related to the theme "listening to music"
- Conceptualizing and shaping a device for listening to music in 3D form

Case Study 2: " Casual bag" workshop performed with middle-aged housewives

- Preparation activity – "Inside the bag" collage
- Mood board activity related to the theme "shopping"
- Conceptualizing and shaping a casual bag that would be used while going to shopping

Case Study 3: "Communication device" workshop performed with young male engineers

- Preparation activity – "Who are you talking with?" charts
- Mood board activity related to the theme "communication"
- Preparation activity – "Who? – With whom? – Where?" boards
- Conceptualizing and shaping a communication device

4.3 Case Study 1: Workshop with young educated people

As it is stated before, this case was planned as a pilot study of this research. Therefore the participants were chosen according to ease of their availability and they are mostly friends of the author. The group is composed of young educated people, who do not have design education.

The aim of the case study is

- exploring the ways by which the participants can define their intangible needs and problems, and express their visual considerations and preferences in relation with the subjects that were given to them for performing activities, in order to obtain the user knowledge as an input for the design process,
- examining appropriateness of the techniques for obtaining information about the potential users, which the study is intended to provide.

The case study is composed of two different concept development activities, because in this initial study one of the aims is to test suitability of the techniques for obtaining the intended information. Therefore two different topics were chosen and two different techniques were tested with these topics, namely drawing and shaping activities by users. At first, participants were asked to develop a concept beverage or drink container, and try to *draw* it. This activity was planned to observe how participants handle the drawing activity. After this activity, they were asked to compose a mood board in relation with the theme "listening to music", in order to direct them to consider the context of listening to music. This stage was designed as a preparation activity of conceptualizing a "device for listening to music" and *shaping* it in 3D form.

4.3.1 Planning the case study

4.3.1.1 Part 1: Conceptualizing and drawing a beverage or drink container for personal use

Selecting the subject for concept development and drawing activity
Since the participants might have difficulty in drawing their ideas, an uncomplicated product, which might be conceptualized as a simple shape,

was chosen as the subject of the activity. By this way, it could be possible to express their needs and visual considerations easily. In order to be able to elicit intangible needs and visual preferences of the participants, the product, which was chosen as the subject of the concept development and drawing activity was described as a personal product. A beverage or drink container for personal use was decided as the subject, since it could correspond these considerations.

Formulating the brief of concept development and drawing activity

When formulating the brief of the activity for directing the participants to conceptualize a beverage or drink container, it was emphasized that the container was for their personal use, and they should consider their favorite beverages or drinks, while designing the concept product. Since the drink or beverage was the participant's favorite, s/he could specify different aims and problems related to the product, or express his/her needs and visual preferences. In order to ease the process of conceptualizing the container, they were directed to consider the usage of the container by pointing out that the usage of the product should be considered, while drinking or carrying the beverage or drink. Moreover, some specific examples were given for the beverages or drinks, which could be chosen as the subject for their designs, by expressing them according to their types – whether they are served cold or hot. This was planned to help them in specifying their subjects for the activity by considering their physical attributes. The activity brief was expressed as follows:

> Imagine your favorite beverage or drink, and design a container for it. This container will be used both for drinking that beverage or drink, and for carrying it. It will be for your personal use, so you should consider what you like, what your preferences are. The beverage or drink can be a hot drink like tea, coffee, cappuccino, or it can be cold like cola, alcohol drink, fruit juice or milk.

4.3.1.2   Part 2: Conceptualizing a "Device for listening to music"

Selecting the theme for the mood board activity

A general theme for the activity was specified so as to prepare participants for the concept development activity by directing them to consider the context of use. Therefore this theme was named as a general activity, in which the subject of the concept development activity would be used. In this case, "listening to music" was decided as the theme of Part 2 of the workshop, since it is a general theme, which could direct participants to think about the context of "listening to music".

Selecting the subject for conceptualizing and shaping activity

The subject for the concept development activity was planned as a personal product, however this time it was not expressed as personal, while naming it, because participants might have general ideas, which might not be for personal use, thus it was avoided to restrict their imagination. While identifying the subject of the activity, it was important not to name it as an existing product, since this could limit their ideas and imagination. Therefore the subject was named as "device for listening to music" instead of identifying as a specific product, such as an MP3 player or portable CD-player.

Formulating the brief of the mood board activity

Without mentioning about the concept development activity, participants were asked to prepare mood boards considering the theme "listening to music". By this way they were led to think the general meaning of the theme for them, which could be helpful in considering the context of the product use without getting stuck in thinking about the product itself. As a result the brief was expressed as follows:

From the given images, select the ones, which you find relevant with the theme "listening to music", think about what it means to you, and prepare a collage with these images. You will briefly explain your collage later on.

Formulating the brief of conceptualizing and shaping activity

Since the mood board activity was planned to prepare participants by leading them to consider the context, in the conceptualizing and shaping activity the brief was only focused on expressing the task of the activity by stating the name of the subject of the concept development activity. Thus the brief stated as:

Imagine a device for listening to music, and shape it by using colored play-dough. You can also use cardboards and colored pencils to color them. After finishing this activity you will briefly explain the outcome.

Selecting materials and the image set for the activities

In order to perform the activities, some stationery tools, which are colored pencils, colored markers, erasers, scissors, glue, drawing paper, cardboards, staplers, and scotch tapes were provided. For the conceptualizing and shaping activity, colored play dough was supplied to the participants, since it could be easy for them to express their thoughts with such a tool, and it was presumed that the outcomes of this activity would be suitable for representing with play dough.

The image set for the mood board activity was composed of approximately 150 images. They were searched in the Internet. Many of them were searched by using keywords *listening* and *music*. These subject-related images were chosen according to diversity of people, activities and themes in the images. Besides, images of different places, activities, objects, views from nature, animals, and some abstract illustrations and photographs, which were not directly related with the theme of the activity, were also included in the image set. Some magazines were offered to the participants for using images in them, however they did not consider using them.

4.3.2 Performing the workshop

Participants

There were three female, and two male participants, who were between 21 to 25 years old. Two of them were students at university, while others were graduates, and employed in different companies. All of them had different educational backgrounds: Three of the subjects knew each other before, and two of them have just met with others. Moreover, the author knew three of the participants before. The names of the participants are kept confidential, and they are represented with the letters from A to E.

The workshop environment and atmosphere

The study was carried out on a Sunday noon till the evening, and took approximately five hours. It was performed in a house and in a friendly atmosphere. During the activities, subjects were having conversations, joking and laughing time to time. They were willing to participate in the study, besides that they regarded the study as a leisure activity, and they found it entertaining. Drawing part was carried out on table, and then they preferred to move to the other side of the room and performed the later parts on armchairs and on the floor. Snacks and beverages were served to participants during the activity, they were allowed to smoke, and there was a background music one of the participants chose.

Recording

Due to some technical constrains, the workshop was not video-recorded, and only the presentation about the outcomes could be tape-recorded. Therefore the outcomes of the study are limited to the visual outputs, voice recordings of the participants' presentations and the author's notes.

Figure 4.1 Case Study 1 – the workshop environment and atmosphere

4.3.3 Analysis of the outcomes

The outcomes of the workshop consist of 2D and 3D visual expressions of conceptualizing activities, mood boards in relation with the theme "listening to music", and the participants' statements about the outcomes. The voice recordings were transcribed for the analysis of the workshop.

Since the study aims to provide user knowledge for the design process, the designer should be involved in the study, so that he can get to know the user group and empathize with them. If the designer can be involved in the study, he can directly observe the outcomes and the activities, and make his own interpretations related to them. Moreover, he can reach the raw data, which may have valuable details for getting to know the user group (Bruseberg and McDonagh-Philp, 2000). Therefore the outcomes of the workshop should be documented for later consultation including the verbal expressions with related visuals. The expressions should be categorized according to stated emotions, defined problems and specifications of their concept products, and their visual considerations. Since this activity is a fictional case, it was not analyzed and documented entirely.

4.3.4 Discussions and limitations for the case study

Discussions regarding the outcomes and the overall process of the workshop:

In the case study, generally subjects were able to generate concepts and define problems in relation with the given brief without getting stuck on existing product ideas and stereotypes, and their statements about these works were helpful in conceiving their needs and problems. Participant B and Participant C were able to establish association between the mood board and the concept development activities; outcomes of these activities were consistent in these two of the works (See Table 4.2 and Table 4.3). Thus the mood board activity was useful for preparing participants for the concept development activity.

Table 4.2 A part of the documentation related to Participant B's mood board and concept product

Participant B's mood board related to the theme "listening to music"			
	Related images	Category	Verbal expression
		Emotional need: Need for privacy	Music is completely **special for the individua/** … in these two pictures, there is an empty place, where there is nobody. A place, where an individual can listen to music, and feel the mood, which he is in.
			…I think this resembles a very beautiful **musical dome.** You can enter inside … there is only music here, you can rest in it
Participant B's "device for listening to music"			
Related image		Category	Verbal expression
		Product specification	"My idea originates from that picture from the previous activity … a half sphere-shaped musical event, I mean **a studio** … it is in this shape, because **it provides acoustical perfection** … **a place for creating music**, and its name is Domestic."

Table 4.3 A part of the documentation related to Participant C's mood board and concept product

Participant C's mood board related to the theme "listening to music"	
	Related images

Category	Verbal expression
Emotional need: Need for companionship	"...These last three pictures here, now you discover music by yourself, and to some point you listen music alone, after that **you can share it with others**…"

Participant C's "device for listening to music"		
Related image	Category	Verbal expression
	Emotional need: Need for companionship	"...apart from that its most important feature is that it has two speaker outs, **two people can listen to music at the same time**, and it is a small thing, you can carry it with you..."

