Functions of Social Networking Services

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Abstract. Social Networking Services (SNS) are the fastest growing type of social software – both in the Internet and in company-wide Intranets. Due to the fact that SNS have emerged just recently and the development speed of the services is enormous, there exist large gaps in research about this type of service. For example, so far there has been no attempt to identify and categorize the basic functionalities of SNS. This is the goal of this contribution. Six groups of functionalities for SNS are proposed and their categorization is motivated. The identification of a distinct set of SNS functions will facilitate the modularization and integration of different social network applications.

Keywords: Social Networking, Expert Finding, Yellow Pages, Knowledge Management, Web 2.0, Social Software, Enterprise 2.0

1 Introduction

While Knowledge Management activities have long been focused on the collection of documents and their storage in anonymous knowledge silos, in the past years companies are becoming more and more aware that employees are the real knowledge repositories and that real knowledge management is supporting communication and networking among the employees. Cohen and Prusak [4] for example highlight the high potential of networking employees to increase productivity and speed of innovation in companies.

Therefore, support to find experts and in a broader sense support to human social networks is becoming more and more important in companies.

The technological and technical developments of the last years make it possible to digitally reproduce human social networks. Thanks to this technical support users can establish and maintain contact to persons with whom contact would be difficult due to regional and social barriers. Users with alike interests and subject areas can now find each other and can stay connected in communities (of practice) and networks. In the context of the often-quoted Web 2.0 a new form of software to support collaborative work has evolved to cover this: Social Networking Services (SNS).

Social Networking Services (SNS) are application systems that offer users functionalities for **identity management** (1) (i.e. the representation of the own person

e.g. in form of a profile) and enable furthermore **to keep in touch** (2) with other users (and thus the administration of own contacts)[1]. In this context one can distinguish between open SNS that are available to use for everyone in the WWW and closed SNS that are used by a rather closed user group, e.g. within the intranet of an organization.

Apart from private use, open SNS as well as closed SNS are also used for supporting the exchange of implicit knowledge within and between enterprises. As a result, SNS replace or extend the "yellow pages" which have so far been used in enterprises as a sort of tools for finding expertise.

The latter were originally implemented as Intranet-based directories, supplemented with additional information on the users' expert knowledge and skills (see e.g. [1], [2] and [14]). In contrast to traditional expertise finding tools, SNS provide a wider range of functions (sometimes even including communication functions like forums and chat). Besides, they stress the idea of user participation. Hence, SNS offer users the possibility of updating their personal contacts and expert's assessment data themselves. Even more important: Each user can manage his or her personal network, i.e. a list of contacts. As a "side effect" and major advantage the personal social networks become visible for other users. Thus, the initiation of relationships is simplified, and the advantages resulting from Granovetter's theory of the "strength of weak ties" [8] can be better utilized.

Due to the importance of SNS for companies, IS and CSCW research should try to provide practitioners with some insights into success factors of SNS introduction and usage. However, until now not much work has been published in this direction. Therefore, we have defined as one goal of our research to identify success factors for and barriers / limiting factors of the employment of SNS in the enterprise and their reciprocal relations.

In the context of this work we identified a possible reason for the research gap concerning SNS: SNS are a mix of different functions supporting matchmaking, direct and indirect communication. When different people are talking about SNS they are usually implicitly addressing different aspects of this – and therefore often misunderstand each other. This makes it especially hard to start a scientific discourse on SNS. Thus, it is important to have a clear map to address what one is focusing at. There is a need to categorize the different functions of a SNS.

To address this need we propose six basic functionalities of SNS. We have identified these by extracting potential functionalities from reviewing existing internal and external SNS. Furthermore, we matched these basic functionalities with the process description of IT supported social networking. The results are presented in Section 2. Building on this categorization we have conducted an online survey to support the categorization and to find out how Germans are using the different functions of open SNS. We present the first results of this survey and its implications (Section 3) and conclude with the limitations of the study and with an outlook on further research and possible further developments of SNS (Section 4).

