

Please quote as: Goswami, S.; Köbler, F.; Leimeister, J. M. & Krcmar, H. (2010): Using Online Social Networking to Enhance Social Connectedness and Social Support for the Elderly. In: International Conference on Information Systems (ICIS) 2010, Saint Louis, MO, USA.

Using Online Social Networking to Enhance Social Connectedness and Social Support for the Elderly

Journal:	<i>International Conference on Information Systems 2010</i>
Manuscript ID:	ICIS-0357-2010.R1
Track:	Human Behavior and IT
Keywords:	Social networks, Online communities, Social ties, Field experiment, Human factors
Abstract:	<p>Social integration is crucial for the overall well-being of the elderly who are more prone to social exclusion because of the natural aging process. We propose online social networking as means to enhance social connectedness and social support – two aspects of social networks that have significant implications for the well-being of elderly. While prior research investigating the benefits of online social networking has primarily focused on user groups such as teenagers and college students, there is less understanding on how online social networks can be used to support and strengthen social ties among elderly. This study intends to investigate means of increasing social connectedness and social support among elderly through participation in online social networks, and the resulting implications on overall satisfaction with life. Our aim is to identify features of online social networks that cater to the specific social connectedness and support related requirements of elderly users.</p>

Using Online Social Networking to Enhance Social Connectedness and Social Support for the Elderly

Research-in-Progress

Suparna Goswami

Chair for Information Systems
Technische Universität München
Boltzmannstr. 3, 85748 Garching
Germany
suparna.goswami@in.tum.de

Felix Köbler

Chair for Information Systems
Technische Universität München
Boltzmannstr. 3, 85748 Garching
Germany
felix.koebler@in.tum.de

Jan Marco Leimeister

Chair for Information Systems
Universität Kassel
Nora-Platiel-Str. 4, 34127 Kassel
Germany
leimeister@uni-kassel.de

Helmut Krcmar

Chair for Information Systems
Technische Universität München
Boltzmannstr. 3, 85748 Garching
Germany
krcmar@in.tum.de

Keywords: Social networks, Online communities, Social ties, Field experiment, Human factors

Abstract

Social integration is crucial for the overall well-being of the elderly who are more prone to social exclusion because of the natural aging process. We propose online social networking as means to enhance social connectedness and social support – two aspects of social networks that have significant implications for the well-being of elderly. While prior research investigating the benefits of online social networking has primarily focused on user groups such as teenagers and college students, there is less understanding on how online social networks can be used to support and strengthen social ties among elderly. This study intends to investigate means of increasing social connectedness and social support among elderly through participation in online social networks, and the resulting implications on overall satisfaction with life. Our aim is to identify features of online social networks that cater to the specific social connectedness and support related requirements of elderly users.

Acknowledgement

The underlying research was conducted in the context of the research project Mobil50+ (Innovative NFC- and IT-based Services for Mobile and Active Life for the 50+ Generation). Mobil50+ is funded by the German Federal Ministry of Education and Research (BMBF - FKZ: 01FC08046). It is a joint project of the Technische Universität München and various partners. For further information, see www.projekt-mobil50.de.

Using Online Social Networking to Enhance Social Connectedness and Social Support for the Elderly

Research-in-Progress

Introduction

Aging population is a reality in most developed societies today. In Germany for instance, it has been reported that by the year 2050 more than 30% of the population will be made up of people over the age of 65 (Eisenmenger et al. 2006). This shift in demographic profile of countries poses significant challenges for the government, healthcare providers, and the society at large. Such challenges include not only monetary costs in terms of providing healthcare and other social benefits to the elderly, but also on devising ways of keeping them functional (both cognitively and physically) and active in the society, and devising support services that can improve the quality of life for the elderly. In addition to age and health-related problems, the elderly people also face a higher risk of suffering social exclusion (Craig 2004). Research in geriatric science has further found that lack of participation in social activities, and reduced social contacts increases the risk of functional decline among elderly, while emotional support from social networks can keep them functionally capable (Stuck et al. 1999). Social interaction is essential to satisfy various basic human needs such as that of being loved and the need to belong (Maslow 1954).

Addressing the above-mentioned issues related to an aging population in a more effective and efficient manner by making use of modern technological advances is therefore a growing concern among researchers and policy makers. A few research projects have examined the role of online networks for supporting offline communities (Arnold 2003; Carroll and Rosson 2003; Cohill and Kavanaugh 2000; de Cindio et al. 2003; Hampton and Wellman 2003; Meredyth et al. 2004; Pinkett 2003). These projects had different motivations, and met with varying levels of success. While some of these projects were able to demonstrate that the use of online networks to support geographically co-located communities resulted in higher levels of network identity (e.g., Hampton and Wellman 2003), none of these projects focused specifically towards the elderly population, and the needs and requirements of this particular target group. We use the term 'elderly' to refer to people who are above the age of 65. Although there exists no established definition of old age or the elderly, the World Health Organization (WHO) has suggested that the age at which a person become eligible for occupational retirement can be considered an acceptable definition (WHO 2010), and the retirement age in most developed countries is 65¹.