Although the study aims to investigate the ways by which users define their intangible needs and visual preferences, which are related to the emotional dimension of user product relation, outcomes of the study also includes

expressions and ideas in relation with the participants' tangible needs and problems concerning the operational dimension. In the drawing activity, Participant D defined an operational problem regarding a beverage (Table 4.4), and Participant B stated his product specifications based on the physical condition of the product (Table 4.5).

Table 4.4 A part of the documentation related to Participant D's beverage container

Participant D's beverage container		
Related image	Category	Verbal expression
	Defined problem and product specifications	"…This product is a Sprite and lemon mix container. **Usually, lemon goes up, it is very annoying**. You taste its particles, or the taste of lemon lefts in the upper part, when you drink the bottom you only feel the taste of Sprite. For this reason, I designed **something like a clip to fix the lemon at the bottom of the glass**…"

Table 4.5 A part of the documentation related to Participant B's drink container

Participant B's drink container		
Related image	*Category*	*Verbal expression*
	Product specifications	"…It is designed **for using in The Ice Hotel**. It is **a glass for cold stiff alcoholic drinks** … the plain surface of the glass is leaned against a wall of The Ice Hotel, so that the drink would not be warmed up … the amount of heat transfer would change according to the size of the surface area, therefore I think, because of the size of the surface, the drink would stay cold with this design…"

In the concept development and shaping activity, Participant D stated his ergonomic considerations about the usage of the product (Table 4.6) and Participant E noted that her concept product was designed to make the music player easier to carry, while playing sports (Table 4.7). These statements regarding the usages of the concept products can be useful in conceiving the participants' needs and problems in relation with the operational dimension.

Table 4.6 A part of the documentation related to Participant D's device for listening to music

Participant D's device for listening to music		
Related image	Category	Verbal expression
	Product specifications	"…It is **very ergonomic**. It can be held only in one position … it can be **used with one hand**. Voice is adjusted with pinkie. The thumb is placed on the speakers. The forefinger is on play and pause. The middle finger is on stop button, and the ring finger is on search button … **its coolest feature is its screen**, which is not on left or right side as in ordinary players, **it is thin-stripe shaped, and it is on the top of the player**…"

Table 4.7 A part of the documentation related to Participant E's device for listening to music

Participant E's device for listening to music		
Related image	Category	Verbal expression
	Product specifications	"…This is an Mp3 player for **using in sports centers**. It composed of a remote control and earphones. Earphones are wireless. After placing these in your ears, you **wear the other on your arm like a bracelet**. **This makes it easy to carry**. …"

The drawing activity took the longest time, because the participants spent considerably long time for illustrating and detailing their drawings. In addition to these, Participant B stated that he was concerned about his drawing skills. Therefore this activity is decided to be eliminated from the study for the next case studies, since it is time consuming, and subjects were more comfortable with play-dough.

During the drawing activity, Participant B was worried about his idea as being not good enough. The reason of this situation may be because the participants were not prepared for the concept development activity by performing preparatory activities.

Since the study is planned to be a pilot study, the chosen group was composed of participants among the people, who are easily accessible for the author. However, the group was easy to empathize with by designers, as they were young and educated people, and a popular market segment, which is well known for designers. Therefore another workshop should be also planned for, and performed with a less familiar user group for designers.

Discussions and limitations regarding the planning stage of the workshop:

The outcomes of the mood board activity were generally focused on the meaning of "listening to music", since the brief directs the participants to do so. Such an open-ended brief led participants to express abstract interpretations about the theme by making associations between images and their ideas regarding the theme. This outcome may be inspiring, however, in order to elicit participants' emotional needs and to conceive their experiences, the brief should be more focused on directing the participants to consider the context of use by stating specific directions in relation with their past experiences, and the context of use. Moreover the image set of the mood board activity should be composed of wider range of examples, so that they can evoke thoughts about different aspects in relation with the theme.

Besides the mood board activity, additional preparatory activities could be planned, in order to lead the participants to consider the context further, since these activities are helpful in conceptualizing a product for shaping activity. Also, the 3D shaping activity can include some additional tools, which suit the chosen subject's character. In addition to these, colors of the play-dough can be diversified.

Since a schedule for the workshop was not prepared before the activities, the workshop took a long period of time, and the timing was unbalanced between the activities. For example the drawing activity took the longest time whereas the shaping activity took the shortest, because participants rushed to finish the activity in the end, since the workshop was getting too long time.

Discussions and limitations regarding organizing and performing the workshop

In this case study, because of some technical restrictions, recording was not done properly. It is important to record whole process for later analysis, since the conversations during the workshop can include useful data about the user group. Moreover video-recording is necessary for observing the details of the workshop process and participants' expressions with their gestures and mimics.

While presenting the outcomes verbally, the participants were let free to express their ideas and thoughts in anyway they chose. Generally, they were not directed by asking specific questions, while explaining the outcomes. The verbal expression parts can be structured, according to the aims of the study.

4.4 Case Study 2: "Casual bag" workshop performed with middle-aged housewives

In this case study, the selected user group was middle-aged housewives, which are more unfamiliar to the designer compared with the user group of the previous study.

After observing the previous study and its outcomes, the aim of the study was broadened by including the inquiry for users' tangible needs and problems. Therefore the aim of the study was investigating the user groups' tangible and intangible needs regarding "casual bag" use in the context of shopping activity, and directing them to consider and define problems and solutions in relation with the context of use.

In this study, the main activity was conceptualizing a casual bag, which would be used while shopping. In order to be able to perform this activity, an additional preparatory activity and a mood board activity were planned, so as to prepare the participants for the concept development stage. At first, the additional preparatory activity – "Inside the bag" collage –was performed. In this activity, participants were given boards, which symbolize their bags, and they were asked to prepare their imaginary bags by drawing the items or placing the images of those items on the boards. Also they were asked to pretend that they were doing this like in an ordinary day, when they would be planning to go shopping. After this activity, mood board activity brief was revealed with a scenario that describes one of their ordinary days, in which a shopping activity takes place. By these two preparatory activities, the participants were directed to think the context of use together with their usual experiences related to the product. Finally, they were asked to conceptualize and shape a "casual bag" by considering the outcomes of the previous activities.

4.4.1 Planning the case study

Selecting the subject for conceptualizing and shaping activity

For the conceptualizing and shaping activity part, a casual bag was chosen as the subject, because the casual bag is a personal and simple product. By conceptualizing a casual bag the participants could reflect their visual preferences as well as their concerns regarding the product use. Moreover casual bag is a typical product for this user group. Therefore it was presumed that they could define problems, needs and preferences in relation with the context. Since the participants were housewives, it was presupposed that they might have crafting experience about sewing or knitting a bag, which could be helpful in shaping activity.

Selecting the theme for the mood board activity

The activity workshop theme was decided as a general activity, in which a "casual bag" is used. Thus the theme of the mood board activity was specified as "shopping", since it is a usual activity, which the user group performs in daily life, and it could direct the participants to focus on the specific context without limiting their attention on a particular product.

Formulating additional preparatory activity

In order to direct participants to consider the usage context before the mood board and concept development activities, a simple task was designed so as to be able to prototype the usual experiences of participants with the product (Buchenau and Fulton Suri, 2000). By this way, they were warmed up for the rest of the activities, and considerations regarding the context of use could be initiated. For this reason, "inside the bag" collage activity, which was previously mentioned, was developed, in order to prepare participants for the rest of the workshop. By prototyping an experience of an uncomplicated usual activity, which is preparing their bags for going to shopping, the participants were directed to think about the context of use.

The brief of the activity was revealed as follows:

> Imagine one of your ordinary days. On this day you will be going to shopping, whether to a supermarket or to the shopping district. What would be the stuffs that you put in your bag, while you are going to shopping? Pretend that the given boards are your imaginary bags, and on these boards, place the images of the stuffs, which you put in your bag, or you can draw them.

Formulating the brief of the mood board activity

In the mood board activity, the participants were not directly asked to express the meaning of the theme with images as in the previous workshop. In this case a scenario, which describes one of their ordinary days, were expressed with the mood board brief, so as to visualize their usual experiences. Since this scenario involves the shopping activity as the main event in the narrative, "shopping" was not emphasized further as the theme of the activity. In order to be able to initiate thoughts about the "casual bag" usage, it was stressed that while composing mood boards, they should consider their relations with their bags during the activities in the given scenario. Some directions were also given with the brief, in order to lead participants to prepare mood boards considering their problems, the environment of usage, their needs in relation with the context and their visual considerations. As a result, the brief was expressed as follows:

> You put your stuff in your bag then you go out. In order to go to the shopping place, you get on a bus or you walk. This place may be a department store, a supermarket, or a shopping district, where the shops are outside on a street. When you finish shopping, you will visit one of your friends in her house, after that you go back to home. During these activities you are having some kind of relation with your bag. Select images that represent your relation with your bag, and prepare a collage with selected images. You will briefly explain your collage later on.
>
> While preparing those collages, you should consider:
> - problems you encounter while using your bags,
> - places where you are going for shopping,

- intangible concepts which can be related with the usage of your bags or the bag itself (for example, I wish my bag could do ….),
- how you would like to look with your bags.

Formulating the brief of conceptualizing and shaping activity

With this brief, the participants were asked to conceptualize and shape a casual bag, which would be used during shopping activity, considering the outcomes of the previous activities. Moreover, while revealing the brief of the activity, they were guided about the usage of the given materials by stating how they could use them. The brief was stated as follows:

> Considering collages, which you have prepared in the previous activities, design a casual bag that would be used while shopping with given materials. You can use the colored papers and cardboards for shaping your bags, and you can use the colored play-dough to form accessories for the bags. You will present the outcomes after the activity.

Selecting materials and the image set for the activities

In addition to the stationary materials, which were also provided in the previous workshop, colored papers with different textures and qualities, and needle and thread were supplied to the participants, in order to perform the conceptualizing and shaping of a casual bag activity.