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[1] Cf. [9]. See also the similar definition by Boyd and Ellison [3] who define SNS as „web-based services that allow individuals to (1) construct a public or semi-public **profile** within a bounded system, (2) articulate a list of other users with whom they share a **connection**, and (3) view and traverse their list of connections and those made by others within the system."

2 Functionalities of SNS

To address the need to structure and to identify the basic functionalities of SNS theoretically we start by the two categories 'keeping in touch' (1) and 'identity management' (2) which are the two main characteristics of (the definition of) SNS.

(1) Keeping in touch can be split in direct communication (direct <u>exchange</u> with someone) and indirect communication (via artifacts[2]) according to communication theories (e.g. the person-artifact framework by Dix et al. [5]). In the context of indirect communication there is a need for <u>contact management</u> – i.e. for defining filters of who will be able to get information about one's activities (access control), and from whom one wants to see information. There is a lot of research on these types of filters in CSCW on the communication of <u>awareness</u> – one prominent example of using indirect communication (e.g. [6], [11]).

(2) The field of <u>identity management</u> can be further specified regarding reasons for presenting oneself: <u>to be found</u>, to (enable others) building a <u>common context</u> (more quickly) and to generate information for indirect communication. This can also be seen from the other side: to find someone, to build a common context (see if one has something in common with the other), or to stay informed about the other (via indirect communication).

2.1 The Six Basic Functionalities of SNS

In addition to this theoretical approach from communication theories we have analyzed several open and closed SNS to identify common functionalities. From this analysis a list of common components was extracted and finally mapped to the tasks identified from theory.

As a result we propose a list of six basic functionalities of SNS:
- Identity management
- Expert finding
- Context awareness
- Contact management
- Network awareness
- Exchange

Identity Management
Goffman [7] views social interaction as human performance, which he compares to the performance in a theater, and which is shaped by the audience and the environment. Because people are constantly analyzed by others they construct consciously a social identity which they present to their counterpart. In SNS the profile people construct is this staging of oneself - for a particular audience, for a particular task to be achieved. Thus, in our context identity management means

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[2] This means sending a message to a public board or manipulating a public artifact without knowing exactly who will receive the message or notice the manipulation.

managing the availability of identity information – i.e. filling in information and setting access rights (who is allowed to see what). Access rights can be direct or role based – e.g. allowing access for all users in the personal network. This form of self presentation satisfies several human needs, as a study by the SNS MySpace has shown [13]. Examples for functions enabling identity management in SNS are: (user) profile, group memberships.

Expert Search

CSCW research has already dealt extensively with the use of the expert search as a possibility to identify implicit knowledge (cf. e.g. [1]). In this context one has to distinguish between the possibility to search the network according to different criteria (e.g. name, interests, company) and the possibility to pro-actively receive recommendations of interesting contacts by the SNS. Examples for functions enabling expert search in SNS are: search boxes.

Context Awareness

Context Awareness is the awareness of a common context with other people. This can be information about common contacts, about common interests, about the same university one has visited or the same company one has worked at. Context Awareness contributes a lot to creating common trust among the users, which is essential for a successful collaboration (cf. e.g. [10]). Moreover, according to Soonhee and Hyangsoo [16] "knowledge sharing requires the dissemination of individual employees' work-related experiences and collaboration between and among individuals, […] and organizations". Examples for functions enabling context awareness in SNS are: "How you're connected to …"-box.

Contact Management

Contact management combines all functionalities that enable the maintenance of the (digital) personal network. Examples for functions enabling contact management in SNS are: tagging people, access restrictions to profile.

Network Awareness

The awareness of the activities (and/or the current status and changes of the latter) of the contacts in the personal network is supported by functionalities, too. These functionalities enable indirect communication via awareness. Examples for functions enabling network awareness in SNS are: News Feeds, "Birthdays"-box.