We propose the use of online social networking to facilitate social interactions among elderly and help reduce the risk of social exclusion. The phenomenon of online social networking, fueled by the advances in Internet technologies, and the advent of Web 2.0 (O'Reilly 2005) – a participative human-centric virtual environment has generated significant academic as well as industry interest. Researchers have attempted to understand the phenomenon by focusing on issues such as what motivates people to join and regularly participate on online social networking sites (SNS), characterizing and classifying different groups of users of SNS, benefits and gratifications that users experience from participating in such sites, and the risks and costs (such as security and privacy implications) incurred from participation (Acquisti and Gross 2006; Ellison et al. 2007; Lampe et al. 2006). However, in most documented research, the target population has been college students or teenagers, i.e., predominantly young people who are usually the early adopters and the more active users of such technologies. Barring a few examples (Dixon 1997; Kanayama 2003; Wright 2000), there has been little research investigating online social networking among the elderly, the motivations that elderly might have in participating in such networks and factors that can facilitate or inhibit them. The possible ways of using these technologies to support social interaction and other needs among elderly, is therefore much less understood.

This study aims to analyze the social needs of elderly and analyze how these needs can be better supported through the use of online social networks. Drawing from research in psychology and gerontology, we identify the need to

¹ Wikipedia (<http://en.wikipedia.org/wiki/Retirement>)

feel socially connected and perceived social support as two important aspects of social needs that the elderly have. Based on research on online social networking, we propose that an SNS that addresses these needs, will be successful among elderly users, and can have a positive effect on elderly people's overall satisfaction with life. We further identify design and technology features of the SNS that can enhance feelings of connectedness and support among the elderly, given that current SNS are particularly targeted towards younger people, and therefore only cater to the requirements of this segment of the population, and might not always be suitable for elderly users having a different level of computer usage skills and familiarity (Saunders 2004).

The rest of this paper is organized as follows: the following section provides the theoretical background for our proposed research model; this is followed by a description of the research methodology we intend to use to validate our research model, and some initial findings from focus group interviews and their implications. We end by briefly stating the implications and likely contributions of this research.

Theoretical Development

Sense of belonging and community are important aspects of people's overall quality of life (Putnam 2000) that influence both psychological and physical well-being. Communities or social networks result from interaction with other human beings, and are essential for satisfying various human needs (Maslow 1954) and giving access to several forms of social capital (Huysman and Wulf 2004). A social network represents the web of social ties within which an individual lives. A social network can be characterized by its structural properties such as the network size, density, strength of ties, homogeneity and others (Scott 1991), and its functional characteristics such as social connectedness, social support, social influence and social comparison (Berkman and Glass 2000). While the structural characteristics describe the properties of the social network at large, the functional characteristics can influence the general well-being of network members. Previous research has identified several beneficial outcomes of social connectedness and social support among the elderly (Bowling et al. 1991; Cohen 1988; Cornwell et al. 2008; Rook 1990). Therefore, we identify social connectedness and social support as means of overcoming isolation, and enhancing social integration in the lives of elderly people.

Social Connectedness

The social network provides the context within which individuals can interact with each other leading to perceptions of being socially connected (Ashida and Heaney 2008). While social connectedness is often measured objectively by the number of ties that individuals have, in reality it has a more psychological and subjective connotation, since individuals assess their social relationships based on the extent to which they feel connected. Accordingly, the term social connectedness is used to represent the quality and number of connections an individual has with other people in their social circle. Lack of social connectedness may be experienced as feelings of loneliness and a desire for companionship (Rook 1990).

Social connectedness is therefore a relevant notion for all segments of the population, irrespective of age or occupation. However, it is of particular relevance for the elderly because isolation is often believed to have a strong negative influence on mental and physical health of people compared to the positive effects of being socially integrated (Cohen 1988). Aging typically results in isolation from voluntary and involuntary diminishes in social interactions owing to health issues, retirement from active occupation, reduced role in the family, and reduced mobility. Older adults' ongoing integration through social networks has been suggested as the key to successful aging (Cornwell et al. 2008). Research on aging has suggested many benefits of social connectedness among elderly people, such as moderating the rate and extent of cognitive decline (Bassuk et al. 1999; Fratiglioni et al. 2000), and higher self-reported physical health (Rook 1990). Accordingly, increasing research attention is being focused on identifying the different social network related factors that can be used to assess social connectedness among elderly and the positive effects of social connectedness (Ashida and Heaney 2008; Cornwell et al. 2008).

