



Co-creation and user-generated content–elderly people's user requirements

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ABSTRACT

There is an increasing demand on citizens to participate in social network websites and to create and share their own user-generated content (UGC), such as photographs, videos, and blogs. So far, little is known about how elderly people respond to these new trends and master the techniques required. This paper reports on three studies that investigated elderly people's user requirements related to consumption, sharing and co-creation of UGC in new media. The first study, conducted in Norway, identifies patterns of Internet usage, age differences, and participation in online communities and the consumption, sharing and co-creation of UGC on a macro level. The second study, conducted in Belgium, investigated the social requirements of elderly people on a group level. The third study, also conducted in Belgium, investigated user and context requirements on an individual level. The results of the first study show that the elderly rarely participate in online communities and share audio-visual UGC. However, they embrace some aspects of the new media and more often express themselves politically. The results of the second study show that the elderly are very motivated to contribute with UGC, given the right circumstances. The results of the third study show that it is important for elderly people that they be able to use the new technologies easily and identifies their worries about using them.

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1. Introduction

This paper investigates how we can enable participation among elderly citizens in the co-creation¹ of user-generated content (UGC). As stated in a new report by the Organisation for Economic Co-operation and Development (OECD), “the Internet is increasingly influenced by intelligent web services that empower the user to contribute to developing, rating, collaborating on and distributing Internet content and customising Internet applications” (Wunsch-vincent & Vickery, 2007). In particular, social network and community websites have changed the way people use the Internet, in creating personal profiles and content, sharing photographs, videos, blogs,

and UGC in general. The most popular social networking and UGC sites, MySpace, Facebook, and YouTube are among the 10 most-visited websites worldwide, according to Alexa Internet² (Alexa, 2007).

The increasing popularity of social networking and UGC demonstrates that the importance of the Internet in work, education, and daily life is incontrovertible. The evolution of the Internet and the increasing significance of UGC therefore pose certain social challenges as well. New media put a greater demand on the user to be active and productive in terms of co-creation. This may indicate a new notion of the digital divide, a divide between those who just consume and those who produce or co-create (Brandtzæg, 2007). On the other hand, new media and co-creation have the potential to increase individuals' flexibility, expand opportunities for information retrieval and learning, and compensate for functional limitations such as reduced mobility, vision, hearing, and cognitive abilities (eInclusion@EU, 2004).

Research has been done on elderly people and modern technologies (Hawthorn, 2000; Tinker, 1997). So far, the lack of elderly

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¹ By co-creation, we mean “the act of interacting, creating content or applications by at least two people” Trogemann and Pelt (2006). The contributions of users to Wikipedia are typical examples of co-creation. More than one person is involved, there is social interaction involved, and content or applications are created. In this study, in view of the growing amount and importance of user-generated content in the new media landscape, content is taken to mean user-generated content, as opposed to content created by professionals.

² Alexa's data are gathered from users who have installed the Alexa toolbar in their browser, and therefore their statistics can only be taken as a very crude estimate.

framework that identifies constructs that are critical to the adoption and usage of UGC. It then presents our research questions.

2.1. Current knowledge of elderly people's use of the Internet and co-creation of UGC

Firstly we will briefly characterise the new media landscape and the current knowledge of how, and to what extent, elderly people participate in new media, in terms of computer and Internet usage as well as co-creation related activities such as social networking and the creation, uploading, and sharing of UGC.

In the European Union position paper (EU, 2005) on future competitiveness in Information and Communication Technology (ICT) it is stated that “people [will] interact with their surroundings and with each other in totally new ways.” Networked and Electronic Media initiative (NEM, 2006): “Enabling individuals and consumers to create personal applications is seen to be of extreme importance for the future [media] landscape” (p. 24). This trend is driven by the growing broadband penetration and the growing availability of Web 2.0 applications.

2.1.1. Internet use

The take-up of broadband Internet access has risen fast. More than 250 Europeans regularly use Internet (ICT, 2008). Nevertheless, there are differences in the use of the Internet between different age groups. Measures from the UK show that the Internet is used by 52% of people between 55 and 64 years and only by 15% of those over 65 years (Livingstone, Van Couvering, & Thumim, 2005). The situation is the same in most other countries in Europe. A newly published study found that people who do not use ICT (in Germany, Austria and Norway) are mainly 45 years and above, while younger people often are characterised as active and advanced users of ICT (Heim & Brandtzæg, 2007). A similar pattern can be found in Belgium, where recent figures show that 48% of people in the category 55–64 years have never used the Internet, while this increases to 76% in the age category of 65–74 years (Economics, 2007).

According to a Pew Internet survey in December 2006, seniors in the USA are using the Internet in larger numbers. The Internet is used by 70% of Americans from 50% to 64%, and by 33% of Americans 65 and older (Fox & Madden, 2006). Moreover, while some cross-sectional figures suggest that fewer elderly than younger people use the Internet, longitudinal trends reveal that Internet use is increasing at the highest rates among the elderly over the age of 55 (Bucar, Renold, & Henke, 1999; Carpenter & Buday, 2007). It is therefore suggested that the generational digital divide may soon disappear, given the right circumstances (Frissen, 2005). However, there is little evidence that many people in their 70s and 80s are suddenly getting online (Fox & Madden, 2006).

Some early research on elderly people's use and adoption of new media suggests that elderly people are resistant to change (Gilly & Zeithmal, 1985). Other researchers highlighted that factors such as the elderly's attitude towards the Internet and previous experiences of ICT are of crucial importance to gain ICT user skills (Eastman & Iyer, 2004). The problems faced by elderly people in their use and engagement with interactive media are therefore currently less associated with physical and cognitive factors, and more related to previous experiences and attitudes (Turner, Turner, & van de Walle, 2007). Today, the focus is more on the perceived relevance of interactive media to everyday life, usefulness, and usability (Dickinson, Eisma, & Gregor, 2003; Turner, Turner et al., 2007). Another important aspect is in what way and to what extent new media supports social relationships (Kanayama, 2003).

2.1.2. Co-creation activities

Media activities that pertain to the co-creation of UGC seem to be related to a bigger generation gap than Internet use as such. Currently, the elderly seem to take a less active role in the creation and dissemination of interactive media, and do not fully exploit the advantages of Web 2.0 platforms and UGC. Most users over the age of 60 might be regarded as passive consumers of new media. According to (Fox et al., 2001), the top Internet interests among seniors who go online include email, hobby information, news, health information, browsing for fun, and weather updates.

It is mainly young people who have been found to be the most likely to participate in new online communities (Hargittai, 2007). Similar, several new research and market studies report that it is mainly younger people who use new media for co-creating UGC and user social networking sites such as Facebook and MySpace. According to the Office of Communications Market Report (OF-COM, 2006), more than 70% of 16–24-year-old Internet users use social network sites (compared to 41% of all UK Internet users) and 37% of 18–24-year-olds have contributed to a blog or website message board (compared to 14% of all UK Internet users). Furthermore, a study from the USA found that social networking and the co-creation of UGC is most popular among the younger heavy user segments (Nathan, Berman, & Kelyy, 2006). Similarly, an analysis of Eurostat data of media usage in Austria, Germany and Norway, done by Heim and Brandtzæg (2007), finds hardly any older people among heavy and advanced Internet users.

Despite the above findings, a recent marketing report from the US-based comScore Media Metrix found a growing trend of older users on the social network sites MySpace, Facebook, Friendster, and Xanga, as shown in Table 1 (Lipsman, 2006). The largest group of users is the age group 35–54 years, which mirrors demographics for domestic Internet usage. The group of persons 55+ is also rather large, and consists, for example, of 11% of the unique visitors in MySpace.

Jack Flanagan, Executive Vice President of comScore Media Metrix, commented on these finding as follows:

“As social networking sites have become mainstream, the demographic composition of MySpace.com has changed considerably. Last year half of the site's visitors were at least 25 years old, while today more than two-thirds of MySpace visitors are age 25 or older. It will be interesting to monitor the shifts in Facebook's demographic composition that will undoubtedly occur as a result of the company's recent decision to open its doors to users of all ages” (Lipsman, 2006).

Table 1 demonstrates that online communities and social networking are not exclusively the domain of teenagers. The appeal of such sites is far broader, including elderly users. This data might indicate a trend that elderly people will participate in social networking activities to a larger degree in the future. Unfortunately,

Table 1

Demographic profile of visitors to select social network sites; percent composition of total unique visitors August 2006

	Total internet	MySpace	Facebook	Friendster	Xanga
Unique visitors (000)	178,836	70,478	27,956	1667	2914
Total Audience in %	100.0	100.0	100.0	100.0	100.0
Persons 12–17	9.6	11.9	14.0	10.6	20.3
Persons 18–24	11.3	18.1	34.0	15.6	15.5
Persons 25–34	14.5	16.7	8.6	28.2	11.0
Persons 35–54	38.5	40.6	33.5	34.5	35.6
Persons 55+	18	11.0	7.6	8.1	7.3

Total Internet user in U.S. Source: comScore Media Metrix.

this study did not cover whether elderly users differ from younger ones in the level of their frequency of use and creation of content.

Recent academic work that explores participation in, motivations for usage, and production of UGC, or even identifies who these users are, is scarce (Boyd & Ellison, 2007; Brandtzæg & Heim, 2008). Some of the few academic studies on social network sites so far are documented in a special theme issue of the *Journal of Computer-Mediated Communication* by Boyd and Ellison (2007). However, only one paper by Hargittai (2007) looks into usage patterns and suggests that the adoption of particular social networking services correlates with an individual's race and level of parents' education. The analysis presented here was based on data from mainly 18- and 19-year-old college students.

Furthermore, few empirical data are available to illustrate why people in general contribute to UGC; an exception is a newly published study by Nov (2007) entitled "What Motivates Wikipedians?" Nov asserts that UGC is simply another form of volunteering. As such, the factors underpinning volunteer activity can help explain why people contribute to Wikipedia. Those factors are: fun, ideology, values, understanding, enhancement, protectiveness, career, and social. Fun proved to have the strongest correlation between the level of motivation and the level of contribution. A limitation of Nov's study is that it only focuses on users of Wikipedia, which is a quite specialized community that consists mainly of highly educated users. Therefore, the results of this study cannot be generalised either to users of UGC sites in general or to elderly people in particular.