Exchange

Exchange combines all possibilities to exchange information directly (e.g. messages) or indirectly (e.g. photos or messages via bulletin boards). Morone and Tayler [12] found e.g. that the reduction of communication barriers is essential for successful knowledge sharing. Examples for functions enabling exchange in SNS are: Messages, photo albums.

2.2 The Process of IT Supported Social Networking

When the above mentioned basic functionalities are mirrored back to the initial goal of SNS (i.e. to support building, maintenance and usage of social networks), one can identify different possible sequences in the utilization of the single functionalities.

As one result of this categorization of SNS functionalities a process description of IT supported social networking has been developed (see Figure 1 and [15] for further information). Note that the two basic functionalities direct and indirect exchange of views in exchange and network awareness are integrated in one process step.
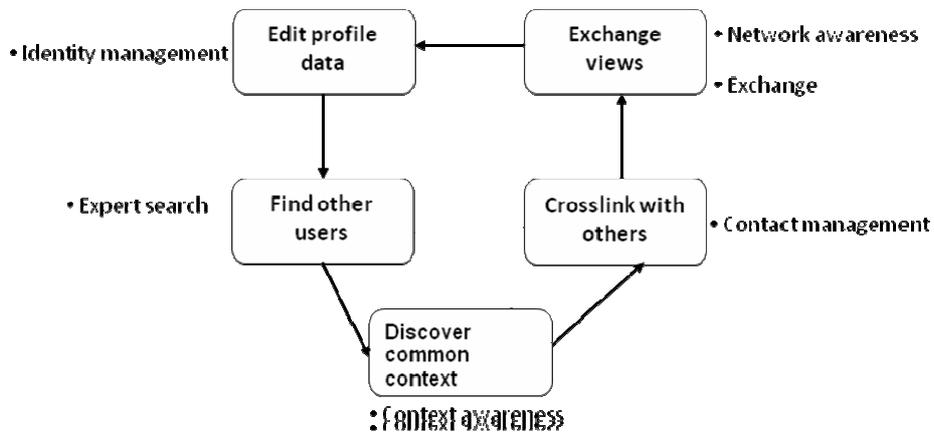
Figure 1: process of IT supported social networking

The process illustrates the typical succession of several steps in the individual usage of SNS (which are all more or less supported by current SNS implementations). It also shows that there are different successions thinkable. The process is not strictly chronological or repetitive, i.e. starting steps and successions can differ.

3 Online Survey: Private Usage of SNS in Germany

In order to validate the results of the systematized organization of basic functionalities a comparative user survey has been conducted. The overall goal of the survey was to obtain an overview of private usage of SNS in Germany.

3.1 Realization and Questionnaire

The quantitative research took place from December 5, 2007 to January 31, 2008 and consisted of an online survey directed towards all German users of every sort of open (public) SNS. The study population was approached in three different ways: (1) Five well-know German bloggers linked the online survey in their blogs. The readers of the blogs are mainly IT-interested and already in working age. (2) An invitation email was sent to all students and employees (n≈4000) of the Bundeswehr University

Munich. (3) Two German SNS (www.spin.de, feierabend.de) approached all their users directly, bringing their attention to the survey. Respondents entering the survey site (www.sns-umfrage.de) received an introduction with the definition of SNS (mentioned above) and examples so that every participant was well informed.

The questionnaire contained 24 questions that aimed towards the kinds of private use of different SNS by German web users. It consisted of four parts:

1. socio-demographic questions (age, gender, usage of the Internet etc.; 6 questions in total),
2. questions that allowed for the clustering of the different user types based on their SNS usage ("how often do you use SNS?", "how many contacts do you have"; 4 questions in total, including filter questions on the respondents' specific SNS),
3. questions concerning the functions of SNS ("how often do you use the following functions…", "how important do you consider the following functions…"; 11 questions in total) and
4. questions concerning online advertising and targeting ("how bothersome do you consider the following forms of online advertising…"; 3 questions in total).

