DEVELOPING A MODEL FOR EFFECTIVE COMMUNICATION OF
USER RESEARCH FINDINGS TO THE DESIGN PROCESS

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

GÜLŞEN TÖRE YARGIN

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
INDUSTRIAL DESIGN

JANUARY 2013

Approval of the thesis:

DEVELOPING A MODEL FOR EFFECTIVE COMMUNICATION OF USER RESEARCH FINDINGS TO THE DESIGN PROCESS

submitted by **GÜLŞEN TÖRE YARGIN** in partial fulfillment of the requirements for the degree of **Doctor of Philosophy in Industrial Design, Middle East Technical University** by,

Prof. Dr. Canan Özgen
Dean, Graduate School of **Natural and Applied Sciences**

Prof. Dr. Gülay Hasdoğan
Head of Department, **Industrial Design**

Assoc. Prof Dr. Çiğdem Erbuğ
Supervisor, **Industrial Design Dept., METU**

Examining Committee Members:

Prof. Dr. Gülay Hasdoğan
Industrial Design Dept., METU

Assoc. Prof Dr. Çiğdem Erbuğ
Industrial Design Dept., METU

Prof Dr. Erol Sayın
Industrial Engineering Dept., Karabük University

Assoc. Prof Dr. Owain PEDGLEY
Industrial Design Dept., METU

Assist. Prof Dr. Naz BÖREKÇİ
Industrial Design Dept., METU

DATE: 29 January 2013

iii

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name   :

Signature   :

ABSTRACT

DEVELOPING A MODEL FOR EFFECTIVE COMMUNICATION OF
USER RESEARCH FINDINGS TO THE DESIGN PROCESS

Töre Yargın, Gülşen

Ph.D., Department of Industrial Design

Supervisor : Assoc. Prof. Dr. Çiğdem Erbuğ

January 2013, 235 pages

It is a commonly held belief that the integration of user research data into the design process can bring great benefits; and there have been many studies that not only examine these benefits, but have also suggested how these researches may be carried out. However, effective integration relies as much on the way information gathered from user researches is delivered to the designer as the quality of the information gathered. Examples of how user research findings are communicated can be found in literature; but what is lacking is a structured approach to developing deliverables with a framing of discussions about effectiveness, considering the practitioner's needs and expectations.

This study aims to investigate how user research findings should be communicated to the designers in order to maintain effectiveness in integration of the findings to the design process. A model and strategies and guidelines to achieve effective communication are proposed as the result. In order to propose them the methodology involves three main stages, including a literature search, an in-depth interview with the practicing designers and a verification questionnaire to confirm the findings of the previous two stages. The results of the study reveal expected outcomes of the user research activity by designers as the dimensions of effective communication of user research findings. Moreover qualities of the delivery mediums and informational content of the deliverables are identified from practitioners' perspectives. The outcome of the study is a set of strategies and guidelines that the researches should consider, while designing new deliverables and planning communication activities for delivering user research findings to the design process.

Keywords: User research; deliverables; models of effective communication; interdisciplinary communication

ÖZ

KULLANICI ARAŞTIRMASININ TASARIM SÜRECİNE ETKİLİ BİR ŞEKİLDE İLETİMİNE YÖNELİK BİR MODEL GELİŞTİRİLMESİ

Töre Yargın, Gülşen

Doktora, Endüstri Ürünleri Tasarımı Bölümü

Tez Yöneticisi: Doç Dr. Çiğdem Erbuğ

Ocak 2013, 235 sayfa

Kullanıcı araştırması bilgisinin tasarım sürecine entegrasyonunun çok büyük faydalar sağlayacağı yaygınlıkla inanılan bir konudur. Bu araştırmaların sadece faydalarını değil, nasıl gerçekleştirilmesi gerektirildiğini de inceleyen birçok çalışma mevcuttur. Ancak etkili entegrasyon kullanıcı araştırmasında toplanan bilginin niteliklerine dayandığı kadar, bu bilginin tasarımcıya nasıl sunulacağı ile de yakından ilişkilidir. Literatürde kullanıcı araştırması bulgularının nasıl sunulacağına dair örnekleri bulmak mümkündür. Fakat araştırma çıktısı sunumlarının geliştirilmesine ilişkin eksiklik duyulan konu, pratisyenlerin ihtiyaçları ve beklentilerini gözeten ve etkili sunum ile ilgili tartışmaları göz önünde bulunduran, düzenli olarak yapılandırılmış bir yaklaşımdır.

Bu çalışmanın amacı kullanıcı araştırması bulgularının tasarım sürecine etkili bir şekilde entegrasyonunu sağlayabilmek amacıyla, bulguların tasarımcılara nasıl sunulması gerektiğini araştırmaktır. Çalışma sonucunda etkili iletişimi sağlamaya yönelik bir model, stratejiler ve yönergeler önerilmiştir. Bunları önerebilmek amacıyla, çalışmada uygulanan yöntem üç ana basamaktan oluşmuştur. Basamaklar literatür taramasını, alanda çalışan tasarımcılar ile gerçekleştirilen derinlemesine mülakat çalışmasını ve bahsedilen iki basamakta edinilen bulguların doğrulanması amacıyla gerçekleştirilen anket çalışmasını kapsamaktadır. Çalışma sonuçları, kullanıcı araştırması bulgularının etkili iletimine ilişkin boyutlar anlamında, tasarımcıların kullanıcı araştırması sonucundaki beklentilerini ortaya koymuştur. Ayrıca iletim yöntemlerinden ve sunumdaki bilgi içeriğinden beklenen nitelikler, pratisyenlerin bakış açısı ile tanımlanmıştır. Çalışmanın temel çıktısı, kullanıcı araştırması bulgularının tasarım sürecine iletimine yönelik yeni sunum araçları tasarlarken ve iletişim aktiviteleri tasarlanırken, araştırmacının göz önünde bulundurması gereken bir grup strateji ve yönergeler olmuştur.

Anahtar Kelimeler: Kullanıcı araştırması; araştırma çıktılarının sunumuna yönelik teslimler; etkili iletişim modelleri; disiplinler arası iletişim

to my mother Halime
and to the memory of my father Selçuk

ACKNOWLEDGMENTS

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1. Problem background

Incorporating user knowledge into the design process has always been considered as a problematic issue in user research. The first efforts to manage the integration of user knowledge into design were experienced during the design methods movement of the 1960s. According to Jones (1992), in proposing design methods the aim was to integrate a knowledge of ergonomics to the design process:

> I didn't want to get involved with design theory or methods. I just wanted to get the ergonomics work into action. […] So I did this ergonomic study of how the designing was done purely with the view of getting the ergonomic information which was obviously sound and well tested into the engineering design process at the point where it wouldn't be rejected, so the human requirements would come first and the machine requirements would come second, instead of the other way round, and in doing that I hit on what's now called design methods. (qtd. in Mitchell, 1992, p. x).

What Jones had "hit on" was received with great enthusiasm at the time; and despite the fact that the movement was rejected a decade later by proponents such as Jones, the need for the integration of user knowledge into the design process retained its importance from that time on. The effectiveness of the involvement of user research in the design process has been called into question in many studies (see e.g. Kujala, 2003; Mao, Vredenburg, Smith, & Carey, 2005 for detailed discussions; Vredenburg, Mao, Smith, & Carey, 2002), although it is commonly accepted that the use of user research in the design process has particular benefits for organizations. It is certain that the methods and tools used in obtaining this information have major impacts on the effectiveness of user research, and there is a broad range of literature on how this may be conducted to assure success. User research is usually carried out and delivered to the designers through a process that requires communication between the parties, meaning that the way this communication takes place is also an important factor in the effective integration of user research.

In this section, motivations behind the need for effective communication of user research findings are highlighted, first by indicating the communication gaps in the design process and how effective delivery of user research is helpful to overcome these gaps, and then the current approaches that are proposed to manage the communication gaps are reviewed and the reasons why they are not sufficient to maintain effective integration is discussed. At the end of the section a summary for the motivation of the study is presented to maintain an overview of the section.

1.1.1.   Communicative issues in design process

Communication in the product development activity involves problems between different stakeholders among the product development team. In this process, the designer faces with many obstacles while both *receiving* information as *inputs* for the design process and *communicating* his/her ideas as *outputs* to the other stakeholders (Figure 1).
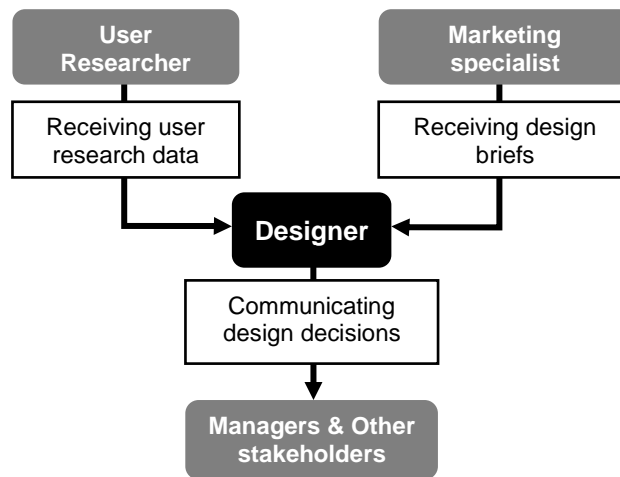
Figure 1. Designers receiving information and communicating ideas

Briefs and user research findings are critical *inputs*, delivery of which to the designer is commonly referred as problematic. As an input to the process, it is well received that effective briefing has critical importance (Petersen & Phillips, 2011; P. L. Phillips, 2004; Topalian, 2010). However usually briefs generated by non-design departments lack in clarity and do not include the information that the designer needs for initiating the process or sometimes too fixed in a sense that it limits creative idea generation phase for the designer. Designers start the design process with incomplete data and develop certain constraints which are not covered in the brief and generate new meanings in the form of design (Kolko, 2011). In this earlier stage, if it is effectively communicated to the designers, user research can aid the process by providing constraints and inspiration. During the user research activity, typically researchers are involved in the process to collect data from users and communicate them to the designers commonly in the form of a deliverable. Although designers' involvement in the user research process is highly recommended (Stappers, 2006), it is usually hard for the designer to accomplish such a multitasking procedure due to the division of labor in today's market conditions (van Veggel, 2005). Therefore the researcher acts as a mediator in the process of user research activity and such mediation can have problems in terms of effective integration of user research data to the design process.

As an obstacle for effective integration, the communication gap between the researcher, who is usually a social scientist, and the designer is considered as critical in the design research community (Diggins & Tolmie, 2003; Nijhuis & Boersema, 1998; Sleeswijk Visser, 2009; St Pierre, 2002; Stanton, 1998; van Veggel, 2005; Wasson, 2002). There are many underlying reasons for this gap (Table 1). According to Hughes et al. (1997), the gap is a result of the different ways of approaching a problem. Designers are accustomed to solving complex problems through abstraction, while in contrast researchers, especially in design ethnography, aim to illustrate situations in every detail and from different perspectives, avoiding abstraction and simplification (Hughes, et al., 1997). While searching for user information, designers usually have inspirational aims, however the researcher's approach is informational, and thus focuses on gathering reliable user knowledge (Sanders, 2005). Furthermore, it is stated that the differences in the educational backgrounds of designers and researchers, and in their respective terminologies and languages, create difficulties in communication (Griffin & Hauser, 1996; Hughes, et al., 1997; Stanton, 1998; van Veggel, 2005). In addition, their approaches to the design process are different, with the attention of social scientist being on the user, while the designer's focus is on the object being designed (Dorst, 2003; St Pierre, 2002).

2

Table 1. Some of the underlying reasons for the communication gap between the designer and researcher

	Designer	Researcher	Source
- problem-solving approach	Abstraction	Simplification	(Hughes, et al., 1997)
- research aim	Inspirational	Informational	(Sanders, 2005)
- design focus	Object-oriented	User-oriented	(Dorst, 2003; St Pierre, 2002)
- educational backgrounds	Design	Social sciences (usually)	(Stanton, 1998; van Veggel, 2005)
- terminology and language	Design-solution oriented	Academic-scientific	(van Veggel, 2005)

Design decisions as the *outputs* of the design process should be persuasive enough to convince management for the investment of production. Martin (R. Martin, 2007) argues that the disagreement between managers and designers is caused by their orientation type in the product development process. According to him, executives focus more on reliability in terms of producing "a dependable, consistent, replicable outcome" (p. 7) and they look for verifiable solutions which can be proven with reliable data, on the other hand, designers are much validity oriented and they are in search of deep understanding and multidimensionality regarding their design problems. In order to be persuasive, the designer needs to support his/her decisions with reliable data while communicating them to the managers.

It is considered that effective delivery of user research findings has great benefits for designers for overcoming these communication difficulties. If the findings are effectively communicated, they can be utilized for (1) managing the insufficiency of design briefs usually delivered by marketing specialists, (2) bridging the gap between the researcher and designer in the user research process by maintaining empathy with the user, and (3) they can provide data for supporting decisions of the designer while justifying them and maintaining proofs for persuading the other stakeholders in the product development team.

1.1.2. Efforts to overcome the communication gap

Active participation of the designer in the research process and methods, tools and techniques for effective integration of user research are proposed in the literature to overcome the communication gaps that are discussed in the previous section. In this section, these efforts are briefly presented and the reasons why they fall short to overcome the mentioned communication gaps are discussed.

1.1.2.1. Active participation of the designer

To overcome the communication gap between the designer and the researcher, one of the strategies commonly proposed in literature is the active participation of the designer in the research process. While from many aspects the inclusion of the designer in the user research is beneficial for the design process and profession (Stappers, 2006), the division of labor in today's market requires specialization in certain areas, and generally the designer has little opportunity to meet with the user (van Veggel, 2005). In addition, in a bid to overcome the time and budgetary problems experienced by companies, user research is often outsourced. In this case, the active participation of the designer may not be possible, and makes efforts at integration more complicated in that it brings different external factors into the equation, such as distance communication.

The active participation of designers can have other drawbacks. Usually designers are known for their skill in shaping and modifying objects, however their abilities in carrying out research and communicating with users are usually regarded as limited (Bruseberg & McDonagh-Philp, 2000; Dorst, 2003; Vihma, 2006). Obtaining views of social scientists regarding user activities can provide new insights for the designer (St Pierre, 2002), and therefore their collaboration is needed in order to understand user experiences, which can then be integrated into the design process (Blomberg & Burrell, 2008; Sanders, 2002; Wasson, 2002). However according to Blomberg and Burrell (2008),

simply relying on the active collaboration of the designer and researcher is not sufficient, as a means of communicating should be developed to allow the sharing of the results so that the designer can make full use of the user research study. According to Brown (2008) thinking like a designer can help companies to enhance their visions and to develop strategies that lead to innovation. Similarly, in order to maintain an effective communication of user research findings, a strategy and method of the delivery should be adopted that corresponds with the design thinking approach.

1.1.2.2. Methods, techniques and tools for effective communication

The effective communication of user research findings has been the topic of many studies, especially in such areas as design ethnography (e.g. Crabtree, Hemmings, & Rodden, 2002; Diggins & Tolmie, 2003; Hughes, O'Brien, Rodden, Rouncefield, & Viller, 2000; Sleeswijk Visser, 2009; Wasson, 2002), ethnography in system design regarding computer-supported collaborative work studies (e.g. Hughes, et al., 1997; D. Martin & Sommerville, 2004) and usability testing (Nørgaard & Hornbæk, 2009; Ramey, Robinson, Carlevato, & Hansing, 1992).

Besides the traditional representation methods for the effective communication of user research findings, such as written reports, scenarios and oral presentations, many novel solutions have been proposed to this end. These include: different applications of personas (Pruitt & Adlin, 2006); interactive multimedia presentations that present the findings in a structure which are claimed to be "digestible by the designer" or "trackable to design" (Grounded Innovation Map by Diggens and Tolmie (2003); Hypermedia-Supported Requirement Documents by Ramey et al. (1992); Patterns by Hughes et al. (2000)); play-acting and experience prototyping for presenting user experiences (Buchenau & Fulton Suri, 2000; Iacucci, Iacucci, & Kuutti, 2002); and collaborative workshops for the sharing of results with designers (Sleeswijk Visser, Van Der Lugt, & Stappers, 2007).

Although it is clear that the importance of effective communication has been recognized in previous literature, few studies have actually evaluated the effectiveness of such means. The study of Sleeswijk Visser et al. (2007) regarding collaborative workshops with designers raises subjective conclusions about the way some designers utilize the results of a design research study, and provides a fair understanding of the effectiveness of the model. Another effort to evaluate effectiveness in the means of communication was made by Nørgaard and Hornbæk (2009), who conducted a study with software developers in which five usability feedback formats were evaluated. Although this permits an understanding, the developer's perception of the formats, the matter of their actual effectiveness is largely overlooked. This prevents an overall understanding of the topic and fails to draw inferences related to other means of communication of user research studies, since the study is focused on usability testing alone. Similarly, Molich et al. (2007) have evaluated usability recommendations made by selected experts related to website design based on their usability and usefulness, and suggested how usable and useful recommendations may be managed. As is the case with the former example, only limited dimensions are covered, which may not satisfy the requirements of the design team in regards to the effective communication of user research findings.

While utilizing these methods, tools and techniques for the delivery of user research findings, the researcher needs to understand what kinds of *decisions are made by the designer in the design process* (Blomberg & Burrell, 2008). For this purpose, similar to a designer's "user model" in the design process, the researcher creates "a designer model" while preparing the deliverables for their use, however there can be a mismatch between the researcher's model of the designer and the actual model (Hasdoğan, 1996). Usually, such models are based on theories and assumptions of the researcher about the user information required by the designer, and how this knowledge will be utilized in the design process.

In user research studies, the categorizations and criteria used to analyze the results of the study are usually defined by the researcher, which may not correspond to the designer's actual needs in the design process. The design team's considerations of the subject area are of primary importance, since they are the end users of the research findings (Diggins & Tolmie, 2003); therefore *considering*

the needs of the design team not only leads to a more usable knowledge resource, but also a more communicable knowledge among the interdisciplinary team.

1.1.3. Problem background summary

Figure 2 summarizes the issues that constitute the motivation for developing a model of effective communication and discussions about the background of the problem. If the communication gap between the researcher and the designer is to be overcome, a strategy for delivery should be adopted that considers the designer's needs and expectations regarding their utilization of the user research findings.
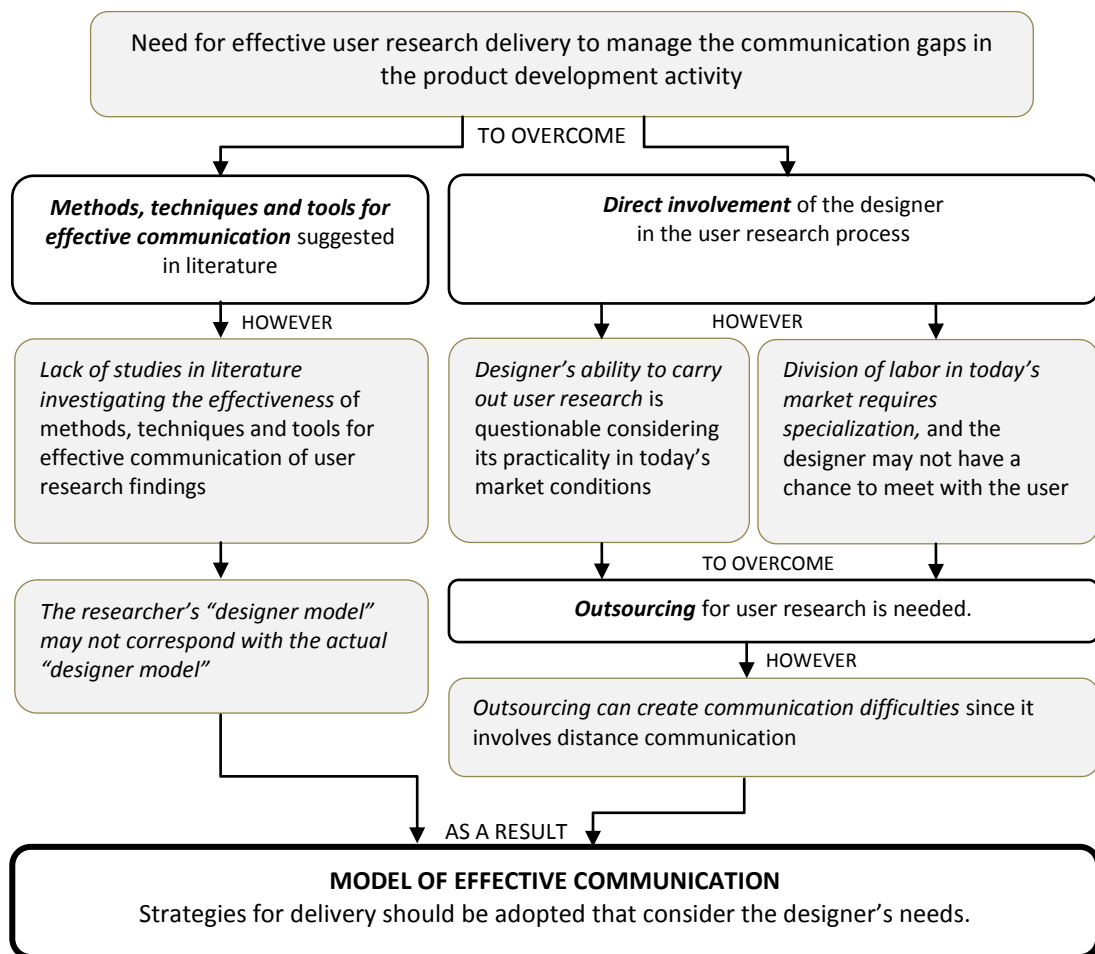
Figure 2. Motivation to develop a model for effective communication

1.2. Aim of the study and research questions

Considering the arguments mentioned in the problem background, this study aims to develop

- ❖ a model for effective communication of user research findings to the design process and
- ❖ guidelines and strategies for user researchers regarding how to utilize the framework in constructing the research and the presentation for effective delivery of the results.

By accomplishing these aims, it would be possible to empower user researchers with guidance for devising effective communication strategies for delivering user research findings, which meet

designers' informational needs and provide designers with the ability to overcome communicative difficulties in the product development process.

In order to propose the model and guidelines and strategies for effective communication, there are three major research questions that this thesis aims to answer (Figure 3).

- **What** are the dimensions of effective communication? Which outcomes are requested by the designer as the result of user research?
- **How** can effective communication be achieved? What are the ways to achive it in order to maintain effective integration of user research findings to the design process?
- **In which cases,** expected outcomes from user research differ? Which external factors have effects on the dimensions of effective communication and the way it is achieved?
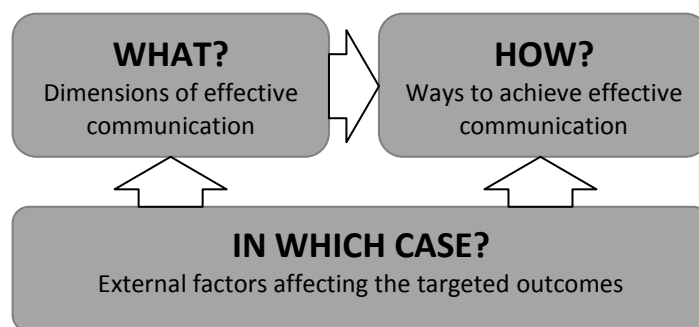
Figure 3. Research questions

1.3. Structure of the methodology

Stages of the methodology are presented in Figure 4 together with the research questions being explored in these stages. At the first stage, a literature search is conducted to explore the dimensions of effective communication and how it is achieved based on the secondary sources. The outcome of this stage is a set of constructs, which are utilized as a provisional list for the analysis of the second stage that involves in-depth interviews with the practitioners. Cognitive mapping with laddering approach is utilized as the main methodology for the second stage to explore the constructs of effective communication and how it is maintained from the perspectives of designers. Moreover external factors' effect on the evaluations of respondents is also questioned at this stage. The third stage involves a verification questionnaire carried out with a large sample group. At this stage, constructs that are identified in the first two stages and patterns of relations between these constructs identified at the second stage are questioned in response to the questions "how" and "in which case". Through these stages, the model and strategies and guidelines for effective communication are developed, which are the aims of this thesis study.
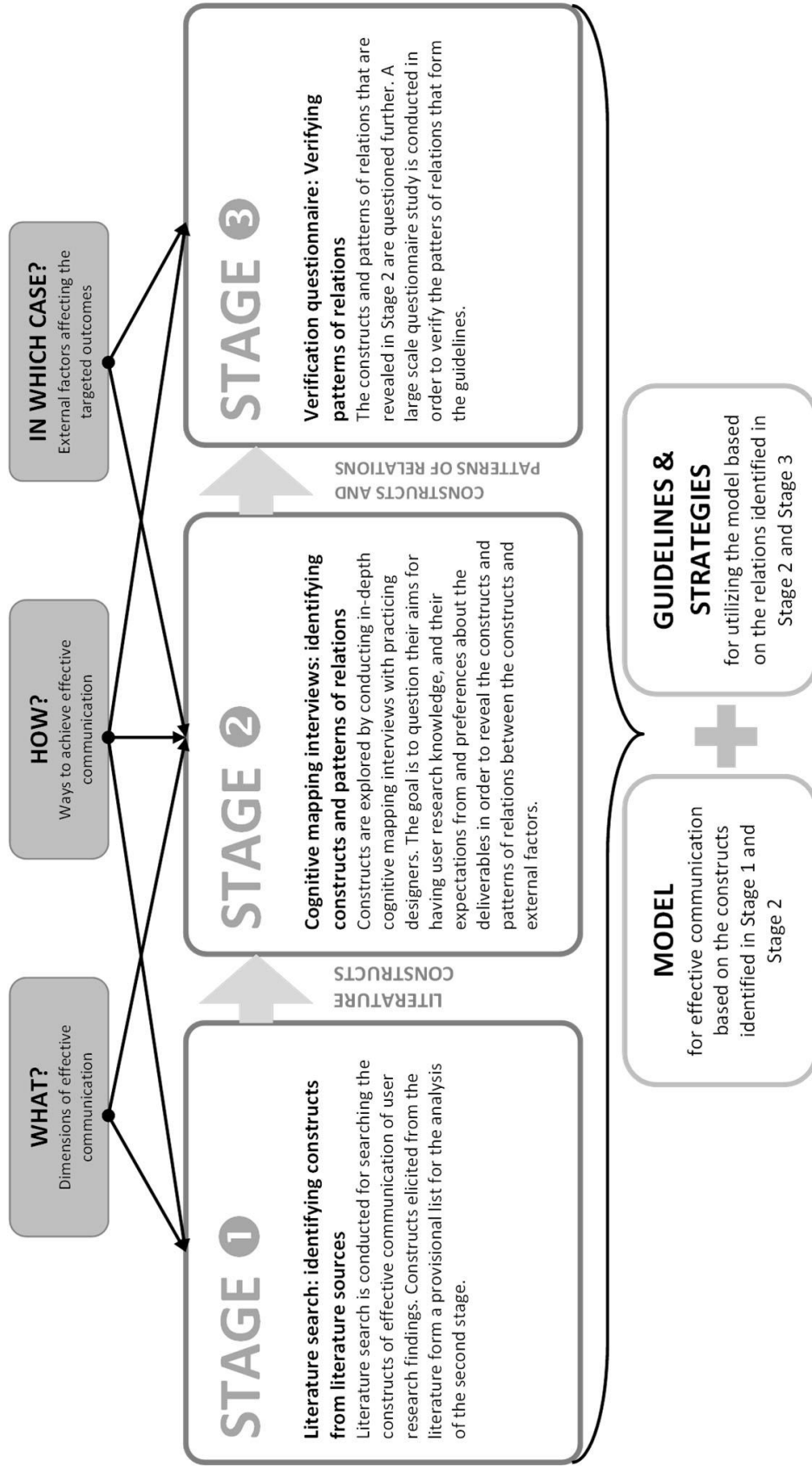
Figure 4. Questions and structure of the methodology

WHAT?
Dimensions of effective communication

HOW?
Ways to achieve effective communication

IN WHICH CASE?
External factors affecting the targeted outcomes

STAGE ❶

Literature search: identifying constructs from literature sources
Literature search is conducted for searching the constructs of effective communication of user research findings. Constructs elicited from the literature form a provisional list for the analysis of the second stage.

LITERATURE CONSTRUCTS

STAGE ❷

Cognitive mapping interviews: identifying constructs and patterns of relations
Constructs are explored by conducting in-depth cognitive mapping interviews with practicing designers. The goal is to question their aims for having user research knowledge, and their expectations from and preferences about the deliverables in order to reveal the constructs and patterns of relations between the constructs and external factors.

CONSTRUCTS AND PATTERNS OF RELATIONS

STAGE ❸

Verification questionnaire: Verifying patterns of relations
The constructs and patterns of relations that are revealed in Stage 2 are questioned further. A large scale questionnaire study is conducted in order to verify the patters of relations that form the guidelines.

MODEL
for effective communication based on the constructs identified in Stage 1 and Stage 2

GUIDELINES & STRATEGIES
for utilizing the model based on the relations identified in Stage 2 and Stage 3

1.4. Structure of the thesis

Figure 5 outlines the structure of the thesis. The first two chapters form the background of the study. In Chapter 2, integration of user research findings into the design process is reviewed by examining its historical and theoretical background and an overview about the types of user research is presented.

Chapter 3 presents an overview of the methodology of the study which is presented in the previous section. The research questions are explored through the stages that are presented in this chapter.

The last three chapters provide answers that are acquired as the result of the study. Chapter 4 covers the findings regarding the constructs of the model for effective communication. Definitions, importance hierarchy and characteristics of the constructs are presented in this chapter. Moreover relations conceptual relations that are identified between the constructs are outlined with the findings from interview and questionnaire studies.

Chapter 5 introduces the major outcomes of the thesis study, which are the model utilized in practice and detailed strategies and guidelines involving the effects of external factors on constructs of effective communication.

In the final Chapter, research questions are answered by considering the findings of the study.

| Background for the study | **Chapter 1.**
INTRODUCTION: Motivation of the study |
| | **Chapter 2.**
INTEGRATION OF USER RESEARCH INTO DESIGN PROCESS
• Historical and theoretical background
• Types of user research |

Research questions being explored	**Chapter 3.** **METHODOLOGY: DEVELOPING A MODEL FOR EFFECTIVE COMMUNICATION** • Fundamentals of the basic framework for the model • Description of the stages of the methodology
WHAT?	STAGE ❶: Literature search
HOW?	STAGE ❷: Cognitive mapping interviews
IN WHICH CASE?	STAGE ❸: Verification questionnaire

Answers acquired	**Chapter 4.** **CONSTRUCTS OF EFFECTIVE COMMUNICATION** • Definitions of constructs • Importance hierarchy of impacts and qualities • Characteristics of constructs • Relations between construct
	Chapter 5. **MODEL FOR EFFECTIVE COMMUNICATION: STRATEGIES AND GUIDELINES** • Model for effective communication in practice • Major impacts and the regarding qualities • Strategies for effective communication
	Chapter 6. **CONCLUSIONS**

Figure 5. Structure of the thesis

CHAPTER 2

INTEGRATION OF USER RESEARCH INTO DESIGN PROCESS

In this chapter, first a brief review of historical and theoretical developments regarding user research integration into the design process is presented to provide background information for the thesis study and then types of user research from different perspectives are outlined to maintain a description of user research in the scope of this study.

2.1. Historical and theoretical background

Historical developments regarding integration of user research into the design process are illustrated in Figure 6 by highlighting the changes in the designer's role and major developments regarding design theory and user research. The review that is outlined here is not aimed to be an exhaustive one rather the goal is to provide a brief overview for the theoretical and historical roots for the integration as the background for the study.

Integration history is examined by considering five major periods based on the major developments in user research.

	1. Earlier periods of integration		2. Design methods and integration of ergonomics	3. Rejection to design methods and participatory design era	4. Entrance of Social sciences		5. Current issues: Meaning centered experience research
	1950's	1960's		1970's	1980's	1990's	2000's
DESIGNER'S ROLES (According to Valtonen, 2005)	The designer as the creator	The designer in a team with mechanics and marketing		The designer as an end-user expert	The designer as a coordinator	The designer creating experiences	The designer pushing innovation
DESIGNER'S ROLES (According to Perks et al., 2005)	19th Century: Design as Business Oriented / 1920s to 1950s: Design as Specialized	1960s to 1970s: Design as Profession			1980s: Design as Brand	1990s: Design as Sub-process of New Product Development	Early 2000: Design as Product Development Process Leader
DEVELOPMENTS IN DESIGN THEORY	*Design by drawing*	*Design methods movement*			*Postmodernism* / *Product semantics* / *Design as a discipline*		*Design driven innovation* / *Experience design* / *Design and emotion*
DEVELOPMENTS IN USER RESEARCH	*Studies related to physical and cognitive ergonomics for military purposes*	*Utilization of ergonomics in the design process*		*Participatory design*	*Social sciences* / *Ethnography* / *Emergence of HCI*	*Projective and participatory techniques* / *Contextual Design*	

Figure 6. Integration of user research into the design process from historical perspective

2.1.1. Earlier periods of integration

It is commonly argued that separation of designing from the activity of making signifies the emergence of design profession (Heskett & Giorgetta, 1980; Lawson, 2006). Their togetherness refers to the craft based processes, in which the final design is the outcome of planning and making activities that evolves through long periods of time. Such kind of processes deals with the same problems through the development period of the product and if anything is changed in the final outcome, the product may fail to accomplish its function. For this reason, the craftsman does not make major changes to keep the satisfactory quality. With the emergence of industrialization and advancements in production techniques, products were becoming complicated and there needed to be a division of labor between the maker and the designer of the product (Lawson, 2006).

After the First World War, as a newly industrialized country, America benefitted from mass production techniques and productivity was increased considerably. Companies were striving to achieve success by differentiating their products in the market with visual appeal. It was this period that industrial design began to be reputed as a profession (Heskett & Giorgetta, 1980). In this earlier phase, designers were much like artists who create stylish and aesthetically pleasing products (Perks, Cooper, & Jones, 2005; Valtonen, 2005). Individuality of the designer was important to be able to produce significantly recognizable images (Lawson, 2006). Though the wars had harsher effects on the European countries, they were still able to recover later on, and follow a similar path regarding the emergence of the profession. To illustrate, according to Valtonen (2005), in Scandinavian countries, it was in 1950s that individual designers entered into the scene to create products with a stylish look by emphasizing the national identity.

In this period, the main methodology for designing was *design by drawing*. Since the activity of making and designing are separated from each other, the designer needed to communicate his/her thoughts through a medium, such as production or technical drawings (Lawson, 2006).Furthermore, the design itself is conceptualized through producing drawings by the designer. By this way, s/he reflects his/her thoughts and the products can be developed by considering these reflections and by producing new ones. Jones (1970) identifies this process as *design by drawing*, and he states that this gives freedom to the designer to manipulate the product prior to the production process, in order to correct problems regarding the proposed solutions.

During this early period fitting the user's task demands was not the central concern of industrial designers, although studies regarding human factors and ergonomics were started especially for the military purposes. Such kinds of studies were mostly carried out by psychologists, anthropologists, medical doctors and engineers (Pheasant, 2003; Reese, 2002).

There are different views regarding the genesis of human factors and ergonomics, however it is commonly postulated that wartime efforts for developing military products to improve the efficiency of soldiers was one of the first remarkable developments in the history of product ergonomics. Both cognitive workload and physical capacities of soldiers were the concerns of these earlier studies (Reese, 2002; Stanton, 1998). European and American approaches to this kind of user studies was also different in this initiation period. In Europe physiological and anatomical aspects of work were at the focus as *ergonomics* studies, while in US the efforts were named as *human factors* and the focal point was human psychology and performance in relation to the task (Helander, 2006; Reese, 2002).

After the Second World War, scientists and practitioners, who studied for the efficiency of soldiers, were gathered to discuss 'the study of human beings in their working environment' (Pheasant, 2003, p. 4), and they postulated that these efforts should be utilized in other areas during the peacetime (Pheasant, 2003). This kind of utilization was experienced in design of telephone sets and drivers' working stations in tractors, earth- and materials-moving and road-building machines which were designed by Henry Dreyfuss during 1930s to 1960s (Heskett & Giorgetta, 1980). Heskett and Giorgetta (1980) claim that Dreyfuss' book about human body proportions and capabilities, *The Measure of Man*, which was published in 1961, was one of the first attempts to propose ergonomics as a crucial tool for the product development. According to him, Dreyfuss' success in industrial design originated from his perspective on human machine interaction about that the machine should fit its user, as opposed to the misconception that the user has to fit to the machine.

2.1.2. Design methods and integration of ergonomics

In 1960s with the advancements in production techniques and rise in consumer demands, the designer could no longer play the role of the product creator solely. S/he needs to develop the product with careful inspection and through systematic conceptualization (Archer, 1965; Lawson, 2006). In the industry, designers were becoming to be employed in the companies as members of the product development teams (Valtonen, 2005). In many countries such as Japan and UK, design was officially accepted as a profession with the establishment of councils and associations for industrial designers (Perks, et al., 2005). However designers were still regarded as artists who were deprived of technical knowledge which is required for the product development process and they even needed to prove themselves that they were necessary for the company (Valtonen, 2005). Moreover, some academicians and practitioners such as Christopher Jones, who is one of the leading figures of Design Methods movement disturbed by the superficiality of the ways that industrial design was practiced (Mitchell, 1992). In the light of these circumstances, systematic approaches to problem solving regarding industrial design gained attention, and the movement began with the actions of these people starting from its first conference in 1962 (Cross, 2007).

Operational research, which had been crucial for overcoming the wartime problems, and management decision making techniques were influential in the establishment of design methods movement (Archer, 1999; Cross, 2007). According to Archer (1999), these areas were facilitative for the design methods in terms of providing systems approach for analyzing the complex problems. He also asserts that theories concerning science that are posited by Karl Popper had a great impact on design methodology. Popperian view on science maintains that real science is performed by stating *conjectures* and then testing them systematically by seeking ways to *refute* them. Archer (1999) explains this view's effect on the early developments in design methodology as follows:

> Conjecture, exploration and refutation (or, more popularly, proposition, development and test) is exactly what designers do! Design activity was scientifically respectable! More than that, in the light of the Popperian revolution, we can assert that research can just as properly be conducted through the medium of design activity itself, as it could by orthodox scientific enquiry! The Design Methods Movement had matured into the new discipline of Design Research. (Archer, 1999, p. 567).

This development received a great enthusiasm in the field. According to Bonsiepe (2007), there were two underlying reasons for the success of design methods in that period. First the problems regarding the products were becoming too complicated to be handled just *design by drawing,* therefore there needed to be systematic approaches to overcome such kind of complexities, and the other reason was that design as a profession is wanted to be recognized and respected as having methodologies and theories to build its own knowledge as a discipline, therefore systematic approaches aroused attention mostly in the academia.

In the design practice, since designers were becoming to be employed in the product development teams, design activity was no longer an individual process and team work was required in order to develop new products, for this reason there was a need for integrating knowledge from other disciplines such as "ergonomics, cybernetics, marketing, and management science" (Archer, 1965, p. 57). Design methods were proposed also for incorporation of such knowledge in a systematic manner and they were offered for supporting the teamwork as well (Jones, 1963).

Jones (1992) categorizes the early design methods under three groups: *designers as black boxes, designers as glass boxes* and *designers as self-organizing systems*. Methods related to creativity are implied in *designers as black boxes*. These methods highly depend on the designer's creative ability, and they assume that the most crucial part of the process is performed in the designer's mind. The second group, *designers as glass boxes*, denotes rationality in the design process that the design thinking can be explained in a systematic manner, and the process should follow a strictly systematical sequence which should be planned beforehand. The third group, *designers as self-organizing systems*, can be considered as a mutual relation between the first two groups of activities in which the designer has control over the process, and s/he decides on appropriate

methods to carry out stages of the design procedure and allocates his effort accordingly. By utilizing both rational and intuitive methods the designer could control the process systematically to solve the complex problems and use his intuition and creativity to produce product alternatives that are different than the existing ones. Mostly the last approach is respected in the earlier phases of the design methodology.

In this period, developments in user research are mostly focused on the integration of ergonomics to design. As it is stated before, knowledge from different disciplines were started to be employed in the design process and ergonomics was one of the most crucial ones, since it enables to identify the user needs and to incorporate them in the design process as the requirements for design. Employment of ergonomics knowledge is appropriate since as a scientific discipline, it makes the design activity a more respected profession.

Prior to this period, Henry Dresyfuss was already utilizing ergonomic requirements in his designs (Heskett & Giorgetta, 1980). Similar to Dreyfuss, Jones[a] asserts that his intentions to propose systematic design methodologies were based on the fact that he was aiming to integrate ergonomics knowledge to the design process. Considering these intentions, application of ergonomics knowledge to the design process gained popularity through design methods. After this period, in 1970s, originated from the previous developments in the field, the designer was becoming to be regarded as an "end-user expert" (Valtonen, 2005).

2.1.3. Rejection of design methods and participatory design era

In beginning of 1970s, rejection against design methods movement began, and most interestingly, remarkable refusals came from its founding fathers, especially Jones (1977) and Alexander (1971). They think that such a systematical approach is not suitable for design practice that needs allowance for creativity. Jones (1977) further confesses that he was wrong about his assumptions regarding the integration of rational and intuitive methods, since proposing a fixed frame for carrying out the design activity endangers the mental processes that are necessary for designing unique and successful products. Moreover he states that *black box* methods work better than the *glass box* ones, because the latter is aiming to bring certainty to the problem area, however "design is to do with uncertainty", thus the former ones are more suitable in this sense. In addition, as it was earlier asserted by Jones (1963), systematic design methods were suggested when the solutions are required to depart considerably from the existing ones, nonetheless as opposed to this claim such systematic methods were indeed directing the design process to evolve in a restricted ground.

Although early design methods were proposed against the superficiality of industrial design practice, they were criticized for underestimating the creative process in design conceptualization by trying to put it in strictly ordered sequences and by decomposing it into subparts. Furthermore Lawson (2006) argues that often natural design processes are not following a sequence as the design methodologists suggest (*analysis, synthesis*, and *evaluation*). Design problems were primarily respected as "wicked" or "ill-defined" that cannot be easily solved with scientific and engineering procedures, which usually deal with "tame" problems (Rittel & Webber, 1984). Sometimes a design process can start with identifying some details that would be used in the final design, through evaluating alternative detail solutions; or sometimes the material is chosen among the alternatives and whole design can be developed considering the aspects of the material. In such cases the design process actually starts with detail evaluations, although in generic design process that was posited by design methodologists maintains that the design process evolves through proposing several alternative solutions and afterwards by making decisions and adding details. Therefore actually design does not evolve from generic to specific. Besides iteration, it can start from any of the steps that were suggested by early methodologists (Lawson, 2006). As it can be understood from these views, there was an obvious gap between theory of design methodology and design practice that brought the movement to its final stage.

---

[a] in an interview conducted by Mitchell (1992)

In spite of the gap between theory and practice, social and cultural context of the late 1960s had negative effects on the movement in a way that it facilitates the rejection of conservative values (Cross, 2004). Broadbent (1979) claims that "expert-knows-best" approach was dominant in the earlier phase that they even design buildings or products in order to show people "how they 'should' live" on the contrary to Jones' intentions of fitting user needs. Such an approach was obviously subject to protestation considering the social movements at that time. Therefore restraining the creative design process with such a standard and systematic way was ruled out. "Expert-knows-best" approach leaves its place to more disorganized and *participatory* approaches in which the designer is a stakeholder of the problem together with the users (Cross, 2004).

According to Rittel, as it is referred by Broadbent (1979), through these developments, actually design methods did not come to an end, instead they evolve into a different form in which the designer was not the sole owner of the expertise rather its shared by all of the participants, and design activity became a more democratic process with the involvement of users. Furthermore he defines the latter methods as second generation design methods, which involves participation of other stakeholders such as users.

It is commonly accepted that participatory design was originated from developments in software industry during 1970s in Scandinavia and it was proposed based on the thought that workers should have right to manipulate design of their work environments and tools (Spinuzzi, 2005). Broadbent (1979) mentions its earlier applications in architectural design while describing the second generation design methods and their implications on design practice. He claims that total participation was tried in some cases; however they ended up with failures, since the outcomes had several major problems that were not predicted by the user-designers. Moreover he states that even if guidance by the designer was provided in some cases, participation did not provide successful outputs since the users still considered existing solutions that are already proposed by professional designers. Therefore he suggests that both first and second generations had failures, and a third generation is required in order to provide expert framework and problem solving approach to the actual problems and needs of the users. It is not certain that this proposal have been successfully achieved, however both generations' approaches evolved on their way to some extent.

Participatory design was seen as a way to include users in the design process, and elicit their *tacit knowledge* originated from their experiences (Spinuzzi, 2005). Such knowledge is important for the design process since it cannot be easily obtained by the designers. Participatory design mostly evolved in systems design and its applications are widely used in many design areas including product design. In many fields especially computer software and industrial products that is specialized for producing specialized equipments are developed by their users (Hippel, 2009). Currently "open user innovation" (Hippel, 2013) is a crucial subject area regarding participatory design where users of products have became so expert in use that they feel necessity to develop customized solution for their own problems which provides important leads for manufacturing firms to make innovations.

As for the first generation systematic methods, although they were rejected by practitioners and methodologists, they were further developed and applied in different areas especially in engineering design (Cross, 2004). Moreover design thinking has been the concern of design theorists since the beginning of design methodologies, and earlier periods were facilitative in developments regarding design theory. In 1960s earlier proponents of design methodology were trying to prescribe procedures to conduct design activity. After the refusals to this normative perspective, there were several attempts to understand and analyze (1) design as an individual activity both in its natural setting (e.g. Akin, 1979; Thomas & Carroll, 1979) and in contrived settings (e.g. Akin, 1979; Lawson, 1979); (2) its cognitive differences from other disciplines (e.g. Cagan, Kotovsky, & Simon, 2001; Lawson, 1979; Purcell & Gero, 1996); (3) and designing as a teamwork and team behavior (Cross, 1997; Cross, Christiaans, & Dorst, 1996).

2.1.4. Entrance of social sciences to the design research activity

In 1980s there were two different approaches apparent in the practice of industrial design. One approach was artistic and individualistic that was emerged with the impact of postmodernism on design (Heskett, 2005). On the other hand with the advancements in technology and design management, there were also professional designers, who were working as team players and coordinating the information flow between different units in the firm to design better products (Valtonen, 2005). Moreover, prior to this period, design consultancy firms were generally small-sized firms and they were usually established under the name of an individual designer, such as Raymond Loewy or Henry Dreyfus, however in this period consultancies were considerably enlarged by including not only designers but also individuals from diverse areas, and consultancies' names were becoming to hold no specific reference to individuals (Heskett, 2005).

According to Cross (2007), in this period design manifested itself as a distinct discipline with its own way of thinking that makes it different than "scientific and scholarly ways of thinking" (Archer, 1979 qtd. in Cross, 2007, p. 3), and according to him "Design as a discipline means design studied on its own terms, within its own rigorous culture, based on reflective practice of design" (Cross, 2007, p. 3). In the light of these developments design research also gained importance since through its employment it can be possible to build knowledge of design discipline.

Social sciences became an important tool for design research during 1980s. As the focus of design was starting to shift towards the user, it became necessary to include social scientists, such as ethnographers and anthropologists, in the product development processes to inform the development team with user knowledge. According to Reese (2002) these developments start to occur towards the beginning of 1980s, and he mentions several leading figures that begin to integrate social science knowledge to the design process and have strong influence on the current design research approaches. Reese (2002) claims that among them Chuck Mauro is the one of the first social scientist who proved that the establishment of a good relation between human factors research and industrial design can lead success in product development. His observations regarding the context of use revealed necessary problems and considerations that were needed to be taken into account in the design process. Like Mauro these early leaders were helpful in many aspects of product development process, especially for identifying the actual problems of users and how these problems are differentiated from the ones that the designer presumes. Therefore ethnographic and contextual studies in design research became commonly employed for understanding users.

During this period, besides social sciences, marketing research came up as one of the major ways for designers to obtain user knowledge (Margolin, 1997). It became widely used for devising product development strategy and generating new product ideas (Heskett, 2005). Although marketing research borrows many of its techniques from social sciences such as in-depth interviewing and observation (Malhotra, 2007), utilization of its data in design process is often criticized by some design researchers, since they are limited to users' verbal expressions that may lead to erroneous results (Sanders & Dandavate, 1999). Moreover marketing research studies are usually conducted by its researchers, and designers are not included in the process of formulizing the research activity, therefore questions, which may lead to investigation of design problems, may not be asked to the users (Bruseberg & McDonagh-Philp, 2000; Cross, 2004), and often raw data are not reachable by the designers though they may provide real insight about the problem area (Bruseberg & McDonagh-Philp, 2000). Such kinds of conflicts between marketing and design departments are usually referred in the literature (Perks, et al., 2005). Although social research can provide genuine understanding of actual user needs, it may not be enough for achieving success if the product sales are considered. In such cases, marketing research is crucial, since it can give generalizable data, which is essential if the product is to be marketed to large amount of consumers (Vihma, 2006).

By the mid 1980s, with the development of personal computers, Human Computer Interaction (HCI) as a discipline emerged (Caroll, 2003). Originating its knowledge from cognitive sciences HCI introduced methods to develop interactions for users, who were generally novices. This development is important for product design research, since products began to involve embedded technologies and interactive interfaces, and design research makes use of some of the HCI methodologies for understanding user behavior (Hanington, 2003).

Towards the beginning of 90s, originated from the participatory approaches in the earlier periods and utilizing ethnographic research methodologies, contextual design is proposed as a user centered design approach involving procedures regarding (1) data collection from the field, (2) collaborative analysis with stakeholders in the development team, (3) prototyping with the considerations from the analysis and (4) testing and refining them with the users (Holtzblatt & Beyer, 2013; Holtzblatt, Wendell, & Wood, 2004). The major principle is building a partnership with users to improve the systems they work with through user centered design and research steps. Major inputs for the design activity are representational models that enable the designers to see patterns in contextual information. Contextual design is widely applied in information systems design projects from that time on and there are applications in other areas such as consumer products, automobiles, medical products etc.

In the 1980s, another important development in industrial design profession was the emphasis of meaning in design. With the effects of postmodernism, there were some designers who preferred to reflect their intuitions and styles on their designs rather than user needs and expectations. Semantic values rather than the utilitarian ones were emphasized and the traditional approach 'form follows function' was transformed into 'form follows meaning' (Heskett, 2005). Individuality of the designer gained importance again, and companies promoted their brands by labeling them with the names of well-known designers (Perks, et al., 2005).

In this period product semantics, which was initially proposed by Krippendorff and Butter (1984), gained attention in the field of design research. They defined Product semantics as "the study of man-made forms in the context of use and the application of its knowledge to industrial design" (Krippendorff & Butter, 1984). According to product semantics, the product is a communication medium through which the designer expresses his/her intentions to the product's user (Krippendorff, 1989). The designer objectifies his thoughts in the shape of a product however this medium may not reflect the designer's intentions to the user as the way the designer designates (Crilly, Moultrie, & Clarkson, 2004). With this problem in mind, several empirical studies were carried out in order to understand the meanings that the objects convey. However as Vihma (2006) points out, it is hard to employ and interpret such kind of knowledge by designers, since it is usually regarded as theoretical and "fuzzy".

By the end of 1990s product semantics and the concept of communication through product left its place to understanding emotional domain in product design and providing pleasurable experiences through products (Cupchik, 1999; Demirbilek & Sener, 2003; Desmet, 2003; McDonagh, Bruseberg, & Haslam, 2002; Norman, 2004; Redström, 2006; Sanders, 2002).

2.1.5. Current issues: Innovation and meaning centered experience research
Innovation, which can be achieved through employment of successful design procedures, becomes a crucial aid for winning in today's competitive market. Designers are received as leaders of product development teams who are the agents who "push innovation" by utilizing user knowledge especially in innovation focused firms (Perks, et al., 2005; Valtonen, 2005).

There are different views regarding how to achieve innovation in business settings. Users are seen as an important source for innovation and this view is supported by many scholars in the field (Chayutsahakij & Poggenpohl, 2002; Leonard & Rayport, 1997; Thomke & Von Hippel, 2002). On the other hand, according to scholars such as Verganti (2009), if companies are striving to achieve radical innovation they should avoid adopting a user centered strategy at the beginning of their design processes. Supporters of this view claim that since user research is about the current circumstances regarding the context and usually based on people's personal opinions which rely on existing products, such kind of research cannot lead to breakthrough ideas. Radical innovation driven by design can take place through generating new meanings for utilization of existing technologies (Verganti, 2009). However such radical innovations can only be valid if the new meanings are adopted by users. As a matter of fact user research activity that is conducted with generative purposes usually aims at identifying such kinds of new meanings for the user (Chayutsahakij & Poggenpohl, 2002). As the receiver of the user research information the designer

synthesizes this knowledge to design products (Kolko, 2011). Therefore, how findings of user research is communicated to the designers is as important as qualities of information gathered through user research, especially if the designer is unable to get involved in the research process due to division of labor in today's market conditions (van Veggel, 2005).

In contemporary design practice, it is not enough to correspond the functional needs only, it is also important to provide pleasurable products (Jordan, 2000) and hedonic qualities (Hassenzahl, 2001); and in addition, emotional dimensions of product use becomes important (Cupchik, 1999; Desmet, 2003; McDonagh, et al., 2002; Norman, 2004; Sanders, 2002). Sanders (2002) acknowledges that social sciences' existing literature regarding emotions' effects on human experience have considerable influence on the contemporary design research practice, and the focus of current user research is on "experience design" and providing "pleasurable experiences" that have vast literature in the area of user research (Laurel, 2003; Schifferstein & Hekkert, 2008). Moreover the direction of interest in this area is heading towards "possibility driven design" that leads to happiness in use from the traditional focus on "problem driven design" (Desmet & Hassenzahl, 2012).

In order to understand users and their needs, it is commonly stated that the designer should learn to put user research into practice (Bruseberg & McDonagh-Philp, 2000; Cross, 2004; Poggenpohl, 2002; Sanders, 2002; Stappers, 2006), since knowledge from other sources may fall short to give the information that is needed in the design process. Generally while designing for users, especially when the user is not familiar to the designer, the designer feels the need for making informal observations of the user by entering into the naturalistic setting in order to identify the problems and needs regarding the product use. Such observations usually do not have well established structures or methodological approaches. St Pierre (2002) names this process as "emphatic immersion" by which the designer tries to understand the problems that the user encounters. This sensitization activity is crucial for the designer, however it may not be enough for a throughout understanding of the user. For the designer, application of methods for user research can help to reveal further insight about the user (Stappers, 2006).

Involvement of designer in the user research activity is also necessary for the development of design as a discipline. Bonsiepe (2007) claims that in present-day design research, two approaches can be identified: one is *endogenous* which is carried out in the design process spontaneously when the information is needed. This involves instant applications, and usually they are not well-documented to be able to create a knowledge base, which would be beneficial for the design practice and discipline. The other one is *exogenous* design research in which other disciplines perform studies by considering design as the subject of inquiry. According to Bonsiepe (2007) the latter one should be approached with caution since the knowledge is created by other parties, who may have certain presumptions about the design activity and profession. Therefore in order to build knowledge of the design discipline endogenous design research, which is conducted by its practitioners, is crucial. Moreover Buchanan (2007) argues that since its beginnings design and design research have problems that continuously evolve through time and make its history and theories hard to be described. According to him it is these problems that make design pluralistic in a way that it originates its knowledge from various areas and branches of sciences. This pluralism nurtures design research with knowledge from different areas, on the other hand it also weakens the field, and makes it hard to build and communicate its own knowledge (Buchanan, 2007).

From many aspects, designers' immersion in user research is beneficial for the design process and profession. However division of labor in today's market requires specialization in certain areas and generally the designer does not have a chance to meet with the user (van Veggel, 2005). Furthermore usually designers are known as good at shaping and modifying objects, however their abilities in handling research activities and communicating with users are usually regarded as problematic (Bruseberg & McDonagh-Philp, 2000; Dorst, 2003; Vihma, 2006). In addition obtaining views of social scientists regarding the user activities can provide new insights for the designer (St Pierre, 2002). Therefore their collaboration is needed in order to understand user experiences and design for them (Sanders, 2002; Wasson, 2002).

Since information regarding the user is multidimensional, that is, a statement that the user expresses may convey several considerations regarding the use, therefore it is commonly indicated

that the designer should be able to access the raw data in order to interpret the results for utilizing them in the product design (Bruseberg & McDonagh-Philp, 2000). Inspirational effect of social studies' outcome on the design process pointed out by many researches in the area (Reese, 2002; Sanders, 2002). Moreover user research is considered as an important way to create new product ideas that maintain innovation (Perks, et al., 2005). In recent studies of user research, providing inspirational data with projective and participatory techniques became widespread (e.g. Bruseberg & McDonagh-Philp, 2001; Gaver, Dunne, & Pacenti, 1999; Hulkko, Mattelmäki, Virtanen, & Keinonen, 2004; Sleeswijk Visser, Stappers, Van der Lugt, & Sanders, 2005; Stappers & Sanders, 2003; Westerlund, Lindquist, Sundblad, & Mackay, 2003). Hemmings *et al.* (2002) refers them as *nonscientific approaches* since their outputs are not generally analyzed instead they are documented for designers interpretation. Such participation is different than the methods utilized for "open user innovation" suggested by Hippel (2013) and earlier approaches of participatory design, since the projective techniques are utilized to explore user's intangible needs and problems by evaluating the proposals or artifacts users make during the participatory activities to maintain inspiration and empathy for the designers.

2.1.6. Conclusions regarding historical and theoretical background

Historical developments regarding integration give clues about the changing expectations of designers from user research activity. Since the beginning of user research history, *guidance* is always sought from user research outputs. Initial periods of integration took place with military purposes to improve the efficiency of soldiers during world wars, and not much later the industry realized that such guidance was necessary for fitting user's task demands and improving products. As design profession matured, the need for user knowledge became crucial especially for establishing a respected profession through making *scientifically proven decisions* with ergonomics data. Designers made use of user knowledge to *strengthen* the theoretical roots of the profession. Currently building *empathy* with user and *inspirational value* of user research is critical for the designers, since by maintaining them real innovation which is meaningful for the user can be attained.

2.2. Types of user research

In this section an overview for types of user research is presented by considering different kinds of classification schemes in the literature based on different characteristics of user research. Table 2 summarizes types of categorizations for user research methods.

Categorizations help the researcher to understand the considerations to choose a methodology. Investigating these categorization types is important for the study since the characteristics that are considered while making the classifications reveal the distinguishing qualities of the research that specifies the type of informational outputs it provides. By this way it is possible to understand which informational qualities should be delivered as the result of the user research activity that meets the expectations of designers.

Table 2. Categorizations for user research methods

Classification according to …				
PHASES OF THE DESIGN PROCESS	Generative		Evaluative	Stappers and Sanders (2005)
	Formative		Summative	Rosson and Caroll (2002)
	Discovery	Definition	Evaluation	Squires (2002)
	Front-End Analysis		Testing and Evaluation	Wickens et al. (2004)
TYPE OF RESEARCH ACTIVITY BASED ON THE FOCAL PROBLEM	Clinical	Applied	Basic	Buchanan (2006)
	Exploratory	Descriptive	Causal	Malhotra (2007)
	Experimental	Empirical	Theoretical	Strickler (1999)
ORIGINS OF METHODS	Traditional	Adaptive	Innovative	Hannington (2003)
PARTICIPATION DEGREE OF THE USER	Consultative	Representative	Consensus	Carmel *et al.* (1993)
THE WAY OF APPLICATION	Direct - undisguised		Indirect - disguised	Hudlicka, (1996); Malhotra, (2007)
ANALYTIC PERSPECTIVE THAT THE RESEARCHER ADOPTS	Conceptual		Procedural	Melican (2000)
DEGREE OF ABSTRACTION	Raw		Abstract	Melican (2000); Sleeswijk Visser (2009)
TYPE OF DATA	Qualitative		Quantitative	

Classification according to phases of the design process: User research methods can be grouped according to their application phases in the product development process. Before the design activity, there is a need for user knowledge to explore the context of use and to get to know the user, and after the preliminary phase of product development process, when the design alternatives produced, they need to be evaluated by potential users through employing certain methods in order to retrieve the data to develop the alternatives or to choose the most appropriate ones. According to this type of categorization, the methods can be generative or evaluative (Gage, Sanders, & William, 2002; Stappers & Sanders, 2003) summative or formative (Rosson & Carroll, 2002); or they can be employed with the aim of discovery, definition or evaluation (Squires, 2002); or front-end analysis or testing and evaluation (Wickens, Gordon, & Liu, 2004).

Table 3 lists some example methods which are grouped according to the phases of the development process.

Table 3. Some examples of user research data collection and analysis instruments according to the phases of design process as it is suggested by Squires (table adapted from Squires, 2002)

	Discovery	Definition	Evaluation
Data collection	• Contextual observation (tours, maps, inventories) • Focus groups • Open-ended interviews • Participant observation (active or passive) • Videography • Tracking	• Contextual observation (tours) • Directed and semi-structured interviews • Free-lists, ratings, rankings, definitions, explanations • Role-playing • Scenarios • Displacement research	• [Testing with] Product simulations • Usability tests • Surveys
Data analysis	• Categorical matrices • Time series analysis • Network mapping • Content analysis (text, audio, and video) • Semiotic analysis	• Categorical matrices • Concept mapping (multidimensional scaling and property fitting) • Activity flow diagramming • Decision modeling	• Standard inferential statistics • Scaling (Guttman, multidimensional scaling)

Classification according to type of research activity based on the focal problem: The type of problem that the research activity deals with is also another concern regarding the methods' classification. According to Buchanan (2001), considering the focal problem of the study, types of design research fall into three main categories, namely *clinical*, *applied*, and *basic*. *Clinical research*, which refers to the activities that are focused on individual cases, is helpful in identifying problems on the basis of a certain case. Case study research is commonly applied for this type of research. A*pplied research* deals with many individual cases, which share certain kinds of characteristics, in order to discover *rules-of-thumb* regarding the problem area; and *basic research* is conducted with the purpose of understanding the basic principles to explain the phenomena. Buchanan (2001) thinks that although *clinical research* is the most commonly employed research type by the practitioners, *applied* research is the most critical one for the design research area, since it provides the understanding of the relations between different individual cases. In addition, *basic* research is necessary for the future of the design research, because it helps to establish principles and theories of design. Similar to Buchanan's (2001) categorization Strickler (1999) proposes very similar groups namely *experimental*, *empirical* and *theoretical*. Moreover Malhotra (2007) also proposes a categorization for marketing research methods based on the central problem to be investigated. According to him there are *exploratory* studies to gain the initial understanding of the problem area; *descriptive* studies to discover and identify the problem and its relation the variables of the research; and *causal* studies for exploring to cause and effect relation between the variables to test a hypothesis.

Classification according to origins of methods: Hanington (2003) claims that being inconsiderate about the iterative and cyclical nature of the design process, categorizations based on phases, such as generative and evaluative, generally make false distinctions between the methods. Both generative and evaluative methods can be applied together to investigate the problem area or evaluate a set of product, therefore according to Hannington (2003) categorizing the methods considering the stages of the development process is erroneous. He proposes a different classification based on the origins of the methods. According to him, there are (1) traditional methods, which involve conventional consumer research techniques and methodologies such as interviews, surveys and focus groups; (2) adapted methods, which take their origins from various areas, such as ethnography and HCI, and modified with the purpose of conducting user research; and (3) innovative methods originated from recent approaches regarding participatory and

projective techniques. Examples for these categories and the ways of interpretation are listed in Table 4.

Table 4. Types of user research methods (from Hanington, 2003)

Traditional	Adapted	Innovative
Market research	Observational research	Creative/Participatory
Focus groups	Participant observation	Design workshops
Surveys	Still, video documentation	Collage
Questionnaires	Ethnographic methods	Card sorting
Interviews	Video ethnography	Cognitive mapping
Unobtrusive measures	Beeper studies	Velcro modeling
Archival methods	Experiential sampling	Visual diaries
Trace measures	Cultural inventory	Camera studies
Experiments	Artifact analysis	Document annotations
	HCI	
	Thinkaloud protocol	
	Heuristic evaluation	
	Cognitive walkthrough	

Interpretation and analysis tends toward:

←   →

Counts	Content analysis
Statistics	Categories
Spreadsheets	Patterns, Themes
Graphing	Affinities, Clusters
Verbal + numerical information	Visual + verbal information

Classification according to participation degree of the user: User research methods require participation of user to different extents. Therefore the classification can also be made based on the degree of used involvement in the design process. Regarding this issue, Carmel, Whitaker and George (1993) categorize the methods into three groups: (1) *consultative* in which the user is source of the knowledge, (2) *representative* that involves user representatives in the design team to develop the product, and (3) *consensus* for which the total participation of the real users is necessary and the product is developed together with users.

Classification according to the way of application: The way the user is questioned or observed is also another consideration for classifying the user research. There can be *direct* and *indirect* methodologies. Direct methods refers to the methods, which elicit knowledge from the user in an undisguised manner, that is, the user is informed about concerning what s/he is questioned or why s/he is observed, while indirect methods are the ones in which the user is questioned or observed in a disguised manner (Hudlicka, 1996; Malhotra, 2007). Both approaches have advantages or disadvantages when they are compared to each other. While utilizing indirect methods observer effect can be eliminated since the subjects are uninformed about they are being observed, thus more honest views can be obtained through such kind of a study. However, there are ethical concerns regarding application of this kind of methods, since the subject's consent is not obtained.

Besides the direct and indirect ways of application, the methods can be structured or unstructured (Malhotra, 2007). Structured methods can be applied, if the researcher has previous knowledge about the issue that is being investigated and it is possible to have quantitative and conclusive findings, since the dimensions are clearly specified before designing the study. Unstructured methods are utilized when there is limited previous knowledge about the issue to explore it for generating knowledge input to the design process. The findings are used for explorative purposes rather than drawing conclusions. In Figure 7, a relation map regarding these two dimensions (direct

vs. indirect and structured vs. unstructured) is illustrated with the example methods that belong to each category.
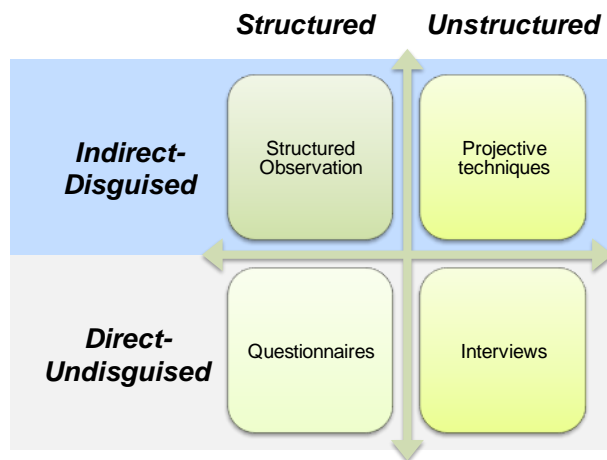
Figure 7. Relational map of direct- indirect and structured- unstructured approaches involving example methods

Classification according to analytic perspective that the researcher adopts: According to Melican (2000), in which sense the researcher is aiming to understand user is definitive in the analytic perspective that s/he adopts while conducting the research. In other words, the researcher may need to investigate what the user *thinks* by exploring his/her perceptions beliefs attitudes or motivations and expectations regarding behaviors, or s/he may search for what the user *does* to learn the tasks that s/he carries out to explore physical and cognitive limitations and capabilities. In that sense, the analytical approach can be *conceptual* if the cognitive structures, perceptions and opinions are sought, on the other hand, it can be *procedural* if the behaviors and actions are to be observed. For the former one, interviews or methods that are based on having opinions of the user is applied and for the latter one observation or more indirect methods are utilized to understand user actions and behaviors.

Classification according to degree of abstraction: The degree to which the data gathered through user research activity processed by the researcher can be considered as a critical characteristic of user research output (Melican 2000; Sleeswijk Visser, 2009). In a typical user research process, gathered data is recorded through certain means and then analyzed to prepare inputs for the design activity. Such recordings can be provided in raw format without the interpretation of the researcher on one end of the spectrum, on the other end, through analysis, they can be put in certain categorizations to communicate the findings in a structure, or they can be further abstracted through visuals and design recommendations with the interpretations of the researcher. The designer's immersion can be considered as the rawest form of data.

Figure 8, a relation map of user research outputs are exemplified by considering the dimensions of degree of abstraction and analytical approach that is adopted in the research activity.
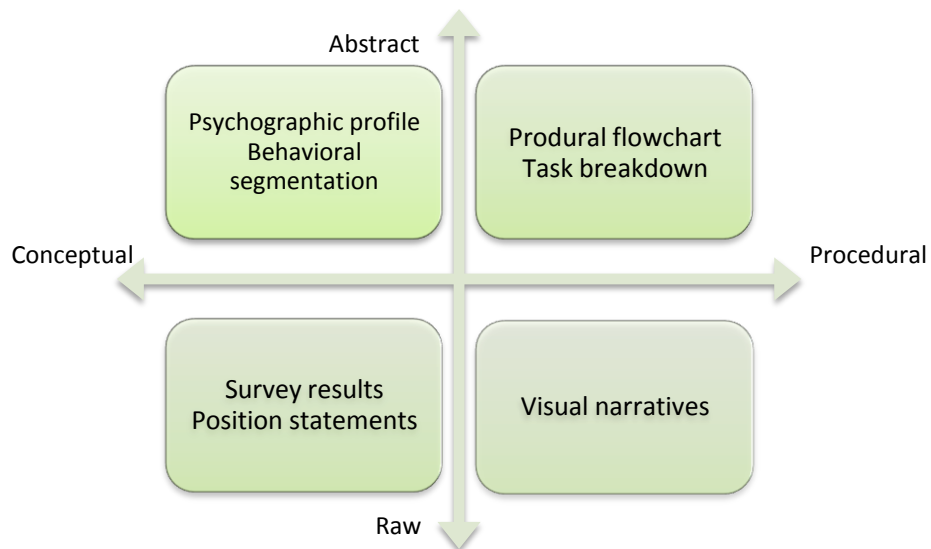
Figure 8. Relational map of user research data according to degree of abstractness and analytic perspective adopted in research (figure adapted from Melican, 2000)

Classification according to type of data: The nature of data that are retrieved as the outcome of the applied method can be either *qualitative* or *quantitative*. At the beginning of the design process, in order to get initial understanding of the user, generally qualitative data is needed, since they can provide in-depth knowledge about the context of use and the user (Blomberg & Burrell, 2008; McDonagh, et al., 2002; Roth, 1999). Quantitative data is obtained through measuring certain variables of the study, such as attitudes, opinions, emotions, or more concrete variables such as times of mistakes etc. Typically they are evaluated through statistical analysis, therefore validity and reliability measures can be applicable to this kind of data, though in social sciences validity can never be thoroughly achievable, since the findings are more sensitive to personal or external variables when it is compared to natural sciences (Strickler, 1999). Quantitative user survey results cannot be applied alone for generative purposes in design, since such kind of surveys are usually based on presumptions about the user's behaviors and attitudes unless a preliminary qualitative research is done to explore the subject area (van Veggel, 2005).

2.2.1.   Importance of triangulation approach in user research

The methodology that is employed in user research activity is determined and modified by the researcher considering the requirements of the cases. According to Denzin and Lincoln (1994) in social sciences, the qualitative researcher should act like a *bricoleur*[b], who devises strategies and methods considering the necessities of the cases and also if it is needed s/he has to invent new tools for investigating the subject area. The design researcher who conducts studies with users is also similar to social sciences' qualitative researcher in this respect. In user research, methods for conducting the study are identified opportunistically or improvisatorially (Blomberg & Burrell, 2008; Hanington, 2003; Poggenpohl, 2002; van Veggel, 2005), also constructing a design research study is a creative activity in itself (Wasson, 2002).

Holism is important in design research in order to understand the dimensions that affect the user-product relation and the context of use. A method alone cannot bring the holistic perspective to the research activity; therefore *data triangulation* by utilizing different methods is needed (Blomberg & Burrell, 2008; Bogdan & Biklen, 2006; Kuniavsky, 2003; Love, 2005; Strickler, 1999). Using qualitative

[b] As it is quoted in Denzin and Lincoln (1994), *bricoleur* refers to "Jack of all trades or a kind of professional do-it-yourself person" (Lévi-Strauss, 1966, p.17, qtd. in Denzin and Lincoln, 1994, p.2)

and quantitative methods together can help to reveal further insight and it can enable to compare variables of the research and explain the relations (Blomberg & Burrell, 2008; Purpura, 2003). Existing demographic data can be linked with ethnographic data in order to have a better understanding of behaviors of a certain population (Blomberg & Burrell, 2008). Moreover quantitative techniques can be utilized for validating the results of the qualitative studies, since the latter ones can be applicable to limited amount of people, while the former can be practiced with large numbers in order to be able to generalize the findings (Purpura, 2003). Furthermore, Blomberg and Burrell (2008) also suggests that using both interview and observation in a research study is crucial in order to gain a holistic view about the context of use. Similar to this perspective, employing both *direct* and *indirect* methods can help to reveal user requirements, since users may not be able to express their thoughts or they may not be aware of them (Blomberg & Burrell, 2008; Bruseberg & McDonagh-Philp, 2001)

2.3. Conclusions regarding the chapter

As it is mentioned in this chapter, different categorization types exist to classify user research methodologies. These categorizations indicate the considerations that are taken into account while choosing the methodology for collecting data. Methods that are included in these categorizations enable to collect data to meet the informational needs of design activity, which have been evolving throughout the history of user research integration. The methods provide information to assist design activity by providing guidance in the process of design through collecting user requirements, maintaining ability to have scientific proofs that support designer's decisions while justifying them to the other stakeholders and giving inspiration through providing empathy with users.

Data collected with these methods need to be communicated by the researcher to the designers, since in general, it is impractical for a designer to conduct user research or involve into the entire research process. Therefore, for effective user research integration and meeting the informational needs of designers, communication strategies should be developed. In the next chapter, the methodology for investigating the ways to maintain effective communication is presented for this purpose.

CHAPTER 3

METHODOLOGY: DEVELOPING A MODEL FOR EFFECTIVE COMMUNICATION

This chapter focuses on the methodology of the thesis study. It involves three main stages that are planned to respond to the main questions of the study in order to propose the model for communicating user research findings and guidelines for effective communication.

In the first section, fundamentals of the basic model is presented together with its theoretical underpinnings, in order to provide an umbrella structure for framing the findings of the study and guiding the stages of the methodology. After that, stages are presented together with the research approach that is adopted in the study.

3.1. Fundamentals of the basic framework for the model

The subject of communications is a vast area of study; and models proposed for investigating and improving communications provide the theoretical basis for the proposed model in this study.

Models play an essential role in scientific studies, and are utilized with the purpose of communicating, exploring, learning and representing phenomena or theories (Frigg & Hartmann, 2009). They can constitute an "organizing" function when aiming to associate disconnected data by identifying patterns or similarities that may previously have been unnoticed; or a "heuristic" function, supporting the exploration and discovery of new ideas and directions (Deutsch, 1952). According to Frigg and Hartmann (2009) a model can function in two main representational ways, representing either: the phenomena or "selected part of the world" in a descriptive way; or a theory, by highlighting its rules and propositions. They can be utilized with the aim of concretizing to aid in the explanation of abstract theories, dealing with complex theories through simplification and constructing preliminary theories with developmental purposes (Frigg & Hartmann, 2009). Models can be criticized for over simplifying the phenomena; however such a simplification procedure is necessary when dealing with complex or even contradictory situations regarding the phenomenon that is being studied.

