A SCENARIO OF USER EXPERIENCE

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ABSTRACT
A steady stream of research in user experience (UX) has been produced over the last ten years. However, published work has not been reviewed and analysed to synthesise the knowledge developed. To address this issue, this article presents a review of theories, models and frameworks of UX from different disciplines. Based on the review a scenario in which user experience develops is proposed. Four elements have been identified that have a strong impact on user experience: the user, the interaction, the artefact, and the context. Each element is reviewed in detail, outlining its major characteristics.

Keywords: User Experience, Interaction, Psychology of Design, Artefacts, Product Design

1 INTRODUCTION
Artefacts, objects, and products are always there, interacting with us in our daily lives. We perform activities with them, e.g. a knife to cut an apple; we express part of our identity with them, e.g. wrist watches; and we use them as a medium to interact with other people, e.g. mobile telephones. The diverse role of artefacts may explain why they are studied within different disciplines, including Psychology, Anthropology, Sociology, Philosophy, Engineering, and Design. Susi and Ziemke [1] explain that the role of artefacts cannot be ignored when looking at human activity, since they are an essential part of it. In design research the motivation for studying artefacts covers a broad range: from creating methodologies for designing better artefacts to understanding how users experience artefacts. The latter has gained attention from scholars, professional designers and companies. As a result there has been a noticeable increase in research into understanding user experience (UX) and an overview is provided in Hassenzahl and Tractinsky [2]. The reasons for investigating UX are extensive, namely to increase well-being [3], to improve users' lives [4], to design holistic products [2, 5, 6, 7, 8], to develop strategies to reduce product failure [9], to stimulate brand attachment [10], and to understand consumer preference based on affective reactions [2, 3, 11].
Over recent years the body of literature on UX has constantly increased. Several theories, models, and frameworks have been proposed. However, these have not been adequately reviewed and analysed in order to synthesise the knowledge developed. Crilly, Maier and Clarkson [12], carrying out research in the field of communication and design, have argued that unconnected theories represent a drawback for research because complementary or overlapping ideas from different authors are not necessarily connected. Two negative outcomes of this are that some concepts may be overlooked and other relevant features may be absent from a general perspective [12].
The aim of this paper is to compare, analyze and synthesize different perspectives on UX. As a result we propose a scenario of UX characterising its principal elements. With this research we contribute to establishing a platform of discussion that can be useful to better understand UX and define a general UX framework as advocated by Law and colleagues [13].
In section 2 we present the characteristics of UX. In Section 3 the paper describes the constituent elements of UX. Section 4 presents a typical scenario in which UX develops and the discussion of the scenario. Section 5 will close the paper with a summary of the key findings that emerge from the synthesised work.

2 CURRENT VIEW ON USER EXPERIENCE
In order to explore the issues mentioned in the previous section, theories, models and frameworks on UX were reviewed [2, 3, 4, 5, 6, 7, 13, 14, 15, 16]. These were taken from the fields of product design, interaction design, UX and social psychology. When selecting this literature it was considered important to capture different perspectives and to determine whether they were successful in describing their scope and constituent elements. In synthesising the theories, models and frameworks,

no attempt was made to favour any single approach. The aim was to identify issues that scholars had pointed out as being relevant for UX. Table 1 presents a comparison of scholars' views on the different characteristics of UX. The elements in Table 1 were extracted from published work and used to describe and define the characteristics of UX.