2.2. Relevant theories

The purpose of the following discussion is to present a theoretical framework that identifies constructs that are crucial for the actual usage of UGC. The proposed framework is inspired by user acceptance models of technology (e.g. TAM), users and gratification theory, social capital theory, the hyperpersonal model of communication, and perspectives on rich media and co-creating users. The novelty of this approach lies in (i) its combination of theories from information systems, psychology, sociology, and media and communication studies, and (ii) the effort to explain what it takes to get non-users to use and create UGC. The following table presents relevant theoretical approaches and is compiled by the authors (see Table 2).

The combination of perspectives presented in the above table constitutes a useful framework for understanding the appropriation of, and participation in, UGC. A deeper understanding of the adoption rates, purposes, and characteristics of elderly users with regard to services related to co-creation should be beneficial in two main areas: (i) companies that are operating in domestic markets that wish to account for current differences in customers' acceptance and adoption of such services, (ii) an analysis of elderly citizens' user needs to help public authorities to develop policies that are aimed at further developing digital infrastructures and promoting the use of Internet-related services for a broader segment of the population (Ortega Egea, Menéndez, & González, 2007).

Using the above described theories as a basis, we can derive the following main obstacles that elderly people face in adopting UGC:

- An inability to see how UGC can meet their needs and desires with respect to affect, personal integration, affiliation, release of tension, and creation. Whereas studies indicate that the use of computer-mediated communication (CMC) and social network media present opportunities for personally rewarding communication (Bargh, McKenna, & Fitzsimons, 2002), and positively affect social capital (Ellison, Steinfield, & Lampe, 2007) as

well as creative contentment (Lüders, 2007), non-users fail to recognise such outcomes. This point is derived from all of the above theories.

- Fear that systems are too hard to learn, and concomitant low expectations towards support that will help them. This point is derived from models for the acceptance of technology.
- Lack of social influence; i.e. users do not perceive that others who are important to them believe they should use the application. This point is derived from models for the acceptance of technology.
- Pre-established negative attitudes towards digital technologies, coupled with potential computer anxiety and/or concerns about privacy (sharing content can potentially compromise privacy). Whereas the previous points were derived from the theories that have been presented, this point is a more general consideration and is seen as important for explaining elderly people's potential scepticism towards ICTs. For a detailed discussion of constructs that are specific to the elderly, see (Ryu, Kim, & Lee, 2009).

2.3. Research questions

Academic research that focuses directly on the elderly and co-creation related activities is scarce. Market research indicates that younger users are more active, but that elderly users are increasingly participating in social network sites. An important user-centred challenge appears to be the transition between passive consumption and active participation in the different media channels among elderly users. Another factor that needs to be considered is how social interaction can be supported through the interface by enhancing the social networking and social aspect of the co-creation process. A more solid basis of data on usage patterns and user requirements among the elderly is needed in the co-creation of UGC.

The overall goal of the CITIZEN MEDIA project is to explore how non-professional users can aid in the co-creation of networked applications and experiences with their own content. To achieve this goal, we need a more solid basis of data on usage patterns and users, context, and social requirements among elderly people with respect to the co-creation of UGC.

Therefore, we pose the following research questions:

- How do elderly people use ICT in their everyday lives? How do they communicate, consume, share, and co-create UGC?
- Which factors affect the way content can be co-created, shared, and consumed by the members of a community in general and the elderly community in particular?

3. Method

To answer the above-stated research questions we conducted three studies, summarised in Table 3. In order to explore a broader range of issues related to the appropriation and use of UGC by elderly people, we applied different research methods and tools. Whereas a survey performed in Norway allowed us to cover a larger sample of potential users of co-creation of UGC, ethnographic research and the use of proxy technologies allowed us to describe and interpret the cultural and social behaviour of an offline social group that used applications that were similar to co-creation applications, and made it possible to identify social requirements. An online research blog, an experience-sampling method (ESM), and interviews provided us with an in-depth understanding of user and context needs on an individual level. Sections 4.1 to 4.3 describe these studies in more detail. Threats to the validity of our studies are discussed in Section 6.

Table 2
Overview of relevant theories

Theory	Scholarly field	Type
<i>Technology acceptance model (TAM) and related models</i>		
<p>According to Davis (1989) the core constructs “perceived usefulness” and “perceived ease of use” influence “behavioural intention,” which in turn affects actual usage of ICT.</p> <p>Based on a review of user acceptance literature, Venkatesh, Morris, David, and Davis (2003) identified three constructs as determinative for user adoption. (1) <i>Performance expectancy</i>: “the degree to which an individual believes that using the system will help him or her to attain gains in job performance” (p. 447), (2) <i>Effort expectancy</i>: “as the degree of ease associated with the use of the system” (p. 450), and (3) <i>Social influence</i>: “the degree to which an individual perceives that important others believe he or she should use the new system” (p. 451). Actual usage behaviour is conditioned by the intention to use and <i>facilitating conditions</i>, defined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system” (p. 453). The key relationships in the model are moderated by gender, age, and experience. For example, the effect of facilitating conditions only matters for older workers in later stages of experience.</p>	Information systems	<p>Explanation and prediction model of ICT adoption</p> <p>Model has been used for depicting, predicting, and testing acceptance and usage of ICT (mostly office automation software)</p>
<i>Uses and gratification theory (UGT)</i>		
<p>Audiences are seen as goal-oriented, with rationales for their use (and non-use) of various media.</p> <p>Katz, Gurevitch, and Hass (1973) originally distinguished among five categories of needs. <i>Cognitive needs</i> derive from the desire for information, <i>affective needs</i> derive from the desire for pleasure, entertainment, and aesthetics, <i>personal integrative needs</i> derive from the desire to strengthen self-image and self-confidence, <i>social integrative needs</i> derive from the desire for affiliation and social relationships and, finally, <i>tension release needs</i> derive from the need for escape and diversion.</p>	Social sciences Media and communication studies	<p>Explanation</p> <p>Seeks to explain why people use various media</p>
<i>Social capital theory</i>		
<p>Whereas human capital can be defined as embodied in the skills and knowledge acquired by an individual, <i>social capital</i> exists in the <i>relations</i> among persons (Coleman, 1988). Social structures are hence acknowledged as resources that actors can use to achieve their interests (<i>Ibid.</i>).</p> <p>Ellison et al. (2007) adapted the social capital concept to examine and test hypotheses regarding use of and intensity of use of Facebook for bridging (weak ties), bonding (strong ties), and maintaining social capital. They found a strong connection between Facebook usage and indicators of social capital.</p>	Sociology Media and communication studies	<p>Explanation and prediction</p> <p>Coleman (1988), for example, examined how social capital affects human capital</p>
<i>Hyperpersonal communication and related research</i>		
<p>Walthers (1996) concept of “hyperpersonal communication” depicts communicative situations as socially desirable when cues are limited and users are allowed to edit their expressions and self-representations without the interference of environmental reality (social time/space co-presence). Relational intimacy in mediated settings may be significant, although social relationships may require more time to evolve in online settings (Henderson & Gilding, 2004; Hian, Chuan, Trevor, & Detenber, 2004; Tidwell & Walther, 2002; Valentine & Holloway, 2002).</p>	Psychology Media and communication studies Sociology	<p>Explanation</p> <p>Seeks to provide answers to how and why questions Also gives examples of testing and so is an element of prediction</p>
<i>Rich media and co-creating users</i>		
<p>Creativity is a normal yet essential function of humanity (Armstrong, 2000; Dewey, 1980; Pope, 2005). Moreover, human creative expressions are collaborative, in the sense that creative work is always based on what has been done before (Bohm & Nichol, 2004; Negus & Pickering, 2004; Weisberg, 1993). Digital technologies extend commonly available creative spaces, and analysts have diagnosed contemporary media users as active, connected, noisy, and taking media into their own hands (Deuze, 2006; Jenkins, 2006).</p> <p>Nevertheless, participating in digital co-creative environments requires digital competence. One challenge is consequently to motivate participants to produce content, and to create applications that are easy to use for novice or elderly users. In order to succeed, experiences from Digital Storytelling workshops are valuable, illustrating the importance of expert guidance and structured tasks, e.g. (Lambert, 2002; Landry & Guzidal, 2004).</p>	Humanities and social sciences media and communication studies	Explanation

(continued on next page)

Table 2 (continued)

Theory	Scholarly field	Type
<i>Diffusion of Innovations Model</i>		
The study of the diffusion of innovation is about how, why, and at what rate new ideas and technology spread through cultures. The following factors are said to determine the innovation adoption process, according to Rogers (2003): (1) innovation characteristics, (2) communication channels used to communicate its benefits, (3) time that has elapsed since the introduction of the innovation, and (4) the social system in which the innovation is going to spread. This model offers the following categorization of consumers, which is based on their adoption rates of technological innovations over time: Innovators (around 2.5%), Early Adopters (13.5%), Early Majority (34%), Late Majority (34%) and Laggards (16%). Each adopter's willingness and ability to adopt an innovation depend on their awareness, interest, evaluation, trial, and adoption.	Communication Sociology	Explaining how, why and at what rate people adopt to new ideas and technology
<i>Domestication theory</i>		
The domestication of media and technology describes and analyses processes of (media) technology's acceptance, rejection and use (Berker, Hartmann, Punie, & Ward, 2005). The notion of "domestication" originated from anthropology and consumption studies, as well as from a move in media studies to consider the contexts in which ICTs were experienced. In this regard, domestication research focuses on what technologies and services mean to people, how they experience them, and the roles that these technologies can come to play in their lives (Haddon, 2006). However the domestication perspective is not only about how (potential) users behave in relation to the technology and vice versa, but also about how people deal with ICT, which can also be an articulation of existing practices, conflicts, and meanings within the user community (Pierson, 2005).	Media and communication studies Sociology (of technology)	Explaining how (media) technologies are "tamed" within the context of everyday life and a mutual shaping process

3.1. Study I

The Norwegian study investigated who the elderly users are in terms of their attitudes and preferences regarding ICT use and communications, and the ways in which they consume, share, and co-create UGC.

3.1.1. Representative sample of Internet users

The procedure for collecting data was designed to obtain a representative response to our research questions. We collected data from an Internet panel of users that was nationally representative of Norwegian Internet users. The data was collected by Norstat⁴ in March 2007.

A sample of 500 Internet users in Norway was examined. Participants were representative of the Norwegian Internet population with regard to gender, geographical location, and age (15–74 years; 62% of them were 49 and below; 9.8% were 50–54; 9.2% were 55–59; 12.8% were 60–64; 3.4% were 65–69; and 2.4% were 70 and above). The sample consisted of 250 women and 250 men.

