Users' Opinions on Public Displays that Aim to Increase Social Cohesion

Matthias Böhmer
Münster University of Applied Sciences
D-48565 Steinfurt, Germany
matthias.boehmer@fh-muenster.de

Jörg Müller
Deutsche Telekom Laboratories, TU Berlin
D-10587 Berlin, Germany
hans-joerg.mueller@telekom.de

***Abstract*—In this paper we present results from a questionnaire on public displays that aim to increase social cohesion. The displays highlight unexpected social links between passers-by in urban areas, which might lead to the strengthening of existing links and even the creation of new links between people. The results from the questionnaire show that the majority of respondents believes that the proposed displays might increase social cohesion, and about half of them would use them. Some respondents however are afraid for their privacy, security, and being annoyed by strangers. For personal displays, which show information only about single persons, the most popular content are name, interests and contact options. For interpersonal displays, which show information about pairs of people, the most popular information are common friends and common interests. The popularity of the proposed displays however depended strongly on the social context where they would be used. We present a preliminary prototype of a personal display, which is deployed in a university context.**

I. Introduction

Life in big cities is often characterized by anonymity and namelessness and a lack of social cohesion. In some cases, this results in social problems and deprived areas. The key issues are the large size, the high density and the heterogeneity of population. Individuals get overloaded and they blend out everything unimportant, especially other people as described by Milgram [1]. On the other side, human society is a *small world*. Meaning that the connectedness of our modern society is surprisingly high as Travers and Milgram [2] show. Therefore in urban areas, it is very likely that people who come across each other are socially linked and have something in common [3]. For example, they might have a common friend, common interests or common leisure time activities. Nowadays, a lot of information on social connectedness is available on social network sites[1]. Further, this data can be enriched and enlarged by crawling unstructured information that is available on the web [4].

In this paper, we explore how pervasive displays can leverage the small world phenomenon to increase social cohesion. We expose the available social information on digital displays for stimulating social activities. For example, it can be advertised on displays, when two persons know each other either directly or share one ore more mutual acquaintances. The anonymity would be broken.

[1]e.g. on platforms like Facebook, LinkedIn, or MySpace

This paper presents the results of an online questionnaire regarding the users' opinions about the concept of public displays that show social content. Our insights informed the design of a preliminary prototype of the proposed social signs.

II. Related Work

Stimulation of social cohesion with ubiquitous computing technologies has already been a topic of research. Paulos and Goodman [5] present a personal, body-worn, wireless device and a mobile phone based application to support relationships with individuals we regularly observe but do not interact with. Davis and Karahalios [6] also design a mobile device, which gives people a better sense of community awareness.

In different approaches large displays are used to foster information sharing within communities to stimulate connections. For example, Churchill et al. [7] use interactive posters to support digital information sharing within communities. In [8] Kuriyama et al. introduce a social communication system that supports face-to-face communications between people in a research community by providing information on coauthor relationships. Also McCarthy et al. [9] present a system for displaying social media to improve relationships among collocated colleagues. In [10] Koch deals with public shared displays that support insiders and outsiders gaining awareness of communities.

Up to now, public displays have mostly been used for informational content, leisure time activity, advertisement, or community support. In this paper, we use public displays to make social connections apart from communities more apparent and focus on increasing social cohesion by advertising content that is automatically extracted from social networks sites. Chew et al. [11] already connect people on a visual basis. However, appropriate content is still sought for.

III. Stimulating Social Cohesion

Two randomly selected people from a large population are connected by somewhat more than five intermediaries on average [2]. It is very likely that people who meet in public spaces, e.g. train stations, shopping arcades, or simply on the street, have a social link [3]. We think of a social link as something between two persons, that might make them acquainted with each other if they knew about it. A knowledge of mutual interests, hobbies, friends or jobs can

turn weak-tie relationships into friendships [3]. Therefore, an advertisement of such social links might stimulate people to begin a conversation and mingle with each other.

We propose that content presented on social signs can be personal, i.e. related to a single individual, or interpersonal, i.e. related to pairs of individuals. An example of personal social signs is shown in figure 1. Social network sites hold a variety of individual content, like name, age, gender, relationship status, or interests. All of this information can possibly be attached to individuals on social signs.

Fig. 1. Personal information shown in spots centered at the person's position (mockup image) [12].

An example of interpersonal social signs is shown in figure 2. Possible content for such displays are common friends, friendship chains, or common interests.

Fig. 2. Interpersonal information within a carpet connecting the corresponding persons (mockup image) [12].

IV. Online Survey

In order to understand the peoples' view on the proposed social signs, we conducted an online survey. We were especially interested in 1) the participants' general usage of social networks sites, 2) their opinions on displaying personal information, 3) their opinions on displaying interpersonal information, 4) if they personally would use social signs, and 5) their personal backgrounds. During the study, we claimed that the proposed displays are not only hypothetical but also feasible in the nearby future due to emerging technologies. We presented mockup images similar to figures 1 and 2 to give the participants an idea of our approach.