Table 1. Characteristics of User Experience

Authors	Characteristics of User Experience					
[2] Hassenzahl and Tranctinsky (2006)	Internal states / Experience is subjective	Experience takes a 'human' perspective	Judgments help differentiate experiences	Explicitly mention the relevance of emotion and affect	Acknowledge an experience	Acknowledge experiencing
[3] Hassenzahl (2010)	Experience is subjective	Holistic view of experience	Explicitly refer to consciousness and awareness in experience	Emotion is at the centre of experience	An experience is a chunk of time	Experiencing is a continuous stream
[4] Forlizzi and Battarbee (2004)	Experience is subjective	*	Experience is a self-talk that happens while we are conscious	Emotion is at the heart of any human experience	An experience is something that could be articulated or named	Experiencing is the constant stream of self-talk
[5] McCarthy and Wright (2004)	Experience does not refer to subjective states	Holistic view of experience (without reducing quality of life)	Awareness is a salient feature of making sense of experience	Emotional thread: emotions colour the experience	An experience is when the material experienced runs its course to fulfilment	Believe that we are always engaged in experiencing
[6] Desmet and Hekkert (2007)	Experience is subjective	Holistic view of experience	Explicitly refer to conscious awareness in experience	Emotional experience is part of their framework	*	Believe that we constantly experience core affect
[7] Hekkert and Schifferstein (2008)	Experience is subjective	See experience as a whole	Awareness of the psychological effects in experience	Explicitly mention the relevance of feelings and emotions	Recognise that there are experiences of special, memorable events	Experiences are constantly happening, including day-to-day experiences
[13] Law, Roto, Hassenzahl, Vermeeren, and Kort (2009)	Experience is individual	*	Acknowledge the conscious aspect of experience	Feelings are relevant in experience	Acknowledge the relevance of the overall experience score	Acknowledge the constant experiencing of products, objects, and services
[14] Mahlke and Thuring (2007)	Experience is related to subjective feelings	Holistic view of experience	Refer to user's appraisal of the system in experience	Emotional Reactions are relevant in experience	*	Experiencing extends over a limited period of time
[15] Varela, Thompson, and Rosch (1991	Experience is lived by an experiencer	*	Acknowledge the relevance of consciousnesses during experiences	Feeling sensations are relevant in experience	*	Focus on the experiencing
[16] Hektner, Schmidt, and Csikszentmihalyi (2007)	Experience is subjective	See experience as a whole	Acknowledge the relevance of consciousness in experience	They acknowledge that emotions play a role in human experience	Recognize retrospective or average experiences	Focus on the experiencing; what happens here and now
					An Experience	Experiencing
Outcome	**Subjective**	**Holistic**	**Conscious**	**Emotional**	**Dynamic**	

The review and analysis of past work on UX shows strong similarities. Based on this we present the following definition of user experience:

The overall appraisal, judgment or evaluation of the subjective and conscious encounter that the user has with an artefact through interaction, occurring in a particular context and time.

In the following sections we will discuss each characteristic and compare scholars' perspectives.

2.1 Subjective process

Experience is influenced by feelings, tastes and thoughts resulting from our personal way of living an event. As a consequence, each person lives his or her own experience and determines what is significant about it. There is a general consensus between scholars that individuals evaluate their own experiences from a subjective perspective [3, 6, 7, 13, 15, 16]. Even though Mahlke and Thüring [14] make no specific statement about the subjectivity of experience, their model is presented in terms of user and subjective feelings. Forlizzi and Battarbee [4] point out that there are different types of experience. Among these they argue that experiencing is a constant stream of 'self-talk' that happens when we interact with products, hence 'self-talk' is a subjective action. In contrast, McCarthy and Wright [5, p. 85] argue that experience does not refer to subjective states, but to the irreducible totality of people acting, sensing, thinking, feeling, and making meaning in a setting, including their perception and sensation of their own actions.

2.2 Holistic process

Experience is the consequence of the interplay of human systems [3], and it is explicable only by reference to the whole. Hekkert and Schifferstein [7] state that humans are biologically equipped with a number of systems that make it possible for them to interact with their environment: a motor system to act upon the environment; sensory systems to perceive changes in the environment; and a cognitive system to make sense of the environment and to plan actions. In a similar line of thought Mahlke and Thüring [14] describe UX in terms of distinct components interacting with each other in a particular way. Desmet and Hekkert [6] when drawing the conclusions of their framework mention that the understanding of affective experience requires an approach that explains how behaviour, cognition, and experience are interrelated as a result of human-artefact interaction.

2.3 Conscious process

Experience is conscious because the user is aware of what he or she is living, feeling, and sensing, as a result of the interaction with an artefact. Scholars tend to agree that when users are experiencing an artefact they are in a state of consciousness [3, 4, 6, 7, 8, 13]. In the framework proposed by Varela, Thompson, and Rosch [15] consciousness contains all the aggregates of experience. There is *contact* between the mind and its object; a specific *feeling* tone of pleasantness, unpleasantness, or neutrality; a *discernment* of the object; an *intention* toward the object; and *attention* to the object. Hekkert and Schifferstein [7] explain that most research in UX focuses on the awareness of the psychological effects elicited by the interaction with a product, and typically assesses users' subjective reports of their experiences with products. It should be stressed, however, that unconscious processes play a role in experiences [17]. Furthermore, Bargh and colleagues [18] have pointed out that contemporary psychology has come to recognize that a great deal of human functioning is rooted in nonconscious processes as well. The current focus on conscious events may be the result of the early stages of UX development.