The image set of this workshop contains images for both "inside the bag" collage activity and the mood board activity. Approximately 250 images, which were searched in Internet and women's magazines, were presented to the participants for using in both activities. Images in relation with the theme were searched by using keywords *shopping, supermarket, mall, money, discount, bag, carrying*, and *thief*. Images related with the items, which they might put in their bags, were searched by using keywords *purse, glasses, keys, cellular phone, shopping list, cosmetics, notebook,* and *pen*. Also, images unrelated with the context, which were mentioned in the previous workshop, were added to the image set.

Planning the schedule of the workshop

Considering the durations of the activities in the previous workshop and the characters of the activities in this workshop a schedule was prepared (Table 4.8).

Table 4.8 The schedule for Case study 2: "Casual bag" workshop performed with middle-aged housewives

Activity	Duration	Task
Preparation activity – "Inside the bag" collage	5 min.	Introduction and a brief presentation about the study Revealing the brief of "inside the bag" collage activity Responding to questions of the participants regarding the brief
	10 min.	Preparing "inside the bag" collage
Mood board activity	5 min.	Revealing the brief of "shopping" mood board activity Responding to questions of the participants regarding the brief
	10 min.	Preparation of "shopping" mood boards
	20 min.	Participants' verbal presentations in relation with the outcomes
	30 min.	Break
Conceptualizing and shaping activity	5 min.	Revealing the brief of the activity of conceptualizing and shaping a casual bag that would be used while going to shopping Responding to questions of the participants regarding the brief
	30 min.	Preparation of the casual bags
	20 min.	Participants' verbal presentations in relation with the outcomes

4.4.2 Performing the workshop

Participants

Six people participated in the study. All of them were female and they were between 35 to 56 years old. Four of them were retired schoolteachers, one of them was a university graduate, and one of them was a primary school graduate. Five of the participants knew each other well; the other one knew just one of the participants and the author knew all of the participants before the study. In this study, the participants were denoted by the letters from F to K.

The workshop environment and atmosphere

The study was carried out around a table in a house on a Tuesday afternoon, it took approximately two and a half hours. A break was given between the two parts. Since five of the participants knew each other well, during the activities they were having conversations, joking and laughing sometimes.

Figure 4.2 Case Study 2 – the workshop environment and atmosphere

Recording

The activity was tape-recorded entirely, and a part of the concept development activity's process and presentations related to the outcomes of the activity were video-recorded. The recordings were transcribed for the later analysis.

4.4.3 Analysis of the outcomes

The outcomes of the workshop were documented in view of the considerations and categorizations stated in the analysis section of the previous workshop. While documenting the outcomes, times of verbal expressions in the whole video recordings were also added to the related part of the documentation, if video recordings in relation with those expressions were available. This can be helpful in observing and conceiving the participant's own expressions including his/her mimics and gestures.

4.4.4 Discussions and limitations for the case study

Discussions regarding the outcomes and the overall process of the workshop:

Compared to the mood board activity, the participants were more comfortable with the "inside the bag" collage activity. They preferred both drawing the items in their bags and placing the images of them (Figure 4.3).
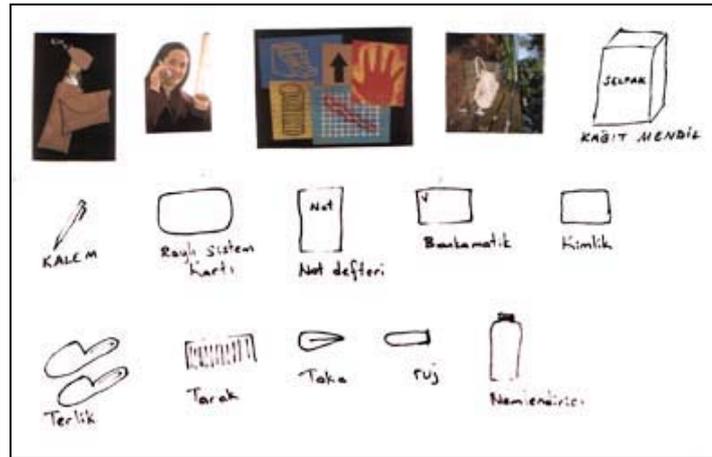
Figure 4.3 A bag from "Inside the bag" collage activity

Most of the questions were raised regarding the brief of the mood board activity. They were responded by explaining the brief further or by stating some examples in relation with the usage of the images. Some of the participants had difficulty in composing mood boards. Two of the mood boards were consisting of very few images, and one of the participants was not able to perform the mood board activity. The participants might have felt restricted while preparing mood boards because of the given brief, since it was considerably detailed and referred to the usage of the product many times.

In two of the participants' concept products, their solutions and preferences were consistent with their considerations in the mood boards, and these considerations were related to the operational problems regarding the product use (Table 4.9 and Table 4.10).

Table 4.9 A part of the documentation related to Participant I's mood board and concept product

Participant I's shopping mood board		
Related images	*Category*	*Verbal expression*
	Defined problem	"…I usually can not find a place to put my bag while shopping … when I'm trying to find a cloth for myself, and trying on it, **I cannot find a solution to where to put my bag**… at the and there are always lots of shopping bags in my hand, and the bag usually slips from my shoulder …"
	Product specification	"…the bag should be in a shape that can be put in the shopping trolley like the little girl in this picture..."
Participant I's "casual bag"		
Related image	*Category*	*Verbal expression*
	Product specifications	"…this length of handles should be at this height, because **it is safer and comfortable**, it shouldn't swing around my hips …there is a hard material in it so that **it wouldn't bend, when you put it somewhere**…"

Table 4.10 A part of the documentation related to Participant G's mood board and concept product

Participant G's shopping mood board		
Related images	Category	Verbal expression
	Emotional need: Feeling relieved	"…when I feel upset or stressed, I prefer to go to shopping, because I can forget everything while shopping, so that I can be happy…"
	Preferences	"… however I never forget my bag because I prefer one of those **across body bags**…"

Participant G's "casual bag"		
Related image	Category	Verbal expression
	Product specifications	"…it is **a very safe bag,** because it is **an across body bag** … by this way, while shopping, my hands can be free. If the roads are icy, I can grip something in order not to fall down… I can carry the shopping bags easily, if my hands are free, or when I don't have shopping bags **I can freely walk around**…"

They generally expressed their visual and functional preferences in relation with the "casual bag" and how their ideal bags should be. Those considerations were generally related to the operational dimension of user product relation Furthermore, for all of the outcomes, it was observed that

their concept products were similar to their bags, which they brought with them to the workshop.

Four of the participants were focused on organization of the items inside the bag, while conceptualizing products (for example Participant H and Participant K, See Table 4.11 and Table 4.12), and the other two mentioned the preferences regarding this issue. This may be because in the preparatory activity, they were directed to concentrate on the items inside their bags.

Table 4.11 A part of the documentation related to Participant H's concept product

Participant H's "casual bag"		
Related image	Category	Verbal expression
	Defined problem Product specifications	"…**woman's bag is like her home, when she goes outside**. She can put everything she needs in it. Here I will put my purse so that I won't look for it, here in this pocket… I put my keys and my cellular phone inside here, and I will put my bus card here … I mean **I won't need to open my bag every time**…"

Table 4.12 A part of the documentation related to Participant K's concept product

Participant K's "casual bag"		
Related image	Category	Verbal expression
	Product specifications	"**It can be handled from the strap or this handle**. It can be hung on shoulder, too. Here, I put my railway card and my ID-card, and here I can put my keys … this pocket is for my purse … this part is for my slippers or my moisturizer cream … a few candy bars can be put in it…. because there is always candies in my bag…"

Discussions and limitations regarding the planning stage of the workshop:

Dark colored papers, like black, brown, and navy blue, were not provided for the participants, because of some practical constraints. However, in the study, four of the participants noted that they would prefer to use dark colors in their concept products, but they had to use bright colored papers, since the formers were not available. Moreover they stated that they would prefer that the color of their bags should suit the color of their outfits and shoes, which were generally in dark colors. Therefore while selecting materials and planning workshops, preferences of the user group should be considered by observing them, if it is possible.

For the verbal presentation parts, in order to structure the presentations, some questions were prepared according to the aims of the study. These questions were:

- What are the problems that you defined, while designing this bag?
- Could you explain the functional attributes of the bag?
- Could you state your preferences regarding the outlook of the bag?
- Where and in which occasions have you planned to use this bag?

Although these questions were prepared while planning the study, usually, they were not needed to be used in the verbal presentations, because without being asked, the participants stated those aspects in relation with their products.

Discussions and limitations regarding organizing and performing the workshop

Since the author moderated the study without assistance, video recording and responding to the participants requests were sometimes problematic.

Therefore while performing workshops, assistance in relation with those practical issues is needed.

4.5 Case Study 3: "Communication device" workshop performed with young male engineers

For this workshop, the user group was chosen as young male engineers. Since many stereotypical judgments exist related to this group and they can be a difficult user group for designers to empathize with, performing the workshop with them was considered to be worth studying.

The aim of this user workshop case was,

- investigating tangible and emotional needs of the user group "young male engineers" in relation with communication issues,
- directing them to define and express the context of communication experience for them,
- and guiding them to define problems related to their experience.

The workshop was composed of two main parts, and each of these parts contained two activities. The first part was planned to be the preparation part of the workshop, and it included (1) a simple preparatory activity – "Who are you talking with?" charts – for warming up the participants to the rest of the activities, and (2) a mood board activity in relation with the theme "communication". The second part was the concept development part of the workshop, which involved (1) a preparation activity – "Who? – With whom? – Where?" boards – for guiding participants to conceptualize their products by directing them to make decisions about the usage context of the product, and (2) conceptualizing and shaping a "communication device" activity.

4.5.1 Planning the case study

Selecting the theme for the mood board activity

The theme for the workshop was chosen as "Communication", since communication has close relations with technology, which is closely related to the user group's occupation; also it was assumed that communication has an integral part in their daily lives.