In order to create a framework of the issues related to communication activities and explore the phenomenon of communication, a series of models and theories have been proposed in literature, many of which have focused on the transmission of information between the sender and the receiver (Berlo, 1960; Schramm, 1954; Shannon & Weaver, 1949). One of the most influential of these is Shannon and Weaver's (1949) model of communication, in which the *information source* generates a message by encoding it into a *signal* that is then transmitted through a *channel.* The signal is then decoded by the *receiver* and delivered to the targeted *destination*. During this process, the *channel* is affected by a *noise source*, which may interrupt the *signal*. Although Shannon and Weaver's (1949) model strongly affects the works of scholars in the area (such as Berlo, 1960; Schramm, 1954), this view has been criticized for its description of communication as a static, linear and one way process, with no consideration of factors related to the individual or the context of the communication (Eckert, Maier, & McMahon, 2005; Mortensen, 1972). Nonetheless, this basic model and the concepts it introduces is considered as the foundation for many studies in the field (Fiske, 1990).

Models put forward in communication studies have had a major effect on the development of models in design theory. User interaction with the product is commonly presented as a communication process in design literature with a series of diagrammatic "design specific

communication models" that characterize and explain the phenomena of design. These are proposed either directly grounded on communication theories or without reference to them (see Crilly, Good, Matravers, & Clarkson, 2008; Crilly, Maier, & Clarkson, 2008 for detailed discussions). In this case, the product stands as a communication medium, and the design is seen as a "process of mediated communication" (Crilly, Good, et al., 2008). Moreover, since the activity of design itself requires communication between different stakeholders, communication models are also important for framing discussions regarding the collaborative work studies (Chiu, 2002; Eckert, et al., 2005).

The models mentioned above have focused on how the act of communication takes place, and they try to explain the phenomenon and provide a basic means of structuring and managing the issues of the communication activity. Since the aim in this study is to suggest a model for effective communication, it will differ from the mentioned models in that it will propose how it should be carried out to maintain effectiveness. For this reason, models that have aimed at improving the effectiveness or success of communication are of crucial importance for this study. DeLone and McLean's (1992) widely cited model of information systems (IS) success can be considered as such kind of a model in the sense that it proposes a structure that accumulates the dimensions of effective or successful communications of information systems. While proposing their model, they conducted an extensive literature review to discover how success is defined by scholars in the area, and categorized these dimensions under a basic structure to form their final model. There have been subsequent investigations of the relationships between the dimensions suggested in DeLone and McLean's model, and further elaborations have been made by a number of researchers (for further information, see DeLone & McLean, 2003; Petter, DeLone, & McLean, 2008).

The structure proposed in DeLone and McLean's (1992) model draws influence from Shannon and Weaver's (1949) definition of the different levels of communication problems described in their well-known theory, as well as Mason's (1978) later elaborations on these levels. According to Shannon and Weaver's communication theory (1949), there are three levels of communication problem, namely: technical, semantic and effectiveness levels (Table 5). The *Technical* level deals with the accuracy of the means of communication in the transmission of information, while the *semantic* level relates to the success of the information in conveying the intended meaning. Finally, the *effectiveness* level considers the communication's influence on the receiver. Mason (1978) refers to the first two levels as *production* and *product*, however he extended the last level to three dimensions, which are a "hierarchy of events" as a result of the communication that begins from the *receipt* of information to become *influence on the recipient* and *influence on the system*. DeLone and McLean (1992) adopted this last categorization, though renamed its dimensions.

Table 5. Levels of communication problems and corresponding categories of IS success (Adapted from DeLone & McLean, 1992)

Method of delivery	Information delivered	Effects of communication process on the receivers				Source
Technical level	Semantic level	Effectiveness level				(Shannon & Weaver, 1949)
Production	Product	Receipt		Influence on recipient	Influence on system	(Mason, 1978)
System quality	Information quality	Use	User satisfaction	Individual impact	Organizational impact	(DeLone & McLean, 1992)

In this thesis, in order to propose a model for the effective communication of user research findings, the major categories of DeLone and McLean's (1992) IS success model are adopted (Figure 9). Their model uses six major categories to classify the measures, the explanations of which are as follows:

- *System quality* comprises measures that are related to the system itself. In the user research case, they are the dimensions of the method of presentation or how it is delivered to ensure effectiveness.
- *Information quality* refers to the qualities of effective information that can be utilized in the design process.
- If the information and system qualities are achieved, they will have effects on the *use* of the system and the *user satisfaction* gained from it. The system can be used more frequently, durations can be longer or the information can be utilized more in working activities or while designing if these qualities are met, and this can result also in *user satisfaction* from the system use.
- The provision of qualities, the achievement of user satisfaction and the utilization of the system would have *impacts* at both *individual* and *organizational* levels. Such impacts are of critical importance for the effectiveness of the delivery, since they are the highest level criteria for evaluating the success of the system. In addition, while designing the systems, the considerations they bring are crucial, and as such they are considered as the effective parameters while constructing the information system.

USE

Utilization of the system

SYSTEM QUALITY

Dimensions of the method of delivery

EFFECTIVE COMMUNICATION

IMPACTS

Effective parameters while constructing the information system

ORGANIZATIONAL IMPACTS

Impacts at higher levels

INFORMATION QUALITY

Qualities of information

USER SATISFACTION

Satisfaction from system use
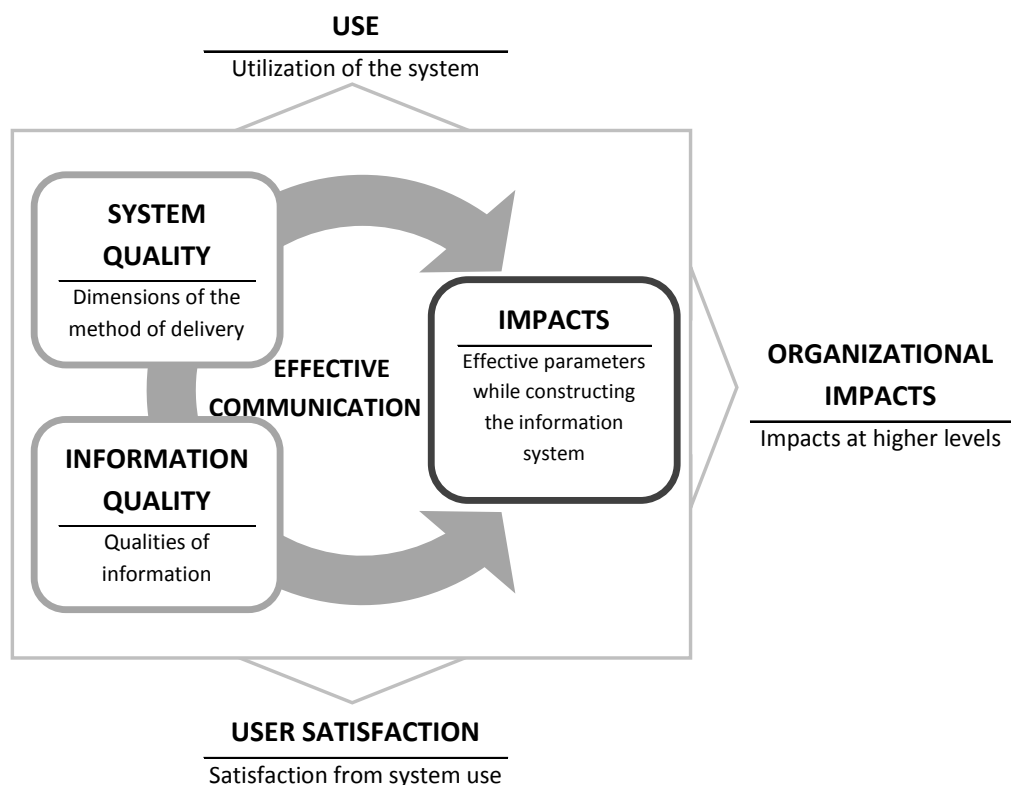
Figure 9. Basic model of effective communication (Adapted from DeLone & McLean, 1992)

System quality, *information quality* and *individual impacts* are considered as the core dimensions of effective communication in the current model (Figure 9), as the other three dimensions are dependent on them. For this reason, the focus of this study is an exploration of the constructs of these three dimensions as the major categories of the model.

This umbrella structure guides the study by providing the framework for the model of effective communication. The model that is presented in this thesis helps to create a reference framework that will support discussions related to the communication of the user research findings, and will help to improve the process. It is suggested that the model constitutes an "organizing" function for exploring the relations and patterns between the constructs and "heuristic" function by supporting

imagination and directing the discovery of new ideas in the effective delivery of user research (Deutsch, 1952).
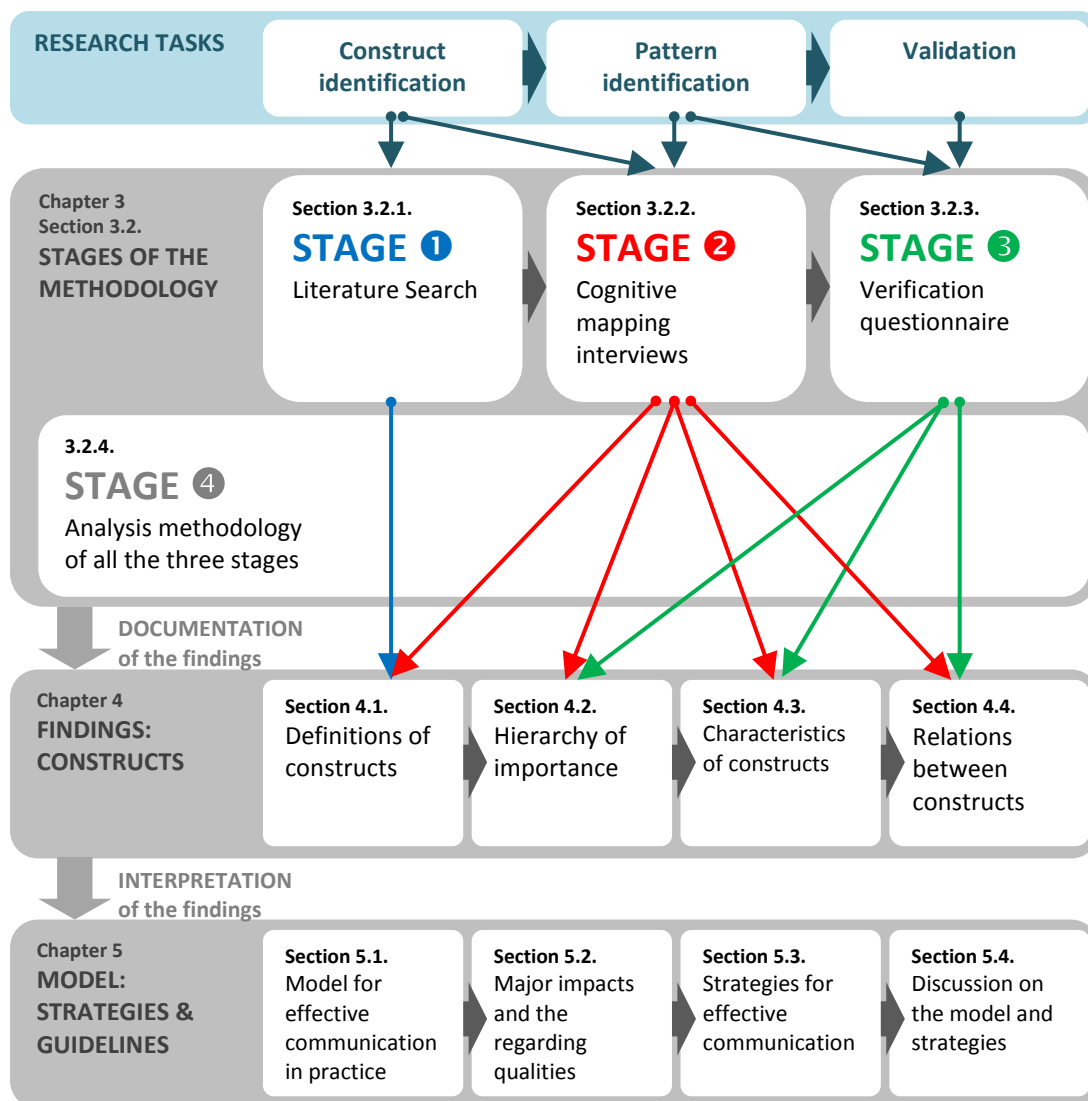
Figure 10. Structure of the methodological stages and findings of the study

Figure 10 represents the structure of this chapter and following two chapters. In the figure, research tasks that are formulated for this study and corresponding methodological stages are presented. In order to model the framework, first, constructs regarding the effective communication are identified through literature search and a cognitive mapping interview study with professional practitioners. And then, patterns representing relations among the constructs are identified through examining practitioners' cognitive structures regarding the issue with the interview study. At the last phase, these relations are validated through the verification questionnaire. In Section 3.2 stages of the methodology are delivered by discussing their theoretical background and presenting their procedures, sampling structure and analysis approach that is adopted for reaching the findings.

The figure also illustrates which outcomes are retrieved from the methodological stages. In Chapter 4 these findings are documented in detail. First, definitions of constructs are made through literature search and interview studies, and then importance hierarchy between the constructs is revealed by analyzing the findings of the interview study and verification questionnaire. After that

characteristics of constructs are identified through the analysis of both interview and questionnaire data. Lastly relations between the constructs elicited from interview and questionnaire findings are presented.

The findings documented in Chapter 4 are further interpreted in Chapter 5 in the form of strategies and guidelines for achieving effective communication. In order to preserve richness of data in cognitive mapping interviews and provide transparency for the analysis process quotations from respondents statements are given to illustrate guidelines in Chapter 5.

3.2. Stages of the methodology

3.2.1. Scope of the literature search

As it is discussed in previous chapters, integration of research findings to the practice has been the interest of many studies from diverse areas. As for the user research case, to some extend this issue attracts attention of both practitioners and some academic researchers. In order to identify constructs of the model presented in the previous section and provide a provisional list for the analysis of the later stages of the methodology, sources providing recommendations about delivering user research findings are reviewed. The most important criterion for selecting the sources is that they should describe the delivery that is developed for communicating the results of research activity that is planned to be integrated to the design process. Journal articles and articles that are included in the scientific indexes only cover scientific work that may or may not depend on the practice. For this study, findings from studies which are presenting the outcomes of practice based research have crucial importance, since the focus is identifying effectiveness variables which are identified while communicating the research results, thus they should rely on practice. By considering these issues, the search should be comprehensive enough to cover conference papers and books that may not necessarily be peer reviewed but rely on data based on practice, for this reason, although "scholarliness" of Google Scholar is criticized and questioned by scholars (Howland, Wright, Boughan, & Roberts, 2009; Jacsó, 2008), conducting the inquiry in Google Scholar found appropriate since it includes both most of the peer reviewed publications and books and non-peer reviewed journals and conference databases and its comprehensive coverage aids the researcher in the "discovery process" (Howland, et al., 2009; Jacsó, 2008; Kesselman & Watstein, 2005).

The inquiry is done by utilizing keywords in Table 6, and it is restricted to 20 years period from 1992 to 2012.

Table 6. Keywords utilized in inquiry for the literature search

Keywords
"communicating user experiences"
"communicating research findings" "information systems"
"communicating user needs"
"communicating results" "user research"
"communicating results" "design research"
"communicating findings" "user research"
"relevance" of user research"
"user research" deliverables
"representing user research"

The sources that specifically provide guidelines or recommendations regarding integration of research findings to the design process are chosen to be included in the review. The chosen sources constitute the preliminary bibliographic list of the review. By reviewing the bibliographies of these

sources and the sources that cite the chosen sources and by reviewing the relevant sources as it is provided by Google Scholar, the list is extended. The full list is included in APPENDIX A.

3.2.2. Methodology of the cognitive mapping interviews

At the second stage of the study, constructs and their theoretical relations are explored from the practitioners' perspectives. In regarding literature, such constructs are identified for effective delivery of the results, however it is hypothesized that there can be a gap between theory and practice, since those constructs are proposed by the researchers and usually based on their personal experiences with the subject and not relying on empirical findings. Therefore in this stage of the study, the aim is to conduct an empirical research with the users of these presentations (practitioners), in order to understand constructs of the basic model which is presented in Section 3.1 from their perspectives by questioning,

> (1) their **aims** of requesting such kind of a study and their **expectations** from the outcome of the research to understand the IMPACTS they are expecting from the outcome of user research, and
> (2) their **preferences** regarding the way of the presentation to understand the SYSTEM QUALITIES and INFORMATION QUALITIES of the effective delivery.

In order to achieve the aim of this stage, small-scale semi structured in-depth interviews are conducted with the users of the user research findings. The methodology and the theoretical background of the methodology selection are discussed in this section.

3.2.2.1. Theoretical background and methods and techniques for eliciting personal constructs

In this study, it is aimed to elicit personal constructs that the users of the research presentations have while evaluating the outcomes of a user research study. Therefore the methodology of the study is based on the Personal Construct Theory, which is developed by Kelly (1955). According to him, an individual develops theories about the world and situations around himself. These theories are dependent on his previous experiences, and he conceives the world, makes predictions about the circumstances according to them, and takes actions accordingly. These theories are originated from the individual's "systems of constructs" that are composed of bipolar concepts, meaning that a construct has two opposing ends such as "clever" and "stupid" regarding the construct of "intelligence level". However it should be noted that definition of the ends may be different from person to person or it may change according to time, for example the extreme end of "clever" may refer to "not so clever" for a person though it may denote "stupid" for another or for the same person in different time or case. To explain this situation, Kelly (1955) grounded his theory in the philosophy of "constructive alternativism" positing that there can be different alternative constructions regarding the way the concepts are perceived (Tindall, 1994).

In the literature, several techniques are proposed for identifying the personal constructs. Commonly *repertory grid technique* (RGT), which is developed by Kelly (1955), is utilized. In RGT, usually participants are asked to choose "elements", which are used as a way to elicit the constructs regarding the subject of the study. "Elements" are the things that carry the meanings, which the participant attaches to it in the form of constructs. To reveal the construct the participant is asked to define the differences and similarities between the elements. By describing these, it can be possible to understand continuums, by considering which the participant evaluates the elements. While evaluating differences and similarities s/he indicates one end of a continuum, by this way, bipolar constructs and how the participant conceives the two extreme ends of the construct can be understood (Bernard & Flitman, 2002; Tindall, 1994).

More details about how to conduct RGT in psychological evaluation can be found in Fransella et al. (2004) and Kelly (1955). The technique has also applications in design research (e.g. Hassenzahl, 2002; Hassenzahl & Wessler, 2000). In such cases, instead of asking the participants to choose elements, product designs are provided as elements to elicit constructs regarding the usage and

perception of them. Through this, it can be possible to understand constructs of the users while evaluating that product.

According to Rugg et al. (2002), traditional RGT has some drawbacks regarding the consequences of its application. Although it provides "element-construct-value triplets" to investigate the systems of constructs that the individual has, it does not provide hierarchical relations between them, in other words, the results do not indicate core goals, personal values or more subordinate constructs in the system (S. Miles & Rowe, 2004; Rugg, et al., 2002; Tindall, 1994). In order to respond to this need, as it is referred by Rugg et al. (2002) and Miles and Rowe (2004), Hinkle (1965) suggested *laddering* as a technique for utilizing in RGT sessions to be able to investigate such hierarchies.

Laddering is known as a technique for structuring the interviews by using typical directed probes to understand personal importance of the decisions made by the respondent (Reynolds & Gutman, 1988). In a typical laddering interview session, first, attributes are elicited regarding the subject of the study. These attributes can be properties of a product in an advertisement research case, or they can be personality characteristics of a person in a clinical setting (S. Miles & Rowe, 2004). Secondly the reasons of importance of these attributes for the respondent are asked, and then each of the explanations are questioned by asking "why" questions in order to arrive core personal values of the respondent. By this way, "attribute-consequence-value" chains are created from the perspective of the respondent (S. Miles & Rowe, 2004; Reynolds & Gutman, 1988; Reynolds & Olson, 2001).

The laddering technique has a wide area of application. For example, Rugg et al. (2002) claim that laddering is a suitable method for exploring goals and explanations regarding the organizational culture, in order to provide knowledge input for the design process of systems. Though the theoretical roots of laddering technique lie in the domain of personality psychology, it has wider applications in marketing and advertising research (S. Miles & Rowe, 2004). The technique is commonly utilized for exploring personal values of customers that are attached to the certain product qualities. Studies on such personal values have a considerably long history and their importance for marketing and design research is well received in literature (for a detailed review, see Gallarza, Gil-Saura, & Holbrook, 2011; Khalifa, 2004; Sánchez-Fernández & Iniesta-Bonillo, 2007; Zeithaml, 1988). However, what is commonly declared by scholars is studying on such personal constructs has some limitations (Gallarza, et al., 2011). It is indicated that one of the major difficulties in research about user values is that the values and qualities are subjective and vague concepts, definitions of which can differ according to users, practitioners and researchers. In order to overcome this difficulty it is important to concretize these vague definitions by exemplifying them with tangible product attributes and with its visuals. In this case laddering is a helpful methodology that links the subjective values to concrete product examples in a way that it gives insight about the meaning of the values for the subject group.

In the domain of marketing and advertising research, the technique grounded in a different theoretical basis, which is called as "means end theory" (Gutman, 1982; Reynolds & Olson, 2001). According to this theory, consumers make decisions while purchasing a product based on their personal values. Learning such kinds of values and attributes that are linked to them is important for marketing and advertising domains. The theory adopts "attribute-consequence-value" chain model, for explaining the hierarchical relation between the personal concepts. As it is stated before, attributes are the physical characteristics of a product that make it preferable or different than the others. Consequences are the results that the respondent expects from the attributes, and they usually refer to benefits or costs regarding the attributes. Values are higher-order expectations from the attributes and liked with its consequences (S. Miles & Rowe, 2004). In order to illustrate these relations, the example in Figure 11 can be given. In this example, different attributes of chocolate are linked with related consequences and higher-order values.
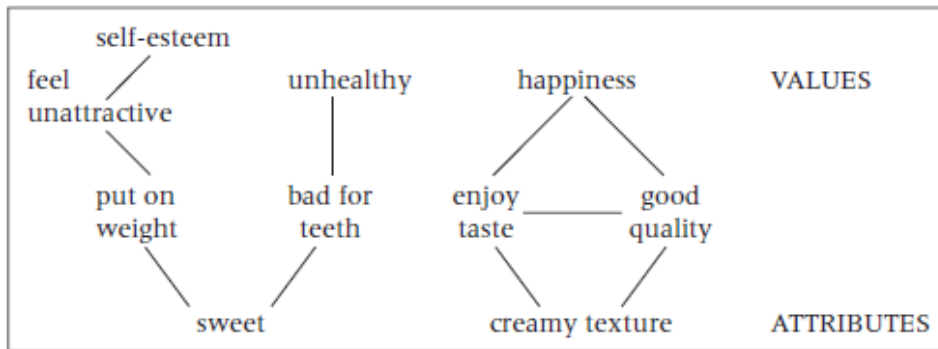
Figure 11. Example of an "attribute-consequence-value" chain (S. Miles & Rowe, 2004)

Laddering can also be done downwards, which is called as pyramiding by Landfield (1971). In pyramiding, the interview is started by asking the respondent to explain higher order values through describing consequences and attributes (Rugg, et al., 2002; Tindall, 1994). Moreover the laddering can be carried out sideways by directing the respondent to give examples on the same level, whether it can be on attribute level or higher-order value level (Rugg, et al., 2002).

Mainly RGT with laddering is used for eliciting personal construct, in addition to them, there are other approaches or techniques suggested in the literature for different purposes or when different restrictions are present. These are usually conducted for the purpose of psychological therapy but applications in other areas can also be possible. Other approaches that can be given as examples can be *ABC*, *self characterization* and *drawings* made by participants of the research (Fransella, Dalton, & Weselby, 2007; Tindall, 1994).

ABC (Tschudi, 1977) is a technique for understanding core constructs, in this technique the respondent is asked to identify advantages and disadvantages of two circumstances, one is his/her present condition while the other is a changed condition or an idealized condition. By identifying these, s/he is stating the core constructs which are close to his/her personal values or goals (Fransella, et al., 2007; Tindall, 1994). *Self characterization* is used for understanding how the individual construes his/her personality by directing him/her to "write a character sketch" of her/himself (Fransella, et al., 2007). *Drawings* by the participants can be used as a way to express themselves by initially letting them free from language restrictions, after that they are asked to explain the drawings, by this way constructs can be elicited (Tindall, 1994).

Apart from the previously mentioned methods and techniques, *cognitive mapping* can be utilized for eliciting personal constructs. In general terms, cognitive mapping is used for understanding mental contents of individuals regarding a certain topic (Farsides, 2004).

Cognitive mapping has a wide area of usage, such as in the domain of operations research (Ackermann, Eden, & Cropper, 1992; Eden, 2004), management science (Pidd, 1996), organizational studies (Cossette & Audet, 1992), and social psychology (Farsides, 2004). It is used as a way to analyze the qualitative data retrieved through interviews (M. B. Miles & Huberman, 1994), in strategy development (Eden & Ackermann, 1992), problem solving (Eden, 1991), as a way to record the interview session and stimulate discussion in interviews (Ackermann, et al., 1992) and most commonly as a representation tool for illustrating the mental contents of individuals regarding a subject (Eden, 2004).

According to Eden (2004), cognitive mapping has also its roots in personal construct theory and he states that typically means/ends graph format is used in order to investigate the relations between the concepts to be able to compose the cognitive maps.

Considering the overview of the methodologies that are mentioned above and utilized for exploring personal constructs, cognitive mapping through laddering is utilized in this study. As it is stated

previously, RGT is one of the most commonly utilized techniques for eliciting personal constructs. If RGT was to be employed in this study, it is appropriate that the elements would be different presentation cases or different parts of a presentation. However, most of the respondents that can be chosen for this study have limited experience in utilizing user research findings; therefore, it would be hard to carry out the studies by just considering such limited number of cases that the respondents have experience with. Thus instead of RGT, cognitive mapping through laddering is used in order to understand cognitive structures of the respondents regarding how they appraise and evaluate presentations of user research findings.

3.2.2.2. Data recording and research setting

Recoding the laddering interview data graphically and textually during the interview session can be helpful in keeping track of participant's responses and making sure that the interviewer and the respondent are discussing on the same subject. It is also beneficial in checking whether the respondent has additional things to state or not (S. Miles & Rowe, 2004). Therefore, it is found appropriate to utilize cognitive mapping as a note taking method during the interview, in order to stimulate discussion. The constructs that are verbalized by the respondent are immediately written on sticky notes by the researcher and stuck on a 50*70 cm cardboard for the laddering phase of the interview. While conducting laddering phase the sticky notes are moved or new ones are added and their relations with each other are represented with arrows drawn on the cardboard. By this way it can be possible to discuss on abstract concepts and clarify their meanings for the respondent by relating them with the other concepts and attributes of the presentation mediums. Moreover since the constructs are recorded on the sticky notes during the respondent's evaluation, they can be remembered during the laddering phase of the interview and by this way it is aimed to generate a conceptual ladder for each of the construct that is stated during the interview. At the end of the interview session, a cognitive map is generated that includes the mental structure of the respondent regarding user research activity and its deliverables (Figure 12).

Figure 12. An example of a cognitive map generated by a respondent at the end of the interview session (The image is retouched for enhancing the readability of the sticky notes)

The interview sessions are also audio-recorded for easing the process of analysis. In order to do that the respondents permission is requested before the interview.

Appointments are scheduled with the respondents via email by briefly indicating the study's subject and why their opinions are requested. Most of the interviews are carried out in an isolated space such as meeting rooms in the respondent's work places or the meeting room at UTEST, in order to direct the respondent to focus on the subject and to have adequate space for conducting the activity (Figure 13).

Figure 13. A photograph from the interview procedure

3.2.2.3. Procedure

The materials presented during the interview and interview questions can be found in APPENDIX B. The interview is started by briefly explaining the study's aim. While conducting a laddering interview, it is important to explain the intention of the method to the respondent, since asking to explain reasons of their statements each time can be burdensome. An example of a cognitive map from a laddering interview is presented to the participant at the beginning of the interview, in order to explain how the interview session will be carried out. Mainly there are two phases in the interview considering the questions that are directed to the respondents:

Phase I - Expectations as the outcome of effective communication of user research findings
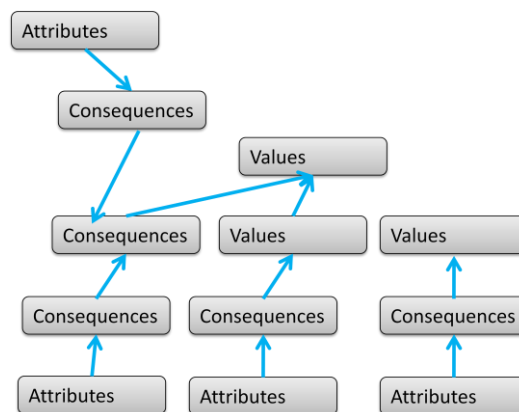
Figure 14. Conceptual structure of Phase I

- The questions of the interview begin by asking the **reasons of their request** for user research and the **benefits** that they had. Expectations regarding the **IMPACTS** of outcome are questioned. Considering the attributes-consequences-vales chain in a typical laddering interview, answers for these questions correspond to attribute level in the structure (Figure 14).
- By asking typically directed probe questions such as "Why is it important to you?"(Reynolds & Gutman, 1988), reasons of their statements are questioned by laddering up, in order to understand higher level constructs.
- Laddering up continues until it reaches the highest level values for the respondent.

Phase II – Preferences regarding the presentation mediums
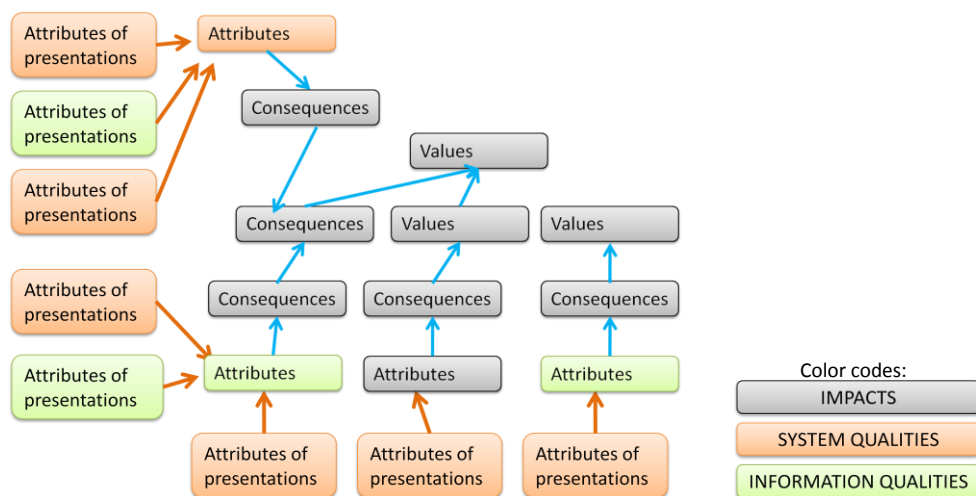
Figure 15. Conceptual structure of Phase II

- Dimensions related to effective presentation are questioned by using the research cases as a stimuli and idealized presentations.
- Their relation to the IMPACTS are questioned (Figure 15). If a new impact which is different than the previous ones is stated by the respondent, its importance is questioned by laddering up. By this way ladders that represent the conceptual structure of relations between the constructs can be elicited from the respondent's statements.

3.2.2.4. Considerations regarding the interview materials

Suggestions from the literature are considered, when preparing questions and the other interview materials, and while probing.

- There are two types of laddering interview style, which are called as hard and soft laddering (S. Miles & Rowe, 2004; J. M. Phillips & Reynolds, 2009; C. Russell et al., 2004; C. G. Russell et al., 2004). In hard laddering, respondents are asked to strictly follow the sequence of "attribute-consequence-value" chains while explaining the reasons of their statements, on the other hand, in soft laddering, interview session is similar to a natural dialog in which the respondent is directed to talk in a natural flow and constraining the dialog is avoided. In this study, natural flow is tried to be preserved, while in some instances the respondents are directed to answer certain questions. Therefore the approach adopted in this study falls somewhere in between the two mentioned approaches.

- Asking to compare different people's opinions with theirs regarding the same subject may also reveal the personal constructs (Farsides, 2004; Miles and Rowe, 2004; Reynolds and Gutman, 2001). Therefore, the respondents are asked to state whether there are any colleagues that have different opinions about the research presentations or not, and if there is they are directed to explain the differences and its reasons.
- Directing to explain negative consequences or why the respondent does not prefer certain attributes can be asked as a way to understand different constructs (Miles and Rowe, 2004; Reynolds and Gutman, 2001). The technique is known as "negative laddering" and it is applied in this study by asking the respondent to describe negative consequences of utilizing research presentations.
- "Communication check" (Reynolds and Gutman, 2001) is done when it is necessary in order to make sure that the respondent's answers are understood or recorded correctly.

3.2.2.5. Sample of the Cognitive Mapping Interviews

Although in general considerably high number of respondents[c] are included in a laddering interview study by the marketing research studies, considering the average number of ladders that each respondent provide in a laddering session, 20 respondents are found appropriate as a minimum sample size for a laddering interview (Reynolds, Dethloff, & Westberg, 2001). According to Reynolds et al. (2001), if the sample is carefully specified and questioned during the interview, full range of constructs regarding attributes-consequences-values chain can be obtained. For this study the population of interest is designers who utilize user research outputs in their design processes. Since duration of interviews are considerably long and the group involves professional respondents who usually have busy schedules, it is hard to reach a high number as a sample size. Therefore purposive sampling is utilized based on a quota that is defined according to the minimum number of respondents for a laddering interview by Reynolds et al. (2001). Table 7 summarizes the sampling structure of the interview study including the attributes of the individuals that are considered as the criteria for deciding on the sampling structure.

Table 7. Sampling structure of the cognitive mapping interviews

Industry	User research experience			Educational background		Total number of respondents
	Only reported (outsourcing) – no experience	Only own experience – never reported	Both reported (outsourcing) and have own experience	Designer	Engineer	
Consumer products	4	1	3	4	4	8
Automotive	2	1		3		3
Defense		3		3		3
Medical products		2	1	3		3
Design consultancy		1	2	3		3
Total number of respondents	6	8	6	16	4	20

---

[c] According to Reynolds and Gutman (1988), 50 to 60 number of respondents provide an ability to utilize different cutoff levels while representing the relations in the Hierarchical Value Map (HVM). Excluding minor relations by adopting a proper cutoff level enables the researcher to draw clear conclusions. The methodology for generating HVMs are discussed analysis methodology section.

While deciding on sampling, industry difference is considered as the major factor. Industries that are commonly utilizing user research in their product development processes are chosen, since their designers are familiar with user research and thus it is expected that they have considerations and mental models regarding the subject of the study. The largest group consists of respondents from consumer products (8), since it includes diverse product types and such diversity brings different considerations regarding respondent's evaluation of user research. The other industries are automotive (3), defense (3) and medical products (3), product development processes of which requires user knowledge input to the design process. As a professional group which can work for different industries, design consultancy (3) is also another important group which may have different considerations for the user research activity, since their needs and preferences regarding user research might be case-based.

The respondents have different types of experiences regarding user research. 11 of them are familiar with outsourcing for user research projects, and of which 8 are UTEST's[d] collaborators. Most of the respondents have been involved with user research activity and they have their own experiences (14), and 9 of them have not utilized outsourcing user knowledge for their design activity instead they conduct user research by themselves whenever it is needed.

Respondents are mostly composed of industrial designers (16), however as an audience group of user research deliverables, engineers, who are involved with design activity and who utilize user research findings in their product development processes, are also considered (4).

Another consideration for grouping the respondents in the sample is type of design integration approach that is adopted by the firm that the respondent works for. There are different design integration types that are modeled in the literature for emphasizing the role and value of design in product development processes, such as **Design Ladder** by Danish Design Institute (2003); **designer's roles** according to Perks et al. (2005); and **design management types** according to Mozota (2002). These integration types represent a hierarchy indicating the level of design integration in an organization. Companies that are placed higher in this hierarchy have more mature attitude toward integration while lower levels do not see design as a central asset of the company or they do not integrate design at all. Detailed explanations regarding these levels are provided in Table 17 in APPENDIX C.

Respondents of the interview study are assigned to the levels in the design integration hierarchy (Table 8). Designers in the respondent group are heuristically placed in the hierarchy by considering the definitions that are listed in Table 17 in APPENDIX C and the heuristics are formed according to the tasks that are listed in Table 18 in APPENDIX C based on the task definitions of the designer roles defined by Perks et al. (2005).

---

[d] METU-BILTIR / UTEST Product Usability Unit (http://utest.metu.edu.tr/)

Table 8. Distribution of the respondents according to design integration levels

Distribution of respondents according to the levels	LEVEL	Danish Design Ladder	Designer's role according to Perks et al. (2005)	Design management type according to Borja de Mozota (2002)
R15, R16, R14	4	Design as innovation	Design as NPD Process Leader	Design as a managerial competence
R07, R09, R06, R05, R13, R02, R03, R04, R12, R11, R17, R18, R19, R08	3	Design as process	Design as Part of Multifunctional Team	Design as a resource competence
R10, R20, R01	2	Design as styling	Design as Functional Specialism	Design as an economic competence
	1	None design		

Legend:
- Consumer products
- Automotive
- Medical
- Defense
- Design consultancy
- Designers
- Engineers

All of the respondents are practicing designers or engineers from Turkish industry, for this reason the interviews are carried out in Turkish.

3.2.3. Verification questionnaire

After having the results of the interview study, the findings are brought to a broader context through an online questionnaire that is distributed to a larger audience from the population of interest. The questionnaire involves close-ended questions to obtain quantitative outputs for interpreting them with the outcome of the interview study. Benefits of combining qualitative and quantitative data are indicated by many scholars in social sciences (Firestone, 1987; Jick, 1979; Rossman & Wilson, 1994; Sieber, 1973; Tashakkori & Teddlie, 1998). Rossman and Wilson (1994) refer to these benefits as "combing methods can enhance the research purposes of *corroborating*, *elaborating*, *developing*, and *initiating* understandings of social phenomena" (Rossman & Wilson, 1994, p. 315). Such an approach enables verification and *corroboration* through triangulation; *elaboration* and *development* for analysis and maintain more elaborate view for the researcher; and *initiation* of new perspectives and directions that can challenge the existing framework of the study for further development (M. B. Miles & Huberman, 1994).

Triangulation is a key term that is valued for maintaining the validity of the research (Creswell & Miller, 2000; Denzin, 2009). It can be done by (1) triangulating data sources through utilizing different time frames, conducting the study in different locations and with different participants; (2) involving different investigators in the study; (3) adopting different theories while interpreting the results; and (4) utilizing different methods to explore the phenomenon (Denzin, 2009). Advocates of

triangulation for maintaining validity assert that it enables the researcher to view the phenomenon from different angles and by this way allows to obtain a more accurate and complete picture as the outcome (Denzin, 2009; Moisander & Valtonen, 2006). However there are objections to this view arguing that triangulation cannot be considered as a measure for validity, since multiple methods that are utilized in the process is originated from different theories, thus deficiencies of one method cannot cover the others' defects, and actually the accuracy stems from "systematic application" based on an established theoretical perspective or model (Fielding & Fielding, 1986; Silverman, 2006). On the other hand, this opposing view also embraces the benefits and necessity of triangulation for different reasons. As Silverman (2006) denotes by quoting from Denzin and Lincoln (2000). "Triangulation from this perspective, is not a way of obtaining a 'true' reading but 'is best understood as a strategy that adds rigor, breadth, complexity, richness and depth to any inquiry'" (Denzin and Lincoln (2000) as qtd. in Silverman, 2006, p. 292). Therefore applying multi-methods for investigating the constructs and their relations is found appropriate by integrating qualitative and quantitative data, thus at this stage an online questionnaire is designed for further evaluating the importance hierarchy of impacts and how they can be achieved with system and information qualities in the model.

According to Miles and Huberman (1994), there are three levels for integration of qualitative data with the quantitative data. The integration can be done at (1) "quantizing level" by counting the instances in qualitative data such as occurrence of certain words or qualitative evaluations that are converted into ranks or scales, (2) "linkage between distinct data types" at which the qualitative data is compared to the quantitative findings, such as comparing open ended answers with the numerical evaluations made by the same respondent in a questionnaire study, and (3) "multimethod design" involving combination of different methods for exploring a phenomenon. In this study both *quantizing level* and *multi-method design* are utilized for combining qualitative and quantitative data. At *quantizing level*, findings of the qualitative interview, methodology of which is introduced in the previous section, are analyzed by content analysis and codes are quantified for certain cases to interpret data and through *multi-method design,* a verification questionnaire is designed for comparing its findings with the qualitative outputs from the interview study. Qualitative study provides rich description of the findings that are obtained through the quantitative study that is conducted with a larger sample from the population.

3.2.3.1. *Questionnaire design*

In the questionnaire design, first the relevant independent factors are questioned. As it was in the previous study, industry difference, type of experience with user research and their educational backgrounds are considered as major independent factors. Moreover types of design tasks the respondents are carrying out are questioned in order to be able to assess their effects on the respondents' evaluations. The list is originated from Types of Design proposed by Design Council[e].

Since the questionnaire is distributed to different countries the country they are currently employed is asked based on the idea that cultural factors may bring different considerations regarding the subject of the study.

In order to investigate and verify the patterns of relations between the constructs, associations between the constructs that are identified in previous stages are questioned. As it is illustrated in the basic model in Figure 9, core categories of the model involves impacts, system and information qualities. Constructs that are identified in these three core categories are questioned in the study.

- First the impacts are evaluated based on the importance for the respondents and then
- the respondent is asked to evaluate the relation between each impact and related information and system qualities. By this way it is possible to understand which qualities should be met in order to maintain the intended impact. Table 9 illustrates the conceptual structure of this part. Each cell in the table is evaluated by considering the effect of the corresponding *quality* in the column on the corresponding *impact* in the row.

---

[e] http://www.designcouncil.org.uk/about-design/Types-of-design/

Table 9. Questioning the effect of information and system qualities on the impact that are requested as the outcome of user research

| | The Effect of... | | | | | | | | | | | |
| | Information Qualities | | | | | | System Qualities | | | | | |
on...	Info. Quality 1	Info. Quality 2	Info. Quality 3	Info. Quality 4	Info. Quality 5	Info. Quality 6	System Quality 1	System Quality 2	System Quality 3	System Quality 4	System Quality 5	System Quality 6
Impact 1												
Impact 2												
Impact 3												
Impact 4												
Impact 5												
Impact 6												
Impact 7												
Impact 8												
Impact 9												
Impact 10												
Impact 11												

Since all possible relations between the qualities and impacts are questioned in the verification questionnaire, theoretically it is possible to investigate relations that are not stated in the interview study. This would enable to identify new directions that can be explored further for future studies.

Content of the questionnaire, both in Turkish and English, are included as a word document format in APPENDIX D.

3.2.3.2. Translation considerations

The questionnaire is developed based on the constructs that are identified in the interview stage. Initially these constructs were in Turkish, and questions in the interview are formulated in Turkish by considering the terminology that is utilized by the respondents in the interview study. After two pilot tests with the subjects from the population of interest, the questions that are found unclear are revised based on the comments by the subjects. Since the questionnaire is planned to be distributed in the other countries outside Turkey, it is translated into English. At the end of the translation process, in order to come up with the questionnaire's "linguistic equivalence" (Peña, 2007; Van de Vijver & Tanzer, 1997), "translation and back-translation" or "reverse translation" (Bojko, Buttimer, & Zace, 2009) procedure is conducted by including a native language speaker review to maintain accuracy (Peña, 2007).

After the questionnaire finds its final form in Turkish version, the content is translated to English by the author, and then it is passed onto a native language speaker, who is an academician having knowledge about the terminology related to the area of the study, for the revision regarding the language that is utilized in the questionnaire. Unclear parts are revised together with the native speaker by considering his comments. After that English version is sent to another expert in the area for translation to Turkish and this Turkish version is compared to the one that is prepared prior to translation phase, and mismatches are detected and revised for equating the language.

3.2.3.3. Procedure

With purposive sampling approach, the online link is emailed to 155 designer/product developers who are from industries that commonly utilize user research information to develop products. In

order to generate the emailing list, contacts of Industrial Designers Society of Turkey (ETMK) is filtered by considering the field in which they are working. Consumer products, automotive, defence, medical products and design consultancy are the areas that are considered while filtering this contact list. Moreover contacts of UTEST are also included in the list.

The standard text that is used for emailing can be found in APPENDIX E. The contacted individuals are also asked to forward the questionnaire to the relevant individuals. Besides emailing, the questionnaire link is also shared in professional groups at LinkedIn, the list of which can also be found in APPENDIX E.

Data collection period lasted approximately one month from December 17, 2011 to January 15, 2012.

3.2.3.4. Sample of the Verification Questionnaire

The sampling structure of the questionnaire is presented in Table 10. As it can be seen from the table same sampling considerations with the interview study is considered while describing the sample through cross tabulation.

Table 10. Sampling structure of the verification questionnaire

Industry * Research experience * Educational background Crosstabulation

Count

Educational background			Research experience			Total
			Only reported – no experience	Only own experience – never reported	Both reported and have own experience	
Designers	Industry	Consumer products	10	5	18	**33**
		Automotive industry	3	3	4	**10**
		Defence industry	1	3	7	**11**
		Medical products	1	0	3	**4**
		Design consultancy	0	6	8	**14**
	Total		15	17	40	**72**
Engineers	Industry	Consumer products	1	0	5	**6**
		Automotive industry	2	0	2	**4**
		Design consultancy	0	1	0	**1**
	Total		3	1	7	**11**
Total	Industry	Consumer products	11	5	23	**39**
		Automotive industry	5	3	6	**14**
		Defence industry	1	3	7	**11**
		Medical products	1	0	3	**4**
		Design consultancy	0	7	8	**15**
	Total		**18**	**18**	**47**	**83**

83 individuals responded to the questionnaire. The proportions of the sample are quite similar to the proportions in the interview study (Table 7) except there is considerably small number of respondents from medical products industry. Since the questionnaire is considerably long and the population of interest composed of professionals who usually have busy schedules, it is hard to increase the number of respondents, although notifications are made for reminding the questionnaire.

Table 11. Countries where the respondents are employed in the verification questionnaire

Countries where the respondents are employed	Frequency
Turkey	65
United States	4
China	3
Netherlands	3
Italy	2
Sweden	2
Austria	1
Finland	1
France	1
Germany	1

As it can be seen from Table 11, most of the respondents are from Turkey, since it was possible to contact them individually by email. Although there are respondents from other countries just 6 of the respondents fill in the English version, the other respondents who reside in countries outside Turkey preferred Turkish version. The low response rate for English version might stem from inability to contact on individual basis.
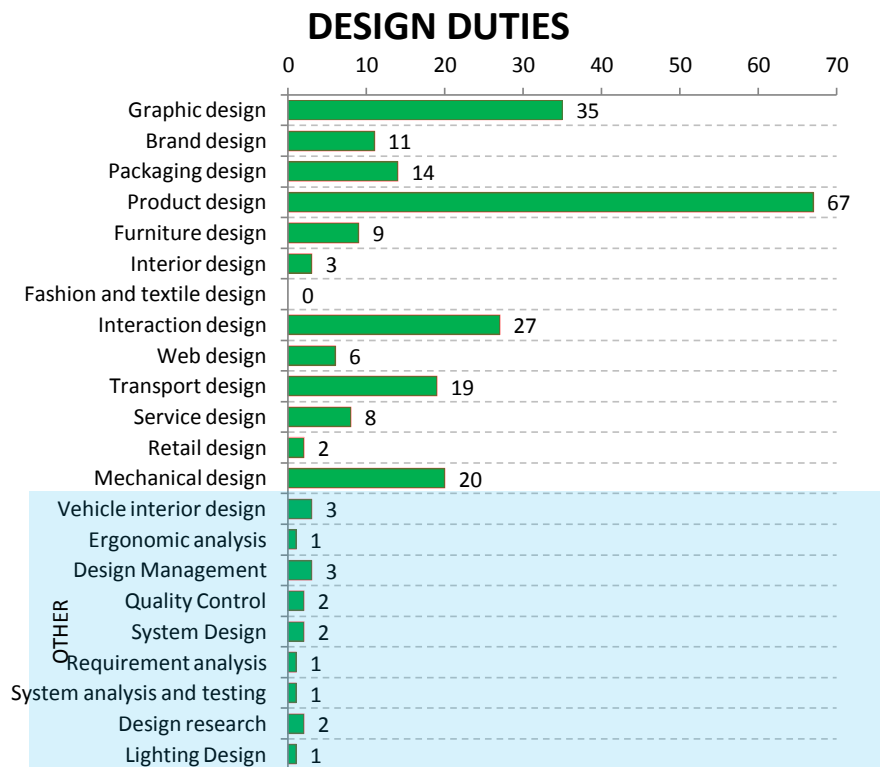
Figure 16. Design duties that the respondents of verification questionnaire carry out

Figure 16 presents the design duties that the respondents are responsible from. As it can be observed from the graph, product design is the most common activity for the sample group. It is followed by graphic design, interaction design, mechanical design and transport design. The other duties that are listed in the questionnaire such as packaging design, brand design, furniture design,

service design, web design, interior design and retail design have considerably low frequencies, while none of the respondents have listed fashion and textile design as their responsibility. Responses to the "other" option, which is provided as an open ended entry in the questionnaire design, is also listed in the graphic.

3.2.4. Analysis structure

Figure 17 illustrates the structure of the analysis and the outcomes that are retrieved trough the analysis stages.

3.2.4.1. Data preparation

As illustrated in Figure 17, as the first stage of the analysis, constructs are elicited from the literature search and interview study. Full list of these constructs and frequencies representing the number of respondents who refer to the construct in the interview study are illustrated in Figure 18 in Chapter 4.

The cognitive mapping interviews are analysed through content analysis for laddering with the aid of items in the cognitive maps that the respondents generate during the interview sessions (An example map can be found in Figure 12). Interview data are coded by considering a provisional list of constructs that are previously elicited from the literature search (M. B. Miles & Huberman, 1994). Coding is an iterative process and the provisional list is enlarged if new constructs are identified from the respondents' statements. The coding procedure is carried out in Microsoft Excel in parallel with the transcription process.

In qualitative research, reliability is dependent on the process of the study's consistency in a way that it is "reasonably stable over time and across researchers and methods" (M. B. Miles & Huberman, 1994, p. 278). For assessing reliability of content analysis, inter coder reliability is a typical method that is conducted by utilizing more than one coder to code data and comparing the resulting codes statistically based on reliability indices (Krippendorff, 2004; Neuendorf, 2002; Perreault & Leigh, 1989; Silverman, 2006). In this study, it is not practical to use more than one coder, since the data is too dense. On the other hand, to maintain reliable outputs, coding structure and the terminology used for coding items are regularly examined and reviewed by a professional researcher, who is the supervisor of the thesis study and revisions are made according to her comments. Moreover codes as the items of the model are brought to a wider context with the verification questionnaire study to assess their applicability to practice. In addition, the methodology is tried to be presented in detail to provide transparency and where it is possible, appropriate quotations from the respondents' statements are given to illustrate the coding schema, which is an important criterion for interview studies that is called as providing "low-inference descriptors" by Silverman (2006).

For preparing the results of the online questionnaire to analysis, data are entered into IBM SPSS Statistics 20 software for calculating descriptive statistics (IBMCorp., 2011).

As one of the outcome of these two preparatory stages, hierarchical importance of ***impacts***[f] is evaluated (Figure 19-a & b). Number of respondents who refers to the importance of impacts in the interview study (Figure 19-a) and mean values for the importance rates of the individual impacts in the questionnaire (Figure 19-b) are utilized to represent the importance hierarchy.

---

[f] As it is seen in Figure 9, the basic model for effective communication that is adopted in the study involves three groups of constructs, namely *system qualities*, *information qualities* and *impacts*. Impacts are the outcomes that are requested from the user research study and system and information qualities should be defined according to these impacts. Therefore, since impacts are higher order values for the respondent and importance of other constructs depend on the specific impact, it is important to prioritize them in order to highlight the important goals for effective communication.
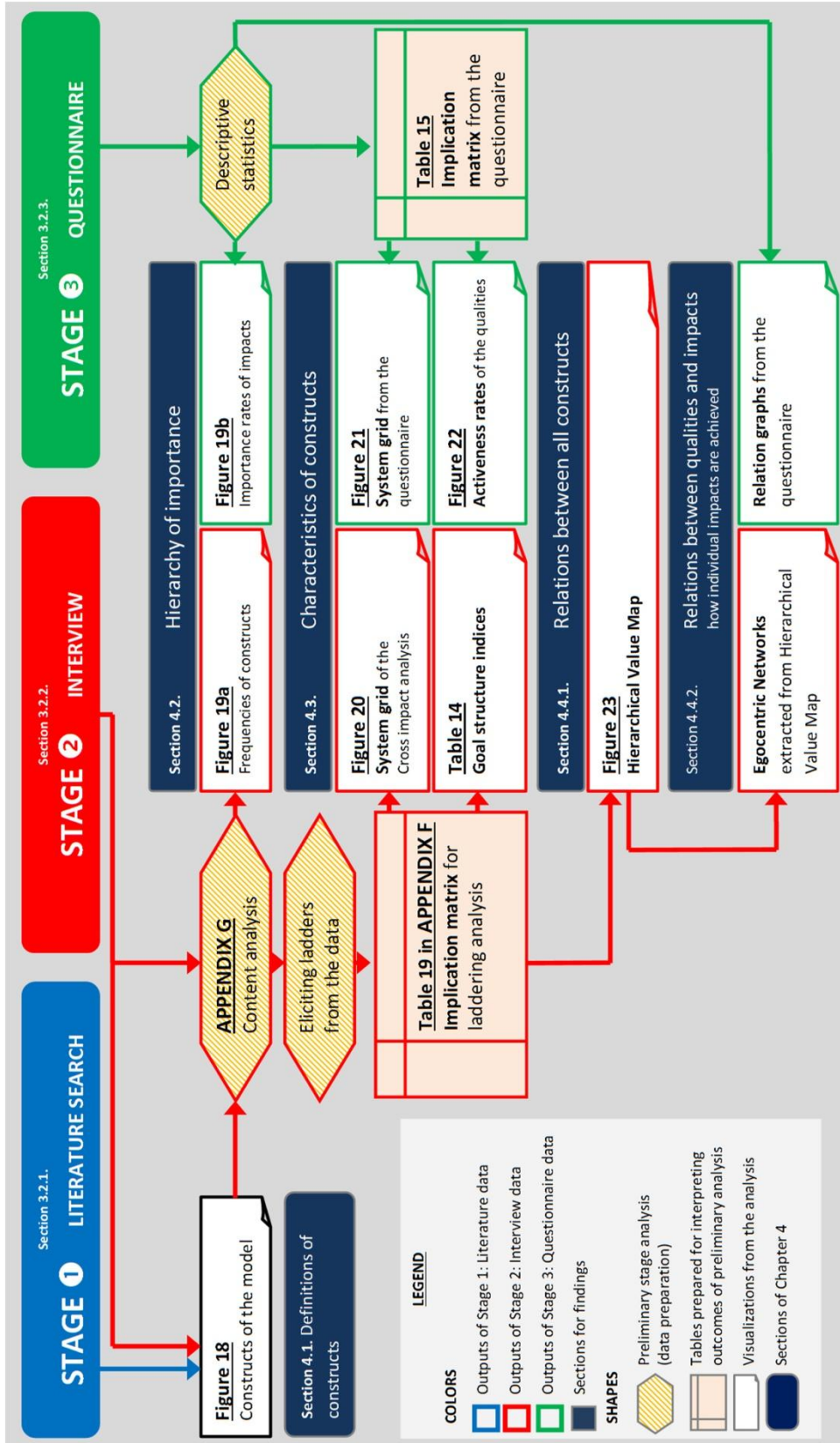
Figure 17. Structure of the analysis

As an another step for data preparation, ladders are elicited from the respondents answers during the coding process in interview analysis (Reynolds & Gutman, 1988; Reynolds & Olson, 2001). Ladders are typical attribute-consequences-value chains that are retrieved through cognitive mapping interview. Each construct elicited in the interview is conceptually linked to other constructs by the respondent as it is illustrated in the structure of the interview which is presented in Figure 14 and Figure 15. In these ladders constructs are directly and indirectly related. To illustrate, considering the example that is provided in Figure 11, "creamy texture – enjoy taste – happiness" is a ladder that is conceptually linked with each other. The *attribute* of "creamy texture" for a food is linked to a *consequence* "enjoying taste" and this consequence is resulted in "happiness" as a personal *value* for the respondent. In this example "creamy texture" and "enjoy taste" is directly linked, while "creamy texture" and "happiness" is indirectly linked. Considering these relations, all direct and indirect links between the construct are calculated in the form of a matrix which is called as "implication matrix" (Reynolds & Gutman, 1988; Reynolds & Olson, 2001). The implication matrix that is generated as the result of the interview study is demonstrated in Table 19 (APPENDIX F). From this matrix, cross impact analysis and system grid (Scholz & Tietje, 2002) is generated and goal structure indices are calculated for representing the characteristics of constructs; and Hierarchical Value Maps are formed for illustrating the relations between constructs. Methodologies of these steps are presented in the following sub-sections.

In order to present the characteristics of the constructs from the questionnaire data, another implication matrix is generated by considering information and system qualities' effects on the impacts (Table 15). The conceptual structure of the questionnaire which is illustrated in Table 9 is the basis for this implication matrix. A separate system grid and activeness rates are calculated based on the data on this matrix.

3.2.4.2. Cross impact analysis and system grids

Cross impact analysis is originally a method for forecasting future scenarios and how variables and factors regarding the scenario effects the future decisions (Bradfield, Wright, Burt, Cairns, & Van Der Heijden, 2005; Schlange & Jüttner, 1997; Scholz & Tietje, 2002). As it is referred by Bradfield et al. (2005) it is first developed by Gordon and Helmer in 1966 and later programmed and reported by Gordon and Hayward (1968). In cross impact analysis, experts regarding the subject of interest are asked to evaluate and estimate causal relations between a set of key variables which are specified through problem analysis by collecting data from the field and literature at the beginning of the procedure (Serdar Asan & Asan, 2007; Wiek, Lang, & Siegrist, 2008). Evaluations are done systematically based on a cross impact matrix, which is similar the implication matrix generated as the result of the laddering analysis in this study (Table 19 in APPENDIX F), except in original cross impact analysis the cells are filled in by experts by estimating the causal relations on rating scale usually between 3 to 7 point (Scholz & Tietje, 2002) whereas in this study they indicate number of relations between the construct in the ladders that are elicited at the end of the analysis phase.

As the data input for cross impact analysis, sum of all direct and indirect relations are utilized in the implication matrix for laddering analysis Table 19 (APPENDIX F). In cross impact analysis the relations between the construct are hypothetical links which are determined by experts based on possibility of dependence between the variables. Similarly, in this study, the relations in the impact analysis are established based on professional designers' statements regarding effectiveness variables of communicating user research and they are based on their perceptions which rely on their past experiences.

In cross impact analysis procedure, after gathering data in the form of cross impact matrix, impact analysis is conducted that resulted in a *system grid* which is a "conjoint display of the column and row sums" in the matrix and a *system graph* which is a "structured network that presents a structural view of the system model" (Scholz & Tietje, 2002, p. 99). In this study, a system grid that represents activeness and passiveness characteristics of the constructs in the system is generated based on the active and passive sums from the implication matrix (Figure 20). As it can be seen from the figure, the grid is partitioned with vertical and horizontal lines which divide the plane into four parts and they are placed at the mean values of total sums of activity and passivity scores (Scholz &

Tietje, 2002). Each construct in the system has a particular place in the grid based on its activity and passivity score. Based on the definitions made by Scholz and Tietje (2002), attributes of the four areas which defines the characteristics of the constructs as follows:

- **Ambivalent-critical**: The constructs in this area are both affected by the other constructs in the system and they have impacts on them, for this reason they are highly instable and critical for the system. They are both means and end goals to achieve effective communication of user research findings.
- **Active**: Active constructs have major influence on the other constructs but they are less affected by them. These constructs is crucial for the system since changes on these variables influence the system's situation. They represent the means to achieve effective communication rather than the end goals.
- **Passive-reactive**: Passive constructs are affected by the other qualities but they do not have much effect on the others. They indicate the system's situation in that sense more personal or higher order values, i.e. end goals, are included in this area.
- **Buffer variables**: Buffer constructs has minor effects on and less affected by the other qualities. They can be means or ends but their influence on the system is not much. However they are parts of the system thus they should be considered for the effectiveness in communication.

In a typical cross impact analysis procedure, a system graph is constructed for visualizing the relations between the variables in a network structure (Scholz & Tietje, 2002). In this study, this network structure is visualized in the form of a Hierarchical Value Map, methodology of which is presented in the following sections.

The system grid in Figure 20 originated from the data retrieved through the interview study. From the questionnaire data a separate implication matrix (Table 15) is generated based on the structure of the questionnaire design. By considering passiveness sums of the construct group "impacts", a system grid which represents how impacts are affected from system and information qualities is visualized (Figure 21). The grid helps to visualize which impacts are affected more by the system and information qualities and which of them are harder to be managed by these qualities. The graph that is showing how active the system and information qualities (Figure 22) is also originated from the implication matrix that is presented in Table 15.

3.2.4.3. Goal Structure Indices

In order to gain more insight about the characteristics of the constructs, Pieters, Baumgartner, and Allen (1995), identify three indices by utilizing active and passive sums or as they defined in-degrees and out-degrees for the constructs in the implication matrix (Table 19 in APPENDIX F). These indices represent the position of individual goals, which are the constructs in the laddering study, in the overall goal structure that is the whole framework of the study. These indices are defined and calculated by Pieters et al. (1995) as follows:

> Abstracters of a goal is defined as the ratio of in-degrees over in-degrees plus out-degrees of the goal. Abstractness ranges from 0 to 1; the higher the index, the larger the proportion of a goal's connections with other goals in which the goal is the destination rather than the source. Goals with a high abstractness score are predominantly ends, while goals with low abstractness cores are predominantly means. [...]

> Centrality of a goal is defined as the ratio of in-degrees plus out-degrees of a particular goal over the sum of all cell-entries in the implication matrix (cf. Knoke and Butt, 1982). Centrality ranges from 0 to 1; the higher the index, the larger the proportion of connections in the goal structure than run through the particular goal. The centrality of a goal would be 1 if all connections in the goal structure involved the goal in question. [...]

> Prestige of a goal is defined as the ratio of in-degrees of a particular goal over the sum of all cell-entries in the implication matrix (cf. Knoke and Butt, 1982). Prestige ranges from 0 to 1; the higher the ratio, the more the particular goal is the destination of

connections with other goals. The prestige of a goal would be 1 if the goal were involved in all connections, but only as a destination, not as a source (Pieters, et al., 1995, p. 236).

The goal structure indices which are elicited as the outcome of the laddering data are listed in Table 14 and discussions regarding indices are made in Section 4.3.2.

3.2.4.4. Hierarchical Value Maps

In order to represent the complex network structure of all relations between the constructs of the system, a Hierarchical Value Map (HVM) is generated (Gengler & Reynolds, 2001; Reynolds & Gutman, 1988) by utilizing the implication matrix of the interview data (Table 19 in APPENDIX F). According to Grunert, Beckmann, & Sorensen (2001), there are alternative techniques to represent laddering data such as multidimensional scaling (Aurifeille, 1991) and multiple correspondence analysis (Valette-Florence & Rapacchi, 1991). However these representation techniques place the constructs individually in a multidimensional space without the linkages between them. In these representations, only distances are utilized to express associations, but representing the relations between the constructs with a network structure is more appropriate considering the theories that underline the laddering technique (Gengler & Reynolds, 2001). Therefore the approach for representing laddering structures in the form of a HMV is adopted in this study.

To obtain a readable visualization of HVM it is hard to represent all of the relations that are present in the implication matrix. Therefore a cut-off value (minimum level of relations) should be determined in order to have a clear picture of the system (Grunert, et al., 2001; Reynolds & Gutman, 1988). Although Grunert et al. (2001), argue that there are no statistics or established rules which are theoretically grounded to guide the decision of a cut-off level, Pieters et al. (1995) suggest some statistics to determine a cut-off level based on heuristics which are postulated by Reynolds and Gutman (1988). These statistics are also considered in this study (Table 12). According to Reynolds and Gutman (1988), generally for 50 to 60 respondents 3 to 5 levels are considered for a cut-off level and if cut-off level 4 is considered approximately two thirds (67%) of all relations among the constructs is represented in the HVM. As Lin and Lin (2011) refer, Frauman, Norman, and Klenosky (1998) suggest to represent 70% of all relations in the implication matrix. Therefore based on the statistics that are presented in Table 12, choosing a cut-off level 2 seems more appropriate since in that case 70,01% of all relations is presented in the map. However since it is important to make the presentation readable and highlight the most crucial associations between the constructs, level 3 is preferred as the cut-off value. HVM with the cut-off level 3 is presented in Figure 23 that is illustrating the major relations between the constructs of the system. In order to avoid data loss, HVM without a cut-off that is presenting all relations in the matrix is also presented in Figure 64 (APPENDIX F). Moreover the egocentric networks, which are basically parts of the HVM without a cut-off and concentrated on the relations of individual impacts with the other construct in the system, are presented in Section 4.4.2. Discussions regarding the resulted HVM are made in Section 4.4.1.

Table 12. Statistics of determining a cut-off level

Cutoff Level	Number of active cells in the implication matrix	Percentage of active cells represented in the map	Number of linkages	Percentage of linkages represented in the map
1	345	100%	672	100%
2	144	41,74%	471	70,01%
3	75	21,74%	333	49,56%
4	45	13,04%	243	36,16%

3.2.4.5. Egocentric networks and relation graphs

In order the explain how central impacts are achieved, egocentric networks (Hansen, Shneiderman, & Smith, 2010) which are illustrating the relations of the specific impact with its adjacent constructs are generated, and they are compared with the relation graphs that are visualized based on the questionnaire data on how the impact is affected by the qualities. These networks and graphs constitute the basis for the guidelines that will be presented in Chapter 5.

3.3. Conclusions for the methodology

The chapter focused on introducing how the methodology is developed by considering the aim and research questions of the study. The methodology composed of three main stages, (1) a literature search on identifying the constructs of effective communication of user research findings, (2) a cognitive mapping interview study to specify the constructs by considering the provisional list that is formed during the first stage, and (3) an interview study aiming at verifying the findings of the former two stages.

In the next two chapters, outcomes of the study are presented. In Chapter 4 the content is about documenting the findings, while in Chapter 5 it is more focused on interpretations of the findings by referring to the respondents' statements.

CHAPTER 4

CONSTRUCTS OF EFFECTIVE COMMUNICATION

In this chapter, findings of the study are documented by defining the constructs of effective communication and indicating their hierarchies, characteristics and relations. In the first section definitions are given by referring to literature findings and interview results, and then second section involves importance hierarchy of constructs to understand the crucial dimensions of the study. The third section defines the characteristic of each construct to be able to understand their roles and how they should be considered in the system of effective communication. After that, in the forth section, overall relations in the system of constructs are presented followed by introductions of individual relations of impacts that are targeted for effective communication.

Structure of this chapter together with the stages of methodology that provides inputs for the findings that are presented in this chapter were illustrated in Figure 17 in Chapter 4.

4.1. Definitions of constructs
In this section definitions for constructs of effective communication that are retrieved through literature findings and results of the interview study are presented. The findings are grouped under four major categories considering the basic model that is presented in Figure 9, namely individual impacts, organizational impacts, system qualities and information qualities.

The list of constructs that are elicited through the literature search stage are documented in Table 13. This list is considered as the provisional list for the interview analysis.

Figure 18 illustrates the final set constructs retrieved as the result of the interview study. The figure visualizes hierarchies of constructs based on the number of respondents who refer to the construct in the cognitive mapping interviews.

The section is considered as a terminology list involving brief explanations of constructs. Detailed descriptions from the interview data in the form of a coding list containing all sub-constructs are presented in Table 21 in APPENDIX G.

Table 13. Constructs that are elicited through the literature search stage

IMPACTS	SYSTEM QUALITY	INFORMATION QUALITY

• **Prevention of time loss** (Nørgaard & Hornbæk, 2009)
• **Inspiration** (Ramey et al., 1992; Blomberg and Burrell, 2008; Sleeswijk Visser, 2009)
• **Consideration of users** (Blomberg and Burrell, 2008; Sleeswijk Visser, 2009)
• **Unity in team's communication** (Blomberg and Burrell, 2008; Bartocci et al., 2008; Hughes et al., 2000)
• **Enjoyment in utilization of the system** (Nørgaard & Hornbæk, 2009)
• **Supportiveness in design decisions** (Ramey et al., 1992; Friess, 2010)
	• **System's Clarity:**
	  ○ **Avoidance from excessive information** (Diggens, & Tolmie, 2003; Nørgaard & Hornbæk, 2009)
	  ○ **Holism** (Ramey et al., 1992; Diggens, & Tolmie, 2003)
	  ○ **Avoidance of reductivity** (Blomberg and Burrell, 2008; Diggens, & Tolmie, 2003)
	  ○ **Prioritization of problems and findings** (Blomberg and Burrell, 2008; Barnum, 2002; Rubin, 1994)
	  ○ **Availability of justifications for the recommendations** (Abraham & Atwood, 2009; Nørgaard & Hornbæk, 2009)
	• **Usability:**
	  ○ **Ease of use** (Nørgaard & Hornbæk, 2009)
	  ○ **Ease of accessing the intended information** (Nørgaard & Hornbæk, 2009)
	  ○ **Well-structuredness** (Hughes et al., 1997; Diggens, & Tolmie, 2003)
	  ○ **Ability to share** (Sleeswijk Visser, 2009)
	• **Representativeness:**
	  ○ **Illustration of the context of use** (Nørgaard & Hornbæk, 2009; Abraham & Atwood, 2009)
	  ○ **Personification** (Sleeswijk Visser, 2009)
	• **Interpretability:**
	  ○ **Open-endedness** (Diggens, & Tolmie, 2003)
	  ○ **Interactivity** (Sleeswijk Visser, 2009)
	  ○ **Indexicality** (Diggens, & Tolmie, 2003)
	  ○ **Capability of integration with the present knowledge** (Sleeswijk Visser, 2009)
	  ○ **Avoidance of fixation** (Diggens, & Tolmie, 2003)
	• **Attractiveness:**
	  ○ **Engagingness** (Sleeswijk Visser, 2009)
		• **Persuasiveness** (Nørgaard & Hornbæk, 2009; Ramey et al., 1992)
		• **Credibility** (Nørgaard & Hornbæk, 2009)
		• **Usefulness** (Nørgaard & Hornbæk, 2009; Molich et al., 2007)
		• **Applicability** (Molich et al., 2007)
		• **Information's Clarity** (Nørgaard & Hornbæk, 2009)
		• **Sustainability** (Ramey et al., 1992)
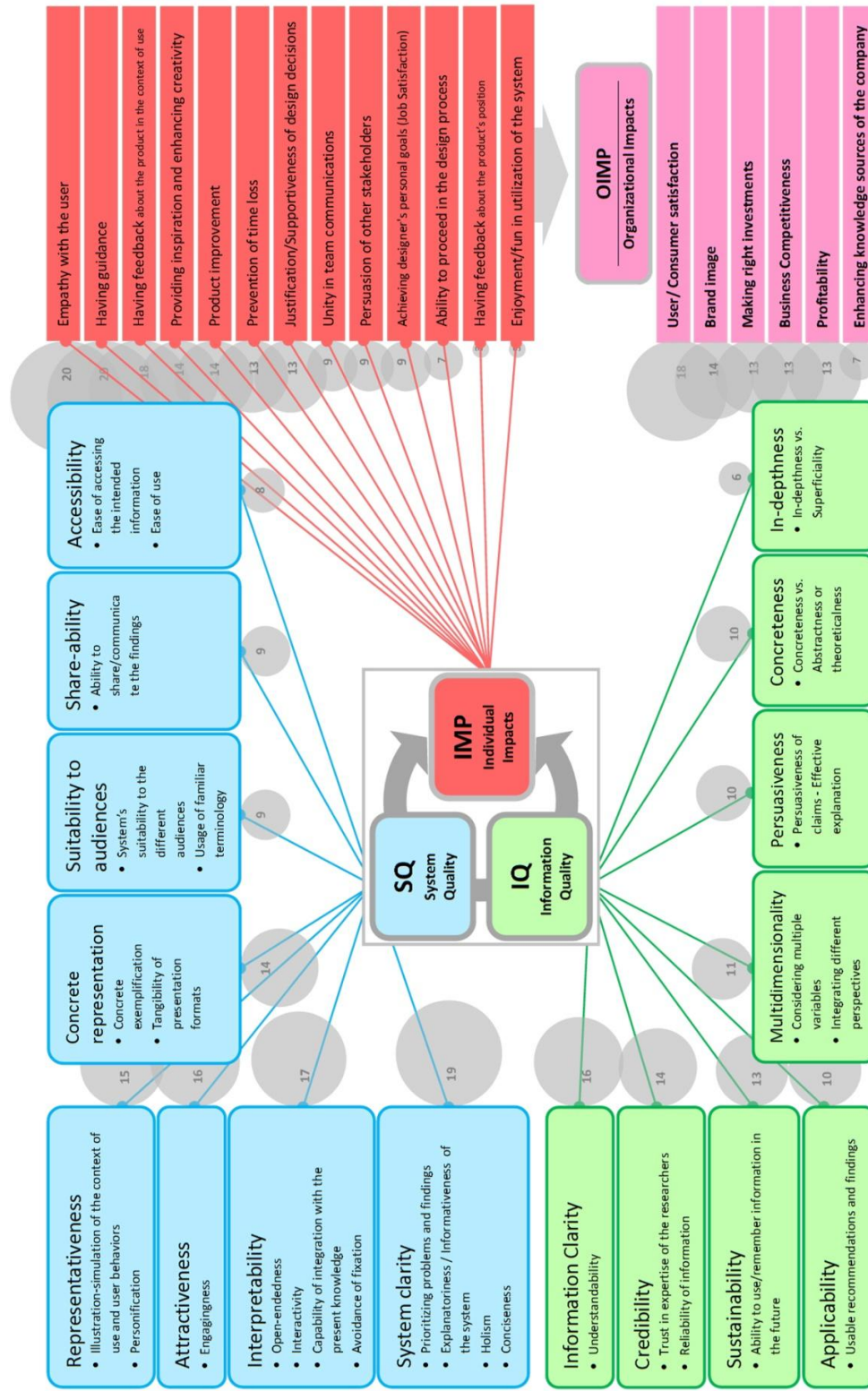
Figure 18. Constructs of the model of effective communication (Circles represent the number of respondents who refer to the regarding main construct in the interview study)

4.1.1. Individual Impacts

Empathy with the user: The most obvious impact that the effective communication of user research findings can provide is consideration of users. Enhancing empathy with the user is received as a critical part of user research and there is an extensive literature on how to maintain empathy (see e.g. Crossley, 2003; Kouprie & Visser, 2009; McDonagh-Philp & Lebbon, 2000; McGinley & Dong, 2011; Sleeswijk Visser, 2009; Suri, 2003). This impact refers to the designer's ability to get to know the users, understand their needs, problems and preferences and comprehend underlying reasons behind their evaluations and perceptions. The designer's goal in having understanding of these issues is to define design requirements with a user centred perspective and manage the gap between the designer and user, which is a commonly known problem both received by designers and the regarding literature.

Having guidance: As it is presented in Chapter 2, from the initiation periods of user research activity, one of the main reasons for conducting user research is gaining guidance in the design process by knowing user needs and problems. User research outcomes are expected to provide information regarding design requirements for the current projects of the firm as well as possible directions for future investments. The guidance gained through user research can provide designers with the ability to formulate clear and targeted design briefs and assist them in project planning activities.

Having feedback about the product in the context of use: Evaluating the product in the actual use context is critical for designers since the information provided with such kind of a study maintains critical feedback for product development activity, especially it is considered that unexpected problems which cannot be foreseen by the designer or the development team can be specified through testing with users.

