Needs, desires and fantasies: tools for analyzing user interaction from a subjective experience point of view

Oscar Tomico  
Project Engineering Dept, UPC  
Diagonal 647, pl. 10,  
08028 Barcelona, Spain  
oscar.tomico@upc.edu

Marc Pifarré  
User Lab, La Salle  
Quatre Camins, 18-34,  
08022 Barcelona, Spain  
marcpifarre@eresmas.com

Joaquim Lloveras  
Project Engineering Dept, UPC  
Diagonal 647, pl. 10,  
08028 Barcelona, Spain  
j.lloveras@upc.edu

ABSTRACT
The paper’s theme is mainly related to create design-relevant user experience research tools in early stages of product development. On one hand, it focuses on user-product interaction as the conceptual design process starting point. On the other hand, it analyzes the use of subjective psychological explorations for the user experience information gathering process. The subjective information gathering tools developed are the up to date results of a PhD research about developing and integrating qualitative methodologies centered on subjective experiences on product engineering. The set of tools can be defined as a set of inspirational, concept generation and evaluation tools to design user’s experience. After testing them, it can be said that subjective information-gathering tools, working as product-interaction guide styles, showed a promising approach distant from objective user-experience exploration and creativity methods.

Author keywords  
User experience, interaction design, subjective explorations.

ACM Classification Keywords  
H5.2 User Interfaces: Interaction styles, evaluation/methodology.

INTRODUCTION
The continual auto-redefinition of the human being today places tremendous expectation on designing products for their everyday needs and aspirations. The modern day product not only has to adequately encompass the positive effects of their predecessors, but also has to go beyond and attain a deeper relational sense with the user, especially on the emotive level [1]. Therefore, “even though consumers may not always be able to express their wants, it is important to understand how they perceive products, how their needs are shaped and influenced and how they make product choices based on them” [2].

To design products that attain a deeper relational sense with the user (over and above the product functionality and usability), we analyze users subjective experience. Defined as the appreciation and the resulting relationship between the product and the user [1]. “The user is seen as a human being and the human’s motivations or reactions to these experiences are not merely practical. There is a wide range of other important dimensions which should be defined and separated from user’s goals. Design for user experience seeks to understand and fulfill also these human user’s deeper motivations” [3].

“Experience is a very dynamic, complex and subjective phenomenon. It depends upon the perception of multiple sensory qualities of a design, interpreted through filters related to contextual factors” [4]. The task of the research study then was to establish guiding ideas for product perception and user experience for an improved design practice. Intrinsic and affective product qualities that a designer needs to take into account in the object-user relationship were studied and incorporated into the design object and/or the design process. [1]

GATHERING USERS’ EXPERIENCE: HOW DO WE ACCESS EXPERIENCE?
There are many ways in which we can learn from people about their memories, their current experiences and their ideal experiences. Sanders [5] divides user research in early stages of product development into three areas according to different tasks asked to the users: say ..., do..., or make .... Say and do relate to interviews and observations. Make relates to physical or visual aids to allow people to explore and describe their expectations and dreams. To develop tools to achieve an empathic understanding of the users, these different tasks should be used simultaneously [6].

The problem with user experience gathering tools is that the overall information (e.g. diaries, photos, stories) can hardly
be used in the design process without being interpreted and modified (indirect link between subjective information about users' needs, desires and fantasies; and product characteristics). Therefore, it arises the need for analyzing and decomposing user subjective experience from interacting with products to get design relevant information directly from the users in such a way that interpretation from the designer is not needed (relationships between physical, functional and emotional attributes).

The aim of this text is to analyze the complex area of users’ individual and subjective experience and develop subjective product experience gathering and inspiring methods in user’s own words, to help designers obtain a correct understanding of user’s requirements (present guiding ideas for how to assess user experience). In this paper we propose the use of subjective psychological exploration and projection techniques for characterizing user experience in a deeper and detailed way.

SUBJECTIVE INFORMATION GATHERING TOOLS
Theoretical background
This article presents a guided interview system to gather subjective information relevant for design purposes. The interview is mainly divided into two phases (see figure 1). First, an exploration phase that analyzes, with a high detail level, user’s experience with existing products, prototypes or services. This phase is the base for developing a projection system, which abstracts users to their emotions and desires (called the projection phase). The latter, allows the discovering of unmet and unconscious desires for the analyzed range of experiences.