Selecting the subject for conceptualizing and shaping activity

For the subject of the conceptualizing activity "communication device" was chosen, and with the given briefs and additional preparatory activities, it was expressed that this "communication device" would be for their personal use, so that they could be directed to consider their preferences and personal needs in relation with the context of use.

Formulating additional preparatory activity – "Who are you talking with?" charts

A simple introductory task was planned, in order to direct the participants to consider their usual experiences of communicating. In the given "Who are you talking with?" charts, they were asked to write the names of people, with whom they communicated with usually. Writing down the names of people could be helpful in conceptualizing the rest of the tasks. While formulating the brief, in order to ease the process of writing the names, the people they communicate with were classified according to their situation of being in work place or outside of it, because it was presumed that the user group spends most of their time in the work places. Thus the brief was revealed as follows:

> Think about the people you communicate with, and the places you communicate in. These people can be:
> - in your work place, the people unrelated with your work;
> - outside your work place, the people in your work place or the people related with your work;

- in your work place, the people in your work place or related with your work.

Write down the names of these people in the related box on the given boards.

While responding to the questions of the participants and explaining the brief, it was expressed that this task was a preparation activity, and for the next stages they might need to look at those names just to remember with whom they communicate. Therefore it was stated that this activity was about taking reminder notes for them to use later. Thus they were not asked to explain the outcomes.

The given chart was composed of questions based on the categorization expressed in the given brief. The chart and the collage area for the mood board were designed to be on the same board, so that the participants could review the charts easily, while composing mood boards, since "Who are you talking with?" activity was planned to prepare the participants for the rest of the activities (Figure 4.4).

Figure 4.4 Participant M's "Who are you talking with?" chart and mood board

Formulating the brief of the mood board activity

While formulating the brief of the mood board activity, in order to make the participants to imagine their experiences of communicating, they were given directions. The directions were planned to guide them to think about the people they communicate with, problems they encounter, and their visual considerations. These directions were supported by examples, which they might encounter in their daily lives. The activity brief was as follows:

> With the given images, prepare a collage related with the theme "communication". Try to express what communication means to you in your collages.
>
> *Directions:*
> - Think about the people you communicate with regularly; and the people you are unable to communicate with, although you want to.
> - You can think about the problems you encounter while communicating. (For example, you are considering changing your job, and while your employer is somewhere around you, your telephone rings, and it is about an interview offer from a company; or while you are chatting with your girlfriend through MSN, your department director spies on your computer.)
> - You can think about how you want to look while you are communicating.
> - Images you selected don't have to reflect exactly the same thing you thought, you can express your ideas depending on the associations, which you think the images awake.
>
> After this stage, you will briefly present your collages by explaining the images you used.

Formulating additional preparatory activity – "Who? – With whom? – Where?" boards

After the mood board activity, they were given a task, which was planned to prepare them for the concept development activity. In this activity they were informed that they were going to design a concept "communication device", which is specialized for communicating with a certain person, in a certain place, and for talking about certain topics. With the given brief, they were asked to select images, which symbolize themselves; the person they

wanted to talk with by using their designs; the place they wanted to communicate in, while using their designs; and the subjects they wanted to talk about through their designs; and glue those images to "Who? – With whom? – Where?" boards. This stage was intended to help the participants to plan their designs. The brief for this activity was expressed as follows:

At this stage, you will choose a person you communicate with regularly, then you design a communication device that would be used for communicating with this person. While you are doing this, you should consider what you have thought in the previous stages. Related with this design, you will glue images, which represent:

- you (*who?*),
- the person you communicate with (*with whom?*),
- the place you communicate in (*where?*),
- the subjects you talk about (*what are they talking about?*).
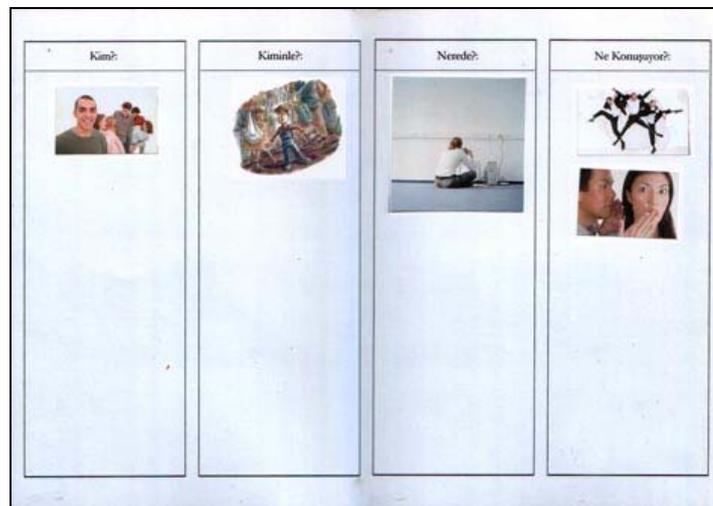
Figure 4.5 Participant M's "Who? – With whom? – Where?" board

Formulating the brief of the conceptualizing and shaping activity

Since in the previous activity, it was expressed that they were going to conceptualize a "communication device", it was not necessary to formulate

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an additional detailed brief. Therefore at the beginning of the activity, the participants were given a brief as follows:

> Considering what you have done in the previous activities, design a communication device with the given materials. After this stage, you will briefly present your designs.

Selecting materials and the image set for the activities

The same stationary tools as in the previous workshops were provided for the participants. For the concept development and shaping activity colored play dough and cardboards were supplied.

The image set of the mood board activity contained almost 400 images. Besides the images that are unrelated with the subject, subject-related images were included to the image set. They were searched in Internet by using keywords *communication, working, office, house, night club, gossip, fighting, limited time, casual, sign language,* and *touching.* Apart from this image set, another image set was composed for the "Who? – With whom? – Where?" boards activity. For this activity, images were selected from images, which involves the people, with whom they possibly communicate with in daily life. Also, images of different places, people from different occupations, different activities, animals and cartoon characters were added to this image set. The images in the set were separated and categorized in the boxes, which were labeled as "Who?", "With whom?", "Where?", and "Topics".

Planning the schedule of the workshop

This workshop schedule was prepared as in Table 4.13.

Table 4.13 The schedule for Case study 3: "Communication device" workshop performed with young male engineers

Activity	Duration	Task
Preparation activity – "Who are you talking with?" charts	5 min.	Introduction and a brief presentation about the study Revealing the brief of "Who are you talking with?" charts Responding to questions of the participants regarding the brief
	5 min.	Preparing "Who are you talking with?" charts
Mood board activity	5 min.	Revealing the brief of "communication" mood board activity Responding to questions of the participants regarding the brief
	10 min.	Preparation of "communication" mood boards
	20 min.	Participants' verbal presentations in relation with the outcomes
	20 min.	Break
Preparation activity – "Who? – With whom? – Where?" boards	5 min.	Revealing the brief of "Who? – With whom? – Where?" boards Responding to questions of the participants regarding the brief
	10 min.	Preparing "Who? – With whom? – Where?"
	15 min.	Participants' verbal presentations in relation with the outcomes
Conceptualizing and shaping activity	5 min.	Revealing the brief of the activity of conceptualizing and shaping a communication device Responding to questions of the participants regarding the brief
	30 min.	Preparation of the communication devices
	20 min.	Participants' verbal presentations in relation with the outcomes

4.5.2 Performing the workshop

Participants

There were five participants, who were between 24 to 28 years old. Three of them were industrial engineers graduated from the same university, one of

them was a computer engineer, and one of them was a mechanical engineer from different universities. All of them were employed in different companies. Three of the subjects were classmates from university; the other two had just met with others. The author knew three of the subjects before the study. The subjects are represented with the letters from L to P:

The workshop environment and atmosphere

The study was performed in a house on a Saturday afternoon; it took almost two and a half hours. A break was given between the activities, and during the parts and the break snack and beverages were served. The study was performed in a friendly atmosphere. Throughout the activities the subjects were having conversation and fun.

A researcher-designer was present in order to assist the author by recording videos, and taking pictures. During the activities, she stressed out some points, which she thought important for the study. There was also a person, who was not a participant of the study, present in the workshop. The author and four of the participants knew her before. She participated in the conversations, and made comments and critiques for the works of the subjects.

Figure 4.6 Case Study 3 – the workshop environment and atmosphere

Recording

The study was tape-recorded entirely and video-recorded partially. The recordings were transcribed for the documentation.

4.5.3 Analysis of the outcomes

The outcomes of the workshop documented according to the same considerations, which were stated in the two previous workshops.

4.5.4 Discussions and limitations for the case study

In the "who are you talking with?" charts activity, the words used in the brief seemed to be confusing for the subjects. They mostly raised questions about the categorizations stated in the chart. Therefore, those categorizations were explained by using examples.

Although they were told that they were going to explain all the pictures in their mood boards, they did not hesitate to use considerable amount of picture compared to the previous workshops. Therefore presentations regarding the outcomes of the mood board activity took longer time than the previous workshops. While expressing the mood boards, all of them were able to state their ideas and intangible problems in relation with the "communication" theme, and their past experiences related to the theme, by using associations between their thoughts and images.