Providing inspiration and enhancing creativity: Inspiration is an important outcome that the user research deliverables can maintain. "Providing inspiration" (Sleeswijk Visser, 2009), "stimulate[ing] the designers' creativity" (Ramey, et al., 1992), "enrich[ing] the designers' imagination about the domain" (Ramey, et al., 1992), "supporting innovation and creativity" (Blomberg & Burrell, 2008) are the impacts referred in the literature about this construct. Regarding this impact user research activity is highly valued, since it can lead to innovations by provoking thoughts in the designer's mind to generate new solutions, which do not exist in the current market.

Product improvement: By utilizing user research outcomes, it is possible to improve products by eliminating its problems and creating better designs that meet users' needs and maintain added value for them.

Justification/Supportiveness of design decisions: Designers need to support their arguments with valid data and this is one of the main reasons why they search for user knowledge. Such validation is critical for the designer since it maintains self confidence in the design activity and it is also crucial for persuading other stakeholders, especially managers. While presenting design solutions, s/he needs to prove his/her claims and decisions by justifying them with reliable data (Friess, 2010; Lai, Honda, & Yang, 2010)

Prevention of time loss: It is believed that user research can prevent time loss if correct guidance and actionable results are provided as the outcome. Prevention of time loss is also critical when utilization of the deliverable is concerned. It is important that the deliverable is not "time consuming to use" (Nørgaard & Hornbæk, 2009).

Persuasion of other stakeholders: As it is mentioned while defining "justification/supportiveness of design decisions", persuasion of other stakeholders and managers is a critical impact which can be achieved by having valid and reliable findings as the result of user research study. Designers would like to gain ability to persuade managers and other stakeholders in the development team or client firms (if they are consultants) through the utilization of user research findings.

Achieving designer's personal goals (Job satisfaction): Through the utilization of user research findings, designers can also achieve such personal goals as self-confidence as a designer, enhanced job satisfaction and raised motivation.

Unity in team communications: User research deliverables are considered as means of providing unity in the team's communication through the provision of shared references (Blomberg & Burrell, 2008). Providing such a shared reference can be helpful for supporting decision processes and keep diverse team members "on the same page" (Bartocci, Potts, & Cotugno, 2008). The deliverable can play a role of shared language or *lingua franca* in the design team's communications (Erickson, 1998 as referred in Hughes et al., 2000).

Ability to proceed in the design process: If user research findings can be effectively utilized in the design process, it is believed this can provide the designer with the ability to move on to the next stages in the design process by supporting design decisions with user information. Moreover designers consider that user research data can initiate the design process by maintaining starting points for conceptualization.

Having feedback about the product's position among the competitors: Studies regarding evaluation of product together with the competitors' are valued, since they provide information regarding the product's position, which is highly critical for the improvement of the product.

Enjoyment/fun in utilization of the system: Enjoyment is another important impact that can be caused by the utilization of the deliverables. If the deliverable or the system is "enjoyable to work with" the team would be more willing to utilize it and this would have impacts on the effectiveness of the system (Nørgaard & Hornbæk, 2009). This impacts is considered a desirable outcome for some designers, although others consider it less important, believing there are more important impacts to maintaining effectiveness in user research.

4.1.2. Organizational impacts

User/ Consumer satisfaction: One of the major higher ordered goals in conducting user research is to maintain user satisfaction as an organizational impact of effective communication. Providing preferable products for the user and pleasurable experiences for them to maintain happiness in use are considered as critical goals for organizations by the designers.

Brand image: Another consequence in utilizing effective user research is considered as enhancing or empowering brand image through making innovations and being a trendsetter in the field. Designers think that maintaining brand loyalty, reliability and awareness depends on effective user research integration.

Making right investments: If valid findings are retrieved from user research outcomes, it is possible to decrease investment risks, since investments can be verified with the data from the actual users. Moreover effective user research enables utilization of company sources wisely while making management decisions by supporting them with reliable data. By this way, possible profit losses can be avoided.

Business Competitiveness: User research outcomes are expected to raise competitive power of the company by enabling to conduct right market positioning activities.

Profitability: Enhancing company profitability by increasing sales and maintaining sustainable profit by enhancing the product's market is one of the highest level goals that can be indirectly achieved as the result of utilization of user research knowledge.

Enhancing knowledge sources of the company: User research outcomes are considered as an important asset for the corporate memory. It is believed that the research outputs can be utilized in future projects of the firm and enhances knowledge sources for research and development that is carried out inside the company.

4.1.3. System qualities

System's Clarity: System's clarity is about ease of understanding the system, and perceived clarity while using the system.The system is expected to clearly communicate the required information; and four different sub-qualities related to system clarity were identified as important by most of the respondents.

- **Prioritization of problems and findings**: Among these sub-qualities, prioritizing problems and findings is considered as highly ciritical, for which it is important to prioritize the problems and findings by emphasizing the primary information for the audience (Barnum, 2002; Blomberg & Burrell, 2008; Rubin, 1994). Responding questions of the research brief by highlighting critical findings have importance. Moreover findings should be put in a hierarchical order to prioritize the critical ones.

- **Explanatoriness / Informativeness of the system**: Deliverables are expected to be self-explanatory. Recommendations, guidelines or conclusions from the findings of the user research involve the researcher's interpretations, and as such they need to be justified by *providing underlying reasons* so as to provide a clear understanding of the problems or issues that are considered by the researchers (Abraham & Atwood, 2009; Nørgaard & Hornbæk, 2009). During the analysis of the user research studies, *reductivity* should be carefully considered, since meaningful findings and details or "contextual richness" can be lost if the data is excessively worked or summarized (Blomberg & Burrell, 2008; Diggins & Tolmie, 2003). Generalizing the user data with quantitative majorities is found restricting , since it is considered that important details which makes the designer to see critical problems can be lost with such kind of a reduction.

- **Holism**: The system should also provide a *holistic* perspective regarding the context of use to inform the designers about the criticality of the identified problems, and thus enhance their creativity (Ramey, et al., 1992). In this way, a shared reference for the discussions of the design team will be provided (Diggins & Tolmie, 2003). Ramey et al. (1992) claims that combination of several different forms of data and providing "holistic feel" is helpful in persuading the designers about the criticality of the proposed requirement and enhancing their creativity.

- **Conciseness**: For the sake of system clarity, giving excessive information should be carefully considered, since this may distract the audience and make the delivery unattractive, which may result in reluctance from the designer to utilize it (Diggins & Tolmie, 2003; Nørgaard & Hornbæk, 2009). It is a well-known fact that designers have a tendency to overlook exhaustive and long written reports, as indicated in different sources (Bartocci, et al., 2008; Kuniavsky, 2003; Ramey, et al., 1992). Therefore repetitive information should be eliminated from the deliverable and providing excessive data should be carefully considered while designing the deliverables.

Interpretability: The system of delivery is expected to allow an interpretation of the findings in such a way that the designer is not limited while examining it. Open-endedness, interactivity, capability of integration with present knowledge and avoidance of fixation are the sub-qualities of interpretability.

- **Open-endedness**: Diggins and Tolmie (2003), indicate the problem of constraint for future investigations, if the groupings and categorizations in the presentation are too defined and not open to further interpretation, therefore open-endedness is required and the presentation should allow "recipient design" and open to further investigations by the designer.

- **Interactivity**: Sleeswijk Visser (2009) asserts that the interactivity of the user research deliverables can direct designers to interpret the findings according to their particular purposes, which may be a source of inspiration for the designer. By interactivity, Sleeswijk Visser (2009) is implying the ability of the means of delivery to provide designers with the opportunity to "select, categorize and organize the information as suits them best" (Sleeswijk Visser, 2009). In this study, it refers to providing the designer's with the ability to retrieve immediate responses to the questions that s/he has in mind.
- **Capability of integration with the present knowledge:** Sometimes companies outsource to different firms to conduct research on the same subject, or have their own data sources for the issue in hand. In this case, the findings should be comparable and interpretable with consideration of other sources, meaning that the system's capability of integration with present knowledge is important (Sleeswijk Visser, 2009).
- **Avoidance of fixation:** The deliverable is expected to allow future investigations by avoiding fixation on the delivery's categorizations and conclusions (Diggins & Tolmie, 2003). It should not restrict designer's imagination with rigid conclusions and suggestions.

Attractiveness: User research can be more effective if the designer is willing to utilize the deliverables in their design process, and for this reason the system of delivery should be more engaging and attractive (Sleeswijk Visser, 2009). Excessive information results in digression from the central topic and distracts the audience. Therefore engagingness should be carefully considered for not to lose attention of the audience.

Representativeness: While delivering research results regarding user behavior, how the user and the context of use are represented is considered as a crucial quality of the system of delivery. According to Sleeswijk Visser (2009), representing users by referring to real individuals enhances empathy in the designer. For this reason, the *personification* of the findings gathered through a user research, projecting the user as a real individual that can be encountered in the actual context of use, is a good way of enhancing the designer's empathy with the user (Pruitt & Adlin, 2006; Sleeswijk Visser, 2009). Moreover, in order to understand the underlying reasons behind problems experienced with the product, the *context of use should be well-illustrated* in the delivery (Abraham & Atwood, 2009; Nørgaard & Hornbæk, 2009).

Concrete representation: It is commonly accepted that the designer's way of thinking is product centered (Dorst, 2003), and since it eases the communication of complex ideas, they tend to communicate their conceptual designs by referencing existing designs or images that illustrate similar designs, moods or styles (Eckert & Stacey, 2000). Therefore, in easing the communication of user research findings, *tangibility* is considered as an important quality of the system. Moreover, designers require explicit definitions of perceived qualities that are expressed by users while evaluating the product. Terms attributed by the users referring to product qualities, such as nice, comfortable, pleasurable etc., are usually considered as abstract and vague by designers, and so it is important to explain these qualities by relating them to actual examples of the physical properties of the product. In this case, product comparisons may be deemed useful for clarifying the explanations, as supplying good and bad examples of the product qualities in the explanations are considered as more concrete, and thus maintain understandability for the designer.

System's suitability to the different audiences: A product development team is made up of several different stakeholders, besides designers, including managers and marketers, all of which are audiences of the deliverables. Thus the *system's suitability to different audiences* should be considered since there is diversity in the expectations and needs from the system of delivery for the individual members of the audience (Kuniavsky, 2003; Sleeswijk Visser, 2009; Volk & Wang, 2005).

Share-ability: The media used in the delivery are expected to be sharable among the stakeholders in the product development team, and thus should be designed in such a way that they can be viewed with the current communication media used by the company (Sleeswijk Visser, 2009).

Accessibility: The usability of the system of delivery has impacts on the effectiveness of communication. Requested information from the system should be *easily accessible* in order to

maintain *ease of use* and prevent time loss (Nørgaard & Hornbæk, 2009). For this purpose, the structure of the delivery should be well-conceptualized and should consider the requirements of the design process and the developer (Diggins & Tolmie, 2003; Hughes, et al., 1997).

4.1.4. Information qualities

Information's Clarity: The clarity of the information received was cited by the respondents in the study as the most important quality in the delivery of user results. Information should be clearly understood by the audience in order to maintain effectiveness in delivery (Nørgaard & Hornbæk, 2009).

Credibility: Credibility is a crucial quality of the information that designers expect from user research findings. According to Nørgaard & Hornbæk (2009), researchers who provide information are expected to be *credible experts*, and are thus able to provide dependable results. Credibility also depends on the *reliability of the information* retrieved from the system.

Sustainability: User research is considered as valuable to the design process, and information provided by user research is expected to endure for long periods of time and contribute the knowledge base of the firm. Therefore "the bandwidth of the information" should be enhanced and information should be easily utilized and remembered in the future in order to meet this expectation (Ramey, et al., 1992).

Multidimensionality: Information retrieved through user research is multi-dimensional in character since it involves different criteria that are relevant to different dimensions. It is important not to lose this multi-dimensionality when delivering the findings. *Integrating different perspectives* by conducting the research with diverse user groups and *considering multiple variables* while providing conclusions in the deliverables are methods that are valued by the designers.

Persuasiveness: The information garnered from the user research is expected to be persuasive so as to convince the designer of the criticality and importance of the problems and findings (Friess, 2010; Nørgaard & Hornbæk, 2009; Ramey, et al., 1992). In this way, the information can be regarded as an effective explanation in support of design decisions.

Applicability: Providing usable recommendations and findings that are applicable in practice is an appreciated result of user research studies. It is expected that the user research provides actionable results as outputs. According to Molich et al. (2007), the applicability of recommendations or their usability is one of the major criteria in evaluating a design recommendation.

Concreteness: Rather than abstractness or theoreticalness of information, in some cases, concreteness is valued by designers, since it facilitates understanding. The data which is certain and not open to debate, in that sense concrete, is useful especially for persuading others.

In-depthness: Superficiality is shunned since it does not facilitate a deep understanding of the issue and thus inhibits the conceptualization of new ideas. On the other hand, the in-depthness of information is considered valuable, in that it supports understandability and maintains the effectiveness of the user research. In-depthness provides understanding of underlying reason for user's behaviors and statements. Therefore maintaining contextual richness is critical for this dimension.

4.2. Hierarchy of importance

In Figure 18, frequencies of individual impacts that are elicited as the result of the interview study and mean values for the importance of individual impacts that are retrieved as the result of the questionnaire are listed and compared. As it can be seen in both figures, the first three impacts, *empathy*, *guidance* and *having feedback about the context of use*, have the same order in the importance hierarchy, and it can be concluded that they are the most important individual impacts that are requested as the result of user research activity. Although the other impacts have different

orders in the interview data and questionnaire data, *justification*, *inspiration*   and *persuading others* are the other critical impacts that have higher importance rate or are frequently mentioned by the respondents. The rest of the individual impacts (*having feedback about the product's position, job satisfaction, unity in team communication,* and *prevention of time loss and enjoyment*) have lower importance rates and frequencies when it is compared to the mentioned impacts.

Product improvement and *ability to proceed* in the design process are not questioned in the questionnaire study, since it is considered that they are the generic impacts of user research effort.

Frequencies of Individual Impacts - Cognitive Mapping Interviews

Number of respondents

Impact	Value
Empathy with the user	20
Having guidance	20
Having feedback about the product in the context of use	18
Providing inspiration and enhancing creativity	14
Product improvement	14
Supportiveness/Justification of design decisions	13
Prevention of time loss	13
Persuasion of other stakeholders	9
Achieving designer's personal goals (Job satisfaction)	9
Unity in team communications	9
Ability to proceed in the design process	7
Having feedback about the product's position among the competitors	3
Enjoyment/fun in utilization of the system	3

a

Importance of Individual Impacts - Verification Questionnaire

Not important at all------Mid-level importance------Very important

Impact	Value	SD
Empathy with the user	6,47	0,817
Having guidance	6,36	0,820
Having feedback about the product in the context of use	6,29	0,918
Supportiveness/Justification of design decisions	5,60	1,287
Persuasion of other stakeholders	5,39	1,360
Providing inspiration and enhancing creativity	5,35	1,469
Having feedback about the product's position among the competitors	5,14	1,380
Job satisfaction	5,12	1,728
Unity in team communications	4,86	1,586
Prevention of time loss	4,49	1,435
Enjoyment/fun in utilization of the system	4,31	1,814

b

Figure 19. Importance hierarchy for the individual impacts

4.3. Characteristics of constructs

4.3.1. Results of cross impact analysis

As it is presented in the methodology section, cross impact analysis is conducted with the laddering data, relations of which are summarized in the implication matrix in Table 19 (APPENDIX F), and resulting system grid is shown in Figure 20. The aim of conducting this analysis is to specify the characteristics of each construct in the overall system of constructs regarding effective communication.

As it can be seen from the system grid (Figure 20), *empathy*, *guidance* and *having feedback regarding context of use* are the **critical** impacts for this study. These impacts are highly unstable, which means that they are highly affected by other constructs and they are highly affecting them, and satisfying them is definitive for the perception of effective communication by the designers.

Obviously, dimensions regarding impacts requested as the result of user research are more close to the passive continuum, since by definition they are affected by system and information qualities, and dimensions regarding information and system qualities are more close to active continuum as they are affecting variables in the study. Therefore **active** area only involves constructs from system and information qualities. *Representativeness* of context and behavior, *prioritization of problems and findings*, *concrete exemplification* and *explanatoriness/informativenes* of the delivery are the active system qualities, while *multidimensionality* and *credibility* are the active information qualities. These constructs are crucial for maintaining desired impacts for effective communication.

Most of the individual and organizational impacts are in the **passive** area involving variables satisfaction of which indicates whether effective communication is maintained, thus they act as indicators for the system's status. *User satisfaction*, enhancing *brand identity*, *profitability*, *competitiveness* and making *right investments* are passive organizational impacts, maintaining which is highly dependent on provision of other constructs in the system. Moreover *inspiration*, *justification*, *product improvement*, *prevention of time loss* and *job satisfaction* are the individual impacts that are placed in the passive area. Among them *inspiration*, *justification* and *product improvement* are closer to the critical area, which means that they should be taken into account while devising a strategy for communicating user research findings.

The rest of the constructs are in the **buffer** area. Although their effects on the overall constructs are minor, they should be individually considered while devising a communication plan, since they may have effects on the critical impacts.
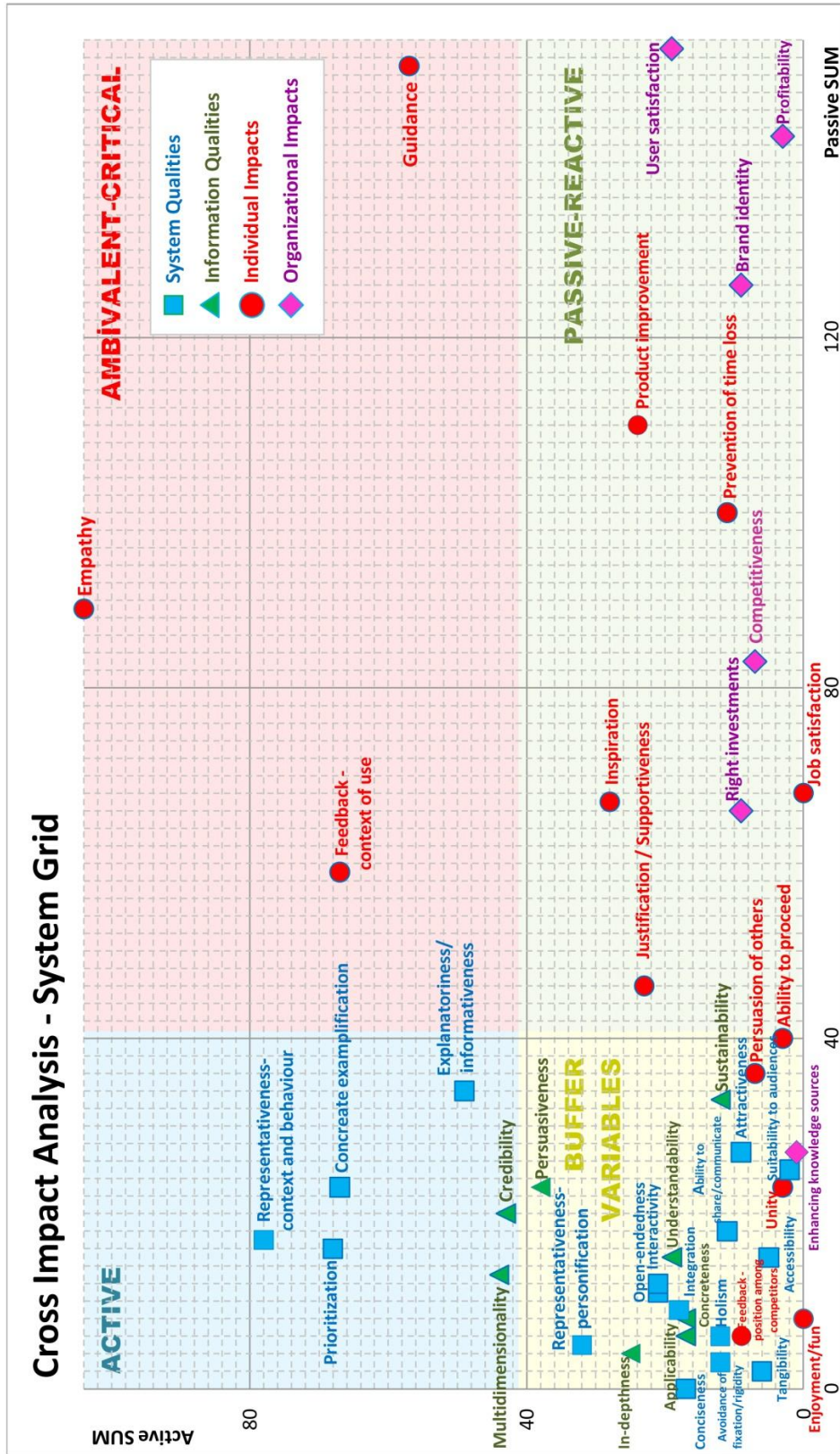
Figure 20. System grid from Cross impact analysis –
Sum of all direct and indirect relations are considered in the implication matrix for laddering analysis (Table 19 in APPENDIX F)

4.3.2. Goal structure for the constructs of the study

In Table 14, goal structure indices that are calculated from the laddering analysis data (implication matrix in Table 19) based on the definitions of Pieters et al. (1995), which are presented in Section 3.2.4.3, are listed. These indices provide information regarding the characteristics of the constructs in the system.

Centrality measure is critical for the study, since it provides information regarding which constructs are key for attaining effective communication by providing a value that represents to which extent the construct is related to (cause or result of other constructs) the other constructs in the system. The centrality values show that *guidance*, *empathy* and *having feedback regarding the context of use* are the most central constructs which is similar to the findings of cross impact analysis. When individual impacts are considered *inspiration*, *prevention of time loss*, *justification* and *product improvement* have higher centrality values. Therefore these impacts are considered as key to maintaining effective communication. Moreover system qualities such as *concrete exemplification*, *explanatoriness*, *prioritization* and *representativeness* have higher centrality values, thus they are critical for achieving effective communication. Although they are not as critical as the mentioned central system qualities and impacts, information qualities such as *persuasiveness*, *multidimensionality*, *sustainability*, and *credibility* have relatively high centrality values which make them important constructs of effective communication.

Abstractness index indicates how much the construct is perceived as higher order value for the respondents. If a construct has higher abstractness value, it should be considered as an end for the means-end chain structure. *Job satisfaction* and *enjoyment* as two of the individual impacts have the highest abstractness values, which is 1,00 that is the highest possible value. They are the definite ends for the chains that they are involved. Among the other individual impacts *unity in team communications*, *prevention of time loss*, *ability to proceed* and *persuasion of others* are more abstract constructs when they are compared to other individual impacts. Naturally all organizational impacts have higher abstractness values since they are considered as consequences of effective communication. There are information and system qualities, such as *suitability to audiences*, *accessibility*, *sustainability* and *applicability*, which have higher abstractness values, although in this study, they are considered as means for achieving impacts of effective communication. This may be caused from the fact that they might be inadequately questioned in the laddering interview structure due to the time limitations.

Prestige is a similar index with abstractness, in that it represents higher ordered constructs if its value is high, except while calculating this index, all the other relations in the system is considered, thus it represents weight of the construct as an end goal. This value is defined by the quantity of in-degrees to the construct and the higher the quantity of in-degrees gets, the more prestigious the construct becomes. *Having guidance*, *empathy*, *inspiration* and *explanatoriness* are the most prestigious constructs in this system. They are followed by *prevention of time loss*, *user satisfaction* and *having feedback* about the context of use as some of the impacts of effective communication.

Table 14. Goal structure indices

			In-degrees	Out-degrees		Abstractness	Centrality	Prestige
Individual Impacts	1	Empathy	43	42		0,51	**0,126**	**0,064**
	2	Justification / Supportiveness	19	15		0,56	**0,051**	0,028
	3	Having guidance	59	29		0,67	**0,131**	**0,088**
	4	Having feedback - context of use	24	28		0,46	**0,077**	**0,036**
	5	Having feedback - position among competitors	3	4		0,43	0,010	0,004
	6	Inspiration	31	13		0,70	**0,065**	**0,046**
	7	Prevention of time loss	29	5		**0,85**	**0,051**	**0,043**
	8	Unity in communications	10	1		**0,91**	0,016	0,015
	9	Persuasion of others	14	4		**0,78**	0,027	0,021
	10	Product improvement	22	12		0,65	**0,051**	0,033
	11	Ability to proceed	8	2		**0,80**	0,015	0,012
	12	Job satisfaction	15	0		**1,00**	0,022	0,022
	13	Enjoyment/fun	4	0		**1,00**	0,006	0,006
Information Qualities	14	Concreteness	5	10		0,33	0,022	0,007
	15	In-depthness	4	9		0,31	0,019	0,006
	16	Credibility	15	14		0,52	**0,043**	0,022
	17	Sustainability	22	7		**0,76**	**0,043**	0,033
	18	Applicability	8	3		**0,73**	0,016	0,012
	19	Multidimensionality	12	19		0,39	**0,046**	0,018
	20	Persuasiveness	20	13		0,61	**0,049**	0,030
	21	Understandability	13	6		0,68	0,028	0,019
System Qualities	22	Open-endedness	10	7		0,59	0,025	0,015
	23	Interactivity	11	13		0,46	0,036	0,016
	24	Integration with the present knowledge	7	7		0,50	0,021	0,010
	25	Avoidance of fixation/rigidity	1	6		0,14	0,010	0,001
	26	Concrete exemplification	23	26		0,47	**0,073**	0,034
	27	Tangibility	2	2		0,50	0,006	0,003
	28	Attractiveness	20	9		0,69	0,043	0,030
	29	Representativeness- context and behaviour	17	19		0,47	**0,054**	0,025
	30	Representativeness- personification	5	13		0,28	0,027	0,007
	31	Suitability to audiences	19	1		**0,95**	0,030	0,028
	32	Accessibility	10	3		**0,77**	0,019	0,015
	33	Ability to share/communicate	12	6		0,67	0,027	0,018
	34	Explanatoriness/ informativeness	31	16		0,66	**0,070**	**0,046**
	35	Holism	5	3		0,63	0,012	0,007
	36	Conciseness	0	13		0,00	0,019	0,000
	37	Prioritization	16	30		0,35	**0,068**	0,024
Organizational Impacts	38	User satisfaction	26	14		0,65	0,060	**0,039**
	39	Brand identity	17	8		0,68	0,037	0,025
	40	Enhancing knowledge sources	9	1		0,90	0,015	0,013
	41	Right investments	17	9		0,65	0,039	0,025
	42	Competitiveness	14	7		0,67	0,031	0,021
	43	Profitability	20	2		**0,91**	0,033	0,030

4.3.3. System grid from questionnaire data and activeness rates of the qualities

From the questionnaire results, an implication matrix is generated with the mean values of evaluations regarding qualities' effects on the individual impacts (Table 15)[g].

By considering passive averages in the implication matrix in Table 15, a system grid illustrating how much the impacts are affected by the overall qualities that are questioned in the study is formed (Figure 21). According to this grid, *guidance*, *justification*, *empathy*, *persuasion of others* and *having feedback regarding the context of use* are the impacts that are affected by both system and information qualities, which means that the questioned qualities are perceived as effective variables on these impacts.

Only *prevention of time loss* is considered as a variable that is more affected by overall system qualities and not much affected by overall information qualities. It can be concluded that the effects on questioned system qualities are perceived as effective on prevention of time loss while utilizing deliverables of research.

Other impacts are not much affected by overall system and information qualities questioned in the questionnaire. This is because some of the qualities have negative effects on the questioned impacts, which decrease passive averages of the questioned impacts that are visualized in this grid. To illustrate concreteness as an information quality is perceived as having negative effects on many of the impacts such as job satisfaction (M=-0,02, SD=1,42) and enjoyment (M=-0,11, SD=1,22) and mean values for the effect of this quality relatively low for impacts such as inspiration (M=0,20, SD=1,52) and unity in team communication (M=0,18, SD=1,73). Which qualities are effective in achieving these impacts are discussed individually in Section 4.4.2.

---

[g] Reliability analysis is conducted with SPSS software (IBMCorp., 2011) for assessing internal consistencies of all the scales that are questioned in the questionnaire. The scales are considered based on (1) all information qualities' effects on each individual impact, (2) all system qualities' effects on each individual impact (for these two types of scales, values on rows are considered as a scale in the implication matrix) and (3) based on each individual quality's effect on all impacts (values on columns are considered as a scale in the implication matrix). All of the scales are above the unacceptable level ($\alpha \geq 0.5$) (Kline, 1999). Therefore none of the items are removed from any of the scales. Detailed documentation of reliability analysis can be found in APPENDIX H. Items that have negative effects on reliability, that is, reliability of the scale increases if the item is deleted, are mark with an asterisk in Table 15.

Table 15. Implication matrix from the questionnaire

IMPACTS	INFORMATION QUALITIES									SYSTEM QUALITIES								
	Concreteness	In-depthness	Credibility	Sustainability	Applicability	Multidimensionality	Persuasiveness	Understandability	IQ - Passive Average	Interpretability	Concrete exemplification	Attractiveness	Representativeness	Suitability to audiences	Accessibility	Share-ability	System clarity	SQ - Passive Average
Empathy with the user	0,67*	2,47*	2,42	1,16	1,43	2,23	1,69	2,14	1,78	1,73	2,29	0,87	2,57*	1,06	1,57	1,12	2,06	1,66
Having guidance	0,78*	1,89	2,40	1,69	2,13	1,99	1,87	1,82	1,82	1,66	2,20	0,88	2,11	1,46	1,76	1,29	1,75	1,64
Having feedback - context of use	0,92*	2,04	2,23	1,19	1,75	1,83	1,46	1,70	1,64	1,37	2,29	0,60	2,35	0,86	1,37	0,93	1,72	1,44
Justification/Supportiveness in design decisions	0,77*	1,88	2,40	1,66	2,00	1,87	2,07	1,73	1,80	1,75	2,23	0,80	1,98	1,70	1,67	1,59	1,81	1,69
Persuasion of other stakeholders	0,95*	1,51	2,20	1,49	1,92	1,25*	2,22	1,96	1,69*	0,86*	2,07	1,60	1,96	2,29*	1,41	1,92†	2,13	1,78
Providing inspiration	0,20*	1,42	1,40	0,95	1,66	1,72	1,27	1,30	1,24	1,76	1,36	1,14*	1,82	0,75	1,12	0,84	1,35	1,27
Having feedback - position among competitors	0,39*	1,11	1,64	0,67	0,96	1,17	0,90	1,22	1,01	0,86	1,46	0,39	1,22	0,71	0,90	0,69	1,16	0,92
Job satisfaction	-1,98*	0,98	1,12	0,64	1,06	1,01	0,96	1,05	0,85	1,25	0,98	1,16	1,17	0,53*	0,92	0,75	0,98	0,97
Unity in team communications	0,18*	0,73	0,95	0,73	0,82	0,45†	0,94	1,19	0,75	0,33*	1,17	0,57	0,84	1,10	0,88	1,34	1,34	0,94
Prevention of time loss	0,69*	-1,98	0,99	0,53	0,75	-1,92†	0,77	2,18†	0,72*	0,94*	1,57	1,23†	1,24	0,47*	2,05†	1,89†	2,45	1,48
Enjoyment/fun in utilization of the system	-1,89*	2,76	0,93	0,54	0,89	0,98	0,70	1,25	0,74	1,36	1,24	1,93†	1,53†	0,61†	1,23	0,99	1,54	1,30
Active Average	0,49	1,34	1,70	1,02	1,40	1,31	1,35	1,60	1,28	1,26	1,71	1,01	1,71	1,05	1,35	1,21	1,66	1,37

**Scale: -3 to 3

* Negative effect on reliability - Internal consistency based on qualities' effect on each individual impact (values on rows are considered as a scale)

† Negative effect on reliability - Internal consistency based on each individual quality's effect on all impacts (values on columns are considered as a scale)

Figure 21. System grid from the questionnaire data - Impacts and how they are affected by the qualities of the system

In Figure 22, activeness rates of the qualities are illustrated by considering the active sums in the implication matrix in Table 15. The graph shows that among the information qualities, *credibility* and *understandability* are the most effective constructs on the overall impacts, while *concreteness* is the least effective one, as it is discussed before this is caused by the dual effect of concreteness on the overall impacts, that is it is positively affecting some of the constructs, while it has negative effects on the others.

For the system qualities, *concrete exemplification*, *representativeness* and *system's clarity* are the most active constructs. They are followed by *accessibility*, *interpretability* and *share-ability*. *Attractiveness* and *suitability to audiences* are the least active constructs for the impacts of effective communication.

Activeness rates of the qualities

Negative Effect--------No Effect--------Positive Effect

-3,00	0,00	3,00

Quality	Value
Credibility	1,70
Understandability	1,60
Applicability	1,40
Persuasiveness	1,35
In-depthness	1,34
Multidimensionality	1,31
Sustainability	1,02
Concreteness	0,49
Concrete exemplification	1,71
Representativeness	1,71
System clarity	1,66
Accessibility	1,35
Interpretability	1,26
Share -ability	1,21
Suitability to audiences	1,05
Attractiveness	1,01

■ Information qualities ■ System qualities

Figure 22. Activeness rates of the qualities

4.4. Relations between constructs

4.4.1. Relations between all constructs

Based on the laddering analysis a Hierarchical Value Map (HVM) with the cut-off value of 3 is created which is presented in Figure 23. Apparent ladder structures in the HVM are listed as follows:

- The most obvious structure is the one that is presented at the center of the map which involves the most central constructs in the system, namely empathy and guidance. According to this structure, empathy is achieved by maintaining representativeness regarding context of use and user behavior and to do that video recordings have critical role together with photos scenario regarding the context. Empathy achieved through this way maintains inspiration and guidance for the design activity and if such guidance is provided, time loss in the product development activity can be avoided and product improvement can be achieved. Product improvement results in user satisfaction, which effects perception of brand identity in a positive way. If brand identity is empowered, it results in profitability for the company.

- Another structure can be identified with the relations of the construct 'having feedback about the context of use'. If concrete exemplification is provided (1) by presenting findings on the images of the product, or (2) through providing actionable design recommendations based problems identified, or (3) with product comparisons, feedback from the context is more clearly received by the designer and this will result in having proper guidance in the design activity. A similar path, which is discussed, while explaining the previous structure, is followed as a result of having guidance.

- One of the critical information qualities in the system is multidimensionality. If it is maintained inspiration and guidance is achieved, results of which are discussed previously.

- Persuasive data which can be maintained by providing video recordings can result in persuasion of other stakeholders in the product development team.

- For supporting and justifying design decisions credibility of the findings has importance and considerations regarding research setting are the cause for credible data. Supporting decisions credible information results in persuasion of other stakeholders.

- Prioritization of findings and problems in the deliverables through highlighting quantitative majorities, infographics and filtered quotations can result in guidance and empathy, and it also causes sustainability for the deliverable lifetime. If sustainable deliverable is provided, it can enhance knowledge sources of the company.

- Conciseness in delivery results in attractive and engaging deliverables which are found enjoyable to explore by the designers and prevent time loss while reviewing them.

A more abstracted and refined version of the HVM for the relations of impacts is shown in Figure 47 and relations that form the ladder structures are discussed more in-depthly in Chapter 5.
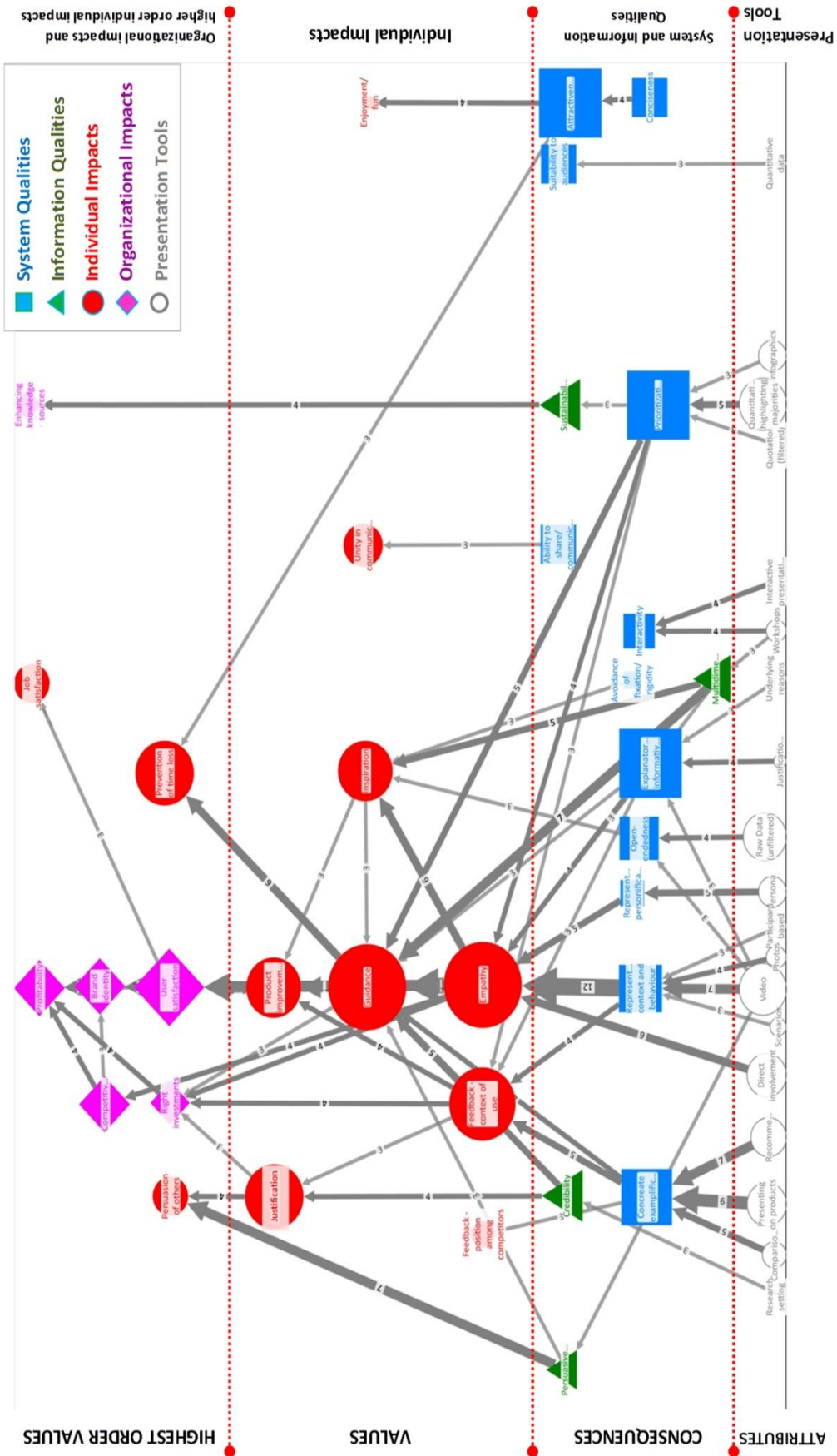
Figure 23. Hierarchical Value Map with the cut-off value:3

4.4.2. Relations between qualities and impacts

In this section egocentric networks that are generated according to the results of the interview study and relation graphs as the results of the questionnaire findings are presented to investigate how targeted impacts can be achieved through maintaining which system and information qualities. The section only addresses brief documentation of relations that are identified through egocentric networks and relation graphs. Related detailed discussions covering respondents' statements are presented in Chapter 5 while presenting the guidelines.

4.4.2.1. Empathy with the user

Empathy with the user is a critical and central construct for the system and its prestige value is among the highest ones. According to the results of the questionnaire, empathy is affected by both system and information qualities that are being questioned in the study.

Egocentric network generated as a result of the interview study in Figure 24 represents the conceptual relations of the "empathy with the user" with the other constructs of effective communication. According to this figure, *representativeness* is the most effective system quality that results in empathy. From the sub-constructs of *system's clarity, explanatoriness* and *prioritization* are affecting empathy. All of the information qualities have relations with empathy; however their relations are not as strong as the mentioned system qualities. As it can be seen from the egocentric network, empathy is mostly affecting the *guidance* and *inspiration* as the outcome.

The relation graph generated as the result of questionnaire data in Figure 25 shows that *in-depthness*, *credibility*, *multidimensionality, understandability* and *persuasiveness* as information qualities are affecting empathy with the user as an impact of user research activity, and from the system qualities, *representativeness*, *concrete exemplification*, *system's clarity, interpretability* and *accessibility* have effects on empathy[h].

---

[h] Qualities that have mean values above 1,5 is considered as qualities that have effect on the impact
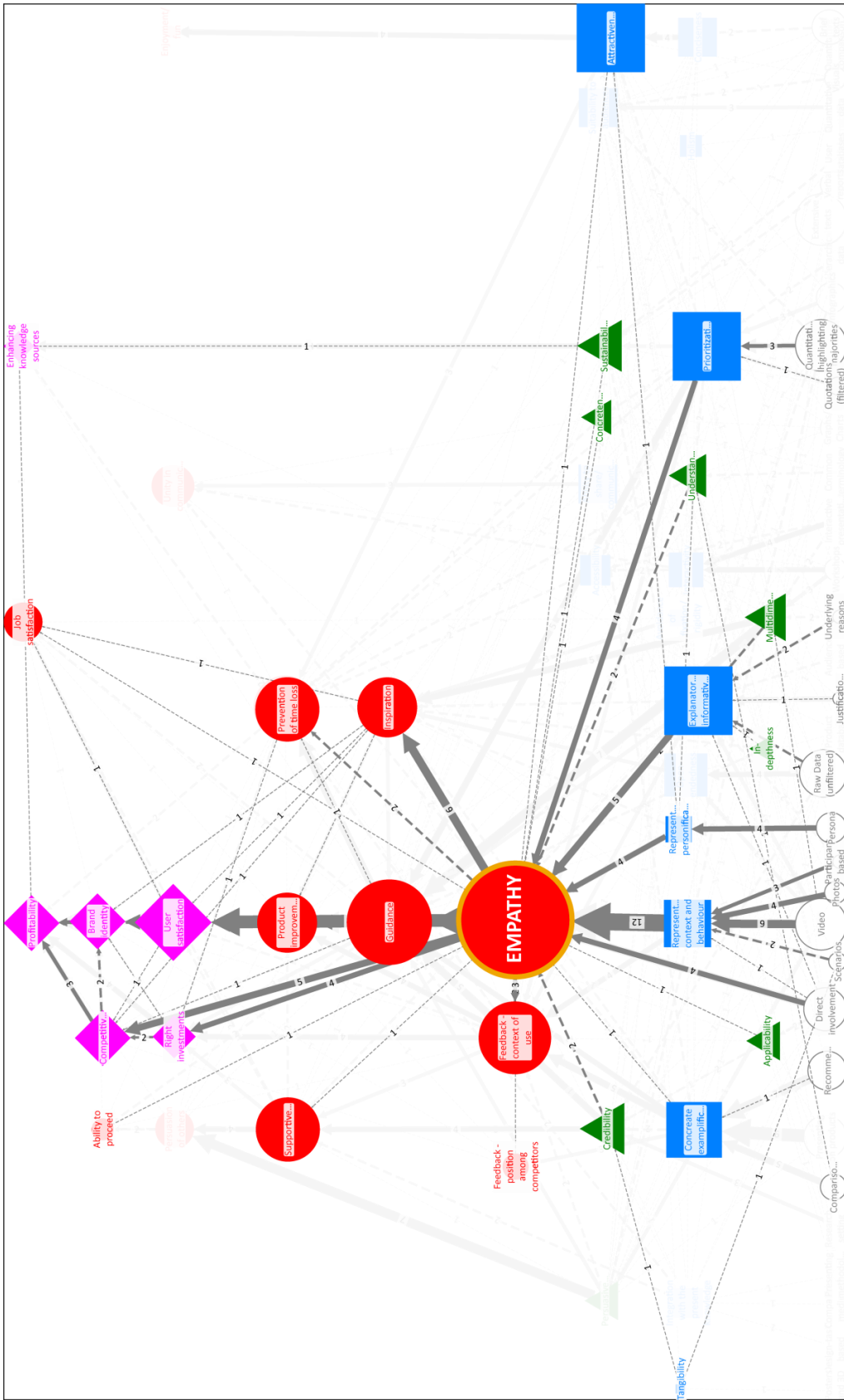
Figure 24. Egocentric network of the impact "Empathy with the user"

Empathy with the user

Highly adverse-------Not perceivable--------Highly favourable

	-3,00	-2,00	-1,00	0,00	1,00	2,00	3,00	SD

Quality	Value	SD
In-depthness	2,47	0,650
Credibility	2,42	0,885
Multidimensionality	2,23	1,086
Understandability	2,14	0,989
Persuasiveness	1,69	1,229
Applicability	1,43	1,202
Sustainability	1,16	1,302
Concreteness	0,67	1,768
Representativeness	2,57	0,784
Concrete exemplification	2,29	0,982
System clarity	2,06	1,086
Interpretability	1,73	1,335
Ease of ease of access to intended information	1,57	1,171
Ability to share/communicate the findings	1,12	1,098
System's suitability to audiences	1,06	1,243
Attractiveness	0,87	0,997

□ Information Qualities   ⠿ System Qualities

Figure 25. Relation graph of the impact "Empathy with the user"

4.4.2.2. Having guidance

Having guidance is a critical and central construct for the system and it is also a prestigious construct. According to the results of the questionnaire, guidance is affected by both system and information qualities that are being questioned in the study.

According to the egocentric network in Figure 26, *multidimensionality* and *credibility* are the most effective information qualities on this impact and *concrete exemplification, prioritization* and *explanatoriness* are the most effective system qualities. Moreover, among the individual impacts, *empathy* and *having feedback regarding context of use* are affecting this impact. As the result of guidance, *product improvement* and *prevention of time loss* are achieved.

The relation graph presented in Figure 27 shows that all of the information qualities, except concreteness, are affecting guidance as an impact of user research activity, and from the system qualities, *concrete exemplification, representativeness, accessibility, system's clarity* and *interpretability* have effects on guidance.
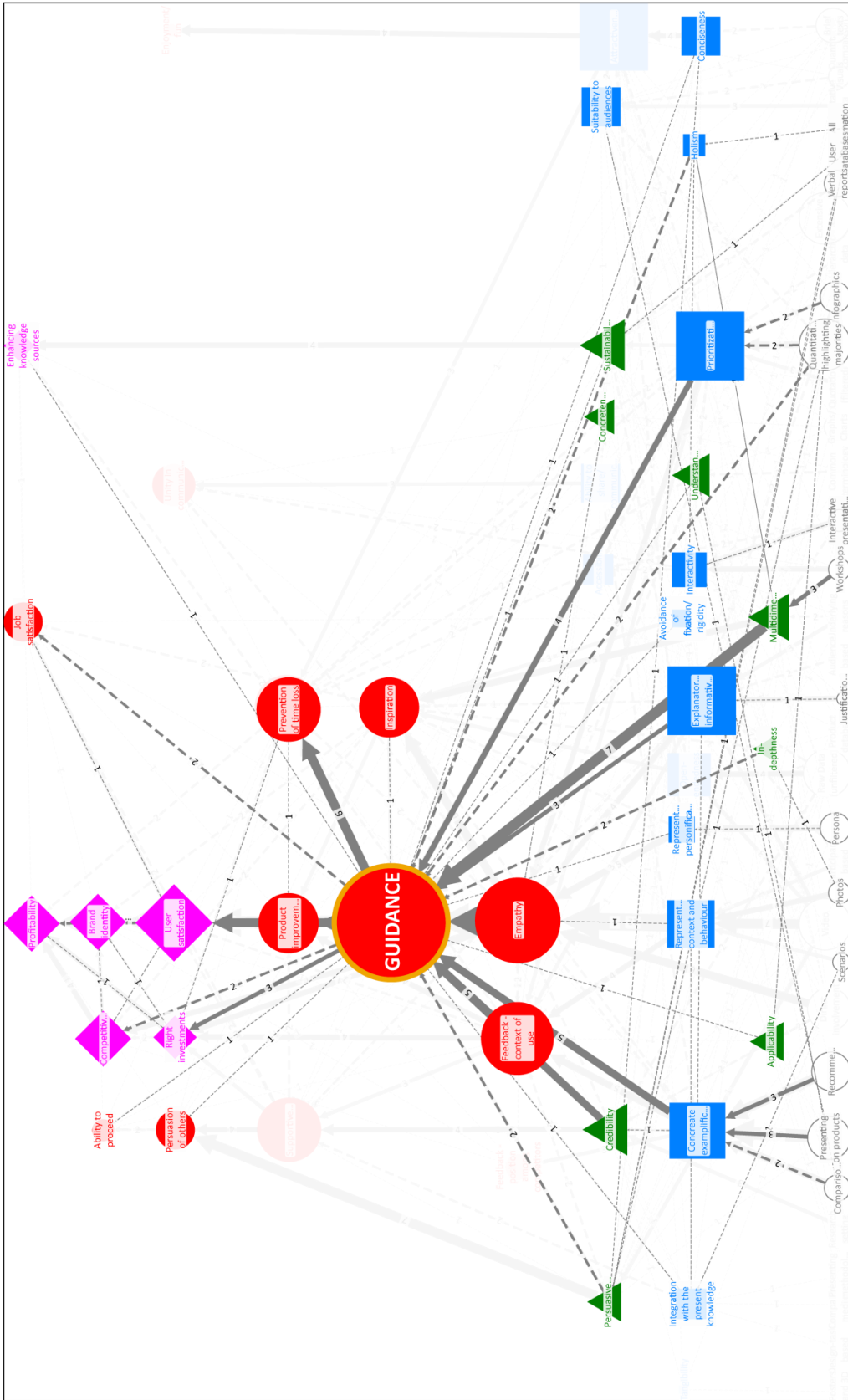
Figure 26. Egocentric network of the impact "Having guidance"

Having guidance

Highly adverse-------Not perceivable--------Highly favourable
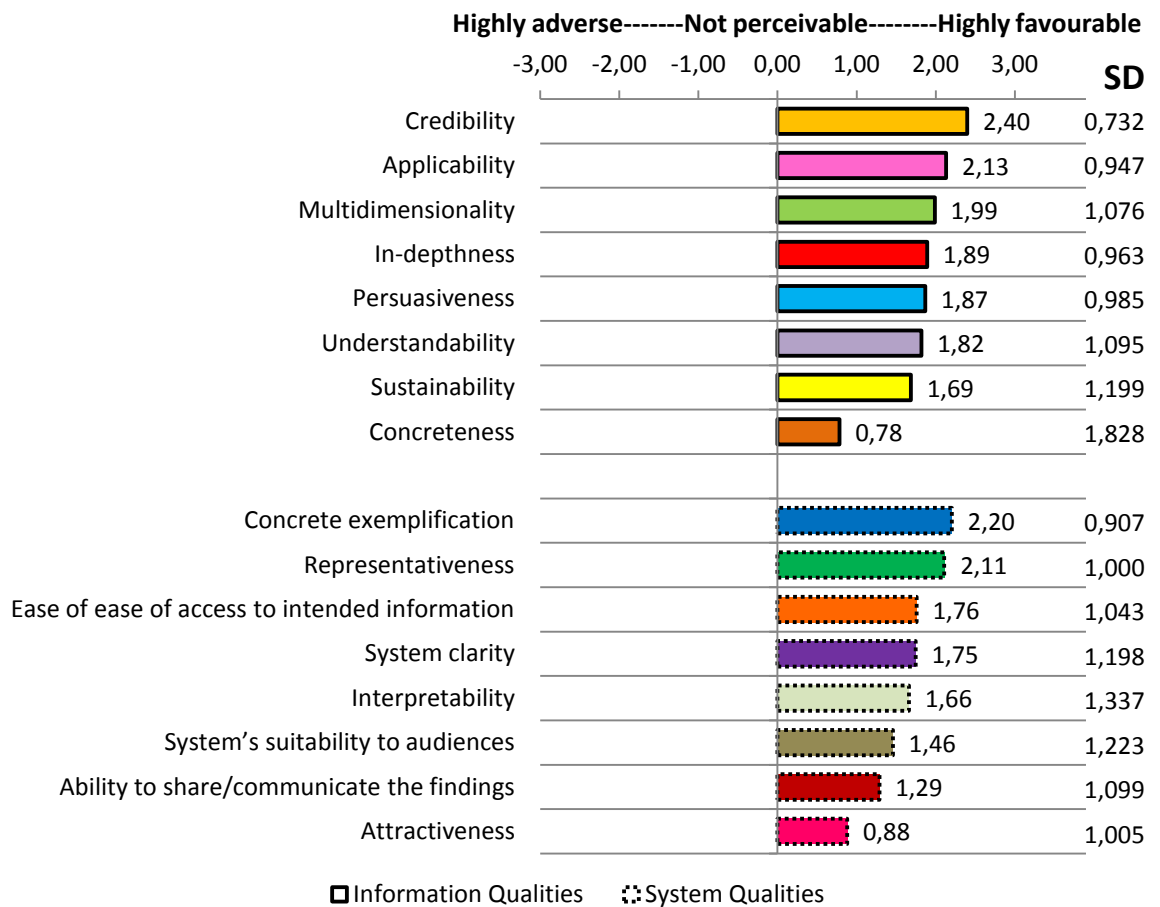
Figure 27. Relation graph of the impact "Having guidance"

4.4.2.3. *Having feedback regarding the context of use*

Having feedback regarding the context of use is a critical and central construct for the system. According to the results of the questionnaire, having feedback regarding the context of use is affected by both system and information qualities that are being questioned in the study.

According to the egocentric network in Figure 28, *concrete exemplification* is the most effective system quality that results in having feedback regarding the context of use. From the sub-constructs of *system's clarity, explanatoriness* and *prioritization* are affecting this impact, and *representativeness* has also effect on it. Most of of the information qualities have relations with this impact; however their relations are not as strong as the mentioned system qualities. The impact is mostly affecting *guidance* and *justification* as the outcome. Moreover, it is also affecting *making right investments*, *product improvement* and *user satisfaction* as higher order values.

The relation graph presented in Figure 29 shows that *credibility*, *in-depthness, multidimensionality, applicability* and *understandability* as information qualities are affecting this impact, and from the system qualities, *representativeness*, *concrete exemplification* and *system's clarity* have effects on it.

Figure 28. Egocentric network of the impact "Having feedback regarding the context of use"

Having feedback - context of use

Highly adverse-------Not perceivable--------Highly favourable

	-3,00	-2,00	-1,00	0,00	1,00	2,00	3,00	**SD**

	Value	SD
Credibility	2,23	0,888
In-depthness	2,04	0,943
Multidimensionality	1,83	1,102
Applicability	1,75	1,198
Understandability	1,70	1,112
Persuasiveness	1,46	1,161
Sustainability	1,19	1,184
Concreteness	0,92	1,768
Representativeness	2,35	0,889
Concrete exemplification	2,29	0,918
System clarity	1,72	1,097
Interpretability	1,37	1,377
Ease of ease of access to intended information	1,37	1,123
Ability to share/communicate the findings	0,93	1,068
System's suitability to audiences	0,86	1,180
Attractiveness	0,60	0,936

□ Information Qualities   ⁞⁞ System Qualities

Figure 29. Relation graph of the impact "Having feedback regarding the context of use"

4.4.2.4. Justification/Supportiveness in design decisions

Justification/Supportiveness in design decisions is a passive, but central construct for the system. According to the results of the questionnaire, this impact is affected by both system and information qualities that are being questioned in the study.

According to the egocentric network in Figure 30, mostly *credibility* and *feedback from the context of use* are affecting justification. This impact is mostly affecting *persuasion of others* and *making right investments* as the outcome.

The relation graph presented in Figure 31 shows that all of the information qualities, except concreteness, are affecting justification. Moreover, all of the system qualities, except attractiveness, have effects on it.
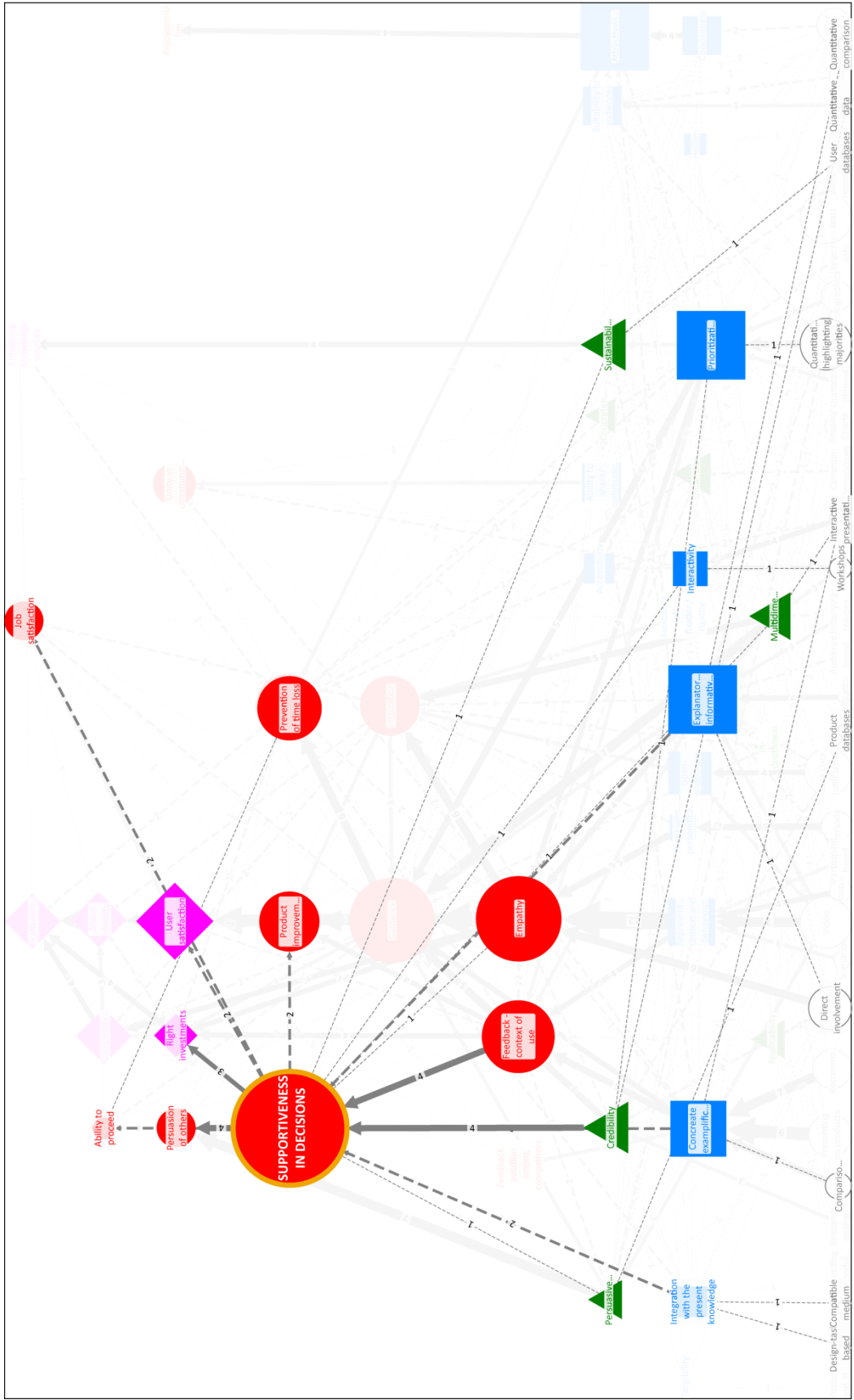
Figure 30. Egocentric network of the impact "Justification/Supportiveness in design decisions"

Justification/Supportiveness in design decisions

Highly adverse-------Not perceivable--------Highly favourable
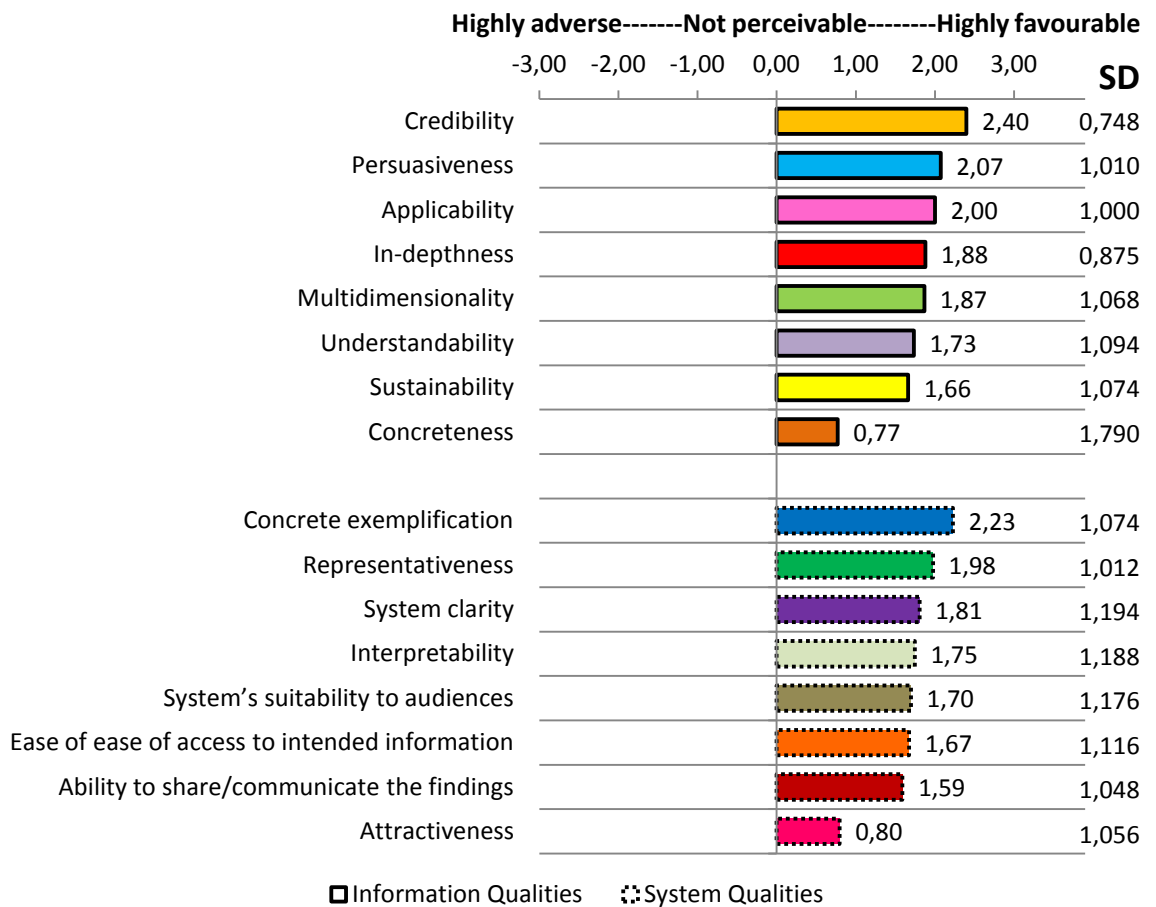
Figure 31. Relation graph of the impact "Justification/Supportiveness in design decisions"

4.4.2.5. *Persuasion of other stakeholders*

Persuasion of other stakeholders is a buffering construct for the system. According to the results of the questionnaire, it is affected by both system and information qualities that are being questioned in the study.

According to the egocentric network in Figure 32, mostly *persuasiveness* of the information and *justification/supportiveness in design decisions* are affecting this impact. It is mostly affecting *ability to proceed in the design process* as the outcome.

The relation graph presented in Figure 33 shows that persuasiveness, *credibility, understandability, applicability* and *in-depthness* as information qualities are affecting this impact, and all of the system qualities, except accessibility and interpretability, have effects on it.
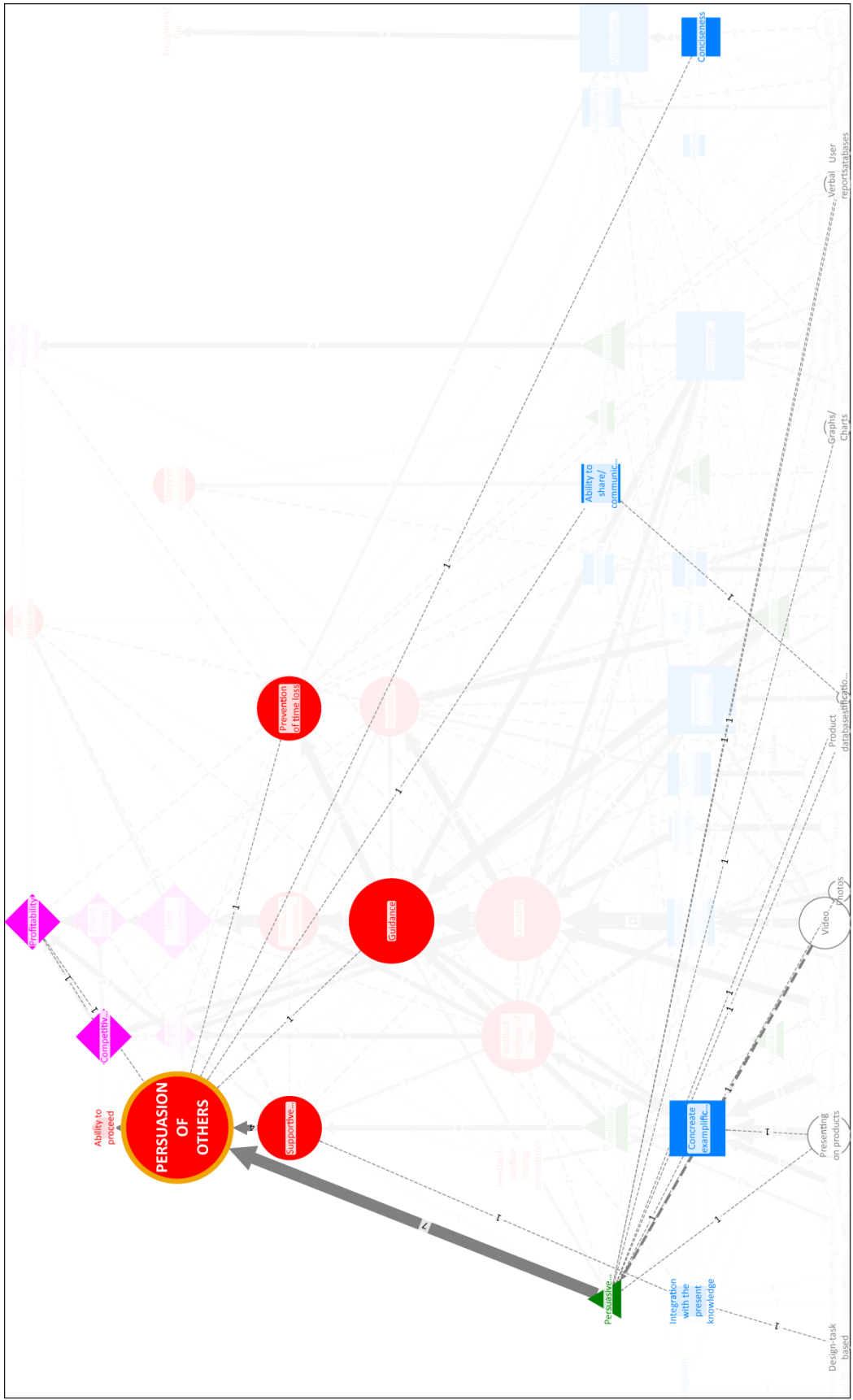
Figure 32. Egocentric network of the impact "Persuasion of other stakeholders"

Persuasion of other stakeholders

Highly adverse-------Not perceivable--------Highly favourable

									SD
	-3,00	-2,00	-1,00	0,00	1,00	2,00	3,00		

Persuasiveness — 2,22 — 1,001
Credibility — 2,20 — 1,045
Understandability — 1,96 — 1,120
Applicability — 1,92 — 1,095
In-depthness — 1,51 — 1,203
Sustainability — 1,49 — 1,319
Multidimensionality — 1,25 — 1,360
Concreteness — 0,95 — 1,931

System's suitability to audiences — 2,29 — 0,957
System clarity — 2,13 — 1,045
Concrete exemplification — 2,07 — 1,156
Representativeness — 1,96 — 0,968
Ability to share/communicate the findings — 1,92 — 1,073
Attractiveness — 1,60 — 1,126
Ease of ease of access to intended information — 1,41 — 1,137
Interpretability — 0,86 — 1,555

□ Information Qualities   ⸬ System Qualities

Figure 33. Relation graph of the impact "Persuasion of other stakeholders"

4.4.2.6. Providing inspiration

Providing inspiration is a passive but central construct for the system and it is also a prestigious construct.

According to the egocentric network in Figure 34, mostly *empathy* is affecting this impact. *Multidimensionality* as an information quality and from the sub-constructs of interpretability, *open-endedness* and *avoidance from fixation* have effects on it. The impact is mostly affecting the *guidance* and *justification* as the outcome. Moreover, it is also affecting *guidance* and *product improvement* as the outcome.

The relation graph presented in Figure 35 shows that *multidimensionality* and *applicability* as information qualities are affecting this impact, and from the system qualities, *representativeness* and *interpretability* have effects on it.
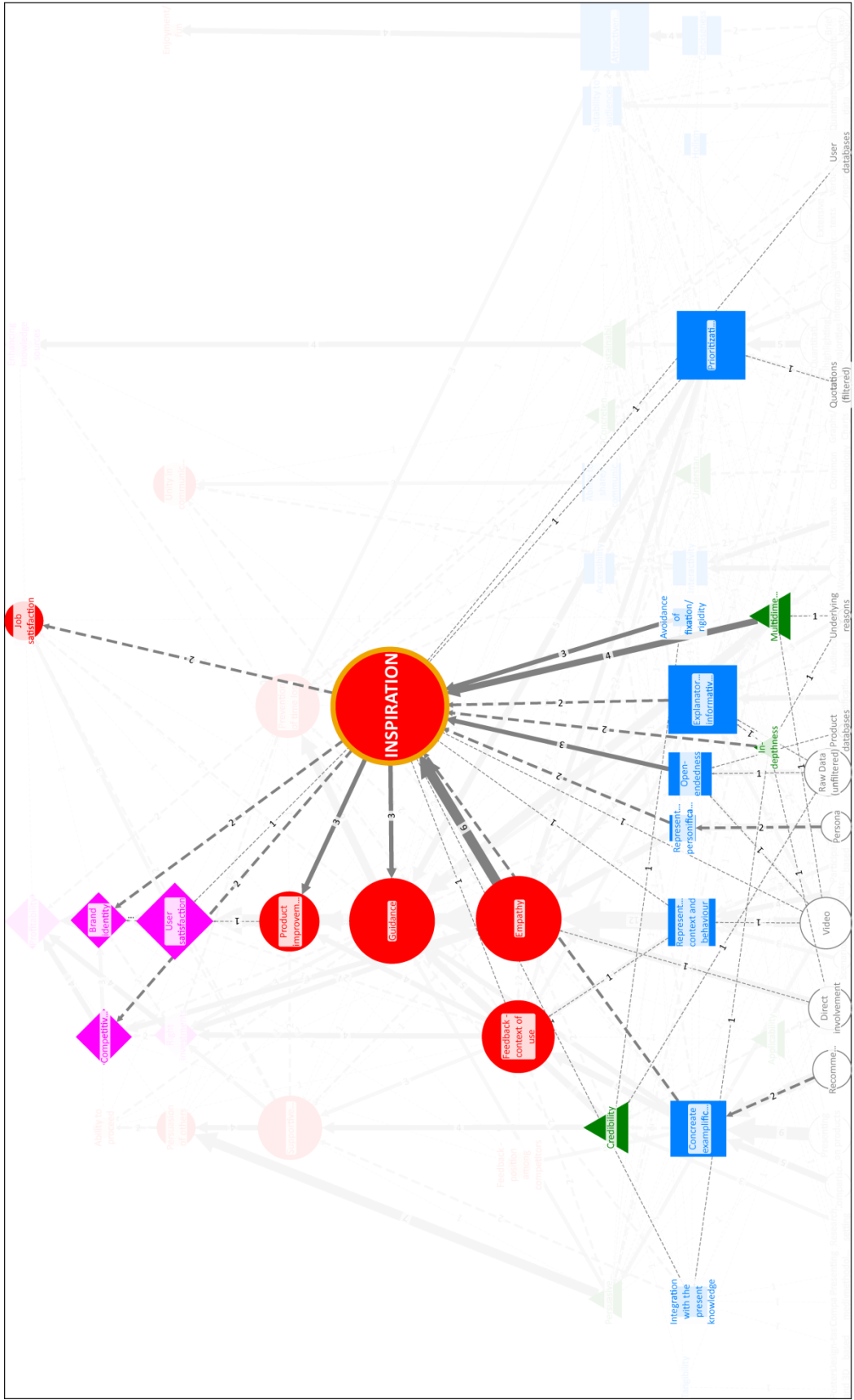
Figure 34. Egocentric network of the impact "Providing inspiration"

Providing inspiration

Highly adverse-------Not perceivable--------Highly favourable
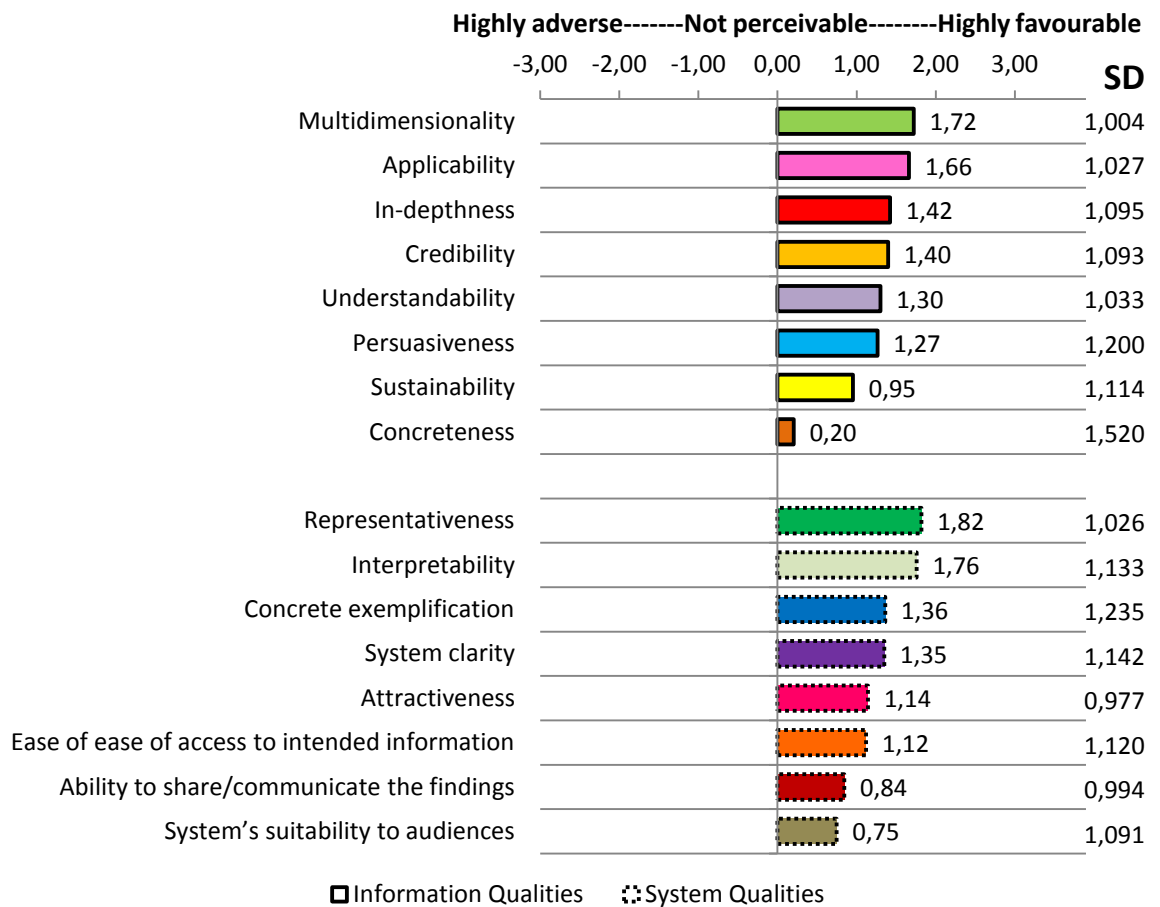
Figure 35. Relation graph of the impact "Providing inspiration"

4.4.2.7. Having feedback about the product's position

Having feedback about the product's position is a buffering construct for the system.

