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PROPOSAL TO IDENTIFY THE ESSENTIAL ELEMENTS TO CONSTRUCT A USER EXPERIENCE MODEL WITH THE PRODUCT USING THE THEMATIC ANALYSIS TECHNIQUE

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1. Introduction

The User Experience with the product, UX, is defined as "the awareness of the psychological effects elicited through interaction with a product" [Schifferstein and Hekkert 2011]. In the new experience economy [Pine et al. 1999], the UX appears as the new paradigm to add value and differentiation; this considers for example, that emotions and aesthetic experiences are economic factors that determine the quality of a product, good or service. New market dynamics, demand shorter life cycles, cost reduction, and higher quality but they are also considering the importance of emotion and impressions (hedonism and individuality) in product development [Cagan et al. 2002], [Michailidou et al. 2013]. "More and more companies in industries have recognized UX as a significant element in product design" [Liang et al. 2013].

The UX concept is extensively used in reference to the study, the design and evaluation of experiences people have through the use of (or the encounter with) a system [Roto et al. 2009]. Even though, the UX concept emerged in the field of Human-Computer Interaction [Law and van Schaik 2010], research in this topic is situated at the intersection of several scientific disciplines [Hekkert 2008]. Each approach has gradually helped to enrich the concept of the user experience, but has also made this topic grow in different directions, providing a number of theoretical bases, which shows that there is still no agreement upon its roots of knowledge, dimensions or research perspectives [Law et al. 2009], [Cordoba 2012], a much less unified definition.

Over time, the UX has included subjective aspects such as emotions, perceptions and meanings. Those aspects go beyond the instrumental, they are considered non-utilitarian [Hassenzahl 2003], [Cordoba 2012]. Those aspects offer a broader perspective of the functionality and usability, focusing on how to create experiences of value perceived by the user [Wimmer 2011]. The UX is consequently associated with a wide range of fuzzy and dynamic concepts, which alone are vast fields of research [Hassenzahl et al. 2006], [Hekkert and Schifferstein 2008], [Law et al. 2009]. These concepts associated with UX are one of the major challenges in modeling for understanding and analyzing UX [Liang et al. 2013]. Moreover, the subjectivity of people derived from cognitive and affective understanding of their surroundings, and the temporal and situational perspective of interaction, [Roto et al. 2011] add variables that challenge the assessment and /or relation of the variables among them. This intangible nature of the UX is making it even more difficult to estimate the consequences of the decisions when designing for the experience. In an attempt to approach designing or evaluating the UX, it is found that the inclusion and exclusion of any of these variables seem sometimes arbitrary, since it depends more on the author's research field and interests [Law et al. 2009].

As the UX gains strength in disciplines of design, the greater the importance of defining, delimiting, categorizing and theorizing about it, aiming to be more precise, comparable, and generalizable [Kaye 2011]. The challenge from an academic view is to reach an understanding of UX through the creation of a solid conceptual base that takes into account the complexity of human experience, and leads the construction of UX models and methods that offer an immediate benefit to the practitioners of product design, helping close the gap between UX research and UX practice [Scapin 2012].

When reviewing the literature about UX, a series of research studies on modeling, measuring and evaluating the UX had been made [Law and van Schaik 2010]. But it was evident, for example in UX models, that those were mainly made, based on self-reflections or insights of the author, (Hassenzahl, Hekkert, Desmet, Forlizzi for example) and not on empirical studies that reported the collection of qualitative or quantitative user data [Bargas 2011]. Even thought, those models provide an understanding of the UX, their lack of empirical research through their construction, restricts a theoretical advance and limits the understanding of UX as a concept and its future development [Hassenzahl et al. 2006].

This work makes part of an ongoing research project whose objective is to propose a prescriptive design method for the UX readily applicable in companies with very short NPD cycles, low risks projects and without specialized personnel to study UX. The first part of the project, which is reported here, seeks to identify, the essential elements of the UX (set of attributes that make an entity or substance what it fundamentally is, and which it has by necessity, adds character and without which it loses its identity [Stanford Encyclopedia of Philosophy 2008]). Those elements would serve further on in the project as a conceptual framework for the construction of an UX model, which would be the main basis to construct the UX prescriptive design method.

