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Understanding Social Media Acceptance and Use in the Context of Technology Generations and Life-Based Design

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Summary

People's relation to technology, and especially to ICT, is changing. A good example of this is the existing and emerging social media which allows people to build new types of networks with each other. As it is a new phenomenon which has become an important part of life to many people, it is logical to ask if differences can be found between people of various ages in their relation to social media. Here, the differences and similarities between technology generations are examined. The study begins with the idea of a cohort learning and adopting technology, and gives insights about the relevance of a technology generation paradigm in the context of life-based design.

Key words: design, life-based design, social media, technology generations, human-technology interaction

Introduction

Modern ICT technology, mobile and fixed, allows people to use the same device for practically an unlimited number of purposes. The possible purposes people have for using technologies are becoming a vital topic in the science of human-technology interaction (HTI) design and design discourse. In technology development this means that finding new ways of investigating the relationship between people and technologies have become central. As it is possible to find numerous ways of carrying out the design process with users it is time now to ask what the rational forms of HTI design can be.

Life-based design is a design paradigm with the key idea of investigating the HTI design process in the concepts pertaining to research into human life (Leikas and Saariluoma 2008; Leikas 2009; Saariluoma and Leikas 2010). Here, the sociology, psychology and biology of human life form the basic conceptualization, methodology and factual basis for design (Leikas 2009; Saariluoma and Leikas 2010). In our research we apply life-based design methodology to investigate differences in social media use between generations and in different stages of life.

Technical devices and services motivate people by the added value they bring to everyday life. The added value of technology can be found in the practical outcome of technology use (Cockton 2006; Melenhorst 2006; Bohn et al. 2004). In other words, the end results prove that an outcome has been reached with the help of technology, which could not have been achieved without the tool in question. This is why it is valuable in designing new technological ideas to have a clear idea about the expectations and goals of the potential users. Here, understanding the demands harboured by people of different ages is significant, as age impacts the way in which people utilise technology and more importantly influences the goals of usage in everyday life (Leikas and Saariluoma 2008; Morris, Venkatesh and Ackerman 2005). Accordingly, the connection between age and technology use is an important problem in life-based design (Leikas 2009).

A concrete challenge today in HTI discussion is to understand the differences in usage of social media by people of different ages. Services such as Facebook, Twitter and Orkut have promptly found a place in human everyday life. These services create possibilities for social contacts, which can promote psychological well-being and enhance the quality of life (Gollwitzer, Delius and Oettingen 2000; Jones and Fox 2009). Today, we still have relatively little information about the use of these services though the number of users can be measured in hundreds of millions (Lievrouw and Livingstone 2002; Boyd and Ellison 2007). For life-based design research, this aspect of the information society is central.

The notion of technology generation has become valuable in research into the effects of age in ICT-use. Technology generations reflect the historical timing of computing innovations and their diffusion into productive and cultural spheres, linked with the time period in which a cohort comes of age (McMullin,

Duerden Comeau and Jovic 2007). One reason for understanding this concept in HTI design is that people learn to use technologies at a certain age, and this understanding of how to use technologies (present and future) is built on the kind of knowledge that is typical for that cohort (Docampo Rama 2001). For example, Sackmann and Weymann (1994) introduce different generations based on the experience of technology usage available in the formative period.

Studies have outlined the different technological eras (Lim 2010) generally divided into the 'mechanical' (M) era (born before 1930), the 'electro-mechanical' (EM) era (born 1930 – 1960), and the 'digital-software' (DS) era (born after 1960). Lewis, Langdon and Clackson (2007) have categorized the time era during which one was born in relation to interface technology. These categories are 'the electro-mechanical' era (born pre-1928), 'sees the remote control' era (1928-1964), 'dominated by displays' era (1964-1990), and the era where post 1990 layered menu systems are generally prevalent and popular.

