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Understanding Touch Screen Mobile Phone Users by Taxonomy of Experience (ToE)

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Introduction

User experience is one of the most important elements of mobile phone design and in recent decades has received increased attention in the HCI community. The user experience should include considerations of the usefulness and usability of a product (Alben, 1996; Shedroff, n.d.), the 'user's internal state, the context, and the user's perceptions of the product' (Väänänen-Vainio-Mattila, Roto, & Hassenzahl, 2008, p.1). It is generally the case that the user's experience is highly subjective, situated and dynamic in nature (Väänänen-Vainio-Mattila, Roto, & Hassenzahl, 2008). Therefore, efficient methodologies to obtain and to evaluate user experience accurately are essential for improving product design. Norman indicates that an understanding of user experience should be able to evaluate the user's experience in a circumstance that is similar to the actual using situation to avoid the user imagining the experience (Anderson, 2000). The data collection process should record the user's experience as it happens rather than relying on the user's memory of the experience. Moreover, the user's experience should be understood through his/her subjective information about the experience (Isomursu, 2008). Methodologies for evaluating experience have been established based on the user's attitudes and expectations (Isomursu, 2008), emotion (Hole & Williams, 2008), concept of the object (Al-Azzawi, Frohlich & Wilson, 2008),

judgment of the product (Karapanos & Martens, 2008.), and through comparing the user's reference to different interfaces (Aula, Granka, Heimonen & Hutchinson, 2008). These studies capture and analyse user experience by experimental pilots (Isomursu, 2008), emotion sampling (Hole & Williams, 2008), multiple card sorting (Al-Azzawi, Frohlich & Wilson, 2008), and repertory grids (Karapanos & Martens, 2008.). In addition, the approaches of diary (Bolger, Davis, & Rafaeli, 2003), focus groups, surveys and competitive analysis are also tools that are commonly used (Kuniavsky, 2003). Whilst many researchers attempt to transform user experience into quantitative data, Coxon's (2007) Taxonomy of Experience (ToE) and its analytic approach of SEEing, uncover an understanding of the user experience through qualitative analysis. The term 'SEEing' attempts to analyse users' experience by an alternative angle with its unique themes (Coxon, 2007). The nine steps of the SEEing process aim to clarify the user's experience. It begins by transforming the user's verbal commentary and ends by synthesising them into super-ordinary metaphors. This study applied the ToE to capture the user experience of trialing an unfamiliar touch screen mobile phone, and provides an alternative consideration for the interface design of touch screen mobile phones.

Taxonomy of Experience (ToE)

The purpose of ToE is to understand users' experience with a product via analysis of their verbal commentary to explore and consider meanings hidden from verbal commentaries. The structure of the ToE is based on philosophy, methodology and design theory to provide a multi-layered method to understand user experience. It was first developed in the study of the user experience of transportation vehicles (Coxon

2007). In Coxon's (2007) review, the video recording of his own trial experience of an electric vehicle helped him to recall the deep aspects of the experience that he was not particularly conscious of while personally trialing the vehicle. The process of transcribing the sequence of the dialogue and other activities brought the experience more vividly into consciousness. Figure 1 depicts the framework for understanding an experience with considerations to temporality, spatiality, relationality and corporeality (Coxon, 2007).