3.1.2. Measures

At the time that the study was conducted, no tools for measuring the creation of UGC in online communities were available (Wunsch-Vincent & Vickery, 2007). We therefore developed the questionnaire on the basis of input from three different sources: (1) other researchers in the field of social science and human–computer interactions at the Catholic University of Leuven, the Flemish Interdisciplinary Institute for BroadBand Technologies (IBBT) and the University of Salzburg, (2) questions from previous studies (Ellison, Steinfield, & Lampe, 2007), and (3) results from related work (Heim & Brandtzæg, 2007).

We used the following three measures:

- Demographics, such as residence, gender, age, and education.
- A measure of attitudes toward Internet use, partly adapted from our previous research on patterns of media usage (Heim & Brandtzæg, 2007), and partly inspired by research by Tsai *et al.*, which

classified adolescents' perceptions of the Internet into categories (Tsai, Lin, & Tsai, 2001). Our instrument had four items formulated as statements, for example: "I am dependent on the Internet to get several practical tasks done," using a five-point Likert scale, from "strongly disagree" to "strongly agree".

- Measures covering different Internet activities, such as Information, E-commerce, E-banking, E-health, E-government, downloading and entertainment, all of which were developed from Eurostat; see Heim and Brandtzæg (2007).

In order to cover both experience with UGC and motivational issues, we used the following measures:

- A measure to cover motivational issues with respect to UGC.
- Usage measures, which covered time spent using the online community/communities and types and frequency of UGC.

An excerpt from the questionnaire is given in Appendix A. A more detailed description is given in a separate report by (Brandtzæg & Heim, 2007).

3.1.3. Analyses

We conducted descriptive statistical analysis for the following age groups: 49 and below, 50–54, 55–59, 60–64, 65–69, and 70 and above. We also calculated the Spearman range correlation coefficient according to these categories, using Statistical Package for the Social Sciences SPSS 14 in order to avoid effects of askew distribution.

3.2. Study II

This study investigated which social factors exist in communities, from which the social requirements that should be taken into account may be derived. We investigated how do the structure of a community, the existing social relationships, and the social capital, that is present within the examined community of Hasselt, influence the way content can (not) be co-created, shared, and consumed by the members of this community.

In order to identify social requirements, it is necessary to investigate closely the everyday life of the selected community, because

⁴ Norstat is a Nordic market research company, best known for its specialization in the field of information and data gathering.

Table 3

Overview of the empirical studies

	Study I	Study II	Study III
Objective	Identifying usage patterns at macro level	Identifying social requirements at group level	Identifying user and context requirements at individual level
Approach	Quantitative research, User-centred approach	Qualitative research – ethnographic approach	Qualitative research
Method(s)	Survey	Proxy technology assessment (PTA)	ESM Interviews online research blog
Tools	Questionnaire (110 questions)	Focus group interviews, in-depth interviews, (participative) observation, diary method, online monitoring	A blog (Blogger)
Subjects	500 – representative sample of Internet users in Norway	A neighbourhood community of Hasselt (three streets with a total of 87 houses)	34 participants in total from two online communities
Country	Norway	Belgium	Belgium
Duration	four weeks	six months	Two months
Analysis	Statistical analysis	Thematical analysis (Grounded theory approach)	Affinity diagramming

the pre-existing social relations are of vital importance. Therefore an ethnographic approach was followed. This approach enabled us to acquire an overview and an understanding of the relationships within the community.

3.2.1. Participants

A neighbourhood community was selected that was situated in the suburbs of Hasselt (a middle-sized city of about 70,000 inhabitants in the northeast of Flanders in Belgium). The offline community, which had a supporting committee, comprised three streets with a total of 87 houses in which 233 people were living. The selection was based on the following criteria:

- High level of activity in the community.
- Existence of both strong and weak ties in the community. The concepts are defined in (Granovetter, 1973).

Within this offline community, several senior users have registered online and there are a few who have created content. Those who created content are of different ages and have a different background when it comes to ICT. Linda (50+) has very limited knowledge of computers and the Internet, and was at first not very eager to learn more about them. Karel (50+), her husband, on the other hand, is an ICT manager and has many ICT skills. Marie (60+) is really interested in new technology, and although she still has a lot to learn, she is willing to do so. Bert (60+) is an active member of an ICT club and consequently does not have any problems with ICT.

3.2.2. Proxy Technology Assessment (PTA)

After outlining the main motivations of the participants, our goal was to integrate future technologies related to co-creation into their everyday lives. Given that the future applications and appliances do not yet exist, we applied the newly developed method of Proxy Technology Assessment (PTA) (Pierson et al., 2006). A number of proxy technologies were selected to resemble future applications and appliances as much as possible.

The main advantages of the PTA-method is:

1. The respondents do not talk about abstract concepts, but instead report about concrete experiences and practices with technology.
2. All users talk about exactly the same concrete technical concepts, thus avoiding the problem of misunderstandings.
3. It enables to study the role of co-creation tools, because the proxy technologies have characteristics that are essential for the co-creation of UGC.

The selection of adequate proxy technologies was based on two explicit functionalities: content creation and content sharing. We used the following proxy technologies: digital and video cameras,

software for editing photos and videos, Ipad, mobiles, a slide scanner, a beamer, webcams and a platform for content creation, sharing and consuming (Ning.com).

The combination of these proxy technologies enabled the community members to co-create, distribute, and consume content, and made it possible for us to research social requirements. For this we combined different qualitative and ethnographic methods (in-depth interviews, focus group interviews, diaries, and observation), complemented by systematic monitoring of online behaviour.

3.3. Study III

The third study, which was done in Belgium by CUO/K.U. Leuven–IBBT, explored how the personal and social context-of-use affected the way in which the interface was designed (individual level) for two online communities: Seniorennet, which is a Belgian web community for (mostly) elderly people (over 50) and Pietel, which is a popular community for younger people.

In order to define the user and context requirements, we wanted to investigate: (1) what elderly people share, and with whom, and how, when, where, and why they do this, and (2) what stimulates users to co-create using user-generated content as a basis.

All participants were chosen heterogeneously in terms of gender, age, familiarity with technology, and professional background. The total population ($n = 34$) was divided into two equal groups, the members of which took part in either an offline ($n = 15$) study or an online study ($n = 19$). The offline method used the Experience Sampling Method (ESM). Users were asked to fill out a short demographic and technological experience questionnaire, after which they were asked to report their own behaviour and thoughts by means of the ESM (Barrett & Barrett, 2001). The subjects were asked to keep a diary, which included questionnaires, for one week (preferably seven successive days). Among the subjects who participated in the offline study, 10 subjects were above 50 years: three were aged from 50 to 55, two were aged from 56 to 60, and five were over 60.

In addition, the online participants were asked to report on one blog (all participants posted on the same blog) which combined such online tools as YouTube, Picasa, and Blogger. These tools were selected on the basis of the following criteria: ease of use, the possibility of keeping statistics, fast configuration, and low cost. The participants could write reports, add videos and photographs, and look at the profiles of the other participants, which extended the scope from a mere study of user requirements to a study of social interaction.

Finally, all 15 participants of the offline study were interviewed by telephone and email to help us to understand users' needs in relation to the creation and sharing of content. For the online research, interviews were held via the blog or via email.

Combining the data from different sources allowed us to cover different areas of context and to gain a deeper understanding of user needs in relation to the UGC. Results from the different methods were analyzed during an Affinity Diagramming session (Beyer & Holtzblatt, 1998).

4. Results

4.1. Study I

Tables 4–8 present the findings from Study I. In these tables, the first column lists the measures (questions). The second column (*N*) gives the number of the participant who answered the question. A 'C' denotes that a question was posed only to members of online communities (174 in total). The third column (ρ) gives a Spearman range correlation coefficient according to the following age categories: 49 and below, 50–54, 55–59, 60–64, 65–69, and 70 and above. A * means that correlation is significant at the 0.05 level (two-tailed) and a ** means that the correlation is significant at the 0.01 level (two-tailed). Non-significant but interesting results are written in italics. The details are given in Appendix A.

4.1.1. Attitude to ICT and its use in everyday life

Table 4 presents our results regarding the effect of age differences on people's attitudes toward information and communication technology and their computer literacy. Elderly people have broadband access to a larger degree than younger people and acknowledge the importance of a good PC. Mobile telephones are more important to younger people. This might be because elderly people spend more time at home, but might also be also because mobile telephones do not meet elderly people's needs with respect to usability. Our findings regarding computer literacy confirm the common general opinion that younger people are more comfortable in using computers with respect to downloading software, programming, and making web pages. An interesting finding is that there is no significant difference between age categories in

Table 4
Access, attitude to the ICT and computer literacy

Questions	<i>N</i>	ρ
Broadband access	498	0.106(*)
Importance of a good PC	497	0.188(**)
Importance of mobile phone for communication	499	–0.145(**)
How often do you download software?	500	–0.174(**)
How often do you do programming?	500	–0.150(**)
How often do you make web pages?	500	–0.198(**)
Use of text editor	500	–0.022
Use of spread sheet	500	0.004

Table 5
Information, E-commerce, E-bank, E-health, E-government

Questions	<i>N</i>	ρ
Reading newspapers and the like on the Internet	500	–0.123(**)
E-commerce		
clothes or sportswear	500	–0.331(**)
tickets for the cinema, theatre, and other events	500	–0.204(**)
books, magazines	500	–0.070
travel, hotels	500	0.064
E-bank	500	0.133(**)
E-health	500	–0.094(*)
E-government		
Seek information from the authorities	500	0.080
Send forms to public administration	500	0.086
Download forms from public administration	500	0.082

Table 6
Entertainment

Questions	<i>N</i>	ρ
PC and the Internet are very good sources for entertainment for me	498	–0.353(**)
How often do you play PC games?	500	–0.193(**)
How often do you listen to music on the PC?	500	–0.433(**)
How often do you watch videos/DVDs on the PC?	500	–0.324(**)
How often do you play console games (PlayStation, Xbox, etc.)?	500	–0.414(**)
How often do you watch videos/DVDs on television?	500	–0.401(**)
How often do you watch television?	500	0.153(**)

Table 7
Communication

Questions	<i>N</i>	ρ
Express myself politically, and be heard	171c	0.160(**)
How often do you chat or use instant messenger on the Internet?	500	–0.423(**)
How often do you use the PC for talking to others (so that you can hear each other)	500	–0.162(**)
How often do you write submissions to newsgroups, Internet fora, blogs, etc.?	500	–0.301(**)

Table 8
Co-creation of UGC –Publishing and sharing AV content

Questions	<i>N</i>	ρ
Publish and share pictures	166c	–0.221(**)
Watch and listen to others films/videos and pictures	166c	–0.296(**)
How often do you publish pictures on the Internet?	500	–0.236(**)
How often do you use file sharing programs for music and video?	500	–0.382(**)

the use of such traditional programs as text editors and spread sheets.