Table 4.14 A part of the documentation related to Participant P's mood board

Participant P's communication mood board		
Related images	Category	Verbal expression
	Emotional need: Need for sincerity	"...if someone from the group cooks, and others have the dinner, this can make possible to have **communication close to the ideal in an intimate atmosphere**…" (in VCD-1; time of quotation: 40:27/1:06:19)
	Defined problem	"...it is a device for calling the receptionist or for making the receptionist to stop his work to come to you. In the work place, at the end because my job requires concentration, this type of communications, these **forced communications** – for example when phone rings, and in the work place someone tells you about a problem – these are hampering type of communications for my job…" (in VCD-1; time of quotation: 41:10/1:06:19)
	Defined problem	"…another type of bad work place communication is that the **people, who are at approximately same level with you can despise on you** ... people at same seniority with you may look at you strangely, because they are in a different department. I mean they may see you such inferior in an unrelated way…" (in VCD-1; time of quotation: 41:45/1:06:19)
	Emotional need: Need for sincerity	"…however **without such a discrimination or a hierarchy, people can be very intimate**…" (in VCD-1; time of quotation: 42:10/1:06:19)

The participants did not consider the activity of "Who? – With whom? – Where?" boards as a planning stage of the concept development process. It

might be because it was not properly stressed out that this was a part of the concept development activity, in which they should also think about their designs, while considering the person they communicate with, the place they communicate in, and the subjects they communicate about. Because of that, the outcomes of this activity were similar to the outcomes of the communication mood board activity as having general considerations and thoughts about the subject. Although this was targeted in the previous activity, for the "Who? – With Whom? – Where?" activity, it was expected that the subjects could be more specific about the communication theme, and for them, this could be helpful in considering their experiences and generating solutions and designs for the communication context. However, they handled the activity brief with a general perspective. Therefore, the outcomes of the activity were not related to their concept products in four of the works.

The outcomes of the concept development activity were consistent with the outcomes of the mood board activity only in the works of Participant O (Table 4.15). In addition to that, the outcomes of the "Who? – With whom? – Where?" activity was related with the outcomes of the concept development activity just in Participant L's works (Table 4.16).

Furthermore, one of the participants preferred to draw the concept product instead of shaping it, because he thought that his concept product could not be shaped with play dough.

Table 4.15 A part of the documentation related to Participant O's mood board and concept product

Participant O's communication mood board		

Related images	Category	Verbal expression
	Emotional need: Need for privacy	"..for example generally with my family, or my wife, or others… in our work place, our room is crowded, in a crowded place **I usually go outside in order to talk private things**, which I don't want others to hear, same as this corridor in this picture. To talk easily on my own, **without bothering by anyone, anyway I like**..." (in VCD-1; time of quotation: 32:33/1:06:19)
		"...**aiming gossiping a bit**, I mean, someone did something, for example, in the work place a director will be fired or not… related with these issues… for hearing about new gossips…" (in VCD-1; time of quotation: 34:05/1:06:19)

Participant O's "communication device"		
Related image	Category	Verbal expression
	Defined problems/ Emotional need: Need for privacy	"...in the work place there are conversations, which you don't want everyone to hear. For these conversations, instead of going to outside…" (in VCD-2; time of quotation: 10:33/45:20)
	Product specifications	"…I thought that there is something goes down from your ear to the back, to your throat, and it senses very slight voices like breathing, and it hardens those voices, …it directs to them to the cellular phone… **think about a thing that can convert your whispering sound, in this way, into understandable words to the person on the other side of the phone**…"(in VCD-2; time of quotation: 11:02/45:20)

Table 4.16 A part of the documentation related to Participant L's "Who? – With whom? – Where?" board and concept product

Participant L's "Who? – With who? – Where?" board		
Related images	Category	Verbal expression
	Emotional need: Need for emotional communication	[About "Who?"] I thought that, **communication should also have emotional side**. Not only technological, it should be something that reflects how you feel, for example eating, the smell of the tobacco, **the smell, the taste… what I expect from the communication is it should contain … also emotional side**. (in VCD-1; time of quotation: 54:31/1:06:19)
		[About "With whom?"] The communication, in fact the place is not that important, everywhere, with whom, the person across us, with the family, it can be children. I want to have **emotional communication**; it can be even with a fish, the thing across can be a fish. (in VCD-1; time of quotation: 55:10/1:06:19)
Participant L's "communication device"		
Related image	Category	Verbal expression
	Defined problems	"…while communicating **emotional side is very important** too…I think it would be better, if things that can be perceived by five senses would be passed through communication. Because of that I want to design a product that **makes possible for two people to have same tastes while communicating** with each other, even if they were distant…"(in VCD-2; time of quotation: 05:20/45:20)
	Product specifications	"…maybe this helmet has something inside of it, some places, which are touching the nerve endings. Those are for sensing these things while perceiving with brain. **It makes possible for two people, who are far distant from each other, do something together.** In the same way, it has places, which can spread odors at that place. For view…"(in VCD-2; time of quotation: 06:00/45:20)
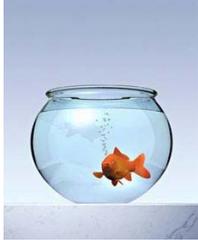
CHAPTER 5

A PROCEDURE FOR ELICITING USER NEEDS AND USER DEFINED PROBLEMS: USER WORKSHOPS

Based on the findings from the performed case studies, which are reviewed in Chapter 4, guidelines for employing the procedure of "user workshops" are devised. In this chapter, these guidelines and the procedures that are followed, while performing "user workshops", will be described in detail. The chapter will focus on how to plan and organize user workshops; and how to analyze outcomes of them.

5.1   Aim of user workshops

Methods, techniques and tools examined in Chapter 3 are generally developed based on the thought that if appropriate tools are provided for users, they can express their tangible and emotional needs and provide the knowledge required for understanding their experiences and the context of use. Adopting the same approach, user workshops aims to investigate users' tangible and emotional needs and user defined problems, by directing them to experience creative activities and by letting them to express the context of use and problems related to the product usage, in order to provide knowledge input for the design process.

In order to achieve the aim of the study, the procedure of user workshops, which is composed of application of several techniques – two main and additional techniques –, is devised. In the following section, reasons of selecting these techniques will be discussed, and then the procedure of user workshops will be described by stating the guidelines of performing them.

5.2   Selection of techniques

The procedure of user workshops is basically composed of two stages: preparatory stage and concept development stage. The main activity is designing a concept product by users. As it is noted in Chapter 3, drawing and shaping the ideal product by users can be a suitable way of exploring user defined problems regarding the product usage and the context of use. Since users become experts in using the product, besides providing knowledge about their needs, they may propose solutions for their design related problems, which are certainly beneficial for designers to observe. Thus, by observing those solutions, designers can obtain a better understanding of users' needs and problems.

In user workshops, users are asked to create product concepts by taking certain steps. By this way, they are directed to define problems related to the usage, while considering their tangible and emotional needs. However since conceptualizing a product is a difficult task for users, additional sensitization activities are required in order to prepare users for the concept development activity (Sleeswijk Visser *et al.*, 2005-b). Mood boards and collages are suitable techniques for eliciting emotional needs and conceiving the user's feelings towards his/her past experiences (McDonagh *et al.*, 2002; Stappers and Sanders, 2005). With mood board activities, images can be used as metaphors to express intangible emotions and needs, which are difficult to be verbalized by the user. While performing user workshops, users are asked to compose mood boards considering a theme related to the product

usage. They are briefed with directions, which are aimed to guide them to think about the context of use, emotions and mood related to the experience, and their visual considerations about the product. With this activity, participants are prepared for the concept development stage.

Furthermore additional stages can be required for sensitizing participants. There may be a need for prototyping the user experience (Buchenau and Fulton Suri, 2000) in relation with the context of use by using scenarios and additional generative techniques; or in order to be able to conceptualize the product, the context may need to be considered further by the participants with the help of tools that are designed specially for the case, thus additional stages, which are peculiar to cases, can be planned according to the goal of the research. "Inside the bag" collage activity, which was stated in Section 4.4, is an example of such an additional preparatory activity. By this activity, it was planned to direct the users to prototype their usual experiences with the product.

While generating user workshops, the major steps are planning, organizing and moderating, and analyzing the workshops. In Table 5.1 the stages are presented in detail.

Table 5.1 The process of user workshops

5.3. Planning the workshops

5.3.1. Formulating the research brief

5.3.1.1. Selecting the theme for mood board activity

5.3.1.2. Selecting the subject for concept development 2D and 3D concept generation

5.3.2. Formulating the briefs of activities

5.3.2.1. Formulating the brief of mood board activity

5.3.2.2. Formulating the brief of concept development 2D and 3D concept generation activity

5.3.3. Planning and organizing activities

5.3.3.1. Selecting image sets for mood board activities

5.3.3.2. Deciding on appropriate tools for activities

5.3.3.3. Formulating additional stages if needed

5.3.4. Planning the schedule for workshops

5.4. Organizing and moderating the workshops

5.4.1. Selecting the participants

5.4.2. Setting the workshop environment and atmosphere

5.4.3. Recording

5.5. Analyzing the workshops

5.3   Planning the workshops

5.3.1   Formulating the research brief

It is important to set a clear brief for the research activity at the beginning of the planning process. Setting a clear brief is crucial to the research activity, because, the brief should be considered through all the stages of the user workshops. The brief should be aimed at getting to know the user group, and it should focus on finding ways:

- to elicit emotional and tangible needs of the user group in relation with the *theme* of the research,
- to direct the participants of the selected user group to consider and express *the usage context* and *experiences*, and
- to define problems in relation with this *context* and their *experiences*.

Selecting a *theme* for the mood board activity and choosing a *subject* for the concept development activity are parts of formulating the research brief stage, since the theme and the theme related considerations are expressed in the research brief.

5.3.1.1   Selecting the theme for mood board activity

Specifying a general theme for the research activity is important for directing the user to consider the context of use and their experiences related to the theme. Thus the theme should be expressed with a broad name, which can evoke thoughts about all aspects of the context. The theme can be named as a general activity, which the product is used while doing it. By this way, all the relative actions in relation with the context can be considered by the participant. For example, in the user workshop with middle-aged housewives related to the product "casual bag", "shopping" is selected for the theme of the user workshop, since it does not directly refer to the product and it is specific enough to direct the focus of the participant on the context of use.