2.4 Emotional process

All experiences have some kind of feeling tone [15] regulated by human emotions. There is a general agreement between scholars on the relevance of emotions in UX. Emotions are at the heart of experience; they colour human experience [3, 4, 5]. Without emotional engagement, experience would lack unity and would fail to be an experience [5]. Emotions, motivation, and cognitive processes coexist and contribute to experience in every moment of our life [16]. Desmet and Hekkert [6] have used emotional experience as one element of their framework of product experience. Similarly, Mahlke and Thüring [14] support their model of UX by assessing, on the one hand,the user's perception of instrumental and non-instrumental qualities of human-product interaction and, on the

other hand, the users' emotional reactions. The role of emotions on UX is apparent in a number of models of emotions in the context of HCI [19, 20, 21, 22, 23]. These models offer different perspectives on emotions, which are very useful for understanding their role in UX.

2.5 Dynamic process

Experience is dynamic, always evolving, scalable, cumulative, and provisional [3, 4, 5, 15, 16]; it develops over time and, as it does, it enriches permanently. To illustrate the dynamic nature of UX we introduce now the concepts of: 1) experience, 2) experiencing, and 3) an experience.

Experience refers to the bulk of experiences that we gather in life. These emerge from the interplay of human characteristics, e.g. action, perception, motivation and emotions, and are the result of a dialog with the world at a particular place and time [3]. Experience includes UX as well as any other experience we face. McCarthy and Wright [5] call it the general stream of experience; this stream is the space in which an experience connects with other experiences. Thus, experience is the 'space' that embodies the always changing and evolving quality of experience [3, 5]. Although we are always engaged in experience, UX is interested in the dialog that happens when we interact with artefacts.

Experiencing refers to the specific moment in which the user-artefact interaction occurs. It is the period in which a user makes sense of the experience; the constant stream of 'self-talk' that happens when we are interacting with products [4]; the here and now [6].

An experience happened in the past and thus it can be articulated or named [4]. An experience, therefore, has a beginning and an end [3, 4, 14]. When an experience runs its course to fulfilment, it is integrated within the general stream of experience, and at the same time, demarcated from other experiences [5]. When Hektner, Schmidt, and Csikszentmihalyi [16] discuss past experience similar ideas are found. They say that after more than a century, advances in psychology and neurobiology show that we memorize only parts of an experience, we interpret them and we associate them with previous similar situations. For example, based on previous experiences with Sony products, users may assume that new Sony products are easy to operate without evaluating the ease of operation of the specific product at hand [10]. The relationship between experience, experiencing and an experience is presented in Figure 1.