Social Support

Social support can be conceptualized as 'information leading a person/the subject to believe that he/she is cared for and loved, esteemed and is a member of a network of mutual obligations' (Cobb 1976). Social support exists only if it leads to certain beliefs in the prospective recipient. The perceived availability of social support is believed to be a source of enhanced self-esteem, feelings of belonging and security and an overall positive affect. One of the most important functions of social networks is the provision of social support to its members. Social support occurs when

members of a network provide aid to each other with the intention of being helpful, in contrast to social connectedness which can emerge without any conscious effort (Heaney and Israel 2002). The need for social support is likely to be particularly higher among elderly who suffer from aging related health problems (Ashida and Heaney 2008).

Social support can occur in different forms. A widely accepted typology of social support (House 1981) includes emotional support, instrumental support, informational support and appraisal support. *Emotional support* refers to expressions of empathy, love, trust and caring; *instrumental support* refers to aid and services of the tangible form, support in the form of advice, suggestions and information is referred to as *informational support*, while *appraisal support* refers to as information that is useful for self-evaluation. Significant research has shown that higher levels of social support are associated with better health and well-being among the elderly (Bowling et al. 1991).

Online Social Networking

Online social networking is a relatively new phenomenon that has gained significant popularity over the last decade. It is a form of computer mediated communication facilitated by advances in information and communication technologies, and the advent of Internet based applications, commonly referred to as Web 2.0 applications. Although academic research on online social networking has so far been relatively sparse, researchers are trying to identify and understand the different implications of participating in online social networks. For instance, there has been investigations on the privacy and security concerns that users of such networks have and how they affect their usage behavior (Acquisti and Gross 2006), different motivations of using SNS, such as for finding and connecting to strangers or for connecting and keeping up with acquaintances (boyd 2004; Joinson 2008; Lampe et al. 2006), how online profiles can be created and managed to increase the number of online connections that people have and enhance feelings of social connectedness among users (Köbler et al. 2010), and benefits that one could gain out of online social networks, such as enhanced social capital (Lampe et al. 2007; Wellman et al. 2001).

Much of the early research on virtual communities and computer mediated communication has been based on the assumption that people participating in virtual communities would be using these platforms to connect with individuals outside their pre-existing social group or location (Wellman et al. 1996) primarily based on shared interests or shared life scenarios. The role of virtual communities in providing informational, emotional and appraisal support to elderly and patients groups have been investigated (Kanayama 2000; Leimeister et al. 2008). Current social networking sites can be distinguished from these virtual communities by the fact that they are primarily used for the maintenance of existing ties, although they also allow for the creation of totally new online ties. For instance, in Facebook, the direction of usage is typically from offline to online, i.e., people are more likely to use it for maintaining their offline social network, rather than creating purely online ties. The use of such online social networking helps in strengthening and intensifying offline relationships that people have (Ellison et al. 2007; Lampe et al. 2006). Studies of geographically co-located community supported by online networks have further shown that computer mediated interactions had positive effects on community interaction and involvement (Hampton and Wellman 2003; Kavanaugh et al. 2005; Kavanaugh and Patterson 2001).

Given this characteristic of SNS, we identify the potential for using them as means for enhancing social engagement and interaction among the elderly. By enabling the replication of offline social networks in an online platform, SNS make it easier and cheaper for the elderly to keep their social ties active, and can therefore enhance feelings of social connectedness among the elderly. It has been suggested that being a member of online social networks give access to various forms of networks resources, enhances social capital, and satisfies different kinds of needs such as the informational needs (Donath and boyd 2004). By participating in online social networks, the elderly are likely to have better access to relevant information, and emotional and appraisal support. Further, such platforms can be designed to give them access to various forms of instrumental support as well.