According to the egocentric network in Figure 36, mostly *concrete exemplification* is affecting this impact and it has minor effects on some of the impacts.

The relation graph presented in Figure 37 shows that *credibility* as an information quality is affecting this impact, while none of the system qualities have effects on it.
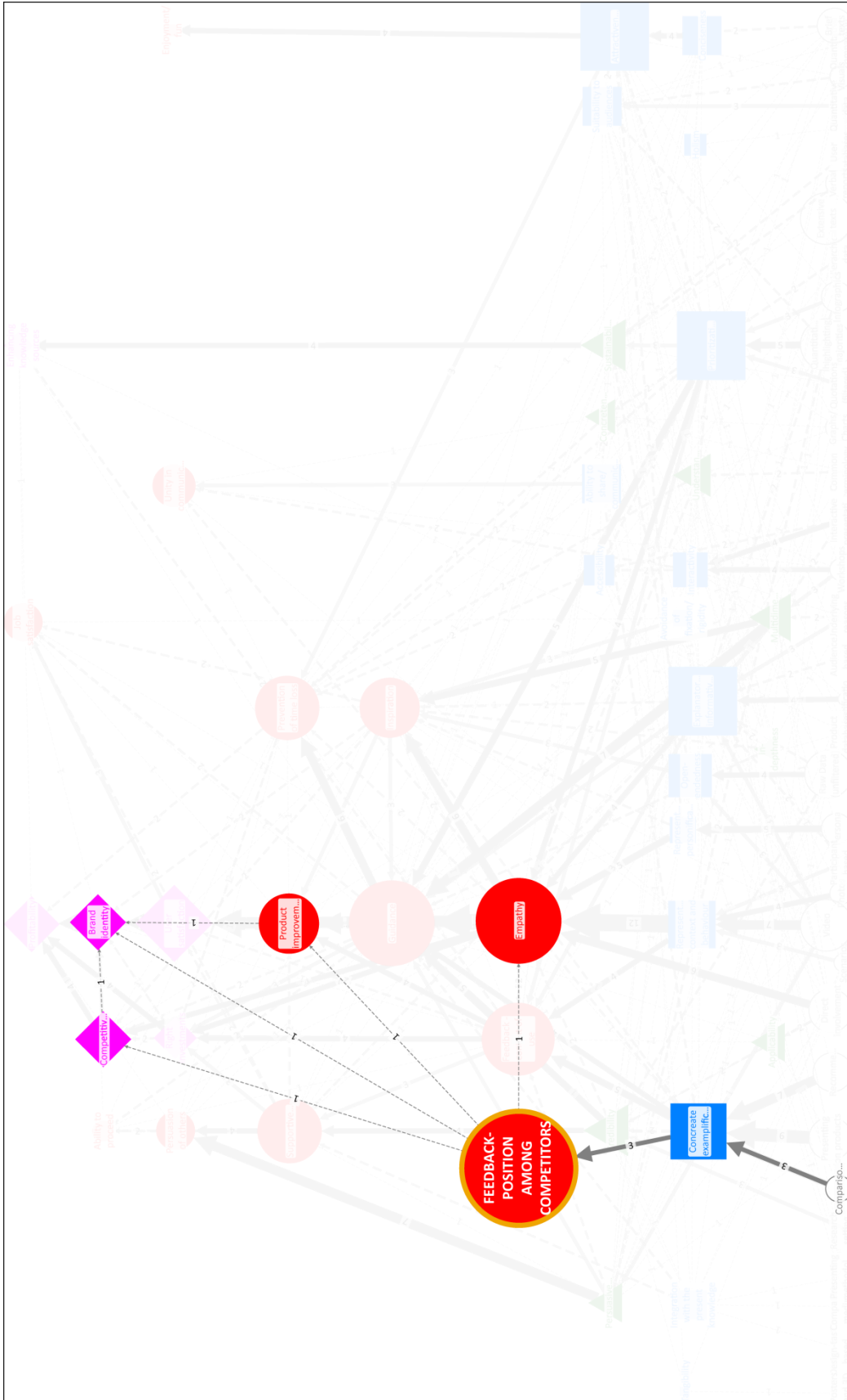
Figure 36. Egocentric network of the impact "Having feedback about the product's position"

Having feedback - position among competitors

Highly adverse-------Not perceivable--------Highly favourable

	Value	SD
Credibility	1,64	1,111
Understandability	1,22	1,116
Multidimensionality	1,17	1,069
In-depthness	1,11	1,126
Applicability	0,96	1,131
Persuasiveness	0,90	1,122
Sustainability	0,67	1,149
Concreteness	0,39	1,584
Concrete exemplification	1,46	1,108
Representativeness	1,22	1,159
System clarity	1,16	1,174
Ease of ease of access to intended information	0,90	1,055
Interpretability	0,86	1,336
System's suitability to audiences	0,71	1,132
Ability to share/communicate the findings	0,69	0,987
Attractiveness	0,39	0,730

□ Information Qualities   ⠿ System Qualities

Figure 37. Relation graph of the impact "Having feedback about the product's position"

4.4.2.8. *Job satisfaction / achieving designer's personal goals*

Job satisfaction is a passive construct, which has a higher abstractness value.

According to the egocentric network in Figure 38, it is mostly affected by *user satisfaction*.

The relation graph presented in Figure 39 shows that none of the qualities have much effect on it.
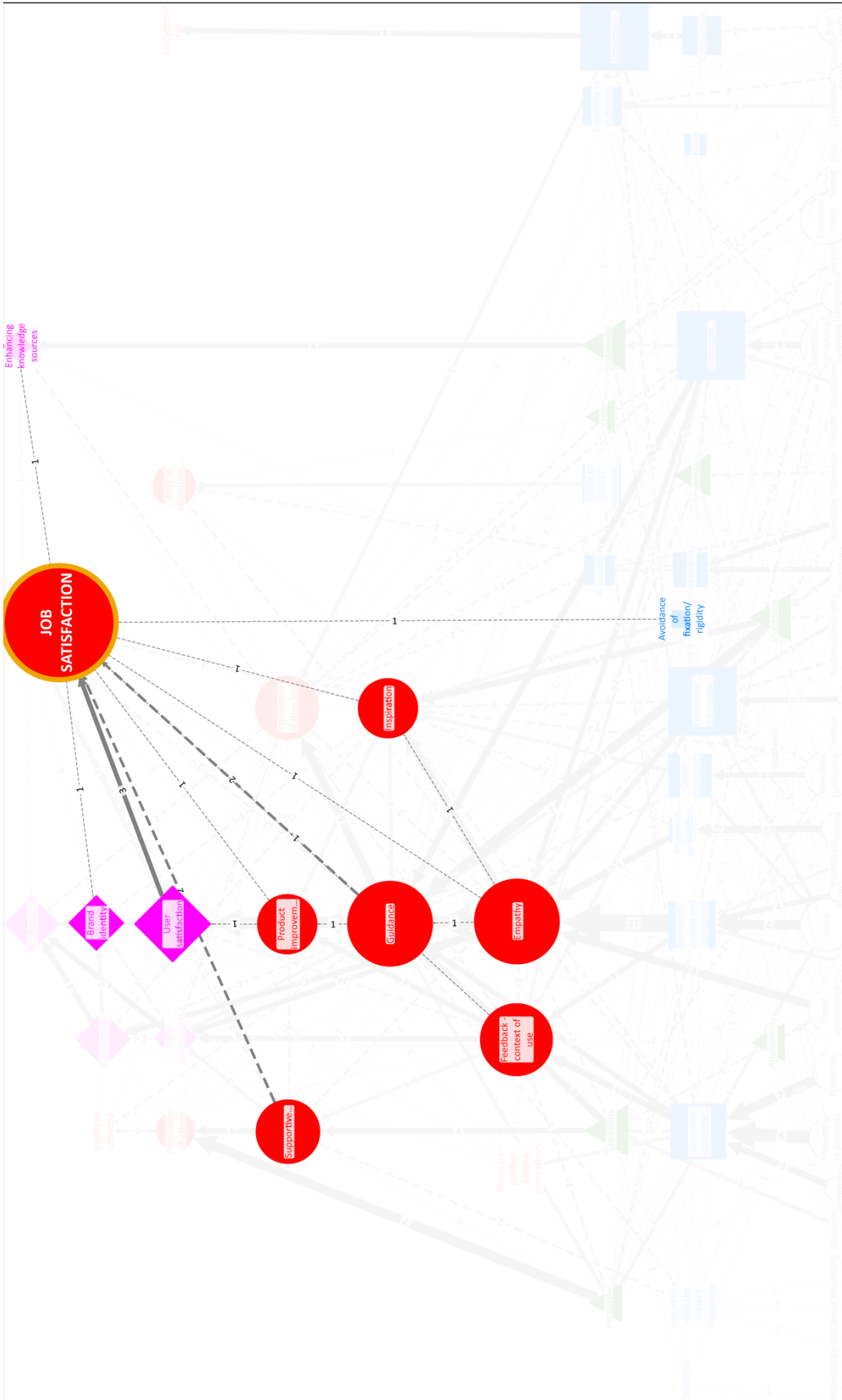
Figure 38. Egocentric network of the impact "Job satisfaction – achieving designer's personal goals"

Job satisfaction

Highly adverse-------Not perceivable--------Highly favourable

	-3,00	-2,00	-1,00	0,00	1,00	2,00	3,00	**SD**
Credibility					1,12			1,029
Applicability					1,06			1,119
Understandability					1,05			1,047
Multidimensionality					1,01			1,065
In-depthness					0,98			1,093
Persuasiveness					0,96			1,109
Sustainability					0,64			0,891
Concreteness			-0,02					1,423
Interpretability					1,25			1,228
Representativeness					1,17			1,057
Attractiveness					1,16			1,053
Concrete exemplification					0,98			1,115
System clarity					0,98			1,115
Ease of ease of access to intended information					0,92			1,084
Ability to share/communicate the findings					0,75			0,973
System's suitability to audiences					0,53			1,004

☐ Information Qualities   ⬚ System Qualities

Figure 39. Relation graph of the impact "Job satisfaction"

4.4.2.9. Unity in team communications

Unity in team communications is a buffering construct, which has a higher abstractness value.

According to the egocentric network in Figure 40, it is mostly affected by *share-ability* as a system quality.

The relation graph presented in Figure 41 shows that none of the qualities have much effect on it.

Figure 40. Egocentric network of the impact "Unity in team communications"

Unity in team communications

Highly adverse-------Not perceivable--------Highly favourable
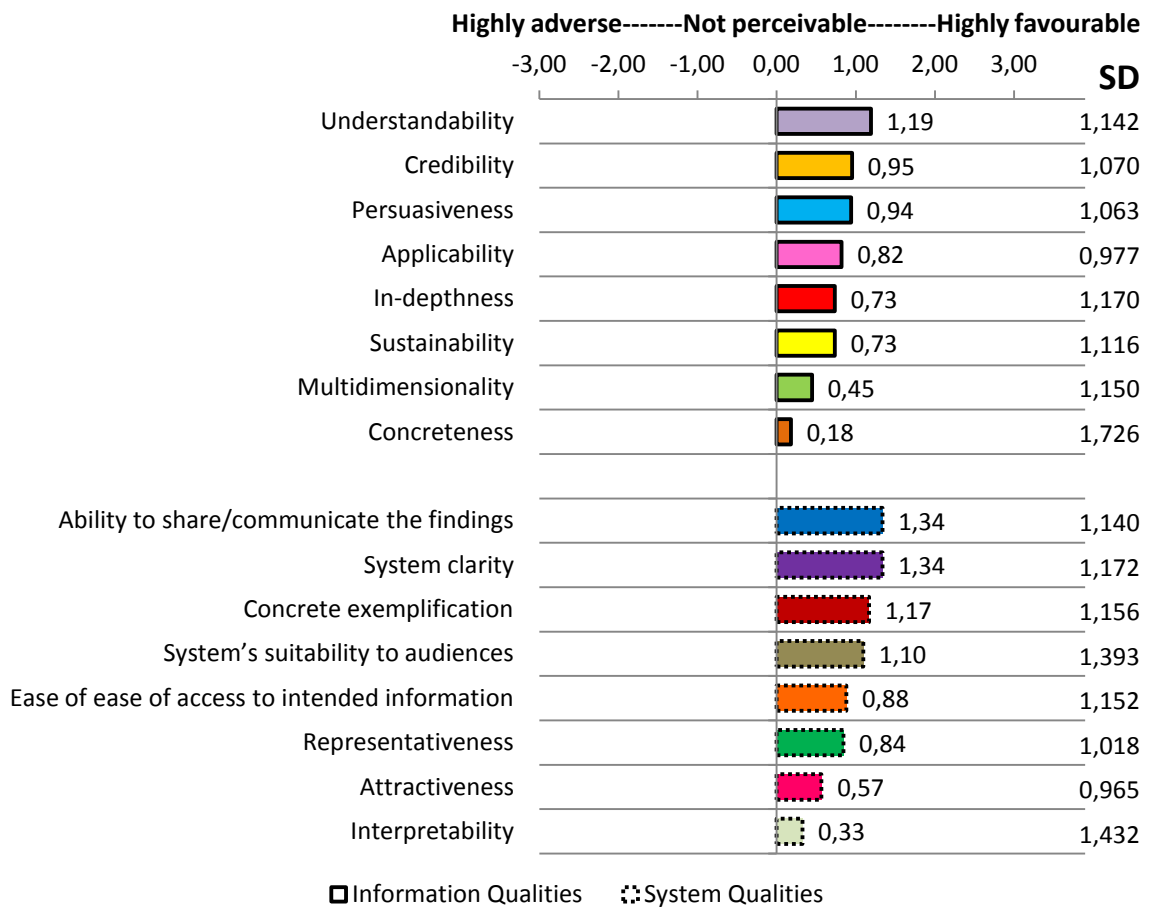
Figure 41. Relation graph of the impact "Unity in team communications"

4.4.2.10.   Prevention of time loss

Prevention of time loss is a passive but central construct for the system. According to the results of the questionnaire, it is affected by overall system qualities that are being questioned in the study.

According to the egocentric network in Figure 42, mostly *attractiveness* of the system and *having guidance* are affecting this impact. It is mostly affecting *profitability* and *making right investments* as the outcome.

The relation graph presented in Figure 43 shows that *understandability* as information quality is positively affecting this impact, while *in-depthness* and *multidimensionality* negatively are affecting it. From the system qualities, *system's clarity, accessibility, share-ability* and *concrete exemplification* have effects on it.

Figure 42. Egocentric network of the impact "Prevention of time loss"

Prevention of time loss

Highly adverse-------Not perceivable--------Highly favourable

	Value	SD
Understandability	2,18	1,170
Credibility	0,99	1,088
Persuasiveness	0,77	1,130
Applicability	0,75	1,069
Concreteness	0,69	1,530
Sustainability	0,53	0,860
In-depthness	-0,02	1,465
Multidimensionality	-0,08	1,232
System clarity	2,45	0,873
Ease of ease of access to intended information	2,05	1,229
Ability to share/communicate the findings	1,89	1,059
Concrete exemplification	1,57	1,261
Representativeness	1,24	1,206
Attractiveness	1,23	1,040
Interpretability	0,94	1,699
System's suitability to audiences	0,47	1,426

☐ Information Qualities   ⠿ System Qualities

Figure 43. Relation graph of the impact "Prevention of time loss"

4.4.2.11.   *Enjoyment/fun in utilization of the system*

Enjoyment/fun in utilization of the system is a buffering construct, which has a higher abstractness value.

According to the egocentric network in Figure 44, it is mostly affected by *attractiveness* as a system quality.

The relation graph presented in Figure 45 shows that none of the information qualities is affecting this impact. From the system qualities, *attractiveness*, *system's clarity* and *representativeness* have effects on it.

Figure 44. Egocentric network of the impact "Enjoyment/fun in utilization of the system"

Enjoyment/fun in utilization of the system

Highly adverse-------Not perceivable--------Highly favourable

	Value	SD
Understandability	1,25	1,208
Multidimensionality	0,98	1,229
Credibility	0,93	1,022
Applicability	0,89	1,024
In-depthness	0,76	1,206
Persuasiveness	0,70	1,090
Sustainability	0,54	0,831
Concreteness	-0,11	1,220
Attractiveness	1,93	1,124
System clarity	1,54	1,151
Representativeness	1,53	1,119
Interpretability	1,36	1,340
Concrete exemplification	1,24	1,175
Ease of ease of access to intended information	1,23	1,203
Ability to share/communicate the findings	0,99	0,943
System's suitability to audiences	0,61	1,177

□ Information Qualities   ⋮⋮ System Qualities

Figure 45. Relation graph of the impact "Enjoyment/fun in utilization of the system"

CHAPTER 5

MODEL FOR EFFECTIVE COMMUNICATION: STRATEGIES AND GUIDELINES

In this chapter, the major outcome of this thesis is presented in the form of a model for effective communication of user research findings. The chapter starts with a brief introduction regarding how the model is utilized in practice. Major impacts, which are identified as the result of the study, are discussed together with the qualities that are found relevant with these impacts by positioning them in the model's structure. After that, strategies and guidelines which are formulated to maintain the targeted impacts are presented. The chapter ends with a discussion on how the model, strategies and guidelines should be taken into account at macro level considering organizational structure and design integration approach of the firm that requests user research information.

5.1. Model for effective communication in practice

The basic model (Figure 9) that is presented in Section 3.1 illustrates the communication activity in a descriptive way. It points out system and information qualities as *inputs* for effective communication, while it indicates impacts at both individual and organizational level as the *outputs* of effectiveness. In order to utilize the model in practice, in this chapter, it is represented in a prescriptive format as in Figure 46. In this case, to maintain effective communication targeted impacts should be taken into account as considerations and relevant system and information qualities form a ground for the advises that are presented in this study.
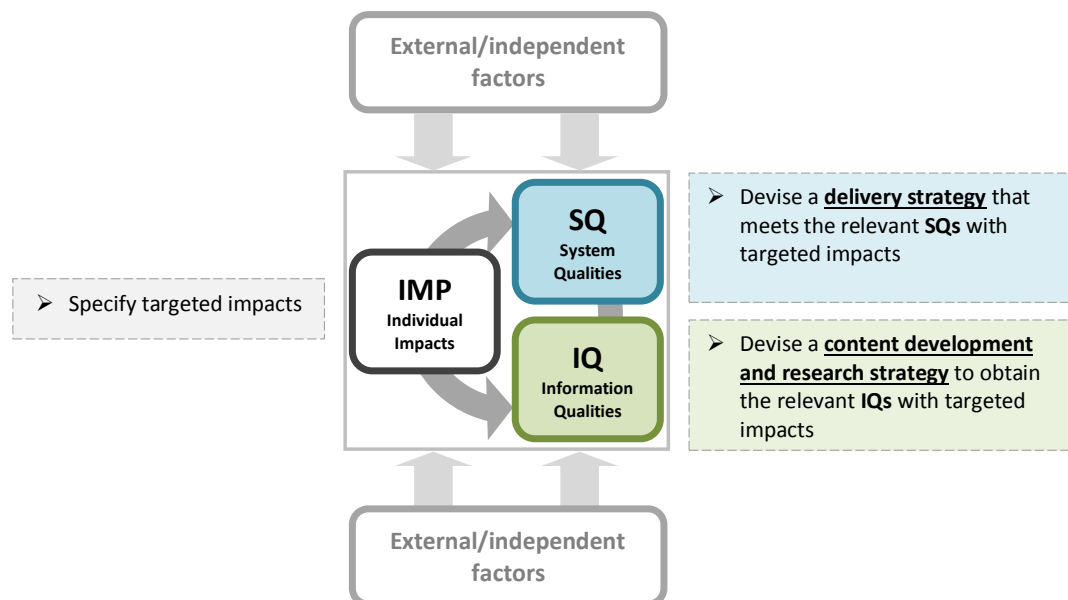
Figure 46. Model of effective communication to be utilized in practice

As it is identified in this study, certain interrelations exist between the constructs of the model (Section 4.4), which can act as guidelines when devising a strategy for the effective communication of user research findings. Figure 46 illustrates how the model for effective communication can be used in practice while devising a strategy for the delivery of user research findings. There are three basic requirements to be considered when utilizing the model:

- o First, the **targeted impacts**, as the outcome of user research should be identified, and considering these impacts:

  - ➢ A strategy should be devised for designing the means of delivery, considering the relevant **system qualities** and the targeted impacts, and
  - ➢ A content development and research strategy should be specified to maintain the **information qualities** of the targeted impacts.

While devising these strategies, influences from external or independent factors on the dimensions of the model, such as specific requirements of different industries and design integration approach of the firm that the designer works for, should be taken into account.

In the following section, major impacts and their relations to other impacts are discussed together with how these impacts are achieved with the relevant qualities.

5.2. Major impacts and the regarding qualities

Several impacts at different hierarchical levels for the designer are identified in this study. Figure 47 illustrates the causal relations between the impacts at both individual and organizational levels. Statements that are referred in the rest of the sections are supported with respondent's statements that are retrieved during the interview study. These statements are numbered and relevant quotations are listed at the end of this chapter.
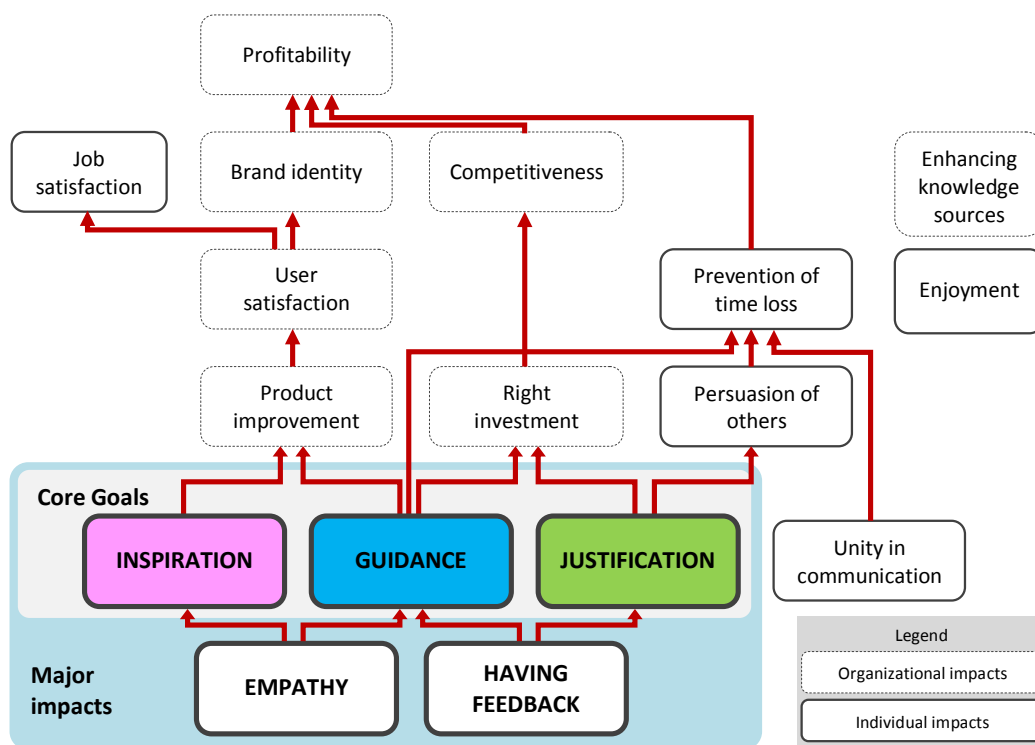
Figure 47. Relations between the impacts

Empathy and *having feedback* are among the central constructs that are identified in this study and relevant findings are discussed in Chapter 4. In order to have effective communication these two impacts have critical roles since they are closely related to core goals, namely *inspiration*, *guidance* and *justification*, which are also found central for the effective communication. Major causal chains presented in Figure 47 can be summarized as follows[i]:

- If *empathy* with the user can be maintained as the result of communication of user research findings, it can (1) *inspire* the designer since by getting to know the user s/he can identify new problems based on his/her observation, which can lead innovative ideas[1]; and (2) it can *guide* the designer so that s/he can specify the design criteria based on those problems which may be lacking in design briefs[2]. Having these two impacts result in *product improvement* in a way that it successfully meets the design criteria and *satisfies the user*[3]. User satisfaction is an important precondition for *job satisfaction*[4] for the designer, since it verifies his/her professional success. User satisfaction also enhances the brand awareness and improves the *brand identity*, which results in raising *profitability* of the firm that is the highest-level impact at organizational level.
- If the designer can have satisfactory *feedback* regarding the product s/he designs, s/he can have *guidance*[5] considering the feedback s/he receives and gain ability to *justify*[6] his/her decisions if the design is approved by user research findings. If guidance and justification are maintained, they enable the designer and product development team to make right decisions, which result in *right investments*[7] for the firm, and this affects firm's *competitiveness* and its *profitability*.
- *Justification* is an important activity for *persuading managers and other members*[8] in the product development team about the criticality of designer's decisions. If managers are persuaded, the product development activity can proceed without interruption and this result in *prevention of time*[9] *loss* both for the designer and for the firm, which directly affects the *profitability*[10].
- Findings of user research can enable design team to have *unified communication* since they can discuss on concrete findings because of that the data is not "lost in translation"[11] during the communication between the members. If this unity can be maintained, it can *prevent time loss* caused by misunderstandings.
- *Enjoyment* from utilization of the system and *enhancing knowledge sources* are impacts that are not closely related with other impacts but highlighted as impacts of user research delivery.

Considering the five major impacts which are indicated in Figure 47, designer's core goals in utilizing the user research knowledge are having *inspiration*, obtaining *guidance* and gaining ability to *justify* design decisions, and gaining *empathy* with the user and *having feedback* regarding the designed product are the means for achieving these core goals. Therefore, in this chapter, the concentration is on the ways to achieve these core goals since they are closely related to critical higher level impacts from user research delivery.

Figure 48 presents the system and information qualities that are relevant with the core goals. Each quality is linked with a certain strategy that should be taken into account while developing a user research deliverable. These strategies are coded with numbers in the figures and listed in Table 16.

---

[i] Numbered statements are supported with relevant quotations from the interview data which are provided as endnotes at the end of the chapter. Quotations are translated to English. Original versions (in Turkish) are in APPENDIX I
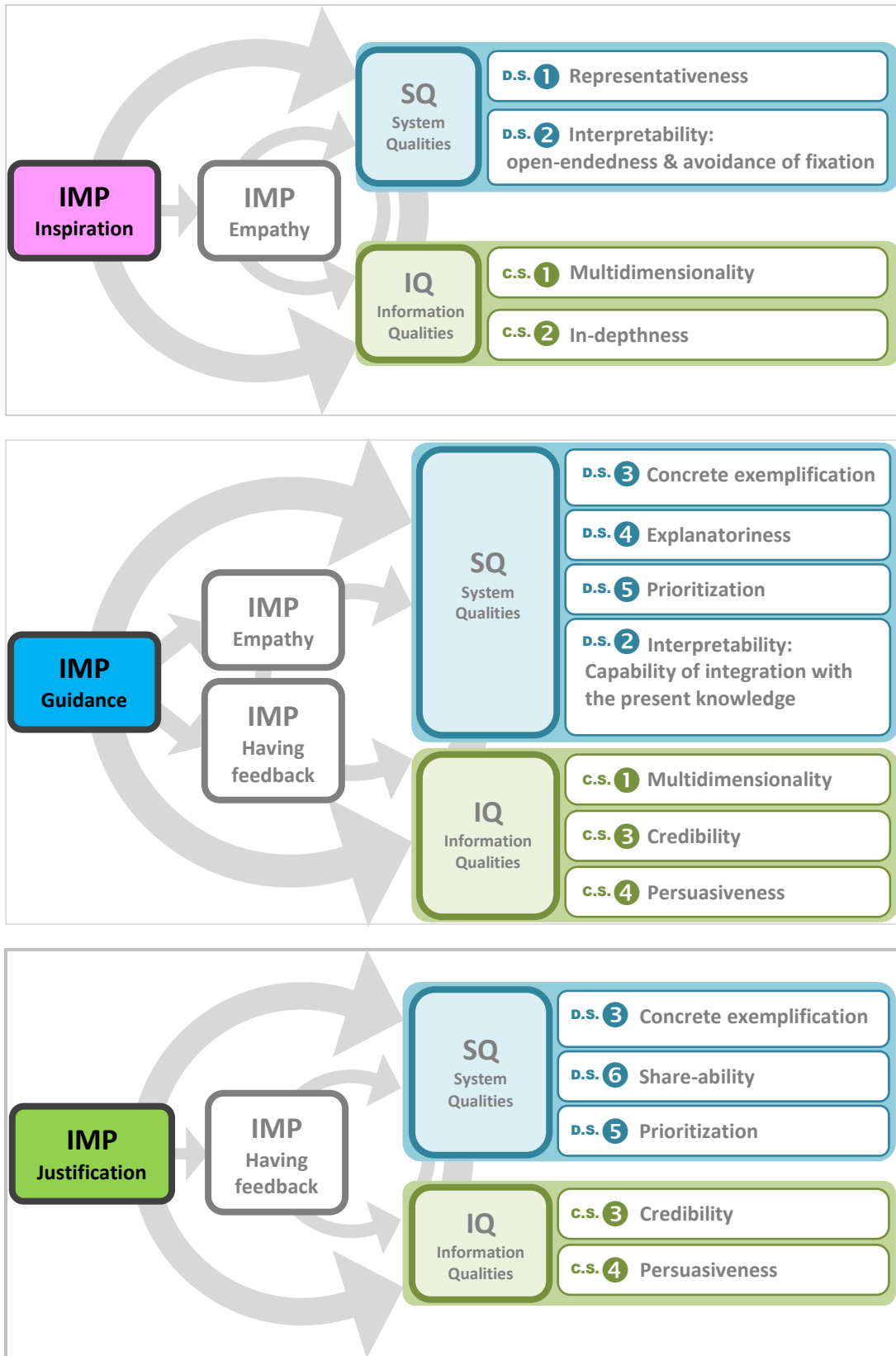
Figure 48. How "inspiration", "guidance" and "justification" can be achieved

Table 16. Strategies for effective communication

Delivery Strategies		Content Strategies	
D.S. ❶	Representing user and context of use	C.S. ❶	Obtaining and delivering multidimensional data
D.S. ❷	Providing an interpretable system	C.S. ❷	Maintaining in-depthness
D.S. ❸	Providing concrete exemplification for findings	C.S. ❸	Providing credible information that the design team can rely on
D.S. ❹	Providing an informative system	C.S. ❹	Providing persuasive data to convince designers and other team members
D.S. ❺	Prioritizing problems and findings	C.S. ❺	Maintaining sustainability for the information
D.S. ❻	Providing shareable outputs		
D.S. ❼	Maintaining ease of access to the intended information		
D.S. ❽	Maintaining conciseness in delivery		

In the following sections, the strategies are discussed by referring to the presentation tools preferred by designers. These tools are utilized for exemplifying the abstract qualities and they are mentioned by the participants of the study as their preferred presentation technique for conveying the relevant quality. By considering the characteristics of qualities and relevant designer needs new tools can be developed to deliver the desired impacts and qualities for the designer.

5.3. Strategies for effective communication

5.3.1. Delivery Strategies

5.3.1.1. Delivery Strategy 1: Representing user and context of use
Guidelines for achieving **representativeness** as the quality of the system are summarized in Figure 49. The designer has different needs which can be satisfied by providing this quality being closely related to the impact **empathy with the user**.

- First of all, to empathize with the user, the designer needs to understand user behavior in the context of use and type of the user group that the designer deals with is an important external factor while deciding on the delivery medium and strategy. (1) If *consumers* such as users of home appliances and consumer automobiles are the user group, the delivery should be heavily based on visual materials through which the designer can make observations. If it is preferred by the designer and resources are available, the designer can directly participate in the contextual observation process. This would enable him/her to draw his/her conclusions and have first hand observations, which is a crucial factor for empathy. Since in some cases, it may not be possible for the designer to involve in such an observation process, the observations can be done through raw video recordings[12], which is a rich source for the designer to have his/her own interpretations. (2) If the user group consists of *professionals*, direct involvement[13] to observation activity is a must for the designer, since in many cases usage of these products is a matter of life and death and the expert's knowledge is a key component of the design activity, which usually takes place in collaboration with those experts[14]. Moreover, many times the designer is not familiar with the utilization of the product. Therefore s/he needs to learn how the product is used by observing and interviewing with experts. For this reason designer's direct involvement in user research activity is vital for the design process of expert products. If the designer's ability to contact with users is restricted, their limited observations can be supported with

simulations[15] of actual usage environment to convey both user's physical condition (such as posture, thermal and environmental conditions) and psychological condition (such as stress level and cognitive task load). In addition, when direct involvement is restricted, the need for learning expert usage tasks can be satisfied to some extent, if video recordings[16] showing the usage tasks or scenarios summarizing the tasks is provided.

- Understanding user's emotions and intangible needs that are hard to be verbalized by users is an important precondition of gaining empathy. Designers realize that relying on users' verbal comments is misleading in many cases and for them, observing what they do in natural context without the awareness of being observed by researchers can provide more insight about user's tangible and intangible needs. In order to empathize with their feelings, the designer needs to see users' reactions and expressions. For example, providing video recordings to show users' facial expressions[17] when they first encounter the product can reveal their actual reactions and feelings towards the product.

- Understanding underlying reasons of user evaluations is critical for identifying actual needs and problems of users for the designer since problems interpreted by the designer himself/herself can lead to more creative ideas. Interpretable materials such as raw video recordings or direct involvement can be helpful in understanding underlying reasons, but when they are unavailable or found time consuming to review and to carry out in the design process, relevant analysis and background information in relation to user's evaluations should be provided together[18]. In such a case, presenting the findings based on individual respondents by providing respondent's evaluations coupled with information about the respondent's previous experiences and habits and illustrating respondent's context with photographs (if possible video recordings and transcriptions) is beneficial since the designer can interpret this data to infer conclusions about underlying reasons regarding user's evaluations.

- The designer usually searches for visual clues[19] from user's environment in order to have further interpretations which would lead him/her to reach generative ideas. To satisfy this need, it is important to provide clear images of the context of use[20]. If enough images are not provided in the delivery, the research can be perceived as superficial. Therefore photographs that vividly represent the context are outputs that should be provided to communicate findings to the designers.

- While designing, the designer needs to position his/her solutions in the context through imagination and during this process s/he needs to consider user's behavior and actions. Personification is a beneficial quality for delivery, since considering a specific individual[21] is found convenient by the designer. Therefore while presenting user's needs and problems, it is helpful to create a real-like imaginative character and supporting this fiction with photographs, stories and quotations that are retrieved as the result of the user research activity.

D.S. 1 : Representing user and context of use
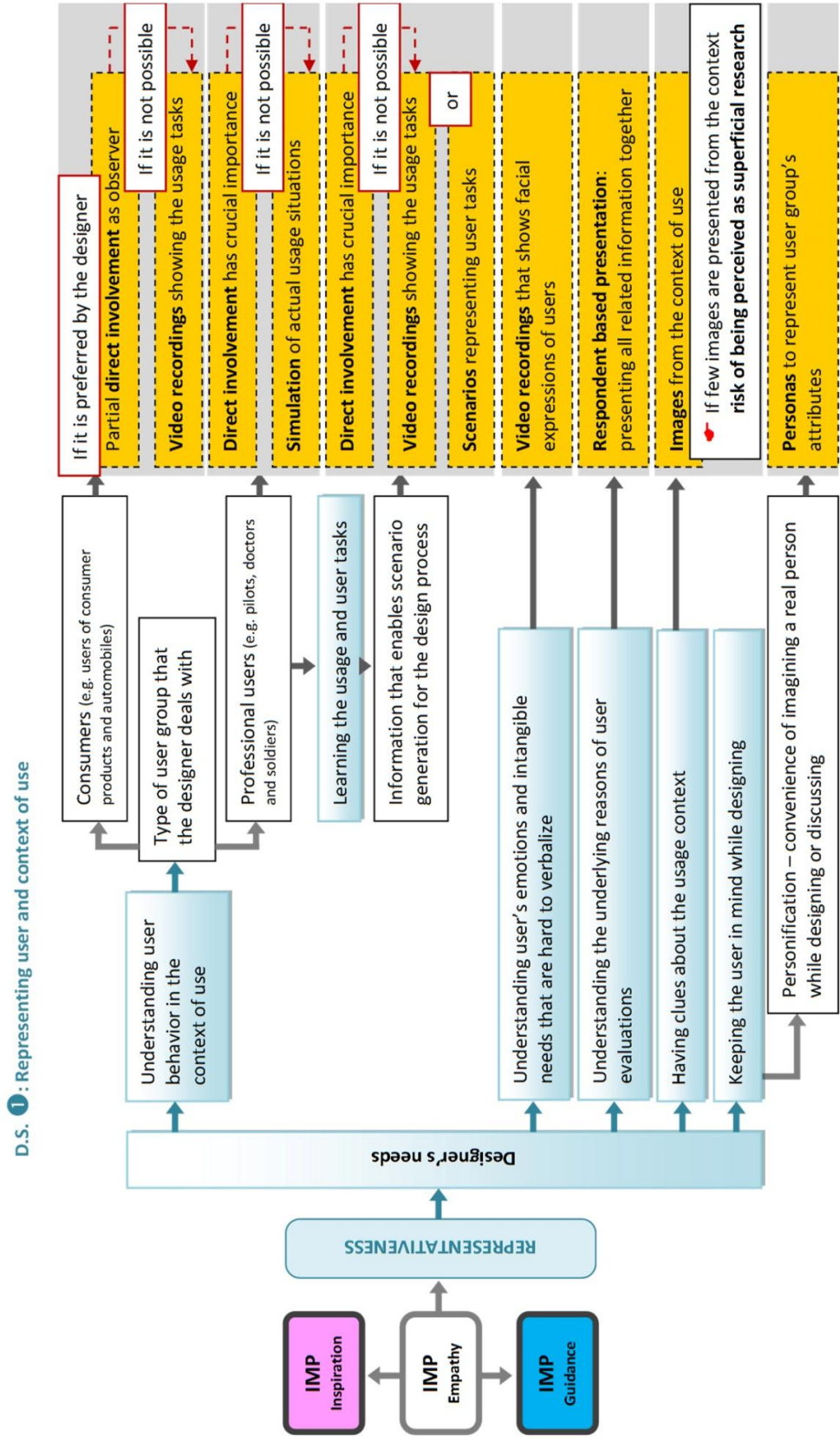
Figure 49. Delivery Strategy 1: Representing user and context of use

Interpretation is an important part of the design process and it has different dimensions which have effects on *empathy*, *inspiration* and *guidance* as the impacts of effective communication. In this study interpretability is examined under three categories, namely open-endedness, integrate-ability, and interactivity (Figure 50).

Open-endedness in delivery results in inspiration and empathy for the designer. If the delivery is open to further interpretation of the designer it can enable him/her to obtain his/her own insights and since those interpretations can be unique to the designer, such delivery can lead to more creative outputs. Moreover, when interpretable materials are provided, the designer can have more in-depth understanding about underlying reasons for user's expressions and evaluation, thus s/he gets to know the user better and this is critical for empathy.

- The designer's need for user observation for such purposes can be satisfied though direct participation in the observation process, however if this is not possible, raw data[22] especially in the form of video recordings[23] should be provided by avoiding too much interpretation of the researcher, since added interpretations are found restricting by some designers.
- Avoidance from fixation[24] is an important precaution that should be considered while developing an interpretable delivery. Reducing the data by only highlighting quantitative majorities is found to be concrete and not interpretable by the designer. Moreover written reports are criticized because of their delivery style in a way that it delivers the data in a linear way and this may reduce the delivery's ability to convey multidimensional data[25].
- Sometimes the designer needs to evaluate how the researchers interpret and analyze the data[26]. By examining it, the purpose is again reaching his/her own interpretations and conclusions or assessing whether the methodology for the research task and analysis is valid and reliable for their case. The latter is especially important for the credibility of the research, if the designer is experienced in the context. Therefore in such cases the methodology should be explained in detail to satisfy the curiosity of the designer. Moreover raw data especially transcriptions should be provided for further examination of the designer regarding how the coding structure is made or interpretations are done. However many designers consider that raw data is time consuming to review and may be disregarded for some cases. Therefore the researcher's interpretations should be provided with satisfactory underlying reasons and raw data is documented separately in case the designer may need them for further consultation.

Integrate-ability of the research data with the firm's current knowledge is an expected quality for effective guidance that can be obtained from user research.

- In some cases, the findings of a specific user research study can shed light into future projects of the firm. For such cases, applicability of the findings to the future project should be assessed by the firm. For this purpose, whether the sample, study's context and procedure is valid for the future case or not should be checked, thus the methodology of the research should be transparent[27] enough to enable such examination.
- Usually firms have previously employed research on the research study's subject or they have certain degree of expertise and knowledge on that subject. It is important that the deliverable can be examined and interpreted by the designer by considering the knowledge that the designer and firm currently have[28]. Providing interpretable materials such as raw data and respondent based presentation[29] or letting designer to participate in the observation process enable him/her to accomplish such integration. Ideally it is beneficial to consider and build on the firm's previous research and knowledge while developing the deliverables. However, for outsourcing research institutions and firms, which are carrying out the research task, generally it is not possible to do so, since usually confidentiality issues are involved.

Interactivity is considered in this study as the designer's ability to have responses for the information s/he requests regarding user and context. This is important when guidance is sought as the result of the delivery.

- Workshops and meetings with the research team are considered as crucial for discussing the findings and being on same the page with the researchers. In these workshops or meetings the designer can express their requests[30] regarding his/her knowledge needs and supervise the research activity that is being carried out by researchers. Moreover interpretations can be done collaboratively which is an important request by the designers who are willing to involve in the research study. In that sense direct involvement to development of research methodology can be preferred by such designers. Furthermore delivery's interactivity is another issue, which also maintains ease of access to intended information. By providing hyperlinks or features developed for enhancing searching capability of the delivery, the designer can easily find answers to his/her questions based on his/her knowledge needs.

D.S. ❷ : Providing an interpretable system

Types of INTERPRETABILITY

IMP Empathy

IMP Inspiration

IMP Guidance

Open-endedness

Integrate-ability

Interactivity

Designer's needs

Designer's needs

Designer's needs

Gaining ability to observe user to draw own conclusions

❗ Fixation

Gaining ability to evaluate how the researcher interpret the data

Gaining ability to interpret methodology's validity for future projects

Gaining ability to interpret and integrate with the present knowledge

↝ Building on firm's previous knowledge while presenting results is critical.

❗ Confidentiality issue

Gaining ability to retrieve immediate responses to the questions that the designer has in mind

Direct involvement as observer

Video recordings showing user actions in the context

❗ **Quantitative data**

❗ **Written reports**

❗ Too much concrete

❗ Linear explanation – not conveying multidimensionality

If it is not possible

Raw data especially transcripts

Presenting **methodology** in detail

❗ Time consuming to review

🌿 Important for credibility, especially if the designer is experienced in the context

Direct involvement to the part of the process

Respondent based presentation: presenting all related information together

Workshops and meetings with the research team for discussion on findings

Interactive presentations with enhanced search-ability

Direct involvement while developing the methodology

Figure 50. Delivery Strategy 2: Providing an interpretable system

5.3.1.3. Delivery Strategy 3: Providing concrete exemplification for findings

Concrete exemplification is needed for clarification of the findings, since they may be based on abstract verbalizations of user's perceptions and by exemplifying, it can be possible to have a unified understanding of findings for the design team. Therefore exemplification is especially important when **guidance** is needed, since it makes it possible to understand user's perceptions and problems and researcher's recommendations which can lead to better solutions. Moreover it is important to have concrete examples together with reliable user data, while **justifying** design decisions for persuading others. Furthermore **feedback** is better understood when it is coupled with visual examples (Figure 51).

- Understanding user perceptions is critical when identifying requirements for design. Since perceptions and perceived qualities are vague concepts[31] it is required to identify and explain these abstract concepts with visual examples so that it is meaningful for the designer. Providing example product features that meet the perceived quality or against it through product comparisons maintains a reference for the abstract quality which makes it understandable by the designer[32].

- Identifying and indicating user's problems that need to be solved is a critical output that is expected as the result of user research activity. Identification of such problems requires certain level of interpretation by the researcher. However designer's tolerance or expectations regarding researcher's interpretations has different levels. Different views exist towards the researcher's interpretation in user research delivery. If the designer is *against too much researcher interpretation[33]*, design recommendations proposed by the researcher are not preferred or even rejected by the designer. Problems identified during the research activity should be highlighted with visuals and relevant raw materials directly obtained from the context and user, such as video recordings and transcriptions of verbal materials, which can persuade the designer about the criticality of the problem. If the designer has *positive attitude towards researcher interpretation* and s/he would like to obtain comments and advises of the researcher as an expert, then design recommendations formulated by researcher are expected to explain design problems with underlying factors and possible solutions.

- Receiving design recommendations or solutions regarding the identified problems in the research can be a need for the designer if s/he has positive attitude towards researcher's interpretation and guidance.
  - In order to provide understandable and shareable presentation among the stakeholders in the product development activity, recommendations should be provided with visualizations and discussions[34] regarding the underlying reasons and problems that the product has solved. Moreover while providing feedback about a designed product, the recommendations based on the problems of the product should be visualized and discussed on the evaluated product's images.
  - While proposing recommendations, "ready-made" and "must do" type of suggestions which is hard to be interpreted and further evaluated by designer should be avoided since they not only restrict designer imagination but jeopardize credibility of the research, if the designer does not agree with the criticality of the problems and solutions suggested by the recommendation[35]. Also, recommendations can be criticized for their unidimensionality, if the designer considers other dimensions which can have negative effects on the applicability of the recommendation. Therefore while proposing recommendations possible disadvantages of the recommendation should be discussed as well as its advantages.
  - As an expert from the production side, the designer needs to evaluate applicability of the recommendation. Besides providing justifications, pros and cons and underlying factors for the recommendations, it is important to provide recommendation's actualization in detail, if actionable results are requested as the

result of the research by the designer. In such a case, working prototypes or 3D visualizations or animations, which simulate the working prototype, is preferred for clear communication of the recommendation.

- o If the designer and the firm count on the researcher's expertise in the area, it is crucial for him/her to obtain the researcher's recommendations together with their justifications. If these justifications are provided, it can make the recommendation considerable for future projects[36] even if it is not applicable for the current one because of external restrictions.

Exemplification is needed while receiving feedback about the designed product. Discussion on recommendations regarding the changes that should be done on the existing products and visualizing changes on its images are important, if the researcher's advises are requested as the result of user research. Moreover product comparisons are an important feedback component, which explains strengths and weaknesses of the evaluated product by comparing other alternatives or competitors' products. Furthermore, comparisons done by users with hidden brand names[37] are valued since it is believed that they provide honest opinions independent from perceptions or prejudgments regarding brand identity.

D.S. ③ : Providing concrete exemplification for findings

Product comparisons illustrating positive and negative aspects through comparison

Product visuals coupled with **raw data** exemplifying problems

While proposing recommendations

Negative

Designer's view towards researcher's interpretation

Positive

Recommendations that are visualized and discussed on the existing product's images

Working prototypes

If it is not possible

Simulations

Recommendations with expert justifications

Product comparisons comparing old and new designs, alternative design solutions and competitive products

Product comparisons done by users with hidden brand names

! Negative effect on credibility

! Avoid "Ready-made" and "must do" propositions

! Avoid unidimensionality

⬥ Discuss "pros and cons"

⬥ Understandable design recommendation

⬥ Sharable

⬥ Applicability of recommendation can be evaluated

⬥ Positive effect on credibility

⬥ Applicable for future projects

Understanding user perceptions

Obtaining design problems

Exemplifying problems with design recommendations

Obtaining design solutions

Obtaining feedback

Designer's needs

CONCRETE EXEMPLIFICATION

IMP Guidance

IMP Having feedback

IMP Justification

Figure 51. Delivery Strategy 3: Providing concrete exemplification for findings

5.3.1.4. *Delivery Strategy 4: Providing an informative system*

Providing an explanatory delivery is important for ***clearly communicating the feedback*** about the evaluated product and ***guidance*** provided for the designer. Needs and relevant presentation tools regarding this strategy are listed in Figure 52.

- One of the major expectations of designers is to have knowledge about underlying reasons for users' statements about their problems, needs and perceptions if guidance is pursued. If the data is interpreted by the researcher, those interpretations should be supported with relevant user[38] data and user expressions to clarify the interpretations while communicating to the designers. In that case, participant based presentation which presents relevant user information together in the same view can be helpful in understanding and making sense of user's evaluations. Moreover, providing quotations or video recordings as raw data for exemplifying the researcher's interpretations is helpful in conceiving the underlying reasons and actual user problems for the designer[39]. Since direct involvement enables empathy with the user, it is also considered as an informative way to have knowledge about underlying reasons. Furthermore, observing user behavior from video recordings or through direct involvement is found more explanatory when its compared to written parts of the report since it is believed that it can convey more information for the designer to interpret user behavior[40].

- Reductivity should be avoided while interpreting the findings since minor details in data can provide important clues for the designer. It is crucial to preserve richness of data while communicating them to the designer[41]. Therefore interpretations that are solely based on quantitative majorities are criticized by the designers since they do not convey critical details that can inspire him/her and provide guidance while defining user problems and needs. For this reason, findings that can be critical for the design process should be highlighted by referring to the relevant user data even if they are not significant in quantity. Also, quantitative findings should be explained by referring to the relevant user data in order to make the delivery informative for the designer.

- In order to maintain an explanatory delivery, recommendations should be justified[42] by the researcher by referring user data and indicating their advantages and disadvantages for the user[43].

D.S. ④ : Providing an informative system

Respondent based presentation: presenting all related information together

Raw data for exemplifying and clarifying researcher's interpretations

Video recordings showing user behavior

Quantitative data highlighting only majorities

Recommendations with justifications and pros and cons by referring user data

Not open to interpretation

Provide critical minor comments even if they are not statistically significant

Provide explanations and underlying reasons for quantitative findings

Understanding underlying reasons

Reductivity

Understanding why researcher's recommendations should be considered

Designer's needs

EXPLANATORINESS

IMP
Guidance

IMP
Having feedback

Figure 52. Delivery Strategy 4: Providing an informative system

109

5.3.1.5. Delivery Strategy 5: Prioritizing problems and findings

It is crucial to prioritize findings while delivering them to the designers, in order to provide clear guidance and data to justify their judgments while communicating them to the other stakeholders. Prioritization is also helpful for clear communication of the feedback that is provided as the result of the user evaluations. Designers' needs that can be met with prioritization and relevant delivery mediums are listed in Figure 53.

- While assigning the research task, there are different kinds of aims that the design team has. The research can aim at specifying potential areas for prospective design projects or its target can be finding answers to specific questions regarding the design project.
    - o If information about potential areas is requested by the design team, critical issues that have investment potential should be highlighted with priorities for the user. Priorities supported with quantitative data are important when persuading certain stakeholders especially managers. For them the data should be reliable and verified by conducting research with great majorities in order to constitute investment potential[44]. Graphs and charts emphasizing statistically significant factors and issues that effect investment decisions are valued highly when justifying decisions to others stakeholders. Moreover infographics[45] summarizing data in a visual diagram by giving quantitative weights is received as beneficial while communicating complicated findings, such as information regarding abstract qualities. Such prioritization based on quantitative differences are important for the design team to have guidance and strength to justify decisions, however, while providing priorities, reductivity should be carefully considered as it is also mentioned in the previous subsection. Moreover prioritization can also be applied for qualitative findings through highlighting critical findings by providing relevant raw data. Such prioritization is especially important for convincing the designer about the criticality of the issue[46].
    - o If the research brief is formulated with specific questions that the team has in mind (for example whether the requirements that are targeted while designing the product is met or not), prioritization is needed to certain extent for clearly communicating the answers that the team wonders. This is crucial for justifying decisions and judgments of the designers since the questions are answered by users of the product through user research and put in an importance hierarchy[47] and it maintains confidence for the designer about the product s/he designs[48]. Quantitative findings visualized with graphs and charts are preferred when receiving this kind of information. Moreover commonly repeated words during the interview give clues about how the product is perceived and delivering this kind of data through infographics such as word-clouds can be beneficial while communicating such data[49].
- Prioritization is crucial for maintaining ease of access to the intended information. Providing information concisely by giving priority to major findings and requested information is important for ease of use of the delivery. Brief reports or executive summaries briefly highlighting major outcomes and presenting content of the study are preferred to have the overview of the research easily when it is needed[50]. Extended reports and details should also be provided together with these brief reports in order to avoid reductivity.

D.S. 5 : Prioritizing problems and findings

Having information about potential areas

Identification of the issues that are critical and have investment potential

Graphs and charts emphasizing significant findings and quantitative data

Infographics illustrating all relevant factors with their quantitative weights

Filtered raw data highlighting important statements or critical behaviors

Convincing the manager

Reductivity should be avoided

Convincing the designer

The aim of conducting research

Having answers for specific questions

Responding to the research brief (e.g. how the designed product is perceived)

Graphs and charts illustrating the position of the product or concept among competitors or alternative designs

Infographiscs such as word clouds illustrating the most repeated words, actions etc. while evaluating or using the product

Ease of use for the delivery

Providing primary information concisely and maintaining readability for regarding details if needed

Brief reports/executive summaries that highlight major findings

Details are needed for guidance during the design process and sustainability of the data

Designer's needs

PRIORITIZATION

IMP Guidance

IMP Having feedback

IMP Justification

Figure 53. Delivery Strategy 5: Prioritizing problems and findings

111

5.3.1.6. Delivery Strategy 6: Providing shareable outputs

In order to maintain unity in design team's communication share-ability or communicability of the content of the delivery is highly critical. The designer's preferences regarding the deliverable's attributes change depending on with whom s/he communicates (Figure 54).

- If the designer is communicating with the researcher while receiving user research information, s/he needs to have face to face contact with the researcher in order to understand user requirements better and sometimes s/he needs to get involved in the research formulation process so that his/her questions can be answered[51]. Meetings and workshops with the research team is highly valued by the designers since such kind of gatherings provide an atmosphere where a unified understanding regarding user knowledge can be reached by discussing on the methodology or on the findings[52].

- During internal communication in the design process, having shareable data and deliverables are vital to have a unity in communication. Presence of the evaluated product with its existing form, visuals or simulations is critical while discussing on the user research findings[53]. Such a concrete example is helpful in keeping the discussion on the same focus without losing time to clarify the arguments. Moreover, well-representation of the user, use and the context of use is highly important for internal communication on the user research findings, since the team members can refer to these representations while discussing decisions if they are well-represented with user data[54]. Furthermore, compatibility of the user research delivery medium with the current communication tools of the design team is very important, since the designer needs to utilize findings in his/her presentations while communicating and justifying his/her ideas[55]. Therefore the medium should be flexible or customizable according to communicational needs of the designer by providing ability to integrate parts of the delivery in designer's presentation, printable materials that the designer can work on while evaluating his/her ideas and documents that can be quickly transferred between the team members by email or through intranet[56].

While delivering user research findings to the managers, it is found critical to provide brief results with visual content highlighting major findings, since they usually have limited time to receive such kind of information[57]. Also, if design suggestions are provided or the designer wants to justify his/her decisions, justifications done by experts in user research is helpful while communicating to the managers[58].

D.S. ⑥ : Providing shareable outputs

Ability to interpret findings together with researchers

Ability to discuss on a concrete example

Well- representing user, use and context of use

Compatibility of the delivery with the current communication mediums of the design team

Meetings - workshops involving design and research team members

Direct involvement of the designer in the research formulation process

Presenting findings on the existing product or its visuals or simulations

Respondent based presentation: presenting all related information together

Integrate-able deliverables to the designer's presentations

Printable deliverables ease of printing or copying the parts of it work on

Emails or intranet for quick share-ability and access

Graphs and charts emphasizing significant findings and quantitative data

Brief reports/executive summaries that highlight major findings

Recommendations with expert justifications

Researchers

Other team members (internal communication)

Managers

Effective communication for designers communicating with....

Designer's needs

SHARE-ABILITY

IMP
Unity in communication

Figure 54. Delivery Strategy 6: Providing shareable outputs

113

5.3.1.7. Delivery Strategy 7: Maintaining ease of access to the intended information

The deliverable should provide quick access to the requested information during and after the design process in order to prevent time loss. Preferred tools for maintaining such accessibility is listed in Figure 55.

- Interactive documents or databases which include hyperlinks to access detailed data are preferred when quick accessibility is concerned[59]. With such an interactive structure, it can be possible to present major findings in brief and provide details through hyperlinks, so that the audience can access the details if they are needed without distracting the flow of information while presenting the major findings[60].
- After completion of the design process related to a user research case, findings can be needed for future projects. In that case, executive summaries or brief reports that summarize the case by highlighting major issues are needed to have a quick overview of the content[61].
- Product comparisons are critical when receiving feedback about the designed product. Comparisons done on the same view or page together with relevant discussions maintain ease of access to the information.
- When extensive reports or databases are provided as the result of the user research study, accessibility through time can be problematic, since after a period of time, it can be hard for the designer to remember and find the information which s/he assigned as critical while reviewing the deliverable[62]. In that case, personalization features such as bookmarking or annotation can be helpful for customizing the content for later use.

D.S. ❼: Maintaining ease of access to the intended information
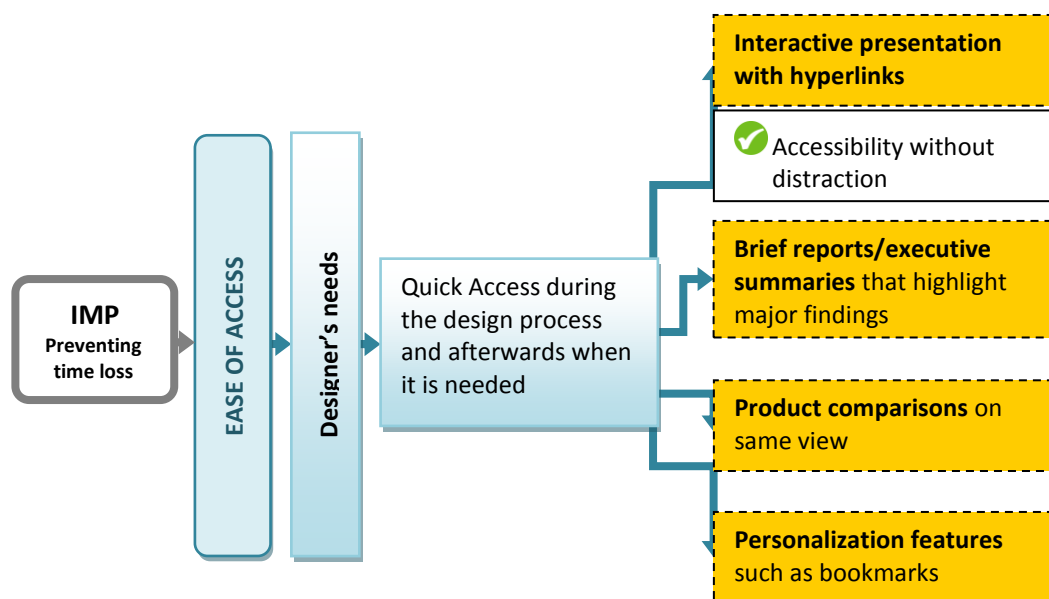
Figure 55. Delivery Strategy 7: Maintaining ease of access to the intended information

5.3.1.8. Delivery Strategy 8: Maintaining conciseness in delivery

Conciseness is critical for not losing time while reviewing and utilizing the deliverables. Receiving refined analysis by avoiding excessive information maintains this quality and preferred tools and tools that are found against this quality are listed in Figure 56.

- Providing delivery that has a proper structure and involves refined analysis is highly valued by designers who have not much time to interpret extensive reports or raw data[63]. For such cases, critical findings should be clearly communicated and highlighted in a brief document[64]. If extensive data have to be provided and requested, the deliverable, which can be in the form of written report or interactive database, should provide a clear overview[65] and have a proper structure that meets the designer's expectations.

- While providing an effective delivery, excessive information should be avoided, since the delivery may become not engaging and time consuming if redundant information is provided. Therefore while providing written reports, it is critical to not to give information that the designer already knows, too much details on common standards[66] that are already available for the designer somewhere else, and too much details on the methodology of the research. Moreover, although raw data is considered as rich information, when interpretability is taken into account, it is expected that raw data should be categorized and interpreted by the researcher in order to prevent time loss[67]. Furthermore, providing visuals are valued for maintaining more explanatory delivery, however visuals, especially infographics, should be carefully designed to convey its content clearly by avoiding complexity and involving too many dimensions that are hard to understand.

D.S. 8: Maintaining conciseness in delivery

IMP
Preventing time loss

CONCISENESS

Designer's needs

Receiving refined analysis

Reports or interactive presentations structured properly according to the designer's needs

Providing whole briefly by putting major findings into a hierarchy and maintaining ability to dig into detail if needed

Brief reports/executive summaries that highlight major findings

⊙ Avoidance from excessive information

⊙ **Extensive reports** that includes redundant information, such as standards, information that the designer already knows, or too much details on methodology

⊙ **Raw and unfiltered data** that are not refined and analyzed

⊙ Not engaging

⊙ **Infographics** that are too complex and include too many dimensions

⊙ Time consuming to review

Figure 56. Delivery Strategy 8: Maintaining conciseness in delivery

5.3.2. Content Strategies

5.3.2.1. Content Strategy 1: Obtaining and delivering multidimensional data

Multidimensionality is a natural characteristic of user research data and complexity in design activity is caused by this multidimensionality. The data communicated through user research delivery should convey this multidimensionality in order to the guide design process by informing the designer with all relevant factors and considerations that lead to formulation of design requirements and constraints. By understanding these factors and considerations, it is possible to get to know the user better and maintain empathy. Moreover, conveying such multidimensionality provides inspiration since through understanding different factors and identifying different requirements it can be possible to attain original ideas that leads to creative outputs. The designer's needs regarding multidimensionality and preferred delivery materials and tools are listed in Figure 57.

- Designers need to elaborate on design briefs by identifying new requirements that are lacking in the brief in order to develop new designs that meet user needs. Uniqueness of user research findings for the designer is critical while identifying new requirements. Therefore user research deliverables that communicates information regarding original design requirements that are not foreseen by the design team is highly valued since they can lead to more generative results. For identifying such requirements, designers think that user research should reflect different perspectives in terms of both its content, i.e. gathered data and interpretations done regarding the data. While presenting data, it is important to reflect diversity[68] of the sample by pointing out information collected from different types of users. While making interpretations to identify design requirements, conducting workshops or meetings with research team and design team members with different backgrounds is found beneficial since different perspectives are integrated into the interpretation process and more fruitful results are expected as the outcome of such an interpretation process[69].

- Providing all relevant factors regarding product qualities and user's perceptions is highly critical to support multidimensional thinking while designing the product. User's perceptions are verbalized with abstract concepts by the user and they need to be clarified by referring to attributes of concrete product examples that causes user's perception. These relations require clear analysis and representation in order to support multidimensional thinking[70]. Relations can be represented with infographics that are designed to represent relevant dimensions with their relative importance weights. However such infographics should be carefully designed by avoiding complexity. In order to provide ease of use while exploring the multidimensional data, interactive presentations with hyperlinks that are linked to explanations regarding different dimensions can be helpful[71].

- For observing user's behavior and drawing his/her own interpretations, the designer can prefer direct involvement in the user observation process. During live observation, details regarding user actions can be missed since observation is carried on from only one view and there is no chance to repeat the actions. However when actions are recorded with different cameras from different perspectives, it is possible to view them with more detail by having ability to observe multiple perspectives and consider different variables that have effects on these actions[72].

C.S. ❶: Obtaining and delivering multidimensional data
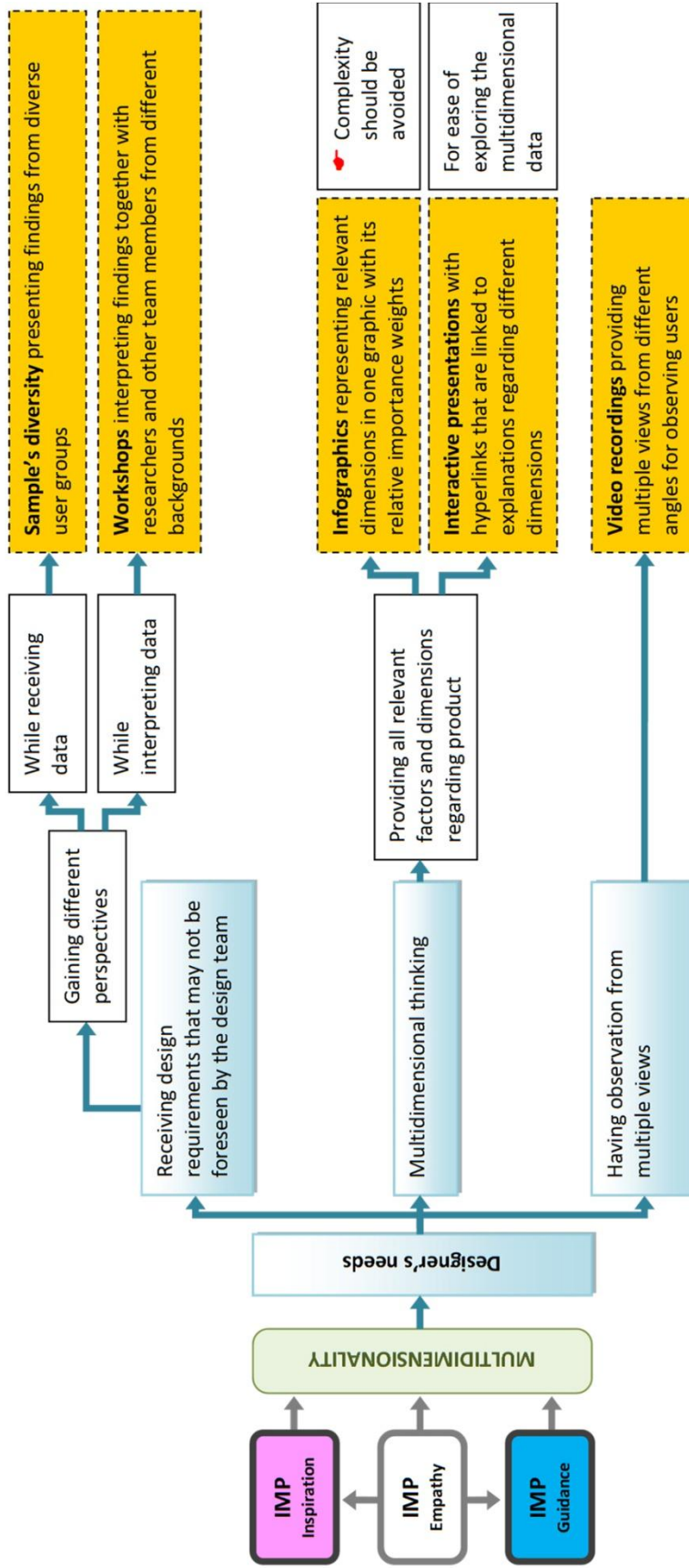
Figure 57. Content Strategy 1: Obtaining and delivering multidimensional data

5.3.2.2. Content Strategy 2: Maintaining in-depthness

Maintaining in-depthness in user research findings is highly critical, while providing empathy with the user and inspiration for the designer. Designers' opinions about research methodology and delivery mediums that maintains in-depthness is summarized in Figure 58.

- Understanding underlying reasons for user behavior and evaluations is considered as an important benefit of user research activity[73]. In order to interpret and understand underlying reasons, it is important to receive in-depth information rather than summarized findings or quantitative data[74]. Raw data in the form of organized transcriptions and video recordings are considered as in-depth data that the designer can investigate while searching for underlying reasons for problems and needs[75].
- If underlying reasons cannot be understood from the deliverables, the research can be considered as superficial. Providing only quantitative findings without indicating their explanations and referring users' expressions[76] or actions or providing few images from the context of use and research setting[77] are received as superficial delivery that should be carefully considered.

C.S. ❷ : Maintaining in-depthness
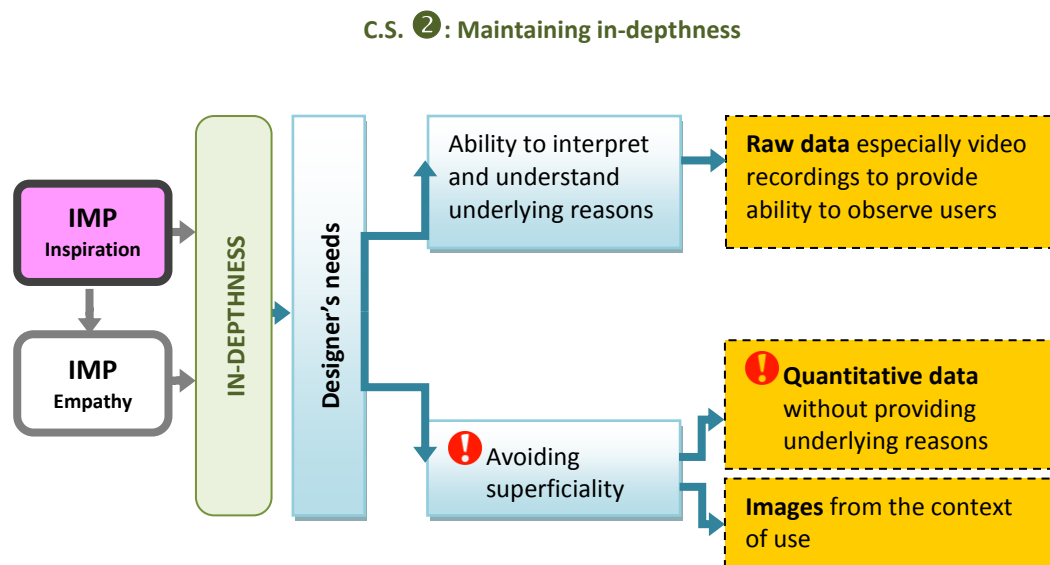
Figure 58. Content Strategy 2: Maintaining in-depthness

5.3.2.3. Content Strategy 3: Providing credible information that the design team can rely on

Credibility of the information delivered regarding user research is highly important when receiving reliable feedback about the design product, having guidance in the design process while making right decisions, and justifying those decisions to the other stakeholders by supporting them with credible and valid data. Trust in the expertise of the researchers is very critical for the credibility of the research[78] and preventing organizational blindness while evaluating the designed products[79]. Such trust is crucial when persuading managers and making investment decisions with the data provided by user research. Methodological decisions and delivery mediums that are considered to maintain credibility by the designers are listed in Figure 59.

- Obtaining credible information is highly critical for the designers when they need reliable guidance and valid arguments to justify their decisions. For achieving such credibility, they have certain methodological considerations which should be taken into account while designing the methodology of the research. When research setting is considered, conducting research in natural setting[80] with disguised manner is found more credible

when it is compared to laboratory setting, since it is believed that in contrived settings user's actions and statements may not reflect their actual behaviors. When research procedure is taken into account, presence of stimuli in the form of actual products[81] is considered as a reliable strategy since without such stimuli user's expressions may not reflect the truth because they are based on user's memories or preconceptions. When sample size is considered, diversity with large groups of users[82] is highly valued since it can lead to more generalizable and reliable outputs that can be utilized when making investment decisions.

- Having own interpretations by making observations through direct involvement[83] or video recordings[84] as if the designer participates in the observation activity is important for him/her for understanding users' actual problems and needs and getting to know user's behaviors in-depthly by assessing whether there are discrepancies between user's statements and their behavior. The latter is highly critical when the designer is experienced in the context and highly knowledgeable about user behavior[85]. In that case, if the designer does not have chance to get involved in the research activity raw materials in the form of transcripts and video recordings should be provided so that the designer can review them to be able to assess the credibility of the information if s/he wants.

C.S. ❸ : Providing credible information that the design team can rely on
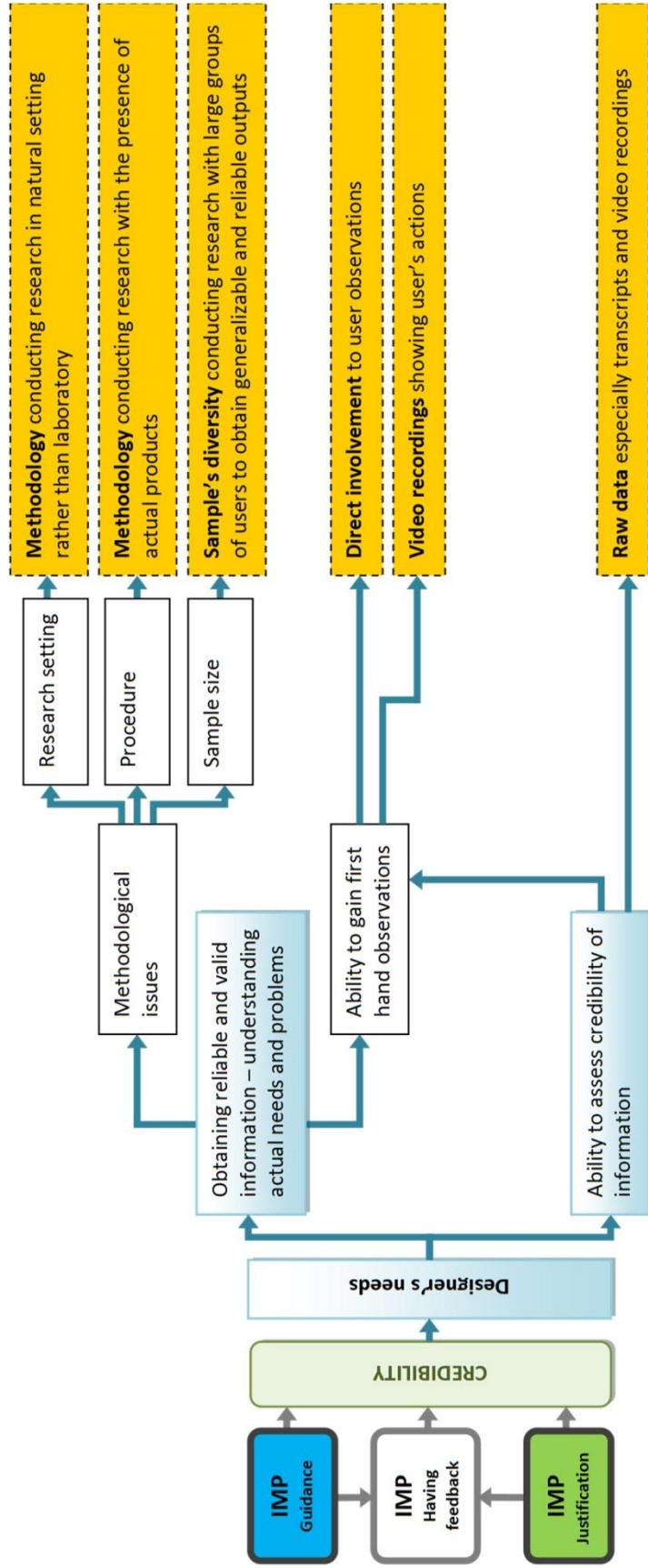
Figure 59. Content Strategy 3: Providing credible information that the design team can rely on

5.3.2.4. Content Strategy 4: Providing persuasive data to convince designers and other team members

Persuasiveness as an information quality is important when two different aspects are considered: (1) the data elicited through user research should convince the designer about the criticality of the issues that are highlighted as the result of the analysis, in order to maintain guidance for the design activity and (2) it should be persuasive enough so that it can be utilized to persuade managers and other stakeholders while justifying design decisions. In Figure 60, mediums that are preferred in the content of user research delivery, when persuasiveness is expected, are presented.

