

Emotion and technology: an empirical study

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Abstract. This paper reports on a study of peoples' experiences and emotions when using technology. Early results from the study give insight into a range of emotional responses to technology and the factors influencing them. The results suggest that a highly significant element of users' experience of technology is related to the social context of use. We propose different dimensions of social context and explore social interaction using technology.

Keywords: emotion, user experience, HCI, personal technology.

1. EMOTIONS AND TECHNOLOGY

In every day life we experience a rich variety different situations; from walking through a park full of fresh flowers to working out different functions of our new mobile phone or simply having a coffee with a friend. Emotions and affective responses are central parts of our experience and frequently shape and colour the kinds of experience we have. Recently, the concepts of user experience and emotion have been receiving growing attention within the Human-Computer Interaction community as a way of adding value when designing products. It is no longer sufficient for a product to be simply usable or aesthetically pleasing, but it needs to evoke positive emotional responses [13, 16].

Traditionally emotions were studied in the fields of psychology and sociology. However, this interest has extended to the fields of marketing and computer science. One of the fields within computing is Affective Computing, where computers are designed to adapt their behaviour to match that of the user [1, 15]. Other researchers [17, 20] reported that factors such as pleasure, enjoyment, fun are an important part of the overall experience and interaction with a product. Other studies within Human-Computer Interaction explored users' enjoyment when working with technology [3,17], or focused on positive user experience with personal computers [8,9,18]. For instance, Kashdan reported users experiencing pleasure when absorbed in specific novel activities using technology [11].

Jordan defines pleasure with products as the 'emotional, hedonic and practical benefits of product use' [10]. He distinguishes four categories of pleasure: physio-pleasure, psycho-pleasure, ideo-pleasure and socio-pleasure. The latter will interest us most here and arises from interaction with others or from a product that represents a social grouping.

It appears that user experience and emotions are integral part of a design and can be influenced by many factors [10]. In addition user experience and emotions are very much dependent on the time and context of use. One of the focuses within this area that has recently received attention is user experience in social interaction [e.g. 6,7,20]. Forlizzi and Battarbee argue that "social situations greatly influence co-experience" (p.263), where co-experience is about user experience in a social context [7].

This paper begins to explore how social context and the experience, especially positive experience, of technology use are intertwined. The exploration emphasised emotions that are associated with positive user experience (e.g. pleasure, enjoyment, fun) when using technology (e.g. PDAs, digital cameras, mobile phones, i-pod, interactive TV, and computers) in social contexts and interactional settings.

2. DESCRIPTION OF THE STUDY

The two sets of studies we carried out, the first consisting of 13 interviews and second of 2 focus groups. Participants were asked to talk freely about their understanding and examples of experience when using technology, and discussed having pleasurable or “hedonic” experiences while using mobile phones, digital cameras, PDAs, i-pod, interactive TV, computers, and various software packages. Interviews lasted 30-50 minutes focus groups 50-65 minutes. All sessions were audio taped, and data were then transcribed and analysed to extract high level concepts and themes that captured participants’ experiences with technology.

2.1 Results

2.1.1 Hedonic experience and technology

When interacting with technology people identified five distinct types of experience: pleasure, enjoyment, excitement, fun, and happiness. Several factors shape the felt experience, including the functionality provided by a device, the usability of which the functionality is delivered, and the social setting in which use takes place (reported elsewhere: [17]).

2.1.2 Factors affecting user experience

Five main factors were identified that appeared to shape the nature of the experience felt by technology users. These factors were: functionality, usability, aesthetics, physical factors and social element.

It was apparent from participants’ comments that *functionality* would determine the usage of a specific technology. People very often look for functions that would help them in activities they need to perform even when ‘on the move’ as one participant noted:

“...I have used it as my travelling office... So I would write a report if I’m on a plain using my PDA, or work out the conference budget.”

Furthermore, the important issue is to provide functionality that is transparent to the users and allows the efficiency of the technology being exercised to its full potentials “... it’s functional, it does all I need to do” commented one of the participants discussing his PDA. Another one noted:

“... if the functionality there is transparent and it’s kind of intuitive and you can relate these piece of technology or interaction that you perform with something from your prior experience with a different thing you’ll find it that it can improve your interaction.”

Usability was another crucial factor pointed out by participants; one remarked “... it has to do all the things that I want it to do without all the hassle”. The important point was that users expectations also changed over time and the issues of having technology, which would do the work is not enough. Users expect technology to improve their quality of life as one of them commented: “... it makes my life easier.” Furthermore, having technology for only its look and ‘coolness’ is not enough. People want to use it in a ‘walk up and use it’ manner. If it does not do what is expected to do, they ‘walked away’ from it and choose another one [2]. Therefore, usability seems to be of high importance not only in relation to ‘goal’ oriented usability but also in context of user experience. This is well in line with Pilke’s study, where the “requirements for a flow-inducing interface seem to be exactly the same as demands for a usable user interface” [14, p 9]. The issue of a good usability that endorse flow (enjoyable experience) was raised also by Finneran and Zhang [5]. They argue that perceived ease of use is a person’s perception of being able to use an artefact, which in turn influences flow.