At the end of the questionnaire a link to a wiki provided the possibilities to give additional open feedback concerning personal SNS usage in general and the survey in particular. More than 30 people wrote commentaries, some of them were very helpful for understanding some individual user behavior better.

In the eight weeks under review about 5500 people visited the survey website, 2650 of them completed the full questionnaire and were included in the analysis. The sample is representative as far as education is concerned, whereas gender (62% men) and age (58% are younger than 26 years, only 18.2% are older than 35 years) are unequally distributed. The data was collected by the questionnaire tool UniPark (http://www.unipark.de) and analyzed using SPSS 15 statistical software.

3.2 Important Results of the Study

The study had several aims – one of them was the validation of the basic functionalities presented in Section 2. In the following we present some of the results for validating the categorization of the functionalities[3].

In the questionnaire we asked the respondents three times in three different ways questions about functionalities in SNS. In Question 5 we wanted to know how often the population uses different functions, in Question 7 we asked because of which function the users do not want to renounce on the SNS and in questions 13 till 18 we interrogated the importance of our basic functionalities. We considered it to be a difference if one uses a function (often or seldom) or if he considers a function so important that he doesn't want to leave the SNS because of the function.

The functionalities interrogated in questions 5 and 7 were: "to keep contact", to share information", "to get to know people", "to share pictures", "contact management", "to present myself", "expert/person search", "Dating", "to find

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[3] We therefore concentrate on presenting frequency distributions. Much more information about the results can be found on our website www.kooperationssysteme.de/tag/umfrage.

business partners". From the first sight it is obvious that these are not really basic functionalities. Those are rather "success factors of SNS" i.e. reasons for people to use SNS[4]. As can be seen in figures 2 and 3 the frequency of use and the opinion on the importance of the proposed features were quite similar. Respondents mentioned they used features "to keep contact" most often (87.1%) and don't want to renounce on these (78.5%).
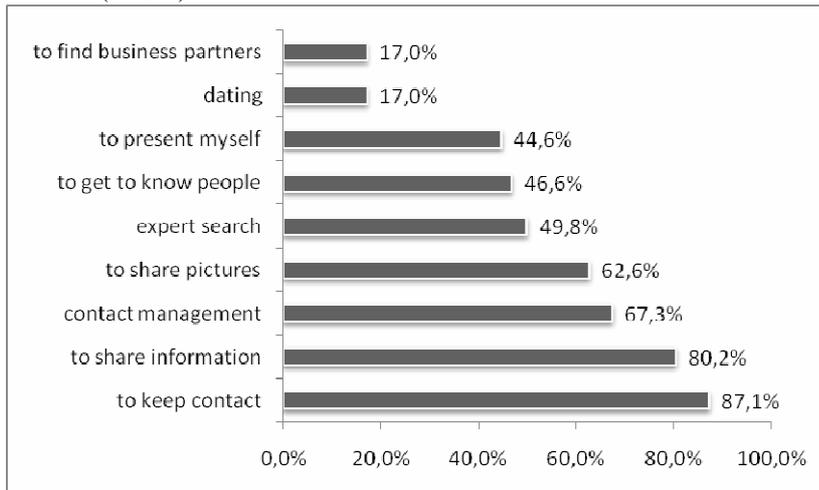