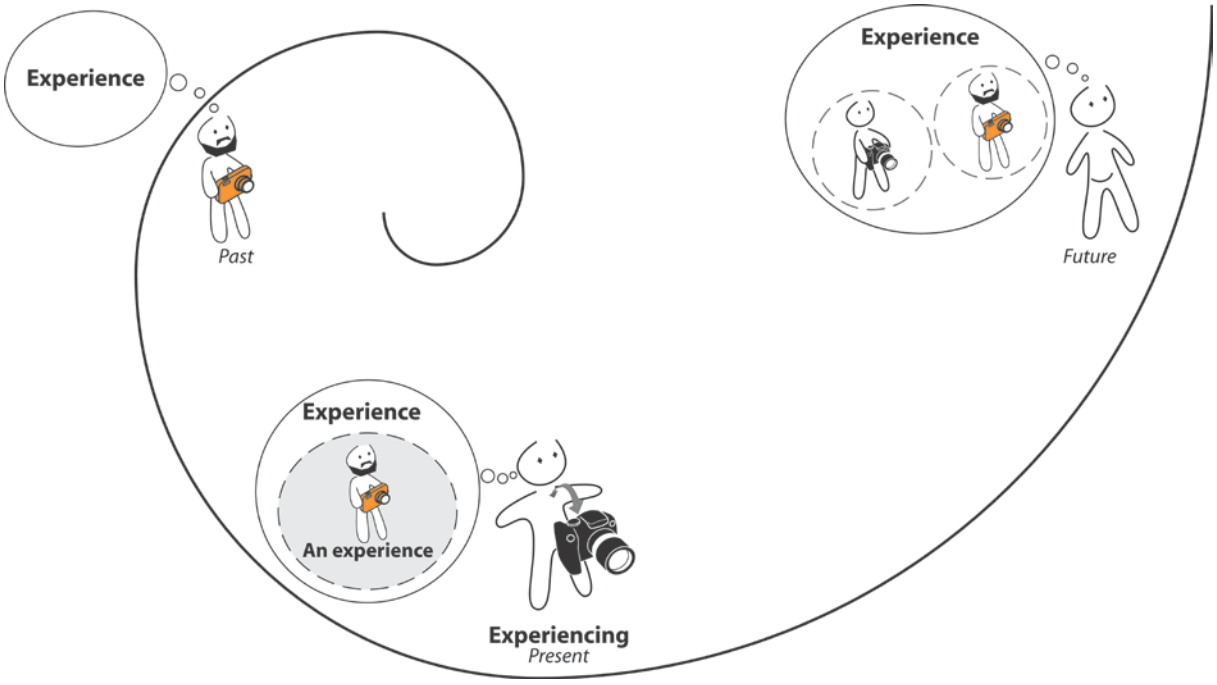

Figure 1.The relation between 'Experience', 'Experiencing' and 'An experience'

'Experience' is always there, embodying and affecting experiencing and an experience. This is why in Figure 1 experience is in the Past, the Present and the Future.

'Experiencing' an artefact impacts on current and future interactions. By interacting with a digital camera the knowledge gained will help the user interact with other cameras in the future. Experiencing can also influence the good or bad experiences that one has had in the past. A user, for example, may

have had bad experiences with a camera due to lack of knowledge about the camera's functionality. However, after learning all the functions of the camera and developing a bond with it, the perception of the user can evolve as a provider of a positive experience; and vice versa.
'An experience' also impacts on current and future interactions. Many people can imagine or fantasise the experience of interacting with a product that they still do not own. This is part of experiencing because it occurs in a particular place and time; it is not retrospective. This fantasy will impact on the real interaction between the user and the artefact. At that time it will be retrospective and it will be an experience that impacts on experiencing. Thus, both processes will continually evolve. Dewey [5] calls this the principle of continuity of experience which means that every experience takes up something from those which have gone before and modifies the quality of those which come after.

In this section we have outlined the current view on UX based on existing literature. In the next section we are going to present the elements of UX.

3 THE ELEMENTS OF USER EXPERIENCE

This section presents the constituent elements of UX. From Table 2 it can be seen that the four elements of UX are: the user, the context, the interaction and the artefact.

Table 2. The elements of user experience

Authors	Elements of UX			
[2] Hassenzahl and Tranctinsky (2006)	Human perspective	See interaction as part of situatedness or context	Products or technology use	Explicitly refer to context or environment
[3] Hassenzahl (2010)	User	See interaction as part of the 'dynamic' element	Interactive products	See context as part of the 'situated' and 'dynamic' elements
[4] Forlizzi and Battarbee (2004)	User or people	Explicitly refer to interaction within the social context	Product or interactive systems	Explicitly refer to context or environment
[5] McCarthy and Wright (2004)	Person or People	See interaction as part of the 'compositional thread'	Technological artefacts	See context as part of the 'spatio-temporal thread'
[6] Desmet and Hekkert (2007)	User	Explicitly refer to interaction	Product	Explicitly refer to the influence of context
[7] Hekkert and Schifferstein (2008)	People	Explicitly refer to interaction	Product	Explicitly refer to environment or context
[13] Law, Roto, Hassenzahl, Vermeeren, and Kort (2009)	User	Explicitly refer to interaction	Products, systems, or objects	Explicitly state that UX is context dependent
[14] Mahlke and Thuring (2007)	User	Explicitly refer to interaction	Human-technology interaction	Explicitly refer to context
[15] Varela, Thompson, and Rosch (1991	Person	Acknowledge that there is a relation that binds together the experiencer and the object experienced; see interaction as part of 'consciousnesses'	Forms or objects	Refer to the physical environment
[16] Hektner, Schmidt, and Csikszentmihalyi (2007)	People	Acknowledge that activities that occur in a context shape human experience		Explicitly refer to the context or environment
Outcome	**User**	**Interaction**	**Artefact**	**Context**