- Outcomes of the research and researcher's claims and interpretations regarding findings should be convincing for the designer so that s/he can utilize them in the design process. Direct involvement in which the designer can obtain first hand observation is one of the most convenient ways to convince the designer about the outcomes[86], since s/he can have his/her own observations regarding critical problems and needs during his/her involvement. However, this type persuasiveness is only valid for convincing designer, for persuading others the designer's observations are not legitimate[87], since they can rely on his/her own prejudices (e.g. in case the designer's design is evaluated, s/he may be protective about his/her decisions). In that case, the researcher's evaluations are more reliable for preventing operational blindness and persuading others, especially if s/he is from an outsourcing firm or institute which is specialized in the area. For enhancing convincingness of the results for the designer, the researcher's interpretations should be supported with relevant raw data[88]. Backing up the findings by providing video recordings regarding user's critical comments[89] or behaviors and actions is highly convincing especially while giving feedback about the designed product. Highlighting critical comments of users by giving quotations, while presenting findings to the designer, is also helpful for vivid expression of the findings. While receiving feedback about the designed product, highlighting major problems or positive evaluations with quantitative data is found highly conclusive and convincing if the majorities are evidently significant[90].
- It is important to provide quantitative evidence while persuading other stakeholders especially managers, since they request concrete findings to be able to make investment decisions. Therefore if management decisions are to be made according to the outcomes of user research, findings should be supported with quantitative and generalizable evidence. Such evidence is crucial[91] while justifying design decisions for the designer.

C.S. ❹ : Providing persuasive data to convince designers and other team members
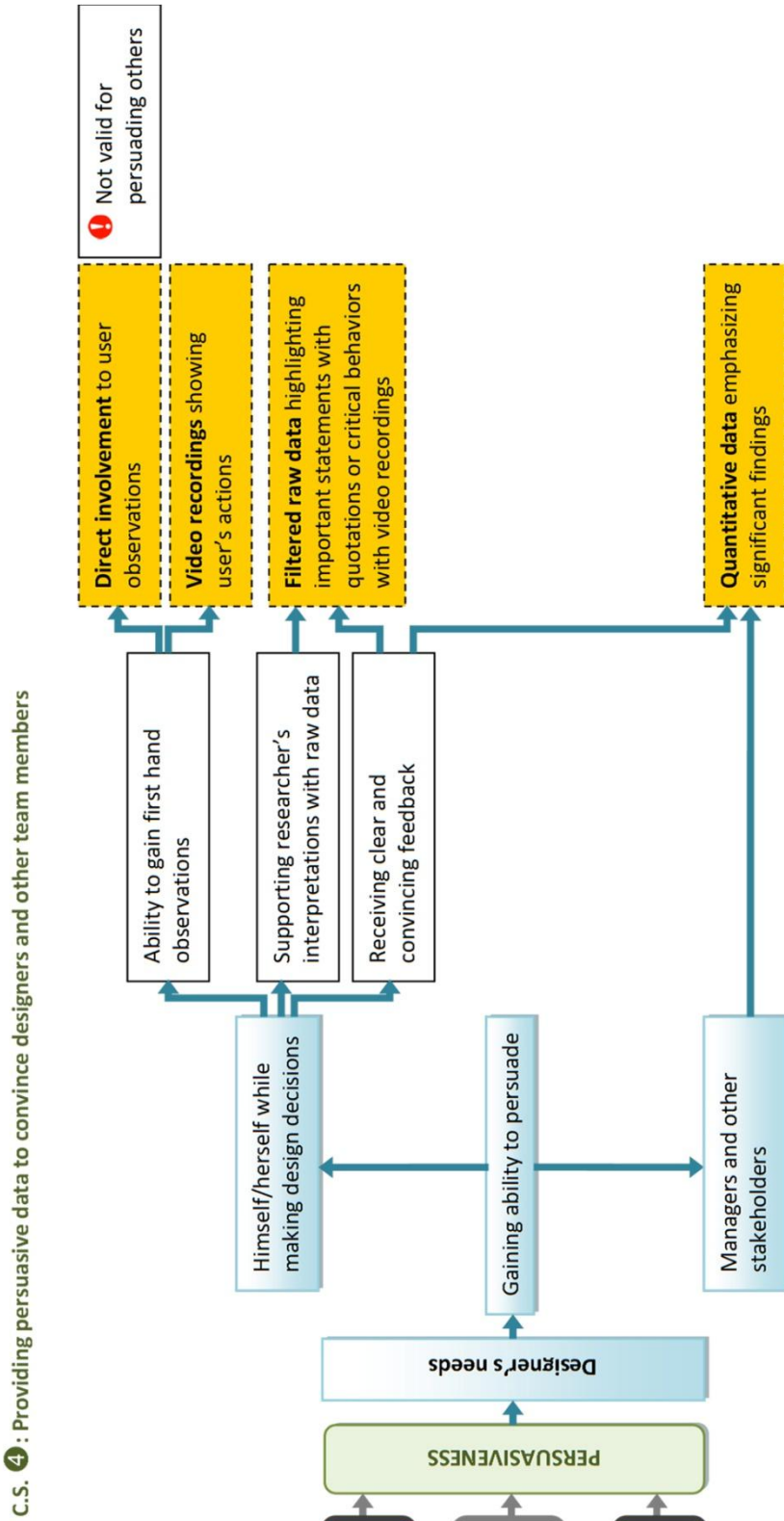
Figure 60. Content Strategy 4: Providing persuasive data to convince designers and other team members

5.3.2.5. Content Strategy 5: Maintaining sustainability for the information

User research is considered as a valuable asset for corporate memory, which requires effort to maintain. It is expected that the research findings should have certain quality which makes them to be considered for future projects of the firm[92] even if the research is conducted for either generative or evaluative purposes. If the data delivered as the result of the user research study have the quality of sustainability, they can enhance the knowledge sources of the company and provide guidance and ability to justify design decisions for future projects. From designers' perspectives different types of contents which are listed in Figure 61 together with relevant designers' needs can convey sustainable information.

- Having all relevant data regarding the user research study is preferred to maintain an archive for the study in case it is needed for future consultation. However such an extensive document should be separate from the actual presentation in order to avoid excessive information which can distract the audience[93].
- Including raw data in such an archive can be beneficial for later investigation[94], if the designer wants to interpret and draw further conclusions which may not be present among the interpretations of the researcher for that particular project. In that case, it is important to provide a proper structure and organization for the transcriptions or video archive, in order to ease the access for later investigation by the designer. Besides raw data, maintaining the methodology[95] in proper detail can be important while assessing its applicability for future projects (e.g. for checking whether the sample or study's context is representative for the future project or not).
- Usability of the delivery medium is highly critical for later usage and sustainability of that medium. Extensive findings and raw materials should be provided in proper structure in a usable database[96] and such a database can be enhanced by including all user research activities done by the firm and outsourcing firms or institutes that carry out user research activities for the firm. This constitutes tremendous value for the corporate memory and for guidance for later projects of the firm. Accessibility can be provided in such a database by providing interactivity through hyperlinks. Moreover integrate-ability of parts of the delivery in the designer's presentations or materials that s/he utilize during internal communication in the design team is important for sustainability, since the designer may want to utilize the findings in future communications[97].
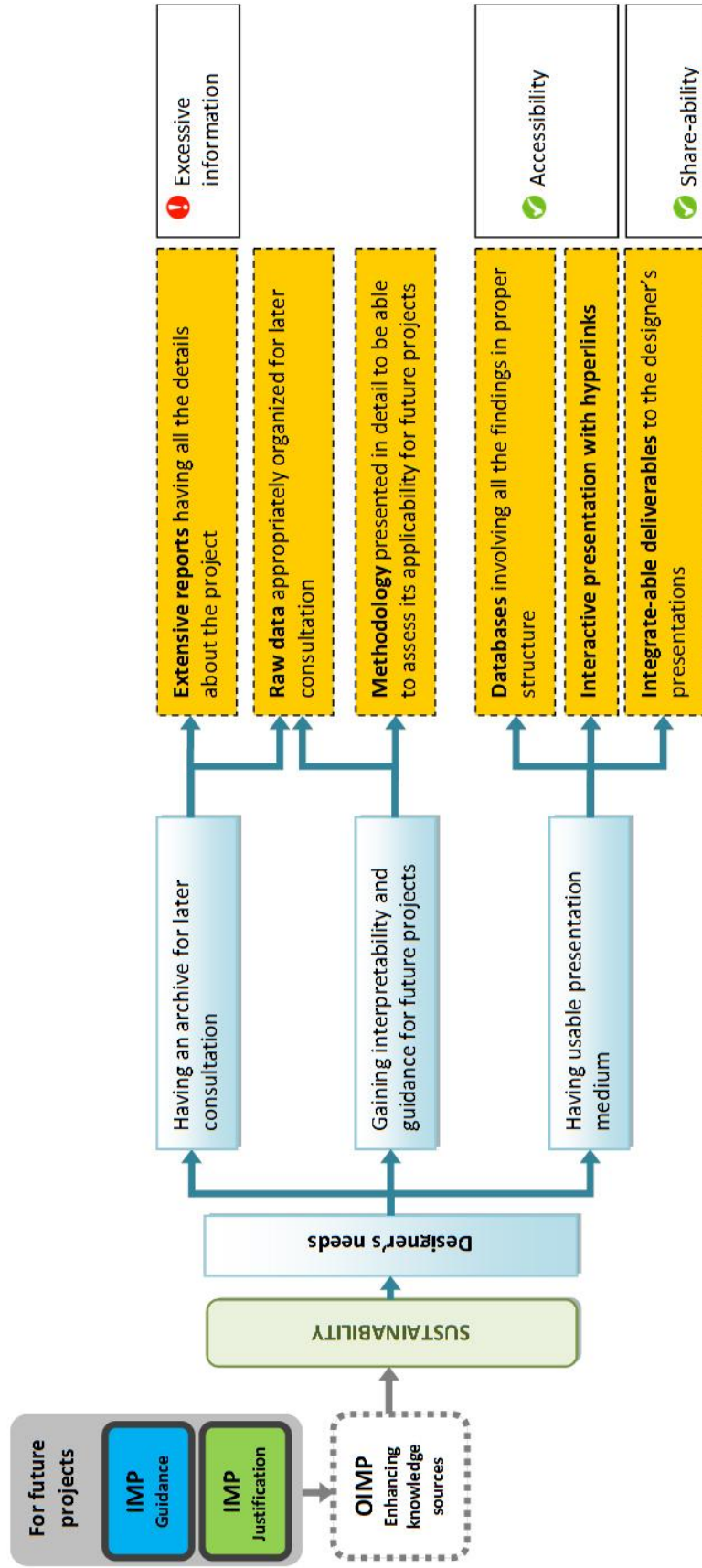
Figure 61. Content Strategy 5: Maintaining sustainability for the information

125

5.4. . Discussion on findings regarding the model and strategies

Strategies and relevant guidelines for accomplishing these strategies presented in this chapter are the major findings of this study. They are intended to be presented in detail at micro level so that it can be possible to understand the strategies in-depthly, while devising a plan for developing user research delivery. The discussions for the findings are made at more macro level by referring how organizational approach to design integration have effects on the delivery strategies that are discussed in this chapter.

Distribution of respondents according to the levels	LEVEL	Danish Design Ladder	Designer's role according to Perks et al. (2005)	Design management type according to Borja de Mozota (2002)	Relative weights of core impacts requested as the result of user research	Researcher interpretation level and relevant qualities requested in delivery
R15 R14 R16 R09 R07 R02 R06 R13 R11 R05 R03 R12 R18 R08 R04 R17 R19 R10	4	Design as innovation	Design as NPD Process Leader	Design as a managerial competence	**Inspiration**	Low interp. • Interpretability • Representativeness • In-depthness • Multidimensionality
	3	Design as process	Design as Part of Multifunctional Team	Design as a resource competence	**Justification**	• Prioritization • Representativeness • Share-ability • Persuasiveness • Multidimensionality
R20 R01	2	Design as styling	Design as Functional Specialism	Design as an economic competence	**Guidance**	• Concrete exemplification • Prioritization • Credibility • Persuasiveness High interp.
	1	None design				

Consumer products / Automotive / Medical / Defense / Design consultancy
Designers / Engineers

Figure 62. Relevant constructs of the model according to design integration hierarchy

As it is presented in the methodology section, respondents of the interview study are assigned to the levels in the design integration hierarchy. Impacts requested by individual respondents are compared[j] to their place in the integration hierarchy and it is interpreted that higher levels in the design integration hierarchy require inspiration, while mid-levels need proofs for justification as the result of the user research activity, on the other hand, all levels require guidance from user research to a certain extent. Major discussion points that make the conclusion for this chapter are listed in the following and visualized in Figure 62.

- At the highest level, where design is considered as innovation and managerial competence and the designer is the process leader, interpretations of the researcher in the user research delivery are not welcomed with the conception that it can block designer's imagination, instead, interpretable and representative materials such as raw data in the form of video recordings are highly valued. Moreover, in-depthness and multidimensionality of the information delivered through user research is very crucial since they support inspiration.

- The third level involves most of the respondents and they are usually received as team players as the part of a multifunctional design team and design is received as a process where the designers are active at all stages and valuable assets of the organization. At this level all the core goals are crucial to different extents. Users and the context should be represented well in order to get to know them better and have inspiration. Furthermore, guidance should be provided with the focus of user-centered design. In this case, the designer consults user research data to clarify the questions in his/her mind to justify design decisions. Therefore, prioritization in the delivery is critical for maintaining this request. Since the group involves team players, share-ability of the user research findings is critical in the internal team communication. Moreover, multidimensionality and persuasiveness are the requested qualities of the information delivered through user research to maintain proper guidance.

- At the second level, designers are not the key components of product development activity rather they received as functional specialists responsible from the outlook of the product which makes it to be sold at higher prices and contribute the profitability only in this way. Since they do not have a key role in the company, the designers at this level needs concrete proofs to justify and strengthen their decisions to the upper management and other stakeholder in the development activity. Therefore, interpretations of the expert researchers are highly valued in user research delivery since it maintains credibility and persuasiveness for convincing others. Moreover, prioritization of the findings and concrete exemplification by providing design recommendations are also helpful for both convincing others and having guidance in the design process.

- By definition, there are no respondents at the first level since it does not involve design and user knowledge integration. However there are respondents who are a bit closer to this group and whose work tasks involve less design activity (one is an engineer developing the electronic card of an interface and the other is a designer whose design decisions are highly dominated by expert users). For them guidance with researcher's expertise is highly critical since they require such knowledge for both making decisions and persuading other stakeholders.

---

[j] Characteristics of the individual respondents in the interview study and impacts and qualities requested by them are listed in APPENDIX J

[1] We are trying to solve these problems by making new solutions that are not considered before. In fact, these are hidden expectations. The user defines the problem for you, but he cannot define what needs to be done. Therefore if there is no solution for the problem that user defines among the examples that we explored or the benchmarking studies that we carried out and the problem still exists, we can focus on this problem and this will result in happiness for the customer. You make the customer happy and in fact, this will create the real innovation and difference… R15

[2] [the research case the this designer carried out previously] it was about specifying needs of users. I needed to relate the specific needs with age groups, profession etc. and specify which of them I should consider in my design. Or what are the aesthetical concerns? What should I propose them? I mean, of course a female bank manager wouldn't use a stupid promotion bag which worth 30 Liras accompanied with a laptop that costs 2000 Liras. Maybe she would like to buy a nice leather bag, but what is she carrying in it? Cable or 3 kilograms of something else? IS she carrying documents or makeup materials? What are they carrying mostly? That study was about specifying the functions that should be considered in this design. Therefore it was about the needs that the alternatives that we design should meet. R16

[3] The goal is to reach the actual product… The goal is to design a product that meets the satisfaction that is defined here, but more importantly the goal is to make it different that the existing products and much better looking. Avoiding to be left behind in the competition among the other products… R15

[4] As a designer what I do is to design a product that makes the life easier for people, designing a product that is useful and used for longer periods of time, benefitted from it much longer… It is about self-satisfaction… R07

[5] If the brief is about redesign of an existing product, the user may already have an opinion about it. He might have used it previously. So we can learn the product's deficiencies by this way. R14

[6] [Receiving feedback from user in the middle stages of the design process] It is important to check if we are on the right way. I am deciding the way of interaction. So this helps me to understand whether I am making correct or wrong decisions. After all, I am interpreting. By collecting all the data, I am trying to guess users needs and design for them… R17

[7] Also, we are verifying ourselves. Another useful side of this [conducting user research] is that we can use the data to verify that we added value to the product. However, there may be a price of this. For example, we may have made the product more expensive or we may have made it more difficult to be manufactured. On the other hand, when the studies are completed and it is reported that 'the product is useful', we would have the proof that this product deserves an investment, namely proof of investment and verification. R07

[8] We are trying to foresee how the user uses the product. In fact, our success depends on how much we can foresee it. If the outcome of research is resulted as we foresee, this would strengthen our arguments. If the marketing group, who we call them as "clients", offers a different design than ours, and if we have to justify it [our design], then that [research outcomes] will bring us in a strong position. R10

[9] When we see such kind of high levels in user ratings [showing the graph in the report], then marketing also sees the light in the product, and this can speed up the persuasion process. R10

[10] It is important to speak as soon as possible, in terms of preventing time loss. If I receive the information late, it will be expensive for me R18

[11] For example utilizing this kind of visuals [showing the visual] is better a way to communicate it [findings], instead of explaining the context verbally. When visuals are utilized, although people name them with different words, there can be a shared understanding. So there is no problem of 'lost in translation'. R03

[12] Sharing the visual materials such as video and photos of the user observation is very important. In that case, you can get insight as if you are involved in the observation process. I think this is really critical. R07
[about a video s/he saw previously] I was really impressed….. The designer can have so many exciting tips from there. Nobody can see the clues and tips except the designer. Such as closing the lid with her foot. I am living this way, designing process is based on seeing. You can start to draw in the cinema, while watching the movie, because you see a clue that nobody else sees. R16

[13] Especially in the design process of a military vehicle, I want to be in the actual environment of the product. I want to experience the conditions that are described to me. For example, I want to stay 3 months with them. I feel the need for observing them in their actual context. R12

[14] We can't intervene a lot as a designer, since it is an airplane. Because they [pilots] know how to use it [and you don't]. It is difficult to design a thing that you don't know how to use. For example, the guy [pilot] say that I use this [a certain equipment] very often. But for me it not such an important equipment and I can place it at the back [behind the cockpit], but since he said that he uses it very often, I have to place it at front [inside the cockpit] What I mean by saying how it is used is that I need to learn for what purposes he use it […] There are standard procedures I am searching for them. They have their own regulations. So we try to learn all of them R20

[15] [user context information] I think, it is the level of stress in the context. Such things can be important for me, also the speed is very important. For us, speed means whether the system is a real-working or or analyzing system. In a real-working system, the user has about 8 seconds to respond, which means if you lose the focus for a short period of time, the data will be missed. That speed is very important. Speed increases the stress and lots of things such as precision of the user. I would like to have simulations for such things, which make me feel those emotions. I mean, if the system make me feel the same level of stress that the user experiences in my own environment, my mind would start to work in that way […] I would like empathy rather than sympathy. In other words, how stress is defined in my own environment may differ. For example, a commander shouting at him may be different than a manager shouting at me. Or, if you don't bring that thing [that the commander shouts about], it won't result in getting fired instead you will die! I mean, I would like to experience that emotion in a more realistic manner. R17

[16] [observing the user in the context] Observing on the airplane can be good, however, since you cannot do it, video can be good also. R20

[17] [specifying the elements that provides happiness] This is about whether I fulfill the emotional needs or not, that sort of a thing. In that case, rather than presentation, user's facial expressions at the first encounter is higly critical. I mean maybe the image of the product and image of the user at the first contact should be displayed together. Like I said earlier, the emotions and the feelings that the user has when s/he sees that [the product] in the store, shop window or on the shelf are important. Therefore, maybe I can catch it when I show the products to him or her. And maybe, I can perceive it easier. His/her look [and facial expression] can be more important than all the things that s/he said. For example, there are ten products, the one s/he headed is very important for me. This type of tests should be conducted. R15

[18] [delivery] should view from the user's perspective well. That is very important. I mean, I am mentioning about a very sociological thing and it is not very easy to do so. However, if the user needs can be associated with the user profile, that is an important thing. For example, the user needs such and such because of rheumatism or his or her age. If such things can be associated, for example, if I want to address the user while designing the product then I will consider his or her

needs. Although, I am aware of the fact that users are already chosen by considering the profiles that we provide [for the researchers as a research brief] and I know that we have this associations already, however, it would be better if the user profiles can be formed by the observations, for example, this age group liked such and such better or this group who has a such disease liked such and such better. R06

[getting to know the user] It is necessary to give some background information regarding the user. I mean, when asking a person about a product which has a touch screen, the background information is needed whether the person has a previous experience with the touch screen or not. R07

[19]For me [empathy] is visual.. for me it is like a snapshot from one's room, you may see some examples in magazines. That snapshot is very valuable to me.. for example a screenshot of a corner that is of value to that person R09

[20][photograph] Because in the photograph, there is the subject which you want to explain, and also the things which you didn't place deliberately that are near to the subject. This provides clues about the user. Like a detective, you observe the environment, condition of the room, cleanness, whether there is a cloth on top of something, or there is a very absurd lamp etc which are also informing you about the context you will place the thing you have done... R18

[21] Persona is also a successful method... When you designing a product for a person, like, you are listening to the problems of that person. Designing for a particular person part, I guess, is a good thing… When you design for a person, I mean reduced to a person, I guess, it is better to have one target that you are aiming at to be able to focus on better. The more you focus easily, the better you hit the target. That leads to a more successfully responded need. R13

[22] Raw data may be useful for future reference to listen and look at it again. Normally, in our projects there are 10 people who will use the product... [advantage of raw data] Sometimes, when the present data is not enough [to understand situation], such a thing occurs, you wonder how should it be [you wonder the reasons]. Then, you are able to find the answers by reviewing the previous raw data... Actually the user doesn't say that I want this in such a manner or I want the button of the recording device to be placed here, but rather, he or she says that I want to reach it easily. When you ask why do you want the ease, he or she replies that 'while I'm doing things quickly, I want to be able to do such and such quickly also'. Moreover, that quickness involves a response to another answer. A response that is peculiar to one case can be a response to another question. R17

Raw data should always be available. Because raw data is a kind of data where you can refer to and dig out the points that the researcher may be missing; in other words, it is always possible to come up with different interpretations on how to summarize and how to obtain outputs. That's why, raw data is essential. R18

[23] [presentation that aims to create a concept] in that kind of a presentation, the things that user has done shouldn't interpreted much. The things user has done should be transferred directly. Because we don't expect that [verbal explanations]. It is not that 'people opened the door', but rather, did people open the door with their hand or did they open door with two fingers? Or did they open the door with their elbows? In that case, in a user observation, it is critical that the actions of the user should not be filtered. Otherwise, as I said, the user opens the door and enters. We can already predict that it will result in this way after it is mentioned. Or, it is not how the user opened and closed the lid of the washing machine, but rather, the user slammed the door with his or her knee, without filtering the information, slamming the door and being disturbed by the noise... I prefer that in direct observation researches, like, at that moment, the user startled. However, in a test environment, it is a very artificial environment in which the user has been asked whether to prefer this or that. There, the aim is to learn about the thing about the preference. If there is a detail of that, I want to know that. But other than that I don't prefer to know that he or she looked at it in such a manner or something like that... In that case, I prefer fewer interpretation. R07

[24] I think the thing that is overly interpreted is not accurate. I mean, when the designer or researcher biased the information, it is not accurate as well. It is necessary to make you know that the information is objective, however, it shouldn't be strict. For the reason that may lead to misinterpretation or missing it entirely by over interpreting the information. R17

I mean, these researches should be transferred without interpretation and alteration as much as possible because the littlest nuances are the things that make us feel why the user is happy or not, I believe. R15

[25] The best way to transfer this knowledge, I think, is not to make it a literary work, but rather to let them know that you are here to give information which includes this and that. And with this graphical and visual materials, you can transform it to the other forms which depends how you want to use the information... Instead of turning it into a report, it needs to continue, like, we saw that such amount of people liked it in such a manner and it goes on like that. R13

[26] If I understand how you collect data and understand you methods by reviewing raw data, I can better understand the parts that I missed R12

[27] In the methodology section, if this study repeats, when the technical team wants to return and work whether the quality of the then study is enough or not, there are 20 people in the study and some regions are not included... It may be performed when you want to do something for that specific region and want to be evaluated in that region, if the evaluation team is only from Ankara, then, for example, this is very local, so we should change it. R04

[28] We don't see this studies as absolute truth or absolute facts. We certainly discuss them further and filter them... There are occasions that we perform that does not like the current situation, but rather, how it can be more likely when we think that it may look like that, but it can be like this by adding our experience. In other words, we use this not as the absolute truth, but as an inspiration source indeed. R05

[29] I mean, by these [user based expression part] we could nicely choose user profiles. We had our own methods and stuff like that, we were visiting houses and so on... We also had an accompanying study [a study that is carried by another firm] where we get the consumer expectations. We combined it with our study and made inferences. GTY: Do you mean it has provided the opportunity of combining it with the other studies? R03: Sure, sure... Where we had branding study especially based on marketing, that … to us "naked consumer" which is the actual will of the user... Because there is a fact that generally the user doesn't want what he or she says so. When we look more, we can combine it with that as well. GTY: To being able to combine this study with other studies... R03: It is being able to cross check actually. R03

[30] While preparing the questions [in the questionnaire or interview] or while planning the structure of the research, definitely the designers, who will be in the project, must be involved in the research formulation process. R15

[31] I consider that statements such as 'the iron's aesthetics is nice' and 'I'm happy with it' are abstract answers. I'm looking for concrete answers to problems or functional elements that can create problems. positive or negative... R15

You are using such terms as masculine and feminine. What is masculine and what is feminine? They [other departments] cannot understand these terms [as they are abstract concepts]. As a designer you can visualize the terms in your head. However it is meaningless if you cannot explain it to other departments. There should be more concrete explanations, but it is really a big deal to make them more concrete. After all design is about doing this… R08

[32] [in the deliverable,] it can be stated that the user perceive this basket as wider and spacious... Let's say that, the most obvious difference between the two baskets is thickness of wires. Then it occurs to me that this feeling of spaciousness corresponds perception of wideness for the user. [in the deliverable] By making interpretations, it does not tell me to make the wires thinner in a

technical way but it tells me the perceived benefits of it by translating it into industrial design language. This is really critical for me […] My aim is to reach that perception. By this way it [the deliverable] decodes that perception. R06

[33] If you ask me, I think there should not be interpretations especially in visual form, because this limits imagination of people. I mean, if you ask me, it is something restricting designer's imagination. There should not be visual recommendations as you just described. R15

[34] If a problem is detected, there must be solution recommendations for that problem. It would be better if there are visual examples for the recommendations [...] Also at the end of the [user research] presentation, I want to see potential areas for future studies and a work plan about what can be done to develop projects for them. R05

[35] Design recommendation is necessary, but it is necessary to test the applicability of the recommendation... Sometimes recommendations comes after these tests, I think it is required to return the test and repeat it for those recommendations, or, at first, the design should be evaluated by an expert and tested together with the alternative design recommendations that expert will offer... […] because after this stage [when the researcher proposes recommendations] s/he wears the same hat with me, s/he wears the designer hat. R07

[36] Sometimes we are benefitted from design recommendations. I mean, we can see the alternatives that are proposed by a different perspective from ours and different from the way we think about. By this way, it definitely contributes to your knowledge as a designer, but it may not constitute a direct input for the design project. R07

[37] Because the research is conducted independent from the brand name, you leave the brand image aside .At the end, to enhance brand image, it uncovers the aspects that you should improve to meet customer demands. Therefore for the next stage, you uncover the aspects that are open to further improvement. R02

[38] in the presentation, there are 5 users which are observed. Let's say one of them is the user A. Let's assume the information about the user A is given, like, the person's age and what he or she does. Then, when we see the user A and the user C says this, we need some data in the corner to remind us that the user A doesn't own a refrigerator, or owns what brand of car. Maybe A and C didn't have any problem as we know that they have such history. Rather than just coding it with names or letters… Such kind of summaries [which are relating individual data with the other attributes the user has] are needed in some cases R07

[39] Since video recordings are unfiltered data, you are watching it as a researcher and making conclusions from it, but when I watch it as a designers, my conclusions as a designer would be different. So raw data or an infographic based on raw data could be more useful to understand what the problem is, since they are unfiltered. So raw data and guidance given with it will be more convincing and efficient. R09

[40] Maybe a video recording will be required. I am talking about hidden cameras. For example, video observations of interaction between customer and products. I mean, I'm saying that it will be like a psychological test in a laboratory with hidden cameras. Because, then, you can see everything. Instead of explaining it with 50 sentences or to ask customer to explain it verbally, to be able to observe how s/he does gains importance. R14

[41] Without generalizing the user, being able to express the true characteristics of the response this specific user says, he or she loves this for this reason, rather than degrading the user to an academic number, like, 8 users say this. These [quantitative data] are already available and we expect them to be, but if it can state that 2 users say this with these feelings, then it is more advantageous. Then I can understand the user... R06

We can determine 'the musts' while we are observing users on our own. May be this kind… while the researcher who conducted observations are analyzing the data, there can be results indicated by one or two people, however you know that they are really critical. You can miss critical things because they are not significant in statistics. However, as a designer, if you are aware of such minor things even if they occurred only ones, it will be easier not to make those mistakes […] Because of this, it is better to underline some of the things, which are not significant in the statistics. Instead of indicating how often the mistake occurs or such things, it is important to indicate problems that can be solved easily. Maybe such filtration can be necessary. R07

[42] [recommendations section of the report] it was like a route to a final [recommended solutions for the product], it was good for us. We saw as a picture that why it is targeted to that result, that part was good, we satisfied by the development of the display in such a manner indeed [...] there would be a gap in our mind, if we had been told that the result is just this, but we could understand that why our suggestion [the evaluated product] is not appropriate. R01

[43] There [design recommendations section], it provides information for me, but I must filter them again. If s/he [the researcher] filters the data in several different ways, if s/he provides several paths as guidance for me, this will become information that I can utilize easily. R06

[44] when we present this [outcomes of user research] to the general manager, he was most interested in graphics. At the end, they [managers] always look for the result. They even review the reports [by just skimming]. Since they mostly pay attention to data in the form of graphs, charts, quantities and percentages, presentations that are quantitative and can be documented in Excel should be delivered to general managers or the people from marketing... R08

[45] For example, [info]graphics for perceived qualities were such graphics that are converted into industrial design language. It is well filtered knowledge and if I design a brand new dishwasher concept, [...] this will be the thing that I consider. Totally abstract... This is the thing that explains to me 'what people pay attention while putting dirty dishes in the dishwasher'. It is the graphic that shows the most important things. Otherwise, the situation in current dishwashers were already explained in detail previously [in the report that is discussed during the interview]. Currently, I am mostly dealing with them, but if I will be designing a concept product, that abstract evaluation [infographics for perceived qualities] would constitute great information for me... R06 [infographics for perceived qualities] there, circles had different diameters. At the first glance, we could see which of the qualities and to which degree are related, or where should we focus on. We could say this circle is much bigger so we should focus on it. Because of these, it had advantages. It emphasized important things with colors and dimension differences. I think this was a good attribute [of the deliverable] too. R08

[46] I think what is done here is great [the deliverable that is discussed in the interview]. Although they conducted lengthily in-depth interviews, they summarized the main theme with only one sentence... By highlighting the expert user's sentence... they did not document the entire dialogue, but they just highlight the striking sentence... R09

[47] We have always assumptions that are 'according to me or us' [...] We had questions in mind and we asked UTEST to quantify these questions. Does thickness of the part that the customer touches really give the intended feeling? Or is it the sense of stiffness that is more important? Are the colors confusing for the customer? Or is coloring the parts guides him? In that case, we quantified the needs according to the results of the user research. When the needs were quantified, we no longer had questions in mind. Why is it so? Because we know that, for us, these qualities were evaluated with a large sample group and put in an importance order. R04

[48] When you target a certain user group and start to work for it, you want to know the percentage of the target group that you appeal. Therefore, percentages are critical. Or, I will give an example regarding ergonomics, you want to know the percentage of users that the product you design fits.

You want to know the percentage of Turkish people who can see the information screen behind the steering wheel, when they are seated in the automobile seat that you use in the design. R13

[49] [understanding how the product is perceived] you can distribute a survey and ask what the product evokes in their minds. As a result of this, positive or negative evaluations can be obtained. In this example, you can ask the connotations of this fitness product, or you can ask the emerging keywords, if mostly negative keywords are emerging... You know, there are tweeter trends, for example, some words are displayed in upper case because of high rates of search, and the others are lower case and so on... Ultimately, whether it is positive or negative in the minds of people, if this one was very negative, we are able to understand that... a product can be understood as absurd in one cultural environment. You can notice that... you can understand the thing that you would not notice under the normal circumstances... R09

[50] Generally, the work which is done is described, afterwards presentations are given, but, in the end, we want this report for its result, therefore, result is the most vital part. Hence, I should be able to see it as a clear, summarized and easy to be described [document], because after two or three years, or someday when I share this report with people who does not know anything about the context, the graphics, the indicators, the sequence and the charts are vital... for example, after 10 minutes, if I present this study to general manager, most likely we have 10 to 15 minutes. In 15 minutes there should be catchy visual and result oriented evaluation. R04

[51] The designer should definitely be involved in the research process. S/he may intervene in the process of planning the deliverables and change it or s/he may change the research structure so that s/he can get clear answers… S/he must definitely get involved in the process. While preparing the questions [in the questionnaire or interview] or while planning the structure of the research, definitely the designers, who will be in the project, must be involved in the research formulation process. Indeed, I participate as much as I can by visiting the research companies. For example, as in the hairdryer case I mentioned […] I went to the company, we sat round the meeting table, and I said I wanted these and these, I mean I would like to get these information. What are they? At first, the points where they got disturbed regarding use… What do they do, while storing it? How do they store it? Where are they putting it? Are they winding the cable around or throwing it anyway? R15

[52] Only report is not enough, discussions are definitely required. We should discuss on it. Because we are always recording the right messages there. While I am writing it [the report], I have a different thing in my mind and I amd I am writing it, because my world is different [than the researchers]. While I am reading it [the report] I understand a different thing, because my perspective and world is different. Therefore even if so much effort is spent on it, I can receive its outputs and still make mistakes, since I may get it wrong. Thus I think there should be meetings at which we can discuss and check that whether we are on the same page or not R05
There should be statistical information, we should read it, but maybe something in there [among statistical findings] stuck my mind, I may want to see them. Because I can search for something else in there also. I can call back and ask something to you. I can say that 'you said this but I have a different interpretation, for example, it is good to make it tight, but wouldn't it be more appropriate, if we make it thinner? You see, in this figure it is like that' […] we have to share the same language with you. I am on the design side […] maybe somewhere in the middle of the [research] process I have to be involved R16
Checking would be beneficial for these workshops [where the user research findings are discussed] also… Conducting workshops with the researchers, who carried out these tests, would enable us to easily communicate [team communication]. Because, on a piece of paper, I have chance to discuss whether s/he [the researcher] implies this while s/he is saying that… R17

[53] At the first place, while making the [verbal] presentation, the product that the presentation is about should be there. During the presentation, it is important to deliver the problems again by pointing out such things as 'when this happens that happens too'. Because for example, during this kind of presentations, a considerable time may have passed since the completion of the project or there can be people who are not knowledgeable about the project and they do not understand

what is being discussed there at that time. For example the red light appears there, not everybody who are present there can know why that light appears… especially if this presentation is done in a really formal context, I think the product that is being tested should be present and some of the things should be simulated there again. This would ease comprehension… R07

Definitely, there should be verbal and visual descriptions of the product examples or simulations. Because, I think, it is the best way to communicate something to others. It also saves time. Also, it is important whether everybody understands the same thing or not. Instead of imagining, it is always easier to describe on something that is present there. I think obviously people can easily come to an agreement if this happens. R11

[54] For example, this part [participant based presentation] is a part which we consider and talk about it a lot. Participant profiles and visuals from their homes.. You can explore them through the hyperlinks. It really describes the user well, house appliances and such... for example mini oven user, this appliance is a small thing.... You can also look for the comments about it later on. R03

[55] The deliverable should be flexible so that you can utilize it in your internal presentations and in your own design process. I am talking about the deliverable materials. It should be flexible. It is critical that some of the things in the deliverable are easily printable or some parts of the deliverable can be integrated and added in your own presentations. I think these are really important. If such a source is in your hand, you should be able to separate it, cut it and use it in anyway you like and anytime you want. R07

[56] I think it could be more useful, if they [deliverables-reports] are sent via e-mail. […] The circulation will be faster. For example, if I am not going to look at it, I can forward it to somebody else [in the team]. R03

[57] As I said before, I am fully in this process. But we have managers who have only half or one hour for this subject we need very simple. They come from [a different city] and watch the presentations. Catchy, clear and simple information is needed. R04

[58] [Justification of design recommendations by the researchers] when we present them to the managers, this enables this will enable them to see where this final interface originated from. So they also know that why we need this thing. It enables to justify solutions and convince them. R01

[59] Since designers not have so much time to examine books and reports in practice, it is better to deliver information with interfaces or presentations that enables to access the information instantly. In that sense, we appreciated this interactive presentation very much. I mean, that enables us to reach the statistics and the related detailed data if we want. R08

[60] [hyperlink usage in the deliverable] You can show whatever you want without moving away from the main page and without distracting the people in a very fast way. I liked this method, it is very useful. R04

[61] [extensive reports] they can reside somewhere else somehow, but in the end a very concise thing is required, something that everybody can look up and find answers immediately when they have questions in mind, something that is catchy for everybody… R02

Of course you can have deliverables that must be read. However we need deliverables that communicates though more visuals and graphs. Because as I said, a designer, or in fact nobody likes to read a lot. Everybody wants information available in hand any time s/he wants. R08

[62] For example, sometimes when deliverable comes as a Word document, it contains so many pages and so many chapters that you can to miss the important parts. Chapters should be arranged…
Maybe documents should be separated by defining different parts. For example, one of the can be detected problems. You know there are detected problems, you heard them during the presentation, but you don't know where it is in the document. Sometimes you want to use it again maybe after a year, and you have a 150 pages report and you don't know where to find it...Maybe

there can be something to be able to find things easier… The most important thing is to reach the critical information again whenever you want. R07

[63] Good user research, first of all, should be really informative. While giving information, it should be filtered and refined. This is very important and valuable for designers. Otherwise we will lose so much time trying to refine it on our own. R14

[64] These deliverables should not be very complex and complicated. Because, generally, these deliverables are 200-300 pages long, and to be honest, all you are interested in is only 2 or 3 spots there. They should be explained well, and instead of information crowdedness, we look for more clear and concrete results. R15
Written parts are not so important. These reports are not read anyway, unless somebody makes a summary. So if it will be written, it should be summary. R11
Only written document without visuals is certainly not [OK]... I'm not talking about reports only, generally it is like that. Because if you receive a report more than two pages, you don't read after certain number of pages. You fairly scan them all. Therefore they are not useful... So, refined information is enough. R03
The information should not be delivered like a Master's thesis... I don't want to read 80 pages. I only read the summary and move on. I don't read, if something like that is delivered... R16

[65] When the report has too many details, it is very difficult to look at it from the big picture. The report, which shows the big picture once in a while, would be better. R06

[66] Sometimes the report mentions about standards and so on, it is a little bit... Personally, that part makes me a little bit [bored]... Yes, there is a standard, but it [the report] talks about a very general thing, however, I want to know more about the other parts in which our product is discussed specifically. Although the part about the standards may be important, maybe we could have a separate session on standards, because when I attend a user research activity, I want to focus directly on the specific issue... If it is necessary or if it is requested, they can do a separate thing for standards... In presentation, repeating and reviewing basic things about the fundamentals of that work can take a lot of time unnecessarily. R07

[67] If I try to make a conclusion by examining all of the raw data, it becomes a very time consuming and unnecessary task for me. But it would make me happier, if somebody receives these data and deliver it to me in a refined and summarized format. R14
I don't want raw data as a presentation medium. I thought that, in that case, I can conduct the study on my own and there is no need for a researcher. R20

[68] Approaching from various angles is important. For example, a research conducted from one point of view does not always make it possible to acquire proper information. For example, acquiring data from only one group does not always give the most correct information. It is possible that different segments of society will utilize the design. It is important to approach from various perspectives and cover various groups. [...] it is useful to acquire information from a wide sample by including various groups as much as possible to define the criteria for design… R14
[focused thinking] as a designer, I don't think that it makes us gain a lot of thing. Therefore, my approach is more generalist, I mean, for problem solving, it is OK to be a specialist. I mean, it may have critical benefits for problem solving, when solving technical problems. However, especially for solving problems regarding the entire product, it is necessary to think widely. There is this way and the other, and also gathering the sum of results for producing something is more useful [what feeds the generalist idea?] the user research is feeding it, but you shouldn't interview with only a single specialist, you should interview with a lot of specialists. R09

[69] I think, interpretation of the findings should be done at the presentation together [with the designers and researchers]. Because it is important to know how the people gathered there get, digest and interpret the information. Therefore, interpretation part shouldn't be left to research companies only… R15

[the advantage of design collaboration of researchers and designers] I mean, I think that [research] team will be composed of designers as well, I mean, actually it will be, like, designing with a large group of designers, I think, who are a bit more experienced. I consider that they had experience [with the user] R17

Workshops can be good as well. Although we didn't have such a team, I was sharing my findings with the factory manager, for example. They suggest something, in that way, that supports the user research in a way [...] I could be headed towards a different way with their comments and by considering my findings from user research... R19

[70] This provides multi-dimensional thinking, while designing a component of interior or exterior of the vehicle. I can establish one or two relations when I work on my own. On the other hand, since this is a very detailed study, I can establish more relations. So I can look at it by considering other dimensions. R08

[71] [multi-dimensional thinking] For example, we can establish associations with that multimedia CD [software]. By clicking a button [on the software] we can go other places. By clicking back, we can look at the big picture. I mean, what I meant is to have multi-dimensional thinking by bringing those associations to a higher level each time. So we can establish dimensions between the relations of design elements. Instead of two dimensions, maybe we can examine them in three or four dimensions. R08

[72] Especially if the phases of usage are considered, looking from different angles can provide a richer perspective. If I am there, I can view it from an angle, from the point where I am standing. It may be influential to view it through the eyes of another person... divide the screen into half, if it is related with the body, it is here, if it is being done by hand, it is here [in the other half]... in situations like this, displaying all of it in the same view in the presentation can be very effective... I won't be able to catch all of it in the actual observation. However if there will be analysis, the four views retrieved through separate cameras will be analyzed separately. I am talking about a visual summary here. R16

[73] You can think the purpose of testing again, however, here it is also possible that, we are producing 2000 products at once, and give it to the users. The users we haven't any relationship with. I can evaluate the complaints they have. But we couldn't correctly analyze the underlying reasons that cause the problems or we couldn't analyze the problems at all. But by outsourcing research regarding user testing and problem analysis, we get the chance to understand their complaints and why they bother them. So I can see the underlying reason rooted here. This is the most important benefit of user testing, in my opinion. R05

[74] You can think the purpose of testing again, however, here it is also possible that, we are producing 2000 products at once, and give it to the users. The users we haven't any relationship with. I can evaluate the complaints they have. But we couldn't correctly analyze the underlying reasons that cause the problems or we couldn't analyze the problems at all. But by outsourcing research regarding user testing and problem analysis, we get the chance to understand their complaints and why they bother them. So I can see the underlying reason rooted here. This is the most important benefit of user testing, in my opinion. R05

[75] basically unfiltered information [raw data] enables to understand what the problem is.. R09

[76] I don't think that the quantitative deliverables are very useful. Findings like 10 people like this or3 people like that...Reasons should be questioned, because there can be superficial answers or there can be answers that are stated by properly thinking on them. Or there is only one person among those 100 people who tells very interesting things. You should detect that. Therefore there shouldn't be only quantitative questions like: 'Which one is beautiful? This or that?' R15

For some decisions, bar charts and pie charts can be useful. But design decisions have so many variables. For example, 80% of users look at the left. Okay, they are looking, but why are they looking? So what should I put the left, this or that? I need so many things to decide. Or deliverable

tells me what kind of information is needed by the user. But in that case, I say there are 20 ways of giving that information, and I question advantages and disadvantages of those ways. Therefore these are too concrete information for me. GTY: Do you mean concrete information as it does not convey the underlying reason? R17: Yes I find it that way.I mean, more correctly, I need much more philosophical [abstract] information which broadens my perspective, which inspires me... R17

[77] For example, recently we worked with a company in India, an outsourcing [research] firm. I can't say that I'm satisfied with the way the study is conducted or its outcome. Although they made a very extensive research, there is little amount of information that directly affects the design. The valuable information for the design is about 10% or 15% of the results. When I look the results, I can't see clear information. I mean, the right questions were not asked. The project remains superficial. Maybe, they visited a lot of places and spent a lot of time more than a good study requires. However it seems that they didn't spent qualified time. For example, there are really few photos. I mean it should be heavily visual with photos. R18

[78] There wasn't any misleading guidance. But it was entirely up to people, who conducted the research. I mean, I really want to underline this. We didn't experience any problems, because the information we receive is correct. If there were mistakes in the analysis, definitely we would be harmed because of the wrong decisions we had made. Because, the quality of analysis is very very critical. R05
Since we receive the information from an expertise center [research institute], their recommendations are very valuable for us. R03

[79] You can observe the things that I cannot observe as another person observing it. In fact, I really feel this need. I always ask myself whether I miss something. Because of this, the method that I apply is creating a mock up, and putting the user inside it, as I cannot pass this work to someone else for now. R12
It is important to be objective. Well, in fact, it is more important that presentation is done by an independent institution than it is done by the firm itself. Because the firm has its own criteria and these can direct the study intentionally or unintentionally. Looking at its own point of view, it will gather the data only about those criteria or it will not care for the information that will disrupts its work. R14
You could say objectivity. The thing is very important, here, on all the work we do, we get stuck on a certain point, like a virus. In the beginning of the project, you said some level is enough for users, but it might turn out to be wrong, well in fact it would have turned out to be wrong in the next year. We get accustomed the idea and we cannot keep ourselves from that. Then we say it is finished and we forget about it. But in the early phases of the project, when a really objective person, who encounters with that telephone or that operator for the first time, identifies the problems, we earn a lot of things. R10

[80] It may help to see the consistency of the user's answers in one-to-one environment [in the context] and his/her answers in the test environment. But I say this here, I also consider myself like this, in test environment, people can act more artificially. They will be different than the real themselves. Something inside me also says that individual interaction is more critical. For example, instead of the mood when you say: 'Hi buddy, what's up? Let's go to some place, and you try it', when they [researchers] say just 'use it', if I were them, I will be tense. I think that true result might not come up from that. R12
The videos that are taken when people are unaware has this quality. They say the things they really want to say at that time. I guess it is that what we need to have. I mean it is available in the current studies as well. They do the clinical research, but the user is unaware of he is being tracked. You get the true data at that time. That type of information creates the surprise effect. R13

[81] When you directly ask the user, he says that he wants it all and tells you to show him all. Because of that verbal interaction is not very beneficial. He should start using the system a little bit. R17

[82] The survey with 103 people was very beneficial. Because the data that come from 10 people is generalized with the survey data. If the findings were limited with that 10 people, we would always think that 'but these were 10 people'. Supporting the data with 103 people was very beneficial. R05

[83] For example in this process, the thing is bad: You gave the design [for conducting user research], it is put in a box, data comes out from another box, I think that conducting the observation together with the designer and including the designer in the process [of user research] would be better. Because, at the end, you are already translating an event here. Maybe directly seeing that event can be more trustworthy for the designer.R03
I mean, these studies should be reported without interpretations and as they are coming from the original source as much as it is possible. Because I think that even the little nuances there are important, and they are the things that provide clues for us to understand why the user is happy or unhappy. R15

[84] For example it requires a video record, for example observing a customer or any individual's interaction with something, this is like a laboratory or like a psychological experiment, like recording it through a hidden camera, I am mentioning something like this. Because then, with that image, everything will be revealed in front of the eyes. Instead of explaining it with 50 sentences or going and asking it to that person, observing how the user does those things is more critical. R14

[85] I, for example, pay extreme attention to some of the things. For example, recently we had a meeting. We asked some questions to the user. There were also engineer fellows, they were gathering information and I was also collecting information there. We asked something, I immediately told that it was a lie, I mean, I shouldn't say it is a lie, but he [the user] didn't know, he couldn't say that he didn't know, he was confused, he was saying contradicting things. I directly ignore that data as it was not true. The other fellows recorded that and they were trying to analyze it. I said that certainly he was not telling the truth. I understood later on that he was not telling the truth, I could catch that from his behavior, probably because I had long term experience. I will absolutely question this; whether these people [researchers] who are conducting the test really understood the information when they are collecting it or not. Or did they notice something else? Therefore they [researchers] should provide me to experience [investigate/question] the information somehow. If this is provided, then the trust is maintained. At least, it enables me to check it to some extent. R17

[86] [receiving feedback] It is very effective when the information is delivered by making you to interview with the person who provides that information. For example, sometimes they bring us there, and they say that 'we are the producer of that device, and that friend is designing a product for us. Do you have problems with or comments about this product?' They talk about the existing old device. Then he starts explaining… R11

[87] But this [the research that the designer conducts] has a shortcoming also. In a way, I think of this, and say that the result is only a result that I deduct. It will be a thing that only I will apply. But when the result is provided by an institution, then it will be easier to convince others about that...R12

[88] Guidance provided with unfiltered data will be more persuasive and efficient...
Persuasiveness...You come up with a result, but when you question it, it needs to be persuasive somehow. By showing raw data, you ensure that persuasiveness. R09

[89] A thing like this could be striking. A thing that we are not aware of, it can be a customer's sentence regarding something s/he notices. I mean, you have explained it, but in order to be more effective, you can put the image, the screen shot, very briefly, the point when s/he says if I do this, it will be really good. This will be effective. R04
[Showing the user behavior through a video recording] Seeing persuades me immediately. […] but my manager, the boss of my firm, is familiar with a different kind of information, he only accepts the statistical data as the truth.

90 When you are saying this percent of people use this in the wrong way because of this reason, then there is a bomb error in that product. It is very persuasive. Absolutely, it shouldn't be like that. This button needs to be elsewhere. R16

91 You as a designer see a thing , and you say that we need to resolve it, it is a problem. But the other people do not care about it, until there is a complaint from a customer or until you prove your point with a study you have conducted. 'Yes look at it, I conducted a survey with this many people, and the results show that I'm right.' Then they care about it. And this makes your subjective opinion valuable once you prove that to somebody, because everybody can put different priorities. R18 Indeed, when we see that the product is at higher levels considering customer preference, the marketing can see the light in that same product. I mean, this can accelerate the persuasion procedures. R03

92 The most important thing here is that the study done should not be done for only one project and dies afterwards. It is important that it should live and it should be sustained. It needs to be sustainable. R07
This [user research case] becomes the criteria for a product that will be developed regarding the same topic. There are customers, we work with repeatedly. For example, the following year's model for the same product is requested to be designed from us again, but at that moment, we receive feedback. For example, they say that there are customer complaints regarding this detail of this product, such information is coming to us. R14

93 A thing [report] that is this thick can be a backup at most, I mean, an extra backup. R02
Report, which is an archive document, and presentation document are different things. Report presented there is an archive document, an information that needs to be archived. R06

94 [The part that includes raw data] They should be given to industrial design, so that they can understand what needs to be cared for the future projects. In this part, there is very detailed and beneficial information for the future projects. That group [industrial design department] should explore the part in more detail. R01
Raw data may be useful for future reference to listen and look at it again. Normally, in our projects there are 10 people who will use the product... [Advantage of raw data] Sometimes, when the present data is not enough [to understand situation], such a thing occurs, you wonder how should it be [you wonder the reasons]. Then, you are able to find the answers by reviewing the previous raw data... R17

95 In the methodology section, if this study repeats, when the technical team wants to return and work whether the quality of the then study is enough or not, there are 20 people in the study and some regions are not included... It may be performed when you want to do something for that specific region and want to be evaluated in that region, if the evaluation team is only from Ankara, then, for example, this is very local, so we should change it. R04

96 After a certain period of time, looking at the all the users, a database formed like this [will be critical], for example while doing safety security analysis, how many times and to what places his hand strike, or how many times and where it is locked, where it does something, a topic like this, that I think it [content of the database] will bring solution to the design. I predict this will reveal the problem in the current design. R12
In fact there are two things, in specific, it makes the design we are working on better, besides this, it forms an experience database that builds a database of the designs we will make in future, for ourselves. R11
As I said, that it is heading to a correct situation, like design verification, you know those decisions reside in the marketing. I mean, I don't know… 'not the red one, here, we looked at every product in the market, all of them are black, ours should be black too'. Bu then, you observe that after a period of time all the products start to resemble each other. If you want to be the trendsetter, you need to consult other data. You are required to create a pool with such kind of data. R03

[97] [Flexible presentation for what purposes?] For example when you are carrying out the next project, you look at the brief, in the previous one and in this study, we have information about the users reactions or you know that the user prefer this product. Accordingly in the new project's brief I can use that, but in the other study, or in the ovens, people like green color, but in your oven study not only color, only it is related to the door or has this and that, everything is included. You need to pick up the line related to the statement that he likes the green color, and could write that here with its proof there, with its findings there, you should be able to put that there. Where? Well, when you are preparing a new project brief, when you are preparing a design brief for yourself. R07

CHAPTER 6

CONCLUSION

In this chapter, conclusions drawn from the results are highlighted by answering the questions of the study, and then contributions of the thesis are summarized. Finally further research which can be conducted by considering the outcomes of the thesis are discussed.

6.1. Research questions revisited

The aim of the study is to develop a model for effective communication of user research findings to the design process and to propose guidelines to utilize it while designing user research deliverables. A basic frame (Figure 9) is adopted as an umbrella structure both to explore the dimensions of effective communication and to prescribe the way it is achieved. Specifically, the model is first investigated in the descriptive format in Chapter 3, while conducting the literature search and empirical study to explore its dimensions, and then it is converted into the prescriptive format while formulating the guidelines in Chapter 5, so that the strategies and guidelines can be clearly communicated. While developing the model with its dimensions and guidelines, three major questions are answered.

6.1.1. WHAT? : Dimensions of effective communication

Impacts requested as the result of user research activity are considered as the dimensions of effective communication. They signify **WHAT** outcomes are expected from user research activity. According to the results of the study five major impacts are identified as critical ones and among them three are the core goals which are clearly identified as the targeted impacts. In order to achieve effective communication these target impacts should be carefully considered while developing the deliverables and communication strategy with the designer.

- **Inspiration**: The designer wants to utilize the knowledge gathered through user research as a source for inspiration to lead creative idea generation. For achieving this, ability to have his/her own observations and interpretations is highly critical and s/he needs to get to know the user and gain empathy. However while doing this s/he does not want to be restricted by the rigid suggestions made by the researchers.
- **Guidance**: User research should maintain guidance for the designer by providing suggestions and possible directions that s/he can consider while designing and delivering the data to initiate the design process by overcoming the insufficiency of knowledge that design briefs lack in. It is observed that usually designers do not receive detailed briefs that correspond to their needs regarding the initiation process or they do not receive any formal brief at all. They need to identify requirements that outline the boundaries of their designs. In that case user research has a critical role by assisting the designer in the requirement gathering process. Moreover, according to the results of the study if the firm that the designer works for does not integrate design activity in the product development process in a mature way as in the lower levels of Danish Design Ladder, guidance becomes a critical issue since they expect design suggestions and solutions from research outcomes.
- **Justification**: The designer needs to justify his/her decisions while communicating them to the other stakeholders and managers to be able to convince them. Moreover for the designer, justification is necessary for his/her internal decision making process in the

design activity. By supporting his/her ideas with the reliable data from user research s/he can be able to proceed in the design process by making effective decisions and without losing time.

The other two critical impacts, *empathy* with the user and *having feedback* about the designed product regarding its use in the context and position among competitors, are expected as the generic outcomes of user research and they are functioning as means to achieve the core goals.

6.1.2. HOW? : Ways to achieve effective communication

By answering the first question, what effective communication means to designers is revealed, while the second question explores the ways to achieve it. Therefore **HOW** it can be maintained by considering the content and the means of delivery is a critical question to be answered in this study. Results show that degree of designer's involvement in the observation and interpretation process is one of the major decisions to be made in order to maintain targeted impacts and thus to achieve effective communication.

While exploring dimensions of effective communication and describing how it is maintained, the basic model which is presented in Figure 9 is utilized as a generic structure. To conclude this exploration process, a macro model in which the critical outcomes and relations represented based on the degree of designer's involvement is illustrated in Figure 63.
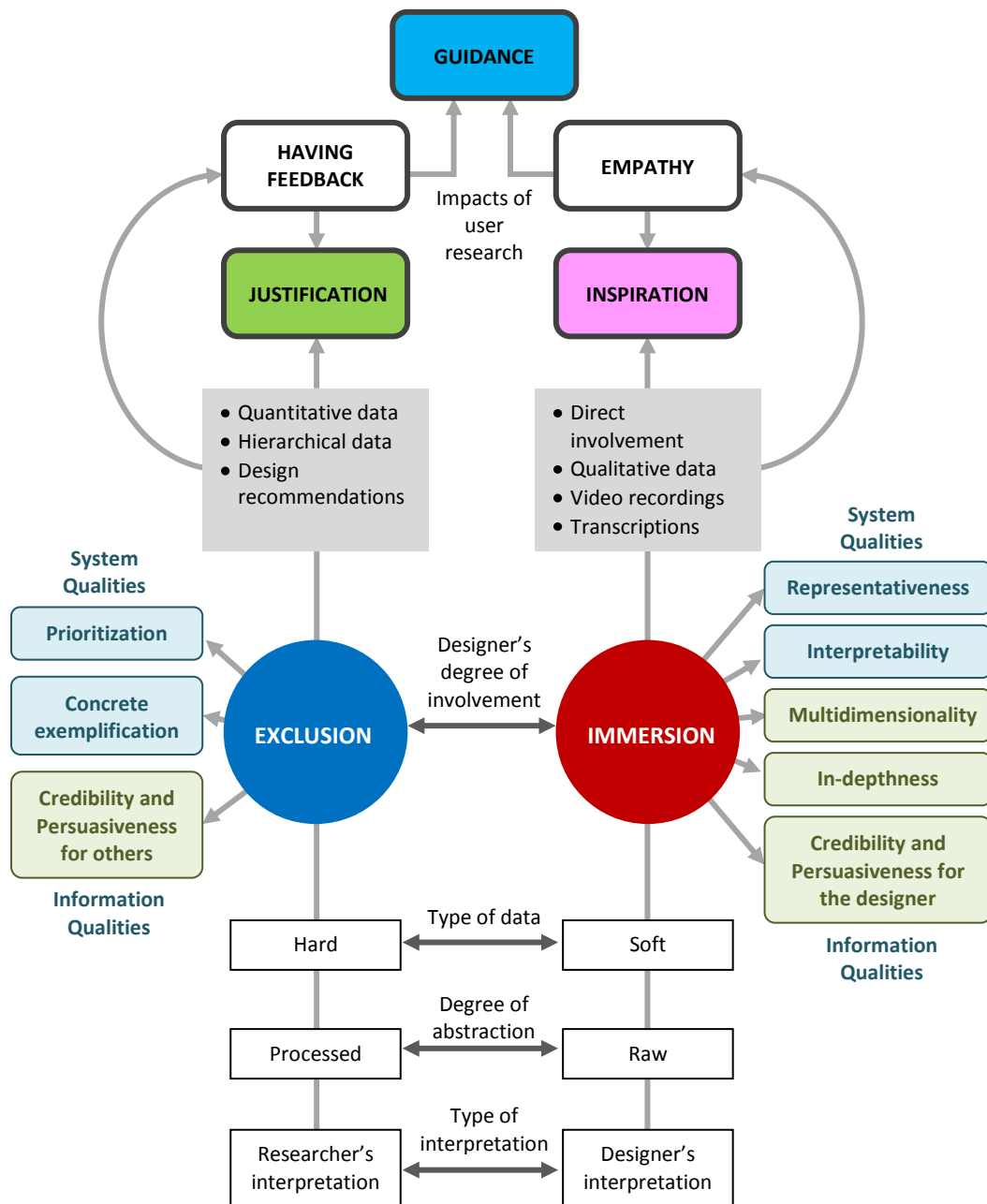
Figure 63. Macro model based on designer's degree of involvement

Designer's immersion in the user research activity is highly preferred for maintaining empathy and having inspiration by observing users. Many times, direct involvement in the research process and observations is referred as a need for gaining empathy, which is helpful in identifying design requirements. If it cannot be maintained, raw data in the form of video recordings and transcriptions are requested to cover this need. These types of soft data support multidimensional thinking and maintain in-depthness, which is crucial for understanding underlying reasons of user's behaviors and expressions. Moreover they provide well-representation of users and the context of use and they are open-ended for the interpretation of the designer.

Although immersion through direct involvement is vastly critical for inspiration and empathy, the researcher should have control over the immersion process; since sometimes the conclusions drawn by the designer can be misleading; because they are based on the limited number of cases s/he is involved in and may not be generalizable considering all the data gathered through the entire

research process. Moreover observations drawn by direct involvement are highly personal thus they are not legitimate for persuading others and they are only valid for convincing the designer about the criticality of the issues s/he observes. Since generally the designer does not have time to be involved throughout the entire research process by observing all users and reviewing all the gathered data, the researcher should provide a valid sample from the critical observations in the form of video recordings or transcriptions to satisfy designer's immersion needs. This filtration process is critical to reflect the researcher's conclusions which are based on all the data gathered throughout the process and these reflections constitute a beneficial input for the design process which maintains the real effectiveness in communicating user research findings.

To maintain inspiration and empathy it is critical to provide an observation lens for the designer to immerse in the context through deliverables. Since relying only on active participation of designer is not sufficient to have a full use of the research findings and misleading if erroneous conclusions are drawn by the designer based on limited number of cases s/he observes, the deliverables should be carefully designed by considering the balance between designer's involvement and exclusion. In fact, in this study, this is the reason why designer's degree of involvement is considered as a major decision to be made while developing deliverables and devising communication strategies.

Exclusion of the designer from the research and interpretation process is necessary when outside opinion is requested as a result. This can prevent operational blindness especially if the research is carried out by an outsourcing firm/institute. The designer can justify his/her decisions with the information provided by researchers while communicating design ideas to the other stakeholders. Concrete results such as quantitative priorities by indicating the statistical significances are persuasive while justifying decisions to the managers since it can aid investment decisions. Design recommendations or example cases provided in delivery constitute concrete proofs that enhance share-ability of the results with the managers, who would like to see evidences. Moreover, even if they are unwelcomed by some of the designers based on the thought they can restrict imagination, recommendations provided by outsider perspective are very valuable, if guidance is pursued as the outcome of research.

The conclusions that are discussed above are aimed to answer the question of how effective communication is made from a macro perspective and thus they reflect generic qualities to achieve the effectiveness. How these qualities are maintained is discussed in detail as specific strategies and guidelines in Chapter 5.

6.1.3.   IN WHICH CASE? : External factors affecting the dimensions of effective communication and ways to achieve it

It is seen that design integration type is one of the critical parameters that should be considered, while deciding on the targeted impacts and system and information qualities for creating the impacts (Figure 62).

- Designers working in design driven and innovation oriented firms require inspiration thus immersion of the designer should be provided by providing interpretability and maintaining empathy with the user.
- If the designer works in a multidisciplinary environment where team work is central, share-ability of the results are critical while justifying decisions, and since there are more time restrictions immersion should be provided through researcher's guidance.
- Designers who are functioning only as stylists and receiving briefs from departments, such as marketing, need concrete findings to persuade other stakeholders and managers while making decisions. Therefore exclusion of the designer from the interpretation activity by providing recommendations and quantitative results is more appropriate for designers' informational needs.

Moreover, since the type of industry that the designer works for has a decisive role in the type of target user group that s/he deals with, requirements for getting to know the user change according to this parameter. Immersion is a must for the designers dealing with professional users, and in some cases, they can access the whole population who are using the product they designed, while

on the other hand, in others, they may not have any access to the context of use, because of the task restrictions such as a design case for battlefields in peacetime. In such cases immersion should be supported through simulations of the context.

6.2. Implications of the study

The study has critical implications for delivery design and evaluation and the methodology that is utilized in this study.

Delivery design: It is suggested that the outcomes of the study can be utilized by researchers, while developing the delivery mediums and communication strategies for user research activity. By considering the outcomes it can be possible to devise case specific requirements based on the indicated external factors and impacts requested as the outcome of the user research.

Strategies that are presented at micro level in Chapter 5 provide detailed and specific guidelines for the researchers for planning both delivery strategies and content development strategies.

Delivery evaluation: This study constitutes generative research for designing deliverables for maintaining effective communication. However, constructs of the model can be considered while evaluating or measuring the effectiveness of delivery mediums and communication strategies that is adopted while delivering the findings of user research. It is considered that such contribution is highly valuable, since it maintains feedback regarding the delivery, which constitutes tremendous value for organizational development of the research department or outsourcing firm/institute which carries out user research.

The methodology: The methodology for the interview study is regarded as a unique approach considering the analysis strategy that is developed peculiar to this study. Cognitive mapping study is analyzed through laddering analysis and cross impact analysis charts are utilized for representing the characteristics of the individual constructs of the study. Gathered data is presented in detail through providing detailed analysis in the chapters and appendices. In this way transparency for the methodology is aimed and it is considered that such transparency maintains repeatability for the methodology. Thus it can be developed further by utilizing it in different cases and contexts.

6.3. Recommendations for Further research

Considering the outcomes of the study, new delivery mediums can be developed and evaluated by the designers and related audience with the measures that are considered while developing the deliverables as it is indicated in the previous section. Moreover all of the constructs in the model (impacts, system and information qualities), are open to further investigation and they can be explored on an individual basis by questioning their relations with other constructs or external factors.

Global generalizability of the findings can be questioned, since the empirical study is conducted with only Turkish designers (except limited number of responses to the English version of the questionnaire) and some of the results can be specific to cultural scope. On the other hand, while retrieving the dimensions, literature findings are considered and they are based on the studies conducted in global scope and it can be argued that the overlapping dimensions with the literature findings are valid in different cultural conditions. However the study can be brought to a global context to test the construct's global validity.

REFERENCES

Abraham, G., & Atwood, M. E. (2009). *Patterns or Claims: Do they help in communicating design advice?* Paper presented at the Annual Conf. of the Australian Computer-Human Interaction Special Interest Group: Design: Open 24/7, OZCHI '09, Melbourne, Australia.

Ackermann, F., Eden, C., & Cropper, S. (1992). *Getting started with cognitive mapping*: Banxia Software.

Akin, O. (1979). An exploration of the design process. *Design Methods and Theories, 13*(3/4), 115-119.

Alexander, C. (1971). The state of the art in design methods. *DMG newsletter, 5*(3), 3-7.

Archer, L. B. (1965). *Systematic method for designers*: London: Council of Industrial Design.

Archer, L. B. (1999). Viewpoint: Design, innovation, agility. *Design Studies, 20*(6), 565-571.

Aurifeille, J. M. (1991). *Contribution of 'instrumental Values' to Means-end Chains Analysis and to Advertising Conceptualization*. Paper presented at the Workshop on value and lifestyle research in marketing, Brussels, Belgium.

Barnum, C. M. (2002). *Usability testing and research*: Longman Pub Group.

Bartocci, G., Potts, L., & Cotugno, C. (2008). *Experience report: communicating ethnographic findings effectively within multidisciplinary teams and to your clients.* Paper presented at the Annual ACM Int. Conf. on Design of Communication, SIGDOC '08, Lisbon, Portugal.

Berlo, D. K. (1960). *The process of communication: An introduction to theory and practice*. New York: Holt, Rinehart and Winston.

Bernard, T., & Flitman, A. (2002). *Using Repertory Grid Analysis to Gather Qualitative Data for Information Systems Research.* Paper presented at the The Australasian Conferences on Information Systems (ACIS).

Blomberg, J., & Burrell, M. (2008). An ethnographic approach to design. In A. Sears & J. A. Jacko (Eds.), *The Human-computer interaction handbook* (Second edition ed., pp. 965-988). New York: Taylor & Francis.

Bogdan, R. C., & Biklen, S. K. (2006). *Qualitative research in education. An introduction to theory and methods*: ERIC.

Bojko, A. A., Buttimer, J., & Zace, S. (2009). Preparation. In R. M. Schumacher (Ed.), *The handbook of global user research* (pp. 53-75). Burlington, MA: Morgan Kaufmann.

Bonsiepe, G. (2007). The uneasy relationship between design and design research. In R. Michel (Ed.), *Design research now* (pp. 25-39): Springer.

Bradfield, R., Wright, G., Burt, G., Cairns, G., & Van Der Heijden, K. (2005). The origins and evolution of scenario techniques in long range business planning. *Futures, 37*(8), 795-812.

Broadbent, G. (1979). The development of design methods. *Design Methods and Theories, 13*(1), 41-45.

Brown, T. (2008). Design thinking. *Harvard Business Review, 86*(6), 84.

Bruseberg, A., & McDonagh-Philp, D. (2000). *User-centred design research methods: the designer's perspective.* Paper presented at the Integrating Design Education Beyond 2000 Conf., Brighton.

Bruseberg, A., & McDonagh-Philp, D. (2001). New product development by eliciting user experience and aspirations. *International Journal of Human-Computer Studies, 55*(4), 435-452.

Buchanan, R. (2001). Design research and the new learning. *Design Issues, 17*(4), 3-23.

Buchanan, R. (2007). Strategies of design research: Productive science and rhetorical inquiry. In R. Michel (Ed.), *Design research now* (pp. 55-66): Springer.

Buchenau, M., & Fulton Suri, J. (2000). *Experience prototyping.* Paper presented at the Conf. on Designing Interactive Systems: Processes, Practices, Methods, and Techniques, DIS '00, New York.

Cagan, J., Kotovsky, K., & Simon, H. A. (2001). Scientific discovery and inventive engineering design: Cognitive and computational similarities. In E. K. Antonsson & C. J. (Eds.), *Formal engineering design synthesis* (pp. 442-465): Cambridge University Press.

Carmel, E., Whitaker, R. D., & George, J. F. (1993). PD and joint application design: a transatlantic comparison. *Communications of the ACM, 36*(6), 40-48.

Caroll, J. (2003). Introduction: Toward a multidisciplinary science of human-computer interaction. In J. M. Caroll (Ed.), *HCI models, theories and frameworks: toward a multidisciplinary science* (pp. 1-10). San Fransisco: Morgan Kaufmann.

Chayutsahakij, P., & Poggenpohl, S. (2002). *User-centered innovation: The interplay between user-research and design innovation.* Paper presented at the European Academy of Management 2nd Annual Conference on Innovative Research in Management, EURAM, Stockholm, Sweden.

Chiu, M. L. (2002). An organizational view of design communication in design collaboration. *Design Studies, 23*(2), 187-210.

Cossette, P., & Audet, M. (1992). Mapping of an idiosyncratic schema. *Journal of Management Studies, 29*(3), 325-347.

Crabtree, A., Hemmings, T., & Rodden, T. (2002). *Pattern-based support for interactive design in domestic settings.* Paper presented at the Conf. on Designing Interactive Systems: Processes, Practices, Methods, and Techniques, DIS '02, London.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into practice, 39*(3), 124-130.

Crilly, N., Good, D., Matravers, D., & Clarkson, P. J. (2008). Design as communication: exploring the validity and utility of relating intention to interpretation. *Design Studies, 29*(5), 425-457.

Crilly, N., Maier, A., & Clarkson, P. (2008). Representing artefacts as media: Modelling the relationship between designer intent and consumer experience. *International Journal of Design, 2*(3), 15-27.

Crilly, N., Moultrie, J., & Clarkson, P. J. (2004). Seeing things: consumer response to the visual domain in product design. *Design Studies, 25*(6), 547-577.

Cross, N. (1997). Descriptive models of creative design: application to an example. *Design Studies, 18*(4), 427-440.

Cross, N. (2004). Expertise in design: an overview. *Design Studies, 25*(5), 427-441.

Cross, N. (2007). From a design science to a design discipline: Understanding designerly ways of knowing and thinking. In R. Michel (Ed.), *Design research now* (pp. 41-54): Springer.

Cross, N., Christiaans, H., & Dorst, K. (1996). Introduction: the Delft protocols workshop in analysing design activity. In N. C. Cross, H. and Dorst, K. (Ed.), *Analysing Design Activity*. Chichester: John Wiley and Sons.

Crossley, L. (2003). Building emotions in design. *The Design Journal, 6*(3), 35-45.

Cupchik, G. C. (1999). *Emotion and industrial design: Reconciling meanings and feelings.* Paper presented at the the First International Conference on Design and Emotion, Delft University of Technology.

Danish Design Centre, D. D. C. (2003). 'The Economic Effects of Design', published by the National Agency for Enterprise and Housing: Danish Design Centre.

DeLone, W. H., & McLean, E. R. (1992). Information systems success: the quest for the dependent variable. *Information systems research, 3*(1), 60.

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of management information systems, 19*(4), 9-30.

Demirbilek, O., & Sener, B. (2003). Product design, semantics and emotional response. *Ergonomics, 46*(13-14), 1346-1360.

Denzin, N. (2009). *The research act: A theoretical introduction to sociological methods*. New Jersey: Aldine De Gruyter.

Denzin, N., & Lincoln, Y. S. (1994). Introduction: Entering the field of qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 1-17). Thousand Oaks, CA: Sage.

Denzin, N., & Lincoln, Y. S. (2000). The discipline and practice of qualitative research. In N. Denzin & Y. S. Lincoln (Eds.), *Handbook of Qualitative Research* (2nd ed., pp. 1-28). Thousand Oaks, CA: Sage Publications.

Desmet, P. (2003). From disgust to desire: How products elicit emotions. In D. McDonagh, P. Hekkert & J. Van Erp (Eds.), *Design And Emotion: The Experience of Everyday Things* (pp. 8-12). London: Taylor and Francis.

Desmet, P., & Hassenzahl, M. (2012). Towards happiness: Possibility-driven design. *Human-Computer Interaction: The Agency Perspective*, 3-27.

Deutsch, K. W. (1952). On Communication Models in the Social Sciences. *Public Opinion Quarterly, 16*(3), 356-380.

Diggins, T., & Tolmie, P. (2003). The 'adequate' design of ethnographic outputs for practice: some explorations of the characteristics of design resources. *Personal and Ubiquitous Computing, 7*(3), 147-158.

Dorst, K. (2003). *Understanding design*. Amsterdam: BIS Publishers.

Eckert, C., Maier, A., & McMahon, C. (2005). Communication in design. In J. Clarkson & C. Eckert (Eds.), *Design process improvement* (pp. 232-261). London: Springer.

Eckert, C., & Stacey, M. (2000). Sources of inspiration: a language of design. *Design Studies, 21*(5), 523-538.

Eden, C. (1991). Working on problems using cognitive maps. In M. F. S. S. C. Littlechild (Ed.), *Operation research in management* (pp. 236-259). Hempstead: Prentice Hall.

Eden, C. (2004). Analyzing cognitive maps to help structure issues or problems. *European Journal of Operational Research, 159*(3), 673-686.

Eden, C., & Ackermann, F. (1992). Strategy development and implementation–the role of a group decision support system. In B. B. R. W. S.Kinney (Ed.), *Computer augmented teamwork: a guided tour. New York: Van Nostrand Reinhold* (pp. 325-342). NY: Van Nostrand.

Erickson, T. (1998). Towards a pattern language for interaction design. In P. Luff, J. Hindmarsh & C. Heath (Eds.), *Recovering Work Practice and Informing Systems Design* (pp. 252-261). Cambridge: Cambridge University Press.

Farsides, T. (2004). Cognitive mapping: Generating theories of psychological phenomena from verbal accounts and presenting them diagrammatically. In G. M. Breakwell (Ed.), *Doing social psychology research* (pp. 255-288). Oxford: Wiley Online Library.

Fielding, N., & Fielding, J. L. (1986). *Linking data*. London: Sage Publications.

Firestone, W. A. (1987). Meaning in method: The rhetoric of quantitative and qualitative research. *Educational researcher, 16*(7), 16-21.

