



AALBORG UNIVERSITY
DENMARK

Aalborg Universitet

Next Generation Social Networks

Elicitation of User Requirements

Sørensen, Lene Tolstrup; Skouby, Knud Erik

Published in:

IEEE 19th International Symposium on Personal, Indoor and Mobile Radio Communications, 2008. PIMRC 2008

Publication date:

2008

Document Version

Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

Citation for published version (APA):

Sørensen, L. T., & Skouby, K. E. (2008). Next Generation Social Networks: Elicitation of User Requirements. In *IEEE 19th International Symposium on Personal, Indoor and Mobile Radio Communications, 2008. PIMRC 2008*. IEEE.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

Next Generation Social Networks – Elicitation of User Requirements

L. Sørensen and K.E. Skouby¹

Abstract—When it comes to discussing the future of electronic communication, social networking is the buzzword. The Internet has become a platform where new social networks emerge and the Internet it itself support the more traditional computer supported communication. The way users build and verifies different online networks for communities of people who share interests or individuals who presents themselves through user produced content is what makes up the social networking of today. The purpose of this paper is to discuss perceived user requirements to the next generation social networks. The paper is based on a survey of users working within the ICT field as well as user requirement categorizations developed within the WWRF.

Index Terms—Computer supported communication, social networks, user requirements, Web-applications.

I. INTRODUCTION

DEVELOPMENTS in the Internet open, from a user's point of view completely new possibilities for communication. Particularly interactivity is strengthened in a way that brings electronic communication closer to the qualities of traditional communication that for many are lost in the “ways of modern life”. The new possibilities have the potentials to enhance both the actual and the traditional social communication both with respect to geographical and social reach as *social networking*. Social networking or Web 2.0 technology presented on specific sites such as MySpace, Facebook and LinkedIn, etc. provides a foundation for communication, exchanging of rich material such as pictures and video, creating new communities, and for searching and connecting with old and new friends through different communities. What characterizes many of the social networking sites today is that users on the one side must commit to and become a member of the “organization” to be able to use the features. On the other side, many sites (such as MySpace and Facebook) then open up for possibilities of exercising user creativity and self-management in relation to the activities that take place within the frames of the web-site. The tendency clearly provides a way for the users to become more autonomous with respect to “for what” and “how to” use the web-services.

For some time, it has been discussed what technically can

be foreseen or expected for the coming Web 3.0 and 4.0 versions: semantic search, semantic databases, widgets, intelligent personal agents and distributed search are some of the elements identified, [1]. Seen from a user perspective, the Web 2.0 created a jump in the user-experience of the Web. Question is then what Web 3.0 and 4.0 will mean for the users. In [2] as well as [3] there is pointed at semantics, trust and identity as key when it comes to next generation Internet and social networks. Whether that is what users are looking for or not is still uncertain.

Experience has shown that system developments in general have a higher probability of succeeding if based on a set of user requirements, [4]. However, it is also clear that user requirements related to web-applications or web-systems are volatile and not easy to identify [4]. Several papers have over the last years tried to gain insight into the connection between user roles and perceived user requirements [5], [6], why people hang out on the Internet [7], to user interfaces and modularization of community support systems [8], for requirement elicitation for Web-based information systems [4], and functional requirements for knowledge sharing communities [9].

The aim of this paper is to contribute to the discussion on perceived user requirements and to address some of the key challenges for the development of the next generation social networks. A survey has been carried on to get insight reactions to existing social networking sites as a basis for identifying high level user requirements for next generation social network sites.

The content of the paper has been organized in the following way: Section 2 discusses the terms of social networking, and perceived user requirements in relation to the next generation social networks. Section 3 presents a survey being made with a set of users with an IT background and a substantial focus and knowledge on IT and social networks. The section presents both the survey itself as well as results. Discussions are made on the survey in Section 4. Finally, Section 5 presents the conclusions of the paper.

II. USER REQUIREMENTS IN SOCIAL NETWORKS

In this paper the concept of social networks is understood broadly: “as a social structure made of individuals/organizations that are tied together by one or more specific types of interdependencies. The interdependencies can be common values, visions, ideas, friends, interests, etc.” [10].