A. Results

The questionnaire was online for three weeks and completed by 154 persons (101 males, 49 females, 4 unknown). They have mostly been recruited by email invitations and announcements on websites. The average age of the participants was 32.93 years. Most participants came from Europe (78.78%), but also from Asia (7.14%), North America (6.49%), Africa (3.25%), and South America (2.60%, 1.95% unknown). 18.18% of the participants live in a metropolis, 53.90% in a large town, 18.83% in a small town, and 7.79% on the countryside[2]. Most of them (86.36%) currently use social network sites like Facebook, MySpace, or LinkedIn.

1) People believe that social signs can increase social cohesion: We asked the participants whether they believe that the proposed displays can increase social cohesion. As shown in figure 3, more than the half think that it could: 8.77% strongly believe, 30.52% think that sometimes it could, and 22.73% think that in a few special cases it might simulate social cohesion. 33.44% of our participants disagreed that this form of ubiquitous social networks might anyhow increase social cohesion, and 4.55% did not answer.

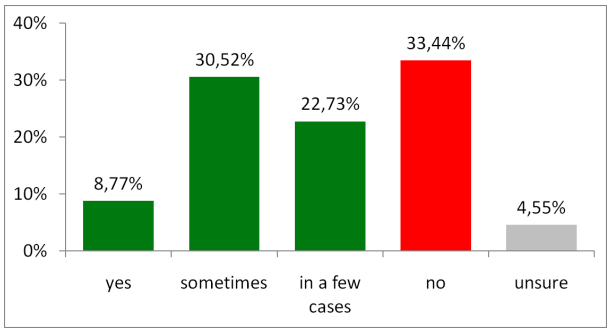

Fig. 3. Participants' opinion on whether social signs can increase social cohesion.

2) 57% of participants would use social signs: Interestingly, if people believe that the proposed displays might increase social cohesion, this does not necessarily mean they would use them themselves. We asked people in which contexts they would use the social signs, and as shown in figure 4, for 57% of all participants there is some situation where they would use the system. The remaining participants said that they would not use the displays in any case.

3) Names, friends, interests and contact options are most popular content: For personal and interpersonal social signs, we asked people which content they would consider relevant on such displays. The results are shown in figure 5 and 6. For personal social signs, the names of persons were considered most relevant (39.6%), followed by their interests (36.4%) and

[2]with small town, large town (> 100,000 residents), and metropolis (> 1,000,000 residents).

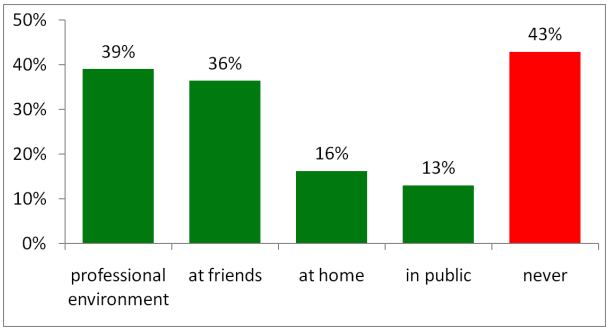

Fig. 4. Contexts in which our participants would use social signs, multiple choices possible.

interestingly contact options (22.1%). In addition, people also named the travel destinations of people and a transcription of spoken words as subtitle for deaf people as interesting content.

For interpersonal social signs, common friends (53.9%) and common interests (44.1%) were considered the most interesting content. This was followed by appointments and dates, pictures with both persons, and dating service. Participants spontaneously proposed also to show common travel destinations and job-related mutualities.

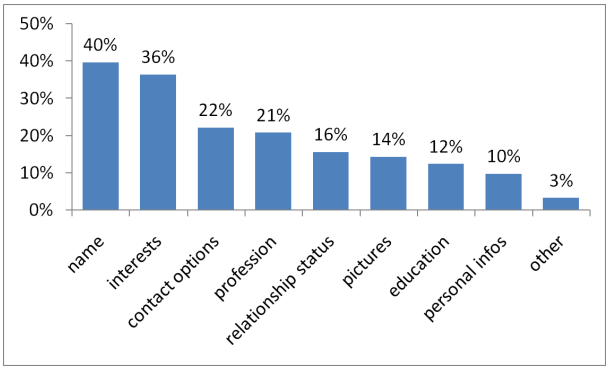

Fig. 5. Participants' opinions on content for personal social signs.