3.1 User

Existing research on UX has referred to the human element through the following terms: user, person (or people) and human perspective, see Table 2. In this paper, the term 'user' was selected to be consistent with the language adopted by other scholars in the field of new product development. The term refers to people, consumers and other stakeholders.

UX is not a property of the product but the outcome of human-product interaction and therefore it is dependent on the user [6]. The user brings to the interaction with the artefact a set of systems. These are studied to understand their effect on the assessment of UX. Examples of aspects that are important are the roles of: senses [24, 25]; motor skills [26]; values [27]; expectations [8]; needs [28]; personality traits [29]; individual sense of fun [30]; and attachment [31]. Equally relevant is to develop an understanding of the role and impact of emotions on UX.

3.2 Interaction

An interaction defines the relationship between the user and the artefact; it is distinct from activity, task, or action. An activity is described as doing in order to transform something. Interacting with artefacts does not necessarily imply a transformation of something. A task is something that has to be done. An action does not require reciprocality, whereas the result of an interaction does [1, 5]. In the field of social psychology an early definition of interaction focused on the reciprocal action of an individual that may influence and modify the behaviour of another individual [1]. The theories, models and frameworks reviewed in this article always acknowledge a relationship between the human and the external world. The majority of them explicitly refers to the interaction between the human and the product. The rest, instead, see interaction as part of other elements, e.g. context.

We define interaction as the action accomplished by a user on an artefact that influences or modifies his or her motor, perceptive, cognitive, and affective systems. Interaction can be either physical, e.g. driving a car, or non-physical, e.g. contemplating a car; and it is a process not the fulfilment of a purpose. For clarity we use the analogy by Varela, Thompson, and Rosch [15] regarding mental factors: they explain that mental factors are the relations that bind the consciousness to its object. In the case of UX the relation that binds the user and the artefact is the interaction [4, 6, 7, 13, 14].

Interaction takes place within a specific context [2, 3, 5, 14, 16] and we acknowledge this. Nevertheless, we believe that it is important to draw attention towards interaction to characterize its properties. Examples of studies to investigate the impact of interaction on UX are: aesthetics of interaction [32]; physical interaction [10,33]; choreography of interaction [34]; and interaction gestalts [35].

3.3 Artefact

Current research on UX has referred to the artefact through the following terms: product, object, item and system, see Table 2. Despite the large preference for the term product, in this article we have opted for the term artefact. This is because the term is more general and it is frequently used across the disciplines that are interested in new product development [36]. In plain words an artefact is an object made by a human being that performs technical and non-technical functions, e.g. social and aesthetical [11, 23, 36]. There is empirical evidence suggesting that users recognize and differentiate between the aesthetic, the social, and the technical function [14, 37, 38].

Technical functions are related to what the product is meant to do, e.g. a glass contains water, scissors cut paper, and cars transport users [36]. Social functions depend on the collective understanding and agreement of the agents that make up the relevant community; they are social-status functions [36]. Moreover, social functions are related to users' manner of thinking of and talking about artefacts [19, 21, 39, 40]. Aesthetic functions are generally used to refer to a response or reaction of the user to an artefact manifested through the senses. Each of the senses contributes to our perception of an artefact and whether it is delightful, pleasing, or elicits feelings of attraction or beauty in us [38, 41, 42]. In general, artefacts impact on human experience which is shaped by the tools and sign systems we use [1]; more specifically, artefacts model UX through the functions that they perform.