Table 5 presents the results regarding age differences in the use of the Internet in everyday life. The elderly read newspapers on the Internet significantly less often. Whereas one might expect elderly people to be more interested in health-related issues, they also read health-related information on the Internet less often. The elderly buy clothes and tickets for the cinema on the Internet significantly less often than younger people. However, there are no significant difference in the purchase of books and travel tickets, and the booking of hotels. Furthermore, there are no significant differences in the use of the Internet for communication with public administration. The elderly use Internet banking significantly more often. However, these results should be interpreted cautiously. There might be differences between age groups in general consumption. For example, people between 45 and 64 years travel slightly more than other age groups.⁵

Table 6 presents the results regarding age differences with respect to entertainment. Not surprisingly, younger people use computers, the Internet, videos/DVDs and play consoles for entertainment to a significantly greater degree than the elderly. Our results show that television should have an important role when designing applications for sharing and co-creation of UGC for elderly people.

4.1.2. Communication use

There is also a significant difference between age groups regarding the use of the Internet for communicating with other people

⁵ According to the data from Norway Statistics, the average number of holiday trips per person in 2006 was 1.7 for the age group 16–45; 1.8 for the age group 45–64; and 1.6 for the age group 65–79.

(Table 7). The results show not only that younger people use the Internet more often, but also that there is a difference in the channels of communication that are used by the elderly and young people. Whereas chat and instant messenger are almost exclusively used by the younger group, the difference in the use of Skype is a little bit lower (but still significant). This might be due to the similarities of Skype to well-known technology (traditional telephone), but also due to their very attractive price.

Generally, the elderly contribute significantly less to news-groups, Internet fora, and blogs. However, amongst elderly people who are members of online communities, there is an opposite trend. To a significantly greater degree than younger people, the elderly state that they participate in these communities because they want to express themselves politically and to be heard.

Fig. 2 presents participation in online communities across age groups. We consider users who visit an online community at least once a month to be community members. For the sake of comparison, we used the same age categories as (Lipsman, 2006). Our results show that participation in online communities among a representative sample of online users decreases with age. We found no 55+ users among the members of Facebook and only 5.7% of 55+ users among the members of MySpace.

4.1.3. Co-creation of UGC – Publishing and sharing AV content

There is a significant difference between the age groups regarding the co-creation of UGC in terms of sharing and publishing AV content, but also in consuming this type of content (Table 8). Even the elderly people who are members of on-line communities rarely publish and share pictures, or watch and listen to others' video and photos.

4.2. Study II

Already at the introduction of the proxy technologies to the community members, one major issue could be identified: the technology should be as simple as possible to use. This was especially the case for elderly people; otherwise, they are too discouraged to use the technology. In this regard, they often referred to computers as being difficult to use. Linda (50+, 09/10/07) told us *"A computer is far too complicated. I wish there existed a computer for dummies, like a typing machine, very simple (...) just to send an e-mail and to look something up on the Internet. (...) You know what I also hate about computers? All these questions that pop up! I never know if I have to choose 'yes' or 'no'. If you are on the computer for ten*

minutes, there are already fifteen of those questions. (...) Also, a computer, it takes so long to turn it on and then something does not work as well, which makes you no longer want to do anything on that computer." Similar as in Study 1, we found that a television with additional functionality might offer a solution for these users, because it takes less time to turn it on and it should be much simpler to work on. Linda would be happy with this solution: *"It would be ideal for me, and for a lot of people if you could just send e-mails with your television."*

In our research in the offline neighbourhood community, we noticed that senior users are very interested in the co-creation of content. Actually, some of them were among the most enthusiastic respondents compared to the younger once. Usability is of course an important issue. We might even say that simplicity and user friendliness was even more important for them than for other average users. The same could be said for the importance of the presence of "warm experts" (Bakardjieva, 2005): friends or family members who know how to handle the applications and devices are vital to understanding how to work with them. The elderly preferred this kind of help to simplified written guidelines.

In order to present social requirements in relation to co-creative applications, we have conceptualised them in three main clusters: social heritage/identity, need for control, and mirroring offline/online. The findings are linked closely to the elderly users in the offline community. However, we also found that most of the findings are true for the elderly, as well as the younger, respondents. We only highlighted a difference in practice between the ages if this was pronounced.

4.2.1. Social heritage/identity

Collective memory seems to be of great value as a social requirement with regard to user generated content, in particular for elderly people. We found that many respondents like to digitise their old material, sometimes in creative ways. One group projected old home movies from the early 1980s on a screen and taped them with one of the digital cameras that we gave them as a proxy technology.

Another group started scanning old slides in order to put them online and share them with other community members. The latter were enthusiastic about this initiative. They scrutinised the old audio-visual material to see if they could recognise themselves or their children, and they loved to see what their neighbourhood looked like so many years ago, for example, how the environment

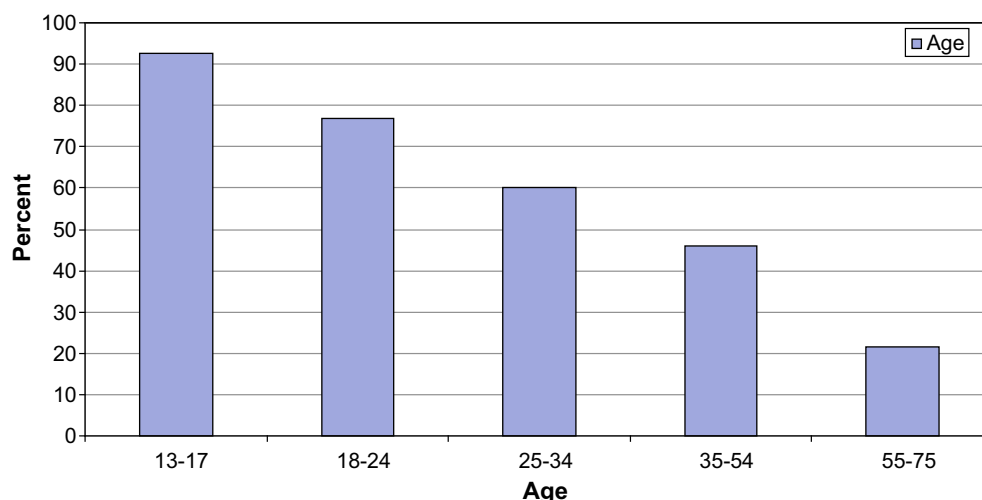


Fig. 2. Participation in online communities.

had changed, how the trees had become so much bigger. We found that they longed to find out about their common neighbourhood history. They wanted to be able to see where they and their community came from. The 60+ users, in particular, were the most enthusiastic about this collective memory (they took the initiative in the use of the dia-scanner for digitising old home movies), but the younger participants were very happy about this as well. Yet Marie did define her interest in this collective memory as a consequence of her age: *"Looking back on my life, or on the environment where I live, the street, what was that like ten years ago, what was it like twenty years ago, thirty, fifty years ago? You start to think about that, when you are older. And images help you with it. How was it when your kids were one year old? You get attached to that. If you don't see the pictures, you forget what it was like. Children are so beautiful, and everything changes so fast, you have to take pictures of them. (...) We should record these stories about our neighbourhood (...) it is a way of writing history"* (Marie, 60+, 09/10/07).

Besides the common identity, we also learned how people want to be able to express themselves individually. The ability to personalise one's own web page and online profile was a big success. For example, they uploaded their favourite songs. They changed the backgrounds of their personal pages as well, and they really liked to see what others had been doing to their pages. They felt as if they got to know each other better or, as one respondent said, *"that music goes with that person; that's nice to know"* (Lara, 40+, 29/10/07). Personalisation is thus highly appreciated by the community members, not only in adapting their own page, but also out of curiosity about what others do with their pages.

4.2.2. Need for control

The members of the community need to feel that they are in control of the technology. This is linked with the need to feel safe and secure. If they are not comfortable and feel they are not in control, they will not create or share any multimedia content. More concretely, they want to be able to choose whether or not their content will be kept private or made public. It should be possible to choose which people can see what content, not only in terms of the outside world, but also within the community itself. Moreover, it has to be very transparent which messages or comments can be seen by everyone and which ones are only viewable by the person you address.

The same goes for advertising. The difference between content produced by the community and links to go to another website, e.g. for advertising, should be obvious. Otherwise people will be worried they might go to another site without realizing it, and they will be confused about their application "disappearing". This was mentioned by Linda (50+) and Karel (50+).

4.2.3. Mirroring offline/online

It should be possible to mirror offline behaviour and structures within the online world, and the other way around. Even communities that seem homogenous by characteristics such as age, ethnicity, and income have different clusters of people. There are different subgroups within each community; in our case, the ones who organize activities. There is a cluster that organizes the yearly barbeque, there is one that organizes activities for children, and so on. Subgroups will always exist, if only because people always like some other people more than others. These different clusters want to be able to reproduce this structure online as well. They would like to have their own virtual social space, in which they can discuss specific matters privately, and share content only with the members of the subgroup. Ideally, for them, other community members would not see that there is a part of a CM application that they cannot join. They feel excluded if they notice that other people have started a group to which they are not invited.

Besides the sharing of online content, there is still a need to do similar things offline as well. The community members want to come together and watch things in a group, so they can laugh and talk about them together in a good atmosphere. This means that any co-creative multimedia application would benefit from the ability to export to different file formats (so that the quality of the content is still good enough if you, for example, project it with a viewer in a room) or to export to different media. (e.g. a DVD that will play on a standard DVD player so that a group can watch it on television together.)