¹L. Sørensen and K.E. Skouby are with center for Communication, Media and Information technologies, Copenhagen Institute of Technology, , Lautrupvang 15, 2750 Ballerup, Denmark (e-mail: {ls; Skouby}@cmi.aau.dk).

Web-based social networks often are a result of usage of a social networking site. Boyd and Ellison (2007) [11] gives this definition of social networking sites: “as a web-based services that allow individuals to a) construct or public or semi-public profile within a bounded system, b) articulate a list of other users with whom they share a connection, and c) view and traverse their list of connections and those made by others within the system”. The social networking sites make it possible for individuals to meet strangers to form new networks that would never have been formed otherwise [12].

The broadness of the social networks concept combined with the large number of existing social networking sites make it a challenging task to discuss user requirements. The scope of user requirements is significantly enlarged and even more diffuse when it comes to discussing the requirements for the next generation social networks.

Generally there is agreement that (based on [4]):

- There do not exist one conventional requirement elicitation method
- User requirements are volatile and keep changing
- Users are generally diverse
- Key users are hard to identify.

The challenges in elicitation of user requirements call for more surveys and analyses on the topic.

Requirements definitions often focuses on system capabilities and conditions (see for example [13]). However, when it comes to user requirements of social networks a broader definition is needed that also address non-task related functions such as social, communicational and entertainment purposes as well as information/knowledge sharing and emotional support [4].

Within the World Wireless Research Forum (WWRF), a so-called reference model has been developed to describe characteristics at different levels of abstraction that is relevant to a human-centered view on wireless-systems [14]. This consists of two planes: the value plane that addresses the core human needs (for example belonging, privacy, control etc.); and the capability plane that focuses on how products/services and certain functionalities are provided by the technology (such as context adaptation, natural interaction, and personalization). In spite of the model has been developed to generally address wireless systems, it could easily be used also to address the Web-based social networks systems. However, when it comes to elicitation of requirements for future systems, this model may be too detailed – in particular when directly asking users directly.

Liu et al. (2001) [15] operate with four dimensions in characterizing users’ reactions to Web-design of Information Systems. These are [15]:

- Information and Service quality, which secures that the user gets satisfaction in using the services and information and has a benefit of using the system.
- System use, which relates to the way the user, uses the system. Often this is employed as a measure of quality and an important determinant of user satisfaction.

- Playfulness, which secures the return of the user. This shall secure that the user finds it enjoyable to use the system and that this provides intrinsic, personal and emotional rewards for the user.
- System design quality, which is linked to the security and reliability of the system. The system must have for example a quick error recovery to have a high system design quality.

These dimensions have all an importance on how users perceive the system and the quality of the system.

It is clear that when discussing user requirements for social networks sites, all of the above-mentioned dimensions and factors will be part of an overall requirement structure. In the following the elements from the reference model and the above-mentioned dimensions will be used to categorize user requirements in the survey carried out.

III. THE SURVEY: WHAT USERS WANT

A survey was conducted during spring 2008. The overall purpose of the survey was to get insight in the use of existing social networking sites and to get an idea of whether experienced ICT users were able to express requirements and needs to next generation social networks.

As mentioned before, there is no standard method for requirements elicitation and in particular not when it comes to the elicitation of needs and wishes for a future (yet unknown) service. Tang and Yang (2006), [6], made a survey on existing requirements to Web-based Information Systems. In that relation they used an open-ended questionnaire, as the basis for elicitation of the user requirements. However, since our survey has a future perspective, it was decided to carry out a number of small interviews instead. Fundamentally, discussing more futuristic services and wishes is not something that all users will be able to do and therefore there can be expected a certain need for facilitation of the more creative visions—which can be done better in an interview situation compared to a questionnaire.

A. *The survey and the users*

The survey was conducted through an interview with a total of 7 users (5 males and 2 females) and one of the authors. A set of questions were prepared before the interviews (see appendix). Questions were related to both the current use of social networking sites today, problems or ideas that the users had for improvement and explicit formulations on visions and needs for future social networking.

The number of seven users was perceived to be sufficient to identify key reactions and requirements—according to [16].

The users were all from the same occupational segment with an ICT focus in their jobs and with personal interests in keeping up with the technology trends of today. It was expected that the users all would have an opinion on the current network sites either by experience or by professional interests and perhaps even would have considered technology trends or wishes for the future on social networking sites.