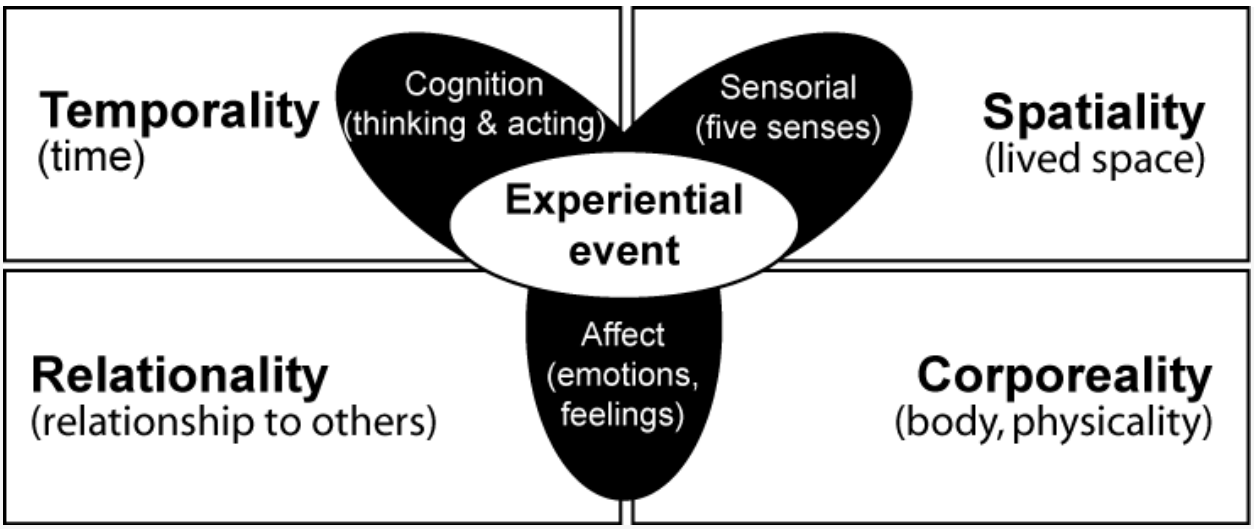

Figure 1. Framework of an experience

These 'lived experience descriptions', should be able to a) describe the experience as it is lived without asking why; b) describe the experience from the inside: the feelings, mood, and emotions; c) focus on a particular example of the experience and describe it; d) focus on an example that stands out, as it was the new experience; e) recognise how the body senses: smells, sounds and so forth; and f) avoid complicating the illustration with flowery language or jargon. Overall, the ToE-SEEing process provides a way to make abstract concepts comprehensible and visible. It comprises nine steps (Coxon, 2007):

Step 1: Gathering data and establishing structures

It is important that the researcher 'gets to know' the experience, and becomes familiar with the experience by understanding its 'language.' This stage emphasises that the researcher must be immersed in the experience completely (Csikszentmihalyi, 1991; Hanington, 2000). The data of people's experience can be collected from observations, interviews, and contextual studies. Information that might be useful to the researcher, including images, sounds, and samples, is collected for the researcher to recall the user's experience.

Step 2: Descriptive narratives

This is the process of transforming the data collected in Step1 into a textual format and breaks the experience into fragments as small as a single word, or a phrase for referring the experience to the themes of the SEEing process in step 3.

Step 3: Sorting fragments into themes

This step includes cataloging data into meta-themes and sub-themes. Meta-themes in the SEEing process include somatic, affective, cognitive and contextual factors; the sub-themes include senses, positive-negative affect, internal-externalised cognition, and many contextual categories. Each theme has a collection of fragments, and provides the researcher with the feeling of the story that they are telling.

Step 4: Developing meaning(s)

This step requires the researcher to look at each fragment of the information carefully and to find deeper 'meanings' behind the fragment. This process helps to 'tease out' the text's different meanings. At this point the researcher is not concerned with establishing

what the meanings of the fragment 'should be'. Instead, the aim of this process is to accept all 'possible' meanings that are contained within the fragment.

Step 5: Essential elements

This step helps to filter out the less important meanings. The researcher has to determine if the meanings in Step 4 are incidental or vital to the essential nature of the experience. It is necessary to know the importance of the experience, whether the element is essential to the experience or the experience might be different without the element.

Step 6: Super-ordinary elements

This step distills the super-ordinary essence of the experience: the unexpected, novel and hidden aspects of the experience. This stage focuses on the everyday experience, and isolates those elements of the experience that might not have been seen as an important part of the original design. However, those elements are still an important part of the experience. This process searches for the surprising elements, the unintended impacts of the experience.

Step 7: Weighting of super-ordinary elements

This is a weighting process to consider which super-ordinary elements are the most 'powerful.' The researcher evaluates the super-ordinary elements by his or her understanding of the language of the experience, to give a subjective numerical scale using a Likert rating (1-7, 1 is low) to determine a relative level of intensity.

Step 8: Super-ordinary summary words

The super-ordinary elements, sorted into descending order, provide a ranking of the

essential super-ordinary elements of the experience by intensity. This stage uses word metaphors to synthesise 'what is the collective meaning behind these elements?' For example, the super-ordinary element of 'no risk means no fun', could essentially be a statement about 'freedom to enjoy danger.'

Step 9: Summary word descriptions

The previous step summarised the super-ordinary elements; this stage focuses on 'explaining' the summary. It concludes the work of Step 6-8. One or two narrative paragraphs help to represent the understanding of the experience to someone who does not understand the meaning of the super-ordinary words.

Design guidelines for the interface design of mobile phones have been well established by mobile phone manufacturers and include design principles for elements such as content, layout, colour, font size, text and terminology. It is also necessary to concern the user's requirements of an object from their experience. As the market for touch screen mobile phones continues to grow, understanding experienced user's thoughts and novices' expectations of the touch screen mobile device is essential to providing a better design. This study applies the ToE and its process of SEEing to generate deeper understandings of users' experience in order to provide extra design principles for mobile phone interfaces.

Experiment Design

This study attempts to develop extra criteria for designing mobile phone interfaces based on user experience. This is the first trial of applying ToE-SEEing to mobile phone

user experience. Participants were required to trial the touch screen mobile phone in the laboratory. Twelve participants were recruited from a British University. Half of them currently use a touch screen mobile phone, whereas the other half currently use a 12 keypad mobile phone. A Vodafone 541 mobile phone was used in this study (Figure 2).