5.3.1.2   Selecting the subject for concept development and 2D and 3D concept generation

The product that is chosen, as the subject can be defined as a personal product, which the user can frequently use, so that the user can better reflect his/her visual preferences, as well as concerns related to the usage of the product. However the product should not be named as an existing product,

instead the definition should be a broad name, which can be related to the usage context. For example, in user workshop with young educated people, instead of "Designing an MP3 player", the concept development activity is named as "Designing and shaping a device for listening to music in 3D form". By this way, users can focus on the context of use rather than details of an existing product, and solutions they propose can reflect their problems rather than duplications or unnecessary embellishments of an existing product.

Both the theme and the subject of the concept development stage are chosen as typical of the user group's activities and products they use. While expressing their ideas related with a typical theme and a typical product for them, the user group can provide the knowledge in relation with their lifestyles, preferences and expectations, thus, by this way, it can be made possible to get to know the user.

5.3.2 Formulating the briefs of activities

The activity briefs should be carefully constructed considering the research brief, because aims of the activities are communicated with the participants based on these briefs. Therefore the briefs should contain all factors that need to be stated for eliciting user needs and conceiving their experiences. The briefs should *direct* users to consider the context of use and their experience, but they should not restrict their imagination. In addition to this, at the end of each brief participants should be informed that they are going to present the outcomes verbally. Because especially when preparing mood boards, it was observed in the performed cases that the participants may tend to consider the activity as a free expression of their thoughts with collages, which, they think, may not need to be explained. However they should be informed that the verbal representations of their outcomes are important for the study. For the mood board activity, although this may restrict the quantity of images, it directs them to consider the context

carefully and to conceptualize the verbal expression, which is a useful resource for analyzing the outcomes.

A sheet, which is composed of written activity briefs, should be prepared for arranging the activities, and for the researchers' use. However briefs should be verbally expressed to the participants, instead of giving written handouts, because written handouts can be taken too seriously and the participants may feel obliged to refer to the written brief, thus it can restrict their imagination.

5.3.2.1 Formulating the brief of mood board activity

Formulating a detailed mood board activity brief is important, since this stage is intended to sensitize the participants to the concept development activity. Therefore each direction given with the brief should be carefully expressed, in order to make the participants conceive and consider the different aspects of the context, their needs and experiences. When briefing about the mood board activity, first the theme should be expressed as the subject of the collage activity. It should be stated in the brief that the meaning of the theme for the participants should be considered. With the brief they should be directed to think about:

- the product usage,
- the problems they encounter,
- the mood they are in,
- and their visual considerations while using the product.

This activity lets them to define and consider the problems related with the context of use. While expressing the directions, scenarios in relation with the context and examples related to the directions can be noted, in order to lead the participants to consider the context further and to be able to explain the

directions. However while giving examples and scenarios, it should be taken into account that these examples and scenarios can limit the imagination of the participants. Therefore they should be context oriented, and they should not be too specific.

While revealing the briefs, it can be noted that images, which they use, while composting mood boards, do not need to refer to the same object or the action that they think, that is, they can explain their thoughts and choose the images based on the associations, which the images awake. Moreover it should be stated that they do not need to explain each of the images on their boards. Although explaining each image seems to provide more data about the participant, considering the explanation at the start may restrict him/her.

For keeping the focus of the participants on this activity, there should be no implications for the concept development and 2D and 3D concept expression activity in the mood board brief. Because at this earlier stage of the workshop, without being prepared for such an activity by considering the aspects of the context and their needs and experiences, the participants may be concerned that they may fail to accomplish the concept generation activity.

5.3.2.2 Formulating the brief of concept development 2D and 3D concept generation activity

The description of the product, which is decided on while formulating the research brief should be given by directing the participants to consider the outputs of the previous activities. While revealing the brief, expressing the existing product name should be avoided. The participants should be directed to feel that they will generate a concept product that is nonexistent. By this way, they can focus on their problems related with the context of use, and they can define the problems by generating solution-led conceptual

products. The brief of this activity does not need to be as detailed as the mood board activity brief, since the participants become familiar with the subject. However they should be notified that they need to consider their ideas and the visual artifacts, which are the outcomes of the previous activities.

While revealing the brief of the concept development activity, participants should be informed that the outlook appearance of the product should be considered. Furthermore, they can be acquainted with how they can use the materials given for this activity. For example in the user workshop with middle-aged housewives, the subject of the concept development activity was assigned as "a casual bag that would be used while going to shopping". While conceptualizing and shaping the casual bags, participants were notified that they could use colored papers and cardboards to shape their bags, and they can use play-dough to form accessories for their bags.

5.3.3 Planning and organizing activities

5.3.3.1 Selecting image sets for mood board activities

Images selected for the mood board activity should be diverse. Some of them should directly be related with the context since users should be directed to focus on the context, while others should not directly refer to the context or they should be unrelated, since users may associate them with the context through metaphorical expressions. Therefore images unrelated with the context should also be included in the image set as well as related images. The set should be varied from tangible to abstract, and people in the images should be diverse (Sleeswijk Visser *et al.*, 2005-b). While selecting images, the guidelines that are proposed by Sleeswijk Visser *et al.* (2005-b) and referred in Section 3.1.2 should be also considered.

While composing image sets for mood board activity, images are searched in Internet by using *keywords* related with the theme of the research; also they can be searched in magazines. By this way, wide variety of images can be found. While choosing keywords for searching, the researchers should consider the usage context; anything related with the context can be used as a keyword for searching, since diversity is important for directing the participants to think about the usage context. Furthermore, the directions given with the mood board activity brief should be considered, while choosing the keywords. In order to decide on the keywords, a mind map (Buzan and Buzan, 2000) in relation with the theme and the user group can be made. This would be also helpful in formulating the activities.

Images found in Internet are printed and cut out for constituting the image set in order to use in the mood board activity. Participants should not need to cut out the images from their places so as to be able to use them. They should be prepared, in order to be easily used and browsed by the participants, and to save time for the rest of the activities, because at the beginning of the mood board activity, all participants start to scan images at the same time. Therefore it is practical to scan them one by one, and if all images are separated, participants can share them for browsing.

Providing magazines or newspapers for participants to select the images from them can be time consuming and may distract participants' attention (Sleeswijk Visser *et al.*, 2005-b). In addition to this, it was observed that participants are not willing to scan images from magazines or newspapers, when cut out images are available.

5.3.3.2   Deciding on appropriate tools for visualization activities

The tools selected for visualization activities should suit the product's character and the selected user group's expression abilities. In some of the

cases several alternative tools may be offered to the participants, such as play-dough, colored cardboards, colored papers with different textures, and different accessories, which are related with the product. Since conceptualizing a product may be a difficult task for the participants, they should be let free to choose their ways of expression, although they should be informed about how they can use the materials to shape their concept products.

Play-dough is an appropriate tool for expressing 3D organic or amorphous shapes. It gives participants freedom of representing their ideas and it does not restrict their imagination. Tools like 3D Velcro modeling toolkits (Stappers and Sanders, 2005) can be suitable for quickening the process, however as user workshops focus on the problems, which can be elicited by observing solutions that participants propose, they should make the participants feel free to create forms without being restricted by certain kinds of shapes.

For all the activities, it is necessary to provide stationery tools like colored pencils and colored markers, scissors, glue, scotch tapes, stationery knifes, staplers, poster boards, and erasers. Each tool should be supplied more than three or four, since participants may need to use them simultaneously.

5.3.3.3 Formulating additional stages if needed

Since the user workshops should be performed within a limited time, and just experiencing the mood board activity may be insufficient to sensitize participants to the concept development activity, some practical tools and activities are needed to be designed, in order to prepare them for the following activities and to lead them to consider the context of use. These activities are planned specific to the cases. By experiencing simple exercises with these activities, the participants are directed to think the usage

environment, their usual experiences with the products and the usage context.

Additional activities may be planned, in order (1) to prototype the existing experiences of users related with the context of use, like in "Inside the bag" collage activity (see Section 4.4); (2) to direct the participants to consider the context at the beginning of the workshop, so as to prepare participants for the rest of the workshop, like in the activity of filling "Who are you talking with?" charts in the user workshop with young male engineers (see Section 4.5); or (3) to ease the conceptualizing process of the concept development activity by directing the participants to assign the product to specific elements of the context, such as specific people and places, like in preparing "Who? – With whom? – Where?" boards in the user workshop with young male engineers (see Section 4.5).

The tools, which are generated specific to these additional activities, should be designed comprehensible for the participants, and they should be also found interesting, in order to attract their attention and to make them to willingly participate in the activity.

5.3.4 Planning the schedule for workshops

Time allocated for the activities should be arranged before the user workshops considering the number of the participants and the activities' characters, because the participants may tend to spend long time preparing mood boards and artifacts for preparatory activities; and this may cause shortage of time for the concept development activity. Therefore when it is necessary, participants should be warned about time limitation.

Since the mood board activity is the major preparation stage, it may take longer time than the other preparation activities. Moreover time allocated for

the concept development activity may differ regarding the crafting technique and materials provided for the participants. If it is demanded small breaks can be given between the activities, in order to make participants feel comfortable. Furthermore, participants generally complete their tasks at different times. When a participant finishes the assigned task, he should be asked to present the outcome without waiting for others to complete, in order to save time for the rest of the activities.

Examples of user workshop schedules can be seen in Table 4.8 and Table 4.13.

5.4 Organizing and moderating the workshops

5.4.1 Selecting the participants

It is important to create group synergy and group discussions in the workshops, because their interpretations and opinions, which they express during the activities, are beneficial for analyzing the outcomes. Therefore the group should be composed of people who already knew each other, or who can potentially get along with each other. Moreover users, who have a design education, are not chosen as participants, because non-designer participants may feel uncomfortable with the activity and they may be concerned about their crafting and problem solving skills.