3.4 Context

When users interact with an artefact they are not only influenced by it but also by the context as they interact in a particular place and time. As a result scholars who are interested in studying human experience acknowledge the relevance of context. Hutchins mentions that context is not a fixed set of

surrounding conditions but a wider dynamic process of which the cognition of an individual is only a part [1]. Similarly, Forlizzi [43] mentions that context is understood as a complex, dynamic set of factors, e.g. social, historical, cultural, and institutional. Five broad types of context that are often mentioned by scholars are: physical, social, cultural, situational, and temporal.
The physical context is the location where the interaction occurs, e.g. an office, a lab or a living room, the surroundings brought to the experience, e.g. temperature, weather, or light conditions, and the relationship between artefacts, e.g. in the case of a home cinema system the physical context includes the relationship between the DVD player, the speakers, and the TV. A case study that illustrates how an artefact influences its physical space can be found in Forlizzi [44].
The social context refers to the effect that social interaction has on UX. Forlizzi [43] has pointed out that there is little knowledge about what happens when groups of users interact with or through a product, evoking social behaviour, or in how to help designers think about designing for social interaction.
The cultural context is related to the effect that values, languages, and norms have on modelling UX. Scholars agree on the enormous potential that cultural studies offer to UX research [6, 16, 45]. One example of this is reported by Tracy [46] who found that pride is influenced by cultural background.

Different researchers have argued that situational factors play a role in experience. Research with adolescents has shown that in general terms they differentiate the work state from the play state. Work was reported as important but unenjoyable. On the other hand, play-like activities were reported as enjoyable but unimportant [47]. Similar differences have been reported in the field of UX, where overall judgments from two situations, goal-mode or action-mode, are usually different when interacting with the same artefact in the same context [48].

4 A SCENARIO OF USER EXPERIENCE

Based on the literature reviewed in the previous sections a scenario of UX is presented in Figure 2. The scenario includes four elements, namely the user, the artefact, the interaction and the context. These elements define UX, which is only a part of experience, see Figure 2. It is worth noting that each of the four elements is characterised further by a set of sub-elements, e.g. context is distinguished into physical, social, situational, cultural and temporal.

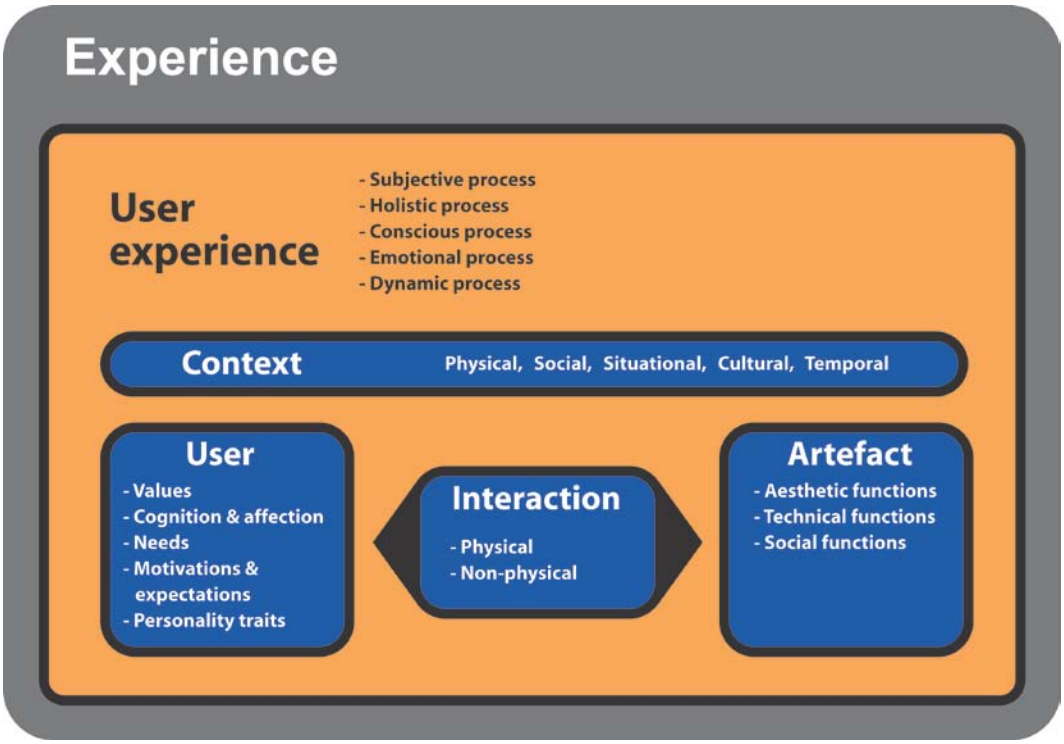

Figure 2. The scenario of user experience

4.1 DISCUSSION

The discussion is divided into four parts. The first part compares the scenario to previous work; the second illustrates the limitations of the proposed scenario; the third focuses on two open issues related to UX; and the fourth discusses the usefulness of the scenario for product design.