Fiske, J. (1990). *Introduction to Communication Studies*. London: Routledge.

Fransella, F., Bell, R., & Bannister, D. (2004). *A Manual for Repertory Grid Technique* (2nd ed.): Wiley.

Fransella, F., Dalton, P., & Weselby, G. (2007). Personal construct therapy. In W. Dryden (Ed.), *Dryden's handbook of individual therapy* (pp. 173). London: Sage Publications Ltd.

Frauman, E., Norman, W., & Klenosky, D. (1998). Using means-end theory to understand visitors within a nature-based interpretive setting: A comparison of two methods. *Tourism Analysis, 2*, 161-174.

Friess, E. (2010). Designing From Data: Rhetorical Appeals in Support of Design Decisions. *Journal of Business and Technical Communication, 24*(4), 403.

Frigg, R., & Hartmann, S. (2009). Models in science. In E. N. Zalta (Ed.), *Stanford encyclopedia of philosophy*. Stanford: The Metaphysics Research Lab, Center for the Study of Language and Information, Stanford University. URL = <http://plato.stanford.edu/archives/spr2009/entries/models-science/>.

Gage, M., Sanders, E. B. N., & William, C. T. (2002). Generative research in the product development process. In S. G. Charlton & T. G. O'Brien (Eds.), *Handbook of human factors testing and evaluation*. New Jersey: Lawrence Erlbaum Associates.

Gallarza, M. G., Gil-Saura, I., & Holbrook, M. B. (2011). The value of value: Further excursions on the meaning and role of customer value. *Journal of Consumer Behaviour, 10*(4), 179-191.

Gaver, B., Dunne, T., & Pacenti, E. (1999). Design: cultural probes. *Interactions, 6*(1), 21-29.

Gengler, C. E., & Reynolds, T. J. (2001). Consumer understanding and advertising strategy: Analysis and strategic translation of laddering data. In T. J. Reynolds & J. C. Olson (Eds.), *Understanding consumer decision making: The means-end approach to marketing and advertising strategy* (pp. 119-141). Mahwah, New Jersey: Lawrence Erlbaum.

Gordon, T. J., & Hayward, H. (1968). Initial experiments with the cross impact matrix method of forecasting. *Futures, 1*(2), 100-116.

Griffin, A., & Hauser, J. R. (1996). Integrating R&D and marketing: a review and analysis of the literature. *Journal of product innovation management, 13*(3), 191-215.

Grunert, K. G., Beckmann, S. C., & Sorensen, E. (2001). Means-End Chains and Laddering: An Inventory of Problems and an Agenda for Research. In T. J. Reynolds & J. C. Olson (Eds.), *Understanding consumer decision making: The means-end approach to marketing and advertising strategy* (pp. 63-91). Mahwah, New Jersey: Lawrence Erlbaum.

Gutman, J. (1982). A means-end chain model based on consumer categorization processes. *The Journal of Marketing*, 60-72.

Hanington, B. (2003). Methods in the making: A perspective on the state of human research in design. *Design Issues, 19*(4), 9-18.

Hansen, D., Shneiderman, B., & Smith, M. A. (2010). *Analyzing social media networks with NodeXL*. Burlington, MA: Morgan Kaufmann.

Hasdoğan, G. (1996). The role of user models in product design for assessment of user needs. *Design Studies, 17*(1), 19-33.

Hassenzahl, M. (2001). The effect of perceived hedonic quality on product appealingness. *International Journal of Human-Computer Interaction, 13*(4), 481-499.

Hassenzahl, M. (2002). Character grid: A simple repertory grid technique for Web site analysis and evaluation. *Human Factors and Web Development*, 183-206.

Hassenzahl, M., & Wessler, R. (2000). Capturing design space from a user perspective: The repertory grid technique revisited. *International Journal of Human-Computer Interaction, 12*(3-4), 441-459.

Helander, M. (2006). *A guide to human factors and ergonomics*. Boca Raton, FL.: CRC Press, Taylor and Francis.

Hemmings, T., Clarke, K., Rouncefield, M., Crabtree, A., & Rodden, T. (2002). *Probing the probes.* Paper presented at the Participatory Design Conference, Malmö , Sweden.

Heskett, J. (2005). *Design: A very short introduction*. Oxford: Oxford University Press.

Heskett, J., & Giorgetta, A. (1980). *Industrial design*: Thames and Hudson London.

Hinkle, D. N. (1965). *The change of personal constructs from the viewpoint of a theory of construct implications.* PhD thesis, Ohio State University Columbus.

Hippel, E. V. (2009). Democratizing innovation: the evolving phenomenon of user innovation. *International Journal of Innovation Science, 1*(1), 29-40.

Hippel, E. V. (2013). Open User Innovation. *The Encyclopedia of Human-Computer Interaction, 2nd Ed.* Retrieved from http://www.interaction-design.org/encyclopedia/open_user_innovation.html

Holtzblatt, K., & Beyer, H. R. (2013). Contextual Design. *The Encyclopedia of Human-Computer Interaction, 2nd Ed.* Retrieved from http://www.interaction-design.org/encyclopedia/contextual_design.html

Holtzblatt, K., Wendell, J. B., & Wood, S. (2004). *Rapid contextual design: a how-to guide to key techniques for user-centered design*: Morgan Kaufmann.

Howland, J. L., Wright, T. C., Boughan, R. A., & Roberts, B. C. (2009). How scholarly is Google Scholar? A comparison to library databases. *College & Research Libraries, 70*(3), 227-234.

Hudlicka, E. (1996). *Requirements elicitation with indirect knowledge elicitation techniques: comparison of three methods.* Paper presented at the Second International Conference on Requirements Engineering.

Hughes, J. A., O'Brien, J., Rodden, T., Rouncefield, M., & Blythin, S. (1997). *Designing with ethnography: a presentation framework for design.* Paper presented at the Conf. on Designing Interactive Systems: Processes, Practices, Methods, and Techniques, DIS '97, Amsterdam, The Netherlands.

Hughes, J. A., O'Brien, J., Rodden, T., Rouncefield, M., & Viller, S. (2000). Patterns of home life: informing design for domestic environments. *Personal and Ubiquitous Computing, 4*(1), 25-38.

Hulkko, S., Mattelmäki, T., Virtanen, K., & Keinonen, T. (2004). *Mobile probes.* Paper presented at the Third Nordic Conference on Human-Computer interaction, NordiCHI '04, Tampere, Finland.

Iacucci, G., Iacucci, C., & Kuutti, K. (2002). *Imagining and experiencing in design, the role of performances.* Paper presented at the Nordic Conf. on Human-Computer Interaction, NordiCHI '02, Aarhus, Denmark.

IBMCorp. (2011). IBM SPSS Statistics for Windows (Version 20.0). Armonk, NY: IBM.

Jacsó, P. (2008). Google Scholar revisited. *Online information review, 32*(1), 102-114.

Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative science quarterly, 24*(4), 602-611.

Jones, J. C. (1963). *A method of systematic design.* Paper presented at the Conference on Design Methods, Oxford.

Jones, J. C. (1970). *Design methods: seeds of human futures*. New York: John Wiley.

Jones, J. C. (1977). How my thoughts about design methods have changed during the years. *Design Methods and Theories, 11*(1), 48-62.

Jones, J. C. (1992). *Design Methods, 2nd edition and additional texts*. New York: John Wiley and Sons.

Jordan, P. W. (2000). *Designing Pleasurable Products: An Introduction to the New Human Factors*: CRC.

Kelly, G. A. (1955). *The psychology of personal constructs.* New York: Norton.

Kesselman, M., & Watstein, S. B. (2005). Google Scholar™ and libraries: point/counterpoint. *Reference services review, 33*(4), 380-387.

Khalifa, A. S. (2004). Customer value: a review of recent literature and an integrative configuration. *Management decision, 42*(5), 645-666.

Kline, P. (1999). *Handbook of psychological testing*: Routledge.

Kolko, J. (2011). *Exposing the Magic of Design: A Practitioner's Guide to the Methods and Theory of Synthesis*: Oxford Univ Pr.

Kouprie, M., & Visser, F. S. (2009). A framework for empathy in design: stepping into and out of the user's life. *Journal of Engineering Design, 20*(5), 437-448.

Krippendorff, K. (1989). On the essential contexts of artifacts or on the proposition that 'design is making sense (of things)'. *Design Issues*, 9-39.

Krippendorff, K. (2004). *Content analysis: An introduction to its methodology*: Sage Publications, Inc.

Krippendorff, K., & Butter, R. (1984). Product semantics: Exploring the symbolic qualities of form in Innovation. *The Journal of the Industrial Designers Society of America, 3*(2), 4-9.

Kujala, S. (2003). User involvement: a review of the benefits and challenges. *Behaviour & Information Technology, 22*(1), 1-16.

Kuniavsky, M. (2003). *Observing the user experience: a practitioner's guide to user research*. San Francisco, CA: Morgan Kaufmann.

Lai, J., Honda, T., & Yang, M. C. (2010). A study of the role of user-centered design methods in design team projects. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing, 24*(3), 303-316.

Landfield, A. W. (1971). *Personal construct systems in psychotherapy*. NY: Rand McNally.

Laurel, B. (Ed.). (2003). *Design Research: Methods and Perspectives*. Massachusetts: The MIT Press.

Lawson, B. (1979). Cognitive strategies in architectural design. *Ergonomics, 22*(1), 59-68.

Lawson, B. (2006). *How designers think: the design process demystified* (Fourth edition ed.). Oxford: Architectural press.

Leonard, D., & Rayport, J. F. (1997). Spark innovation through empathic design. *Harvard business review, 75*, 102-115.

Lévi-Strauss, C. (1966). *The savage mind* (second edition ed.). Chicago: University of Chicago Press.

Lin, Y. L., & Lin, H. W. (2011). A study on the goal value for massively multiplayer online role-playing games players. *Computers in Human Behavior*.

Love, S. (2005). *Understanding mobile human-computer interaction*. Oxford: Elsevier.

Malhotra, N. K. (2007). *Marketing Research: An Applied Orientation* (5th editon ed.). Upper Saddle River, NJ: Pearson - Prentice Hall.

Mao, J. Y., Vredenburg, K., Smith, P. W., & Carey, T. (2005). The state of user-centered design practice. *Communications of the ACM, 48*(3), 105-109.

Margolin, V. (1997). Getting to know the user. *Design Studies, 18*(3), 227-236.

Martin, D., & Sommerville, I. (2004). Patterns of cooperative interaction: Linking ethnomethodology and design. *ACM Transactions on Computer-Human Interaction (TOCHI), 11*(1), 59-89.

Martin, R. (2007). Design and business: why can't we be friends? *Journal of Business Strategy, 28*(4), 6-12.

Mason, R. O. (1978). Measuring information output: A communication systems approach. *Information & Management, 1*(4), 219-234.

McDonagh-Philp, D., & Lebbon, C. (2000). The emotional domain in product design. *The Design Journal, 3*(1), 31-43.

McDonagh, D., Bruseberg, A., & Haslam, C. (2002). Visual product evaluation: exploring users' emotional relationships with products. *Applied Ergonomics, 33*(3), 231-240.

McGinley, C., & Dong, H. (2011). Designing with Information and Empathy: Delivering Human Information to Designers. *The Design Journal, 14*(2), 187-206.

Melican , J. P. I. (2000). *Describing user-centered designing: how design teams apply user research data in creative problem solving.* PhD, Illinois Institute of Technology.

Miles, M. B., & Huberman, A. M. (1994). Qualitative Data Analysis: An Expanded Sourcebook. Thousand Oaks, CA: Sage Publications.

Miles, S., & Rowe, G. (2004). The laddering technique. In G. M. Breakwell (Ed.), *Doing social psychology research* (pp. 305-343): Wiley Online Library.

Mitchell, T. (1992). Prefaces to the Second Edition. In J. C. Jones (Ed.), *Design Methods, 2nd edition and additional texts*. New York: John Wiley and Sons.

Moisander, J., & Valtonen, A. (2006). *Qualitative marketing research: A cultural approach*. London: Sage Publications Ltd.

Molich, R., Jeffries, R., & Dumas, J. (2007). Making usability recommendations useful and usable. *Journal of Usability Studies, 2*(4), 162-179.

Mortensen, C. D. (1972). *Communication: The Study of Human Interaction*. New York: McGraw-Hill.

Mozota, B. B. (2002). Design and competitive edge: A model for design management excellence in European SMEs1. *Academic Review, 2*(1), 88-103.

Neuendorf, K. A. (2002). *The content analysis guidebook*: Sage Publications, Inc.

Nijhuis, W., & Boersema, T. (1998). Cooperation between graphic designers and applied behavioural researchers. In H. Zwaga, T. Boersema & H. Hoonhout (Eds.), *Visual information for everyday use: Design and research perspectives* (pp. 21-41). London: Taylor & Francis.

Nørgaard, M., & Hornbæk, K. (2009). Exploring the Value of Usability Feedback Formats. *International Journal of Human-Computer Interaction, 25*(1), 49-74.

Norman, D. A. (2004). *Emotional design: Why we love (or hate) everyday things*. New York: Basic books.

Peña, E. D. (2007). Lost in Translation: Methodological Considerations in Cross-Cultural Research. *Child Development, 78*(4), 1255-1264.

Perks, H., Cooper, R., & Jones, C. (2005). Characterizing the Role of Design in New Product Development: An Empirically Derived Taxonomy*. *Journal of product innovation management, 22*(2), 111-127.

Perreault, W. D., Jr., & Leigh, L. E. (1989). Reliability of nominal data based on qualitative judgments. *Journal of marketing research, 26*, 135-148.

Petersen, S., & Phillips, P. L. (2011). Inspiring Design—Informed by Metrics. *Design Management Review, 22*(2), 62-71.

Petter, S., DeLone, W., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. *European Journal of Information Systems, 17*(3), 236-263.

Pheasant, S. (2003). *Bodyspace: Anthropometry, ergonomics and the design of work*. London: Taylor and Francis.

Phillips, J. M., & Reynolds, T. J. (2009). A hard look at hard laddering: A comparison of studies examining the hierarchical structure of means-end theory. *Qualitative Market Research: An International Journal, 12*(1), 83-99.

Phillips, P. L. (2004). *Creating the Perfect Design Brief: How to manage design for strategic advantage*: Allworth Pr.

Pidd, M. (1996). *Tools for thinking: modelling in management science*: Wiley.

Pieters, R., Baumgartner, H., & Allen, D. (1995). A means-end chain approach to consumer goal structures. *International Journal of Research in Marketing, 12*(3), 227-244.

Poggenpohl, S. (2002). Design Moves: approximating a desired future with users. In J. Frascara (Ed.), *Design and the Social Sciences: Making Connections* (pp. 66-81). London: Taylor and Francis.

Pruitt, J., & Adlin, T. (2006). *The persona lifecycle: keeping people in mind throughout product design*. Oxford: Elsevier.

Purcell, A. T., & Gero, J. S. (1996). Design and other types of fixation. *Design Studies, 17*(4), 363-383.

Purpura, S. (2003). Overview of quantitative methods in design research. In B. Laurel (Ed.), *Design Research: Methods and Perspectives* (pp. 63-69). Massachusetts: The MIT Press.

Ramey, J., Robinson, C., Carlevato, D., & Hansing, R. (1992). Communicating User Needs to Designers: Hypermedia-Supported Requirements Documents. *Int. Professional Communication Conf., IPCC'92*, 241-247. doi: 10.1109/IPCC.1992.673028

Redström, J. (2006). Towards user design? On the shift from object to user as the subject of design. *Design Studies, 27*(2), 123-139.

Reese, W. (2002). Behavioral scientists enter design: Seven critical histories. In S. Squires & B. Byrne (Eds.), *Creating breakthrough ideas: the collaboration of anthropologists and designers in the product development industry* (pp. 17-43). London: Bergin & Garvey.

Reynolds, T. J., Dethloff, C., & Westberg, S. J. (2001). Advancements in laddering. In T. J. Reynolds & J. C. Olson (Eds.), *Understanding consumer decision making: The means-end approach to marketing and advertising strategy* (pp. 91-118). Mahwah, New Jersey: Lawrence Erlbaum.

Reynolds, T. J., & Gutman, J. (1988). Laddering theory, method, analysis, and interpretation. *Journal of advertising research, 28*(1), 11-31.

Reynolds, T. J., & Olson, J. C. (2001). *Understanding consumer decision making: the means-end approach to marketing and advertising strategy*. Mahwah, New Jersey: Lawrence Erlbaum.

Rittel, H. W. J., & Webber, M. M. (1984). Planning problems are wicked problems. In N. Cross (Ed.), *Developments in design methodology* (pp. 135-144). Chichester: John Wiley & Sons.

Rossman, G. B., & Wilson, B. L. (1994). Numbers and words revisited: Being "shamelessly eclectic". *Quality & Quantity, 28*(3), 315-327.

Rosson, M. B., & Carroll, J. M. (2002). *Usability engineering: scenario-based development of human-computer interaction*. San Diego, CA: Academic Press.

Roth, S. (1999). The state of design research. *Design Issues, 15*(2), 18-26.

Rubin, J. (1994). *Handbook of Usability Testing: How to plan, design and conduct effective tests*. New York: Wiley.

Rugg, G., Eva, M., Mahmood, A., Rehman, N., Andrews, S., & Davies, S. (2002). Eliciting information about organizational culture via laddering. *Information Systems Journal, 12*(3), 215-229.

Russell, C., Flight, I., Leppard, P., Van Lawick Van Pabst, J., Syrette, J., & Cox, D. (2004). A comparison of paper-and-pencil and computerised methods of "hard" laddering. *Food quality and preference, 15*(3), 279-291.

Russell, C. G., Busson, A., Flight, I., Bryan, J., Van Lawick Van Pabst, J., & Cox, D. (2004). A comparison of three laddering techniques applied to an example of a complex food choice. *Food quality and preference, 15*(6), 569-583.

Sánchez-Fernández, R., & Iniesta-Bonillo, M. (2007). The concept of perceived value: a systematic review of the research. *Marketing Theory, 7*(4), 427-451.

Sanders, E. B. N. (2002). From user-centered to participatory design approaches. In J. Frascara (Ed.), *Design and the social sciences Making connections* (pp. 1-8). London: Taylor & Francis.

Sanders, E. B. N. (2005). *Information, inspiration and co-creation.* Paper presented at the Int. Conf. of the European Academy of Design, Bremen, Germany.

Sanders, E. B. N., & Dandavate, U. (1999). *Design for Experiencing: New Tools.* Paper presented at the First International Conference on Design and Emotion, Delft University of Technology.

Schifferstein, H. N. J., & Hekkert, P. (Eds.). (2008). *Product Experience*. Amsterdam: Elsevier.

Schlange, L. E., & Jüttner, U. (1997). Helping managers to identify the key strategic issues. *Long Range Planning, 30*(5), 777-786.

Scholz, R. W., & Tietje, O. (2002). *Embedded case study methods: Integrating quantitative and qualitative knowledge*: Sage Publications, Inc.

Schramm, W. (1954). How Communication Works. In W. Schramm (Ed.), *The Process and Effects of Mass Communication* (pp. 3-26). Urbana, Illinois: University of Illinois Press.

Serdar Asan, S., & Asan, U. (2007). Qualitative cross-impact analysis with time consideration. *Technological Forecasting and Social Change, 74*(5), 627-644.

Shannon, C. E., & Weaver, W. (1949). *The mathematical theory of communication*. Urbana, IL: University of Illinois Press.

Sieber, S. D. (1973). The integration of fieldwork and survey methods. *American journal of sociology*, 1335-1359.

Silverman, D. (2006). *Interpreting qualitative data: Methods for analyzing talk, text, and interaction* (Third ed.). Oxford: Sage Publications Ltd.

Sleeswijk Visser, F. (2009). *Bringing the everyday life of people into design*. Delft: Technische Universiteit Delft.

Sleeswijk Visser, F., Stappers, P. J., Van der Lugt, R., & Sanders, E. B. N. (2005). Contextmapping: experiences from practice. *CoDesign, 1*(2), 119-149.

Sleeswijk Visser, F., Van Der Lugt, R., & Stappers, P. J. (2007). Sharing User Experiences in the Product Innovation Process: Participatory Design Needs Participatory Communication. *Creativity and Innovation Management, 16*(1), 35-45.

Spinuzzi, C. (2005). The methodology of participatory design. *Technical Communication, 52*(2), 163-174.

Squires, S. (2002). Doing the Work: Customer Research in the Product Development and Design Industy. In S. Squires & B. Byrne (Eds.), *Creating breakthrough ideas: the collaboration of anthropologists and designers in the product development industry* (pp. 103-124). London: Bergin & Garvey.

St Pierre, L. (2002). Research and design collaboration. In J. Frascara (Ed.), *Design and the social sciences: making connections* (pp. 135 - 145). London: Taylor & Francis.

Stanton, N. (1998). Product design with people in mind. In N. Stanton (Ed.), *Human factors in consumer products* (pp. 1-17). London: Taylor & Francis.

Stappers, P. J. (2006). Doing design as a part of doing research. In R. Michel (Ed.), *Design research now* (pp. 81-91). Basel: Birkhäuser.

Stappers, P. J., & Sanders, E. B. N. (2003). Generative tools for context mapping: tuning the tools. In e. a. D. McDonagh (Ed.), *Design And Emotion: The Experience of Everyday Things* (pp. 77-81). London: Taylor and Francis.

Strickler, Z. (1999). Elicitation methods in experimental design research. *Design Issues, 15*(2), 27-39.

Suri, J. F. (2003). The experience of evolution: developments in design practice. *The Design Journal, 6*(2), 39-48.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches* (Vol. 46): Sage Publications, Inc.

Thomas, J. C., & Carroll, J. M. (1979). The psychological study of design. *Design Studies, 1*(1), 5-11.

Thomke, S., & Von Hippel, E. (2002). Innovators. *Harvard Business Review, 80*(4), 74–81.

Tindall, C. (1994). Personal construct approaches. In E. B. P. Banister, I. Parker, M. Taylor & C. Tindall (Ed.), *Qualitative methods in psychology: A research guide* (pp. 72-91). Buckingham: Open University Press.

Topalian, A. (2010). Living Briefs to Turn Desired Futures into Reality. *Design Management Review, 21*(3), 72-79.

Tschudi, F. (1977). Loaded and honest questions: A construct theory view of symptoms and therapy. In D. Banister (Ed.), *New perspectives in personal construct theory* (pp. 321-350). London: Academic Press London.

Valette-Florence, P., & Rapacchi, B. (1991). Improving means-end chain analysis using graph theory and correspondence analysis. *Journal of Advertising Research, 31*(1), 30–45.

Valtonen, A. (2005). *Six decades-and six different roles for the industrial designer.* Paper presented at the Nordic Design Research Conference, Copenhagen.

Van de Vijver, F., & Tanzer, N. K. (1997). Bias and equivalence in cross-cultural assessment: An overview. *European Review of Applied Psychology, 47*(4), 263-280.

van Veggel, R. J. F. M. (2005). Where the two sides of ethnography collide. *Design Issues, 21*(3), 3-16.

Verganti, R. (2009). *Design-driven innovation: Changing the rules of competition by radically innovating what things mean*: Harvard Business School Pr.

Vihma, S. (2006). Design Semiotics—Institutional Experiences and an Initiative for a Semiotic Theory of Form. In R. Michel (Ed.), *Design research now* (pp. 219-232). Basel: Birkhäuser.

Volk, F., & Wang, H. (2005). Understanding users: Some qualitative and quantitative methods. In R. W. Proctor & K. P. L. Vu (Eds.), *Handbook of Human Factors in Web Design* (pp. 303–320). New Jersey: Lawrence Erlbaum Associates.

Vredenburg, K., Mao, J. Y., Smith, P. W., & Carey, T. (2002). *A survey of user-centered design practice.* Paper presented at the Proc. SIGCHI Conf. Human Factors in Computing Systems, CHI'02, Minneapolis, Minnesota.

Wasson, C. (2002). Collaborative work: integrating the roles of ethnographers and designers. In S. Squires & B. Byrne (Eds.), *Creating breakthrough ideas: the collaboration of anthropologists and designers in the product development industry* (pp. 72-90). London: Bergin & Garvey.

Westerlund, B., Lindquist, S., Sundblad, Y., & Mackay, W. (2003). *Co-designing methods for designing with and for families.* Paper presented at the European Academy Of Design Conference, Barcelona.

Wickens, C. D., Gordon, S. E., & Liu, Y. (2004). *An introduction to human factors engineering* (second edition ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Wiek, A., Lang, D. J., & Siegrist, M. (2008). Qualitative system analysis as a means for sustainable governance of emerging technologies: the case of nanotechnology. *Journal of Cleaner Production, 16*(8), 988-999.

Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. *The Journal of Marketing*, 2-22.

SOURCES THAT ARE REVIEWED FOR THE LITERATURE SEARCH STAGE OF THE METHODOLOGY

Reviewed sources for the literature search stage
Abraham, G., & Atwood, M. E. (2009). *Patterns or Claims: Do they help in communicating design advice?* Paper presented at the Annual Conf. of the Australian Computer-Human Interaction Special Interest Group: Design: Open 24/7, OZCHI '09, Melbourne, Australia.
Anderson, R. J. (1994). Representations and requirements: The value of ethnography in system design. *Human-Computer Interaction, 9*(3), 151-182.
Applegate, L. M., & King, J. L. (1999). Rigor and relevance: careers on the line. *MIS Quarterly, 23*(1), 17-18.
Barnum, C. M. (2002). *Usability testing and research*: Longman Pub Group.
Bartocci, G., Potts, L., & Cotugno, C. (2008). *Experience report: communicating ethnographic findings effectively within multidisciplinary teams and to your clients.* Paper presented at the Annual ACM Int. Conf. on Design of Communication, SIGDOC '08, Lisbon, Portugal.
Benbasat, I., & Zmud, R. W. (1999). Empirical research in information systems: the practice of relevance. *MIS Quarterly*, 3-16.
Blandford, A., Keith, S., Butterworth, R., Fields, B., & Furniss, D. (2007). Disrupting digital library development with scenario informed design. *Interacting with computers, 19*(1), 70-82.
Blandford, A., Keith, S., & Fields, B. (2006). Claims analysis" in the wild:" A case study on digital library development. *International Journal of Human-Computer Interaction, 21*(2), 197-218.
Blomberg, J., & Burrell, M. (2008). An ethnographic approach to design. In A. Sears & J. A. Jacko (Eds.), *The Human-computer interaction handbook* (Second edition ed., pp. 965-988). New York: Taylor & Francis.
Boess, S., & Lebbon, C. (1998). *Integrating participant research with product design education*. Paper presented at the IDATER 1998 Conference, Loughborough.
Broadbent, S., & Cara, F. (2000). A narrative approach to user requirements for Web design. *interactions, 7*(6), 31-35.
Buur, J., & Bagger, K. (1999). Replacing usability testing with user dialogue. *Communications of the ACM, 42*(5), 63-66.
Caddick, R., & Cable, S. (2011). *Communicating the User Experience: A Practical Guide for Creating Useful UX Documentation*: Wiley.
Carmichael, A., Newell, A., Dickinson, A., & Morgan, M. (2005). *Using theatre and film to represent user requirements.* Paper presented at the INCLUDE, Royal College of Art, London.
Catanzaro, C. D. (2005). *Vizability: Visualizing Usability Evaluation Data Based on the User Action Framework.* Master of Science, Virginia Polytechnic Institute and State University.
Chayutsahakij, P. (2002). *User-Centered Design Goal Setting: The Interplay between Research and Innovation.* PhD, Illinois Institute of Technology.
Crabtree, A., Hemmings, T., & Rodden, T. (2002). *Pattern-based support for interactive design in domestic settings.* Paper presented at the Conf. on Designing Interactive Systems: Processes, Practices, Methods, and Techniques, DIS '02, London.
Crabtree, A., Nichols, D. M., O'Brien, J., Rouncefield, M., & Twidale, M. B. (2000). Ethnomethodologically informed ethnography and information system design. *Journal of the American Society for Information Science, 51*(7), 666-682.
Darroch, F., & Toleman, M. (2007). *Bridging the IS academic-practitioner relationship divide: a review, a theoretical framework, and an example of interaction.* Paper presented at the 18th Australasian Conference on Information Systems, Toowoomba.
Davenport, T. H., & Markus, M. L. (1999). Rigor vs. relevance revisited: response to Benbasat and

Zmud. *MIS Quarterly*, 19-23.

de Jong, A., & Boess, S. (2007). *Product design: Designing with user data in mind.* Paper presented at the Nordic Ergonomics Society Conference, Lysekil, Sweden.

Dearden, A., & Finlay, J. (2006). Pattern languages in HCI: A critical review. *Human-Computer Interaction, 21*(1), 49-102.

Dekker, S., & Nyce, J. (2004). How can ergonomics influence design? Moving from research findings to future systems. *Ergonomics, 47*(15), 1624-1639.

Diggins, T., & Tolmie, P. (2003). The 'adequate' design of ethnographic outputs for practice: some explorations of the characteristics of design resources. *Personal and Ubiquitous Computing, 7*(3), 147-158.

Dourish, P. (2006). *Implications for design*.

Dumas, J. S., Molich, R., & Jeffries, R. (2004). Describing Usability Problems: Are we sending the right message? *interactions, 11*(4), 24-29.

Erickson, T. (1998). Towards a pattern language for interaction design. In P. Luff, J. Hindmarsh & C. Heath (Eds.), *Recovering Work Practice and Informing Systems Design* (pp. 252-261). Cambridge: Cambridge University Press.

Fallman, D. (2008). The interaction design research triangle of design practice, design studies, and design exploration. *Design Issues, 24*(3), 4-18.

Fallman, D., & Stolterman, E. (2010). *Establishing Criteria of Rigor and Relevance in Interaction Design Research*. Paper presented at the Create10 - the 2010 international conference on The Interaction Design Edinburgh Napier University, UK.

Fitzgerald, B. (2003). Informing each other: Bridging the gap between researcher and practitioners. *Informing Science: International Journal of an Emerging Transdiscipline, 6*, 13-19.

Forlizzi, J., & McCormack, M. (2000). *Case study: User research to inform the design and development of integrated wearable computers and web-based services.* Paper presented at the the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques New York.

Foucault, B. E. (2005). *Contextualizing Cultures for the Commercial World: Techniques for Presenting Field Research in Business Environments.* Paper presented at the Human Computer Interaction International Conference, Las Vegas, NV. .

Frankel, L. (2009). *Communicating Design Research Knowledge: A Role for Ethnographic Writing*. Paper presented at the International Association of Societies of Design Research 2009, Coex, Seoul, Korea.

Friess, E. (2010). Designing From Data: Rhetorical Appeals in Support of Design Decisions. *Journal of Business and Technical Communication, 24*(4), 403.

Friess, E. (2011). Discourse Variations Between Usability Tests and Usability Reports. *Journal of Usability Studies, 6*(3), 102-116.

Frøkjær, E., & Hornbæk, K. (2004). *Input from usability evaluation in the form of problems and redesigns: results from interviews with developers.* Paper presented at the the Workshop on Improving the Interplay between Usability Evaluation and User Interface Design, NordiCHI 2004, Aalborg University, Department of Computer Science.

Goodman, J., Langdon, P., & Clarkson, P. (2006). Providing strategic user information for designers: methods and initial findings. In J. Clarkson, P. Langdon & P. Robinson (Eds.), *Designing Accessible Technology (Proceedings of CWUAAT 2006)* (pp. 41-51). London: Springer.

Goodman, J., Langdon, P., & Clarkson, P. (2007). Formats for user data in inclusive design. In C. Stephanidis (Ed.), *Universal Acess in Human Computer Interaction. Coping with Diversity* (pp. 117-126): Springer.

Haddow, G. (2011). Communicating research to practice: The role of professional association publications. *Library and Information Research, 34*(108).

Hanington, B. M. (2010). Relevant and Rigorous: Human-Centered Research and Design Education. *Design Issues, 26*(3), 18-26.

Haughney, E. (2008). *Using comics to communicate qualitative user research findings.* Paper presented at the CHI '08 extended abstracts on Human factors in computing systems.

Hertzum, M. (2006). Problem prioritization in usability evaluation: From severity assessments toward impact on design. *International Journal of Human-Computer Interaction, 21*(2), 125-146.

Høegh, R. T. (2008). Software Development and Feedback from Usability Evaluations.

Interdisciplinary Aspects of Information Systems Studies, 47-53.

Hoegh, R. T., Nielsen, C. M., Overgaard, M., Pedersen, M. B., & Stage, J. (2006). The impact of usability reports and user test observations on developers' understanding of usability data: An exploratory study. *International Journal of Human-Computer Interaction, 21*(2), 173-196.

Hornbæk, K., & Frøkjær, E. (2005). *Comparing usability problems and redesign proposals as input to practical systems development.* Paper presented at the the SIGCHI conference on Human factors in computing systems, Portland, Oregon.

Hornbaek, K., & Stage, J. (2006). The interplay between usability evaluation and user interaction design. *International Journal of Human-Computer Interaction, 21*(2), 117-123.

Howarth, J., Andre, T. S., & Hartson, R. (2007). A structured process for transforming usability data into usability information. *Journal of Usability Studies, 3*(1), 7-23.

Hughes, J. A., O'Brien, J., Rodden, T., Rouncefield, M., & Blythin, S. (1997). *Designing with ethnography: a presentation framework for design.* Paper presented at the Conf. on Designing Interactive Systems: Processes, Practices, Methods, and Techniques, DIS '97, Amsterdam, The Netherlands.

Hughes, J. A., O'Brien, J., Rodden, T., Rouncefield, M., & Viller, S. (2000). Patterns of home life: informing design for domestic environments. *Personal and Ubiquitous Computing, 4*(1), 25-38.

Hughes, J. A., Randall, D., & Shapiro, D. (1993). From ethnographic record to system design. *Computer Supported Cooperative Work (CSCW), 1*(3), 123-141.

Kock, N., Gray, P., Hoving, R., Klein, H., Myers, M., & Rockart, J. (2002). IS research relevance revisited: subtle accomplishment, unfulfilled promise, or serial hypocrisy. *Communications of the Association for Information Systems, 8*(1), 23.

Kouprie, M., & Visser, F. S. (2009). A framework for empathy in design: stepping into and out of the user's life. *Journal of Engineering Design, 20*(5), 437-448.

Kumar, V. (2004). User Insights Tool: a sharable database for user research. *Institute of Design White Paper, Illinois Institute of technology, Chicago*.

Kuniavsky, M. (2003). *Observing the user experience: a practitioner's guide to user research*. San Francisco, CA: Morgan Kaufmann.

Lang, M. (2002). *On the dissemination of IS research findings into practice.* Paper presented at the Informing Science, Cork, Ireland.

Lang, M. (2003). Communicating academic research findings to IS professionals: An analysis of problems. *Informing Science: International Journal of an Emerging Transdiscipline, 6*, 21-29.

Lavery, D., & Cockton, G. (1997). *Representing predicted and actual usability problems.* Paper presented at the International Workshop on Representations in Interactive Software Development, Queen Mary and Westfield College, University of London.

Law, E. L. C. (2006). Evaluating the downstream utility of user tests and examining the developer effect: A case study. *International Journal of Human-Computer Interaction, 21*(2), 147-172.

Lee, A. S. (1999). Rigor and relevance in MIS research: beyond the approach of positivism alone. *MIS Quarterly, 23*(1), 29-33.

Lee, C. P. (2007). Boundary negotiating artifacts: Unbinding the routine of boundary objects and embracing chaos in collaborative work. *Computer Supported Cooperative Work (CSCW), 16*(3), 307-339.

Lewis, S., Mateas, M., Palmiter, S., & Lynch, G. (1996). Ethnographic data for product development: A collaborative process. *interactions, 3*(6), 52-69.

Lindgaard, G., Dillon, R., Trbovich, P., White, R., Fernandes, G., Lundahl, S., et al. (2006). User Needs Analysis and requirements engineering: Theory and practice. *Interacting with computers, 18*(1), 47-70.

Lyytinen, K. (1999). Empirical research in information systems: on the relevance of practice in thinking of IS research. *MIS Quarterly*, 25-27.

Mårtensson, A., & Mårtensson, P. (2007). Extending Rigor and Relevance: Towards Credible, Contributory and Communicable Research. *Communications*, 1325-1333.

Martin, D., Rodden, T., Rouncefield, M., Sommerville, I., & Viller, S. (2001). *Finding patterns in the fieldwork.* Paper presented at the the Seventh European Conference on Computer Supported Cooperative Work, Dordrecht, Netherlands.

Martin, D., & Sommerville, I. (2004a). Ethnomethodology, patterns of cooperative interaction and design. *ACM Trans. on Computer-Human Interaction, 11*(1), 58-89.

Martin, D., & Sommerville, I. (2004b). Patterns of cooperative interaction: Linking ethnomethodology and design. *ACM Transactions on Computer-Human Interaction (TOCHI), 11*(1), 59-89.

McGinley, C., & Dong, H. (2011). Designing with Information and Empathy: Delivering Human Information to Designers. *The Design Journal, 14*(2), 187-206.

MELICAN III, J. P. (2000). *Describing user-centered designing: how design teams apply user research data in creative problem solving.* PhD, Illinois Institute of Technology.

Molich, R., Ede, M. R., Kaasgaard, K., & Karyukin, B. (2004). Comparative usability evaluation. *Behaviour & Information Technology, 23*(1), 65-74.

Molich, R., Hornbaek, K., & Scott, J. (2007). *Recommendations on recommendations.* Paper presented at the CHI '07 extended abstracts on Human factors in computing systems, San Jose, California.

Molich, R., Jeffries, R., & Dumas, J. (2007). Making usability recommendations useful and usable. *Journal of Usability Studies, 2*(4), 162-179.

Moody, D. L. (2000). *Building links between IS research and professional practice: improving the relevance and impact of IS research.* Paper presented at the International conference on Information systems ICIS '00, Atlanta, GA.

Moorman, C., Zaltman, G., & Deshpande, R. (1992). Relationships between providers and users of market research: the dynamics of trust within and between organizations. *Journal of marketing research, 29*(3), 314-328.

Müller, D., Law, E. L. C., & Strohmeier, S. (2010). *Analysis of the Persuasiveness of User Experience Feedback on a Virtual Learning Environment.* Paper presented at the Workshop on Interplay between User Experience Evaluation and System Development (I-UxSED'10) in conjunction with NordiCHI 2010, Iceland.

Nayak, N. P., Mrazek, D., & Smith, D. R. (1995). Analyzing and communicating usability data: now that you have the data what do you do? a CHI'94 workshop. *ACM SIGCHI Bulletin, 27*(1), 22-30.

Newell, A., Morgan, M., Gregor, P., & Carmichael, A. (2006). *Theatre as an intermediary between users and CHI designers.* Paper presented at the CHI '06 extended abstracts on Human factors in computing systems Montreal, Quebec.

Nielsen, C., Overgaard, M., Pedersen, M., & Stage, J. (2005). Feedback from usability evaluation to user interface design: Are usability reports any good? *Human-Computer Interaction-INTERACT 2005*, 391-404.

Nørgaard, M., & Høegh, R. T. (2008). *Evaluating usability: using models of argumentation to improve persuasiveness of usability feedback.* Paper presented at the Designing interactive systems Cape Town, South Africa.

Nørgaard, M., & Hornbæk, K. (2006). *What do usability evaluators do in practice?: an explorative study of think-aloud testing*.

Nørgaard, M., & Hornbæk, K. (2009). Exploring the Value of Usability Feedback Formats. *International Journal of Human-Computer Interaction, 25*(1), 49-74.

Putnam, C., Rose, E., Walton, R., & Kolko, B. (2009). *Mobile phone users in Kyrgyzstan: A case study of identifying user requirements for diverse users.* Paper presented at the Professional Communication Conference, Waikiki, HI.

Ramey, J., Robinson, C., Carlevato, D., & Hansing, R. (1992). *Communicating User Needs to Designers: Hypermedia-Supported Requirements Documents.* Paper presented at the Int. Professional Communication Conf., IPCC'92, Santa Fe, New Mexico.

Redish, J. (2010). Technical communication and usability: Intertwined strands and mutual influences. *Professional Communication, IEEE Transactions on, 53*(3), 191-201.

Robey, D., & Markus, M. L. (1998). Beyond rigor and relevance: producing consumable research about information systems. *Information Resources Management Journal (IRMJ), 11*(1), 7-16.

Rogers, Y. (1997). Reconfiguring the social scientist: Shifting from telling designers what to do to getting more involved. In G. C. Bowker (Ed.), *Social Science, Technical Systems, and Cooperative Work: Beyond the Great Divide* (pp. 57-78). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Rogers, Y. (2004). New theoretical approaches for human-computer interaction. *Annual review of information science and technology, 38*(1), 87-143.

Rosemann, M., & Vessey, I. (2008). Toward improving the relevance of information systems research to practice: the role of applicability checks. *Management Information Systems Quarterly, 32*(1), 1.

Rubin, J. (1994). *Handbook of Usability Testing: How to plan, design and conduct effective tests*. New York: Wiley.

Schneberger, S., Pollard, C., & Watson, H. (2009). Theories: For Academics and Practitioners. *Information Systems Management, 26*(1), 52-60.

Segelström, F. (2009). *Communicating through Visualizations: Service Designers on Visualizing User Research.* Paper presented at the Nordic Conference on Service Design and Service Innovation, Oslo.

Senn, J. (1998). The challenge of relating IS research to practice. *Information Resources Management Journal (IRMJ), 11*(1), 23-28.

Sharon, T. (2012). *It's Our Research: Getting Stakeholder Buy-in for User Experience Research Projects*: Morgan Kaufmann Pub.

Sims, R. (2003). *'Design for all': methods and data to support designers.* PhD, Loughborough University. Retrieved from http://hdl.handle.net/2134/6914

Sleeswijk Visser, F. (2009). *Bringing the everyday life of people into design*. Delft: Technische Universiteit Delft.

Sleeswijk Visser, F., Van Der Lugt, R., & Stappers, P. J. (2007). Sharing User Experiences in the Product Innovation Process: Participatory Design Needs Participatory Communication. *Creativity and Innovation Management, 16*(1), 35-45.

Sommerville, I., Rodden, T., Sawyer, P., Bentley, R., & Twidale, M. (1993). *Integrating ethnography into the requirements engineering process*. Paper presented at the IEEE International Symposium on RequirementsEngineering, San Diego

Stappers, P. J. (2009). *Contextmapping, communication, and conceptualization: taking the "next…" step*. Paper presented at the Conference on Human Factors in Computing Systems, Boston, Massachusetts.

Steinbach, T., & Knight, L. (2006). *The relevance of information systems research: Informing the IS practitioner community; informing ourselves.* Paper presented at the Informing Science and IT Education Joint Conference, Salford, UK.

Stolterman, E. (2008). The nature of design practice and implications for interaction design research. *International Journal of Design, 2*(1), 55-65.

Sutcliffe, A. (2000). On the effective use and reuse of HCI knowledge. *ACM Transactions on Computer-Human Interaction (TOCHI), 7*(2), 197-221.

Theofanos, M., & Quesenbery, W. (2005). Towards the design of effective formative test reports. *Journal of Usability Studies, 1*(1), 28-46.

Vahidov, R. (2006). *Design researcher's IS artifact: A representational framework.* Paper presented at the the First International Conference on Design Science Research in Information Systems and Technology, Claremont.

Van Der Lugt, R., & Sleeswijk Visser, F. (2007). *Creative workshops for interpreting and communicating rich user information.* Paper presented at the INCLUDE conference, London.

Viller, S., & Sommerville, I. (1999). Coherence: an approach to representing ethnographic analyses in systems design. *Human-Computer Interaction, 14*(1), 9-41.

Volk, F., & Wang, H. (2005). Understanding users: Some qualitative and quantitative methods. In R. W. Proctor & K. P. L. Vu (Eds.), *Handbook of Human Factors in Web Design* (pp. 303–320). New Jersey: Lawrence Erlbaum Associates.

Westfall, R. (1999). An IS research relevancy manifesto. *Communications of the AIS, 2*(2es), 5.

COGNITIVE MAPPING INTERVIEW

Katılımcı Bilgilendirme Metni

Bu çalışma Orta Doğu Teknik Üniversitesi, Endüstri Ürünleri Tasarımı Bölümü'nde yürütmekte olduğum "Kullanıcı Araştırması Sonucu Çıkan Bilgilerinin Tasarım Sürecine Aktarılması" konulu doktora tezinin bir parçasıdır.

Çalışmada kullanıcı araştırmasına yaklaşımınız ve kullanıcı araştırmasını değerlendirme kriterleriniz ile ilgili bilgi almak hedeflenmektedir. Bu amaçla sizden daha önce deneyimlemiş olduğunuz kullanıcı araştırması çalışmalarını ve bunları tasarım sürecine nasıl entegre ettiğinizi hatırlamanız istenecektir. Amaç bu çalışmaların içerikleri ile ilgili bilgi edinmek veya nasıl iyileştirilebileceklerini tartışmak değil, sizin genel anlamda kullanıcı araştırmasına bakış açınızı ve araştırmaları nasıl değerlendirip uygulamaya geçirdiğinizi anlayabilmektir. Mülakat sırasında çalışmalar ile ilgili gizlilik konusunda hassasiyet gösterilecektir. Gizliliği ihlal edeceğini düşündüğünüz yanıtları belirtmeyebilirsiniz.

Çalışma ile ilgili yapılacak olan yayınlarda ve tez çalışmasında kimliğiniz gizli tutulacaktır. İsminiz hiçbir şekilde belirtilmeyecek, yapılmış olan çalışmaların içeriği sorgulanmayacaktır . Daha önce de belirtildiği gibi çalışma için önemli olan kullanıcı araştırmaları ile ilgili değerlendirme kriterlerini anlayabilmektir. Dolayısıyla kimliğinizi açığa çıkaracak hiçbir bilgi üçüncü kişilerle paylaşılmayacaktır. Vakit ayırdığınız için tekrar teşekkür ederim.

Gülşen Töre Yargın
Ocak, 2011

DÜŞÜNCE HARİTALAMASI

Çalışmanın bu aşamasında sizinle kullanıcı araştırması ile ilgili düşüncelerinizi yansıtan bir haritalama çalışması yapacağız. Size kullanıcı araştırması ile ilgili önemli gördüğünüz konulara ilişkin sorular soracağım verdiğiniz cevaplar doğrultusunda bir ilişkiler haritası oluşturacağız.

Düşünce haritalamasına örnek olarak aşağıdaki haritayı gösterebiliriz. Haritada en altta bahsedilen özellikler çeşitli değerlerle ilişkilendirilmiştir. En üst seviyedeki değerler kişisel olarak değerlendirilebilecek en çekirdek amaçlardır. Örneğin "tatlı" özelliği, "kilo alma" sonucuyla ilişkilendirilmiş, bu sonuç ise "çekici hissetmeme" kavramı ile ilişkilendirilmiş, bu kavram ise "özsaygı" değeri ile ilişkilendirilmiştir. Bu ilişkiler "tatlı" yemenin düşünsel ilişkiler anlamında "özsaygı" ile ilişkilendirilen belli bir boyutunu göstermektedir.
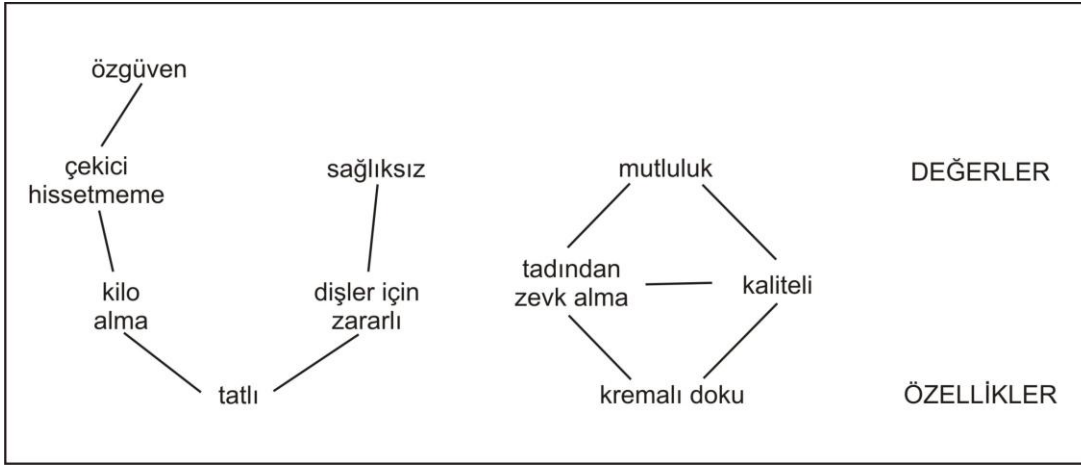
Düşünce Haritalaması Örneği (Miles and Rowe, 2004)

Az sonra soracağım sorulara verdiğiniz cevaplarda belirttiğiniz kriterleri postitlere not alacağım, daha sonrasında verdiğim örnekteki gibi, bu kriterlerin hangi başka kriterlerle ilişkili olduğunu anlamaya çalışacağız.

BÖLÜM I - ETKİLİ SUNUMUN SONUCU İLE İLGİLİ BEKLENTİLER
Şimdi soracağım sorulara geçmişte sizin için yapılan kullanıcı araştırması çalışmalarını hatırlamaya çalışarak yanıt vermenizi rica ediyorum. Elbette sizin için gizliliği olan kısımları belirmeden.

- Geçmişte kullanıcı araştırması gereksinimi duymanızı gerektiren sebepler neler oldu, böyle çalışmalar yaptırmadaki amaçlarınız nelerdi?
- Kullanıcı araştırmaları size nasıl bir güç kazandırıyor?

- Bu çalışmaların size sağlamış olduğu **en önemli faydalar** nelerdi?
  - o Bu kazancın sizin için **ne açıdan önemli** olduğunu düşünüyorsunuz?
  - o (Söylediği neden üzerinden) Peki söylediğinizin **neden önemli** olduğunu düşünüyorsunuz? Bu ne kazanç sağlıyor?

- Bu çalışmaların her hangi bir duruma **kötü etkisi** olduğunu düşünmüş müydünüz? Örneğin süre giden bir işe ya da aktiviteye kötü etkisi oldu mu? Evet ise bu durumu tanımlar mısınız? Nasıl bir kötü etkisi oldu?
  - o Bu kötü etkinin "sizin açınızdan/işletme açısından" nasıl bir önemi var? Hangi amaçları kötü yönde etkiliyor?

- Peki **birlikte çalıştığınız kişiler arasında** kullanıcı araştırmaları ile ilgili **görüşleri sizden farklılık gösterenler** olmuş muydu? Hangi yönde farklılık göstermişti? Bu görüşte hedeflenen fayda/zarar sizin belirttikleriniz arasında hangileriyle ilişkili olabilir? Bu fayda/zarar neden önemliydi?

- Şu ana kadar hangi amaçlarla kullanıcı araştırması talep ettiğinizden ve bu çalışmanın/çalışmaların size sağladığı fayda/zararlardan bahsettiniz. Peki **idealde** kullanıcı araştırmaları hangi durumlarda sürece entegre edilmelidir? Neleri amaçlamalıdır? **İdealde kullanıcı araştırmaları ne gibi faydalar sağlamalıdır**?
  - o Bu kazancın sizin için **ne açıdan önemli** olduğunu düşünüyorsunuz?
  - o (Söylediği neden üzerinden) Peki söylediğinizin **neden önemli** olduğunu düşünüyorsunuz? Bu ne kazanç sağlıyor?

BÖLÜM II - SUNUM BİÇİMİ İLE İLGİLİ TERCİHLER
Bu kısımda size "kullanıcı araştırmasının sunum biçimi" ile ilgili sorular soracağım. Sunum biçimi ile kastedilen size araştırma ile ilgili bilgilerin verilmesi için kullanılan her türlü araç ve anlatım biçimidir.

Sunum biçimi raporlamalar, rapor içindeki bölümler, görsel ve sözlü sunumlar, Powerpoint sunumları ve bunlara ilişkin bölümler gibi her türlü iletişim yöntemini kapsamaktadır. Aşağıda sunum araçları ve araçların içerebileceği şekiller özetlenmiştir.

SUNUM ARAÇLARI
- ❖ Yazılı raporlar:
- • Özet
- • Giriş
- • Yöntem
- • Bulgular
- • Tasarım Önerileri
  - o Tasarım üzerinde yapılacak değişikliklerin sözlü tarifi
  - o Önerilerin görselleştirilerek verilmesi
  - o Deneyimlenebilir prototipler/simülasyonlar sunulması

- ❖ Powerpoint sunumları
- ❖ Bilgi sistemleri: Bulguların veritabanı haline getirildiği bilgi sunumu sistemleri
- ❖ Bulguların tasarım ekibi ile paylaşıldığı çalıştaylar

SUNUM ARAÇLARI İÇİNDE VERİLEBİLECEK SUNUM ŞEKİLLERİ
- ➢ Ham veriler: Kullanıcı görüşmeleri dökümleri, görüntü kayıtları, ses kayıtları, test sürecine ilişkin detaylı sayısal dökümler
- ➢ Bilgi özetleyen tablolar
- ➢ Bilgi özetleyen grafikler: Bar grafikleri, pay grafikleri, trend eğrileri
- ➢ Konuya ilişkin bilgi-grafikleri (infographics)
- ➢ Bulguların entegre edildiği olası kullanım senaryoları: kullanıma ilişkin bağlamı özetleyen senaryolar, kaza senaryoları
- ➢ Kullanıcı grubunu kişileştiren personalar

- Sizce **iyi bir sunum** nasıl olmalıdır? Neleri içermelidir? Sunum nasıl olursa tasarım süreci için daha fazla fayda sağlayabilir?
  - (Tanımladığı özellikler üzerinden) **Neden bu özelliğin önemli olduğunu düşündünüz**? (buna haritaya referans vererek cevap verirse daha üst kriterlerle ilgili sorgulama yapılmaz, haritada olmayan bir şeyi tanımlarsa laddering-up yapmaya devam edilir)
- Ne tarz **sunum biçimlerinin faydalı olmadığını** düşünüyorsunuz? Sizce **neden faydalı değil**ler?
  - (tanımladığı neden üzerinden, nedenin **olumlu hali** *–örn: çözüme yönlendirmiyor-* belirtilerek) Öyleyse *–örn:çözüme yönlendirmenin*-in tasarım süreci için önemli olduğunu mu düşünüyorsunuz? Sizce **neden önemli**? (buna haritaya referans vererek cevap verirse daha üst kriterlerle ilgili sorgulama yapılmaz, haritada olmayan bir şeyi tanımlarsa laddering-up yapmaya devam edilir)
- Peki şirketinizde birlikte çalıştığınız ve bu sunumları kullanan başka kişileri düşünecek olursanız, bu **kişilere daha uygun gördüğünüz sunum biçimleri** var mı? Bu biçimler neye göre farklılık gösteriyor? Farklılığın nedenleri nelerdir? O kişi için bunun önemi neyle ilişkili olabilir?
- **Bu kişilere uygun olmadığını düşündüğünüz sunum biçimleri var mı**? Neden uygun olmadığını düşünüyorsunuz? O kişi için bunun önemi neyle ilişkili olabilir?

Şimdi bir de sizin tanımladığınız kriterler (postitler) üzerinden çalışmayı bir değerlendirelim. Örneğin (Postit 1) ile **ilgili sizce nasıl bir sunum biçimi gerekir? Bu amacı karşılamak için nasıl bir sunum biçimi daha uygun olur?**(Postit2, postit3….)

CONSIDERATIONS REGARDING THE TYPE OF DESIGN INTEGRATION

Table 17. Design integration hierarchy - Explanations are directly taken from the original source as quotations

	Danish design ladder	Designer's role according to Perks et al. (2005)	Design management type according to Borja de Mozota (2002)
❹	**Step No. 4 Design as innovation:** The designer collaborates with the owner/management in adopting an innovative approach to all – or substantial parts – of the business foundation. The design process combined with the company vision and future role in the value chain are important elements.	**3. Design as NPD Process Leader Design** in this categorization is seen as a major force for innovation. Designers drive and support actions throughout the entire development process and across a broad scope of functional activities. At the idea generation stage designers, in the more advanced cases, undertake actions to interact directly with the marketplace. This allows them to glean useful insights firsthand to support initial ideas or to refine design concepts. While the marketing function was tasked to provide demographic and scientifically derived market data on functional requirements, it was frequently the designers themselves who interacted very closely with customers.[…] Some designers show behaviors that influence marketing strategy, proposing new markets, and segments. The designer thus challenges existing marketing assumptions and provides new perspectives on market targets. Contextual Factors This characterization primarily occurred where radical product development was under way. The designer needed to access a broad range of sources to enhance inspiration and creativity. It also was found that, relative to their industry competitors, these companies had rapid development cycles. Evidence was found of designers learning new skills from external agencies.[…] In this characterization, an additional dominant contextual dimension was found, which was less acute in the other categories. The effect of market and technology drivers to the product development effort exerted a strong influence on the nature of the designer's role. The combination of both market pull and technology push appeared to drive a design-led approach to product development. The need to understand market requirements, but also to deploy advanced technologies in the NPD effort, can propel a central role for design in doing this. This was particularly evident in those cases facing highly competitive environments but also being driven to cut back development costs.	**Class 1: Design as a managerial competence** • Design accelerates time to market. • Design improves cooperation among agents. • Design changes relationships with suppliers. All these variables share an "innovation" vision of design management and a strategic orientation based on internal transactions costs. These 16 firms justify the competitive advantage of design by the value it creates on the management of the support activities and, in particular, on the role given to design as a source of ideas and innovation concepts. The variable "design changes the spirit of the personnel, which becomes more innovative" is the one that has the highest score.

	Danish design ladder	Designer's role according to Perks et al. (2005)	Design management type according to Borja de Mozota (2002)
❸	**Step No. 3 Design as process:** Design is not a finite part of a process but a work method adopted very early in product development. The design solution is adapted to the task and focused on the end-user and requires a multidisciplinary approach, e.g. involving process technicians, material technologists, marketing and organisational people.	2. Design as Part of Multifunctional Team: In this characterization, a team approach is used throughout the development process. Design is identified as a crucial aspect of the product development activity. It was found that designers are encouraged and emerge as key players of the team. The case companies made considerable effort to generate ongoing interaction between designers and relevant stakeholders throughout most stages of the NPD process. The designer's role was dominated by communication and interfacing activities. In company N (a manufacturer of vacuum cleaners), for example, the industrial designer interfaced with representatives from production planning, purchasing, and marketing during early brainstorming sessions. In the design phase, detailed design concepts were exchanged frequently with other functions in an iterative fashion. […] Designers, in this characterization, are encouraged to show flexibility in their role. They provide a support role to other functions, such as participating in field trials and in-house reliability testing. Contextual Factors This grouping made extensive use of external designers and integrated them into the team. For example, company R (a floor covering manufacturer) uses a team of textile, graphic, and furniture external designers. External sources provide the creativity needed for radical developments, a dominant orientation in this categorization. However, the process of integrating both internal and external technical and industry-specific expertise can be time consuming. Many organizations had long development cycles. This gives the time to encourage interaction among a larger set of functions and to conciliate different functional perspectives.	Class 2: Design as a resource competence • Design improves coordination between marketing and production. • Design creates a new market. • Design develops care for the customer in innovation. • Design is a core competency. • Design generates technology transfers. These variables show a "market and client-driven" orientation of the strategy and an "external transaction cost" vision of design. Design management gives priority to the impact of design in terms of perspective and imagination and on continuous quality improvement. High scores are given to innovation driven by design and design seen as a know-how that transforms the processes.

	Danish design ladder	Designer's role according to Perks et al. (2005)	Design management type according to Borja de Mozota (2002)
❷	**Step No. 2 Design as styling.** Design is perceived as a final aesthetic finish of a product. In some cases, professional designers may perform the task, but generally other professions are involved.	**1. Design as Functional Specialism:** Designers in this category concentrate purely on design. They are perceived by the business as a resource. They undertake the basic tasks of receiving the brief and carrying out sufficient research to inform their own design. Decisions and actions relating to marketing and manufacture in this category are dictated by other functions. […] In this characterization it was found that design sticks to its functional silo. It is ring-fenced and highly controlled. In some of the cases new designers are initially given greater scope for creativity but are gradually restricted according to commercial risk. This frequently led to design-marketing conflict. Designers were compelled to express performance parameters in marketing terms, of which they had no experience and were unable to understand. This is illustrated in the following quote by company E: "The designers get frustrated with you. If they argue with you, we say to them—tell me why we could sell it and I'll tell you why we can't sell it." Contextual Factors The functional characterization was found mainly in those companies that carried out internal design and undertook incremental product developments. During incremental developments there is less need for creativity and experimentation in the early idea generation stages. In this study's cases, the marketing function carried out traditional market research tasks to appropriate largely quantitative customer data. This sufficed to inform incremental changes to an existing product range. Needs were usually specified in a clearly defined brief from marketing. Discrete design tasks then could be carried out. Second, it was found that the speed of the NPD process influenced the nature of the role of the designer. Where the organization was driven to introduce products quickly and frequently (such as many of the apparel cases in the sample), functional activities were specified and were kept largely in the boundaries of traditional roles. At company E, for example, a shift to the functional approach helped the company to streamline and speed up the NPD process, allowing the company to develop two product ranges a year.	**Class 3: Design as an economic competence** Five firms do not see the importance of design in innovation management. They attribute a lower score to each modality that tends to give a managerial value to design. But they do give a higher score to the following variables: • Design allows the company to sell at a higher Price • Design contributes to benefits perceived by consumers. These variables show that these companies have an economic vision of design, with a profit orientation. The value created is judged by its impact on marketing-mix policies. Design management is operational and limited to product policy internally and to product performance externally.
❶	**Step No. 1:** Design is an inconspicuous part of, for instance, product development and performed by members of staff, who are not design professionals. Design solutions are based on the perception of functionality and aesthetics shared by the people involved. The points of view of end-users play very little or no part at all.		**Class 4: Firms indecisive on the role of design** Four firms are uncertain about the value design can create and give a low score to the variable "design is a core competency." Here design integration seems conjectural. Design management shows no objective of creating a competitive advantage, only the willingness to innovate in the product portfolio.

Table 18. Tasks of the designer based on the empirical study of Perks et al. (2005) based on the phase in product development (adapted from Perks et al., 2005)

		DESIGN ROLES		
		DESIGN FUNCTIONAL	INTEGRATION	PROCESS LEADERSHIP
PRODUCT DEVELOPMENT PHASE	Identification of the Need	• Customer contact • Technology exploration • Idea and theme generation	• Interaction with other functions (e.g. manufacturing, marketing)	• Team assembly • Market observation and research • Market segmentation • Business case development
	Concept Generation	• Receiving Brief • Design Research (e.g., Shopping Visits, Color and Technology Research) • Design Decision-making (e.g., Design Theme and Mood Board)	• Interaction with Other Internal Functions (e.g., Manufacturing, Marketing) • Interaction with External Stakeholders (e.g., Suppliers)	• Market and Technical Research • Informing the Team • Trade Show Visits
	Design and Development	• Designing Prototype, Packaging, and Launch Material (e.g., Sketch Designs, Color Decisions, Catwalk Show) • Making Prototypes (Use of CAD and Product Samples) • Sourcing and Trial of Materials • Testing Prototype	• Detailed Negotiation and Liaison with Internal (e.g., Sales and Technical Staff) and External Functions (Suppliers)	• Observation of Response to Design • Customer Response Measurement • Consider Business Costs • Visit to Manufacturers and Suppliers • Leading the Team and Stakeholders
	Production	• Transferring Designs to Production	• Organize Tooling Liaison with Manufacturing and Suppliers	• Monitoring Production Quality
	Launch	• Designing Launch Material		• Plan and Review Launch (e.g., Manage Public Relations and Marketing)

VERIFICATION QUESTIONNAIRE

ONLINE QUESTIONNAIRE CONTENT – TURKISH VERSION

"KULLANICI ARAŞTIRMASI BULGULARININ TASARIM SÜRECİNE ETKİLİ AKTARIMI"
ÇEVRİM İÇİ ANKET UYGULAMASI

Bu çalışma Orta Doğu Teknik Üniversitesi Endüstri Ürünleri Tasarımı Bölümünde yürütülen **"Kullanıcı araştırması bulgularının tasarım sürecine etkili aktarımı"** konulu doktora araştırmasının bir parçasıdır. Çalışmada **tasarım süreçlerinde kullanıcı bilgisinden faydalanan tasarımcılar**ın, bu araştırmaların kendilerine nasıl iletilmesi gerektiğine ilişkin görüşlerini almak hedeflenmektedir. Anket sonucunda, ankete cevap veren tasarımcıların ve onlarla karşılaştırmalı olarak sizin kullanıcı araştırması ile ilgili görüşlerinize ilişkin bir özeti edinmeniz mümkün olacaktır. Bu bilginin araştırma süreci sonunda size iletilmesini istiyorsanız lütfen e-posta adresinizi aşağıdaki kutucuğa yazınız. (E-posta adresiniz gizli tutulacak, araştırma ile ilgili yayınlar ve tezlerde ankete verdiğiniz cevaplar ile eşleştirilmeyecek ve diğer kişiler ile paylaşılmayacaktır).

E-posta: ☐

(Ankete devam etmek için e-posta adresi girilmesi zorunlu değildir)
Anketin tamamlanması yaklaşık 20 dakika sürmektedir. Vakit ayırdığınız için çok teşekkür ederim.

Gülşen Töre Yargın
Doktora Öğrencisi | Araştırma Görevlisi
ODTÜ - Endüstri Ürünleri Tasarımı Bölümü
www.id.metu.edu.tr
ODTÜ - BİLTİR - ÜTEST
www.utest.metu.edu.tr
E-posta: gulsentore@gmail.com
Tel: +90 312 210 4220

Lütfen çalışma alanınızı belirtiniz.

○ Tüketici ürünleri (Beyaz eşya, elektronik ev aletleri, kişisel telekomünikasyon cihazları gibi)

○ Otomotiv sanayi

○ Savunma sanayi

○ Medikal ürünler

○ Tasarım danışmanlığı

○ Diğer (Lütfen belirtiniz): ……………

Lütfen eğitim almış olduğunuz alanı belirtiniz.

○ Endüstri Ürünleri Tasarımı

○ Makine Mühendisliği

○ Elektrik Elektronik Mühendisliği

○ Diğer (Lütfen belirtiniz): ……………

Lütfen şu an çalışmakta olduğunuz firmada/kurumda yürütmekte olduğunuz tasarım görevlerini seçiniz (Birden fazla seçeneği işaretleyebilirsiniz).

☐ Grafik tasarım
☐ Marka tasarımı
☐ Ambalaj tasarımı
☐ Ürün tasarımı
☐ Mobilya tasarımı
☐ İç mimarlık
☐ Moda ve tekstil tasarımı
☐ Etkileşim tasarımı
☐ Web tasarımı
☐ Taşıt tasarımı
☐ Hizmet tasarımı
☐ Mağaza ve satış noktası tasarımı
☐ Mekanik tasarım
☐ Diğer (Lütfen belirtiniz): ……………

Daha önce kullanıcı araştırmaları ile ilgili ne tür deneyimleriniz oldu? (Birden fazla seçeneği işaretleyebilirsiniz).

☐ Kullanıcı araştırmaları alanında özelleşmiş, **danışmalık hizmeti veren bir kurum/firma** tarafından hazırlanan kullanıcı araştırması bilgisini kullandım.
☐ **Şirket içindeki bölümler** tarafından hazırlanan kullanıcı araştırması bilgisini kullandım.
☐ Kendi tasarım sürecimde **kullanıcı araştırması yaptım**.

Anketin kalan kısmında grafikte gösterilen iki temel konu sorgulanacaktır.

KULLANICI ARAŞTIRMASI SONUCU:

❶ HANGİ KAZANIMLARI İSTİYORSUNUZ? → **❷ BU KAZANIMLAR NASIL SAĞLANIR?**

VERİLECEK BİLGİ
Nasıl bilgiler verilmeli?

SUNUM BİÇİMİ
Nasıl sunulmalı/raporlanmalı?
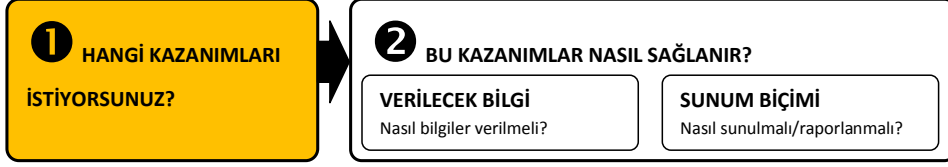
Anket ilerleme göstergesi:

❶ HANGİ KAZANIMLARI İSTİYORSUNUZ?

Kullanıcı araştırmasının sağlayabileceği kazanımlar aşağıda listelenmiştir. Bu çalışmada kimi kazanımların daha önemli olduğu öngörülmektedir, bu nedenle de sizlerin hangi kazanıma ne kadar önem verdiğinizi anlamamız çok bilgi verici olacaktır. Lütfen aşağıda sol kolonda listelenen kazanımları tasarım sürecinde sizin için önemine göre değerlendiriniz.

Araştırma sonucunda… /	Hiç önemli değil		Orta düzeyde önemli			Son derece önemli
	0	1	2	3	4	5	6
kullanıcının düşünme biçimini anlamak							
tasarımda verdiğim kararları desteklemek için kullanılabilecek sonuçlar elde etmek							
tasarım sürecinde **yol gösterici** sonuçlar edinmek							
tasarımımın gerçek kullanımdaki durumunu anlamak							
tasarımımın rakipleri arasındaki durumunu öğrenmek							
sonuçlardan **ilham almak**							
sunumları/raporları incelerken **zaman kaybetmemek**							
tasarım ekibimiz içinde **ortak bir dil yaratan** sonuçlar elde etmek							
ilgili kişileri **ikna edebilmek**							
işimden tatmin olarak çalışmak							
sunumları/raporları incelerken **keyif almak**							

KULLANICI ARAŞTIRMASI SONUCU:

1 HANGİ KAZANIMLARI İSTİYORSUNUZ?

2 BU KAZANIMLAR NASIL SAĞLANIR?

VERİLECEK BİLGİ
Nasıl bilgiler verilmeli?

SUNUM BİÇİMİ
Nasıl sunulmalı/raporlanmalı?

Anket İlerleme göstergesi:

2 BU KAZANIMLAR NASIL SAĞLANIR? – VERİLECEK BİLGİ ÖZELLİKLERİ

Kullanıcı araştırmasının sağlayabileceği kazanımlar yine aşağıda sol kolonda listelenmiştir. Bu bölümde ise araştırma sonucu verilecek **bilgiye ilişkin özellikler**in kazanımlara etkisi sorgulanacaktır. Lütfen bilgiye ilişkin özelliğinin, sizin açınızdan kazanımı ne yönde etkileyeceğini değerlendiriniz.

	1. Bilginin tartışmaya açık olması	2. Kullanıcı bilgilerinin detaylı olması	3. Bilginin güvenilir olması	4. Bilginin gelecekte geçerliliğini yitirmemesi	5. Araştırma sonucu ulaşılan önerilerin pratikte uygulanabilirliği	6. Bilginin çok yönlülüğü (belirli bir konuyu birden fazla açıdan ele alması)	7. Bilginin ikna edici gücü	8. Bilginin kolay anlaşılabilirliği

Ölçek (her sütun için): Çok iyi etkiler +3, +2, +1 · Hiç etkilemez 0, -1, -2 · Çok kötü etkiler -3

Satırlar:
- kullanıcının düşünme biçimini anlamam
- tasarımda verdiğim kararları destekleyebilmemi
- tasarım sürecinde araştırmanın yol göstericiliğini
- tasarımımın gerçek kullanımdaki durumunu anlamamı
- tasarımımın rakipleri arasındaki durumunu öğrenmemi
- sonuçlardan ilham alabilmemi
- sunumları/raporları incelerken zaman kaybetmememi
- tasarım ekibimiz içinde ortak bir dil yaratabilmeyi
- ilgili kişileri ikna edebilmemi
- işimden tatmin olarak çalışmamı
- sunumları/raporları incelerken keyif almamı

KULLANICI ARAŞTIRMASI SONUCU:

1 HANGİ KAZANIMLARI İSTİYORSUNUZ?

2 BU KAZANIMLAR NASIL SAĞLANIR?

VERİLECEK BİLGİ — Nasıl bilgiler verilmeli?

SUNUM BİÇİMİ — Nasıl sunulmalı/raporlanmalı?

Anket ilerleme göstergesi:

2 BU KAZANIMLAR NASIL SAĞLANIR? – SUNUM BİÇİMİ ÖZELLİKLERİ

Kullanıcı araştırmasının sağlayabileceği kazanımlar yine aşağıda sol kolonda listelenmiştir. Bu bölümde araştırma sonucu verilecek **sunum biçiminin özelliklerinin** kazanımları ne yönde etkileyeceği sorgulanacaktır. Lütfen sunum biçimi özelliğinin, sizin açınızdan kazanımı ne yönde etkileyeceğini değerlendiriniz.

	1. Sunumun tasarımcının bulguları kendi kendine yorumlayabilmesine olanak vermesi	2. Sunumun bulguları somut örneklendirme ile aktarması	3. Sunumun ilgi çekiciliği	4. Sunumun kullanıcıyı ve kullanım ortamını iyi canlandırması	5. Sunumun farklı kişilere uygunluğu (mühendisler, pazarlamacılar, yöneticiler gibi)	6. Sunumun istenilen bulgulara erişim kolaylığı sağlaması	7. Sunumun bulguların paylaşımını / aktarımını kolaylaştırması	8. Sunumun kolay anlaşılabilirliği
kullanıcının düşünme biçimini anlamam								
tasarımda verdiğim kararları destekleyebilmemi								
tasarım sürecinde araştırmanın yol göstericiliğini								
tasarımımın gerçek kullanımdaki durumunu anlamamı								
tasarımımın rakipleri arasındaki durumunu öğrenmemi								
sonuçlardan ilham alabilmemi								
sunumları/raporları incelerken zaman kaybetmememi								
tasarım ekibimiz içinde ortak bir dil yaratabilmeyi								
ilgili kişileri ikna edebilmemi								
işimden tatmin olarak çalışmamı								
sunumları/raporları incelerken keyif almamı								

Her sütun için ölçek: Çok iyi etkiler +3, +2, +1, Hiç etkilemez 0, -1, -2, -3 Çok kötü etkiler

175

"EFFECTIVE DELIVERY OF USER RESEARCH FINDINGS TO THE DESIGN PROCESS"
ONLINE QUESTIONNAIRE

This study is a part of a PhD project regarding "**effective delivery of user research findings to the design process**", carried out at Middle East Technical University, Department of Industrial Design. In this study, it is aimed to gather opinions of **designers, who utilize user knowledge in their design processes**, regarding how user research findings should be delivered to themselves.

As a result of the questionnaire, it will be possible for you to obtain a summary of opinions of the designers, who responded to the questionnaire, regarding user research, comparatively with yours. If you would like to have this information to be delivered to you at the end of the study, please leave your email address in the box below (Your email address will be kept confidential, it will not be associated with your answers to the questionnaire, nor will it be revealed in publications, the PhD thesis, or shared with third parties).

E-mail: [   ]

(It is not required to enter an e-mail address to proceed into the questionnaire)
It will take approximately 20 minutes to complete the questionnaire. Thank you very much for your time.

Gülşen Töre Yargın
PhD Student | Research Assistant
Middle East Technical University
Department of Industrial Design
www.id.metu.edu.tr
METU - BILTIR - UTEST
www.utest.metu.edu.tr
E-mail: gulsentore@gmail.com
Tel: +90 312 210 4220

Please indicate your area of study.

- ○ Consumer products (e.g. white goods, electronic home appliances, personal telecommunication devices)
- ○ Automotive industry
- ○ Defence industry
- ○ Medical products
- ○ Design consultancy
- ○ Other (Please indicate):.........

Please indicate your educational background.

- ○ Industrial Design
- ○ Mechanical Engineering
- ○ Electrical and Electronic Engineering
- ○ Other (Please indicate):.........