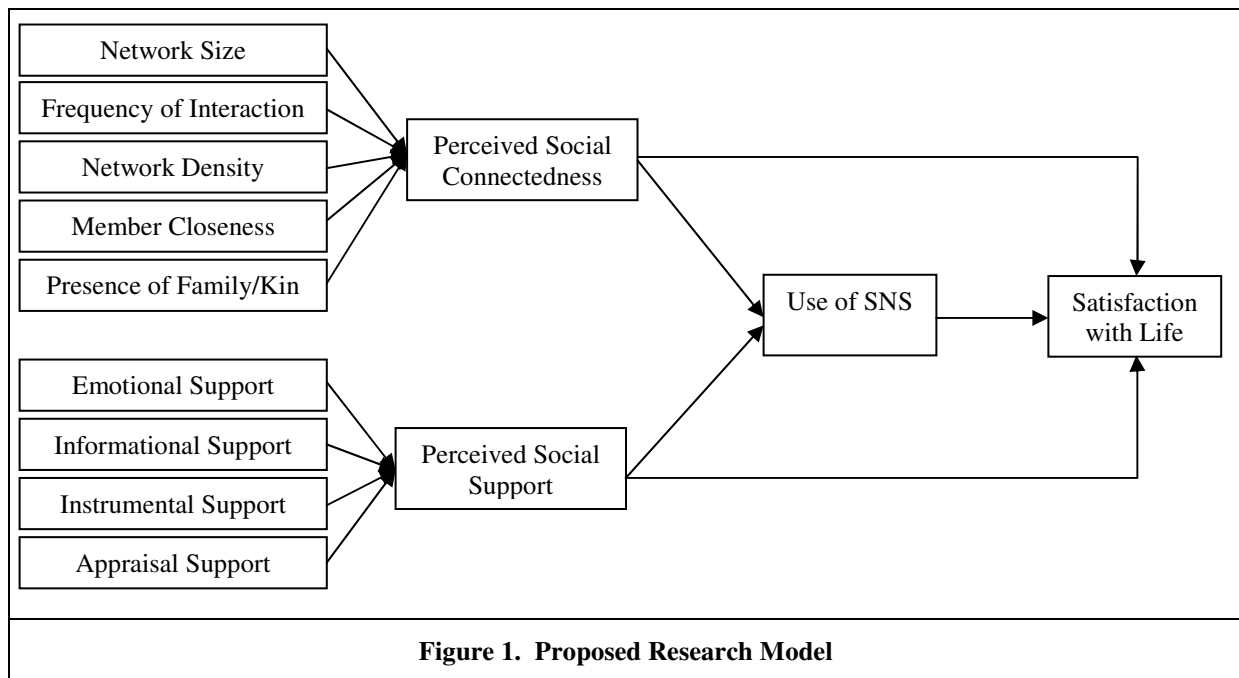
Proposed Research Model

Following the above discussion, we propose that active participation in SNS will have positive implications for the overall well-being of the elderly. Although there are some indications that older adults are increasingly joining some of the popular online social networks, penetration of SNS is still quite low among elderly, and existing online social networks primarily target the younger people as they form the largest user group. Accordingly, there is little understanding regarding the factors that can facilitate SNS use among the elderly.

Previous research on communication and media use by elderly has highlighted the key motivations of using both mass media and media for inter-personal communication – they are socialization, networking and mutual support, entertainment, intellectual stimulation and challenge, companionship and safety (Bleise 1982; Kanayama 2000). These motivations broadly highlight the need for social connectedness and social support that media use is expected to satisfy. SNS that effectively support these needs among the elderly is likely to be actively used by its members.

We propose that perceived social connectedness and perceived social support will be positively associated with the used of online social networking among the elderly. Feelings of social connectedness and social support are positively associated with the mental and physical health of individuals. While direct effects of these two variables on an individual's health are more difficult to measure, researchers have often relied on self-reported measures of health and life satisfaction as an outcome of social integration and as an indication of overall well-being (Bowling et al. 1991). Therefore, in this study we propose that perceived social connectedness and perceived social support will be positively associated with the overall satisfaction with life among elderly. Further, these relationships will be mediated by the use of SNS.

Social connectedness has been characterized by the size of the social network, frequency of contact with members of the network, network density, closeness to members of the network, network density and percentage of network members who are family or kin (Ashida and Heaney 2008; Cornwell et al. 2008); while social support comprises emotional, instrumental, informational and appraisal support (Ashida and Heaney 2008). Users will perceive high social connectedness and high social support provided the SNS that they use caters to the above dimensions of connectedness and support. Therefore, the above dimensions will be used to assess perceived social connectedness and perceived social support, which will then be used as predictors for the use of SNS and satisfaction with life. Figure 1 represents the overall research model.



Existing SNS have features that can address some of the above mentioned needs. However there has not been any systematic investigation on how the existing features can support these specific needs effectively for the elderly. Previous research further indicates that elderly users differ from younger users both in terms of their attitudes regarding computer and Internet use, and also their use related capabilities (Saunders 2004). Previous studies, investigating the effects of age on the usage of information systems, document clear age-related differences in the importance of various factors in technology adoption and usage (Morris and Venkatesh 2000). Among other factors, barriers to use include complexity, ergonomic impediments and lack of interest (Carpenter and Buday 2007). Accordingly, there have been suggestions that the design of applications and services targeted towards the elderly

should take into account the elderly users' perceptions of the technology, and the age-related cognitive, perceptual and motor impairment that they may suffer from (Browne 2000; Carpenter and Buday 2007).