It was apparent from the participants’ statements that *aesthetic* and *physical factors* can enhance their experience. The appeal of an artefact created very positive emotions, which in turn brought some pleasurable experience to its user. When asked about the nature of there experiences of a device, one participant responded: “...it’s attractive and it’s small ...it’s got nice shape, ... it feels nice in your hand” or “...should be easy to hold” was a comment of another participant. However, it emerged from the data that aesthetic does not only apply to an attractiveness of the appearance of technology but also has a much deeper meaning for technology users. People look for aesthetics within the interaction between a user and a product. The smoothness, pace and rhythm of interaction appear to be of a high importance when technology is concerned. Here is an extract from an interview confirming this point:

“...is very slick, very smooth, well designed, and shiny and nice ... it’s just elegant. And it also has a deep interaction style. So you’ve got the stylishness on the surface and you got the deep stylishness ... the other thing that it does is seamlessness. ... interaction that has a voice ... there isn’t just brunt, there isn’t just efficient and effective ... but it gives you more.”

2.2 Technology experience in context

The way the use of a technology relates to the social context of its use also appeared to be a significant factor. The issue oscillates around people using the same technology in some shared way. This paper unfolds two issues related to social element. Firstly, it defines what is social context, and secondly what is social interaction using technology.

2.2.1 So, what is social context?

An important element of social context is the setting in which interaction takes place [17,19]. Participants identified three social settings when using technology. These are: work environment, public spaces (e.g. underground

station, plane) and private spaces (e.g. homes). It was apparent that the usage of technology and reasons for use differ when environment changes; as one of the participants commented:

"...it's social. I don't watch movies on my own ... my computer is nothing but an entertaining centre. . . it gives me a great pleasure whenever I have friends over because there is something nice about having technology on control."

Moreover, people feel very proud of their artefacts especially if it raises interests from external observer. The comments from one of the participants' support this claim:

"... whenever I take it out [referring to PDA] people always get ... uuuuuu, what's that ... it makes me feel proud ..."

or another comment

"...I still remember the time when I was on the airplane. It was a long flight ... I was working on my paper and I was using my PDA to do the work... errr... and the stewardess she was very curious what I do and she asked me if I could explain to her what's this was I was working on. So I explained that it was a document I was working on and I was using my PDA to write a report which I then can upload and print and everything else ...and she was going wow, wow ... this was cool."

This is in line with Jordan's approach to design pleasurable products where social pleasure is associated with belonging to a social group [10].

2.2.2 Technology-Mediated Interaction

The way a technology mediates features of the social context in which it is used may take a number of forms. For instance, a piece of technology may function as a medium of communication between people, providing them with new channels for social interaction. There are different ways of social interaction; it can take a form of a text (e.g. using mobile phone or email, or transferring files through wireless communication), mobile game played with a friend, or graphics (e.g. viewing pictures through emails or on a digital camera). Sharing digital photo with friends and family is a common behaviour. It is often done via email or by posting them on the web [4].

Technological artefacts were also found to play different roles in social interaction, beyond simply being a medium of communication. For instance in one mode of use of a digital cameras or camera phones that was reported a number of times, communication takes place not through the technology, but alongside it. A common practice with such devices is to take a photograph and then immediately to show it to the subject, engendering a rather different and more interactive and engaged form of experience than that involving remote communication [19]. It was reported by participants that these activities are pleasurable and enjoyable as one of them noted:

"... my kids when I take a photo they run up and say: 'can I see it'. That becomes a social thing and we all enjoy it."

All of these activities evoke emotions, which are a central part of user experience. They shape interaction between user and a product and they change when social context is concerned.

3 DISCUSSION AND CONCLUSION

When designing interactive systems that can be used for social interaction, it is important to understand what creates a particular experience and which emotional outcomes are related to it. This will result in products being not merely utilitarian but enhancing the quality of experiences.

The results established that technology changes people's experience and emotions when is used for a social interaction within diverse social settings. Furthermore, technology can be used not only as a communication medium but more interestingly as a catalyst to support a non-technological communication (e.g. kids viewing/sharing the pictures on the camera where the camera is no longer a communication medium but it supports face-to-face communication). Further studies need to be conducted to explore these issues and provide some design implications to support social interaction using technology. The context of use of technology will bring new challenges not only for research of user experience and emotion but also for designers facilitating these challenges.

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