This article has compared, connected, and synthesised previous perspectives on UX into the scenario presented in Figure 2. The scenario is a first attempt at comprehending the key elements of UX and their relationship. The integration of different views into one scenario has been a challenging task. Its main contribution is the overall perspective that it offers for studying and designing experiences. Compared to prior work, the scenario offers an overview of UX. Other models and frameworks tend to focus on specific issues presented in the scenario. Forlizzi and Battarbee [4], for example, explore the role of interaction (fluent, cognitive, and expressive) and its relationship with three different types of experience (experience, an experience, and co-experience). Desmet and Hekkert [6], however, structure their framework on three specific types of experience: emotional, aesthetic, and the experience of meaning. Hekkert and Schifferstein [7] in their model of human-product interaction detail some of the human systems and product characteristics that impact on UX through interaction. Similarly, Mahlke and Thüring [14] present some artefact characteristics that impact on UX and explore the role of aesthetics. McCarthy and Wright present a model with four threads (compositional, emotional, sensual and spatio-temporal) and six sense-making processes, which explain how people make sense of experience. Finally, Hassenzahl explains five properties of experience (subjective, holistic, situated, dynamic and positive) and introduce a three level hierarchy of goals (be goals, do goals, and motor goals) that have a strong impact on UX. This variety of views is of value for a thorough understanding of what UX is. However, these perspectives may be more useful for general interest when they are connected. Thus, the scenario is not necessarily intended to replace the models and frameworks that precede it, but to offer a view on the essential elements that those models have indicated.

It is now important to discuss the limitations of this research. The scenario may be seen as an oversimplification of UX, which in reality is a rich and complex process. However, any attempt to represent or model UX is by itself a simplification of the phenomenon of study [3]. Each of the four elements of the scenario is complex in itself, and further work is needed to understand specific interactions between the elements and sub-elements. Other models and frameworks have already started to explore this endeavour [3, 5, 6]. It is also worth mentioning that throughout this paper we did not consider the different philosophical stances on which each view of experience is based on. For example Desmet and Hekkert's framework [6] is based on Core Affect Theory, and McCarthy and Wright's framework [5] on Phenomenology. This orientation may offer interesting information in relation to the way in which each of these scholars has approached the study of UX.

The focus shifts now to the two UX issues that we intend to discuss. The first questions whether it is possible to set definable limits to experiencing and an experience. Desmet and Hekkert [6] argue that experiences are restricted to the here and now. Once the interaction comes to an end, the experience also stops. On the other hand, McCarthy and Wright [5] mention that our experience with an artefact is not confined to what we do and what we undergo for a specific period of time. Experience includes subsequent activities such as talking about it with friends. Law and colleagues [13] argue that it is important to understand experience in terms of its development over time, including early expectations, actual usage and disposal of the artefact being experienced. Based on these perspectives, the difference between 'experiencing' and 'an experience' is not only methodological, i.e. at what moment these conditions should be assessed, but it concerns also the development of methods for assessing UX, e.g. the measurement of UX over time [9], and the definition of design strategies, e.g. ways to influence the overall UX.

The second issue is related to the general aim of UX. Some scholars believe that an important reason for understanding people's experiences is to improve their lives [4, 5, 13, 16]. However, there is not a clear position regarding this issue. Others argue that what is new is the focus on positive emotional outcomes such as joy, fun, and pride [2, 3]. This view is not shared by everyone as some have taken a neutral view on the potential benefits of UX [6, 7, 14]. On the other hand, it is also acknowledged that negative experiences are part of daily life which nonetheless be turned into a positive one as suggested by different scholars [3, 4, 49]. Nevertheless, it may be worth emphasising the experiential approach to understanding and focusing on what makes an experience positive, pleasurable, good [3]. This is in line with Hektner, Schmidt, and Csikszentmihalyi [16] who explain that the various theories that have

flourished throughout the history of Psychology agree that individuals look for pleasure and avoid pain.