The age of the users ranged from 34-55 years. This means

that the interviewed users could not be expected to be top users of the current social networking sites—in spite of some surveys showing that around 40% of (Facebook) users are between 35 and 55 years [17]. Furthermore, it must be mentioned that all users were Danish by origin, worked in Danish jobs but with an international perspective.

All interviews took between 30-60 minutes and were carried out in face-to-face situations either at work or in home environments.

B. Results

The interviews provided a number of statements, reactions and requirements towards the currently existing social network sites and to the concept of the next generation social networks. All users had a profile on an existing social networking site—most users had between 2-3 active profiles at a similar number of sites. Only one user was actively using one of the networking sites actively more than 15 minutes every day. Other users used their profiles on average once every 2–3 weeks.

Reactions to existing social network sites included:

- Considerations towards losing autonomy in life. One user said: “I don’t like that the system gives access for others to control me and to steer how I interact with the system and them”. This user was annoyed that other users in her social network actually used the systems to control what she was doing and if no responses were made within a short time frame (like 10 minutes), they would call her to check whether she was “unfriendly”.
- Always missing storage capacity
- Too many id’s to keep track of
- Spamming—too many invitations to all sorts of things from different contacts
- Lack of knowledge to where personal data go—lack of transparency
- Irritating that messages sent to you often, including web-links, often not work
- It is annoying with too many personal questions when registering a new profile
- It takes too long to register a profile (too much information in general)
- Existing sites are interested in just getting as much information as they can get—so that they can use it for targeted offers and material
- It is not possible to know what you import yourself when you get invitations from others—some kind of snowball effect in address books can almost be envisioned
- No sites are there for the users—they want to make money some way or another!
- Concerns towards how the sites can combine information and what it is used for.

In relation to reactions and requirements for the next generation social networks, the following issues were mentioned:

- Expects new user interfaces to devices and to managing data etc. The Microsoft “surface” project was mentioned as an example on expectations in interfaces—3D and lots of broadband resources—the augmented reality to become reality. Also speech as interaction mechanism is expected to be used in the future.
- A filter to set up yourself against unwanted information
- Full implementation towards mobile platforms—including GUI, services and content
- Expectations to context aware applications and services. However, several users mentioned that this would be fine IF they worked perfectly and discretely so they never interrupted and always would be right. One user said; “if they are wrong just a few times, it would be really irritating”.
- Expectations to implementation of Artificial Intelligence. The same kind of scepticism was expressed as for the context aware applications.
- Payment? NO!
- Expectations that there will be implemented a well-working global infra-structure (full availability of networks, applications, devices and user interfaces).
- Control of the user’s own life. No applications or networks shall steer or take over your life!
- Expected that there will be more possibilities in relation to setting up profiles which can be set to different levels dependent on mood, need, situation, context etc.
- Control on filtering so that the user can decide which offers he/she wants to receive and when he/she is available
- Expectations that future Web-applications will be able work globally and will be able for example to find special partners (in relation to work) across applications.

It shall be noted that many of the points mentioned above were expressed by more than one user.

Table 1 shows the number of users (in percentage) expressing the same kind of requirements. Overall, the users had almost the same needs however; the need for handling of private data and fewer profiles to handle seems to be the most important requirement from this survey. Fewest persons seem to be inquiring for a full global infra-structure. However, this can be explained by the fact that many users seem to take that as a pre-requisite – something that will be there.

TABLE I
USER REQUIREMENT EXPRESSED IN PERCENT OF TOTAL

Expressed user requirement	Percent of users expressed user requirement
Control and autonomy	42%
Data storage and exchange – full transparency for the user	29%
Private data – profiles and how personal data is handled	57%
System quality (robust underlying systems with minimum interference with the user)	42%
User interfaces (change)	42%
Privacy – filters set by users	42%
Full global infra-structure	29%

The user requirements have been grouped into the overall groupings to allow for a comparison between the expressed requirements

IV. DISCUSSION

When it comes to user requirement elicitation to next generation social networks, the user reactions from the survey can serve to identify some broad tendencies. Discussions shall be made to the following three areas: on the survey results and the overall requirements it has identified; on user requirement dimensions (relations to the WWRF reference model [14] and the Liu et al (2001) reaction dimensions [15]); and the approach itself.