In the realm of mixing online and offline experiences of self-authored multimedia content, the group also find it important to be notified adequately and in a timely manner. Adequately means, for example, that people can invite each other online for an offline activity. As our proxy technology (Ning) did not offer a tool for sending personal invitations to multiple members, they found another way to reach the same goal. They did so by posting an invitation as a comment on everyone's personal profile page. The fact that they searched, found, and used a (not so efficient) solution, demonstrates the need for this social software. The notification should also be timely, which means that members prefer to stay closely in touch by e-mail (or possibly other means of personal communication) on matters such as personally relevant (community) news or a new comment on their page.

4.2.4. Social bonding and social bridging

Both social bonding and social bridging took place. This means that many people who already had a good connection with each other got to know each other even better. At the same time, people who were previously not active members of the community have now participated in community activities from which they would otherwise have been absent. They were invited online, and participated offline. The online platform mediates and facilitates offline contact. There were even future inhabitants of the community who found their way to the guestbook of the community's website, which was appreciated by the members of the committee. This action facilitated the first contact with these people. The online social network site has brought the people in this neighbourhood closer. While two of the participants who were over 60 previously felt that their age was standing between them and the younger part of the street when we first interviewed them, they now feel that they have got to know each other better and they feel much more a part of the community.

In a community where the content was previously produced by one man only, there are now various elderly and young people who co-create, share, and consume multimedia content related to their community.

4.3. Study III

In this section, we examine results from the first phase of the research using the online research blog and ESM about the sharing and co-creation of UGC with average users (with lower ICT skills) and entertainment-orientated users⁶ among the elderly population.

On the questions about what they thought the future would bring, and what future applications should take into account given their experiences with today's applications, all the participants who contributed to this topic indicated that they believe that technological improvement is good and that it makes life easier. Average users noted, though, that more attention should be given to the impact of new applications on everyday life. One of the average users reported that he felt "harassed" when he was called on his

⁶ Further details on average and entertainment users can be found in (Heim & Brandtzæg, 2007).

mobile telephone at a moment when he did not want to be disturbed. Another remark that average users made was that it is not easy for them to keep up to date with all technological innovations.

Two quotations from an elderly participant from the ESM study illustrate this: “After hesitating for a long time and after struggling with using the computer, I’m able to start working with it. I upload the pictures of our skiing holiday to the computer, correct a few and send them to my son via email. It doesn’t go that well and the sending jams in the middle of the process. I’ll try again later on.” Another elderly participant from the ESM study reports: “One daughter and a friend helped us to install a new printer/scanner.”

The main problem with today’s applications is the lack of integration. If people want to use several online applications, they need to create new accounts regularly. All participants who contributed to this topic mentioned this. However, there was a difference between entertainment-orientated users and average users: the first group did not like the fact that they had to use different accounts, but they kept on doing it, while the latter group just set those applications that required new accounts aside.

The following fragment from an entertainment-orientated user on the online research blog illustrates the use of several accounts for uploading and sharing pictures and, simultaneously, the fact that he finds those multiple accounts difficult: “I have to admit that currently there is too little workflow between the different tools! You have too many accounts and sometimes you have to do some crazy things in order to get something done!”

Average users, more than entertainment-orientated users, reported that they found these new online applications for sharing UGC complicated and difficult to use. We can also see this in the explanation that most participants gave for not continuing to contribute to the study. In the online study, only one elderly participant gave a reason for not contributing anymore: “I’m a senior and try the computer once in a while, but this assignment seems too difficult.” In the online study, five of 15 participants gave an explanation for ceasing to contribute. All these elderly people indicated that they found the assignment too difficult, and pointed specifically to using pictures, audio, or videos to illustrate their reports in the blog. One participant stopped for personal reasons and another because of the way the questions were asked. They were asked to describe how they experienced games and quizzes, but some of the participants expected a series of questions that they would have to answer. Average users who contributed to our second study also discussed the fact that they would only contribute by using text, because they found it too difficult to post pictures online. Only one participant provided pictures to illustrate her con-

tribution. It should be noted that she did not upload the picture onto the blog; instead she used email. This illustrates that the UGC services were both very difficult to use and very unfamiliar to these elderly users.

Although it was mainly a qualitative study, the number of posts (Fig. 3) and comments (Fig. 4) were counted to give some indication of whether there was a difference between entertainment-orientated and average users. We found that there is, indeed, a clear difference between the contributions of entertainment-orientated and average users. Another observation is that the contributions of both groups diminished over time. The observed phenomena mentioned above can be explained by looking at the social dimension that blogs often have. Nardi, Schiano, and Gumbrecht (2004) reported that “blogs create the audience, but the audience also creates the blog”. Participants contributed to our blog because they were asked to, not because they had an intrinsic motivation to do so. This is a limitation of the study. Blogging is, in essence, a social activity, whereas in our study it was more a medium of communication between the volunteers and the experimenters. The spike at the end of Fig. 3 for the average users is caused by the late recruitment of additional average users. The contributions of these users were extremely low in the beginning; hence, in order to obtain more contributions, after four weeks additional participants were sought.

Next to issues of usability in UGC applications, we believe that anxiety about using them is an obstacle for average users. This can be illustrated in two ways. Firstly, except for the single participant who stopped contributing because of personal issues, all participants who stopped contributing to the study did so because they felt that the assignment of using UGC in their reports was difficult. (They gave multiple reasons; this was always one of them. One of the other reasons was that they expected to have to answer individual questions, not to write reports.) Perceptions of difficulty may relate to issues of usability; they may also relate to anxiety. Secondly, one average user first used the provided tutorial to post pictures on the blog successfully. In her next post on the blog, she said that she would stop contributing because it was too difficult to post pictures. This can indeed point to usability issues, as she stated, but it can also point to anxiety, or a lack of control.

4.4. Summary and discussion

This paper’s aim was to address the needs of elderly users with respect to the co-creation of UGC. Table 9 summarizes our findings on the macro, group, and individual level.

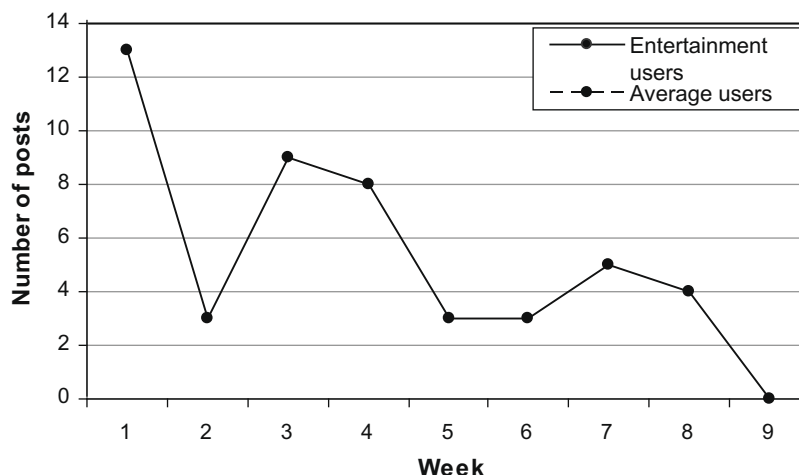


Fig. 3. Number of posts per week, per user group.

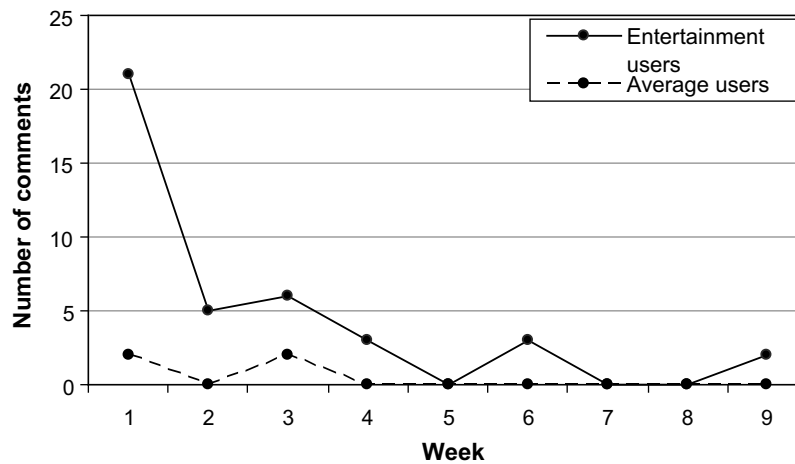


Fig. 4. Number of comments per week, per user group.

Table 9

User needs with respect to co-creation of UGC

Level	Findings
Macro level	<ul style="list-style-type: none"> Significant differences in use: the elderly use the Internet less often than younger people; they publish user-generated AV content less often; they read newspapers on the Internet less often; they use Internet banking more often; they express themselves politically more often; television is more important to them for entertainment
Group level	<ul style="list-style-type: none"> Trend towards accepting technology: no differences in communication with public administration and in the use of traditional programs Ease of use – technology should be as simple as possible Social heritage/identity – collective memory and the possibility of expressing themselves individually were important for the elderly Need to control – control of access rights was important for sharing content Mirroring offline/online – possibility of mirroring offline behaviour and structures to the online world and the other way around Social bonding and social bridging – the online platforms mediate and facilitate offline contact
Individual level	<ul style="list-style-type: none"> Belief that technological improvement makes life easier Ease of use – existing applications are difficult to use Good integration between different tools Skills and anxiety – need for staying up to date and overcoming anxiety related to the use of new technology

Previous studies have suggested that there are differences in Internet usage between age groups in favour of younger people (Livingstone et al., 2005). Our results provide a more detailed picture. For example, the elderly read newspapers on the Internet significantly less often, but more often use Internet banking. Interesting findings are that there are no significant age differences in online communication with public administration and in the use of such traditional computer programs as text editors and spread sheets. This shows that these technologies have become a *de facto* standard and are accepted by all age groups. Taking into account an increasing trend of Internet use among people over 55 (Fox & Madden, 2006), one could expect that other online activities, such as using the Internet for purchasing different products, downloading software, reading the news, and making web pages also will be accepted by the elderly population in the near future.

However, in addition to perceived usefulness, perceived ease of use is of great importance for the elderly people. We noticed that a user from Study II preferred to receive help from friends and family rather than follow written guidelines, even if the guidelines were easy to follow. Marie (60+, 16/10/07) felt that this was so important that she tried to convince the other people to do the same: “That is what I told Linda. It is easy, but someone has to sit next to you and explain everything”. Two friends of Linda (50+), Gerda and Lara (both 40+) went over to Linda’s place, to talk, laugh, have a drink, and at the same time explain the basics of the online platform for the co-creation of content. Moreover, others have shown that previous experiences with Internet activities might be of more

importance than age when explaining differences in media usage in the population (Følstad, Brandtzæg & Hiem, 2008).