Exploration phase is based in the Experience landscapes research [7] where Kelly’s Repertory Grid (RG) [8] method was used to generate experience mind maps so as to determine product experience requirements and benchmark the new design concepts with related existing products. Experience landscapes (spatial analysis visualization of RG constructs and elements) are a visual way of representing results from each participant RG interview. This procedure has been used in many other RG applications in user-centered design [9][10]. In this approach, as it dealt with design relevant subjective information, this visual representation described participants’ product perception from their experience, referenced by fictitious elements (e.g. the kind of existing product the participant would buy or an imaginary product that fulfills all their needs).

The projection phase is based in the Sensory Metaphor Generation (SMG) method [11]. The SMG method bases are the concepts of sensory analogies and sensory metaphors. Sensory Analogies can be defined as “analogy among the user’s basic actions with the product and high emotional content tasks with similar sequences of movements” [1]. Sensory metaphors can be defined as a mental picture of how experiences can be evoked, while designing the product interaction (e.g. a “Christmas Night” sensory metaphor for a backpack concept was characterized by the novelty and accessibility interaction with a present and feeling comfortable and cosy with the family [11]). They facilitate the understanding of a complex emotional system through an intuitive idea (“an existing example in the everyday life with some high emotional contents” [1]). Sensory metaphors can be used throughout the conceptual phase of design when determining the product interaction characteristics. Furthermore, they can facilitate the communication among members of the design team and also with potential users, which enables the experimental validation of the perception of the experiences the product evokes [11].

Set of tools description
The proposed tools consists of a combination of techniques for assessing personal user experience from exploratory phases with existing products, transforming them to analogies of interaction and then into scenarios grounded in users imagination. Precisely, a psychology based subjective interview, an experience analogies generation tool and an experience scenario-writing tool compose the set of tools (figure 2). These different tools can be combined in a single interview; a two hours maximum time interview per participant divided in two parts. The first part (exploration phase) consists of a pre-test (participants basic information) and a subjective psychological exploration. The second one (projection phase) consists of analogies and scenario definition. The different tools are developed to create a psychological breakthrough to jump into higher levels of abstraction in users’ mind (starting from users’ basic needs in the repertory grid analysis, shifting to unconscious experiences).
The exploration phase is based on Kelly’s RG [8] structured interview adapted by Botella [12]. The RG technique can be defined as an organized interview by its management and theoretical foundations. Its aim is to “build up mental maps of the clients’ world in their own words” [12]. The RG results are presented in a data matrix composed of three different basic components [12]. Elements are defined as a representative sample of people, events, activities, places or objects from the area you want to explore (e.g. B6, B8, B3, B1 columns in figure 3 are pens selected as elements for an advertisement pens analysis). They are related to a specific personal experience domain. The rows of the matrix are filed with personal constructs (bipolar dimensions like semantic differentials [13]), which represent personal views or judgments. Precisely, qualities people use to describe the elements in their personal, individual world (e.g. “comfortable hands position” vs. “it hurts”, “right length, no more than thumb size” vs. “too long” in figure 3). Each cell of the matrix represents the quantitative evaluation of the elements by the constructs.

The technique is adapted to gather information about user’s perception related to consumers’ preference behavior in their own words from a subjective experience point of view. It uses Hinkle’s [14] laddering technique, which is based in asking details (e.g. why, why do you say that) to each response in order to go as far as possible and obtain detailed design relevant information (like mixed constructs that relate physical, functional and emotional characteristics [7]).

The experience analogies generation tool is where participants find out and describe other products, objects or situations that represent the best experience related to the topic of each construct. It can be considered as a guided brainstorming followed by psychological projection. The products described can be considered as carriers of user experience knowledge. Therefore, by describing related products they are adding the desired context and behavior to the product attributes described in the exploration phase (e.g. “easy to see” attribute can be found in a fluorescent toy and is described as unnatural, weird and mystic by a participant in figure 4).

The scenario-writing tool generates product interaction experience scenarios by grouping different analogies. Precisely, participants are free to choose some of the analogies and use its descriptions as an inspiration to write a desired interaction behavior (e.g. the fluorescent toy, touching lightly a surface, baton and touch button descriptions were used by the participant to generate the “magic stick” scenario in figure 4). This process forces participants breaking with the real world (experience landscapes and analogies are related to past experiences, real ones) and reach the highest abstraction level, their fantasies. The scenario-writing tool helps to identify participant’s compatible analogies in a way to create a context suitable for them.