2. Methodology

There are different methods to analyze qualitative data that could be conducive to identify the essential elements we were looking for. We considered KJ Method, Affinity diagram method [Kawakita 1982] and Thematic Analysis method, TA [Braun et al. 2006]. The most structured of these methods is TA because its instructions are clearly stated, therefore avoiding the introduction researcher's biases as much as possible. Moreover TA had been widely applied and validated in analyzing many different sorts of qualitative data [Braun et al. 2006]. TA is used to identify, analyze and report patterns (themes) within a data set. This systematic technique enables to organize and describe the data selected in great detail [Braun et al. 2006]. One of its benefits is the flexibility, as it is epistemologically independent of any discipline and can be applied to a range of theoretical approaches and data type [Braun et al. 2006]. Following this, we explain the methodology applied in this work, Figure 1.
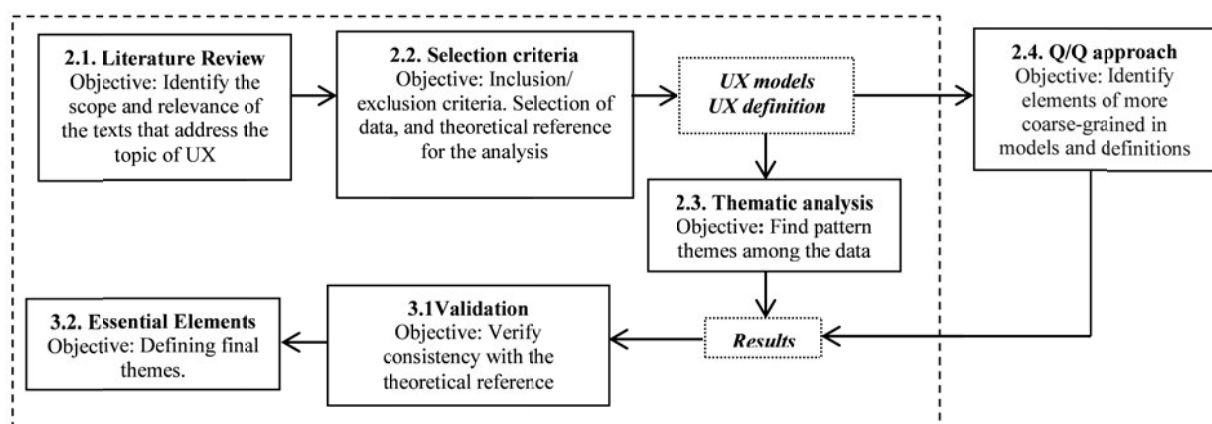

Figure 1. Stages and objectives – methodology

In stages 2.1 and 2.2, the papers and the type of data that would serve as input to the TA, are selected, along with the references that support the theoretical framework of our research (these would allow understand and define the final themes that emerge from the analysis). In stage 2.3, the TA is performed and a set of themes were obtained. In order to verify an initial consistency of the themes found in stage 2.3, and before defining the essential elements (stage 3.2), we applied a quantitative and qualitative approach in stage 2.4, also to the data set. This enabled to visualize the relevance of some UX elements and group them in categories. This stage facilitated the validation analysis in stage 3.1, to ensure that the interpretations of the data are in fact consistent and reflected our theoretical framework. Finally in stage 3 the essential elements are defined.

2.1 Literature review

The challenge in this stage was formulating the research question and systematically reviewed existing work concerning the UX [Kitchenham 2004]. The question: ¿Which elements associated with the UX are essential for the construction of an UX model? was formulated as a starting point. Although, the literature review was influenced by the context of the investigation and our domain of interest, the research of elements related to the topic, the selected keywords representing those elements and the chosen of the type of data for the analysis were systematically assessed to ensure if they were relevant and appropriate for our case. First, an extensive literature review was conducted on the UX literature. A set of references concerning the subject was created and used to define the initial scope of the investigation. Selection of publications was conducted through the search in Google Scholar and major subscription databases (ACM, Elsevier, IEEE Springer, Design Society, etc). We restricted the search to a time frame of 10 years (2003-2013), due the incremental number of publication related specific to UX, in this period of time.