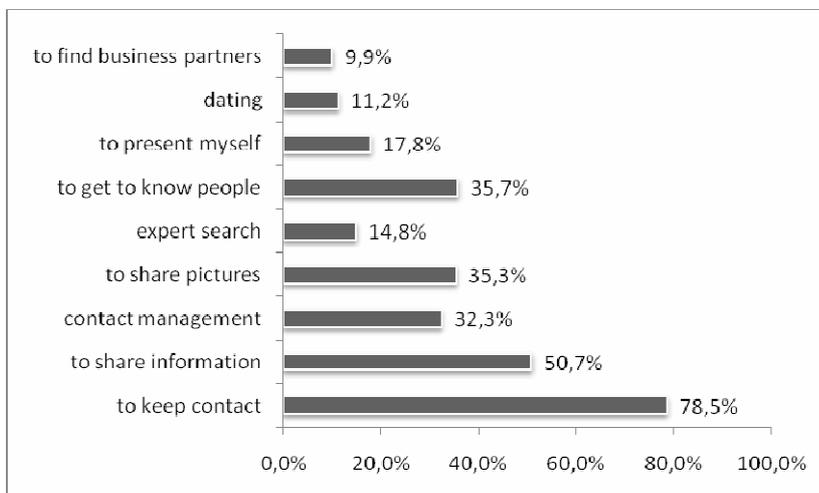Figure 2: Question 5: "How often do you use …" (answers: often-sometimes; multiple choices possible)

Figure 3: Question 7:"On which function don't you want to renounce?" (multiple choices possible, answers sorted in the same order as Figure 2)

Second popular was "sharing information" (frequency of use: 80.2%; importance: 50.7%). Features "to get to know people" are only used half the frequency (46.6%) of the first group, and are esteemed only half so important (35.7%).

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[4] We call them features in the following.

These results reveal a lot about the intentions of the respondents to use a SNS: First of all, the users want to keep contact with friends or colleagues they already know. Secondly they want to share information with these people they already know. Getting to know people in general, dating (frequency: 17%, importance: 11.2%) and finding new business partners (17%, 9.9%) is less important and the features are less used. Further functions like expert search (frequency: 49.8%, importance: 14.8%), self presentation (44.6%) and contact management (67.3%, 32.3%) range in the midfield.

In the following we distinguish two user groups:
1. users of the German business SNS Xing (http://www.xing.de)
2. users of the German student SNS StudiVZ (http://www.studivz.de)

The importance of the features differs according to the predominant use intention of the SNS (cf. Figure 4). Xing is primarily used because it has features for contact management (58.3%), to keep contact (55.3%) and to find business partners (52.3%), whereas StudiVZ is primarily used for its features to keep contact (94.3%), to share information (53,3%) and to share pictures (52.3%).
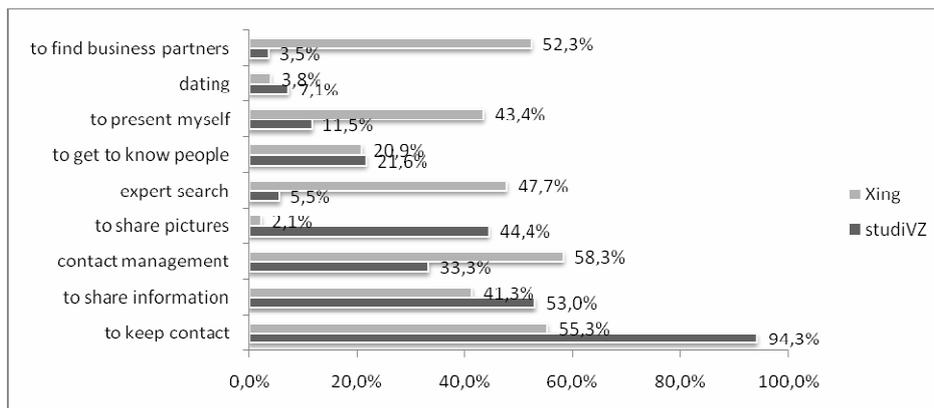

Figure 4: Question 7:"On which function don't you want to renounce?" (multiple choices possible, answers sorted in the same order as figures 2 and 3)

Remarkably: Only 7.1% of StudiVZ users wouldn't leave the SNS because of its potential for dating and only 47.7% of Xing users wouldn't leave the SNS because of its potential for expert finding (which is one of Xing's declared goals). In both cases (for business and for private use), "to keep contact" was a very important reason for the respondents to use the SNS.