### Tools integration in the design process

Each tool from the set is related to different user-product interaction levels of abstraction (see figure 5): the exploration tool is related to a concrete level based on the physical appearance, the analogies generation tool is related to a relational level based in the interaction behavior and the scenario tool is related to a conceptual level which is about users’ overall experience and satisfaction. These three

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**Figure 3. RG results from the pilot analysis of advertisement pens. Basic actions (first column) are used to guide the interview and generate constructs (rows).**

**Figure 4. Experience scenario from the pilot analysis**

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**Figure 5. Integration in the interaction design process**
information abstraction levels can be related to Norman’s Information processing model [15] in order to link the obtained information with the user-product interaction theory:

- The information from the concrete level can be considered part of the visceral level. This is the level of fixed routines, where the brain analyzes the world and responds (initial reactions and the immediate emotional impact). Physical features like look, feel and sound dominate. Shape and form matter.

- The information from the relational level relies on the behavioral level. This level is about use and performance. Refers to the subconscious process that controls everyday behavior and the feelings accompanying skilled accomplishment, the pleasure and the effectiveness of use.

- The information from the conceptual level can be considered as part of the reflective level. This level is all about the message, about culture, about the meaning of a product or its use (the personal remembrances something evokes).

Design relevant information related to each level is useful in different phases in product development (see figure 5):

- The experience scenario can be used as an inspirational tool to guide the creative process. Users experience fantasies can be considered as trends for future interaction possibilities.

- The analogies description generates experience ideas about how to develop interaction concepts. Users experience desires can be considered as an interaction style guide.

- The repertory grid provides detailed design guidelines about the appearance and consumer’s future response validation information. User needs can be considered as basic experience requirements to fulfill.

**PRACTICAL EXAMPLE: AN OFFICE CHAIR REDESIGN WORKSHOP**

The “SMG Workshop: Participatory Tools to Improve User-Product Interaction Experience” was held at the University of Art and Design of Helsinki (UIAH), in the Product Design Department for the Industrial and Strategic Design Masters Program during the first week in October 2005. The aim of the workshop was to train students to be capable to obtain product appreciation and user’s experience information and translate it into design-relevant issues like scenarios, interaction concepts and detailed design guidelines.

**Workshop results**

Students were asked to redesign an office chair, precisely the department chair. The starting point was six existing office chairs in the department student areas. Four groups of two students were formed for the interview part. They were told to apply the subjective product experience set of tools to users of the selected chairs that are not directly related to the design field. They had two days to find the participants and run the interviews and then two days to create and develop redesign concepts from the tests results (Figure 6 and 7 show the results an the resulting concept).

The interview was done in the student’s workspace, where the office chairs used were placed resembling a working environment. Participants used the chairs before and during the test to get fresh and direct information about its use, even though they had been using them for a long time.

![Figure 6. Information extracted from one participant by Ying Yuan and Su Bing (positive constructs from the expression phase, analogies description and scenario from the projection phase).](image)

![Figure 7. Chair redesign sketches from Ying Yuan. Information from the interview translated into design](image)
Each group did one interview and used the results to generate different redesign ideas. Figures 6 and 7 show a sample of the information obtained from one participant by Ying Yuan and Su Bing and its use for one of their chair redesign concepts. Comparing them, can be said that the chair materials (wood and cotton to feel more natural), structure materials (stainless steal for joints for durability and legerity), cushion shape (cylinder shapes to enhance ventilation), behavior (sitting and laying like a dental chair), fabric texture (rough textile but not hard), colors (red and orange, different from environmental colors) are directly obtained from the subjective interview information and relate to the participants’ core needs, desires and fantasies.

Results analysis

The SMG workshop was an exploratory case where psychology-based techniques for gathering subjective experience information were applied. In the analysis of its results, was judged how well the students guide the participants in the guided interview (in terms of eliciting constructs, generating and describing analogies and writing an scenario) and how much they seemed to understand the method after using it. The reason why we had chosen this analysis was to determine the advantages and drawbacks of the set of tools so as to improve them in future works.