The search began with the term "User experience". Although variations in terminology show similarities (such as consumer experience, use experience, game experience) [Bargas et al. 2011], this exact term is used because it is the most used extensively in recent years and is relevant to the product design practice. This term was searched in the title, abstract or keywords of articles without distinction in a particular field. 185,000 results (July -2013) were dropped. It became clear that the challenge to select the studies to review regarded in the diversity, quantity and multiple perspectives found on the topic, and how different disciplines (such as psychology, HCI, human factors, product design, marketing, etc.) manage to conceptualize or represent knowledge about the UX.

2.2 Selection criteria

Referencing to our research question, modeling seeks to represent empirical objects, phenomena, etc., in a logic and objective way, making something easier to understand, define, quantify, visualize or simulate [Pidd 2004]. According to this, the search was reduced only to full academic papers using the term "User Experience Model", including also the term "User Experience definition" in order to determine the appropriate database (387 results were found). Next, a criterion of relevance was used: most citations in their (sub) disciplines and original research paper. It was found in this stage that several meta-analysis or review papers about the UX were highly cited, so we decided to include some of them as part of our theoretical framework. 60 results were obtained.

Selecting data for analysis: It was necessary to reduce the number of papers and extract the type of data that will be used for analysis. At this phase there were identified more than 25 models among different authors and, 20 definitions (most of them from allaboutUX.com definition pool). To define which models and definitions go in the analysis, a final exclusion criterion was used. *These should detail the UX as the result of user interaction with a system or product. Describe the subjective dimensions, context -dependent and dynamics, that achieve to relate the affective needs of the user, with the formal and functional elements of the product, at the time of the interaction*. From this, and with the help of an expert, the data set for analysis was reduced to 13 UX models and 10 UX definitions (Table 2). Finally, 10 review papers were selected [Hassenzahl et al. 2006], [Karapanos et al. 2009], [Law et al. 2009], [Roto et al. 2009, 2011], [Bargas et al. 2011], [Ortiz et al. 2011], [Obrist et al. 2012], [Scapin et al. 2012], [Allam et al. 2013] as part of the theoretical framework that would be used to support the final stage (definition of the essential elements for the UX model).

2.3 Thematic analysis

The TA consists mainly in identifying themes through the "carefully reading and the re-reading of the data." [Rice et al. 1999]. It is a process of coding and pattern recognition within the data, where the emerging of themes become categories for analysis, where it is possible to identify numerous cross-references between the data and the subject of interest of the researcher [Hayes 1997]. Braun et al. [2006], describes a series of stages (see Table 1) that must be performed to produce a thematic analysis. This procedure allows a clear delineation of the TA, to provide a clear-cut explanation of what it is and how it should be done while the "flexibility" remains linked to the object of study.

Table 1. TA stages

1. Familiarizing yourself with your data
2. Generating initial codes:
3. Searching for themes:
4. Defining and naming themes:
5. Producing the report

1. Familiarizing yourself with your data, during this process the reading of the selected set of data was performed: UX models with description and UX definitions (Table 2). The information is read and reread to ensure that the subject becomes familiar.