In particular, impairment of visual and cognitive abilities influences the requirements for design of web-based systems for the elderly (Becker 2004; Dickinson et al. 2007; Echt et al. 1998; Hart and Chaparro 2004). For instance, user interface characteristics such as text formatting, layout, colors, navigation, and content presentation (text as well as multimedia) need to be taken into account when designing systems for the elderly (Becker 2004). Elderly users are also likely to encounter complexity in interpreting the language and phrasing commonly used in the SNS. For example, terms such as 'friend request', 'scribble on the wall', 'poke' (terms commonly used in Facebook) might appear totally alien to elderly users encountering such a system for the first time.

Given that elderly users can only fully benefit from online social networking through active participation and use, in addition to testing the proposed research model, we would like to understand the specific expectations and concerns that the elderly have regarding online social networking. This understanding can facilitate the design of an SNS catering to this population segment and therefore make it possible for the elderly people to take advantage SNS and realize various social benefits through active participation and use.

Research Methodology

This study aims to follow a multi-pronged research approach that comprises: (i) understanding the expectations, needs and concerns that elderly users are likely to have regarding online social networking; (ii) review existing features and functionalities provided by the commonly available SNS, and match them with the requirements elicited in the first step; (iii) configure an SNS for the elderly based on the findings of steps (i) and (ii), i.e., the SNS should address the requirements of the elderly; (iv) design a field experiment where a target elderly population participate in using and assessing the configured SNS; and (v) test the proposed research model using a questionnaire to measure perceptions regarding social support, social connectedness and the other constructs in the research model. The various constructs in the research model will be either measured directly through the system (based on the SNS usage behavior), or will be measured subjectively using survey instruments. Where possible we will use validated scales from literature.

Therefore, in addition to testing the role of perceived social connectedness and perceived social support in the active participation of elderly people in SNS, we would like to identify gaps in current SNS applications and come up with design guidelines for addressing those gaps. As the first step, requirements for an SNS were elicited by conducting focus group interviews with the elderly as participants. We are currently in the process of analyzing the popular existing SNS to identify which features can be used to satisfy the various requirements that the elderly have.

Focus Group Interviews

Two rounds of focus group interviews were conducted. Interview participants came from a small town in southern Germany. Prospective participants from different social and professional backgrounds were shortlisted and invited to participate in the focus groups. People who responded to the invitation were distributed into two groups, one comprising 8 members, and the other group made up of 12 members. The groups were equally distributed in terms of gender. While, no attempt was made to control for prior acquaintance among the participants, it was later found that some of the participants already knew each other (through memberships in same clubs or other interest groups). All participants were retired from their primary professions, although some of them were involved in different community and social service related part-time occupations. Two of the researchers were present in order to brief the participants regarding the purpose of the focus group, ask questions and facilitate the discussions.

In both focus groups, participants were already familiar with computer and Internet use, and also had access to computers. It was also found that the participants of both focus groups had some familiarity with the current developments in online social media, although the groups experienced significant problems in interpreting or understanding terms. For instance, when the researchers mentioned the term online social networking, participants could not understand. However, when the example of Facebook was suggested, many of the participants mentioned that they knew about Facebook. Most of them had heard about it from their children or grandchildren, or from different media sources. Many of the participants also had familiarity with the basic functionalities of existing SNS. However, participants indicated concerns regarding the complexity of these sites, and a sense of feeling overwhelmed or lost if required to manage too many social ties in a vast network. Further, they perceived the task of

searching for personal contacts and establishing ties a high-effort task. In addition to perceived complexity, participants also expressed doubts on the trust-worthiness of the Internet in general, and on the authenticity of profiles in the SNS. In general, they expressed significant fear of miscreant behavior going on in the Internet.

Irrespective of the above mentioned concerns, participants indicated a willingness to join SNS. The motivation was primarily cross-generational communication, such as being able to keep in frequent touch with grandchildren, and other relatives and friends. Most participants indicated that even currently, their primary reason for using computers and Internet is to be able to send emails and keep contact with acquaintances. Regarding, joining online social networks, most participants felt that this would enable them to be a more significant part of their grandchildren's lives.

When asked what their expectations were in terms of an online social network, they indicated a preference for a network that restricts membership, so that the chances of possible harassment from unknown users are minimized. The participants also expressed that they would like to have clear guidelines of how to manage their personal settings, and ties. Further, they expect simpler means to being able to establish ties with their acquaintances. These suggest that a local network or a geographically bounded network might be able to allay some of the fears and concerns of the elderly users, and also be better suited to address their simplicity related needs.