Similar to what has been said above, four major interaction styles of consumer products have been identified by Docampo Rama (2001). These are the mechanical style (1930/1940), the electro-mechanical style (available 1930-1980), the display style (available 1980-1990), and the menu style (implemented 1990 ->). Docampo Rama (2001) goes on to introduce three technology generations, which are: the electro-mechanical generation (born 1930-1960, + before 1930); the display generation (born 1960-1970); and the menu generation (born after 1970). McMullin, Duerden Comeau and Jovic (2007) have studied the phenomenon from an ICT technology point of view and have discovered five technology generations. These are: the pre-ATARI generation (born prior to 1955), who came of age before computing technology had widespread cultural appeal or was widely used; the ATARI generation (born 1955-1963) to whom the ATARI home video games became popular and the first PCs were introduced in the workplace; the console generation (born 1964-1973) who used Commodore64, TRS-80, Tetris, Apple MacIntosh and Windows 3.0, and who had great opportunity to use new computer technology at home; the Windows generation (born 1974-1978) who used Microsoft, Windows 97/98, Excel, Adobe pdf, Email, SimCity, Doom and witnessed the launch of the Internet in the mid-1990s, although it was not immediately or widely embraced; and finally the Internet generation (born after 1978) who are familiar with the Internet, Yahoo, Google, Instant Messaging (MSN), Windows XP and iPods.

Yet another way to categorize users according to their age is to classify them as Boomers (born 1946 to 1964), Generation X (born 1965 to 1976) and Generation Y (born 1977 and younger) (LexisNexis 2008; Tapscott 2009; Stutzman 2010). The introduction of television defined the technological tone of the baby boom. Generation X, the "baby bust", is a much smaller cohort. Though its members are quite educated and regularly use advanced communication technology, they did not grow up with computers, and many feel somewhat excluded from the central cultural debate. Tapscott (2009) also talks about the Net

Generation (born 1977 to 1997), which is again a larger group, a kind of "echo" of the baby boom. This cohort has been around computers since before they could speak. For them, technology is a necessity, yet it is invisible. They cannot imagine living without technology, and their continual connection to others worldwide has produced the first truly global generation.

Social media is emerging technology which has become vital for our future. Therefore, it is necessary to understand the possibilities it opens and the demands it sets for users of different ages. Stutzman (2010) argues that if we examined the communication patterns of people, we would find that cohort-level structures guide a good deal of the use of social technology. Differences can indeed be seen in technology and social media usage between generations. A Pew Internet report (Lenhart et al. 2010) reveals that 93% of American teens ages 12-17 go online, as do 93% of young adults ages 18-29. Three quarters (74%) of all adults ages 18 and older go online. Over the past ten years, teens and young adults have consistently been the two groups most likely to go online, even as the internet population has grown and with larger documented increases in certain age cohorts (e.g. adults 65 and older).

The survey of LexisNexis (2008), with the total sample size of 700 American legal and white collar professionals, reveals differences in technology acceptance among generations. According to the survey, two-thirds of all Boomers agree that Personal Digital Assistants (PDAs) and mobile phones contribute to a decline in proper workplace etiquette, and believe the use of a laptop during in-person meetings is distracting, whereas less than half of Gen Y workers agree on this. Only 17% of Boomers believe using laptops or PDAs during in-person meetings is efficient, while more than one third of Gen Y do. Only 28% of Boomers think blogging about work-related issues is acceptable, while forty percent of Gen Y workers do.

According to LexisNexis (2008), Gen Y workers (ages 31 and younger) generally do not see a problem accessing personal web sites from work - like Facebook and blogs, but only 14% of Boomers access a social network from work. In fact, Gen Y spends a lot more of their day online accessing social networks, news sites, blogs, forums, and multimedia sharing sites than the Boomers. Also, Gen Y switches back and forth between applications far more than the Boomers do.

This brief introduction to technology generations makes it understandable that in developing social media, we have to have a solid understanding of the problems of technology generations. For this reason, we searched for the differences between technology generations in the factors influencing different usage patterns.

Empirical study of usage patterns and technology generations

In our study, we explored the usage of social media within different technology generations. Doing this we have tried to isolate whether or not differences exist between the technology generations, both in terms of generational categories and in terms of age, and what could be possible implications for design. Our study has focused on the examinations of different usage patterns of social media. In HTI, usage patterns have generally been examined in order to sort people as technology users (Prendergast and Roberts 2008; Blyth and Roberts 2005; Shove, Watson and Ingram 2005; Shove and Pantzer 2005; Silverstone 1992). We explored usage patterns of social media between different technology generations and examined whether the generational formation could give insight into analysing different life settings in the context of social relationships. The next section elaborates on the theoretical and methodological bases upon which we have organised the study.