Table 2. UX models and definition (data set)

Fuente "User experience model"	Fuente "User experience definition"
Desmet (2003)	Alben (1996)
Rhea (1992)	Hassenzahl et al (2006)
Jetter, et al (2007)	Mäkelä et al (2001)
Wimmer et al (2011)	Hekkert (2006)
Roto. (2006)	Forlizzi & Ford (2000),
Mahlke (2005)	Kuniavsky (2010)
Arhippainen et al , (2003)	*ISO 9241-210 (2010)*
Alben (1996)	Hassenzahl (2008)
Forlizzi et al 2004	Norman (1999)
Hassenzahl (2003)	Ortiz (2011)
Thüring, Mahlke (2007)	
McCarthy et al (2004)	
Desmet, Hekkert (2007)	

2. Generating initial codes, once familiarized with the subject, initial codes are created. These codes identify a characteristic of the data (semantic or latent content) [Braun et al. 2006], which seems important, and refers to the most basic piece of information that can be evaluated. In this phase, the most important aspect is the amount of codes that could be generated. The codes in this case will depend on the entire data set, and not to identify specific characteristics of the data. When all the data is initially coded and collected, a long list was generated.

3. Searching for themes, this stage involves grouping the different codes into potential themes. In our case each code was printed and cut out to facilitate the clustering process. Then we gave to those initial groups a name, for example codes about the time the interaction occurs: before, during, after,

over time, anticipation, cumulative, etc., were initially grouped into a theme called "UX Dynamics". At this stage we searched for initials relationships between codes, themes or subthemes.

4. Reviewing Themes, at this stage the themes that did not have sufficient data support or were too different were discarded. This refinement of the themes was carried out on two levels: first, they were re-read to ensure that they formed a coherent pattern data. Second, the themes were considered in relation to the whole data set. For example, some codes (design for entertainment, design for outdoors) were dismissed because they were considered more as an approach to design instead of an element present in the UX. This ensured that the themes accurately reflected the information contained in the data set selected for analysis. Other encodings are also performed at this stage to ensure that the codes that were lost in the previous stages were used if necessary.

5. Defining and naming themes: At this stage each theme proposed has been clearly defined and accompanied by a detailed analysis according the whole theoretical framework (see results). The idea is not to paraphrase the content of the data set, but to identify the essentials of what each item is and determine what aspects of the data set is captured (what's interesting and why) [Braun et al. 2006].

2.4 Q/Q approach

To facilitate the analysis, and validate that the themes found in the TA do in fact reflect the data set, we applied a quantitative and qualitative approach to all the raw terms of the 13 UX models and the 10 UX definitions. In the case of the models, all terms were then listed in its original form in order to find their frequency. Likewise, a similar procedure is applied to the definitions, using qualitative analysis software (Yoshikoder), which simultaneously identifies the frequency of terms. This enabled to visualize the relevance of some UX elements.

3. Results and analysis

In the following section only a part of the procedure applied is reported, due the lack of space. A list of 206 codes was obtained. Table 3 shows an example of the initial generation codes, applied to one of the UX definitions. Once codes were grouped, we listed 35 themes (including subthemes), see example Table 4. The codes that did not seem to belong in any group were allocated in miscellaneous. In the *Reviewing themes phase* the priority was to ensure that they were internally homogeneous and externally heterogeneous so we have a clear and identifiable distinction between them [Patton 1990]. For example, about the user, one item is the ability to perceive (physiological systems) and other, the reason why it perceived the way it does (motives, interests, experience, etc.).

Table 3. Example of codification for the definition of the UX

UX Definition [Alben 1996]	Initial Codification
All the aspects of how people use an interactive product: the way it feels in their hands, how well they understand how it works, how they feel about it while they're using it, how well it serves their purposes, and how well it fits into the entire context in which they are using it.	• You must use the product. Direct interaction (tangible) • Different response to use • Sensory response • Cognitive response • Emotional response • User characteristics (ability to understand) • As the product is used (interaction) • Functionality (useful for something) • Have a purpose • Fits where it is used • Depends on the situation

Table 4. Example of themes considered

Grouping codes - example of topics
Purpose of Use
Types of Consequences
User Features
Location of Use
Dynamic aspect of UX

3.1 Validation

At the end of this phase, we had a good idea of what the different themes and subthemes should be, and the way they relate or fit together. To helped us validate the results and reduce the number of themes, we used the data obtain In the Q/Q approach. It was found that the terms which appear more often along the UX models and definitions were: *user, product, experience, interaction, use, service, context, perception*. On the other hand, the common terms between models and definitions were: *context, emotions, expectations, experience, interaction, product and user*. In this first review only the terms in its original form were taken, and it was visible the relevance of some UX elements above others. In a second review, it was noticed that although the use of terms varies between (sub) disciplines, when referring to its definition, similarities could be found. For example, when discussing aesthetics aspects [Mahlke et al. 2007] and aesthetics characteristics [Forlizzi et al. 2000], it refer to the same. We created at this stage, 15 groups clustering similar terms and / or that represent a particular category of UX (see example - Table 5).