In addition the purely social-networking related needs, participants also indicated that they would like to have more information regarding locally organized social and community events, being able to set up meetings with friends, and schedule get-togethers. Further, they said that they would also like to have updated information regarding health-care and emergency services that they could access, and locally-relevant information, such as that of price deals at local shops, availability of specific products in neighborhood shops and so on. These indicate, that not only are the elderly people concerned with social connectedness related features of SNS, they would also like these applications to provided them with informational, instrumental and emotional support as well. In our focus groups, participants seemed to be excited by the idea that, a single system, could act as a source of information on wide ranging topics, community support, and also as means of keeping up with their children and grandchildren, who are often geographically dispersed.

Analysis of SNS Features

There are many examples of popular SNS such as Facebook, MySpace, Friendster, LinkedIn, etc. Although these sites sometimes cater to slightly different user groups, they can be characterized by a common set of functionalities. The basic features provided by established SNS are creation of individual profiles, searching for other people's profiles, establishing connections or ties to other members; messaging, chatting and other communication-related features such as commenting on other people's contents and profiles (using pin-boards and wall entries in Facebook); sharing of photos or videos or links to other interesting Internet sites, and communicating emotional or situational states through status updates.

The different features provided by the SNS can be broadly categorized as *self-presentation related features* (creation of profile, using different profile settings, deciding on the amount of information to share, setting privacy level and so on); *managing social network related features* (sending and accepting friend requests, searching for friends, inviting people to join the network, forming and joining groups); *communication related features* (chatting, text messaging, commenting on other people's profiles); *content sharing features* (uploading photos and videos, links to other information); *awareness sharing features* (updating emotional or situational states such location information, activity information, likes and dislikes).

Table 1 provides a mapping between the elicited requirements/concerns that the elderly have and the current features that can be used to support/address them. Based on our analysis, we provide some initial guidelines to finetune SNS to cater to the elderly. These guidelines will be used to configure an SNS targeted specifically for the elderly.

Table 1. SNS Features – Specific Requirements/Concerns: A Mapping		
	Supporting Features	Suggested Enhancements
Requirements		
Maintaining social ties	Searching for social ties, Establishing connections	Support for initial establishment of ties, Authenticity verification of established profiles

Communication	Sending personal messages, Instant messaging, Comments, Status updates	Voice chats
Keeping up with family members (especially grandchildren)	Personal messages, Photo and video sharing, Status updates	
Organize get-togethers, meetings	Managing events	Integration of / Synchronization of electronic calendar systems
Local community events	Not supported	Integration of local information
Access to emergency or health care services	Not supported	Single-click access to local emergency/ other elderly-specific services
Concerns		
Complexity of managing ties	Simple alphabetically displayed contact list	Graphical display of established ties, Categorization of established ties and creation of sub-networks (e.g. friends/family, coworkers)
Searching for acquaintances	Search for friends / contacts	Local site administrator for initial setting up of profile and establishing connections, Support for authenticity of established profiles
Restricted membership	Setting up groups	Closed groups/sub-networks (membership only by invitation)
Trustworthiness, harassment	Privacy settings	Guidance to enable privacy settings, Reporting of harassment, Blocking of users

Implications and Contributions

As computers and the Internet permeate and enhance different aspects of human life, there is an increasing realization that one group of users – the elderly – risk being left-behind in this development. Therefore, there is a growing need to take into account the specific needs and requirements of this group of users and investigate ways of addressing them. This study addresses this need by examining the viability of SNS as means of facilitating social connectedness and providing social support to the elderly.

The findings of this study are likely to have significant implications along different dimensions. The validated research model will show that SNS can not only address social needs of teenagers and younger adults, but can also be used to satisfy similar needs among the elderly users. Our initial findings from focus group interviews and extensive analysis of SNS suggest that applications such as Facebook currently support most of the expectations that elderly users have. Nevertheless, there is a need to address authenticity and complexity related concerns that were brought up by the focus groups. This could be done by configuring localized, closed sub-networks within the existing SNS, and providing more personalized assistance and guidance to the elderly users on initial profile creation and setup. Further, such localized sub-networks should also incorporate practically and locally relevant information, and access to various essential services. These findings can be further translated into concrete design guidelines for SNS or other forms of Internet based applications that cater to elderly users. Our study, therefore, also addresses the call for more research on investigating the web accessibility issues faced by elderly, and guidelines towards better design (Arch 2008).

Conclusions

Identifying social connectedness and social support as two primary aspects of social interaction that can enhance the lives of elderly people, this study investigates how SNS can be used to address social connectedness and social support related needs among the elderly. More specifically, we try to understand the impediments faced by elderly users and means of overcoming them through appropriate features and user design.