Finally it is relevant to discuss how product design and designers can benefit from the scenario. Considering that successful design behaviour is based not on extensive problem analysis, but on adequate 'problem scoping' and on a focused or directed approach to gathering problem information [50, 51], the scenario is expected to support designers in scoping design problems by considering key issues. Let us assume that a designer has been assigned the challenge of improving the experience that a user will have when interacting with a digital camera, see Figure 3. The characteristics of the user, the artefact, the interaction and the context, along with the functions that the camera has to perform, define the working space of the designer. The designer can rely on the scenario to consider possible users. Equally well, he or she can understand the impact of context on the design of the camera by considering where it will be used and the relation that it has with other artefacts. The exploration of alternative scenarios of use is essential to allow the designer to visualize different stages of the lifespan of UX including social interaction and long-lasting relationship that the user may have with the camera. Based on this understanding the designer can identify relevant criteria for improving the design to enhance UX.

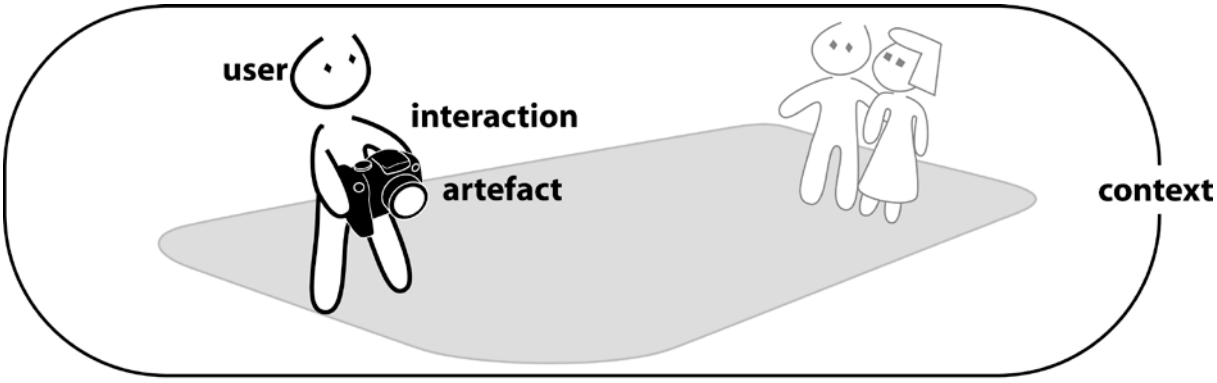

Figure 3. The elements of the scenario as a working space for designing experiences

The scenario offers a perspective on UX, which is aligned with the challenge that designers have to create overall positive experiences. Improving the experience through better appearance or usability is a means, not an end. To exemplify the latter we are going to consider a simple appearance attribute like colour. Cameras differing only by colour (with the same interaction style, technical functions, usability, and shape) are likely to cause different experiences [33, 40]. By changing the colour the perception of the artefact is different as well as its attraction and meaning. The overall view offered by the scenario of UX is an end that can help designers tackle the challenge of designing overall pleasant experiences.

5 CONCLUSIONS

UX is a complex research subject. The results presented in this paper indicate that it is possible to distinguish patterns between the perspectives proposed by different scholars. For instance, the majority of researchers agree on user experience being a subjective, holistic, conscious, emotional, and dynamic process. These patterns are relevant for researchers and professional designers, not only to identify gaps within the current literature, but also to develop design strategies that influence the practice of product development.

Our analysis indicates that an understanding of UX requires an approach that explains how the characteristics of the user, the interaction, the artefact and the context are interrelated. These elements were formalised into a scenario of UX. It is our aim to develop further the scenario by carrying out empirical research with users and comparing the findings with the elements of the scenario. Not all the elements presented in the scenario have been researched to the same extent. For example, this work has shown that interaction, an essential aspect of UX, has been little investigated. In our view UX is an opportunity for creating artefacts that positively influence the lives of users. Such positive influence depends on the development of adequate understanding of the user's needs, desires and wishes along with the characteristics of the context, the artefact and the interaction.

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