In a group of five questions we asked the respondents how important they considered five of the six functions we have identified (identity management, expert finding, contact management, network awareness, and exchange). We couldn't consider context awareness, because functions like the "How you're connected to …"-path are only mostly used "passively" i.e. they are displayed only.

Altogether the respondents considered all functionalities of SNS mentioned above as important. Functions that support exchange (81.3%) and awareness (74.6%) were valued as most important, whereas the functions that enable identity management where valued as less important (54.5%) (cf. Figure 5).
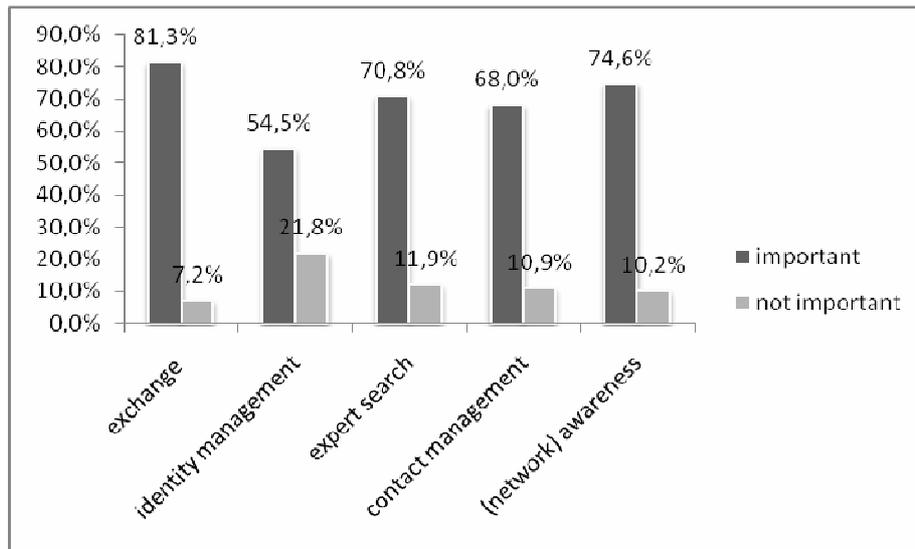

Figure 5: Questions 13-18: "How important is the following function to you?" (m.c. possible)

If we now compare these results with the answers to questions 5 and 7 one can say that, again, keeping contact (awareness about the own contacts, exchange with them) was esteemed most important by the users.

In a further question we interrogated whether the users attached importance to the occasional introduction of new functions: 70% of them did, 12% did not, and the rest was undecided.
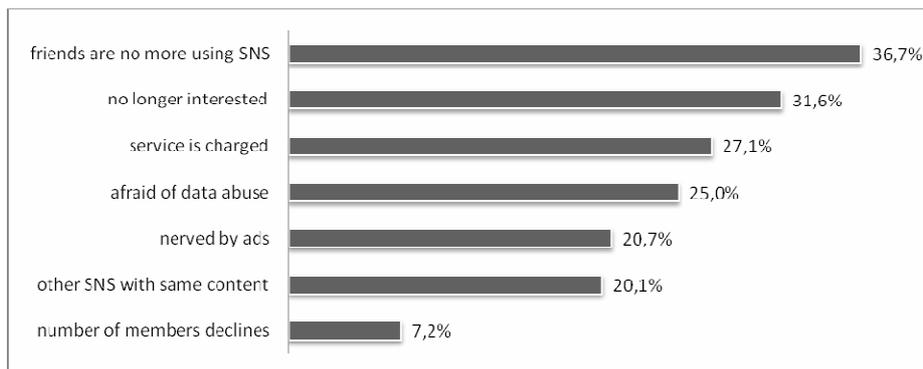

Figure 6: Which are the reasons to leave a SNS (m.c. possible)

Besides the features which are so important for the users that they do not want to leave a SNS, we also interrogated for which reasons users are willing to leave a

platform (cf. Figure 6). We gave seven different reasons to leave the SNS: "the number of members declines", "I have other SNS with same content", "I'm nerved by the ads of the SNS", "I'm afraid of data abuse", "the service is charged", "I'm no longer interested in the SNS" and "My friends are no more using the SNS".