Please specify the design duties that you carry out in the firm/institution in which you are currently employed (You may choose more than one design duty).

- ☐ Graphic design
- ☐ Brand design
- ☐ Packaging design
- ☐ Product design
- ☐ Furniture design
- ☐ Interior design
- ☐ Fashion and textile design
- ☐ Interaction design
- ☐ Web design
- ☐ Transport design
- ☐ Service design
- ☐ Retail design
- ☐ Mechanical design
- ☐ Other (Please indicate):.........

What kind of experiences have you had previously, regarding user research? (You may choose more than one answer).

- ☐ I utilized information from user research conducted by a **consultancy firm/institute,** which specializes in user research.
- ☐ I utilized information from user research conducted by **in-house departments**.
- ☐ I conducted **user research by myself** in my design process.

In the rest of the questionnaire, the two major issues illustrated in the graphic below will be questioned.

AS A RESULT OF USER RESEARCH:

❶ **WHICH BENEFITS DO YOU SEEK?**

❷ **HOW CAN THESE BENEFITS BE REALIZED?**

INFORMATION TO BE DELIVERED
What type of information should be delivered?

THE MEANS OF DELIVERY
How should information be delivered/reported?

Questionnaire progress indicator:
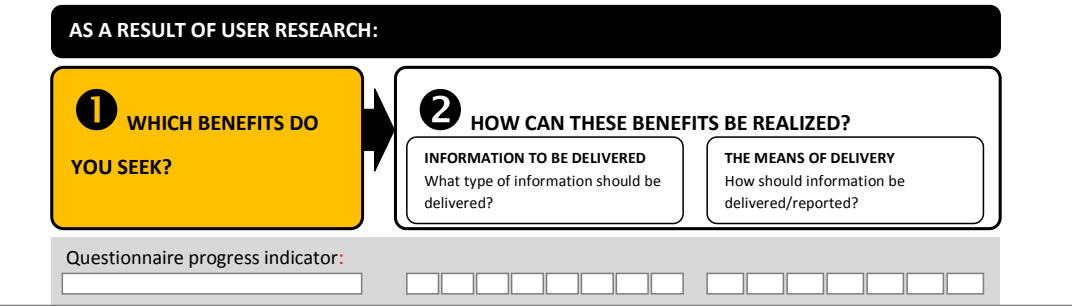
❶ **WHICH BENEFITS DO YOU SEEK?**

The benefits that can be provided by user research are listed below. In this study, it is anticipated that some benefits are more important than others. For this reason, it would be enlightening for us to see which benefits are really important for you and to what degree they are important. Please evaluate the benefits listed in the left column by considering its degree of importance for you in the design process.

	Not important at all			Mid-level importance			Very important
At the end of the user research…	0	1	2	3	4	5	6
gaining **an understanding of users' ways of thinking**							
having results to be utilized in **supporting my design decisions**							
having a **guidance** in the design process							
gaining an understanding of **my design's condition in the actual usage context**							
knowing the **position of my design among its competitors**							
having **inspiration**							
not losing time while exploring the deliverables of user research							
having results that **create a shared language** among our design team							
gaining an **ability to convince** others							
having **job satisfaction**							
having **pleasure/enjoyment** whilst exploring the deliverables of user research							

1 WHICH BENEFITS DO YOU SEEK?

2 HOW CAN THESE BENEFITS BE REALIZED?

INFORMATION TO BE DELIVERED
What type of information should be delivered?

THE MEANS OF DELIVERY
How should information be delivered/reported?

Questionnaire progress indicator:

2 HOW CAN THESE BENEFITS BE REALIZED? - INFORMATION TO BE DELIVERED

The benefits that can be provided by user research are listed again in the left column below. In this section, the effect of the **qualities of the delivered information** on these benefits is questioned. According to your opinion, please evaluate by considering in which way the quality of information affects the benefit that is sought.

The effect of…

on…	Information that is not open to discussion	Depth of findings from the user information	Credibility of the information	Information that will not lose its validity in the future	Practical applicability of recommendations	Multidimensionality of the information (providing multiple dimensions on a particular issue)	Persuasive power of the information	Ease of understanding of the information
gaining an understanding of users' ways of thinking								
having an **ability to support my design decisions**								
having a **guidance** in the design process								
gaining an understanding of **my design's condition in the actual usage context**								
knowing the **position of my design among its competitors**								
having **inspiration**								
not losing time while exploring the deliverables								
having an **ability to create a shared language** among our design team								
gaining an **ability to convince** others								
having **job satisfaction**								
having **pleasure/enjoyment** whilst exploring the deliverables								

Rating scale for each column: HIGHLY FAVOURABLE (+3, +2, +1), NOT PERCEIVABLE (0), (-1, -2), HIGHLY ADVERSE (-3)

AS A RESULT OF USER RESEARCH:

1 WHICH BENEFITS DO YOU SEEK?

2 HOW CAN THESE BENEFITS BE REALIZED?

INFORMATION TO BE DELIVERED — What type of information should be delivered?

THE MEANS OF DELIVERY — How should information be delivered/reported?

Questionnaire progress indicator:

2 HOW CAN THESE BENEFITS BE REALIZED? - THE MEANS OF DELIVERY

The benefits that can be provided by user research are listed again in the left column below. In this section, the effect of the **qualities of the means of delivery** on these benefits is questioned. According to your opinion, please evaluate by considering in which way the quality of the means of delivery affects the benefit that is sought.

The effect of...

on...	Delivery that provides the designer with the ability to interpret findings by him/herself	Delivery that communicates findings through concrete exemplification	Attractiveness of delivery	Delivery that successfully represents a defined user and context	Delivery tailored to different audiences (e.g. engineers, marketers, managers)	Delivery that maintains ease of access to the intended information	Delivery that eases sharing / communicating of findings	Delivery that is easy to understand
(scale per column: +3 HIGHLY FAVOURABLE, +2, +1, 0 NOT PERCEIVABLE, -1, -2, -3 HIGHLY ADVERSE)								
gaining **an understanding of users' ways of thinking**								
having an **ability to support my design decisions**								
having a **guidance** in the design process								
gaining an understanding of **my design's condition in the actual usage context**								
knowing the **position of my design among its competitors**								
having **inspiration**								
not losing time while exploring the deliverables								
having an **ability to create a shared language** among our design team								
gaining an **ability to convince** others								
having **job satisfaction**								
having **pleasure/enjoyment** whilst exploring the deliverables								

VERIFICATION QUESTIONNAIRE EMAIL FORMAT AND LINKEDIN GROUPS THAT THE QUESTIONNAIRE IS POSTED

EMAIL FORMAT

Turkish

Konu: Doktora arastirmasi anket katilimi ile ilgili rica

Sayin ……,

Orta Dogu Teknik Universitesi, Endustri Urunleri Tasarimi Bolumunde, Doc. Dr. Cigdem Erbug danismanliginda, "**kullanici arastirmasi bulgularinin tasarim surecine etkili aktarimi**" konulu doktora calismasini yurutmekteyim.

Bu kapsamda uygulayacagim anket calismasi icin tasarim surecinde **kullanicidan gelen bilgi**ye ihtiyac duyan tasarimcilara/urun gelistiricilerine ulasmayi hedeflemekteyim.

Bu tip bilgiyi edinen ve kullanan bir tasarimci/urun gelistiricisi olarak asagidaki linkte yer alan ankete vereceginiz yanitlar calismam icin son derece degerli olacaktir. Anketi 6 Ocak 2012 tarihine kadar yanitlayabilirseniz cok sevinirim.

www.toreyargin.com

Dilediginiz takdirde ankete katilan kisilerin goruslerini ve onlarla karsilastirmali olarak sizin goruslerinizi iceren bir sonuc ozeti, arastirma sureci sonunda size iletilecektir (Bahsedilen sonuc ozeti kisiye ozel hazirlanacak ve katilicilarin kimliklerini ortaya cikaracak hicbir bilgi paylasilmayacaktir).

Bu epostayi sizinle birlikte calisan, konu ile ilgili tasarimcilara/urun gelistiricilerine de yonlendirebilirseniz cok sevinirim.

Degerli katiliminiz ve yardimlariniz icin simdiden cok tesekkur ederim.

Saygilarimla,

Gülşen Töre Yargın
Doktora Öğrencisi | Araştırma Görevlisi
ODTÜ - Endüstri Ürünleri Tasarımı Bölümü
www.id.metu.edu.tr
ODTÜ - BİLTİR - ÜTEST
www.utest.metu.edu.tr
Tel: [+90 312 210 4220](+90 312 210 4220)

English

Subject: A kind request for participation in the questionnaire of a PhD study

Dear ….,

I have been carrying out a PhD project regarding "**effective delivery of user research findings to the design process**" under the supervision of Assoc. Prof. Dr. Çiğdem Ebuğ at Middle East Technical University, Department of Industrial Design.

For the questionnaire, which is conducted as a part of this project, I am contacting designers/product developers who need to utilize **information from users** in design process.

As a designer/product developer who have access to this kind of knowledge and utilize it in the design process, your responses to the questionnaire in the link below would be highly valued and greatly appreciated. I will be grateful if you could fill in the questionnaire by January 6, 2012.

www.toreyargin.com

If you would like to obtain a summary of the results which will include opinions of the designers, who responded to the questionnaire, comparatively with yours, it will be delivered to you at the end of the project (Each summary will be prepared individually and all of the personal information will be kept confidential).

I will appreciate if you could forward this email to relevant designers/product developers with whom you are working.

Thank you very much in advance for your invaluable help and participation in my study.

Sincerely yours,

Gülşen Töre Yargın
PhD Student | Research Assistant
Middle East Technical University
Department of Industrial Design
www.id.metu.edu.tr
METU - BILTIR - UTEST
www.utest.metu.edu.tr
Tel: +90 312 210 4220

LINKEDIN GROUPS

Design research:
http://www.linkedin.com/groups?home=&gid=80336&trk=anet_ug_hm&goback=.gan_80336

Design research society:
http://www.linkedin.com/groups?home=&gid=2543753&trk=anet_ug_hm

Design thinking:
 http://www.linkedin.com/groups?home=&gid=37821&trk=anet_ug_hm

User experience:
http://www.linkedin.com/groups?home=&gid=72842&trk=anet_ug_hm

User experience professionals:
http://www.linkedin.com/groups?home=&gid=112915&trk=anet_ug_hm

UPA International:
http://www.linkedin.com/groups?home=&gid=717&trk=anet_ug_hm

UX professionals:
http://www.linkedin.com/groups?home=&gid=38178&trk=anet_ug_hm

APPENDIX F

DETAILS ABOUT LADDERING ANALYSIS

In this Appendix, details about laddering analysis are presented.

Table 19. Implication matrix for laddering analysis – Attributes of the presentations

Column headers (1–43):

1 Empathy | 2 Supportiveness/Justification | 3 Having Guidance | 4 Having feedback - co... | 5 Having feedback - p... | 6 Inspiration | 7 Prevention of time l... | 8 Unity in communica... | 9 Persuasion of others | 10 Product improveme... | 11 Ability to proceed | 12 Job satisfaction | 13 Enjoyment/fun | 14 Concreteness | 15 In-depthness | 16 Credibility | 17 Sustainability | 18 Applicability | 19 Multidimensionality | 20 Persuasiveness | 21 Understandability | 22 Open-endedness | 23 Interactivity | 24 Integration with the... | 25 Avoidance of fixatio... | 26 Concreate exampli... | 27 Tangibility | 28 Attractiveness | 29 Representativeness | 30 Representativeness | 31 Suitability to audien... | 32 Accessibility | 33 Shareability | 34 Explanatoriness/inf... | 35 Holism | 36 Conciseness | 37 Prioritization | 38 User satisfaction | 39 Brand identity | 40 Enhancing knowledg... | 41 Right investments | 42 Competitiveness | 43 OIM-PROFIT

#	Row label	Directs	Indirect	SUM
44	Quantitative data	4	2	6
45	Quantitative data - highlighting majorities	11	27	38
46	Quantitative comparison	3	13	16
47	Qualitative data	0	0	0
48	Raw data - Quotations from Raw Data (filtered)	6	9	15
49	Raw data - Raw Data (unfiltered)	9	21	30
50	Providing underlying reasons	7	18	25
51	Providing justifications for the recommendations	7	11	18
52	Providing hierarchical data	5	13	18
53	Covering all of the information gathered	1	5	6
54	Utilizing a common terminology	4	2	6
55	Audience based presentations	3	0	3
56	Design-task based presentations	1	2	3
57	Presenting findings on visuals or products	12	36	48
58	Comparisons	7	28	35
59	Recommendations	8	22	30
60	Participant based presentations	5	20	25
61	Personas	7	23	30
62	Scenarios	6	20	26
63	Photographs	7	28	35
64	Video recordings	21	52	73
65	User information databases	4	11	15
66	Product qualities databases	6	13	19
67	Interactive presentations	9	11	20
68	Workshops	10	19	29
69	Brief texts	8	3	11
70	Extensive-long texts	1	0	1
71	Verbal reports	4	4	8
72	Visuals	5	3	8
73	Infographics	7	14	21
74	Graphs/Charts	5	4	9
75	Posters and 3D materials	1	2	3
76	Delivery's compatibility with the designer's communication medium	2	4	6
77	Presenting the methodology in the deliverables	4	0	4
78	Direct involvement of the designer or product developer	18	52	70
79	Research setting	3	6	9

The "Directs", "Indirect", "SUM" columns fall under the heading "Active sum (outdegrees)".

Table 19. Implication matrix for laddering analysis (continued) – System constructs – Consequences and Values

Row / column constructs:

1 Empathy
2 Supportiveness/Justification
3 Having guidance
4 Having feedback - content of use
5 Having feedback - position among competitors
6 Inspiration
7 Prevention of time loss
8 Unity in communications
9 Persuasion of others
10 Product improvement
11 Ability to proceed
12 Job satisfaction
13 Enjoyment/fun
14 Concreteness
15 In-depthness
16 Credibility
17 Sustainability
18 Applicability
19 Multidimensionality
20 Persuasiveness
21 Understandability
22 Open-endedness
23 Interactivity
24 Integration with the present knowledge
25 Avoidance of fixation/rigidity
26 Concrete exemplification
27 Tangibility
28 Attractiveness
29 Representativeness-context and behaviour
30 Representativeness-personification
31 Suitability to audiences
32 Accessibility
33 Shareability
34 Explanatoriness/informativeness
35 Holism
36 Conciseness
37 Prioritization
38 User satisfaction
39 Brand identity
40 Enhancing knowledge sources
41 Right investments
42 Competitiveness
43 Profitability

Figure 64. Hierarchical Value Map with the cut-off value:1

CONTENT ANALYSIS DETAILS FOR COGNITIVE MAPPING INTERVIEWS

Table 20. Detailed sample description for the cognitive mapping interviews

Resp. No.	Industry	User Research Experience	Educational Background
R01	Consumer Products	Only reported (outsourcing) – no experience	Engineer
R02	Automotive	Only reported (outsourcing) – no experience	Designer
R03	Consumer Products	Only reported (outsourcing) – no experience	Engineer
R04	Consumer Products	Only reported (outsourcing) – no experience	Engineer
R05	Consumer Products	Only reported (outsourcing) – no experience	Engineer
R06	Consumer Products	Both reported (outsourcing) and have own experience	Designer
R07	Consumer Products	Both reported (outsourcing) and have own experience	Designer
R08	Automotive	Only reported (outsourcing) – no experience	Designer
R09	Consumer Products	Both reported (outsourcing) and have own experience	Designer
R10	Consumer Products	Only own experience – never reported	Designer
R11	Medical Products	Only own experience – never reported	Designer
R12	Defence	Only own experience – never reported	Designer
R13	Automotive	Only own experience – never reported	Designer
R14	Design Consultancy	Both reported (outsourcing) and have own experience	Designer
R15	Design Consultancy	Both reported (outsourcing) and have own experience	Designer
R16	Design Consultancy	Only own experience – never reported	Designer
R17	Defence	Only own experience – never reported	Designer
R18	Medical Products	Both reported (outsourcing) and have own experience	Designer
R19	Medical Products	Only own experience – never reported	Designer
R20	Defence	Only own experience – never reported	Designer

Table 21. Detailed coding structure for the analysis and the respondents who refers to the code

INDIVIDUAL IMPACTS	
Empathy with the user (20)	
Understanding user needs and problems (17)	
Understanding user needs and problems Providing user knowledge input for the design process	R03, R04, R05, R06, R07, R08, R09, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19
Getting to know the user (12)	
Getting to know the user	R02, R03, R06, R07, R08, R09, R12, R13, R15, R16, R17, R19
Specifying the target group well	R14
Managing the gap between users and product development	

team (9)		
	Managing the gap between users and designers or engineers	R01, R03, R04, R05, R07, R09, R10, R14, R17
Understanding user's mental model while using the product (9)		
	Understanding user mental models	R01, R05, R17
	Understanding misuses	R03
	Investigating user-product relation	R10
	Understanding requirements regarding user capabilities	R05, R17
	Understanding user requirements about product functions	R07
	Identifying user's aims for using the product	R16
	Understanding user's previous experiences with the products	R17
	Understanding important issues for the user while carrying out the tasks	R17
	Understanding user behaviours that cannot be verbalized by the user	R02
	Understanding user's behaviours while using the product	R16
Understanding physical requirements related to users (4)		
	Having anthropometrical data about user population	R11, R13, R18, R20
Understanding user preferences (10)		
	Identifying product features or qualities that affect consumer preferences	R02
	Understanding user preferences	R02, R03, R05, R07, R09, R10, R12, R13, R14
	Understanding user's criteria for choosing a product	R03, R07, R09
	Gathering opinions of users regarding future products	R07
	Understanding reasons of buying decisions	R15
Understanding user's emotions and affective qualities for user (7)		
	Understanding user's perception of aesthetic qualities	R07, R16
	Understanding perceived qualities that the user unconsciously relates to the product	R08
	Understanding perceived qualities that are effective before purchasing the product	R15
	Understanding user preferences regarding product style	R14
	Identifying actual feelings of the users towards the product	R02
	Identifying product qualities that creates pleasure for the user	R15
	Identifying product qualities that can empower brand image	R02
Getting to know the context of use (5)		
	Getting to know the context of use	R07, R12
	Understanding user requirements regarding context of use	R17, R20
	Understanding requirements regarding context of use	R19
	Identifying unexpected factors regarding usage and context	R20
Learning the tasks and procedures regarding expert products (4)		
	Knowing user's area of work	R17
	Learning the tasks and procedures regarding product usage	R18, R19, R20
	Identifying usages that are not defined by procedures	R20
Understanding cultural differences (8)		
	Identifying cultural differences in evaluating usability of the product	R03
	Understanding the context of use which is unfamiliar to the designer (different countries, cultures etc.)	R06, R07
	Cultural empathy	R09
	Identifying cultural differences regarding perceived qualities	R15
	Understanding user's perception of aesthetic qualities that are changing depending on the market difference	R16
	Learning the cultural differences for procedures regarding product usage	R18
	Understanding user differences regarding cultural and educational backgrounds	R20
Understanding user differences (5)		
	Identifying user related factors that can affect product evaluation of	R07

	products	
	Understanding reasons of buying decisions that changes depending on the user group	R15
	Understanding different user needs	R19
	Understanding different usage styles	R20
	Understanding changing lifestyles and needs of users	R06

Having guidance (20)

Providing a guidance by assisting design decisions (17)

	Assisting design decisions by providing guidance	R01, R03, R04, R05, R06, R08, R11, R12, R13, R16, R17, R18, R19
	Assisting decision processes of managers	R01, R03, R05, R10
	Providing a roadmap for the design activity by the user research experts in an area which is unfamiliar to designer	R06
	Providing a roadmap for the design activity	R13
	Gaining ability to consider multidimensional criteria for product design	R08
	Ability to focus on a certain issue rather than thinking overall - specialism	R09
	Eliminating uncertainties	R10
	Ability to identify new features for the product	R10
	Ability to iterate design process with the information from the users in order to create successful designs	R14
	Ability to have interpretations of stakeholders who have different backgrounds	R15

Ability to identify design requirements (16)

	Identifying requirements to design a product that attract users attention	R02
	Identifying design requirements	R03, R08, R10, R13, R15, R16, R17, R18, R19
	Ability to identify design requirements in the earlier stages of the design process	R03, R04, R05
	Ability to identify design requirements for a non-existing/new design	R06
	Optimization of the product requirements by considering multidimensional criteria that are indicated by the findings	R07, R08
	Identifying requirements related to physical space	R13, R20
	Identifying product requirements that may not be foreseen by the development team	R14
	Identifying requirements for specifying product style	R14
	Identifying system requirements by considering cognitive workload	R17, R20
	Identifying requirements related to material selections	R11
	Identifying user requirements beyond the standards	R18

Having information about existing product solutions to guide design activity – benchmarking (12)

	Understanding differences in perceived qualities between different designs	R02
	Ability to identify market segments	R04
	Selecting a segment for the prospective product in order to identify requirements	R13
	Generating a pool for the existing design concepts and design solutions that can be utilized in the prospective products	R06
	Providing knowledge input for the design process through evaluation of existing products Understanding positive and negative aspects of competitor's products Examining competitor's solutions that are not considered before by the design team	R06
	Identifying better aspects of the competitors' products and integrating them into the prospective products	R07
	Knowing other products that can be considered while making buying decision	R09
	Identifying potential product ideas that can be considered while designing	R11
	Ability to describe abstract perceived qualities with the tangible product properties - Ability to exemplify existing product qualities that results in desired perceived qualities Benchmarking - Understanding positive and negative aspects of competitor's products	R15
	Exploring competitors products - Ability to analyze target segment correctly	R16, R18
	Gathering data about existing products	R19

	Evaluating existing designs in order to provide knowledge input for the design process	R20
Ability to design with valid information, not considering assumptions (7)		
	Being able to design with valid information, not considering assumptions	R03, R04, R05, R08, R10, R12, R14
	Verifying validity of problems defined by marketers/producers/designers for the users	R14
	Preventing operational blindness by outsourcing user research - verification by outsourcing firm	R10, R12, R14
Assisting project planning activities (7)		
	Project management and correct time planning for the product design process	R01, R04, R05, R07, R10, R18, R19
	Adjusting right time for product launch	R04, R10
	Optimization of design qualities by considering the allocated budget	R04
Ability to formulate a clear and targeted design brief (5)		
	Formulation of a clear and targeted design brief	R02, R03, R16
	Formulation of a design brief by considering user needs	R05
	Creating boundaries for the design brief	R11
Having feedback about the product in the context of use (18)		
Having general feedback about product or its concept (13)		
	Evaluating applicability of the initial concepts	R01, R05, R17
	Identifying problems in the earlier stages of the product development process"	R10
	Evaluating the product features	R03, R15
	Evaluating a new product	R03
	Having an approval for the product concept	R05, R17
	Evaluation of the product and concepts - Identifying problems and shortcomings of the product	R06, R07, R11, R12, R14
	Measuring product's success according to users	R07
	Evaluating the product by considering user needs	R08
	Understanding the reasons of product failure Understanding the major problems	R09
	Evaluating product concepts by expert users	R09
	Evaluating product by considering brand image perceived by the user	R15
Identifying unexpected problems (12)		
	Defining unexpected problems	R04, R05, R07, R08, R10, R11, R12, R14, R15, R16, R18, R19
Evaluating product's usability (6)		
	Evaluating product's usability	R03, R04, R05, R19
	testing whether the intended message is delivered through the product	R07
	Evaluating interface usability	R10
Evaluating product's appearance and perceived qualities (4)		
	Evaluating product appearance	R03
	Evaluating perceived qualities that are awaken by the product	R05, R07
	Understanding how the product perceived	R09
Evaluating brand image (2)		
	Ability to understand brand image's and product design's effects on user's evaluation	R02, R15
	Identifying product qualities that can empower brand image	R15
Evaluating physical comfort (1)		
	Evaluating physical comfort	R19
Providing inspiration and enhancing creativity (14)		
Providing inspiration (11)		
	Providing inspiration - Provoking thoughts in the designer's mind	R03, R05, R10, R13, R14, R15, R16, R17
	Providing different perspectives	R07, R10, R08,

		R09, R13
	Obtaining unexpected ideas from the users that are not considered before	R14
Enhancing creativity (10)		
	Enhancing creativity	R13, R19
	Ability to generate new-original product concepts	R06, R07, R09, R17, R13, R14
	Ability to generate creative solutions	R11
	Multidimensional thinking	R09
	Ability to create diverse range of design solutions	R11
	Ability to provide nonexistent solution to the user defined problems	R15
	Providing solutions that are different than the other solutions in the market	R08, R09, R11
Product improvement (14)		
Creating a better design (11)		
	Creating a better design	R11
	Creating a successful product	R08, R09, R13, R14, R15, R16
	Enhancing product usability	R10
	Ability to improve existing solutions	R06
	creating an added value Improving product functioning by design Being able to provide better product solutions	R09
	Ability to create a communicable design (yenilik ve faydaları anlatılabilir tasarım)	R05
	Maintaining longer obsolescence time for the product	R07
	Providing realizable solutions	R14
	Preserving positive aspects of the product Fixing negative aspects of the product Maintaining coherency for overall product qualities	R08
Avoiding design problems (6)		
	Designing products that are causing less problems for the user Ability to design products that do not cause problems for the user Eliminating design problems	R05, R10, R12, R14, R19
	Avoiding problems caused by anthropometrical measures in the earlier stages of the product development	R18
Prevention of time loss (13)		
About presentation tools (10)		
	Time consuming to use or explore the presentation format	R01, R02, R03, R07, R10, R11, R14, R16, R20
	Preventing time loss – time saving	R03, R07, R08, R10, R11
About user research (9)		
	Speeding up the design process	R03, R10, R19
	Preventing time loss in the design process by eliminating product design alternatives that are not clear for the user	R05
	Preventing time loss in the design process	R07, R11, R12, R16, R18
Supportiveness/Justification of design decisions (13)		
	Justifying/validating decisions of the designer	R02, R03, R06, R07, R08, R10, R12, R14, R15, R17, R18, R19
	Maintaining self-control in the design process regarding design decisions	R08, R16
	Questioning requirements identified for the project	R14
Unity in team communications (9)		
	"providing shared reference points" for discussion for the product development team	R03, R07, R11, R12, R16, R17
	Meetings for having unity in communication between design team and research team	R02, R03, R05, R15, R17
	Ability to develop the product collaboratively	R11

Persuasion of other stakeholders (9)	
Persuading managers	R01, R05, R06, R10, R12, R19
Persuasion of other stakeholders	R01, R05, R08, R12, R18
Persuading marketing department	R06, R10
Persuading client firm	R16

Achieving designer's personal goals (9)	
Job satisfaction (9)	
Job satisfaction	R05, R07, R12
Enhancing competency of the designer in the firm	R12
Having an enjoyable design process	R14, R15, R16
Efficiency in the design process for the designer	R16, R17
Self satisfaction (5)	
Personal development	R05, R07, R09, R12
Enhancing social networks	R05
Self satisfaction	R05, R12, R17
Designer's self-confidence (4)	
Maintaining designer's or design team's self confidence	R03, R05, R15, R17
Motivation (1)	
Sustainability of motivation to design	R16

Ability to proceed in the design process (7)	
Being able to proceed in the design process	R01, R19, R05, R18
Constituting initial ideas-starting points for the design activity	R06, R13, R14
Ability to choose a concept from solutions of existing products - benchmark data	R06

Having feedback about the product's position among the competitors (3)	
Evaluating the product's position among the competitors	R04, R07, R08

Enjoyment/Fun in utilization of the system (3)	
Enjoyment-fun in utilization of the system	R08, R16, R19

ORGANIZATIONAL IMPACTS	

User/ Consumer satisfaction (18)	
Meeting user needs and expectations (13)	
Creating products that meets user needs	R03, R14, R15, R16, R17
Being able to make right revisions by considering user needs	R05, R19
Meeting changing user needs and lifestyles through developing new products	R06
Creating coherent product language that can be easily understood by the user Requiring less learning tasks for the user regarding product use	R07
Meeting different users' needs	R07, R20
Meeting the basic needs of the user	R09
Ability to provide functionality to the user	R13
Meeting the needs of majority in the target group	R13
Designing products which ease living	R14
Providing comfortable usage for the user	R18
Decreasing workload of the user Providing ease of use	R20
Maintaining consumer satisfaction (12)	
Maintaining consumer satisfaction	R02, R04, R05, R08, R09, R10, R11, R14, R15, R16, R18, R19
Maintaining user preference (6)	
Designing a preferable product	R02, R03, R05, R07, R08, R15

Maintaining pleasure for the user (3)	
Creating attractive products for the user	R02
Enhancing user's pleasure from the product	R02
User happiness	R07
Providing good user experience	R09
Providing a surprise aspect beyond the expectations of the user	
Providing socio-comfort for the user	
Maintaining acceptance of new product/technological features (2)	
Acceptance of the product new features by the users	R10
Adoption of the product by the user	R14
Preventing complaints (2)	
Preventing user complaints	R05, R18
Maintaining safety for the user (1)	
Preventing accidents and user errors	R20
Maintaining trust in the product (1)	
Maintaining product reliability	R05
Brand image (14)	
Preserving-empowering the brand identity/image (10)	
Empowering the brand identity/image	R01, R02, R03, R05, R07, R08, R15, R16, R18
Preserving the brand identity/image	R04
Promotion of the brand to a higher segment	R03
Maintaining trendsetter-innovative image (6)	
Making innovation	R01, R03, R15
Being a trendsetter in the market	R03
Product differentiation	R07, R08, R09
Maintaining brand loyalty and reliability (5)	
Maintaining brand loyalty	R02, R03, R07
Preventing loss of brand reliability and prestige	R05
Maintaining brand reliability	R16
Maintaining brand awareness (4)	
Improving brand awareness	R05, R10, R11, R19
Enhancing business vision (2)	
Raising energy awareness	R01
User-driven design instead of technology driven design	R05
Making right investments (13)	
Decreasing the investment risks (8)	
Decreasing the investment risks	R02, R03, R05, R18
Setting right future goals	
Investment verification	R04, R07, R16
Using company resources wisely – making right investments	R04, R7, R10, R16
Ability to identify right investment areas	R05
Preventing money loss (5)	
Preventing money loss	R01, R03, R05, R10, R18
Business Competitiveness (13)	
Success in competitive market (10)	
Success in competitive market	R02, R04, R05, R06, R07, R08, R11, R15, R16, R19
Market positioning (9)	
Planning marketing activities based on qualities that are planned to attract users attention	R02

Positioning the product in the market	R02, R04, R09, R11, R16, R18, R19
Positioning the brand in the market	R03, R15
Finding a new market for an unsuccessful product	R09

Profitability (13)

Company profitability	R02, R03, R04, R07, R08, R09, R11, R16, R18
Raising sales	R01, R02, R05, R10, R19
Sustainable profitability	R03, R04
Enhancing the product's market	R03, R10, R16
Growth of the company	R04

Enhancing knowledge sources of the company (7)

Knowledge input for future designs (5)

Providing knowledge input for the future projects	R03, R07, R11, R12, R14

Enhancing knowledge sources for research and development (3)

Investment for knowledge Enhancing company resources for R&D	R05, R10, R12

SYSTEM QUALITIES

System's Clarity (19)

Prioritization of problems and findings (14)

Prioritization of problems and findings – Giving priority to primary information – what they are requested to know ability to answer the questions of research brief	R01, R02, R03, R04, R05, R06, R07, R08, R09, R10, R11, R13, R16, R18
Prioritization of important considerations while presenting design issues that needs optimization	R02
prioritization of problems and findings - putting criteria in a hierarchy	R04

Explanatoriness / Informativeness of the system(13)

Availability of explanations (13)

Availability of justifications for the recommendations	R01, R04, R06, R15, R19
Availability of underlying reasons and explanations for the findings	R05, R06, R08, R09, R10, R14, R15, R17, R19
Availability of other related information- presenting related information together	R03, R07

Avoidance of reductivity (5)

(Negative) Losing contextual richness - losing crucial findings for design while delivering quantitative findings (Negative) Not providing holism - Possibility of omitting different constraints that are present in the design activity	R07
Avoidance of reductivity - Highlighting crucial findings even if it is not significant statistically (Negative) Missing interesting comments that can be important for the design process due to low number of frequency of the comment	R07, R15, R19
(Negative) Misleading the designer with excessively worked out findings	R17
Avoidance of reductivity - not generalizing the user - avoiding reduction of the information to the numbers by giving explanations to the quantitative results	R06

Holism (9)

Comprehensiveness - Should cover all of the information gathered	R01, R20
Providing the whole briefly, digging into details if needed	R02, R03, R04, R06, R08
Presenting the whole picture	R14
Ability to provide different views in one view	R16

Conciseness (9)

	Avoidance from excessive information	R01, R02, R03, R04, R06, R09, R14, R15
	Avoidance from excessive-repetitive information	R02
	Avoidance from excessive information - eliminating minor comments of the users	R05

Interpretability (17)

Open-endedness (11)

	Suitable data for designers further investigation-interpretation Providing knowledge that can be processed by the design team	R01, R03, R05, R09, R12, R13, R14, R15, R18
	Ability to retrieve different information from the deliverables each time it is reviewed	R08
	Ability interpret user's actions in order to identify problems	R16

Interactivity (9)

	Providing hierarchical structure - providing the whole briefly, digging into details if needed	R02, R03, R04, R06, R08
	Providing hyperlinks for related data	R04
	Ability to reach explanations of the quantitative data whenever it is needed	R08
	Ability to explore findings from different views	R13
	Ability of the designer to direct and intervene in the research activity in order to have clear inputs for the design activity	R15, R16
	Ability to respond the questions of the designer right away	R20

Capability of integration with the present knowledge (7)

	Interpreting with other research that is available in the firm	R03
	Ability to assess the validity of the research for the future projects	R04
	Ability to interpret findings with the design team's competencies	R05, R20
	Ability to integrate parts of the presentation in designer's presentations	R06, R07
	Ability to check whether the findings are compatible with the present knowledge of the designer (who conducted user research previously)	R17

Avoidance of fixation (5)

	Ability to focus on different aspects each time it is examined	R08, R13
	Avoidance of fixation - allowance for designer's creativity	R15
	(Negative) Limiting creativity by providing ready-made designs	R15
	Avoidance of rigidity, providing multiple views and solutions	R17
	(Negative) Rigidity - Not conveying multidimensional information, since it is based on single modality	R20

Attractiveness (16)

	Engagingness- Keeping the attention of the audience	R01, R03, R04, R06, R08, R11, R13, R16, R20
	(Negative) Not engaging - Losing the attention of the audience	R03, R04, R07, R10, R11, R12, R16, R19, R20
	(Negative) Digression - Excessive information in reports/presentations that digress into irrelevant details, missing the actual product requirements	R02, R15
	(Negative) Digression - Excessive research that digress into irrelevant details, missing the actual product requirements	R09

Representativeness (15)

Illustration-simulation of the context of use and user behaviors (13)

	Illustration-simulation of the context of use and user behaviours	R03, R07, R08, R09, R13, R16, R17, R18, R19, R20
	Representing user's emotions	R02, R06, R15

Personification (5)

	Personification Reduction of user data into one person	R09, R12, R13, R14, R17

Concrete representation (14)

Concrete exemplification (11)

Providing recommendations (7)		

	Materialization of the results in the form of design recommendations	R01, R03, R04, R06
	Materialization of the results in the form of recommendations and supporting them with simulations, 3D animations and prototypes	R05, R11, R12
Presenting results on existing products or visuals of products (9)		
	Materializing the findings as recommendations by manipulating the existing design's visuals	R01
	Materialization of the results by illustrating with existing products	R02, R19
	Materializing the findings by through discussing them on the existing designs	R07, R11, R14, R17
	Exemplifying solutions - Providing example solutions from existing products to user problems	R06
	Comparing product attributes with the attributes of competitor's products in the same page	R08
	Ability to understand abstract user needs by referring to actual products	R11

Tangibility of the presentation formats (3)

	Providing tangible presentation materials that can be explored by the designer easily	R08, R10, R12

System's suitability to the different audiences (9)

System's suitability to the different audiences (9)

	Ability to suit different audiences' mental models	R03, R05
	Ability to provide suitable presentation for the audience who are familiar to the project	R04
	Suitable/unsuitable presentation way with the designer's mental model	R02, R03, R06, R09, R14, R16
	Suitable/unsuitable presentation way with the marketer's mental model	R02, R08, R09
	Suitable/unsuitable presentation way with the engineer's mental model	R02, R03, R09
	Suitable/unsuitable presentation for the managers mental model	R03, R04, R08

Usage of familiar terminology (2)

	Using a common terminology	R08
	Using terminology which the designer is familiar with	R16

Share-ability (9)

	Ease of sharing the information inside the product development team	R03, R04, R06, R07, R11, R12, R17
	Ability to share-communicate the findings to the managers	R01, R06
	Utilizing communicable terminology (communicable to other stakeholders in the team)	R08

Accessibility (8)

Ease of accessing the intended information (5)

	Ease of accessing the intended information	R02, R07, R08, R10, R16

Ease of use (6)

	Ease of using the presentation format	R02, R04, R06, R08, R10
	(Negative) Hard to use for some audience who may have limited knowledge regarding computer use	R03

INFORMATION QUALITIES

Information's Clarity (16)

	Understandability of the findings	R01, R02, R03, R04, R05, R07, R09, R10, R11, R12, R14, R15, R16, R18, R20
	(Negative) Unclearness of the findings	R01
	Ease of understanding user's actual feelings	R15
	Understandability of information for different audience segments	R02, R03, R06

Credibility (14)

Trust in expertise of the researchers (5)

	Credibility of the researchers and research institute	R05, R03
	Having qualified information that is interpreted by the designer researchers	R06

	Inefficiency of design proposals that are provided by user researchers since they are not as experienced as designers in the area - requiring further validation	R07

Reliability of the information (4)

	Reliability of the information – objectivity	R10, R12, R14, R17

Credibility of user's expressions in different research settings (3)

	Credibility - having more credible result in actual setting with an informal context Questionability of the responses given by users in a contrived setting	R12, R13
	Observing true opinions/reactions of the users	R13
	Being able to have right feedback from the user by the help of tangible products (before the design activity it can be misleading since there is no product)	R17

Maintaining credibility with quantitative data (2)

	Having quantitative data for credibility	R03, R04

Maintaining credibility with larger samples (2)

	Maintaining validity of the information by having larger sample sizes	R05, R15

Maintaining credibility with direct involvement of the designer (2)

	Ability to obtain first hand observation	R03, R15
	Ability to overcome "Inconsistency between what user says and what s/he means" through first hand observation	R15

Sustainability (13)

	Sustainability of the data - ability to use findings in later projects or in the later stages Ability to investigate data for later projects ability to review the findings again in the later stages of the product development	R01, R03, R04, R05, R06, R07, R08, R11, R12, R14, R17, R18
	Constituting an archive for the project that can be consulted later on	R02, R04, R05, R06
	Ability to use/remember information in the future	R02

Multidimensionality (11)

Considering multiple variables (7)

	Providing information about different perceived qualities that are related to product features	R06
	(Negative) Unidimensionality of the design recommendation, necessity for considering other dimensions	R07
	Showing different dimensions regarding product qualities and use	R08, R15
	Multidimensional thinking - having a holistic perspective	R13
	Ability to provide multiple views in one frame	R16
	(Negative) Presenting many dimensions in one infographic	R01

Integrating different perspectives (5)

	Having multidimensional views - having different perspectives regarding product use	R09, R14, R15, R17, R19

Persuasiveness (10)

	Persuasiveness of the findings-claims	R01, R05, R09, R12, R16, R19
	Persuasiveness - effective explanation	R04, R09, R10, R11
	Persuasiveness of the findings for the managers	R03, R12, R16

Applicability (10)

	Applicability of the recommendation	R01, R04, R06, R11, R12, R18
	Lack in providing applicable solutions - Inability to utilize the findings	R07, R09, R10
	Actionable results	R03

Concreteness (10)

	Concreteness	R02, R03, R08
	Concreteness of the findings - not related to the abstract qualities - relevant to functional properties	R15
	(Negative) Abstractness of the information	R02, R15
	Not open to interpretation or debate - certainty	R05, R13
	(Negative) Having rigid conclusive findings supported with statistical information	R17

In-depthness (6)	
In-depthness of information from user research	R05, R11, R17
Comprehensiveness - Having expert user opinion - providing in-depth knowledge about product usage	R09
Richness vs. superficiality of the information	R15, R18

RELIABILITY ANALYSIS FOR THE ITEMS IN VERIFICATION QUESTIONNAIRE

Internal consistency for the <u>evaluation of the importance of IMPACTS</u> (11 items)

Case Processing Summary

		N	%
Cases	Valid	83	100,0
	Excluded[a]	0	,0
	Total	83	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
,824	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Empathy	52,92	76,712	,335	,822
Supporting design decisions*	53,78	74,757	,258	,830*
Having guidance	53,02	76,097	,377	,820
Having feedback - context of use	53,10	73,283	,512	,812
Having feedback - position among competitors	54,24	68,624	,509	,808
Having inspiration	54,04	66,621	,558	,804
Prevention of time loss	54,89	67,683	,526	,807
Unity in team communications	54,53	65,618	,546	,805
Persuasion of other stakeholders	54,00	65,415	,677	,793
Job satisfaction	54,27	61,197	,665	,791
Enjoyment/fun in utilization of the system	55,07	64,092	,509	,811

*Cronbach's Alpha increases if the item is deleted.

Internal consistency for the <u>evaluation of the EFFECTS OF QUALITIES on the IMPACTS</u>

- **Considering how the impacts are achieved – Internal consistency based on impacts**
1. **Empathy**

Reliability Statistics

Cronbach's Alpha	N of Items
,665	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on – EMPATHY*	41,5422	20,641	,177	,714*
The effect of - IN-DEPTHNESS - on - EMPATHY	39,7470	24,411	,277	,655
The effect of - CREDIBILITY - on - EMPATHY	39,7952	22,019	,459	,618
The effect of - SUSTAINABILITY - on - EMPATHY	41,0602	20,423	,382	,627
The effect of - APPLICABILITY - on - EMPATHY	40,7831	19,465	,538	,586
The effect of - MULTIDIMENSIONALITY - on - EMPATHY	39,9880	21,841	,354	,635
The effect of - PERSUASIVENESS - on - EMPATHY	40,5301	19,081	,561	,578
The effect of - UNDERSTANDABILITY - on - EMPATHY	40,0723	22,922	,286	,650

*Cronbach's Alpha increases if the item is deleted.

Reliability Statistics

Cronbach's Alpha	N of Items
,765	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - EMPATHY	39,5301	21,886	,444	,747
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - EMPATHY	38,9759	24,292	,410	,749
The effect of - ATTRACTIVENESS - on - EMPATHY	40,3976	23,828	,452	,743
The effect of - REPRESENTATIVENESS - on – EMPATHY*	38,6988	26,359	,279	,767*
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - EMPATHY	40,2048	21,336	,552	,723
The effect of - EASE OF ACCESS - on - EMPATHY	39,6988	21,652	,569	,720
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - EMPATHY	40,1446	22,613	,518	,731
The effect of - SYSTEM CLARITY - on - EMPATHY	39,2048	23,019	,482	,737

*Cronbach's Alpha increases if the item is deleted.

2. Supporting design decisions

Reliability Statistics

Cronbach's Alpha	N of Items
,650	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on - SUPPORTING DECISIONS*	41,6145	17,215	,193	,703*
The effect of - IN-DEPTHNESS - on - SUPPORTING DECISIONS	40,5060	20,180	,298	,631
The effect of - CREDIBILITY - on - SUPPORTING DECISIONS	39,9880	20,134	,387	,617
The effect of - SUSTAINABILITY - on - SUPPORTING DECISIONS	40,7229	18,983	,337	,621
The effect of - APPLICABILITY - on - SUPPORTING DECISIONS	40,3855	17,971	,509	,580
The effect of - MULTIDIMENSIONALITY - on - SUPPORTING DECISIONS	40,5181	18,155	,439	,595
The effect of - PERSUASIVENESS - on - SUPPORTING DECISIONS	40,3133	18,876	,387	,609
The effect of - UNDERSTANDABILITY - on - SUPPORTING DECISIONS	40,6506	18,254	,410	,602

*Cronbach's Alpha increases if the item is deleted.

Reliability Statistics

Cronbach's Alpha	N of Items
,820	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - SUPPORTING DECISIONS	39,7711	26,105	,607	,789
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - SUPPORTING DECISIONS	39,2892	28,476	,458	,810
The effect of - ATTRACTIVENESS - on - SUPPORTING DECISIONS	40,7229	28,154	,501	,804
The effect of - REPRESENTATIVENESS - on - SUPPORTING DECISIONS	39,5422	27,983	,549	,798
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - SUPPORTING DECISIONS	39,8193	28,272	,418	,817
The effect of - EASE OF ACCESS - on - SUPPORTING DECISIONS	39,8434	26,914	,581	,793
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - SUPPORTING DECISIONS	39,9277	26,751	,649	,785
The effect of - SYSTEM CLARITY - on - SUPPORTING DECISIONS	39,7108	26,525	,564	,796

3. Having guidance

Reliability Statistics

Cronbach's Alpha	N of Items
,664	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on – GUIDANCE*	41,7831	19,733	,117	,746*
The effect of - IN-DEPTHNESS - on - GUIDANCE	40,6747	19,515	,533	,596
The effect of - CREDIBILITY - on - GUIDANCE	40,1687	21,191	,483	,620
The effect of - SUSTAINABILITY - on - GUIDANCE	40,8795	20,107	,320	,643
The effect of - APPLICABILITY - on - GUIDANCE	40,4337	20,005	,481	,609
The effect of - MULTIDIMENSIONALITY - on - GUIDANCE	40,5783	19,954	,402	,622
The effect of - PERSUASIVENESS - on - GUIDANCE	40,6988	20,067	,447	,615
The effect of - UNDERSTANDABILITY - on - GUIDANCE	40,7470	19,777	,411	,620

*Cronbach's Alpha increases if the item is deleted.

Reliability Statistics

Cronbach's Alpha	N of Items
,817	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - GUIDANCE	39,4458	25,884	,508	,803
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - GUIDANCE	38,9036	28,478	,546	,797
The effect of - ATTRACTIVENESS - on - GUIDANCE	40,2289	28,788	,444	,809
The effect of - REPRESENTATIVENESS - on - GUIDANCE	39,0000	28,707	,455	,807
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - GUIDANCE	39,6506	26,791	,498	,803
The effect of - EASE OF ACCESS - on - GUIDANCE	39,3494	26,498	,652	,781
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - GUIDANCE	39,8193	26,345	,623	,784
The effect of - SYSTEM CLARITY - on - GUIDANCE	39,3614	25,868	,598	,787

4. Having feedback - context of use

Reliability Statistics

Cronbach's Alpha	N of Items
,706	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on - FEEDBACK - Context of Use*	40,1928	22,694	,242	,739*
The effect of - IN-DEPTHNESS - on - FEEDBACK - Context of Use	39,0723	25,019	,424	,675
The effect of - CREDIBILITY - on - FEEDBACK - Context of Use	38,8795	24,717	,498	,664
The effect of - SUSTAINABILITY - on - FEEDBACK - Context of Use	39,9157	24,151	,374	,682
The effect of - APPLICABILITY - on - FEEDBACK - Context of Use	39,3614	22,746	,501	,653
The effect of - MULTIDIMENSIONALITY - on - FEEDBACK - Context of Use	39,2771	25,081	,327	,691
The effect of - PERSUASIVENESS - on - FEEDBACK - Context of Use	39,6506	22,108	,590	,634
The effect of - UNDERSTANDABILITY - on - FEEDBACK - Context of Use	39,4096	24,342	,394	,678

*Cronbach's Alpha increases if the item is deleted.

Reliability Statistics

Cronbach's Alpha	N of Items
,797	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - FEEDBACK - Context of Use	38,1205	23,376	,435	,792
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - FEEDBACK - Context of Use	37,2048	25,555	,502	,776
The effect of - ATTRACTIVENESS - on - FEEDBACK - Context of Use	38,8916	25,537	,491	,777
The effect of - REPRESENTATIVENESS - on - FEEDBACK - Context of Use	37,1446	26,759	,381	,791
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - FEEDBACK - Context of Use	38,6386	23,429	,546	,768
The effect of - EASE OF ACCESS - on - FEEDBACK - Context of Use	38,1205	22,790	,653	,750
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - FEEDBACK - Context of Use	38,5663	24,273	,536	,770
The effect of - SYSTEM CLARITY - on - FEEDBACK - Context of Use	37,7711	24,032	,542	,769

5. Having feedback - position among competitors

Reliability Statistics

Cronbach's Alpha	N of Items
,786	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on - FEEDBACK - Among Competitors*	35,6747	31,247	,131	,840*
The effect of - IN-DEPTHNESS - on - FEEDBACK - Among Competitors	34,9518	27,681	,602	,746
The effect of - CREDIBILITY - on - FEEDBACK - Among Competitors	34,4217	27,637	,617	,744
The effect of - SUSTAINABILITY - on - FEEDBACK - Among Competitors	35,3855	28,728	,490	,763
The effect of - APPLICABILITY - on - FEEDBACK - Among Competitors	35,0964	28,844	,490	,763
The effect of - MULTIDIMENSIONALITY - on - FEEDBACK - Among Competitors	34,8916	28,634	,551	,755
The effect of - PERSUASIVENESS - on - FEEDBACK - Among Competitors	35,1566	26,426	,728	,725
The effect of - UNDERSTANDABILITY - on - FEEDBACK - Among Competitors	34,8434	28,548	,527	,758

*Cronbach's Alpha increases if the item is deleted.

Reliability Statistics

Cronbach's Alpha	N of Items
,827	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - FEEDBACK - Among Competitors	34,5181	25,838	,536	,812
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - FEEDBACK - Among Competitors	33,9157	26,346	,644	,795
The effect of - ATTRACTIVENESS - on - FEEDBACK - Among Competitors	34,9880	30,841	,435	,822
The effect of - REPRESENTATIVENESS - on - FEEDBACK - Among Competitors	34,1566	26,768	,566	,805
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - FEEDBACK - Among Competitors	34,6627	28,153	,455	,821
The effect of - EASE OF ACCESS - on - FEEDBACK - Among Competitors	34,4699	26,789	,641	,796
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - FEEDBACK - Among Competitors	34,6867	28,169	,549	,808
The effect of - SYSTEM CLARITY - on - FEEDBACK - Among Competitors	34,2169	26,099	,619	,798

6. Having inspiration

Reliability Statistics

Cronbach's Alpha	N of Items
,765	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on – INSPIRATION*	37,7229	25,495	,262	,791*
The effect of - IN-DEPTHNESS - on - INSPIRATION	36,5060	25,009	,513	,732
The effect of - CREDIBILITY - on - INSPIRATION	36,5301	24,130	,606	,716
The effect of - SUSTAINABILITY - on - INSPIRATION	36,9759	25,877	,415	,749
The effect of - APPLICABILITY - on - INSPIRATION	36,2651	24,758	,588	,721
The effect of - MULTIDIMENSIONALITY - on - INSPIRATION	36,2048	26,189	,450	,743
The effect of - PERSUASIVENESS - on - INSPIRATION	36,6627	24,251	,519	,730
The effect of - UNDERSTANDABILITY - on - INSPIRATION	36,6265	25,749	,478	,739

*Cronbach's Alpha increases if the item is deleted.

Reliability Statistics

Cronbach's Alpha	N of Items
,811	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - INSPIRATION	36,3855	26,898	,404	,808
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - INSPIRATION	36,7831	25,172	,503	,795
The effect of - ATTRACTIVENESS - on – INSPIRATION*	37,0000	28,390	,344	,813*
The effect of - REPRESENTATIVENESS - on - INSPIRATION	36,3253	25,856	,577	,783
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - INSPIRATION	37,3976	27,316	,388	,810
The effect of - EASE OF ACCESS - on - INSPIRATION	37,0241	23,829	,718	,760
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - INSPIRATION	37,3012	25,872	,601	,780
The effect of - SYSTEM CLARITY - on - INSPIRATION	36,7952	23,799	,703	,762

*Cronbach's Alpha increases if the item is deleted.

7. Prevention of time loss

Reliability Statistics

Cronbach's Alpha	N of Items
,536	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on - PREVENTING TIME LOSS*	33,1084	20,098	-,027	,623*
The effect of - IN-DEPTHNESS - on - PREVENTING TIME LOSS	33,8193	17,174	,226	,517
The effect of - CREDIBILITY - on - PREVENTING TIME LOSS	32,8072	16,084	,550	,403
The effect of - SUSTAINABILITY - on - PREVENTING TIME LOSS	33,2651	19,173	,286	,499
The effect of - APPLICABILITY - on - PREVENTING TIME LOSS	33,0482	16,315	,534	,411
The effect of - MULTIDIMENSIONALITY - on - PREVENTING TIME LOSS	33,8795	18,644	,179	,529
The effect of - PERSUASIVENESS - on - PREVENTING TIME LOSS	33,0241	16,438	,475	,426
The effect of - UNDERSTANDABILITY - on - PREVENTING TIME LOSS	31,6145	20,191	,048	,569

*Cronbach's Alpha increases if the item is deleted.

Reliability Statistics

Cronbach's Alpha	N of Items
,690	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - PREVENTING TIME LOSS*	38,8916	23,610	,296	,695*
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - PREVENTING TIME LOSS	38,2651	23,612	,505	,631
The effect of - ATTRACTIVENESS - on - PREVENTING TIME LOSS	38,6024	26,267	,379	,662
The effect of - REPRESENTATIVENESS - on - PREVENTING TIME LOSS	38,5904	24,147	,488	,636
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - PREVENTING TIME LOSS*	39,3614	26,112	,222	,702*
The effect of - EASE OF ACCESS - on - PREVENTING TIME LOSS	37,7831	25,123	,386	,659
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - PREVENTING TIME LOSS	37,9398	25,716	,423	,653
The effect of - SYSTEM CLARITY - on - PREVENTING TIME LOSS	37,3855	26,167	,499	,646

*Cronbach's Alpha increases if the item is deleted.

8. Unity in team communications

Reliability Statistics

Cronbach's Alpha	N of Items
,772	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on - UNITY IN COMMUNICATION*	33,8193	27,369	,275	,806*
The effect of - IN-DEPTHNESS - on - UNITY IN COMMUNICATION	33,2651	27,051	,567	,732
The effect of - CREDIBILITY - on - UNITY IN COMMUNICATION	33,0482	27,973	,548	,737
The effect of - SUSTAINABILITY - on - UNITY IN COMMUNICATION	33,2651	28,148	,500	,744
The effect of - APPLICABILITY - on - UNITY IN COMMUNICATION	33,1807	26,760	,752	,709
The effect of - MULTIDIMENSIONALITY - on - UNITY IN COMMUNICATION*	33,5542	30,153	,304	,775*
The effect of - PERSUASIVENESS - on - UNITY IN COMMUNICATION	33,0602	27,496	,600	,729
The effect of - UNDERSTANDABILITY - on - UNITY IN COMMUNICATION	32,8072	28,401	,461	,750

*Cronbach's Alpha increases if the item is deleted.

Reliability Statistics

Cronbach's Alpha	N of Items
,820	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - UNITY IN COMMUNICATION*	35,2289	34,203	,221	,851*
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - UNITY IN COMMUNICATION	34,3855	31,825	,521	,802
The effect of - ATTRACTIVENESS - on - UNITY IN COMMUNICATION	34,9880	32,719	,571	,797
The effect of - REPRESENTATIVENESS - on - UNITY IN COMMUNICATION	34,7108	31,354	,664	,785
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - UNITY IN COMMUNICATION	34,4578	30,178	,512	,805
The effect of - EASE OF ACCESS - on - UNITY IN COMMUNICATION	34,6747	30,173	,668	,781
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - UNITY IN COMMUNICATION	34,2169	30,782	,623	,788
The effect of - SYSTEM CLARITY - on - UNITY IN COMMUNICATION	34,2169	29,806	,686	,778

*Cronbach's Alpha increases if the item is deleted.

9. Persuasion of other stakeholders

Reliability Statistics

Cronbach's Alpha	N of Items
,673	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on - PERSUADING OTHERS*	40,5542	23,543	,274	,692*
The effect of - IN-DEPTHNESS - on - PERSUADING OTHERS	40,0000	26,537	,356	,645
The effect of - CREDIBILITY - on - PERSUADING OTHERS	39,3012	25,457	,555	,606
The effect of - SUSTAINABILITY - on - PERSUADING OTHERS	40,0120	26,549	,302	,658
The effect of - APPLICABILITY - on - PERSUADING OTHERS	39,5904	25,294	,536	,608
The effect of - MULTIDIMENSIONALITY - on - PERSUADING OTHERS*	40,2530	28,216	,162	,693*
The effect of - PERSUASIVENESS - on - PERSUADING OTHERS	39,2892	25,598	,573	,605
The effect of - UNDERSTANDABILITY - on - PERSUADING OTHERS	39,5422	26,520	,401	,636

*Cronbach's Alpha increases if the item is deleted.

Reliability Statistics

Cronbach's Alpha	N of Items
,822	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - PERSUADING OTHERS*	41,3855	29,118	,329	,846*
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - PERSUADING OTHERS	40,1687	28,557	,580	,796
The effect of - ATTRACTIVENESS - on - PERSUADING OTHERS	40,6386	28,624	,596	,794
The effect of - REPRESENTATIVENESS - on - PERSUADING OTHERS	40,2771	29,520	,628	,792
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - PERSUADING OTHERS	39,9518	30,998	,483	,809
The effect of - EASE OF ACCESS - on - PERSUADING OTHERS	40,8313	29,142	,540	,802
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - PERSUADING OTHERS	40,3253	27,978	,699	,781
The effect of - SYSTEM CLARITY - on - PERSUADING OTHERS	40,1084	28,854	,634	,790

*Cronbach's Alpha increases if the item is deleted.

10. Job satisfaction

Reliability Statistics

Cronbach's Alpha	N of Items
,816	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on - JOB SATISFACTION*	34,8193	28,467	,242	,849*
The effect of - IN-DEPTHNESS - on - JOB SATISFACTION	33,8193	26,760	,549	,792
The effect of - CREDIBILITY - on - JOB SATISFACTION	33,6747	25,564	,725	,768
The effect of - SUSTAINABILITY - on - JOB SATISFACTION	34,1566	28,768	,481	,802
The effect of - APPLICABILITY - on - JOB SATISFACTION	33,7349	26,222	,584	,787
The effect of - MULTIDIMENSIONALITY - on - JOB SATISFACTION	33,7831	27,245	,520	,796
The effect of - PERSUASIVENESS - on - JOB SATISFACTION	33,8313	25,752	,638	,779
The effect of - UNDERSTANDABILITY - on - JOB SATISFACTION	33,7470	25,996	,663	,777

Reliability Statistics

Cronbach's Alpha	N of Items
,905	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - JOB SATISFACTION	34,4699	34,008	,663	,898
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - JOB SATISFACTION	34,7470	34,411	,715	,892
The effect of - ATTRACTIVENESS - on - JOB SATISFACTION	34,5663	36,078	,618	,900
The effect of - REPRESENTATIVENESS - on - JOB SATISFACTION	34,5542	34,860	,723	,891
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - JOB SATISFACTION*	35,1928	38,109	,475	,911*
The effect of - EASE OF ACCESS - on - JOB SATISFACTION	34,8072	34,353	,746	,889
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - JOB SATISFACTION	34,9759	34,487	,837	,882
The effect of - SYSTEM CLARITY - on - JOB SATISFACTION	34,7470	33,094	,832	,881

11. Enjoyment/fun in utilization of the system

Reliability Statistics

Cronbach's Alpha	N of Items
,797	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on - ENJOYMENT/FUN*	34,0482	28,754	,184	,826*
The effect of - IN-DEPTHNESS - on - ENJOYMENT/FUN	33,1807	24,930	,520	,772
The effect of - CREDIBILITY - on - ENJOYMENT/FUN	33,0120	24,573	,694	,747
The effect of - SUSTAINABILITY - on - ENJOYMENT/FUN	33,3976	27,218	,546	,773
The effect of - APPLICABILITY - on - ENJOYMENT/FUN	33,0482	25,632	,575	,765
The effect of - MULTIDIMENSIONALITY - on - ENJOYMENT/FUN	32,9639	24,694	,527	,771
The effect of - PERSUASIVENESS - on - ENJOYMENT/FUN	33,2410	24,649	,629	,755
The effect of - UNDERSTANDABILITY - on - ENJOYMENT/FUN	32,6867	25,291	,485	,778

*Cronbach's Alpha increases if the item is deleted.

Reliability Statistics

Cronbach's Alpha	N of Items
,874	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - ENJOYMENT/FUN	37,0723	34,434	,595	,864
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - ENJOYMENT/FUN	37,1928	34,158	,732	,847
The effect of - ATTRACTIVENESS - on - ENJOYMENT/FUN	36,5060	37,009	,535	,868
The effect of - REPRESENTATIVENESS - on - ENJOYMENT/FUN	36,9036	35,332	,677	,853
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - ENJOYMENT/FUN*	37,8193	38,735	,373	,885*
The effect of - EASE OF ACCESS - on - ENJOYMENT/FUN	37,2048	34,531	,680	,853
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - ENJOYMENT/FUN	37,4458	36,372	,732	,851
The effect of - SYSTEM CLARITY - on - ENJOYMENT/FUN	36,8916	33,708	,790	,841

*Cronbach's Alpha increases if the item is deleted.

- **Considering the effects of qualities on impacts – Internal consistency based on qualities**

  o **Information Qualities**

1. Concreteness

Reliability Statistics

Cronbach's Alpha	N of Items
,940	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CONCRETENESS - on - EMPATHY	44,7470	167,313	,820	,931
The effect of - CONCRETENESS - on - SUPPORTING DECISIONS	44,6506	166,815	,821	,931
The effect of - CONCRETENESS - on - GUIDANCE	44,6386	166,282	,813	,932
The effect of - CONCRETENESS - on - FEEDBACK - Context of Use	44,5060	166,887	,830	,931
The effect of - CONCRETENESS - on - FEEDBACK - Among Competitors	45,0361	173,206	,773	,934
The effect of - CONCRETENESS - on - INSPIRATION	45,2169	179,465	,643	,939
The effect of - CONCRETENESS - on - PREVENTING TIME LOSS	44,7349	180,295	,616	,940
The effect of - CONCRETENESS - on - UNITY IN COMMUNICATION	45,2410	174,185	,676	,938
The effect of - CONCRETENESS - on - PERSUADING OTHERS	44,4699	164,545	,801	,933
The effect of - CONCRETENESS - on - JOB SATISFACTION	45,4458	179,616	,690	,937
The effect of - CONCRETENESS - on - ENJOYMENT/FUN	45,5301	183,155	,706	,937

2. In-depthness

Reliability Statistics

Cronbach's Alpha	N of Items
,852	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - IN-DEPTHNESS - on - EMPATHY	52,2892	52,793	,505	,845
The effect of - IN-DEPTHNESS - on - SUPPORTING DECISIONS	52,8795	50,180	,568	,838
The effect of - IN-DEPTHNESS - on - GUIDANCE	52,8675	49,043	,595	,836
The effect of - IN-DEPTHNESS - on - FEEDBACK - Context of Use	52,7229	49,861	,544	,839
The effect of - IN-DEPTHNESS - on - FEEDBACK - Among Competitors	53,6506	49,840	,433	,848
The effect of - IN-DEPTHNESS - on - INSPIRATION	53,3373	49,397	,481	,844
The effect of - IN-DEPTHNESS - on - PREVENTING TIME LOSS	54,7831	46,343	,476	,849
The effect of - IN-DEPTHNESS - on - UNITY IN COMMUNICATION	54,0241	48,048	,529	,840
The effect of - IN-DEPTHNESS - on - PERSUADING OTHERS	53,2530	46,167	,634	,831
The effect of - IN-DEPTHNESS - on - JOB SATISFACTION	53,7831	47,221	,637	,831
The effect of - IN-DEPTHNESS - on - ENJOYMENT/FUN	54,0000	46,098	,638	,831

3. Credibility

Reliability Statistics

Cronbach's Alpha	N of Items
,836	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - CREDIBILITY - on - EMPATHY	56,2530	37,850	,509	,823
The effect of - CREDIBILITY - on - SUPPORTING DECISIONS	56,2771	39,227	,468	,826
The effect of - CREDIBILITY - on - GUIDANCE	56,2771	39,325	,470	,826
The effect of - CREDIBILITY - on - FEEDBACK - Context of Use	56,4458	37,884	,503	,823
The effect of - CREDIBILITY - on - FEEDBACK - Among Competitors	57,0361	35,840	,534	,820
The effect of - CREDIBILITY - on - INSPIRATION	57,2771	35,422	,581	,816
The effect of - CREDIBILITY - on - PREVENTING TIME LOSS	57,6867	35,706	,561	,818
The effect of - CREDIBILITY - on - UNITY IN COMMUNICATION	57,7229	36,983	,465	,827
The effect of - CREDIBILITY - on - PERSUADING OTHERS	56,4699	36,569	,515	,822
The effect of - CREDIBILITY - on - JOB SATISFACTION	57,5542	36,616	,522	,821
The effect of - CREDIBILITY - on - ENJOYMENT/FUN	57,7470	36,752	,515	,822

4. Sustainability

Reliability Statistics

Cronbach's Alpha	N of Items
,889	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - SUSTAINABILITY - on - EMPATHY	50,1084	56,000	,632	,878
The effect of - SUSTAINABILITY - on - SUPPORTING DECISIONS	49,6024	58,340	,641	,877
The effect of - SUSTAINABILITY - on - GUIDANCE	49,5783	55,564	,727	,871
The effect of - SUSTAINABILITY - on - FEEDBACK - Context of Use	50,0723	57,385	,625	,878
The effect of - SUSTAINABILITY - on - FEEDBACK - Among Competitors	50,5904	56,781	,687	,874
The effect of - SUSTAINABILITY - on - INSPIRATION	50,3133	59,364	,547	,882
The effect of - SUSTAINABILITY - on - PREVENTING TIME LOSS	50,7349	62,441	,502	,885
The effect of - SUSTAINABILITY - on - UNITY IN COMMUNICATION	50,5301	58,813	,581	,880
The effect of - SUSTAINABILITY - on - PERSUADING OTHERS	49,7711	56,471	,595	,881
The effect of - SUSTAINABILITY - on - JOB SATISFACTION	50,6265	60,822	,603	,880
The effect of - SUSTAINABILITY - on - ENJOYMENT/FUN	50,7229	61,495	,600	,880

5. Applicability

Reliability Statistics

Cronbach's Alpha	N of Items
,877	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - APPLICABILITY - on - EMPATHY	53,9398	51,618	,560	,869
The effect of - APPLICABILITY - on - SUPPORTING DECISIONS	53,3735	52,993	,600	,866
The effect of - APPLICABILITY - on - GUIDANCE	53,2410	53,356	,612	,865
The effect of - APPLICABILITY - on - FEEDBACK - Context of Use	53,6265	50,432	,638	,863
The effect of - APPLICABILITY - on - FEEDBACK - Among Competitors	54,4096	50,903	,653	,862
The effect of - APPLICABILITY - on - INSPIRATION	53,7108	54,501	,473	,874
The effect of - APPLICABILITY - on - PREVENTING TIME LOSS	54,6265	52,432	,591	,866
The effect of - APPLICABILITY - on - UNITY IN COMMUNICATION	54,5542	52,762	,635	,864
The effect of - APPLICABILITY - on - PERSUADING OTHERS	53,4578	53,617	,493	,873
The effect of - APPLICABILITY - on - JOB SATISFACTION	54,3133	51,145	,645	,862
The effect of - APPLICABILITY - on - ENJOYMENT/FUN	54,4819	53,472	,548	,869

6. Multidimensionality

Reliability Statistics

Cronbach's Alpha	N of Items
,847	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - MULTIDIMENSIONALITY - on - EMPATHY	52,1807	50,955	,611	,828
The effect of - MULTIDIMENSIONALITY - on - SUPPORTING DECISIONS	52,5422	50,178	,680	,822
The effect of - MULTIDIMENSIONALITY - on - GUIDANCE	52,4217	51,442	,584	,830
The effect of - MULTIDIMENSIONALITY - on - FEEDBACK - Context of Use	52,5783	49,832	,679	,822
The effect of - MULTIDIMENSIONALITY - on - FEEDBACK - Among Competitors	53,2410	51,868	,559	,832
The effect of - MULTIDIMENSIONALITY - on - INSPIRATION	52,6867	54,608	,404	,843
The effect of - MULTIDIMENSIONALITY - on - PREVENTING TIME LOSS*	54,4940	54,838	,288	,855*
The effect of - MULTIDIMENSIONALITY - on - UNITY IN COMMUNICATION	53,9639	51,450	,536	,833
The effect of - MULTIDIMENSIONALITY - on - PERSUADING OTHERS	53,1566	49,061	,562	,832
The effect of - MULTIDIMENSIONALITY - on - JOB SATISFACTION	53,3976	51,901	,559	,832
The effect of - MULTIDIMENSIONALITY - on - ENJOYMENT/FUN	53,4337	52,541	,424	,843

*Cronbach's Alpha increases if the item is deleted.

7. Persuasiveness

Reliability Statistics

Cronbach's Alpha	N of Items
,891	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - PERSUASIVENESS - on - EMPATHY	53,1566	56,817	,646	,879
The effect of - PERSUASIVENESS - on - SUPPORTING DECISIONS	52,7711	61,008	,525	,886
The effect of - PERSUASIVENESS - on - GUIDANCE	52,9759	58,243	,738	,874
The effect of - PERSUASIVENESS - on - FEEDBACK - Context of Use	53,3855	55,728	,763	,871
The effect of - PERSUASIVENESS - on - FEEDBACK - Among Competitors	53,9398	58,252	,630	,880
The effect of - PERSUASIVENESS - on - INSPIRATION	53,5783	56,515	,684	,876
The effect of - PERSUASIVENESS - on - PREVENTING TIME LOSS	54,0723	59,775	,530	,886
The effect of - PERSUASIVENESS - on - UNITY IN COMMUNICATION	53,9036	60,332	,535	,886
The effect of - PERSUASIVENESS - on - PERSUADING OTHERS	52,6265	61,993	,464	,889
The effect of - PERSUASIVENESS - on - JOB SATISFACTION	53,8795	58,156	,645	,879
The effect of - PERSUASIVENESS - on - ENJOYMENT/FUN	54,1446	59,296	,585	,883

8. Understandability

Reliability Statistics

Cronbach's Alpha	N of Items
,862	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - UNDERSTANDABILITY - on - EMPATHY	55,4096	51,635	,655	,844
The effect of - UNDERSTANDABILITY - on - SUPPORTING DECISIONS	55,8193	50,638	,648	,843
The effect of - UNDERSTANDABILITY - on - GUIDANCE	55,7349	50,929	,627	,845
The effect of - UNDERSTANDABILITY - on - FEEDBACK - Context of Use	55,8554	50,613	,637	,844
The effect of - UNDERSTANDABILITY - on - FEEDBACK - Among Competitors	56,3373	51,421	,579	,848
The effect of - UNDERSTANDABILITY - on - INSPIRATION	56,2530	50,630	,696	,840
The effect of - UNDERSTANDABILITY - on - PREVENTING TIME LOSS*	55,3735	55,530	,289	,870*
The effect of - UNDERSTANDABILITY - on - UNITY IN COMMUNICATION	56,3614	51,795	,538	,851
The effect of - UNDERSTANDABILITY - on - PERSUADING OTHERS	55,5904	51,342	,582	,848
The effect of - UNDERSTANDABILITY - on - JOB SATISFACTION	56,5060	52,887	,522	,852
The effect of - UNDERSTANDABILITY - on - ENJOYMENT/FUN	56,3012	53,384	,402	,862

*Cronbach's Alpha increases if the item is deleted.

- **System Qualities**

1. Interpretability

Reliability Statistics

Cronbach's Alpha	N of Items
,915	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - INTERPRETABILITY - on - EMPATHY	52,1325	101,263	,717	,905
The effect of - INTERPRETABILITY - on - SUPPORTING DECISIONS	52,1205	104,107	,693	,906
The effect of - INTERPRETABILITY - on - GUIDANCE	52,2048	99,726	,779	,901
The effect of - INTERPRETABILITY - on - FEEDBACK - Context of Use	52,4940	99,253	,771	,902
The effect of - INTERPRETABILITY - on - FEEDBACK - Among Competitors	53,0120	100,719	,739	,904
The effect of - INTERPRETABILITY - on - INSPIRATION	52,1084	109,122	,503	,914
The effect of - INTERPRETABILITY - on - PREVENTING TIME LOSS	52,9277	99,556	,586	,913
The effect of - INTERPRETABILITY - on - UNITY IN COMMUNICATION	53,5422	100,861	,674	,907
The effect of - INTERPRETABILITY - on - PERSUADING OTHERS	53,0120	97,012	,747	,903
The effect of - INTERPRETABILITY - on - JOB SATISFACTION	52,6145	105,362	,612	,910
The effect of - INTERPRETABILITY - on - ENJOYMENT/FUN	52,5060	104,424	,588	,911

2. Ability to materialize/ concretize

Reliability Statistics

Cronbach's Alpha	N of Items
,898	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - EMPATHY	56,5663	62,200	,635	,889
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - SUPPORTING DECISIONS	56,6265	60,456	,682	,886
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - GUIDANCE	56,6506	62,474	,677	,887
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - FEEDBACK - Context of Use	56,5663	63,493	,593	,891
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - FEEDBACK - Among Competitors	57,3976	61,486	,592	,891
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - INSPIRATION	57,4940	58,765	,671	,886
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - PREVENTING TIME LOSS	57,2892	59,598	,607	,890
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - UNITY IN COMMUNICATION	57,6867	59,462	,684	,885
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - PERSUADING OTHERS	56,7831	59,782	,665	,886
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - JOB SATISFACTION	57,8795	61,254	,602	,890
The effect of - ABILITY TO MATERIALIZE/CONCRETIZE - on - ENJOYMENT/FUN	57,6145	61,484	,550	,893

3. Attractiveness

Reliability Statistics

Cronbach's Alpha	N of Items
,857	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - ATTRACTIVENESS - on - EMPATHY	50,2892	41,671	,601	,841
The effect of - ATTRACTIVENESS - on - SUPPORTING DECISIONS	50,3614	39,990	,696	,833
The effect of - ATTRACTIVENESS - on - GUIDANCE	50,2771	40,544	,691	,834
The effect of - ATTRACTIVENESS - on - FEEDBACK - Context of Use	50,5542	41,909	,628	,839
The effect of - ATTRACTIVENESS - on - FEEDBACK - Among Competitors	50,7711	44,642	,536	,847
The effect of - ATTRACTIVENESS - on - INSPIRATION	50,0120	41,256	,653	,837
The effect of - ATTRACTIVENESS - on - PREVENTING TIME LOSS*	49,9277	44,190	,371	,858*
The effect of - ATTRACTIVENESS - on - UNITY IN COMMUNICATION	50,5904	42,172	,582	,842
The effect of - ATTRACTIVENESS - on - PERSUADING OTHERS	49,5542	40,348	,615	,839
The effect of - ATTRACTIVENESS - on - JOB SATISFACTION	50,0000	43,073	,450	,852
The effect of - ATTRACTIVENESS - on - ENJOYMENT/FUN*	49,2289	44,959	,277	,867*

*Cronbach's Alpha increases if the item is deleted.