References

- Acquisti, A., and Gross, R. "Imagined Communities: Awareness, Information Sharing and Privacy on The Facebook," 6th Workshop on Privacy Enhancing Technologies, Cambridge, UK, 2006.
- Arch, A. "Web Accessibility for Older Users: A Literature Review," 2008.
- Arnold, M. "Intranets, community, and social capital: The case of Williams Bay," *Bulletin of Science, Technology & Society* (23:2) 2003, pp 78-87.
- Ashida, S., and Heaney, C.A. "Differential Associations of Social Support and Social Connectedness with Structural Features of Social Networks and the Health Status of Older Adults," *Journal of Aging and Health* (20:7) 2008, pp 872-893.
- Bassuk, S., Glass, T., and Berkman, L. "Social disengagement and incident cognitive decline in community-dwelling elderly persons," *Annals of Internal Medicine* (131:3) 1999, pp 165-173.
- Becker, S. "A study of web usability for older adults seeking online health resources," *ACM Transactions on Computer-Human Interaction*, 2004, pp. 387 - 406.
- Berkman, L.F., and Glass, T.A. "Social integration, social networks, social support, and health," in: *Social Epidemiology* L.F. Berkman and I. Kawachi (eds.), Oxford University Press, New York, 2000, pp. 137-173.
- Bleise, N. "Media in the Rocking Chair: Media Uses and Functions Among the Elderly," in: *Inter/Media: Interpersonal Communication in a Media World*, G. Gumpert and R. Cathcart (eds.), Oxford University Press, New York, 1982, p. 624.
- Bowling, A., Farquhar, M., and Browne, P. "Life Satisfaction and Associations with Social Network and Support Variables in Three Samples of Elderly People," *International Journal of Geriatric Psychiatry* (6) 1991, pp 549-566.
- boyd, d. "Friendster and Publicly Articulated Social Networks," SIGCHI Conference on Human Factors and Computing Systems, Vienna, Austria, 2004.
- Browne, H. "Accessibility and Usability of Information Technology by the Elderly," 2000.
- Carpenter, B.D., and Buday, S. "Computer use among older adults in a naturally occurring retirement community," *Computers in Human Behavior* (23:6) 2007, pp 3012-3024.
- Carroll, J.M., and Rosson, M.B. "A trajectory for community networks," *Information Society* (19:5) 2003, pp 381-394.
- Cobb, S. "Social support as moderator of life stress," *Psychosomatic Medicine* (38) 1976, pp 300-314.
- Cohen, S. "Psychosocial Models of the Role of Social Support in the Etiology of Physical Disease," *Health Psychology* (7:3) 1988, pp 269 - 297.
- Cohill, A.M., and Kavanaugh, A.L. *Community networks: Lessons from Blacksburg, Virginia* Artech House, Norwood, MA, 2000.
- Cornwell, B., Laumann, E.O., and Schumm, L.P. "The Social Connectedness of Older Adults: A National Profile," *American Sociological Review* (73:2) 2008, pp 185-2003.
- Craig, G. "Citizenship, Exclusion and Older People," *Journal of Social Policy* (33:1) 2004, pp 95-114.
- de Cindio, F., Gentile, O., Grew, P., and Redolfi, D. "Community networks: Rules of behavior and social structure," *The Information Society* (19:5) 2003, pp 395-406.
- Dickinson, A., Smith, M., Arnott, J., Newell, A., and Hill, R. "Approaches to web search and navigation for older computer novices," in: *SIGCHI conference on Human factors in computing systems*, Association for Computing Machinery San Jose, CA, 2007, pp. 281 - 290.
- Dixon, J.M. *Predicting Seniors' Use of Cyberspace* Garland, New York, 1997.
- Donath, J., and boyd, d. "Public displays of connection," *BT Technology Journal* (22:4) 2004, pp 71-82.
- Echt, K., Morrell, R., and Park, D. "Effects of age and training formats on basic computer skill acquisition in older adults," *Educational Gerontology* (24:1) 1998.
- Eisenmenger, M., Pöttsch, O., and Sommer, B. "Bevölkerung Deutschlands bis 2050-11. koordinierte Bevölkerungsvorausberechnung," Statistisches Bundesamt, Wiesbaden.
- Ellison, N., Steinfield, C., and Lampe, C. "The Benefits of Facebook Friends: Social Capital and College Students Use of Online Social Network Sites," *Journal of Computer-Mediated Communication* (12:4) 2007, pp 1143-1168.
- Fratiglioni, L., Wang, H., Ericsson, K., Maytan, M., and Winblad, B. "Influence of social network on occurrence of dementia: a community-based longitudinal study," *Lancet*. 2000 Apr 15, pp 1315-1319.
- Hampton, K., and Wellman, B. "Neighboring in Netville: How the Internet Supports Community and Social Capital in a Wired Suburb.," *City & Community* (2:4) 2003, pp 277-311.