Method

Six focus group sessions were held in total, discussing different life settings and overall opinions about social media. The key rationale here is that the participants are the informants of their everyday life, and the themes given by the moderator provide a conceptual basis through which participants can imagine themselves as users of different social media services. In a focus group it is possible to uncover problems in the usage situations of existing services and identify space for improvement or modifications.

First the participants were asked to undertake a questionnaire concerning how they consume and perceive online services and especially social media. Once the questionnaires were completed, the focus group discussions were structured around the topical sections of the questionnaire. These sections were: usability of existing products, technology generations, life settings (forms of life) and social relationships, as well as privacy and trust. In the focus groups we considered and discussed what social media really is, how social relationships can be enhanced and e.g., how loneliness can be recognised and reduced via the help of technology, and the types of things people do not want to accept through technology. In other words, the groups were used as forums to discuss what technology had to offer, and what it could not offer in relation to different situations in life. The prospect of a hypothetical shopping mall for different situations in life was used to inspire thoughts and ideas to address this area.

The questionnaires were analysed quantitatively, and the focus group audio recordings were analysed and coded via content analysis. The results were analysed both quantitatively (questionnaire) and qualitatively (audio recordings). Content analysis was used to decipher key themes mentioned amongst the participants.

Participants – samples and generations

In total, 31 Finnish citizens and 14 Australian citizens participated in the group discussions. In total there were 13 male and 32 female participants: in the Finnish group there were 23 women and 8 men; in the Australian group there were 9 women and 5 men. The participants were selected according to the following generational categories, which were defined based of the earlier studies of technology generations introduced earlier. The categories were seen to best match the historical development of technology in Finland. These are:

- Electro/Mechanical Generation (born before 1965),
- Layered Interface (the Microsoft) Generation (1965-1980), and
- Games Generation (1981-1992).

The groups were distributed as follows: born before 1965 age group – 22 participants: 18 Finns (5 men and 13 women) and 4 Australians (1 man and 3 women); 1965-1980 – 9 participants: 6 Finns (2 men and 4 women) and 3 Australians (3 men and no women; and 1981-1992 – 14 participants: 7 Finns (1 man and 6 women) and 7 Australians (1 man and 6 women).

Results

In this paper, we report the results of the questionnaire study carried out in the context of the focus groups sessions. The participants were divided into three technological generation groups. But do these predetermined groups represent the reality? In order to test the validity of the three generations outlined above, a gottman sum variable was constructed. The variable represents the number of teenage technological experiences. The participants were asked to mark down how old they were when they had their first experience with the internet, email, social media, mobile phone etc. If the participant was under 20 years of age during the first encounter with the technology, the sum variable got an increase of one unit.

The sum variable had a minimum of zero and a maximum of six teenage technological first encounters. In the data, the mean of this variable was 2,11 (standard deviation 2,48). Half of the participants had no teenage experiences with information technology, and one third had more than 4. We used four or more technological teenage experiences as a cut line in order to determine if the participant was part of the newest technology generation. A cross tabulation confirmed that the technology generations explicated above conform to the empirically constructed test variable (Pearson chi square test, χ^2=37,8, p<,001). Those who had four or more teenage IT first encounters were exclusively classified into the third generation. This is understandable, as most of the technologies queried did not exist before 1980s.

Our second area of interest was computer skills. The participants born before 1965 evaluated their own computer skills as weaker (mean 2,50, standard devi-

ation ,802, on a scale from 1 to 5) in comparison to those born from 1965 to 1980 (mean 3,22, standard deviation ,833) who had evaluated their own skills the highest out of all the generation groups. Finally, those born from 1981 to 1992 (mean 2,64 standard deviation ,650) evaluated their own skills stronger than the eldest participants yet still not as strongly as the middle generation. This difference in means was revealed statistically different by one way anova ($F(2,44)=3,212$, $p=,05$).

The frequency of technological activity was queried using two variables, one for activity at work and one for activity during free time. Not surprisingly, the usage of technology was very frequent among the participants both at work and during free time. Technological activeness did not correlate with technological skills, but for both nationalities activity at work correlated with activity during free-time ($r=,395$, $p<,05$). This finding can be elaborated by comparing the correlation between the technology generations. Spearman correlation between the groups revealed, that only for the third and youngest technology generation, the correlation between technology activity at work and during free-time is statistically significant ($r=,690$, $p<,01$).