Number of participants should not be less than 4, in order to obtain sufficient information from the workshop, and they should not be more than 8, because the workshop can take considerable time, and paying attention to each participant can be difficult.

As the user workshop cases performed for this study are fictional cases, the user groups assigned for this study were selected considering their

unfamiliarity with designers. They were chosen among the groups, which can be difficult for a designer to empathize with, however there were some practical concerns while choosing the user groups, such as availability of finding participants.

5.4.2 Setting the workshop environment and atmosphere

An informal and friendly workshop atmosphere should be created in order to make participants feel comfortable, while expressing their opinions and creating artifacts. Interaction between participants should be encouraged during the workshops, since obtaining their interpretations from discussions in relation with the subject is important for analyzing the workshops.

Moderator's attitude

The moderator should not be judgmental while directing participants and commenting about their works. When expressing briefs, giving directions, and responding the participants' questions, s/he should let them feel free to create and conceptualize anything they would like. When it is observed that a participant has trouble with expressing his/her ideas, or conceptualizing a task, the moderator should direct the participant to reconsider the context and the outcomes of the preparatory activities, instead of giving specific examples or ideas.

Moderating the participants while presenting the outcomes

When a participant completes his/her task about an activity, s/he is asked to present the outcome. At first, the participant is let free to explain the outcome anyway s/he likes. In all of the presentation phases, there is not a particular structured discussion about the presentation. However, when it is necessary, they are asked to explain the outcome further. In the presentation phase of the mood board activity, participants can be asked to express their thoughts about unexplained images, although while revealing the brief of the mood

board activity, it was noted that they are not required to explain each image on their mood boards. Asking them to do so can provide further insight about their needs and problems.

In the presentation phase of the concept development activity, participants generally tend to state the problems they defined related with the context or their needs. If they do not explain the defined problem, they can be asked to express it. Furthermore their visual concerns, while developing the concept product is crucial data for obtaining knowledge about the user group. Thus they should be directed to express their visual considerations, while presenting the outcome of the concept development activity.

5.4.3 Recording

All the workshop process should be recorded with video including the parts during the process of revealing the brief, preparing the outcomes by the participants, and presenting the outcomes. The presentation parts are especially important, because the verbal expressions, in which the participants explain the outcomes, are crucial in analyzing the outcomes. During the preparation of the activities' outcomes, there may not be expressions about the participants' thoughts related with the context of use, however recording this process can provide the resource related to discussions, jokes, and interpretations of the participants, thus it is helpful in getting to know the user group.

Recording with video is crucial especially for conceiving the explanations of the participants with their own expressions, gestures and mimics. Moreover participants generally point at the visuals in the mood boards, or certain parts of their concept products, while explaining their meanings and features. When analyzing and documenting the outcomes, parts of the verbal

expressions in relation with a certain outcome are referred by stating the time of the verbal expression in the whole video recording.

Due to the practical restrictions, the performed cases were not video-recorded entirely. However it was possible to tape-record the whole processes.

5.5   Analyzing the workshops

Since designers are suggested to be involved in the user workshops, they can interpret the outcomes and the process during the activities. Therefore the outcome of the user workshops should be documented for later consultation. Sleeswijk Visser *et al.* (2005) claims that written reports are not suitable for designers' visual thinking processes; and also designers may have difficulty in analyzing the outcomes from raw data, although it contains rich information about users. Thus categorizing verbal expressions under appropriate titles with related images is helpful in interpreting the outcomes later and constituting an inspirational input for the design process. Also the video recordings related with expressions about the related artifacts and images should be accessible, since the participant's way of expression is important when analyzing and interpreting the outcomes.

The outcomes of the user workshops are separately documented for each participant, under certain categories, with images of his/her work, related verbal expressions, and related video recordings (video recording's name if it is saved separately or time of verbal expression in the whole video recording). The categories are decided on considering:

- emotions related with the theme and experience of the product use
- defined problems related with the product and the context of use
- product specifications and solutions

- visual preferences

While documenting the related verbal expressions, certain parts of the expression can be highlighted or underlined, in order to emphasize the expression, which is important in classifying under the category, where it belongs.

CHAPTER 6

CONCLUSIONS

In this chapter, conclusions of the thesis will be made by reviewing the research questions presented in Chapter 1 and making recommendations for future studies in relation to further development of user workshops.

6.1 Research questions reviewed

- *Why is it important to elicit user needs? Which factors necessitate the user information in the design process?*

Knowing the user is important in the design process, because of many factors. First, the designer is obliged to consider user needs and satisfaction by external pressures, which are legislations, standards and concerns of companies. In addition to that, there are operational, social, inventive, and emotional dimensions of user and product relation, which require this knowledge to utilize in the design process. The first part of the literature review in Chapter 2 was focused on these issues concerning the necessity of user knowledge.

- *How can the designer obtain the knowledge of the user?*

The designer simply puts himself into the user's position, while designing the product. In order to be able perform this action, initially he needs to get to know the user. While doing this, he may utilize his knowledge from past

experiences and information provided by human sciences, or he may employ the knowledge that is obtained by consulting the potential users for eliciting their needs and problems in relation with a context of use; evaluating their responses towards products; and investigating and prototyping their experiences. In order to obtain the knowledge that is gained by consulting users, the designer is recommended to be involved in the user research activity so as to be able get to know users and empathize with them. Recent approaches to design research, which were addressed in Section 2.2.2, indicate that besides participation of the designer in the research process, the user should be involved in the design process. They can be asked to express their thoughts, ideas, past experiences, feelings and needs regarding the products through utilizing methods, techniques and tools, which are developed for this purpose.

- *Which methods, tools and techniques do designers use to understand the user and elicit his needs and preferences in relation with products? What are their advantages and disadvantages?*

The methods, techniques and tools for eliciting user knowledge in order to propose input for the design process was examined in Chapter 3. These methods, techniques and tools are categorized according to their aims of utilizing in design process. There are *generative* methods, techniques and tools for exploring experiences, tangible and intangible needs of users; *evaluative* ones for examining responses towards products, and *scenario based* ones for representing experiences of users in order to conceive them. The generative methods, techniques and tools identified in the study are mostly creative activities with users. They are planned to assist the researcher by directing the user to verbalize their needs, expectations, past experiences, and feelings towards products through these creative activities. Besides these, there are tools and techniques that are generative in character, which are designed to help the designer in organizing user information and finding the available data about users. The evaluative methods, techniques and tools presented in Section 3.2 are generally

focused on examining and measuring initial responses of users in a quantitative format, therefore they do not provide in depth data about their experiences and product use. The scenario based methods, techniques and tools examined in Section 3.3 can be used for both generative and evaluative purposes. Their main aims are representing experiences of users by scenarios, playacting and detailed fictional profiles. By representing experiences, they are planned to assist the designer in conceiving the context of use, generating solutions, and communicating and evaluating proposed solutions.

- *What are the methods, techniques and tools, which include the user in the design process? What are the difficulties in involving them in the design process?*

Methods, techniques and tools, which are reviewed in Chapter 3, involve the user to some extent. Users are the source of information, who can be consulted to express their needs, experiences, and problems with generative methods, tools and techniques, and in evaluative ones, users are expected to evaluate the existing products by stating their opinions about them.

Consulting users and obtaining their opinions can be a problematic issue, since users may find verbalizing their needs and problems complicated or they may misinform about their needs and problems. Therefore they are given visual tools and activities in order to direct them to express their needs, past experiences, and future expectations by considering the context and their problems. These methods, techniques and tools were presented in Sections 3.1.1 to 3.1.4.

- *How can users express their intangible needs?*
- *How can they define design problems in relation to their needs?*
- *Which specific techniques can be used to involve the user in the design process? What are the advantages and disadvantages of available*

techniques? What can be recommended to designers when combining these techniques?

The methods, techniques and tools were presented in Sections 3.1.1 to 3.1.4 are helpful for eliciting user needs and user defined problems. By utilizing two of them, namely mood boards and drawing and shaping the ideal product, this study proposes the procedure of "user workshops", which is composed of two stages that involve preparatory and concept development activities. Users are directed to express their needs and design related problems through conceptualizing products. Since the conceptualizing activity can be difficult for users to perform, in order to sensitize them to this activity by considering the context of product use and their past experiences, users are asked to generate mood boards in relation with a theme, which is decided on based on a general activity regarding the product use. It was observed in the performed case studies that besides mood boards, additional preparatory activities are helpful in sensitizing users to the conceptualizing activity. Chapter 4 concentrates on these three fictional case studies and their outcomes. Based on these outcomes, the procedure is presented by setting the guidelines for performing "user workshops" in Chapter 5.

In the user workshop cases performed for this study, participants were able to define problems related to the usage context and propose solutions to those problems. In the works of six participants, outcomes of the concept development stage were consistent with the outcomes of the previous stages. In these works, the problems and the needs, which were expressed in the preparatory stages, were referred in the concept development stage, and they proposed solutions related to those problems. Therefore the activities, which were experienced prior to the concept development stage, were helpful in conceptualizing a product and defining problems related to the usage context.

- *How can users conceptualize design ideas and how can they express their design solutions without restricting themselves to conventional design solutions?*

- *Which strategies should be adopted to devise a procedure for designers, which can enable them to elicit user's needs by involving them in the design process?*

In order to direct users to conceptualize a product, preparatory activities have crucial importance. Therefore the activities should be carefully planned before the sessions. While directing them to consider the context of use, the activities should attract the interest of the participants in a way that they can feel themselves being in a creative activity, so that they can be motivated to create solutions, which, they think addressing their problems. Moreover it should always be avoided referring to conventional products, since directing the participants to create unconventional products lets them inquire their context related problems and needs, carefully. The moderator should not be judgmental while directing participants and commenting about their works. When expressing briefs, giving directions, and responding the participants' questions, s/he should let them feel free to create and conceptualize anything they would like. When it is observed that a participant has trouble with expressing his/her ideas, or conceptualizing a task, the moderator should direct the participant to reconsider the context and the outcomes of the preparatory activities, instead of giving specific examples or ideas.