Table 5. Grouping terms

Semantic	Semantics functions, symbolic aspects, symbols, communicative symbolism, language
Characterization of the user	Age, habits, personality, sex, life style, skills, expectations, values
Types of Context	Social context, task context, temporal context, context of use, life context, physical context
Participation of the user	Anticipating, awareness, appropriating, evocation, identification, connecting

This process and analysis allowed us to reduce the entire dataset to 8 main themes, and 18 subthemes (elements) (Table 6). These results constitute the core, or the essential elements and themes we were looking for the UX Model.

Table 6. Themes and elements of the UX

Themes	Elements
User	• Physiological aspects • Concerns (motives, interests, emotional sensitivities) • Affective appraisal
Product	• Instrumental property (functionality, usability) • No-instrumental (aesthetic, emotional, semantic)
Interaction	• Active, passive • Instrumental aspect (usability) and no-instrumental (aesthetic, emotional, semantic)
Context and external factors	• Context: physic, social and use (situation of use) • External Factors: social, tech, cultural, economic

Consequences	• Behavioral, multisensory, cognitive and affective
Purpose of use	• The purpose of action and purpose of being
UX dynamics	• Before, during, after, over time
Total UX	• Experience and continuous feedback

3.2 Definition of main themes and elements

According with an initial analysis, it becomes apparent that the UX is a process in which the user is involved as part and final influencer of the experience. Direct and indirect Inputs (product, interaction, and context) and even internal inputs (concerns, purpose) could influence the final UX, but is the way they relate that could make the difference when designing for UX. Additionally a complex dynamic aspect that makes the contribution of each variable, vary over time. All of this is defined in more detail, identifying only the essential of what each theme and element is about, taking as reference the theoretical framework of our research complementary sources in psychology and cognitive sciences.

The user, the process of understanding and giving meaning to his environment: The human being is equipped with systems and skills that allow them to re-build the environment from what is perceived and understood from it [Reisberg 2010]. They are biologically equipped with *systems* (motor system to act, sensory system to perceive, and cognitive system to make sense [Hekkert et al. 2008], that let them interact with the environment. But, why does he perceive, act and make sense the way he does? Humans constantly evaluate the properties of the stimulus and situations, and how they relate to themselves [Smith et al. 1990]. The motives, interests, emotional sensitivities, etc., are originated from thoughts, beliefs and unique individual experiences etc., which turn into points of reference (Concerns) [Frijda 1986], [Lazarus 1991]. The meaning of an event is determined by an appraisal process [Scherer 1999] that matches or not with a concern [Desmet 2003]. That is why the UX is not a property of something or a situation, but ultimately depends on the user [Reisberg 2010], [Ortiz 2011]. It is important to note that the user (a term adopted for the paper to be the most consistent in the literature on UX) is no longer consider only as a subject of observation in functional aspects, but also as an actor who can contribute in creating value [Pallot 2011].