The use of social media was frequent among the participants. Fifty-one percent of those who used social media used it daily and only 9% used it only once a week. This frequency was not associated with any technology generation: all age groups were equally active in their usage of social media. The participants use social media at home as well as at work or at school, except for the oldest generation, which understandably does not utilise social media at work. All technology generations responded with high technology activity (mean around 4,5, i.e. “almost daily”) both at work and at home.

The next area of interest was trust in social media. This was examined by using different Likert-scale questions, like willingness to reveal personal information such as name or date of birth. These variables were combined into a sum variable ($\alpha=,892$), which on a scale of 1 to 5 describes the overall trust in social media (five being great trust). The mean for trust in social media was 2,36 (standard deviation 1,06), and one way Anova revealed statistically different means between the technology generations ($F(2,40)=5,398$, $p<,05$). Not surprisingly, the increase in age predicts a considerable decrease in trust towards social media ($r=-526$, $p<,001$).

In accordance with Leonardi et al. (2008), there seems to be general hesitation to reveal too much within social media. Most of the born-before 1965 participants revealed within the discussion, an unwillingness to accept unknown Facebook users as friends. Likewise, there was general consensus among all participants, that friends of friends would not be accepted as friends.

Discussion

We have studied the nature of social media and investigated some of its main features in relation to technology generations. The overall picture is clear. Different generations use social media on a general level rather similarly, but important differences can also be found. Understandably, the basic use of social media is rather similar between different generations. However, young people use special functionalities of social media, such as different discussion groups, more than older users. Older people in turn have much less trust in social media than young people. Possibly, these two phenomena are linked to each other, as being involved with groups usually presupposes trust.

The similarities and differences of social media usage can be considered in the context of life-based design. Life-based design looks at the contexts, events, values, motivations and technologies that shape the cohort over time. For example, life settings of people may differ according to the combination of a number of factors, such as age, family and marital status, social status, profession, health issues, education, gender, skills, and, as introduced here, technology generations. These factors ultimately impact everyday needs related to communication and companionship. These in turn influence the ways in which people experience and evaluate available products and services, and what kind of added value technology could offer them.

The ground idea of life-based design is that it is necessary to consider technology always in the context of human life. The design of technology should begin and end with life (Leikas and Saariluoma 2008; Leikas 2009; Saariluoma and Leikas 2010), and design thinking should be grounded on the concepts of human life science. This means sociology and corresponding sciences such as ethnography, organizational research and management, psychology and its close allies such as philosophy of mind, education, and ergonomics, and finally, biology as well as other related areas of research such as medicine, neuroscience or physiology and anatomy. This list can be added to multidisciplinary areas of research such as cognitive science, gerontechnology, occupational therapy, design science and art design. The key unifying argument is that the problems of human-technology interaction design should be conceptualized and argumentatively supported in concepts and theories developed for the analysis of human life.

Technology generations open an interesting multidisciplinary discourse in life-based design. This problem begins with the idea of a cohort for learning and adopting technology. This means a cohort, which is in part a life history that has been characterized by certain technologies adopted earlier in life. A cohort is a sociologically relevant issue, whereas learning and its transfer through life are important psychological issues. Age groups are also biologically and mentally different in many respects. This is why the problem of technology generations is so vital as it offers a tool to understand people's technological behaviour and

the acceptance of new technologies by studying usage patterns of different technology generations.

Our first study to investigate the role of technology generation-related problems in life-based design illustrated two important features for designers. Firstly, in technological usage there are many standard features, which in turn means that skilled and interested users do not differ much from between each other. Hence, generations do not differ significantly from one another in any essential manner either. Therefore, designers normally look for optimal and working solutions for all 'occasional' users. However, knowing the areas in which there are no significant differences between technology generations can sometimes be vital.

Secondly, there are issues such as trust and privacy in which generations do differ. This means that the designers must understand the requirements set for their work by the nature and background of the specific difference. This is a presupposition for successful design. The designers must understand the logic which differentiates the different generations, and be able to create individually modifiable technologies or find means to set aside such emotional issues as trust and privacy problems.

Future work

When thinking of technology such as social media as a means for enhancing social relationships, much work is yet to be done in terms of addressing the working age- beyond working age divide. What would be e.g., the drive behind encouraging older adults to use these platforms as a means for branching social contacts?

We shall tackle this issue further in our future study of technology generations and forms of life. The study will collect data from different European countries and Australia about technology and life settings and hopefully reveal more about this interesting problem in life-based design.

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