Figure 2. Vodafone 541

This model is the previous generation of touch screen mobile phone. The hardware and software are not advanced enough to compete with new generation phones such as the iPhone. The aim of choosing this model was to push the participants to talk more about the using experience. Before starting the data collection, the observer demonstrated to the participant how to apply the approach of 'think aloud' by trialing a touch screen

camera. Participants then were required to practice a 'think aloud' protocol by trialing the camera. The practice was intended to help the participants to get used to expressing their experience while trialing the Vodafone 541 mobile phone. Participants had five minutes to free trial the phone as they wished. Their interaction behaviour with the mobile phone was filmed for the ToE-SEEing analysis. The camera only focused on their hands and the mobile phone, and recorded their verbal commentary without showing their faces.

Results

The data was transferred into Step 3 of ToE-SEEing which includes two layers of themes (meta-themes and sub-themes). Firstly, each participant's verbal description of the experience was coded into different themes. The meta-themes include the body-somatic experience (sound, touch, feel, sight, smell, taste, comfort-ergonomics, and appearance-aesthetics); the heart-affective experience (positive-negative emotions); the head-cognitive experience (conation, reflective-thought-external-doing, conscious cognition-reflective thought-internal-thinking) as well as a range of contextual factors (environmental, regulatory, social), and existential factors (time, space, corporeality, and the body's relationship to others). Most of the participants' experiences with the touch screen Vodafone 541 mobile phone strongly relate to the sub-themes of sight and cognitive experiences. The following section presents the super-ordinary elements and the summary of participants' user experience with trialing the Vodafone 541.

Understanding-from the head

It is important to see that the 'graphic icon and its title are consistent, and represent the function clearly.' Clear feedback is given confirming whether or not the operation was successful. It is essential to show instructions for unique features of the phone, maybe to demonstrate how to operate the feature, or to make it easy to get 'help' information.

Sensitivity of the touch screen is crucial, and should fit the user's pace when operating the phone. The user would like to dominate, to trust the phone, and to fully understand the operation process before using the phone.

Experienced and familiar-from daily life and history

The way to operate the scroll bar on Vodafone 541 should be the same as using the scroll bar on a computer.

Based on previous experience using mobile phones with 12 keypads, it would be good to see that the icon becomes highlighted when browsing the icon on the menu. It would help to reduce mistakes if the phone can highlight what the mistake was, to detect the failed task automatically, and then provide help and instructions to complete the task correctly before the user has to ask for help.

Freedom-from the operation

The phone should provide links between different functions, rather than having to go to the menu to execute another function. The size of the phone provides the freedom for the user to carry it all the time, and allows users to hold the phone in their hand without worrying that the phone might slip from their grasp.

The three super-ordinary elements above had the highest score from participants. The other super-ordinary elements were 'specific', 'share', 'intimacy', 'comfortable', 'enjoyment', 'flexible', and 'logic.'

The ToE-SEEing process helps to transform and categorise the raw meaning of an experience: to find the meanings behind the user's commentary; to sort the importance of those elements; and to summarise super-ordinary elements of the experience. It provides an overview of the user's experience and describes whether it is the user's previous experience or the experience that was produced when trialing the object. The categories in Step 3 help to clarify the key themes of users' experience, and to establish a good foundation for further analysis. In this case, the summarised super-ordinary elements not only reflect the user's expectation of Vodafone 541, but also highlight the components that the user cares about most. This study indicates that it is not only necessary to follow design guidelines to design interfaces for mobile phones, but also to concern user experience as part of the design.

Conclusion

This paper presents the process of executing the methodology of ToE-SEEing to understand user experience with a touch screen mobile phone. The validity of ToE has been examined with extensive observation data from video clips and interviews during the development process (Coxon, 2007). This method might be questioned due to its explicit subjectively; nevertheless, as mentioned earlier, the nature of an experiential encounter is subjective, situated, complex and dynamic. Therefore, the ToE-SEEing process is a useful tool for distilling the true meaning that lies behind the verbal

description of such a complex event. This short paper emphasises the importance of understanding user experience before design begins. The result provides alternative considerations to achieve the goal of making things 'easy to use.'

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Biography:

Wen-Chia Wang completed her BA in Commercial Design from Ming Chuan University in Taiwan in 1999. She then worked as a graphic designer and an event organizer across the design and entertainment industries. In 2004 she started an MA in Design Management at Ming Chuan University, and upon completion, she worked as a part time lecturer in the the University's School of Product Design from 2006 to 2008. Her passion for understanding human interaction with machines led her to start her PhD at Brunel University in 2008. During her PhD, she has worked on several projects with the telecommunication company 3 in the UK to understand user experience with mobile phones.
Her PhD research addresses the importance of understanding users before conducting design; especially how individual differences of cognitive styles (holistic – serialistic) affect human operational behaviour with mobile phone interfaces. More importantly, her research seeks to establish the linkage between psychology and design, and to provide design guidelines that are based on individual differences. She is expected to complete her PhD in 2011. Meanwhile, Wen-Chia continues to work as a lecturer in Graphic Communications, which she's been doing since 2009.