However, we should not ignore the fact that there is a significant difference between the age groups regarding the consumption, sharing, and publishing of UGC audio-visual content. Even the elderly people who are members of on-line communities rarely publish and share pictures, or watch and listen to others’ video and pictures. However, most people do not publish audio-visual UGC. Study III also revealed that elderly users with lower ICT skills found UGC applications difficult to use. This may explain the difficulties many people are confronted with in the transition of being a consumer to being a producer. It is far more difficult to produce UGC than to passively consume professional broadcast content. Study III also pointed out the lack of integration between UGC-services. If people want to use several online applications, they have to create new accounts regularly. The elderly expressed their worries about learning new technologies and their anxiety about using it. However, it is important to note that they were generally positive about new technologies.

When designing applications for elderly people, one should bear in mind the different age groups have significantly different preferences for entertainment. Television plays an important role in entertainment among elderly people. It seems that to a large degree, television satisfies elderly peoples’ social integrative needs, as defined by uses and gratification theory. For example, the participants in Study II expressed their wish to meet and watch the content that they produced together as a group. They said explicitly

that it would be easier for them if it were possible to use their televisions to use e-mail and other Internet applications.

Our results show significant differences between age groups, not only regarding use of the Internet and membership in online communities, but also regarding other online communication channels. Younger people use the Internet much more frequently than elderly people. Furthermore, younger people are more likely to be members of online communities and to contribute to newsgroups, Internet fora, and blogs. Our findings regarding participation of the elderly in online communities such as MySpace and Facebook differ slightly from those of a recent marketing report (Lipsman, 2006). Whereas the marketing report found 11% of unique MySpace visitors were over 55, we found that only 5.7% of them were over 55. The differences for Facebook are even larger; 7.6% in the marketing report versus 0% in our results. However, one should be aware that our study and the study of Lipsman were done on different samples (a representative sample of Internet users versus a sample of community members) and used different definitions of membership (visit a community at least once a month versus unique visits) and are therefore difficult to compare. Furthermore, Facebook took off seriously in Norway just after our investigation in March 2007. As of January 2008, 30% of the online population⁷ in Norway are members of Facebook. This may indicate that elderly people are also attending this community in greater numbers. Facebook also appeals to a broader user population. The membership of these online communities is also changing rapidly in the direction of including a wider part of the population.

Our results indicate that the collective memory is of significance in the context of co-creation and UGC. People enjoy looking back on their life and their community, with the help of images and video. In addition, people enjoy personalising their own profile, personal page, etc, but they also enjoy seeing what others have been doing and which options they chose. While Paine, Reips, Stieger, Joinson, and Buchanan (2007), for example, report that only 6.8% of the users were worried about disclosing personal information on the Internet, we found that this was a major issue for almost all of our users. They were only comfortable posting content that starred themselves and their family if this content could not be seen by people who do not belong to the neighbourhood.

Another result worthy of note is that the users who shared content online wanted to do so offline as well. Of course, it is important to remember that this was the case for an offline-originated community, where people are used to sharing content offline. They wanted to mirror their offline behaviour in the offline world and the other way around. For this reason, they also felt the need to have a private space online, within the bigger private website, in which they could contact and be contacted by only those people with whom they have the most contact offline. Yet, this does not mean they were not willing to get to know neighbours online that they did not know before. In fact, we saw a multiplying of weak ties. Many people who participated made new contacts in their own neighbourhood. Given that both bonding and bridging took place, we can confirm the view of Quan-Haase and Wellman (2004, Cummings, Heeks, and Huysman, 2003, and Haddon (2004) who all believe that online contact can enable bonding and bridging. Finally, we found that our elderly users enjoyed getting emails when someone left a comment on their personal page, because they felt that this was a motivation to visit the website once more.

5. Threats to the validity

The data in Study I was collected from a panel of Internet users. The panel participants are slightly more highly educated than the population of Norwegian Internet users as a whole. Furthermore, we gathered no data from elderly people who do not use the Internet; hence, our conclusions cannot be generalised to them. We intend to address this lacuna in our future studies.

For the study of social requirements (Study II), we identified two possible threats to validity. The first is that the qualitative study was conducted with a mix of differently aged respondents with only a limited number of elderly people. This means the research explored the requirements in depth, but that these results cannot be generalised statistically to all elderly people. However, we discovered how the context of the elderly respondents plays an essential role in identifying the social requirements, which requires in-depth ethnographic research. Only in this way can we achieve an insight into how the creation and sharing of self-authored multimedia content is practised and experienced by the elderly (and younger people) in the everyday life of a real-life community.

For the purposes of triangulation, a next step could be to test our results quantitatively using a representative population sample of elderly people. This approach could confirm the different types or categories of elderly people who co-create and share content that we found in our study. Defining the main characteristics of each group, and the main consequences when it comes to development of applications that enable the co-creation of multimedia content, might generate valuable follow-up results.

A second threat to validity for Study II could be that the research took place under specific circumstances; we, as researchers, were present in the (online and offline) field and we introduced proxy technologies from outside. The latter was done to avoid people having to buy any hardware or software. We will only see how important this was when we withdraw the proxy technologies and do follow-up research of the community. The fact that we, as researchers, participated actively was necessary for doing valuable ethnographic research, in line with other participative (observation) techniques. Therefore, as long as we are aware of, and register in detail, each step we take in the field, and as long as we are continuously self-reflexive of our actions as researchers, this will not be a threat for validity.

A threat to the validity for Study III could be that for the selection of the user groups, namely average and entertainment-oriented users, we selected communities that matched the profile of those user groups as closely as possible. We mainly focused on the kind of community and on age. Using a questionnaire to establish peoples profile would be more accurate. A further threat to validity for Study III is a relatively small number of participants.

6. Conclusions

We have focused on the participation of elderly citizens in the co-creation of UGC. We developed a theoretical framework that identifies constructs that are critical for the adoption and usage of UGC. We conducted three studies to investigate how elderly people co-create content in on-line and off-line communities, and to identify their requirements with respect to the co-creation of UGC.

One interesting hypothesis is that we are witnessing a process in which elderly users are changing from having instrumental motivations for using computers and the Internet that demand that

⁷ Approximately 75–80% of the Norwegian population are online (Heim & Brandtzaeg, 2007).

they use word-processors, spreadsheets, and online banking services, to recognizing computers and online communities as valuable social environments for communication. That is, elderly users are slowly learning to recognize the affective, personal integrative, affiliative, and creative aspects of online communities and user-generated content sites.

Our data indicate that such a hypothesis is worth testing. Study I, conducted on the macro level, shows that the elderly rarely publish and share AV content, even if they are members of an online community. However, Study I also shows that elderly users may be embracing the expressive aspects of new media to a greater degree than is usually expected: the elderly who are already members of online communities in significant numbers express themselves politically. The benefits of participating in online communities increase with the number of members⁸, so we can expect that UGC sites will soon be adopted to a greater degree among elderly people. Both the Technology Acceptance Model and the Diffusion of Innovations Model emphasise the importance of the social dimension in the acceptance of a technology. Our results confirm this, but also provide further details on the social requirements of elderly people with respect to co-creation of UGC.

Study II, which was conducted on the group level, indicates that elderly people do not necessarily dismiss the co-creative and social aspects of digital technology and online communication. More precisely, Study II suggests that given the right circumstances, elderly people are eager to work with AV content, especially digitizing old analogue material. The opportunity to co-create narratives based on a common history was met with enthusiasm, especially when these stories were also shared in offline contexts. Similarly, Study II showed that elderly people were very motivated to contribute with content that documents the history of their neighbourhood. The social value of the proxy technologies was also undeniable, both in terms of bonding and bridging processes, and a consequent increase in social capital. As with other age groups, online communities and communication proved to be a significant ice-breaker for social interaction.

Study III, which was conducted on the individual level, also pointed to ease of use as being an important factor for elderly users. Although the elderly users were generally positive about new technologies, they had problems with learning them and were anxious about using them. As was shown in Study III, help from family and friends might help in overcoming these obstacles.

More than merely indicating the truth of the above proposed hypothesis, our data suggest how to speed up the process of changing the elderly peoples' use of computers and online communities. The generational divide with respect to digital production should be met by providing contextual support for usage.

Acknowledgments

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Appendix A

A.1. Study I – Statistics

Correlations		Age categories
<i>Spearman's rho</i>		
Broadband access	Correlation coefficient	0.106(*)
	Sig. (2-tailed)	0.018
	N	498
It is very important to me to have a well-equipped and good PC.	Correlation coefficient	0.188(**)
	Sig. (2-tailed)	0
	N	497
I am dependent on Internet to get several practical tasks done.	Correlation coefficient	−0.04
	Sig. (2-tailed)	0.377
	N	498
PC and Internet is very good sources for entertainment to me	Correlation coefficient	−0.353(**)
	Sig. (2-tailed)	0
	N	498
To me, Internet is an important way to keep in touch with other people.	Correlation coefficient	−0.081
	Sig. (2-tailed)	0.07
	N	499
The mobile phone is very important to me, to keep in touch with family and friends.	Correlation coefficient	−0.145(**)
	Sig. (2-tailed)	0.001
	N	499
Write text	Correlation coefficient	−0.085
	Sig. (2-tailed)	0.267
	N	174
Contribute with photos	Correlation coefficient	−0.107
	Sig. (2-tailed)	0.159
	N	174
Contribute with audio/music	Correlation coefficient	−0.09
	Sig. (2-tailed)	0.236
	N	174
Contribute with films/videos	Correlation coefficient	−0.03
	Sig. (2-tailed)	0.691
	N	174
It must be easier to publish own/others video/film	Correlation coefficient	−0.149
	Sig. (2-tailed)	0.384
	N	36
It must be more difficult to misuse films/video that I share with others	Correlation coefficient	0.154
	Sig. (2-tailed)	0.378
	N	35
It must be others in the community that are interested in the content I could share	Correlation coefficient	0.271
	Sig. (2-tailed)	0.11
	N	36
It must be more responses from others in the community on things that I publish or contribute with	Correlation coefficient	0.121
	Sig. (2-tailed)	0.482
	N	36
It must be easier to control who may view videos/films I upload	Correlation coefficient	0.174
	Sig. (2-tailed)	0.31
	N	36
To write and contribute with own text	Correlation coefficient	−0.151
	Sig. (2-tailed)	0.052
	N	166
Download and share sound/music	Correlation coefficient	−0.05
	Sig. (2-tailed)	0.526
	N	166
Publish and share pictures	Correlation coefficient	−0.221(**)
	Sig. (2-tailed)	0.004
	N	166

⁸ More precisely, with the number of members with whom the elderly want to keep in touch.