- *In what ways and by which methods can these needs and problems be analyzed to constitute the knowledge related with user needs in order to prepare a ground for design?*

In user workshop activities, users are not expected to create solutions that can be applied for real products. However solutions they propose can be helpful in understanding their needs and problems they encounter. Moreover observing such creative activities with users can inspire designers and help them to empathize with potential users. Therefore the designer should be involved in the process of user workshops.

Since the designer is recommended to participate in the workshops, the outcome of the workshops are documented for later consultation, including verbal expressions of users, related images to these expressions under certain categories according to stated emotions, product specifications, defined problems and visual preferences. By this way, the raw data, which contains useful information for getting to know the users, is kept available for designers.

6.2 Recommendation for further study

The case studies, which were performed for this study, are fictional cases. The subjects, themes and cases were made up. For the future studies, the procedure can be tested with real cases, in order to understand its appropriateness for providing user knowledge input to the design process. Therefore the workshops should be constructed in an actual project scenario within an existing company setting. In addition to that, the outcomes of the workshops were not presented to practicing designers with the aim of conceiving the impact of the data that is provided by the studies. The future applications of the procedure can involve the practicing designers for observing whether they are able to utilize the outcomes as knowledge input for the design process, or not.

In the performed case studies, selected user groups were intended to be chosen from the groups, which the designer is unfamiliar with. However there were some practical constraints, while choosing them, such as availability of finding participants. In order to be able to develop this procedure further, and to test its suitability, it should be experimented with the user groups, which can have difficulty in expressing their ideas with shapes or abstraction, such as people, who have disabilities or lower level of education.

The procedure of user workshops, which is proposed in this study, is planned for providing input to the early stages of design process. Another issue, which can be proposed for future studies, is that the procedure can be developed and specialized for all stages of design process, by adopting this participatory approach.

Since the procedure is aiming to constitute an inspiration resource for the design process and the designer is suggested to be involved in the workshops, documentation of the outcomes is an important task for later consultation. No matter how the outcomes are well organized, written documentation may sometimes be problematic, while searching for the outcomes related to a topic. This is because the written documentation is composed of related images and transcriptions of related verbal expressions, not the related artifacts or video and tape recordings. For the future studies, a software program that makes possible to organize the outcomes can be developed. By this way it can be possible to review the data in an interactive format together with the rich information recorded during the activities.

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APPENDIX A:

WORKSHOP BRIEFS FOR CASE STUDY 1

VAKA ÇALIŞMASI - 1
Genç ve eğitimli insanlar ile çalıştay

Bölüm-1: Çizim çalışması: İçecek kabı

Kişisel kullanıma özel içecek kabı tasarımı:
En sevdiğiniz içeceği düşünün ve bu içecek için bir kap tasarlayın. Bu kap, hem içeceği içmek için, hem de taşımak için kullanılacak. Tasarım sizin kullanımınıza özel olduğu için kendi zevkleriniz ve tercihlerinizi göz önünde bulundurmalısınız. Seçtiğiniz içecek çay, kahve, cappuccino gibi sıcak bir içecek olabilir, veya kola, meyve suyu, süt, alkollü içecekler gibi soğuk bir içecek de olabilir.

Bölüm – 2: "Müzik dinleme aracı" çalışması

Tema: İletişim
Ürün: İletişim aracı

"Müzik dinlemek" temalı mood board:

Verilen imajlardan "müzik dinlemek" teması ile ilgili bulduklarınızı seçin, müziğin sizin için ne ifade ettiğini düşünün ve seçtiğiniz imajlarla bir kolaj oluşturun. Çalışma sonrasında yaptıklarınızı kısaca açıklayacaksınız.

"Müzik dinleme aracı" tasarımı aktivitesi:

Verilen renkli oyun hamurlarıyla bir "müzik dinleme aracı" tasarlayın. Tasarımınıza şekil verirken kartonları ve renkli kalemleri de kullanabilirsiniz. Daha sonra tasarımlarınızı kısaca açıklayacaksınız.

APPENDIX B:

WORKSHOP BRIEFS FOR CASE STUDY 2

VAKA ÇALIŞMASI - 2
Orta yaşlı ev hanımları ile çalıştay

Tema: Alışveriş
Ürün: Günlük çanta

Çantanın içi kolajı:

Normal bir gününüzü hayal edin. O gün alışveriş (market veya kıyafet alışverişi) yapmak için çarşıya çıkacaksınız. Evden çıkarken çantanıza neleri alırsınız? Verilen karton panoları çantanızmış gibi düşünün. Bu panolara çantanıza koyacağınız eşyaların imajlarını yerleştirin veya resimlerini çizin.

Alışveriş temalı mood board:

Eşyalarınızı çantanıza yerleştirdiniz ve evden çıktınız. Alışveriş yapacağınız mekana gitmek için bir araca bindiniz veya oraya yürüyerek gittiniz. Gittiğiniz yer bir market olabilir veya çarşıda cadde üzerinde mağazaları ayrı ayrı dolaşıyor olabilirsiniz. Alışverişi tamamladıktan sonra bir arkadaşınıza ev ziyareti yapacaksınız, daha sonra da evinize döneceksiniz. Bu aktiviteler sırasında çantanızla bir ilişki içerisindesiniz. Çantanızla olan ilişkinizi

yansıtacak imajları seçip bu imajlarla bir kolaj oluşturun. Daha sonra bu kolajı kısaca anlatacaksınız.

Kolajı hazırlarken:

- Bu aktiviteler sırasında çantanızla yaşadığınız problemleri düşünebilirsiniz.
- Gittiğiniz mekanı düşünebilirsiniz.
- Soyut kavramlarla da çanta kullanımını veya çantanızı bağdaştırabilirsiniz (keşke çantam şunu yapabilseydi...).
- Çantayla nasıl gözükmek istersiniz?

Çanta tasarımı aktivitesi

Önceki çalışmalarda yapmış olduklarınızı göz önünde bulundurarak, alışverişe çıkarken kullanabileceğiniz günlük bir çanta tasarlayın. Verilen kartonları ve renkli kağıtları çantanıza şekil vermek için, renkli oyun hamurlarını da çantanıza aksesuarlar yapmak için kullanabilirsiniz. Çalışma sonrasında yaptıklarınızı kısaca anlatacaksınız.

WORKSHOP BRIEFS FOR CASE STUDY 3

VAKA ÇALIŞMASI - 3
Genç-erkek mühendisler ile çalıştay

Tema: İletişim
Ürün: İletişim aracı

Bölüm-1: Kolaj aktivitesi

Kiminle konuşuyorsunuz?:

Gün içinde kimlerle nerelerde iletişim kurduğunuzu düşünün:

- *İş yerinizde, iş dışındaki kimseler* ile;

- *İş yeri dışında, iş yerindeki kişiler veya iş ile ilgili kişiler* ile;

- *İş yerinizde, iş yerindeki kişiler veya iş ile ilgili kişiler* ile olabilir.

Bu kişileri bu başlıklar altında size verilen panolardaki ilgili kısımlara yazın.

İletişim kolajı:

Verilen imajlarla iletişimin sizin için ne ifade ettiğini anlatan bir kolaj oluşturun.

Kolajı hazırlarken:

- Gün içinde iletişim kurduğunuz kişileri ve iletişim kurmak isteyip kuramadıklarınızı düşünün.
- İletişim kurarken karşılaştığınız problemleri düşünebilirsiniz. (Örneğin işinizi değiştirmeyi düşünüyorsunuz, patronunuz yanınızdayken görüşeceğiniz iş yerinden telefon geldi; veya MSN'de kız arkadaşınızla sohbet ediyorsunuz, bu sırada yöneticiniz arkanızda bilgisayarınızı gözetliyor...)
- İletişim kurarken nasıl gözükmek istediğinizi düşünebilirsiniz.
- İmajlar düşündüklerinizi birebir yansıtmak zorunda değil, yaptıkları çağrışımlara dayanarak fikirlerinizi anlatabilirsiniz.

Bu aşamadan sonra kolajlarınızda kullandığınız imajları açıklayacağınız kısa bir sunuş yapacaksınız.

Bölüm – 2: İletişim aracı tasarımı aktivitesi

Kim-kiminle-nerede panosu:

Bu bölümde, bir önceki aşamada düşünmüş olduklarınızı göz önünde bulundurarak, gün içinde iletişim kurduğunuz kimselerden birini seçip bu kişiyle iletişim kurmanızı sağlayacak bir iletişim aracı tasarlayacaksınız. Bununla ilgili olarak verilen panolardaki alanlara

- *siz*i (Kim?) ,
- *iletişim kurduğunuz kişi*yi (Kiminle?),
- *iletişim kurarken bulunduğunuz mekan*ı (Nerede?) ve
- *konuşulanlar*ı (Ne konuşuyor?)

temsil eden imajları yapıştırın.

"İletişim aracı" tasarımı aktivitesi:

Verilen malzemelerle, yapmış olduğunuz çalışmaları göz önünde bulundurarak bir iletişim aracı tasarlayın. Bu aşamadan sonra tasarladığınız ürünleri açıklayacağınız kısa bir sunuş yapacaksınız.

APPENDIX D:

ACTIVITY MATERIALS PREPARED FOR CASE STUDY 3

Kolaj Alanı:

İletişim Kurduğunuz Kişiler:

İş yerinizde,
iş dışındaki kişiler:

İş yeri dışında,
iş yerindeki kişiler
veya iş ile ilgili kişiler:

İş yerinizde,
iş yerindeki kişiler
veya iş ile ilgili kişiler:

Figure D.1 "Who are you talking with?" chart and mood board area

Figure D.2 "Who? – With whom? – Where?" boards