Product: We define product as a physical object or physical design having a utilitarian function [Hekkert et al. 2008], and non- utilitarian (for example social or aesthetic) [Hassenzahl 2006], [Ortiz 2011], with which the user comes into contact through interaction. The products are made up of a set of tangible attributes (materials, shape, size, etc.) and intangible (language, symbols), which are grouped into two categories: the instrumental (pragmatic) and non-instrumental (hedonic) [Hassenzahl 2003]. On one hand, *the instrumental* refers to aspects that support the achievement of behavioral goals to accomplish a task. This mainly makes use of the functionality (an abstracted description of work that a product must perform [Kahn 2002] and usability ("extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use" [ISO 9241]). On the other hand, the *non-instrumental* aspects are facing the user need that go beyond the achievement of a behavioral goal and the efficient fulfillment of a task and support the achievement of goals that focus on the self [Hassenzahl 2006]. Aspects such as *aesthetics* (ability of the product to delight one or more of our senses [Desmet 2007], *emotions* (as the consensus experience of affection and positive and negative feelings [Scherer 2001]) and *semantics* (meanings assigned to products [Desmet 2007]), acquire greater value for its ability to stimulate, evoke and represent, focusing more on how users experience the features of a system or product. [Wimmer 2011]. Often, one of these properties contributes to give value to the other [Hekkert et al. 2008].

Interaction: The user is constantly bombarded with stimulus, with which he interacts [Reisberg, 2010]. We define in this case the interaction, as the way people use, understand and experience the product [Stappers 2008]. The UX is always the result of an interaction that the user has with a system or product, but is not necessarily restricted to physical action (active role), it may take a passive role or intangible one (for example: anticipation or describe an aspect of the interaction with a product by memory [Desmet 2007]). Thus we see that objects acquire meaning only when the user wants or interacts with them. Furthermore, the value of the interaction (seen as a controllable variable) is not

limited to its utilitarian property (where ease of use, routes the entire sequence or interacting procedures). Developing experiences via the product usage [Von Saucken et al. 2012] could be achieved, considering the non-instrumental aspects (aesthetic, semantic and emotion), as the steering of the interaction. The experience not only results from the interaction but also it also accompanies and guides it and therefore affects the interaction [Hekkert 2008].

Context and external factors: The context is defined as something that is outside of the product, but can influence the way a person uses that product [Staples 2008], it is a complex and dynamic set of factors [Forlizzi 2004] where the experience unfolds. As the context is all that is outside, it is important to make some distinctions within it. We can identify a physical context, a social context and situation of use. The *physical context* exists independently to the product or interaction. The measurable properties of the world (place, time) are used to determine appropriate action of the product and the interaction, and identify the conditions to which the user is exposed. Additionally this context assumes the product as part of a system and so it is important the way it relates to other objects, products or systems [Forlizzi 2007]. *The social context* speaks of the experience with the product in terms of how the meaning of individual experiences emerge and change as they come to be part of a social interaction (the relationship with other people during the interaction) [Battarbee 2005] and the *context of use or situation of use* in which a given set of conditions make seem some attributes to be more or less relevant. Therefore a particular use (goal-mode or action-mode [Hassenzahl 2006]) of a product or system is caused by the same situation.

When we talk about context, we refer to the nearest immediate world of the user, but there is another that is not so immediate. These are forces that addressed the relevance of the attributes of product and interaction, and even influence the evaluation and decision making of the user. We define this less immediate context as *external factors*. These indirect influence, do not have to be controlled, but understood [Johnson et al. 2002]. All these factors affect the way people perceive, use, experience, respond and interact with the products. We only define four relevant factors. The *Social factor,* talks about group dynamics (trends) and how strongly affects the product choices and use. The user chooses products that reflect their role and status within their social circle. *Technology factor* (innovation). Change of technology determinate new behavior or economy. *The Cultural factor* gives meaning to the product, which provides rituals of use, habits, conventions, values and behaviors often reflected in their form and function that are learned from the family and other institutions. (religion, nationality, etc.). Finalizing with the *economic factor*, which is the maximization of the cost benefit for the user.