36.7% of he respondents would leave their SNS if a majority of their contacts would. Only 27.1% would leave if the service was charged and 25% would leave if they were afraid of data abuse.

A declining number of friends was the first reason for StudiVZ users to opt out (43.5%; with "no more interested" on the second place: 32.2%) and the second reason for Xing users (33.4%; with "no more interested" on the first place: 40.8%).
In both cases (StudiVZ: 6.4%; Xing: 5.2%) the least reason for the users to leave a SNS was a diminishing number of members.

This completes the picture of the other results: If a great part of friends are no longer in the SNS there is no possibility to keep contact to them. The users are neither impressed by millions of people in a SNS whom they could possibly contact, nor concerned by a small number of members. Most important to them are the people they already know and with whom they want to keep in touch.

3.3 Implications of the Study

Main finding of our study (concerning the basic functionalities of SNS) is that the key intention for the usage of a SNS is to keep contact with friends or colleagues. Functionalities to enable this key intention are used most frequently.

That reflects also the main difference of SNS and their predecessors, the yellow pages, and the new potential of SNS: There is often no more need to look up someone, people already know each other and know what the other one is doing, since they are connected in SNS.

Another finding sets up on this: To be able to keep contact it is essential to be aware of one's contacts and to exchange with them. Of our identified functions, 'awareness' and 'exchange' were found to be considered as most important by the users. Moreover, SNS allow not only staying in contact; they enable the sharing of information. This was both, by frequency of use and by importance the second answer. Again, sharing information means to use the basic functionalities for 'exchange' (e.g. to send messages).

The third group of functionalities ("to get to know people") is only used half the frequency of the first group (46.6%), and esteemed only half so important (35.7%). To get to know people in general, dating and finding new business partners is not very important and not much used. This emphasizes that it is much more important for users to keep contact than to get to know new people.

Our findings imply that open SNS should concentrate on the development of functions that facilitate users to keep contact. They should further enhance basic functionalities that particularly support (network) awareness and exchange.

These theoretical findings can be mirrored also by corporate practice: Further strengthening our results, Facebook, the worldwide (innovation) leader of open SNS, has simultaneously further integrated two major functionalities in the first two weeks

of April 2008: "Social Stream" (to further support awareness) and a chat (for exchange).

4 Conclusion

In this paper we proposed the categorization of six basic functionalities of SNS which will facilitate the modularization and integration of different social network applications.

To strengthen our categorization of the functionalities and to get an overview of the private usage of SNS in Germany, an online survey has been conducted. The results of questions concerning the usage of functionalities have been presented as well as their implications.

As far as the WWW is concerned our study gives some insights in the development of the so called Web2.0 applications, too. Right now there is a big hype in the Web 2.0-community about an application called Twitter (http://www.twitter.com). Twitter is a micro-blogging service that is used to send "updates" (no longer than 140 characters) to the personal (Twitter) network via web or e.g. a cell phone. Since users send up to ten "tweets" (messages) on average per day, Twitter contributes to create considerable awareness amongst its users. Thus, the success of Twitter can be explained by the fact that it is most important to user to stay in contact. They want to be held up to date and be aware of their network. This is completely confirmed by our study. The task of SNS will be to fully integrate applications like twitter -which Facebook has already began when opening the platform API in May 2007.

The study has some limitations, too: It has not been conducted international, it is no longitudinal study and finally it is in question whether the results can be applied on closed SNS.

To answer the last question is one of our next research goals: we aim to gain further insights of success factors of open SNS which could be (partly) adapted or transferred to the use of closed SNS. Additional questions will be whether factors like age or experience have major influence on the use of SNS.

Thus, further research is necessary to focus and sharpen both success factors and barriers of the deployment of SNS in private as well as corporate usage patterns.

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