- Hart, T., and Chaparro, B. "Evaluation of Websites for Older Adults: How "Senior Friendly" are they," *Usability News* (6:1) 2004.
- Heaney, C.A., and Israel, B.A. "Social networks and social support," in: *Health behavior and health education: Theory, research, and practice* B.K.R. K. Glanz, & F. M. Lewis (ed.), Jossey-Bass, San Francisco, 2002, pp. 185-209.
- House, J.S. *Work Stress and Social Support* Addison-Wesley, Reading, MA, 1981.
- Huysman, M., and Wulf, V. (eds.) *Social Capital and Information Technology*. MIT Press, Cambridge, MA, 2004.
- Joinson, A.N. "Looking at, looking up or keeping up with people?: motives and use of facebook," in: *Proceeding of the twenty-sixth annual SIGCHI conference on Human factors in computing systems*, ACM, Florence, Italy, 2008.
- Kanayama, T. "The Pilot Study of the Uses of Electronic Mail by the Elderly," in: *2000 Mid-Year Conference of AEJMC Graduate Education Interest Group*, Boulder, CO, 2000.
- Kanayama, T. "Ethnographic Research on the Experience of Japanese Elderly People Online," *New Media & Society* (5:2) 2003, pp 267-288.
- Kavanaugh, A., Carroll, J.M., Rosson, M.B., Zin, T.T., and Reese, D.D. "Community Networks: Where Offline Communities Meet Online," *Journal of Computer-Mediated Communication* (10:4) 2005.
- Kavanaugh, A., and Patterson, S. "The Impact of Community Computer Networks on Social Capital and Community Involvement," *American Behavior Scientist* (45:3) 2001, pp 496-509.
- Köbler, F., Riedl, C., Vetter, C., Leimeister, J.M., and Krcmar, H. "Social Connectedness on Facebook – An explorative study on status message usage," 16th Americas Conference on Information Systems, Lima, Peru, 2010.
- Lampe, C., Ellison, N., and Steinfield, C. "A face(book) in the crowd: social Searching vs. social browsing," Proc. 20th anniv. conf. on CSCW, ACM, Banff, Alberta, Canada, 2006, pp. 167-170.
- Lampe, C.A.C., Ellison, N., and Steinfield, C. "A familiar face(book): profile elements as signals in an online social network," Proc. CHI, ACM, San Jose, California, USA, 2007, pp. 435-444.
- Leimeister, J.M., Schweizer, K., Leimeister, S., and Krcmar, H. "Do virtual communities matter for the social support of patients?," *Information Technology & People* (21:4) 2008, pp 350-374.
- Maslow, A. *Motivation and personality* Harper & Row, New York, 1954.
- Meredyth, D., Ewing, S., and Thomas, J. "Neighbourhood renewal and government by community," *International Journal of Cultural Policy* (10:1) 2004, pp 85-101.
- Morris, M.G., and Venkatesh, V. "Age Differences in Technology Adoption Decisions: Implications for a Changing Work Force," *Personnel Psychology* (53:2) 2000, pp 375-403.
- O'Reilly, T. "What Is Web 2.0 - Design Patterns and Business Models for the Next Generation of Software," 2005.
- Pinkett, R.D. "Community technology and community building: Early results from the creating community connections project," *The Information Society* (19:5) 2003, pp 365-379.
- Putnam, R.D. *Bowling Alone: The collapse and revival of American community* Simon & Schuster, New York, 2000.
- Rook, K.S. "Social relationships as a source of companionship: Implications for olderadults' psychological well-being," in: *Social support: An interactional view*, B.R. Sarason, I.G. Sarason and R.P. Gregory (eds.), John Wiley, New York, 1990, pp. 219-250.
- Saunders, E.J. "Maximizing computer use among the elderly in rural senior centers," *Educational Gerontology* (30:7) 2004, pp 573-585.
- Scott, J. *Social Network Analysis* Sage, London, 1991.
- Stuck, A.E., Waltherta, J.M., Nikolausb, T., Bülac, C.J., Hohmannb, C., and Beck, J.C. "Risk factors for functional status decline in community-living elderly people: a systematic literature review," *Social Science & Medicine* (48:4) 1999, pp 445-469.
- Wellman, B., Haase, A.Q., Witte, J., and Hampton, K. "Does the internet increase, decrease, or supplement social capital? Social networks, participation and community commitment," *American Behavioral Scientist* (45) 2001.
- Wellman, B., Salaff, J., Dimitrova, D., Garton, L., Gulia, M., and Haythornthwaite, C. "Computer Networks as Social Networks: Collaborative Work, Telework, and Virtual Community," *Annual Review of Sociology* (22) 1996, pp 213-238.
- WHO "Definition of an Older or Elderly Person," 2010.
- Wright, K. "Computer-mediated Social Support, Order Adults, and Coping," *Journal of Communication* (50:3) 2000, pp 100-118.