As a first approach to analyze how well applied the method was, each tool was explored separately. Then, a psychologist did a global overview considering the obtained information. In the exploration phase the number of design relevant constructs was measured (detailed information mixing characteristics, functions and perceptions). In the projection phase the amount of well generated and defined analogies (well suited and described behavior to a function or an action) and the suitability of the written scenario was considered (the coherence of the selected analogies).

In the exploration phase, the evaluator judged 86% of the repertory grid generated constructs as being design relevant, thus integrated into the new redesign. This high level of usefulness lies into the reliability of the Repertory Grid. The most non-relevant constructs were considered too general due to a low level of exploration during the interview (the laddering technique was not applied correctly to generate mixed constructs).

In the projection phase, the evaluator considered 84% of the analogies as being described correctly and useful for translating participants’ interaction desires into physical characteristics. In those analogies, which were not described correctly, the main problem was that the accuracy level was not high enough; therefore the information obtained from the analogy was not as rich as it could have been. Even though, is interesting to remember that the results considered not appropriate are similar to the ones obtained with other user experience gathering methods (objective qualitative and quantitative approaches).

In the scenario generation, the evaluator considered that the average fantasy level in the descriptions was 67%. Some of the scenarios were created as a selection of analogies or were divided into different actions. This made it quite difficult to create a global context to evoke participants’ inner fantasies. Despite that, all of them were useful in the analogy selection process to generate desired behavior guidelines for new user-product interaction.

The SMG workshop was the first time that the set of tools was used together and the obtained results were very optimistic, even though there are some general things to improve. The low level of detail in the analogy generation caused some of the scenarios to be created directly from the Repertory Grid constructs and description. Moreover, participants’ fantasies were not explored, as they should have been because participants were not motivated by the students to use their imagination to create and describe rich analogies. As a result, the abstraction level of the results decreased. Despite that, laddering to the core information about user experience and projecting it into an imaginary world of desires and fantasies let the students to explore subjective aspects of user experience that even the participants didn’t know.

To analyze how valuable the set of tools were for designing, students were asked to write a short essay about the method (personal feedback). They wrote about what they expected, what they learned in the theoretical part, the examples and the practical part. Some of them considered that the interviews took them more time than they expected and after some time they lost their concentration and aspirations. Also, some of them considered that the whole interview depends on how the interviewer guides the interviewee, meaning that the interviewer must be experienced and skillful, and should know some psychological exploration theory.

Despite that, most of them considered that the method was very sensitive to users emotional feelings and experiences, a good way to mix a subjective interview and a usage test together. They thought that the repertory grid was a good way of showing how different products are perceived. They found that picking the most suitable analogies was interesting and a good way of guiding a brainstorming.

CONCLUSIONS

The paper deals with the complex area of users’ individual and subjective experience from interacting with products. The main goal of it is to present guiding ideas for how to assess this experience. Implicit is that this experience should be visualized and explicated in such a way that interpretation from the designer is not needed. This is quite a task, since experience is dynamic and rests upon complex inner mechanisms. The results show that the presented work is a step in the right direction in this important field.
On one hand, the set of tools has the advantage of the detailed level of the results. The different tools gave information from different points of view (about users needs, desires and fantasies) and all of them were related and presented in a compact and practical way. The information gather can be used to generate product requirements and also as an inspiration tool by designers because it gives them space to create and acts as a guide during the design process.

On the other hand, the usefulness of the results relies on the interviewer experience and psychotherapy skills as well as on participants’ verbal skills and initiative. Additionally, the reduced number of participants (one each group) can be considered not significant for the whole range of potential users. Even though, the SMG workshop was tested with students and participants from different countries, the sample of participants was quite small and the results obtained were really similar. Precisely, the results level of similarity increased with the abstraction level; therefore, even having different needs, the participants’ desires and fantasies were really close. That gave an idea about the usefulness of applying subjective psychological analysis on participatory tools when it comes to interaction design.

FUTURE WORK
To decrease the interviewers experience and skills influence, we should be forced to use objective evaluation systems. That means to systematize the interview using the same questions for all the participants (closed test like point of view). The richness of the results decreases dramatically as a consequence of adopting this approach. Precisely, there is information that cannot be reached with objective tests, like inner desires and fantasies. Our goal is to improve the set of tools to reduce the interviewers influence without loosing the subjective analysis approach.

Another focus of study is the development of validation techniques for the information quality (psychological point of view) and relevancy (design point of view).

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REFERENCES