Consequences: When the user assesses or evaluates the inherent characteristics of products or events, it affects most or all of its body subsystems [Sherer 2005]. These groups of responses that can become synchronized, to a certain point, occur consciously and unconsciously and may trigger a variety of emotions and behaviors that contribute to the evaluation of the experience with the product. These responses (consequences) are directly linked to the stimulus coming from the user - product - interaction in a given context and situation of use. The consequences can be behavioral, multisensory, cognitive and affective. *The behavior*: are those that from a stimulus, invite the user to explore, interact and operate a product [Hekkert 2008]. According to Neisser [1976] knowledge of how the world works, leads to anticipation of certain types of information, which in a way it directs the search behavior of certain information and provides an easy mean of interpretation. *The multisensory is* the sensory feedback in the interaction, which allows evaluating what type of product is and tells the user what sensations are pleasant or which must be obviated [Hekkert 2008]. *The Cognitive*, link the perceived information with stored knowledge to interpret new information; provokes memories, evokes associations, etc. [Scherer 2005] And *the affective*, which are instances of subjective feelings such as emotions, moods and feelings (positive or negative) accompanied by activation of a specific physiological response and expressive behavior [Thüring 2007].

Purpose of use: The process of appreciation done by the user is an assessment of the significance of a set of stimulus for the personal well-being [Smith et al. 1990] or a particular interest. Normally the user can differentiate between 2 types of achievements, one that is inextricably linked to the goals of user behavior (purpose of action) and another that is linked with the self, his ideals, memories and relationships (*purpose of being*) [Hassenzahl 2003]. *The purpose of action* may be given externally by other or be generated internally by the individual. Normally it depends on the current status and may

vary more easily. The current goal has a certain importance and determines all actions, so that the product is only a means to an end. Satisfaction and utility are linked to the successful use of a product to achieve certain performance targets of behaviors that are desirable and in line of expectations. Moreover the *purpose of being* is oriented to the self, where the use of the product can become an end in itself. It is pleasure to use and possess, is found something desirable but unexpected [Hassenhal, 2006]. These do not vary as much since they are not linked only to a utility value, but also for example to the user's identity and can therefore become more stable.

UX dynamics: The UX varies over time; this dynamic behavior can be better understood when taken the UX as a cycle of life [Pohlmeyer 2011]. This way it can be ensured the value of interaction in different stages. The relevance of the attributes of a product or event, may change over time; as equally as the user changes, the product and the context does, and these re-evaluations considering the same variables, come with significant variations that assign different weights to the variables. When talking of the experience, it is an error to evaluate UX only after interaction; it is crucial to do it before the interaction (anticipation), throughout (temporary), after (episodic) and over time (cumulative [Roto 2011]). While it is important to evaluate the immediate experience (short-term), given the dynamic change of user goals and needs related to the environment actors, it is also important to know how (and why) the experiences evolve over time (as how the links are created). Therefore it is dynamic in time, but affects the final UX.

Total UX: The user experiences the encounter with the product as a whole. The sum of momentary experiences contributes to a final UX, which seeks to be positive or suitable for the user. This continuous feedback is what determines a new encounter with the product (repetition) and at the same time it conditions the meeting with new products or comparable systems [Pohlmeyer 2009].

4. Conclusions and future directions

The big difference regarding the state of the art of the elements found in this paper is that they were obtained using a structured analysis technique, not an intuitive one. Although it is possible to identify themes that have been referenced in other UX models, they do not contain all or the same elements which we define for each theme. As a result, we believe that the elements defined inside each theme, would provide a more coherent structure to understand each theme. We believe that this could lead us to an eventual model that could be potentially more potent at its capacity to explain the different variables that are essential along de UX.

For future directions we will develop a powerful UX model with the product constructed on an experiment (empirical base) that engages users and uses as a framework the elements defined in this paper, and whose results will be analyzed with the help of factor analysis (FA). The FA will allow the identification of latent variables, which, by grouping a number of variables involved in the experiment will allow us to propose a model that covers many aspects of UX, but at the time, be concise and manageable. The final objective of our work is to create a prescriptive design method for the UX to be applied in the FFE. This method would provide initial product design concepts, adapted to the FFE conditions, not only based on the designers intuition, but richer product design concepts that consider many different UX aspects that usually designers are not able to consider only from an intuitive basis. Finally, this method would fill a lack of methods for relative accuracy that would be simple, quick and suited to the conditions of design and competitiveness of companies with short product development cycles, without specialized personnel and limited financial resources.

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DESIGN THEORY AND RESEARCH METHODS