Appendix A (continued)

Correlations		Age categories
Publish and share video/film	Correlation coefficient	−0.147
	Sig. (2-tailed)	0.058
	N	167
Mashup content from different sources	Correlation coefficient	−0.06
	Sig. (2-tailed)	0.45
	N	161
Watch and listen to others films/videos and pictures	Correlation coefficient	−0.296(**)
	Sig. (2-tailed)	0
	N	166
Get in touch with people that I have not met before	Correlation coefficient	−0.096
	Sig. (2-tailed)	−0.213
	N	170
Keep me updated on events happening the place where I live	Correlation coefficient	0.064
	Sig. (2-tailed)	0.408
	N	172
Create and share experiences together with others	Correlation coefficient	0.099
	Sig. (2-tailed)	0.202
	N	169
Express myself politically, and be heard	Correlation coefficient	0.160(*)
	Sig. (2-tailed)	−0.036
	N	171
Being anonymous (using a nick)	Correlation coefficient	0.092
	Sig. (2-tailed)	0.23
	N	171
Keep me updated on events happening in the world in general	Correlation coefficient	0.132
	Sig. (2-tailed)	0.084
	N	172
Share my personal secrets/problems with others	Correlation coefficient	−0.14
	Sig. (2-tailed)	0.069
	N	170
Get a boyfriend/girlfriend/lover	Correlation coefficient	−0.071
	Sig. (2-tailed)	0.356
	N	172
Keep in touch with friends and family	Correlation coefficient	−0.011
	Sig. (2-tailed)	0.889
	N	172
It needs more interesting content	Correlation coefficient	−0.143
	Sig. (2-tailed)	0.067
	N	166
It must be more easy to use	Correlation coefficient	0.043
	Sig. (2-tailed)	0.579
	N	171
Several of my friends must start using it	Correlation coefficient	−0.037
	Sig. (2-tailed)	0.63
	N	170
Some one must help med to get started	Correlation coefficient	0.135
	Sig. (2-tailed)	0.078
	N	171
I simply need more time	Correlation coefficient	0.02
	Sig. (2-tailed)	0.792
	N	170
Family members	Correlation coefficient	0.127
	Sig. (2-tailed)	0.096
	N	174
Friends	Correlation coefficient	−0.128
	Sig. (2-tailed)	0.093
	N	174

Appendix A (continued)

Correlations		Age categories
Colleagues	Correlation coefficient	0.035
	Sig. (2-tailed)	0.65
	N	174
Students/pupils	Correlation coefficient	−0.321(**)
	Sig. (2-tailed)	0
	N	163
Teachers	Correlation coefficient	−0.05
	Sig. (2-tailed)	0.514
	N	174
People you have just met on the Internet, and not have met in real life	Correlation coefficient	−0.092
	Sig. (2-tailed)	0.229
	N	174
Importance: Family members	Correlation coefficient	0.086
	Sig. (2-tailed)	0.264
	N	169
Importance: Friends	Correlation coefficient	−0.043
	Sig. (2-tailed)	0.582
	N	169
Importance: Colleagues	Correlation coefficient	−0.079
	Sig. (2-tailed)	0.309
	N	167
Importance: Students/pupils	Correlation coefficient	0
	Sig. (2-tailed)	0
	N	0
Importance: Teachers	Correlation coefficient	−0.126
	Sig. (2-tailed)	0.107
	N	164
Importance: People you have just met on the Internet, and not have met in real life	Correlation coefficient	−0.111
	Sig. (2-tailed)	0.152
	N	167
How often do you use Internet in connection with school or work?	Correlation coefficient	−0.101(**)
	Sig. (2-tailed)	0.024
	N	500
How often do you use Internet in your spare time?	Correlation coefficient	−0.026
	Sig. (2-tailed)	0.556
	N	500
How often do you chat or use instant messenger on the Internet?	Correlation coefficient	−0.423(**)
	Sig. (2-tailed)	0
	N	500
How often do you use the PC for talking to others (so that you can hear each other)	Correlation coefficient	−0.162(**)
	Sig. (2-tailed)	0
	N	500
How often do you publish pictures on the Internet?	Correlation coefficient	−0.236(**)
	Sig. (2-tailed)	0
	N	500
How often do you receive private e-mails?	Correlation coefficient	0.039
	Sig. (2-tailed)	0.385
	N	500
How often do you receive e-mails at work?	Correlation coefficient	−0.032
	Sig. (2-tailed)	0.47
	N	500
How often do you read news papers and the like on the Internet?	Correlation coefficient	−0.123(**)
	Sig. (2-tailed)	0.006
	N	500
How often do you use file sharing programs for music and video?	Correlation coefficient	−0.382(**)
	Sig. (2-tailed)	0
	N	500
How often do you download software?	Correlation coefficient	−0.174(**)
	Sig. (2-tailed)	0
	N	500

(continued on next page)

Appendix A (continued)

Correlations		Age categories
How often do you shop clothes or sportswear on the Internet?	Correlation coefficient Sig. (2-tailed) N	–0.331(**) 0 500
How often do you use net banking?	Correlation coefficient Sig. (2-tailed) N	0.133(**) 0.003 500
How often do you write submissions to newsgroups, Internet fora, blogs etc.?	Correlation coefficient Sig. (2-tailed) N	–0.301(**) 0 500
How often do you shop books, magazines etc. on the Internet?	Correlation coefficient Sig. (2-tailed) N	–0.07 0.116 500
How often do you purchase travels, hotel accommodations etc. on the Internet?	Correlation coefficient Sig. (2-tailed) N	0.064 0.153 500
How often do you purchase tickets for movies, theatre and other events on the Internet?	Correlation coefficient Sig. (2-tailed) N	–0.204(**) 0 500
How often do you get information from official authorities from the Internet?	Correlation coefficient Sig. (2-tailed) N	0.08 0.074 500
How often do you download forms from the public administration from the Internet?	Correlation coefficient Sig. (2-tailed) N	0.082 0.066 500
How often do you send in completed forms to public administration by means of the Internet?	Correlation coefficient Sig. (2-tailed) N	0.086 0.056 500
How often do you get health related information from the internet?	Correlation coefficient Sig. (2-tailed) N	–0.094(*) –0.036 500
How often do you use PC in connection with school or work?	Correlation coefficient Sig. (2-tailed) N	–0.152(**) 0.001 500
How often do you use the PC in your spare time?	Correlation coefficient Sig. (2-tailed) N	0.036 0.42 500
How often do you use a text editor?	Correlation coefficient Sig. (2-tailed) N	–0.022 0.621 500
How often do you use a spread sheet?	Correlation coefficient Sig. (2-tailed) N	0.004 0.932 500
How often do you play PC games?	Correlation coefficient Sig. (2-tailed) N	–0.193(**) 0 500
How often do you listen to music on the PC?	Correlation coefficient Sig. (2-tailed) N	–0.433(**) 0 500
How often do you watch video/DVD on the PC?	Correlation coefficient Sig. (2-tailed) N	–0.324(**) 0 500
How often do you do programming?	Correlation coefficient Sig. (2-tailed) N	–0.150(**) 0.001 500

Appendix A (continued)

Correlations		Age categories
How often do you make web pages?	Correlation coefficient Sig. (2-tailed) N	–0.198(**) 0 500
How often do you play console games (Play station, X-box, etc.)?	Correlation coefficient Sig. (2-tailed) N	–0.414(**) 0 500
How often do you watch video/DVD on the TV?	Correlation coefficient Sig. (2-tailed) N	–0.383(**) 0 500
How often do you play console games (Play station, X-box, etc.)?II	Correlation coefficient Sig. (2-tailed) N	–0.393(**) 0 500
How often do you watch video/DVD on the TV?II	Correlation coefficient Sig. (2-tailed) N	–0.401(**) 0 500
How often do you watch TV?	Correlation coefficient Sig. (2-tailed) N	0.153(**) –0.001 500
When you watch TV, how long do you usually watch?	Correlation coefficient Sig. (2-tailed) N	0.05 0.26 500
Approximately in how many years have you used the Internet?	Correlation coefficient Sig. (2-tailed) N	–0.021 0.633 500

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Broadband access

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Yes	482	96.4	96.8	96.8
	No	16	3.2	3.2	100.0
	Total	498	99.6	100.0	
Missing	Don't know	2	0.4		
Total		500	100.0		

It is very important to me to have a well-equipped and good PC

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Disagree	17	3.4	3.4	3.4
	Neither agree nor disagree	42	8.4	8.5	11.9
	Agree	163	32.6	32.8	44.7
	Strongly agree	275	55.0	55.3	100.0
	Total	497	99.4	100.0	
Missing	Don't know	3	0.6		
Total		500	100.0		

The mobile phone is very important to me, to keep in touch with family and friends

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Strongly disagree	20	4.0	4.0	4.0
	Disagree	34	6.8	6.8	10.8
	Neither agree nor disagree	71	14.2	14.2	25.1
	Agree	129	25.8	25.9	50.9
	Strongly agree	245	49.0	49.1	100.0
	Total	499	99.8	100.0	
Missing	Don't know	1	0.2		
Total		500	100.0		

How often do you download software?

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Never, or almost never	95	19.0	19.0	19.0
	Some times a year	232	46.4	46.4	65.4
	Some times a month	121	24.2	24.2	89.6
	Some times a week	35	7.0	7.0	96.6
	Every, or almost every day	17	3.4	3.4	100.0
	Total	500	100.0	100.0	

How often do you download software?

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Never, or almost never	95	19.0	19.0	19.0
	Some times a year	232	46.4	46.4	65.4
	Some times a month	121	24.2	24.2	89.6
	Some times a week	35	7.0	7.0	96.6
	Every, or almost every day	17	3.4	3.4	100.0
	Total	500	100.0	100.0	

How often do you do programming?