A. User reactions and requirements

In general, the users were satisfied with the social networking sites they had an active profile on. They had no specific expectations to the social networks and what they could do using the sites—in fact there was a little scepticism to the hype of the phenomenon—only one user was active in the Web-based social networks on a daily basis.

The users did not feel that the sites were providing a significantly higher value to their social lives!

Generally the user reactions and requirements expressed in the survey fall into the following overall categories:

- Control and autonomy
- Data storage and exchange—full transparency
- Private data—profiles and how the personal data is handled
- System quality—systems which are intelligent and not makes too many errors, is underlying and supporting the user without obstructing the user
- User interfaces—developed in a playful and interesting manner, and to support the user’s self management
- Privacy—filters, id’s that can be changed and set by the user him/herself
- Full global infra structure—mobility, across networks, devices and applications.

Many of the identified requirements has strong relations to trust—trust between the user and the social networking site administrators as well between users in the network. This is clearly a feature that this group of users found is not fulfilled

to the extent necessary. No users mentioned security but only privacy as a concern and request. This can be perceived as if most users actually know about the security issues using the Internet and somewhat has accepted these (they know about Trojan horses, security wholes in applications etc.), but they have special concern to their own personal data which must be handed with much more care than seen today.

B. User requirement dimensions

The user requirements identified in this survey does not show requirements or dimensions which can be fully categorised in either the reference model or the Liu et al. (2001) [15] reaction dimensions. Within only seven users, that can probably not be expected. From this survey, four overall dimensions for categorising user requirements for next generation social networks can be found. The dimensions are:

- *The user experience* (control, fun interaction mechanisms, applications/systems must bring value to the user, the user must trust the sites and the way their personal data is handled)
- *Interaction requirements* (trust and privacy mechanisms to ensure the user and the level to which the user wants to interact, virtual profiles which can change in interaction level and availability and is set by the user, playful and fun user interfaces)
- *The system/site quality* (transparency to how data is handled and what it is used for, underlying technologies which do not obstruct the user in any way)
- *Full infra structure* (social networking can take place across networks, applications and devices)

This is a high level categorisation but it shows that users have requests to the whole cycle of availability of Web-services; if the infrastructure does not function, the users cannot use the social networks to the extend they would like to; if the user interface is not fun and supportive of how users would like to interact with devices and handle data and connections, then it is less interesting to use.

It seems as if the Liu et al. (2001) [15] dimensions can be covered in the above-mentioned dimensions while the WWRF reference model [14] cover more technical features not mentioned or thought of by these users.

C. The approach

The approach using interviews as the way to get the information worked well. There is no doubt that a questionnaire would have demanded much more closed questions in order to get usable data. Using the open questions as a basis for a small interview gave the possibility to explain and extend questions which would not have been possible other wise. This was in particular necessary when the users were asked about their expectations and requirements to next generation social networks.

One disadvantage about using interviews as the main source of investigation is that there is a clear limit to the number of

users that can be interviewed. Here, seven users have been interviewed, and even though five probably would have been enough (according to [16]), it seems to be on the low side. More users would most likely reveal even more requirements that could be used to make the requirements dimensions more detailed.

The survey and its results is closely related to the profile of the users interviewed; age 34-55, no immediate needs for Web-based social services, but with an interest for ICT and ICT applications. The survey could easily be extended to other groups of users with different profiles.

It should also be mentioned that the group of users involved all were Danish persons. It may be that the Danish have a special culture around the usage and scepticism towards what benefits they themselves will obtain by using the social networking sites, and that the requirements identified here therefore has a special Danish flavour.

V. CONCLUSIONS

This paper discusses the user requirements elicitation in relation to next generation social networks based on a survey with Danish users (aged 34-55 years) and with an ICT interest and knowledge. The survey shows that this group of users expresses requirements that can be categorised into four dimensions; User experience, interaction requirements, system/site quality, and full infra structure. More detailed, the user requirements focused on self control and privacy as a central elements, technologies and unprovoked push services or techniques only if the users not are bothered, and fun interaction mechanisms.

The paper is based on a small survey of seven users. There is a need to extend the survey to more users with different age groups and profiles as well as different cultural backgrounds.