4. Representativeness

Reliability Statistics

Cronbach's Alpha	N of Items
,851	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - REPRESENTATIVENESS - on - EMPATHY	56,2169	44,562	,589	,837
The effect of - REPRESENTATIVENESS - on - SUPPORTING DECISIONS	56,8072	42,523	,591	,834
The effect of - REPRESENTATIVENESS - on - GUIDANCE	56,6747	41,856	,656	,829
The effect of - REPRESENTATIVENESS - on - FEEDBACK - Context of Use	56,4337	43,444	,606	,834
The effect of - REPRESENTATIVENESS - on - FEEDBACK - Among Competitors	57,5663	42,712	,481	,844
The effect of - REPRESENTATIVENESS - on - INSPIRATION	56,9639	41,767	,643	,830
The effect of - REPRESENTATIVENESS - on - PREVENTING TIME LOSS	57,5422	42,934	,440	,848
The effect of - REPRESENTATIVENESS - on - UNITY IN COMMUNICATION	57,9398	43,667	,494	,842
The effect of - REPRESENTATIVENESS - on - PERSUADING OTHERS	56,8193	42,808	,599	,834
The effect of - REPRESENTATIVENESS - on - JOB SATISFACTION	57,6145	42,630	,550	,837
The effect of - REPRESENTATIVENESS - on - ENJOYMENT/FUN*	57,2530	44,801	,353	,854*

*Cronbach's Alpha increases if the item is deleted.

5. System's suitability to audiences

Reliability Statistics

Cronbach's Alpha	N of Items
,887	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - EMPATHY	50,4699	64,301	,736	,869
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - SUPPORTING DECISIONS	49,8313	67,532	,600	,878
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - GUIDANCE	50,0723	65,068	,708	,871
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - FEEDBACK - Context of Use	50,6747	65,710	,701	,871
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - FEEDBACK - Among Competitors	50,8193	70,443	,463	,886
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - INSPIRATION	50,7831	65,830	,762	,868
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - PREVENTING TIME LOSS	51,0602	65,789	,549	,882
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - UNITY IN COMMUNICATION	50,4337	65,858	,562	,881
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - PERSUADING OTHERS*	49,2410	75,624	,239	,896*
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - JOB SATISFACTION	51,0000	67,463	,730	,871
The effect of - SYSTEM'S SUITABILITY TO AUDIENCES - on - ENJOYMENT/FUN	50,9157	66,639	,650	,875

*Cronbach's Alpha increases if the item is deleted.

6. Ease of ease of access to intended information

Reliability Statistics

Cronbach's Alpha	N of Items
,850	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - EASE OF ACCESS - on - EMPATHY	53,3133	50,681	,589	,832
The effect of - EASE OF ACCESS - on - SUPPORTING DECISIONS	53,2048	51,555	,565	,834
The effect of - EASE OF ACCESS - on - GUIDANCE	53,1205	52,595	,541	,837
The effect of - EASE OF ACCESS - on - FEEDBACK - Context of Use	53,5060	50,253	,650	,828
The effect of - EASE OF ACCESS - on - FEEDBACK - Among Competitors	53,9759	51,048	,644	,829
The effect of - EASE OF ACCESS - on - INSPIRATION	53,7590	49,429	,710	,823
The effect of - EASE OF ACCESS - on - PREVENTING TIME LOSS*	52,8313	56,361	,216	,863*
The effect of - EASE OF ACCESS - on - UNITY IN COMMUNICATION	54,0000	52,927	,454	,843
The effect of - EASE OF ACCESS - on - PERSUADING OTHERS	53,4699	52,813	,469	,842
The effect of - EASE OF ACCESS - on - JOB SATISFACTION	53,9639	50,962	,628	,830
The effect of - EASE OF ACCESS - on - ENJOYMENT/FUN	53,6506	52,230	,471	,842

*Cronbach's Alpha increases if the item is deleted.

7. Ability to share/communicate the findings

Reliability Statistics

Cronbach's Alpha	N of Items
,877	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - EMPATHY	52,2169	49,465	,557	,868
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - SUPPORTING DECISIONS	51,7470	49,264	,606	,865
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - GUIDANCE	52,0482	47,388	,706	,858
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - FEEDBACK - Context of Use	52,4096	48,635	,638	,862
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - FEEDBACK - Among Competitors	52,6506	48,523	,711	,858
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - INSPIRATION	52,4940	47,814	,762	,855
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - PREVENTING TIME LOSS*	51,4458	52,274	,384	,879*
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - UNITY IN COMMUNICATION	52,0000	49,610	,521	,871
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - PERSUADING OTHERS*	51,4217	51,783	,411	,878*
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - JOB SATISFACTION	52,5904	49,489	,645	,862
The effect of - ABILITY TO SHARE/COMMUNICATE THE FINDINGS - on - ENJOYMENT/FUN	52,3494	51,254	,528	,870

*Cronbach's Alpha increases if the item is deleted.

8. System clarity

Reliability Statistics

Cronbach's Alpha	N of Items
,903	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The effect of - SYSTEM CLARITY - on - EMPATHY	56,2169	63,684	,677	,892
The effect of - SYSTEM CLARITY - on - SUPPORTING DECISIONS	56,4699	62,057	,697	,891
The effect of - SYSTEM CLARITY - on - GUIDANCE	56,5301	61,569	,723	,889
The effect of - SYSTEM CLARITY - on - FEEDBACK - Context of Use	56,5542	62,616	,736	,889
The effect of - SYSTEM CLARITY - on - FEEDBACK - Among Competitors	57,1205	62,107	,709	,890
The effect of - SYSTEM CLARITY - on - INSPIRATION	56,9277	62,043	,737	,889
The effect of - SYSTEM CLARITY - on - PREVENTING TIME LOSS	55,8313	68,703	,492	,902
The effect of - SYSTEM CLARITY - on - UNITY IN COMMUNICATION	56,9398	64,545	,567	,899
The effect of - SYSTEM CLARITY - on - PERSUADING OTHERS	56,1446	66,223	,546	,899
The effect of - SYSTEM CLARITY - on - JOB SATISFACTION	57,3012	64,018	,635	,895
The effect of - SYSTEM CLARITY - on - ENJOYMENT/FUN	56,7349	65,490	,525	,901

NUMBERED QUOTATIONS THAT ARE REFERRED IN CHAPTER 5 – ORIGINAL VERSIONS

1. Bu problemlere daha önce getirilmemiş bi çözüm getirmeye çalışıyoruz, o da şöyle, işte gizli beklentiler bunlar aslında, problemi tanımlıyo sana kullanıcı ama ne yapılması gerektiğini tanımlamıyo, dolayısıyla incelediğiniz örneklerde, yaptığınız benchmarklarda bu problemin bi cevabı yoksa genelde bu problem hep varsa, siz bu problemin üzerine gittiğiniz zaman aslında müşteriyi mutlu etmiş oluyosunuz, kullanıcıyı mutlu ediyosunuz ve bu da aslına bakarsanız gerçek ürüne ait innovasyonu yaratıyo, yeniliği farkı yaratıyo... R15

2. [kendi yaptığı araştırma] ihtiyaç belirlemek amaçlıydı. Hangi yaş grubu, hangi meslek, ne gibi faklı ihtiyaca sebep duyuyo ben bunların ne kadarını birleştirip bi sunmalıyım. Ya da estetik kaygıları ne bunun, ne sunmalıyım… 2000 liralık laptop için 30 liralık hediye edilen HP aptal laptop çantasını mı kullanacak akbank bayan müdiresi? belki de çok güzel bi tane deri çanta almak isteyecek... ama içinde ne taşıyo, kablosunu taşıyo mu 3 kilo bilmem neyi? evrak mı taşıyo, makyaj malzemesi taşıyo mu? yoğunlukla ne taşıyolar, içerideki fonksiyonların neler olması lazıma yönelik bi araştırmaydı. Dolayısıyla yapacağımız 2-3 ihtimal modelin nelere cevap veriyo olması lazımdı." R16

3. Asıl ürüne ulaşmak hedef… yapacağımız ürünün aslında burada tanımlanmış olan memnuniyeti karşılaması ama diğer ürünlerden de farklı ve daha güzel olması hedef… diğer ürünlerden daha geride kalmamasını sağlamak… R15

4. tasarımcı olarak benim yaptığım ürünün insanların hayatını kolaylaştırmaya yönelik, işe yarayacak bir ürün veya daha uzun süre kullanılcak daha fazla fayda görülcek bi ürün haline getirmiş oluyosun. Kişisel tatmin R07

5. eğer bilindik zaten daha önceden var olan bir tasarımın redesgni isteniyosa, zaten kullanıcının da bi fikri olabilir. Var olan bi obje hakkında fikri olacaktır. Belki kullanmıştır. O zaman da bunun ne gibi eksikleri ne gibi problemleri var öğrenebiliriz… R14

6. [kullanıcıdan ara aşamada feedback alma] o da gittiğimiz yolun doğru olup olmadığını kontrol etmek açısından önemli oluyo, yani bunlara yönelik, etkileşime yönelik karar veriyorum aslında, etkileşim türüne… o doğru mu iyi gidiyo mu yu görmemi sağlar. çünkü bi yorum yapıyorum ben aslında, bütün verileri toplayıp kullanıcı böyle bişey ister diyorum ve ona yönelik bi tasarım yapmaya çalışıyorum R17

7. Bir de kendimizin sağlamasını yapmış oluyoruz, yaptığımız bişeyin yani bize sağladığı faydalardan birisi de bununla ilgili orda sağladığımız bir veriyi kullanarak ürüne kattığımız bi değer olduğunu… bunun bi bedeli olabiliyo bazen. Ürünü pahalılaştırmış olabiliyoruz veya üretimde bişeyleri zorlaştırmış olabiliyoruz ama bunun kullanıcı tarafındaki desteğini, yapılan çalışmalar sonucunda raporlandığında evet bu faydalıdır gibi bir bilgiyi aldığımız zaman bunun gerçekten yatırım yapılması gereken yatırıma değdiğinin bir ispatını yapmış oluyoruz. yatırım ispatı ve sağlama yapmak R07

8. kullanıcının nasıl kullandığını aslında öngörmeye çalışıyoruz ve ön görebildiğimiz ölçüde de bu bizim başarımız aslında ve gelecek data bizim ön gördüğümüz gibi çıkarsa bizim elimizi kuvvetlendirir ve eğer bizim müşteri dediğimiz pazarlama grubuyla biz ortaya farklı bi tasarım koyduysak ve bunu ispatlamamız gerekiyosa o elimizi güçlendirebilir R10

9. hakkaten kullanıcı beğenisinde şuralarda üst seviyede olan şeyleri gördüğümüz zaman pazarlama da demekki o üründe bi ışık varı görebiliyo. yani ikna süreçlerini de hızlandırabilir... R10

10. mümkün olduğu kadar erken konuşmak çok önemli. Zaman kaybetmeme açısından..bilgiyi geç alırsam pahalı olur. R18

11. artı işte mesela ev profilini şöyle anlattığınız zaman işte mini fırın kullanıyo, işte loş bi oda şeyi var, kişiye yönelik kelimelerle yaptığınız zaman yerine bu şekilde görseli koyduğunuz zaman insanlar farklı kelimelerle nitelendirmesine rağmen ortak bişey anlıyolar... lost in translation olmuyo yani... R03

12. yapılan gözlemler ve kullanıcı araştırmasında eğer fotoğraf video gibi bazı kayıtlar varsa onların da paylaşılması, o zaman gözlemde bizzat siz de yer almışsınız gibi faydalanmanızı sağlıyo. o önemli bence R07

[daha önce karşılaştığı bir kullanım videosu ile ilgili] ben çok etkilemiştim... o kadar heyecan verici tüyolar gelir ki tasarımcıya ordan... başka kimse de görmez tasarımcı görür onu, aa böyle ayağıyla kapattı gibi... dolayısıyla ben bu mantıkta yaşıyorum zaten, iş görmek üzere kurulu, kimsenin görmediği şeyi görüp de sinemada çizmeye başlıyosun birisinin arkasında... R16

13. özellikle askeri araç tasarımında bulundukları ortamda o araçları, benzer yada daha önce onların kullandıkları ve bize tanımlamalar olarak gönderdikleri şeyleri ben gidip birebir yaşamak istiyorum. 3 ay onlarla beraber kalayım istiyorum. Onları birebir yerlerinde görmeye ihtiyaç duyuyorum R12

14. şimdi uçak olduğu için tasarımcı olarak çok müdehale edemiyoruz. çünkü onlar biliyolar. kullanmayı bilmediğin bişeyi de tasarlaması zor. adam diyo ki ben bunu hep kullanıyorum. biz bakıyoruz halbuki önemli bi ekipman değil ben onu mesela arkaya koycam, ama o ben kullanıyorum dediği için öne almak zorundayım. işte nasıl kullanıyo derken ve ne amaçla kullanıyo o ona giriyo. [...] onların zaten prosedürleri var. Standart usulleri var onları araştırıyorum. Kendi regülasyonları filan var. Onlara bakıyoruz. R20

15. [kullanıcı ortam bilgisi] o da aslında bana ortamın stres miktarı bana öyle şeyler önemli olabiliyo, hız çok önemli olabiliyo. Yani hız bizde şu demek, canlı çalışan bi sistem mi analiz yapan bi sistem mi? Canlı çalışan bi sistemde kullanıcının 8 saniyesi filan var bişeye cevap vermek için, yani kafam daldı bi yere bakamadım bilmem ne gidiyo zaten o bilgi. o hız çok önemli. hız stresi arttırır, bir sürü bişeyi arttırıyo, kullanıcının keskinliğini de arttırıyo bi taraftan... bunların bana simüle edilmesini isterdim. bana bu duygunun hissetirilmesi... yani o kullanıcının yaşadığı stres miktarı bana kendi ortamımda hissetirilse, çünkü kafam öyle çalışmaya başlar bi süre sonra. [...] sempati değil empati isterim, yani benim ortamında benim için stres ne demek, yoksa yani komutanının ona bağırması müdürümün bana bağırmasına denk gelmeyebilir veya başka bişeye denk gelebilir ya da hemen şunu getirmezsen işten atılacaksın değil de öleceksin! yani o duygunun bi şekilde daha gerçekçi bi şekilde hissedebilmeyi isterdim. R17

16. [kullanıcıyı ortamında görmek] Gidip uçakta daha iyi olabilir ama onu yapamadığı için video daha iyi olur... R20

17. [mutlu olmayı hoşlanmayı sağlayan öğeleri belirlemek] bu biraz duygusal ihtiyaçlarına cevap verip vermediysem tarzında... orda sunumdan ziyade bence kullanıcıların ilk temastaki yüz ifadeleri filan çok önemi. Yani belki de ürün ve kullanıcının görüntüsü bi arada verilmeli, o ilk contact'te. yani ben burda demin konuşurken de söyledim ya, sonuçta mağazada tezgahta vitrinde ya da rafta gördüğü zamanki duyguları hissettiği şeyler önemli bunu iyi bi noktada sağlamaya çalışmak önemli, dolayısıyla onu bu ürünleri gösterdiğimde yakalayabilirim belki... daha kolay algılayabilirim. söylediği bi çok şeyden daha önemli olabilir... bakışı... diyelim ki on tane ürün var on tane üründen bi kere hangisine gittiği çok önemli benim için. bu tip testler yapılması lazım. R15

18. [sunum] kullanıcı gözünden iyi bakabilmeli, o önemli bişey. Yani mesela çok sosyolojik bişeyden bahsediyorum bunu yapmak kolay değil ama, kullanıcının profiline göre ihtiyacını ilişkilendirebiliyosa bu önemli bişey. Kullanıcı ellerinde eklem romatizması olduğu için şunları

şunlara ihtiyaç duyuyo yaşı bilmem ne olduğu için falan... gibi şeyleri ilişkilendirebiliyosa, orda ben şunu seçebiliyorum, bu üründe kullanıcıya hitap etmek istiyorum, o zaman onun ihtiyaçlarını göz önünde bulundurucam.. şimdi burda şunun farkındayım, birlikte çalışılan gözlem yapılan kullanıcılar zaten bizim söylediğimiz profillere yakın kullanıcılar seçiliyo, en baştan bu ilişkilendirme yapılıyo zaten, onu farkındayım ama. kullanıcıların profilleri şu yaş grubu şunları daha çok beğendi, şu sağlık problemi olanlar şunları daha çok beğendi gibi şeyler ortaya çıkan varsa, gözlemden üretilirse o iyi olabilir. R06

[kullanıcıyı tanımak] kullanıcının backgroundu hakkında biraz bilgi vermek gerekiyo, yani mesela birisine dokunmatik tuşlu bi ürünü sorarken o kişinin şimdiye kadar kullandığı dokunmatik tuş tecrübesi var mı yok mu? Evinde veya ailesinde bu tarz bi ürün kullanan var mı... R07

19. [empati] görsel benim için… bu kişinin, dergilerde filan vardır hani, odasının bi karesi benim için çok değerli o bilgi… onun için değerli olan bi köşenin bi screenshotı mesela R09

20. [fotoğraf] fotoğrafta çünkü senin anlatmak istediğin bi konu, bi de senin anlatmak istemediğin ama hemen yanında olan şeyler yani kullanıcınla alakalı ipuçları çok verir. Biraz dedektiflik gibi etrafı görüyosun, odanın koşullarını, temizliğini, orda bez bırakılmış mı bişeyin üzerinde, orda abuk subuk bi lamba var filan, bunların hepsini nası bi koşulda senin yapacağın şeyin duracağı konusunda bilgi veriyo... R18

21. persona kısmı da başarılı bi yöntem… bi kişi için ürün yaparken o kişinin derdini dinler gibi, kişi için tasarım yapma kısmı da sanırım, güzel bişey, bilgilendirme sistemi… bi kişi için tasarım yaparken, yani bi kişiye indirgenmiş bi tasarım yaparken sanırım bazı şeyleri şekillendirmek yönlendirmek için oku atarken alcağınız hedefin bi tane olması, focus olmanız daha kolay… kolay odaklandığınız zaman hedefi daha iyi vurursunuz… ihtiyacın karşılanmasını daha başarılı kılıyo R13

22. ham veriler daha sonrasında faydalı olabilir bir daha dinleyip görmek için. Bizde hepi topu zaten 10 kişi oluyo, o 10 kişi kullanacak oluyo… [ham veri faydası] burdaki veriler yetmediği yerde, bazen öyle bişey çıkıyo ki, acaba burda nasıl bişey olmalı diyosun. o eski hamverilere bakarak o bilginin cevabını da onlar arasında bulabiliyosun... çünkü aslında kullanıcının söylediği şeyde ben bunu böyle istiyorum, işte bu kayıt cihazının düğmesini burda istiyorum demiyo, kolay ulaşmak istiyorum diyo, neden kolay dediğiniz zaman çünkü işte hızlıca bilmem ne yaparken şunu hızlıca yapabilmek istiyorum diyo, aslında o hızlıcalık başka bi sorunun da cevabını barındırıyo. bi tek oraya has bi cevap başka bi sorunun da cevabı olabilir. R17

ham bilgi her zaman olmalı, çünkü ham bilgi dönüp dönüp bakılabilecek ve belki araştırmayı yapan kişinin görmediği şeylerin içinden eşelenip bulunabileceği bi bilgi, yani orda nasıl özetleneceği, nasıl çıktı sağlanacağı bi yorum, her zaman farklı bi yorum yapılabilir o yüzden ham olması lazım... R18

23. [konsept yaratmak amacıyla sunum] o tarz bi sunumda kullanıcının yaptığı şeyler çok yorumlanmamalı. Yaptığı şeylerin direk aktarımı sağlanmalı. Çünkü orda biz şeyi beklemiyoruz. Hepimizin aklına geleceği insanlar kapıyı açtıktan ziyade, kapıyı eliyle tutup mu açtı, iki parmağıyla mı açtı belki dirseğiyle mi açtı o tarz bişeyde kullanıcının gözlemleneceği şeyde o kullanıcının o hareketinin filtrelenmeden gelmesi kritik olur, aksi taktirde dediğim gibi kullanıcı kapıyı açar içeri girer, bu dendikten sonra bunu zaten böyle olacağını tahmin ediyoruz. veya nasıl açtı, çamaşır makinesinin kapağını kapattıktan ziyada onu filtrelemeden kapağını diziyle ittirerek sert bi şekilde kapattı, onu sert kullanması veya çıkan sesten rahatsız olması... o anda irkildi, gibi şeylerin, kullanıcının direk gözlemlendiği araştırmalarda onu tercih ederim... ama bi test ortamına gelip de bunu mu tercih edersin bunu mu dediğinde orda çok da fazla yapay bi ortamda olacak, orda zaten amaç tercihiyle ilgili şeyi öğrenmek. onunla ilgili bi detay varsa onu öğrenmek isterim ama onun dışında buna böyle baktı şuna şöyle baktıktan çok şey yapmam... orda yorumun en aza indirilmiş halini tercih ederim..." R07

24. çok yorumlanmış şeyin de doğru olmadığını düşünüyorum. Yani veya tasarımcının biasladığı, araştırmacının fazla biasladığı bilgi de doğru olmaz. Onun bi şekilde objektif bir bilgi de olduğunu

hissettirmesi gerekiyo, katı olmamasıyla birlikte. Çünkü orada kaçıra da bilir bilgiyi fazla yorumlayarak, yanlış formata da sokabilir belki. R17

yani mümkün olduğu kadar yorumsuz ve ilk ağızdan çıktığı şekilde aktarılmalı bu araştırmalar, çünkü oradaki ufacık nüanslar bile aslıdan kullanıcının neden mutlu neden mutsuz olduğunu bize hissettirecek şeyler olmalıdır diye düşünüyorum. R15

25. Bu bilgi birikimini karşıya aktarmanın en iyi yolu bence bunu bi edebi eser haline getirmeyip ben sana bu bilgileri vermek için burdayım, bu bilgiler bak bunları içeriyo, grafikle görselle başka şekillerle al bak bu bilgiyi nasıl kullanmak istediğine göre o yöne çevir, öbür yönünden bak... bunu rapor haline getirip anlatmak yerine biz şu kadar kişinin bundan şu şekilde hoşlandığına şahit olduk, hatta böyle böyle ilerledi gibi bi anlatım tarzıyla ilerlemesi gerekiyo. R13

26. ham datadan nasıl bir veri toplamışsınız ben onu gözlemlersem yönteminizi algılayabilirsem, ben neyi göremediğimi daha iyi algılarım diye düşünüyorum R12

27. Yöntem kısmında bu çalışma bi daha tekrarlanıyosa o zamanki çalışmanın kalitesi yeterlimiydi diye dönüp teknik ekip çalışmak istediğinde, ha işte 20 kişiyle yapılmış, kimi bölgelerimiz uzak tutulmuş… bölgeye özel bişey yapılmak istendiğinde, ve o bölgede değerlendirilmek istendiğinde, ekibin değerlendirme ekibi Başkentten mesela o zaman bu çok lokal olmuş, değiştirmemiz lazım dendiğinde yapılabilir R04

28. Mutlak gerçekler mutlak doğrular diye de bakmıyoruz biz bu çalışmalara mutlaka çıktılarını yine tartışıyoruz yine süzgeçten geçiriyoruz... öyle gözükmüş ama aslında altında da böyle var diye biz de kendi tecrübemizi katarak olduğu gibi değil olabileceği gibi uyguladığımız durumlar kesinlikle var. yani bunları tam mutlak doğru değil de esin kaynağı olarak kullanıyoruz aslında R05

29. yani şunlardan [katılımcı temelli anlatım kısmı] çok güzel kullanıcı profillerini çıkartabiliyoduk, bizim de kendimize göre yaptığımız şeyler vardı, evleri filan geziyoduk... paralel olarak bi de bu çalışmayla beraber yaptığımız şey vardı [farklı bir firma tarafından yapılan araştırma] consumer expectationları'nı çıkarttığımız çalışma vardı, ondan da bununla birleştirip çıkarımlar yaptığımız oldu GTY: yani başka çalışmalarla da birleştirme imkanı sağladı? R03: tabi tabi ... hani özellikler pazarlama ayağında giden bi de marka çalışması vardı, o da bize hani "naked consumer" dediği hani kullanıcı aslında en basit ne istiyoyu... çünkü genelde söylediğini istemiyo kullanıcı, öyle bişey var. onunla da birleştirebiliyoruz, daha fazla baktığımızda... GTY: başka çalıştırmalarla bu çalışmayı birleştirebilmek... R03: cross check yapabilmek aslına... R03

30. Sorular hazırlanırken veya bu araştırma yapısı kurgulanırken mutlaka tasarımcının da, o projede çalışacak tasarımcıların da bu kurgulama içerisinde yer alması gerekiyo R15

31. ütünün estetiği güzel' 'ondan mutluyum'u ben soyut bi cevap olarak alıyorum ben bunda somut cevaplar arıyorum. sorunlara veya sorun olabilecek fonksiyonel öğelere somut cevaplar arıyorum. pozitif veya negatif… R15

maskülen feminen diye iki terim kullanıyosunuz, maskülen nedir feminen nedir, [diğer birimler] onu tam somutlaştıramıyo kafasında… yani tasarımcı olarak siz yaşıyosunuz onu ama karşınızdakine aktaramayınca bi anlamı olmuyo, o yüzden havada kalıyor... daha somutlaştırılmış şeyler olmalı, onu somutlaştırmak da baya mesele... tasarım öyle bişey zaten... R08

32. [sunum] der ki kullanıcı bunu daha geniş ferah buldu bu sepeti... iki sepet arasındaki tek fark yada en belirgin fark tellerin inceliğidir, ha o zaman bu algıda bir ferahlama, bi daha geniş hacime denk düşüyo kullanıcı için ve bunu yorumlamış ve bana o şekilde söylemiş, bana teli inceltmemi teknik değil ama algısal faydasını endüstriyel tasarım diliyle ifade etmiş bu benim için önemli bişey […] algı olarak ordaki hedefim o algıya ulaşmak... o anlamıyla böyle bi dekode ediyo yani... R06

33. özellikle görsel ve şekilde yorumları olmamalı bana sorarsanız. o çünkü insanların zihinlerini kısıtlayan bişey. yani tasarımcının zihnini kısıtlayacak bi unsur olur bana sorarsanız. demin burda söylediğin görsel öneriler olmamalı. R15

34. mesela tespit edildiyse o probleme yönelik çözüm önerileri mutlaka olmalı, hatta onların görselleri örnekleri de olursa daha yönlendirici olabilir […] bi de sunuşun bitiminde orda

potansiyel çalışma noktalarının seçilip o konuların geliştirilmesi için neler planlanabileceğine dair de bi plan görmek isterim R05

35. öneri de gerekli ama önerinin hayata geçmesni de yine tekrar bi test etmek gerekiyo... bazen öneriler bu testlerden sonra yapılıyo, işte orda dönüp bu testin bi tekrarlanıp veya ilk etapta bi uzmanın değerlendirip onun değerlendireceği önerilerle birlikte test edilmesi [gerekiyor]... [...] o da [araştırmacı da] çünkü o aşamadan sonra benimle aynı gömleği giyiyo, tasarımcı gömleğini giyiyo... R07

36. yani önerilerden faydalandığımız da oluyo, şöyle mesela bizim düşünmediğimiz şekilde 'başka bi göz tarafından yapılsaydı nasıl yapıldı'yı görmüş oluyosun. o şekilde senin tasarımcı olarak bilgi dağarcığına bi artısı ve girdisi kesinlikle oluyo. ama projeye direk girdi olamayabiliyo. R07

37. sonuçta markadan bağımsız olarak yaptığınız için imajı çıkarmış oluyosunuz bi kenara… sonuçta imajınızı da yükseltmek için aslında müşterinize hangi konuda daha iyi olmanız gerektiğini de ortaya çıkartıyo, dolayısıyla bir sonraki etapta daha iyileştirmeye açık notaları ortaya çıkartıyosunuz… R02

38. işte 5 tane kullanıcı diyelim ki gözlendi, diyelim ki birine A kullanıcısı dendi, hani A kullanıcısının ilk başta bilgileri veriliyo diyelim ki, şu yaşta şunu kullanıyo, bunu yapıyo şunu yapıyo, ondan sonra A ve C kullanıcıları bunu dedi ama bu A ve C kimdi neydi hemen o köşede onu bize hatırlatacak A'nın buzdolabının olmadığı, arabasının şu marka olduğu gibi sadece harfle veya isimle kodlayarak değil belki A ve C bunda hiç sorun yaşamadı çünkü onların şöyle bi geçmişi olduğunu da biliyoruz... yani öyle toparlayıcı şeyler gerekebiliyo bazen. R07

39. görüntü kaydı süzülmemiş bilgi olduğu için mesela sen araştırmacı olarak izliyosun onu ondan çıkarımlar yapıyosun, ama ben tasarımcı olarak bakarsam benim çıkarımların farklı olacak, o yüzden ham veri olması, hani hamveri üzerinden gene infographic bişeyler olabilir, ikisi bi arada olabilir, bence daha faydalı.problemin ne olduğunun anlaşılmasını sağlar ve onun süzülmemiş bilgi olması temelde o… gene yönlendirme olabilir, ama süzülmemiş bilgi ile birlikte yönlendirme olursa daha inandırıcı daha verimli olur…. R09

40. mesela video kaydı gerektirebilir mesela müşterinin veya herhangi bi bireyin bişeylerle nasıl ilişkiye girdiğini gözlemlemek, bu bi tür laboratuvar psikolojik deney gibi onu bi gizli kameraya almak gibi bişeyden bahsediyorum, çünkü o zaman o görüntüde herşey gözler önüne serilir 50 tane cümleyle ya da o kişiye gidip sormak yerine onun onu nası yaptığını gözlemlemek adına o görüntü önem kazanıyo. R14

41. kullanıcıyı genelleştirmeyen ve şu kullanıcı şu nedenle şunu sevdiğini söyledi filan gibi kullanıcının gerçek tepkisini açıkça ifade edebilen. onu daha akademik rakama indirgemeyen, işte 8 kullanıcı bunu dedi falan, o var zaten onu tabi bekliyoruz ama, 2 tanesi şu nedenle şu duyguyla bunu dedi diyebiliyosa o daha avantaj oluyo, anlayabiliyorum o zaman kullanıcıyı... R06

"biz kendimiz kullanıcıları gözlemlerken olmazsa olmaz bazı şeyler belirleyebiliyoruz. Belki o tarz, çünkü gözlemi yapan o verileri değerlendirirken bir kişiden çıkacak iki kişiden çıkacak belki ama ciddi bişey o, onu biliyosun. Orda yüzdesel olarak istatistiklerde çok fazla görünmeyince arada kaynama durumu olabiliyo. Ama tasarımcı olarak sen onun bi kere çıktığını bile bilsen ona meyil verecek hatayı yapmamak kolay olabiliyo. [...] o açıdan bazı yerlerin belki istatistiksel olarak olmasa bile yol gösterici olarak altının çizilmesi daha iyi olabilir... hatanın ne kadar çok tekrarlandığı şu bundan ziyade çok kolay bi şekilde düzeltilebilecek olanlar filan gibi bi süzgeç belki gerekiyo..." R07

42. [raporun öneriler kısmı] bi rota şeklinde giden bi finale gidiyodu, hani o kısım iyiydi yani bizim açımızdan. Neden oraya o sonuca gidildiğini resim olarak gördük, o kısım iyiydi hani displayin o şekilde oluşması bizi tatmin etti açıkçası [...] sonuç budur dense kafamızda bi boşluk olabilir ama neden bizim önerdiğimiz olmuyo [onu anladık] R01

43. orda [tasarım önerileri kısmında] bi bilgi sunuyo bana ve ben onları yeniden filtrelemek zorundayım o [araştırmacı] bana benim için bikaç farklı şekilde filtrelerse eğer bi kaç path çizerse bana, o benim daha kolay kullanabileceğim bi bilgi olur tabi… R06

44. bunu genel müdüre sunduğumuzda o daha çok grafiklerle ilgilenmişti mesela, sonuçta onlar en son sonuca bakarlar ya, raporların bile [sayfalı karıştırarak] okurlar. Onlar daha çok grafiklere dökülmüş, chartlara dökülmüş, kaç tane oran olarak % kaç onlara dikkat ettikleri için. Genel müdürlere yada pazarlama tarafındaki insanlara biraz daha o tip sunumlar daha excele dökülebilecek formatta sayılı sunumlar vermek gerekiyo... R08

45. kavram grafikleri mesela o endüstriyel tasarım diline çevrilmiş bişeydi.. O çok süzülmüş bi bilgi ve ben yeni bir bulaşık makinesi konsepti yaratsam, [...] orda kullanacağım şey o olcak işte, tamamen soyut, 'bi insan bulaşık yıkayan bi makineye kirli şeyleri koyarken nelere dikkat ediyor'u az açıklayan şey o, en önemli şeyleri gösteren chart o. Yoksa mevcut konvansiyonel bulaşık makinelerindeki durumu, daha üstteki detaylar anlatıyo, şu an ben projelerde onları çalışıyorum çoğunlukla, ama daha konsept bişey yapıcak olsam işte o en soyut değerlendirme benim için müthiş bi veri... R06

(kavram haritası) orda balonların büyüklükleri de farklıydı, hangisiyle ne kadar ilişkilendirildiyse ya da nereye odaklanılmalı, onu da bir bakışta görebiliyoduk. Bu balon daha büyük buna odaklanmalıyız demekki denebiliyodu, onun için o avantajı da vardı. renklerle ve büyüklüklerle o da vurgulanmıştı. o da iyi bi özellikti bence. R08

46. mesela burda yapılan müthiş [üzerinde konuştuğu örnek proje] Uzun uzadıya röportaj yapmışlar ama ana temasını tek bi cümleyle özetlenmiş mesela... uzmanın cümlesi, highlight ederek... öyle birebir diyaloğu yazmamışlar ama çarpıcı cümleyi highlight etmişler..." R09

47. hep 'bana göre, bize göre' değerlendirmelerimiz var, [...] burda bu soruları sorduğumuzda karşılığında UTEST'ten bunları sayısallandırmasını istedik, yani dokunduğu yerin kalın olması, ona bu hissiyatı gerçekten veriyo mu müşteri açısından, gördüğü zamanki sağlamlık hissi mi daha önemli, renkler kafasını mı karıştırıyor, yoksa aksesuarları renkli yapmak onu yönlendiriyo mu, soruları artık bana göre ona göre buna göre değil, o zaman yapılan kullanıcı grubundan çıkmış sayılara göre yani biz ihtiyaçları sayısallaştırdık. sayısallaştırmış olunca da aklımızda soru işareti kalmadı. Niye soru işareti kalmadı? biliyoruz ki bu özellikler bizim için geniş bi kitle tarafından değerlendirilmiş, önem sırasına konulmuştur. R04

48. ürünü belirli bi targeta yönlendirdiğiniz, orası için çalışmaya başladığınız zaman bu targetin yüzde kaçına sesleneceğini bilmek istersiniz. Dolayısıyla bu yüzdeler önemlidir veya yapacağınız bi işin ergonomik olarak örnek vereyim, kullanım sınırları içerisinde yüzde kaçının kullanımını karşılayabileceğini bilmek istersiniz. kullanacağınız bi koltuğun Türk halkının yüzde kaçı tarafından oturulduğu zaman koyacağınız öndeki bu bilgilendirme ekranlarının direksiyonun arkasından görülebileceğini görmek istersiniz... R13

49. [ürünün nasıl algılandığını anlamak] survey verirsin, çağrıştırdığı şeyleri sorarsın, onun sonucunda, negatif veya pozitif bişey çıkar. gene bu örnekte, yani bu fitness ürününü sizde çağrıştırdığı şeyleri soraiblirsin ve ortaya çıkan keywordleri sorabilirsin, çoğunlukla negatif bi keyword yığını ortaya çıkıyosa ... hani tweter trendleri filan vardır ya bazı kelimeler çok fazla arandığı için büyük puntoyla diğerleri küçük filan onun gibi bişey olabilir mesela... sonuçta pozitif mi negatif mi insanların zihnindeki şey, burdaki çok negatifti onu anlamış olduk... bi kültürde çok abuk subuk bişey olarak algılanabilir bi ürün. onun farkına varabilirsin... normalde farkında olamayacağın bişeyi öyle anlayabilirsin... R09

50. genelde yapmış olunan iş tarif edilir sonrasında sunuşlar olur ama biz sonuçta bu raporu sonucu için istiyoruz, o yüzden sonuç işin can damarı, o yüzden ben onu net özet tarifi kolay bir şekilde görmeliyim çünkü bu raporu iki sene sonra üç sene sonra, ya da bigün hiç bu konuyu hiç bilmeyen insanlarla paylaştığımda ordaki grafikler,ordaki göstergeler sıralamalar chartlar işin can damarı... mesela 10 dakka sonra, mesela şimdiki çalışmayı genel müdüre anlatsam en fazla 10-15 dakkamız var, 15 dakka içerisinde akılda kalacak görsel ve sonuca yönelik değerlendirme olmalı. R04

51. araştırmada da tasarımcı yer almalı mutlaka belki sunumu müdahale edip değiştirtebilir veya araştırmayı değiştirtebilir, daha net bi cevap alabilmek için... sürecin içerisinde bi kere kesinlikle

yer almalı. Sorular hazırlanırken veya bu araştırma yapısı kurgulanırken mutlaka tasarımcının da, o projede çalışacak tasarımcıların da bu kurgulama içerisinde yer alması gerekiyo. Ki ben mümkün olduğunca giderim mesela araştırma şirketine. mesela o saç kurutma makinesi örneğinde olduğu gibi […] kalktım gittim firmaya, oturduk toplantı masasına dedim ki ben şunları şunları istiyorum, yani şu bilgileri edinmek istiyorum. nedir onlar, bi kere kullanıma ilişkin rahatsız oldukları noktalar, depolarken ne yapıyolar, nasıl depoluyolar nereye koyuyolar, kabloyu sarıyolar mı atıyolar mı..." R15

52. Salt rapor yeterli olmuyo, mutlaka tartışmak gerekiyo, üzerinden konuşmak gerekiyo. Çünkü hep orda doğru mesajı kaybediyoruz, ben yazarken aklımda başka bişey var onu yazıyorum, çünkü benim dünyam farklı, ben okurken başka bişey anlıyorum, çünkü benim bakış açım ve dünyam farklı, dolayısıyla bu kadar üzerinde uğraşılmış olsa bile hakkaten çıktısını yanlış anlayıp yanlış iş yapabilirim. onun için de aynı dili mi konuşuyoruz aynı şeyden mi bahsediyoruz diye karşılıklı tartışmanın olduğu bir toplantı olması gerekiyo bence R05

İstatistiki bilgi orda olmalı, onu okumalıyız, ama ordaki bilmem neyi ben kafaya takıp onları görmek istiyorum, olabilirim. Orda başka şey de arayabilirim çünkü. Geri dönüp bişey de sorabilirim. Bunu böyle demişsiniz ama ben şöyle bi yorum da yapıyorum, orayı daraltmak iyi de kalınlaştırmak daha doğru olmaz mı... bakın bu görsel de öyle.. […] senle ortak bi dil konuşabilmeliyiz orda. Design tarafındayım. […] belki ortasında bi yerlerde de bu anlamda entegre edilmem lazım. R16

'Check etme' aynı zamanda şu workshoplar için de faydalı... o testleri yapan araştırmacılarla birlikte workshop yapmak bizim daha kolay iletişim kurmamızı sağlıyor. Çünkü bir kağıt üzerinde acaba bunu derken şöyle mi diye tartışma şansım olur… R17

53. Bi kere sunum yapılırken bence sunumu yapılan ürünün mümkünse orda olması ve sunum sırasında bakın bu böyle olduğunda bu böyle oluyo gibi problemlerin yine bize o anda tekrar aktarılması da önemli, çünkü mesela bu tarz çalışma ve sunumlar yapıldığında belki proje üzerinden belli bir zaman geçmiş olabiliyo veya daha bazı kişiler o projeyle ilgili o kadar bilgiye sahip olmayabiliyo tam olarak neden bahsedildiğini o anda anlayamaya biliyo. işte şurda kırmızı ışığın yanması, her zaman orda bulunan herkes o kırmızı ışığın gerçekten neden yandığını bilmeyebiliyo... çok disiplinli bi ortamda yapılıyosa özellikle bu sunum, bence teste maruz kalan ürünün orda hazır olup, bazı şeylerin orda tekrar simüle edilmesi daha kolay anlaşılmasını sağlayabilir. R07 tasarım önerilerinin sözlü tarifi görsel tarifi veya simülasyonlar olmalı kesinlikle… çünkü karşı tarafa bişeyin en iyi şekilde böyle aktarılabileceğini düşünüyorum. Zamandan da kazandırır. Bi de herkesin aynı şeyi anlayıp anlamadığı önemli. Yani hayal etmek yerine en azından bişey görüp başkasının kafasında başka bişey canlandıysa bile onun üzerinden tarif etmesi daha rahat, ortada olan bişeyin üzerinden tarif etmek her zaman daha rahat. kişiler hemen anlaşır kendi arasında diye düşünüyorum açıkçası... R11

54. Şu kısım [katılımcı bazlı anlatım] mesela bizim açımızdan değerlendirdiğimiz baya üzerinde konuştuğumuz bi kısım oldu, katılımcı profilleri ve evlerinin görüntüleri… yani burda linklerle şey yapabiliyosunuz. Kullanıcıyı zaten çok güzel tanımlıyo, evlerindeki eşyalar, hani mini fırın kullanıcısı mesela, bu alet küçük şey... onn yorumuna daha sonra bakabiliyosunuz" R03

55. Sunumun daha sonraki kendi internal sunumlarında ve kendi proje sürecinde kullanabilmen için esnek bi sunum olması, yani sunum materyalinden bahsediyorum. Esnek bişey olması. Bazı şeylerin kolayca printout alınabiliyo olması veya kendi yaptığın bazı sunumlara belirli bi kesitin o sunumlardan alınıp eklenebiliyo olması, bence bunlar önemli. böyle bi kaynak elinin altına geliyosa onu istediğin zaman istediğin şekilde bölüp parçalayıp kullanabiliyo olman lazım. R07

56. Bunların [sunumların-raporların] maille gelmesi daha faydalı olabilir diye düşünüyorum […] çünkü dolanım hızlanıyo. Alıyo mesela ben bakmıycaksam birine forward ediyorum… R03

57. Dediğim gibi ben çok fazla içindeyim ama konuya en fazla yarım saat bir saatini ayırabilecek yöneticilerimiz, [şehir dışından] geliyolar burda sunuma katılıyolar, onların akıllarında kalabilecek sade net bilgilere ihtiyaç var. R04

58. [arayüze ilişkin tasarım önerilerinin araştırmacılar tarafından ispatlanması] hem de yöneticilere ve direktörlere sunduğumuzda onların nihai arayüzün nereden geldiğini resmi görmelerini sağlıyor. Neden böyle bir şey olduğunu onlar da biliyor. Onları ikna etme ve durumu anlatmaya yarıyor R01

59. Tasarımcının çok fazla kitap karıştırmaya pratikte vakti olmadığı için daha bilgiye çabuk ulaşabileceği bi arayüzle ya da bi sunumla iletilmesi gerekiyo bence. Burdaki o interaktif sunumu çok beğenmiştik o anlamda. Yani hem değer, hani sayı görüp hem de detaylarına inebildiği bi biçimde R08

60. [sunuşta hyperlink kullanımı] o sayfadan uzaklaşmadan insanların dikkatini de dağıtmadan çok hızlı bi şekilde gösterip tekrar ana sayfaya dönebiliyosunuz. Bu güzel bi yöntem çok hoşuma gitti, kullanışlı bi yöntem. R04

61. [detaylı raporlar] onlar bi şekilde bi yerde durabilir ama sonuçta herkesin aklında kalacak ve dönüp de bi zaman bakıp ya bu neydi dediğin zaman bakıp da hemen bulacağı bişey lazım… çok kısa bişey lazım" R02

Yani illaki tabiki okuyacağı bişeylere ulaşırsınız ama, biraz daha görsellerle grafiklerle ilişkilerle anlatılmış anlatımlara sunumlara ihtiyaç var. çünkü dediğim gibi bir tasarımcı, kimse gerçi fazla okumayı sevmez, herkes her istediğim hemen elimin altında olsun ister" R08

62. Mesela bazen bi word dökümanı olarak geldiğinde o kadar çok sayfa ve chapterdan oluşuyo ki bazen mesela gerçekten önemli kısımları kaçırma şansın olabiliyo belki oradaki bölümlerin ayarlamasının… hani şey olarak ayrılmalı belki dosyalar, saptanan problemler diye ayrı bi dosya olup…b unun bi saptanan problemler olduğunu biliyosun, sunumda bi yerde onun dinledim, ama onun dosya içinde nerde olduğunu bilmiyosun. Tekrar kullanmak istediğinde bunun aradan belki bir yıl geçtikten sonra da olabiliyo... elinde işte 150 sayfalık bi rapor oluyo. O raporun neresindeydi.... belki onu daha kolaylaştıracak bi şey olabilir mi... en önemli şey ulaşmak... İstediğin zaman istediğin bilgiye ordan tekrar ulaşabilmek..." R07

63. iyi bi kullanıcı araştırması bi kere gerçekten bilgi verici olması ve o bilgiyi verirken teferruatları elenmiş, rafine olması, tasarımcı için çok önemli çok değerli. Yoksa onu rafine hale getirmeye çalışarak biz vakit kaybederiz. R14

64. çok kompleks ve karmaşık olmamalı bu sunumlar. Çünkü genelde o sunumlar 200-300 sayfa oluyo ve doğrusunu isterseniz orda sadece 2-3 tane yer sizin asıl ilgilendiğiniz yer işte onları çok güzel açıklamak lazım ve bilgi kalabalığından ziyade net ama daha somut sonuçlara gitmemiz gerekiyor. R15

bi kere yazılı çok önemli değil yazılı şeyler. Zaten okunmuyo da birisi onu özetlemediği sürece. Yani yazılı olacaksa bi özet olmalı. R11

görsel içerik olmayan sırf yazı kesinlikle şey olmuyo… bunu rapor için konuşmuyorum genel olarak çünkü öyle size bi rapor gelip de iki sayfadan fazlaysa zaten belli bir sayfadan sonra okumuyosunuz, hafif scan ediyosunuz, o yüzden o faydalı değil... o demek ki scan edilecek gibi bi bilgi olsa içerde yeterli... R03

master tezi gibi sunulmamalı…. Ben 80 sayfayı okumak istemiyorum. Özeti okur geçerim… öyle bişey gelirse okumam… R16

65. yani rapor çok detaysa bazen yukardan bakmak çok zorlaşıyo.. Arada çıkıp yukardan bakan rapor iyi oluyo. R06

66. bazen standartlardan filan bahsedilip işte şey oluyo. O kısım beni şahsi olarak şey yapabiliyo. Evet bi standart var ama çok genel bişeyden bahsediyo orda bizim ürünümüz özelinde daha çok ben diğer kısımlarını merak ediyorum. standartlarla ilgili kısmı belki önemli ama standartlarla ilgili belki başka bi oturum yapalım, çünkü ben bi kullanıcı araştırması şeyine geldiğimde direk o noktayla ilgilenmek istiyorum artık... istenirse gerekiyosa standartlar için ayrı bişey yapılsın... işin temelleriyle ilgili çok basic şeylerin üzerinden tekrar geçmek sunumda gereksiz vakit alabiliyo... R07

67. ham verileri hepsini gözden geçirip ordan bi çıkarım elde etmeye uğraşırsak o benim için vakit harcatan ve biraz angarya bi iş olmaya başlıyo. halbuki birileri bunları alıp değerlendirip bana bunun rafine olmuş bi özetini yorumunu verse ben daha mutlu olabilirim. R14

sunum aracı olarak ham bilgi istemem… o zaman oturup ben kendim yaparım zaten. Araştırmacıya gerek yok diye düşünürüm. R20

68. çok farklı açılardan yaklaşmak önemli. Mesela tek yönlü bi araştırma her zaman sağlıklı bi bilgi elde etmeyi mümkün kılmayabiliyo. Mesela tek bi kitleden veri toplamak her zaman o ürün için en doğru şeyi vermez. Çok farklı kesimler de aynı tasarımdan faydalanacak olabilir. çok yönlü yaklaşmak farklı kitleleri ele almak önemli. [..]tasarım kriterlerini belirlemek için ne kadar geniş ve farklı kitleden bilgi alabilirsek o kadar faydalı olur... R14

[odaklı düşünme] tasarımcı olarak ben çok şey kazandırdığını düşünmüyorum, o yüzden daha generalist benim yaklaşımım, yani specialist problem çözmede tamam. Yani problem çözmede çok ciddi faydaları olabilir. Teknik problemlerde özellikle ama bütünü, bütün bi ürüne yönelik çözümlerde biraz daha geniş düşünmek lazım. bi bu yol var bi bu yol, bir de bu bunların toplam sonuçlarını bi araya getirip bişeyler ortaya koymak bence daha faydalı [generalist düşünceyi ne besliyor?] kullanıcı araştırması besliyo ama tek bir uzmanla görüşmemen lazım, çok uzmanla görüşmen lazım. Buna paralel pek çok yol, onlara beslenme… R09

69. bence o toparlama işinin sunum esnasında birlikte yapılması gerekiyo yine yani... çünkü orda toplanan kişilerin farklı nosyonlardan kişilerin o bilgileri alıp hazmedip, o bilgileri ne şekilde yorumladıkları önemli... dolayısıyla onu sadece araştırma şirketine bırakmamak lazım, yorum kısmını… R15

[birlikte tasarımın faydası] yani ordaki ekibin de tasarımcı olacağını düşünüyorum, yani aslında sadece büyük bir grup tasarımcıyla tasarım yapma gibi bişey olacağını düşünüyorum, biraz daha tecrübeli olan. Onların da tecrübe kazanmış olacağını düşünüyorum [kullanıcıyla]... R17
Bulguların hep birlikte göz önünde bulundurulduğu araştırma ekibi ve tasarımcıların katılımıyla gerçekleştirilen tasarım çalıştayları- farklı bakış açıları workshoplar da aslında iyi olabilir. Bizim öyle bi ekibimiz yoktu ama ben mesela bulduğumu fabrika müdürüyle filan paylaşıyodum. Onlar bişeyler öneriyolar, o şekilde, kulllanıcı araştırmasını destekliyo bi bakıma. […] Onların söyledikleri ve kullanıcı araştırmasından edindiğim şeylerle daha farklı bi yola yönelebiliyodum... R19

70. bir kere aracın üstünde bişey tasarlarken ya da dış görünüş olsun içerde bi eleman olsun çok boyutlu düşünmeni sağlıyo, yani belki tek başıma düşünürken bir ya da iki ilişki kurabiliyoken bunda çok detaylı bi çalışma olduğu için çok daha fazla ilişki kurabiliyorum. yani daha farklı boyutlardan bakabiliyorum. R08

71. [çok boyutlu düşünme] mesela o multimedya CD'sinde çok fazla böyle ilişkiler kurabiliyoduk bi yere tıklayıp başka bi yerlere gidebiliyoduk, geriye tıklayıp daha büyük haritadan bakabiliriz. Yani ordaki o ilişkiler.. Yani o ilişkileri daha bi üst basamağa daha bi üst basamağa çıkarıp o şekilde bi çok boyutlu düşünme kastettiğim... yani tasarım elemanları arasındaki o ilişkileri boyutlandırmış oluyoruz. iki değil 3-4 boyutta belki incelemiş oluyoruz... R08

72. özellikle kullanım aşamaları söz konusuysa, farklı açılardan görmek, daha zengin olabilir. ben ordaysam tek açıdan bulunduğum yerden görüyorum, başka birisinin gözünden de görmek sunuşta etkili olabilir... ekranı ikiye böl, vücutla ilgili bi durumsa , burda başka tespit var elde ne yapıyo görüyosun burda ayakta.. gibi durumlarda hepsini birden göstermek çok etkili olabilir sunuşta... gerçek gözlemde yakalayamıycam hepsini ama analiz yapılıyosa ayrı ayrı 4 kameradaki de analiz edilecek... visual özetten bahsediyorum. R16

73. yine test amaçlı düşünebilirsiniz ama burda şu da yapılabilir ben ürünü üretiyorum 2000 taneyi birden hiçbir ilişki kurmadığım kullanıcıya verebilir ve oralardan dönen şikayetleri de değerlendirebilirim, ama o şikayetlerin altında yatan sebepler doğru analiz edilmemiş olacaktı veya hiç analiz edilmemiş olacaktır. ama kullanıcıyla ilişkili bir test ya da analiz yaptırarak nenden şikayet ediyo ve niye onu rahatsız etti onu anlam şansına sahip oluyorum yani kök nedeni görme şansına sahip olduğum için kullanıcı testi yaptırıyorum, birici faydası bu bence... R05

74. yine test amaçlı düşünebilirsiniz ama burda şu da yapılabilir ben ürünü üretiyorum 2000 taneyi birden hiçbir ilişki kurmadığım kullanıcıya verebilir ve oralardan dönen şikayetleri de değerlendirebilirim, ama o şikayetlerin altında yatan sebepler doğru analiz edilmemiş olacaktı veya hiç analiz edilmemiş olacaktır. ama kullanıcıyla ilişkili bir test ya da analiz yaptırarak nenden şikayet ediyo ve niye onu rahatsız etti onu anlam şansına sahip oluyorum yani kök nedeni görme şansına sahip olduğum için kullanıcı testi yaptırıyorum, birici faydası bu bence... R05

75. problemin ne olduğunun anlaşılmasını sağlar ve onun süzülmemiş bilgi olması temelde o.. R09

76. sayısal sunumların çok faydalı olmadığını düşünüyorum. 10 kişi bunu beğendi, 3 kişi bunu beğendi gibi şeyler.. Nedenleri sorgulanmalı, çünkü yüzeysel cevaplar olabilir veya daha gerçekten düşünülerek cevap verilmiş şeyler vardır. Veya gerçekten o 100 tane kişi arasında 1

tanesi çok enteresan bişey söylüyodur. onu algılamak gerekiyo, dolaysıyla sadece sayısal bu mu güzel o mu güzel gibi sorular olmamalı... R15

bar grafikleri pay grafikleri de faydalı olabilir bazı kararlar için ama, tasarım karaları o kadar çok değişken oluyo ki, (örn) kullanıcılar en çok sola bakıyolar %80, e bakıyolar da ne için bakıyolar, yani sola onu mu koycam bunu mu koycam şunu mu koycam... benim için daha başka bir sürü şey gerekiyo. ya da kullanıcının bu tarz bi bilgiye ihtiyacı var denecek bana, ben diycem ki ama bunu sunmanın 20 tane yolu var, hangisinin artısı eksisi var dicem. Dolayısıyla bunlar benim için çok katı bilgiler... GTY: katı bilgi nedenini vermiyo anlamında mı? R17: evet öyle buluyorum, daha doğrusu çok daha felsefik bi bilgiye ihtiyacım var benim, benim bakış açımı genişletecek... bana ilham verecek diyim... R17

77. Mesela biz şimdi Hindistan'da bi çalışma yaptırdık, bu dışardan bi şirket. Dış firmaya verildi ve çalışmayı çok beğendiğimi söyleyemem çalışmanın yapılış şeklini sonucunu, tasarıma etki edecek şeylerin miktarı az, çıktıları. ama çok yaygın bişeyde yapılmış böyle, fakat bakınca bilginin belki %10u 15i tasarımı etkileyebilecek konular. baktığım zaman bir sürü bilgiye net bişey görmüyorum yani doğru sorular sorulmamış, yüzeysel kalmış falan, çok daha fazla yere gidilmiş belki iyi bir çalışmanın gerektirdiğinden ama asıl nitelikli zaman geçirilmemiş gibi gözüküyo mesela fotoğraf çok az, yani çok ağrılıklı olarak fotoğraf olması lazım. R18

78. Yanlış yönlendirme olmadı ama bu tamamen çalışmayı yapan kişilerden kaynaklanıyo. Yani bunun altını çok çizerek söylemek isterim. Gelen bilgi doğru bilgi olduğu için sorun yaşamadık ama gelen analizde hatalar olsaydı, mutlaka yanlış kararlar aldığımız için zararını mutlaka görecektik, çünkü analiz kalitesi çok çok önemli R05
sonuçta burda bi ezpertiz merkezinden bilgi aldığımız için hani, bizi yönlendirme önerileri de değerli oluyo... R03

79. benim gözlemleyemediğim bi çok unsuru siz gözlemleyebilirsiniz, başka birisi gözlemlerse. Ben bunun ihtiyacını da duyuyorum aslında. Ben acaba bişeyleri kaçırmış olabilir miyim diye hep kendi kendime soruyorum. Bunun için de benim kendimin uyguladığı metod başka bi tarafa paslayamadığım için şu anda işi, kendim bi mokap yapıp, kullanıcıyı getirip bunun içersine sokmak şeklinde oluyo şu an için. R12

objektif olması önemli. Yani o sunumu gerçekten belki bağımsız bi kurumun yapması firmanın yapmasından daha önemli, çünkü firmanın kendi kriterleri olabilir ve o yönlendirebilir o araştırmayı isteyerek veya istemeyerek… kendi bakış açısından bakarak sadece o yönde bilgileri toplayabilir veya işine gelmeyen şeyleri önemsemeyebilir... R14

objektiflik diyebiliriz. Şey çok önemli, biz burda her yaptığımız işte kaçınılmaz virüs gibi zaten saplanıp kalıyoruz bi noktaya, projenin en başında bu yükseklik kullanıcı için yeterli dediğiniz şey bi sene sonra yanlış çıkabilir çıkmıştır da hatta.. O fikre alışıyoruz ve ondan da kurtulamıyoruz hatta bitti diye bakıp unutuyoruz. ama o projenin erken aşamalarında gerçekten objektif, o telefonla santralle ilk defa karşılaşan biri onu tespit ettiği anda bi çok şey kazanmış olur... R10

80. kullanıcının belki bana birebirken ki aktardıklarıyla, test ortamında aktardıklarının tutarlılığını görmek açısından faydası olabilir. Ama burda da şunu da söylüyorum. Kendimi de öyle düşünüyorum. Test ortamında insanlar daha yapmacık, olduğundan farklı olacaklardır, bireysel etkileşimin daha kritik olduğunu da içimden bişeyler öyle söylüyo. yani gidip naber dostum gel bi şuraya girelimdense hadi sen bunu bi kullan modunda şey var. sen bunu bi kullan dediğinde ben olsam bi gerilirim ve doğru sonuçlar çıkmayabilir diye düşünüyorum. R12

kişilerin haberi olmayan çekilen videolarda şey vardır ya, asıl söylemek istediklerini o zaman söylerler, sanırım odur, onu bizim alabilmemiz… şu anki araştırmalarda vardır, klinik test yapılır sizin takip ettiğiniz bilinmez kullanıcıyı takip edersiniz asıl gerçek bilgilerini o zaman alırsınız, o tarz bilgiler sürpriz etkeni yaratır... R13

81. kullanıcıya doğrudan sorarsan kullandı herşeyi istiyorum, sen hepsini göster bana diyo, o yüzden sözel olarak etkileşim çok faydalı olmuyo, direk sistemi birazcık kullanmaya başlaması gerekiyo... R17

82. 103 kişilik anket çok faydalı oldu, çünkü 10 kişiden çıkan bilgi anketle genişletilmiş oldu. 10 kişilik kısımdan çıkan bulgularda aklımızda hep "ama bu 10 kişi" fikri olacaktı. 103 kişi ile bilginin sağlanması çok faydalı oldu. R05

83. çünkü ya da tasarımcının burda katılması da anında mesela şu süreçte şey kötü oluyor. tasarımı veriyosunuz bir kutuya giriyo, bir kutudan data çıkıyo diğerine tasarımcıya beraber gözlemin yapılması belki sürece tasarımcının da dahil edilmesi daha iyi olabilir diye düşünüyorum. Çünkü

zaten burada sonuçta bi olayı translate ediyo oluyosunuz, orda direk görmesi belki daha şey [güvenilir] olabilir... R03

yani mümkün olduğu kadar yorumsuz ve ilk ağızdan çıktığı şekilde aktarılmalı bu araştırmalar, çünkü oradaki ufacık nüanslar bile aslıdan kullanıcının neden mutlu neden mutsuz olduğunu bize hissettirecek şeyler olmalıdır diye düşünüyorum. çünkü oradaki ufacık nüanslar bile aslıdan kullanıcının neden mutlu neden mutsuz olduğunu bize hissettirecek şeyler olmalıdır diye düşünüyorum. R15

84. mesela video kaydı gerektirebilir müşterinin veya herhangi bi bireyin bişeylerle nasıl ilişkiye girdiğini gözlemlemek, bu bi tür laboratuvar psikolojik deney gibi onu bi gizli kameraya almak gibi bişeyden bahsediyorum, çünkü o zaman o görüntüde herşey gözler önüne serilir 50 tane cümleyle ya da o kişiye gidip sormak yerine onun onu nası yaptığını gözlemlemek adına o görüntü önem kazazanıyo.R14

85. ben mesela bazı şeylere çok dikkat ediyorum. Mesela geçenlerde bi toplantımız vardı, kullanıcıya bişeyler soruyoruz hem mühendis arkadaşlar var onlar bilgi topluyo hem de ben alıyorum o sırada... bişey sorduk, ben anında orda yalan söylediğini, yalan da demiyeyim ama, bilmiyo, bilmediğini de söylemez, orda kafası karışık, çelişkili söylüyo... ben direk geçmiştim ordaki veriyi doğru değil diye.. diğer arkadaşlar onu kayıt almışlar onu çözmeye çalışıyolar... dedim orda doğru söylemiyo kesin.. sonra anladım ki doğru söylemiyo mu, ben bazı tavırlarından yakalayabiliyorum, o da uzun zaman tecrübeli olduğum için belki de dolayısıyla. mutlaka şunu sorgulayacağım: acaba bu testi yapan kişiler kullanıcıdan bu bilgiyi alırken gerçekten anladılar mı? ya da bişeyi fark ettiler mi gibi, dolayısıyla benim de bişekilde deneyimlememi sağlamaları gerekiyo, sağlanırsa bana bi güven geliyo o zaman... en azından biraz check etmemi sağlar...R17

86. [feedback almak] o bilgiyi veren kişiyle görüştürülerek sununca çok etkili oluyo… mesela götürüyolar bazen biz bu cihazın üreticisiyiz bu arkadaş da bize ürün tasarlıyo diyolar. Sizin var mı bununla ilgili, mevcut eski cihaz üzerinden konuşuyolar… o anlatmaya başlıyo... R11

87. Ama bunun [tasarımcının yaptığı araştırmanın] handikabı da var. Bi yanda da şunu düşünürüm, derim ki, çıkan sonuç sadece benim çıkardığım sonuç olduğu için, o sadece benim uygulayacağım bişey olur. Ama çıkan sonuç kurumsal bişeyin çıkardığı sonuç olursa onu kabul ettirmek daha rahat olabilir... R12

88. süzülmemiş bilgi ile birlikte yönlendirme olursa daha inandırıcı daha verimli olur…. İnandırıcılık… bi sonuca varmışsın ama sorguladığın zaman onun inandırıcı olması gerekiyo bi şekilde, ham veriyi göstererek o inandırıcılığı sağlamış oluyosun... R09

89. şöyle bişey çarpıcı olabilir. farkında olmadığımız veya burada fark ettiği bir müşterinin cümlesi olabilir. yani bunu anlattınız yani etkili olması için o anda o görüntüyü video karesini çok kısa, bunu yaparsam çok güzel olacağını söylediği andaki görüntüsünü koyabilirsiniz. etkili olur. R04

"[video kaydı ile kullanıcı davranışını] görmek hemen ikna olmama sebep olur […] ama yöneticim, firmamın patronu alıştığı başka düzende olur istatistiki bilgiyi doğru kabul eder. R16

90. Yüzde şu kadar kişi bunu bu sebeple önce şöyle yaparak yanlış kullandı diyosan o üründe bi bomba hata var yani, çok ikna edici. Kesinlikle böyle olmaması lazım, bu düğmenin burda olmaması lazım... R16

91. sen tasarımcı olarak bişeyi görüyosun ve bunu düzeltmemiz lazım bu bi problem diyosun, fakat diğer insanlar onu umursamıyo. ta ki alandan şikayet geldiği zaman, müşteriden o zamana kadar. veyahut da sen onu yaptığın bi çalışmayla ispat edene kadar... evet bak kaç kişiyle anket yaptım ve onlardan da aynı şey geldi. o zaman önemseniyo. bu da senin kişisel subjektif fikrinin, anca birilerine ispat ettiğin zaman değer verilmesiyle sonuçlanabiliyo, çünkü herkes başka öncelikler koyabiliyo... R18

hakkaten kullanıcı beğenisinde şuralarda üst seviyede olan şeyleri gördüğümüz zaman pazarlama da demek ki o üründe bi ışık varı görebiliyo. yani ikna süreçlerini de hızlandırabilir... R03

92. burda en önemli şey yapılan çalışma sadece tek bir proje için yapılıp ölmemeli, yani onun yaşıyo olması önemli olan… sürdürülmeli… sürdürülebilir olmalı. R07

bu [kullanıcı araştırması] bi sonraki aynı konuyla ilgili yapılacak olan ürün için kriter oluyo… devamlı çalıştığımız müşteriler oluyo. Mesela aynı ürünün bir sene sonraki modelini gene bizden tasarlamamız isteniyo ama o esnada bize bi geri-besleme geliyor. Mesela diyolar ki bu ürünün şurasındaki detayda bi takım kullanım şikayetlerim geldi gibisinden bize bilgi geliyo. R14

93. böyle bu kadar kalın bişey [rapor] belki çok backup olabilir, fazladan bi backup yani R02

rapor bir arşiv belgesiyle bir sunum belgesi başka şeyler… orda sunulan çıkan rapor bir arşiv belgesi, arşivlenecek bi bilgi. R06

94. [ham verileri içeren kısım] endüstriyel tasarıma verip işte onların bundan sonraki projelerde nelere dikkat etmesi gerektiği vs.. hakkında baya detaylı ve faydalı bilgiler var .o onların o grubun daha detaylı incelemesi lazım R01

ham veriler daha sonrasında faydalı olabilir bir daha dinleyip görmek için. Bizde hepi topu zaten 10 kişi oluyo, o 10 kişi kullanacak oluyo… [ham veri faydası] burdaki veriler yetmediği yerde, bazen öyle bişey çıkıyo ki, acaba burda nasıl bişey olmalı diyosun. o eski ham verilere bakarak o bilginin cevabını da onlar arasında bulabiliyosun... R17

95. Yöntem kısmında bu çalışma bi daha tekrarlanıyosa o zamanki çalışmanın kalitesi yeterlimiydi diye dönüp teknik ekip çalışmak istediğinde, ha işte 20 kişiyle yapılmış, kimi bölgelerimiz uzak tutulmuş… bölgeye özel bişey yapılmak istendiğinde, ve o bölgede değerlendirilmek istendiğinde, ekibin değerlendirme ekibi Başkentten mesela o zaman bu çok lokal olmuş, değiştirmemiz lazım dendiğinde yapılabilir R04

96. bundan belli bi süre sonra kullanıcıların hepsine bakarak böyle bi veritabanının mesela safety security analizi yaparken kaç kere eli ereye çarpmış gibi bişeyin veya kaç kere nerde takılmış nerde şey yapmış gibi bi konunun tasarıma çözüm içereceğini düşünmekteyim. tasarımdaki problemi ortaya koyacağını ön görüyorum. R12

Aslında iki şey var, özelde şu an uğraştığımız tasarımı daha iyi yapmakla beraber gelecekte yapacağımız tasarımları bir veritabanı kendimizde oluşturacak bi tecrübe veritabanı oluşturmamızı sağlar. R11

Dediğim gibi bunların doğru yerlere gidiyo olmasını... bi tasarım doğrulama hani tamamen kullanıcı pazarlamacının içerisinde kalıyo o kararlar, ne diyim işte, yok kırmızı olmasın, işte pazardaki ürünlere baktık hepsi siyah, bizimki de siyah olsun, o zaman da bakıyosun belirli bi süre sonra bütün ürünler birbirine benzemeye başlıyo, eğer trendsetter olmak istiyosanız başka donelerle gitmeniz lazım... böyle bi havuz oluşturmak gerekiyo. R03

97. [ne gibi amaçlarla esnek sunum?] mesela bir sonraki projeyi yaparken, briefe bakın bi öncekinde veya işte şu yapılan çalışmada kullanıcıların bu konuda işte şu şekilde tepki verdikleri veya kullanıcının bunu sevdiği yönünde bilgimiz var, dolayısıyla yeni bi projenin briefinde onu kullanabilirim, ama diğer yapılmış olan veya fırınlarda insanlar da yeşil rengi seviyo mesela ama sizin yaptığınız fırın araştırmasında rengi değil sadece kapsı şuyu buyu herşeyi var. sen ordan sadece o yeşil rengi seviyo cümlesini alıp buraya yazabiliyo olman veya ordaki deliliyle beraber, bulgusuyla beraber alıp oraya koyabiliyo olman... nerde işte yeni bi proje briefi hazırlarken kendine tasarım briefini oluştururken... R07

APPENDIX J

CHARACTERISTICS OF THE INDIVIDUAL RESPONDENTS IN THE INTERVIEW STUDY AND IMPACTS AND QUALITIES REQUESTED BY THEM

Table 22. Characteristics of the individual respondents in the interview study and impacts and qualities requested by them

Resp. No.	Industry	User Research Experience	Education	Empathy	Justification	Guidance	Feedback - context	Feedback - position	Inspiration	Preventing time loss	Unity in communication	Persuading others	Product improvement	Proceeding in design process	Job satisfaction	Enjoyment - fun	Concreteness	Indepthness	Credibility	Sustainability	Applicability	Multidimensionality	Persuasiveness	Understandability	Open-endedness	Interactivity	Capability of integration	Avoidance of fixation	Concrete exemplification	Concrete exemplification-tangibility	Attractiveness	Representativeness of context and behavior	Personification	Suitability to audiences	Accessibility	Share-ability	Explanatoriness	Holism	Conciseness	Prioritization
							Individual impacts										Information qualities												System qualities											
R01	Consumer Products	Only reported (outsourcing) – no experience	Engineer	1	1	1	1			1		1		1						1	1	1	1		1				1		1					1	1	1	1	1
R02	Automotive	Only reported (outsourcing) – no experience	Designer	1	1	1		1		1	1		1				1			1				1		1	1		1		1		1	1	1		1		1	1
R03	Consumer Products	Only reported (outsourcing) – no experience	Engineer	1	1	1	1		1	1	1						1		1	1			1	1	1		1		1		1	1		1	1	1	1	1	1	1
R04	Consumer Products	Only reported (outsourcing) – no experience	Engineer	1	1	1	1		1	1							1		1	1	1		1	1		1	1				1	1		1	1	1	1	1	1	1
R05	Consumer Products	Only reported (outsourcing) – no experience	Engineer	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1						1		1		1					1			1		1	1
R06	Consumer Products	Both reported (outsourcing) and have own experience	Designer		1	1		1	1			1	1						1	1	1	1		1		1	1		1		1	1	1				1	1	1	1
R07	Consumer Products	Both reported (outsourcing) and have own experience	Designer	1							1	1	1		1				1	1	1	1					1		1		1	1		1	1	1	1	1		1
R08	Automotive	Only reported (outsourcing) – no experience	Designer	1	1	1	1	1	1			1	1																1	1	1	1			1	1	1	1		1
R09	Consumer Products	Both reported (outsourcing) and have own experience	Designer	1	1	1	1	1	1	1	1		1		1	1	1	1			1	1	1	1	1						1	1	1	1			1		1	1

Table 22. Characteristics of the individual respondents in the interview study and impacts and qualities requested by them (continued)

Resp. No.	Industry	User Research Experience	Education	Empathy	Justification	Guidance	Feedback - context	Feedback - position	Inspiration	Preventing time loss	Unity in communication	Persuading others	Product improvement	Proceeding in design process	Job satisfaction	Enjoyment - fun	Concreteness	Indepthness	Credibility	Sustainability	Applicability	Multidimensionality	Persuasiveness	Understandability	Open-endedness	Interactivity	Capability of integration	Avoidance of fixation	Concrete exemplification	Concrete exemplification-tangibility	Attractiveness	Representativeness of context and behavior	Personification	Suitability to audiences	Accessibility	Share-ability	Explanatoriness	Holism	Conciseness	Prioritization
R10	Consumer Products	Only own experience – never reported	Designer	1	1	1	1		1	1	1	1	1	1					1	1	1		1	1					1		1				1		1			1
R11	Medical Products	Only own experience – never reported	Designer	1		1	1		1	1			1					1	1	1	1		1	1					1		1					1	1		1	1
R12	Defence	Only own experience – never reported	Designer	1	1	1	1			1	1	1	1		1				1	1	1		1	1	1	1			1	1	1	1	1			1	1			1
R13	Automotive	Only own experience – never reported	Designer	1	1	1			1		1		1				1		1							1	1	1			1	1	1		1						1
R14	Design Consultancy	Both reported (outsourcing) and have own experience	Designer	1	1	1	1		1	1	1	1	1		1				1	1			1	1		1		1	1		1	1	1	1			1		1		1
R15	Design Consultancy	Both reported (outsourcing) and have own experience	Designer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1	1	1	1		1	1			1		1		1		
R16	Design Consultancy	Only own experience – never reported	Designer	1	1	1	1		1	1	1	1	1		1	1		1	1	1	1		1	1	1	1					1	1		1	1	1					1
R17	Defence	Only own experience – never reported	Designer	1	1	1	1		1		1		1	1			1	1	1	1	1		1	1			1	1		1			1	1			1		1		
R18	Medical Products	Both reported (outsourcing) and have own experience	Designer	1	1	1	1			1		1	1	1					1	1	1			1	1			1				1		1							1
R19	Medical Products	Only own experience – never reported	Designer	1	1	1	1		1	1		1	1	1									1	1						1		1	1					1		1	1
R20	Defence	Only own experience – never reported	Designer	1		1				1													1		1		1	1	1			1	1				1	1			

CURRICULUM VITAE

Personal Information
Surname, Name: Töre Yargın, Gülşen
Nationality: Turkish
Date and Place of Birth: 20 January 1982, Eskişehir
Marital Status: Married
Phone: +90 312 210 4220
Email: gulsentore@gmail.com

Education
MS METU Department of Industrial Design 2006
BS METU Department of Industrial Design 2003

Work Experience
2007- METU - BİLTİR /UTEST Product Usability Unit, User Researcher
2012- METU Department of Industrial Design, Part Time Instructor
2007-2012 - METU Department of Industrial Design, Research Assistant
2006-2006 - EU Engage Project - METU, Assistant Researcher
2005-2006 - Tepe Home, Industrial Designer
2004-2005 - Siemens Business Services – Creat-e Multimedia Solution, Interaction Designer
2003-2004 - Nuriş Welding Machines, Industrial Designer

Foreign Languages
Advanced English

Publications

- **Töre Yargın, G.** and Erbuğ, Ç. (2012). Information System for Visualizing User Research to Lead Innovation. In *Proceedings of the DMI 2012 International Research Conference.* Massachusetts Collage of Art and Design, August 8–9, 2012, Boston, MA, USA.
- **Töre Yargın, G.** and Erbuğ, Ç. (2011). A Proposed Information Systems Framework for Effective Delivery of User Research Findings. In *Proceedings of Designing Pleasurable Products and Interfaces 2011 (DPPI 2011)*. Politecnico di Milano, June 22–25, 2011, Milan, Italy. ACM Press.
- Özer, E. N., **Töre, G.**, and Erbuğ, Ç.(2009). Attitudes of Public Bus Drivers towards Technology Integration in the Dashboard Design. In D. de Waard, J. Godthelp, F.L. Kooi, and K.A. Brookhuis (Eds.) *Human Factors, Security and Safety* (pp. 317 - 329). Maastricht, the Netherlands: Shaker Publishing.
- **Töre, G.**, Özer, E.N., and Erbuğ, Ç. (2008). Emotional Dimensions Regarding Job Satisfaction: The Case of Dashboard Design for City Buses. In: PMA. Desmet, SA. Tzvetanova, P. Hekkert, and L.Justice, (Eds.), *Proceedings of The Sixth Conference on Design and Emotion 2008*. School of Design, The Hong Kong Polytechnic University, 6-9 October 2008, Hong Kong SAR.
- **Töre, G.** and Hasdoğan, G. (2006). User workshops: a method for eliciting user needs. In: Karlsson, M.A., Desmet, P., and van Erp, J. (Eds.), *Proceedings of The Fifth Conference on Design and Emotion 2006*. Department of Product and Production Development, Division Design, Chalmers University of Technology, 27-29 September, Göteborg, Sweden.