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Never, or almost never	397	79.4	79.4	79.4
	Some times a year	53	10.6	10.6	90.0

Table (continued)

		Frequency	Percent	Valid percent	Cumulative percent
	Some times a month	22	4.4	4.4	94.4
	Some times a week	15	3.0	3.0	97.4
	Every, or almost every day	13	2.6	2.6	100.0
	Total	500	100.0	100.0	

How often do you make web pages?

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Never, or almost never	371	74.2	74.2	74.2
	Some times a year	54	10.8	10.8	85.0
	Some times a month	40	8.0	8.0	93.0
	Some times a week	23	4.6	4.6	97.6
	Every, or almost every day	12	2.4	2.4	100.0
	Total	500	100.0	100.0	

How often do you use a spread sheet?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never, or almost never	118	23.6	23.6	23.6
	Some times a year	75	15.0	15.0	38.6
	Some times a month	113	22.6	22.6	61.2
	Some times a week	85	17.0	17.0	78.2
	Every, or almost every day	109	21.8	21.8	100.0
	Total	500	100.0	100.0	

How often do you use a text editor?

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Never, or almost never	35	7.0	7.0	7.0
	Some times a year	35	7.0	7.0	14.0

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Table (continued)

	Frequency	Percent	Valid percent	Cumulative percent
Some times a month	82	16.4	16.4	30.4
Some times a week	130	26.0	26.0	56.4
Every, or almost every day	218	43.6	43.6	100.0
Total	500	100.0	100.0	

How often do you read news papers and the like on the Internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	4	0.8	0.8	0.8
Some times a year	17	3.4	3.4	4.2
Some times a month	44	8.8	8.8	13.0
Some times a week	109	21.8	21.8	34.8
Every, or almost every day	326	65.2	65.2	100.0
Total	500	100.0	100.0	

How often do you shop clothes or sportswear on the Internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	230	46.0	46.0	46.0
Some times a year	207	41.4	41.4	87.4
Some times a month	53	10.6	10.6	98.0
Some times a week	9	1.8	1.8	99.8
Every, or almost every day	1	0.2	0.2	100.0
Total	500	100.0	100.0	

How often do you purchase tickets for movies, theatre and other events on the Internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	153	30.6	30.6	30.6
Some times a year	254	50.8	50.8	81.4

Table (continued)

	Frequency	Percent	Valid percent	Cumulative percent
Some times a month	84	16.8	16.8	98.2
Some times a week	8	1.6	1.6	99.8
Every, or almost every day	1	0.2	0.2	100.0
Total	500	100.0	100.0	

How often do you shop books, magazines etc. on the Internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	182	36.4	36.4	36.4
Some times a year	222	44.4	44.4	80.8
Some times a month	86	17.2	17.2	98.0
Some times a week	8	1.6	1.6	99.6
Every, or almost every day	2	0.4	0.4	100.0
Total	500	100.0	100.0	

How often do you purchase travels, hotel accommodations etc. on the Internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	77	15.4	15.4	15.4
Some times a year	339	67.8	67.8	83.2
Some times a month	69	13.8	13.8	97.0
Some times a week	13	2.6	2.6	99.6
Every, or almost every day	2	0.4	0.4	100.0
Total	500	100.0	100.0	

How often do you use net banking?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	33	6.6	6.6	6.6
Some times a year	6	1.2	1.2	7.8

Table (continued)

	Frequency	Percent	Valid percent	Cumulative percent
Some times a month	137	27.4	27.4	35.2
Some times a week	269	53.8	53.8	89.0
Every, or almost every day	55	11.0	11.0	100.0
Total	500	100.0	100.0	

How often do you get health related information from the internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	138	27.6	27.6	27.6
Some times a year	216	43.2	43.2	70.8
Some times a month	114	22.8	22.8	93.6
Some times a week	25	5.0	5.0	98.6
Every, or almost every day	7	1.4	1.4	100.0
Total	500	100.0	100.0	

How often do you get information from official authorities from the Internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	39	7.8	7.8	7.8
Some times a year	204	40.8	40.8	48.6
Some times a month	186	37.2	37.2	85.8
Some times a week	57	11.4	11.4	97.2
Every, or almost every day	14	2.8	2.8	100.0
Total	500	100.0	100.0	

How often do you send in completed forms to public administration by means of the Internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	122	24.4	24.4	24.4

Table (continued)

	Frequency	Percent	Valid percent	Cumulative percent
Some times a year	273	54.6	54.6	79.0
Some times a month	84	16.8	16.8	95.8
Some times a week	18	3.6	3.6	99.4
Every, or almost every day	3	0.6	0.6	100.0
Total	500	100.0	100.0	

How often do you download forms from the public administration from the Internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	87	17.4	17.4	17.4
Some times a year	279	55.8	55.8	73.2
Some times a month	105	21.0	21.0	94.2
Some times a week	25	5.0	5.0	99.2
Every, or almost every day	4	0.8	0.8	100.0
Total	500	100.0	100.0	

How often do you play PC games?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	172	34.4	34.4	34.4
Some times a year	95	19.0	19.0	53.4
Some times a month	88	17.6	17.6	71.0
Some times a week	92	18.4	18.4	89.4
Every, or almost every day	53	10.6	10.6	100.0
Total	500	100.0	100.0	

How often do you listen to music on the PC?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or alost never	95	19.0	19.0	19.0

(continued on next page)

Table (continued)

	Frequency	Percent	Valid percent	Cumulative percent
Some times a year	84	16.8	16.8	35.8
Some times a month	93	18.6	18.6	54.4
Some times a week	122	24.4	24.4	78.8
Every, or almost every day	106	21.2	21.2	100.0
Total	500	100.0	100.0	

How often do you watch video/DVD on the PC?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or almost never	177	35.4	35.4	35.4
Some times a year	134	26.8	26.8	62.2
Some times a month	105	21.0	21.0	83.2
Some times a week	58	11.6	11.6	94.8
Every, or almost every day	26	5.2	5.2	100.0
Total	500	100.0	100.0	

How often do you play consol games (Play station, X-box, etc.)?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or almost never	346	69.2	69.2	69.2
Some times a year	63	12.6	12.6	81.8
Some times a month	60	12.0	12.0	93.8
Some times a week	26	5.2	5.2	99.0
Every, or almost every day	5	1.0	1.0	100.0
Total	500	100.0	100.0	

How often do you watch video/DVD on the TV?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or almost never	97	19.4	19.4	19.4
Some times a year	102	20.4	20.4	39.8

Table (continued)

	Frequency	Percent	Valid percent	Cumulative percent
Some times a month	157	31.4	31.4	71.2
Some times a week	120	24.0	24.0	95.2
Every, or almost every day	24	4.8	4.8	100.0
Total	500	100.0	100.0	

How often do you watch TV?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or almost never	8	1.6	1.6	1.6
Some times during a month	13	2.6	2.6	4.2
Some times during a week	42	8.4	8.4	12.6
Almost every day	145	29.0	29.0	41.6
Every day	292	58.4	58.4	100.0
Total	500	100.0	100.0	

How often do you chat or use instant messenger on the Internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or almost never	185	37.0	37.0	37.0
Some times a year	46	9.2	9.2	46.2
Some times a month	54	10.8	10.8	57.0
Some times a week	71	14.2	14.2	71.2
Every, or almost every day	144	28.8	28.8	100.0
Total	500	100.0	100.0	

How often do you use the PC for talking to others (so that you can hear each other)

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or almost never	301	60.2	60.2	60.2
Some times a year	71	14.2	14.2	74.4
Some times a month	56	11.2	11.2	85.6

Table (continued)

	Frequency	Percent	Valid percent	Cumulative percent
Some times a week	48	9.6	9.6	95.2
Every, or almost every day	24	4.8	4.8	100.0
Total	500	100.0	100.0	

How often do you write submissions to newsgroups, Internet fora, blogs etc.?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or almost never	287	57.4	57.4	57.4
Some times a year	89	17.8	17.8	75.2
Some times a month	63	12.6	12.6	87.8
Some times a week	38	7.6	7.6	95.4
Every, or almost every day	23	4.6	4.6	100.0
Total	500	100.0	100.0	

Watch and listen to others films/videos and pictures

	Frequency	Percent	Valid percent	Cumulative percent
Valid Not important at all	17	3.4	10.2	10.2
Somewhat unimportant	13	2.6	7.8	18.1
Neutral	49	9.8	29.5	47.6
Somewhat important	51	10.2	30.7	78.3
Very important	36	7.2	21.7	100.0
Total	166	33.2	100.0	
Missing Don't know	8	1.6		
System	326	65.2		
Total	334	66.8		
Total	500	100.0		

How often do you publish pictures on the Internet?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or almost never	298	59.6	59.6	59.6
Some times a year	84	16.8	16.8	76.4
Some times a month	84	16.8	16.8	93.2
Some times a week	22	4.4	4.4	97.6
Every, or almost every day	12	2.4	2.4	100.0
Total	500	100.0	100.0	

How often do you use file sharing programs for music and video?

	Frequency	Percent	Valid percent	Cumulative percent
Valid Never, or almost never	219	43.8	43.8	43.8
Some times a year	90	18.0	18.0	61.8
Some times a month	78	15.6	15.6	77.4
Some times a week	66	13.2	13.2	90.6
Every, or almost every day	47	9.4	9.4	100.0
Total	500	100.0	100.0	

A.2. Study I – Questionnaire

The questions were originally written in Norwegian and were translated into English by the authors. We present here an excerpt from the questionnaire. A more detailed description can be found in [Brandtzæg and Heim \(2007\)](#).

- Do you have broadband Internet access at home (ADSL, cable, fibre etc)?
- Yes
- No
- Don't know
- How much do you agree or disagree with the following statements:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
It is very important to me to have a good PC.						
I depend on the Internet to get many practical tasks done.						
My PC and the Internet are very good sources of entertainment for me						
To me, the Internet is an important way to keep in touch with other people.						
The mobile phone is very important to me, to keep in touch with family and friends.						

- **What is the most important reason for your participation in an online community?**

I participate because _____

- **Questions about your use of PC, TV and Internet. How often do you...**

	Never, or almost never	Several times a year	Several times a month	Once a week	Daily
...download software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...do programming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...make your own web pages (at work or privately)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...use a text editor (at work or privately)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...use a spreadsheet (at work or privately)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...read newspapers and the like on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...read newspapers and the like on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...buy clothes or sportswear on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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