Next generation social networks are already underway. Seen from a technical perspective, many exciting and interesting features can be foreseen and is currently developed. Social networking as a general concept will always be relevant for users. However, if the users shall continue to use the Web-based services, there is a need for more surveys and analyses of what the users want as it is indicated by the survey that this may not correspond to the technical abilities and immediate trends.

APPENDIX

The following questions were used as basis for the interviews (besides the notification of age and gender):

- Which social network sites do you know of?
- Which social network sites have you to tried (have a profile)?
- How often do you use the Web-based social networking possibilities (both in frequency and approximate time)?
- .Which functionalities/features do you use the most?
- Are you the person who takes initiative and invites others or do you await invitations?
- Have you come across some features/ functionalities across

the Web-based social network sites that you use that were somewhat problematic/irritating or just not good enough?

- Do you feel in control of what is going on in the web-based networking sites?
- If you could decide it, which changes would you implement to the currently running Web-based social networking sites?
- Without any technical constraints, which wishes/requests would you have to the next generation social networking sites? You can think 10-15 years ahead in time in order to try to imagine the "perfect" Internet. Think about profiles, mobility, graphical interaction interfaces, and general functionalities.

ACKNOWLEDGMENT

Particular acknowledgements should be given to the interviewed users who willingly discussed the social networking issue with the authors.

REFERENCES

- [1] Radar Networks & Nova Spicack, 2007, http://www.novaspiavack.typepad.com/nova_spivacks_weblog/2007/02/steps_towards_a.html
- [2] Breslin, J. and Decker, S., "The Future of Social Networks on the Internet", IEEE Internet Computing, <http://www.computer.org/internet>, 2007, nov.-dec.
- [3] Jordan, K., Hauser, J. and Foster, S., "The Augmented Social Network: Building identity and trust into the next-generation Internet", *First Monday*, Volume 8, Number 8 (August 2003).
- [4] Yang, H.L. and Tang, J.H., "A three-stage model of requirements elicitation for Web-based information systems", *Industrial Management & Data Systems*, Vol. 103, No. 6, 2003, pp. 398-409.
- [5] Tang, J.H. and Yang, H.L., "User role and perception of requirements in a web-based community of practice", *Online Information Review*, Vol. 29, No. 5, 2005, pp. 499-512.
- [6] Tang J.H., Yang, H.L., "Emergent user roles and perceived requirements in a social-oriented community", *Library Review*, Vol. 55, No. 8, 2006, pp. 508-519.
- [7] Riddings, C.M. and Gefen, D., "Virtual Community Attraction: Why People Hang Out Online", *Journal of Computer-Mediated-Communication*, 2004, Vol. 10, no. 1, Article 4.
- [8] Koch, M., "Requirements for community support systems – modularization, integration and ubiquitous user interfaces", *Behaviour & Information Technology*, Vol. 21, No. 5, 2002, pp. 327-332.
- [9] Garrett, S. and Caldwell, B., "Describing functional requirements for knowledge sharing communities", *Behaviour & Information Technology*, Vol., 21, No. 5, 2002, pp. 359-364.
- [10] <http://wikipedia.org/wiki/socialnetworks>.
- [11] Boyd, D.M. and Ellison, N.B., "Social Network Sites: Definition, History, and Scholarship", *Journal of Computer-Mediated Communication*, Vol. 13, No. 1, 2007, Article 11.
- [12] Haythornthwaite, C., "Social Facilitators and Inhibitors to Online Fluency", Proceedings of the 40th Hawaii International Conference on System Science, 2007.
- [13] IEEE, "IEEE Software Engineering Standards Collection", IEEE Computer Society Press, Los Alamitos, CA, 1997.
- [14] Christler, K., "A User-Centred Approach to the Wireless World", In: Tafazolli, R., "Technologies for the Wireless Future, WWRP", John Wiley & Sons, Chichester, 2005.
- [15] Liu, C., Arnett, K., Carpella, I. And Taylor, R., "Key dimensions of Web design quality as related to consumer response", *Journal of Computer Information System*, October, 2001, pp. 70-82.
- [16] Nielsen, J and Landauer, T.K., "A mathematical model of the finding of usability problems", ACM INTERCHI'93 Conference (Amsterdam, The Netherlands, 24-29 April, 1993), pp. 206-213.
- [17] Goldstein, M., "Social Networking", *Successful Meetings*, Vol. 57, Issue 2, 2008, pp. 26.