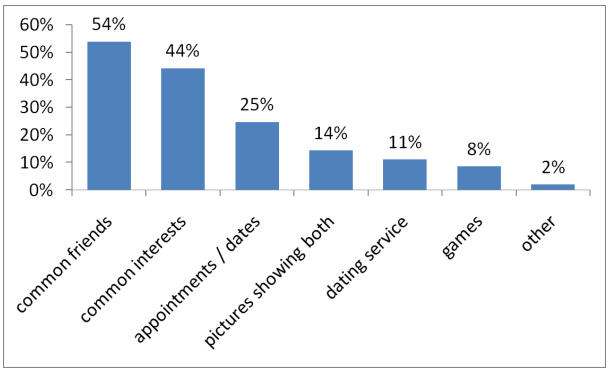

Fig. 6. Participants' opinions on content for interpersonal social signs.

4) The bigger the city, the more people would use social signs: We could observe an interesting effect because we also asked the participants for the size of the city they lived in. From the participants who lived in a metropolis, 67% stated that they would use the social signs. From those living in big or small cities, 56% and 58% resp. would use the system. And from those living on the countryside, only 41% would use social signs.

5) People would only like the proposed displays in certain contexts: Interestingly, the popularity of the social public displays in different settings varied widely, as figure 4 shows. The most popular setting was a professional environment, e.g. at the workplace or a conference (39%). This was followed by usage among friends, e.g. at a party (36%). 16% of the participants stated they would use it in a private setting, e.g. at home, and only 13% of the participants would use it in a fully public setting, e.g. at a train station.

6) Some people may be offended: Although the majority of our participants stated that they would use the displays in some situation, we got strong opinions in the comments fields of the questionnaire. Obviously, participants considered it very important that everybody could freely choose whether to appear on public displays: "everybody should choose". More detailed, participants commented that the appropriateness of the displays would strongly depend on the social situation: "Public access of you interests and information using projection technologies would only be acceptable in a few social situations and depending on the location/environment of the individual". It was also stated that appropriateness depends on the current mood of the individuals: "But only if it is explicitly requested, one will not always be in the mood for it". Some users however seemed to prefer to be for themselves in public places: "I think that is terrible. When one moves in public, that doesn't mean that I am a public being all the time". Also, some users emphasized the use at workplaces: "I would consider such things only useful where one actually wants to be or is asked to be known. For example at the workplace, to show possible competencies".

People also mentioned serious issues regarding privacy ("personal data must be kept secret", "there already exists too much data") and security, like a 44 year old woman from South America concluded: "Good idea, I am just worried about security".

Two more interesting observations were that participants who used social network sites were much more likely to use social signs (58% among SNS users vs. 29% among non-users), and that participants believed that interpersonal displays were better suited to increase social cohesion (67%) than personal ones (57%).

V. Discussion

The reaction of our participants was not as dismissive as we expected from first discussions with third parties. It is promising that the acceptance rate of our displays relates to the place where people live: the higher the population density, the higher the acceptance. The peak is at the target group of our approach – i.e. people in metropolises. However, this fact is not explainable from our data, and it might even arise from the problem itself: people living in high density populations

feel more nameless and therefore the personal exposedness on ubiquitous displays would not be a big issue for them.

Our approach is also supported by the fact, that people who currently use social networks have a stronger belief in the possibility of increasing of social cohesion by social signs. We may assume that the number of people using online social networks or being linked on the Internet increases in the future.

Interestingly, the participants' free text answers do not correspond with our quantitative data. Most of them negatively criticize the social signs due to privacy and security. Other participants claimed that the proposed system simply would not make any sense. However, the data suggests that the common attitude differs in a more positive way.

Our study supports the idea of increasing social cohesion with public social displays. However, to have a real impact the displays need to be pervasive in everyday life – especially in publicity, where on only 13% of our participants would really use them. We can assume, that an increasing pervasiveness of computing technology in our everyday life and a growing usage of social network sites will further increase the acceptance of our system. Also the age of our participants – i.e. 33 years on average – may have had an impact on their answers although our data does not support any correlation.

The fact that the proposed displays are more accepted in a private and professional context than in a public one shows their social nature, otherwise people would not make this difference. This is also supported by the requested content features: they relate to social aspects (e.g. name, common acquaintances, common interests). The displays seem to be suitable for turning anonymous into social cohesive places.

VI. Prototype

Fig. 7. Prototype of social signs showing the personal information display.

Based on the results of the questionnaire we built a prototype of social signs shown in figure 7. It uses the Facebook API to access social network data stored on Facebook. Passers-by are identified by their Bluetooth-enabled mobile phone. The prototype is running on a public display in a university context, which is installed in a sofa corner. When no participants are nearby, the display shows instructions how to use it. Passers-by are asked to set their Bluetooth Friendly Name on their mobile phone to the name they use at Facebook, or their Facebook ID, if they prefer to stay more anonymous to other Bluetooth scanners. Additionally, they are asked to become friend of a dedicated Facebook profile ("Advert Buddy"), that was created specifically for this purpose. The prototype of the proposed social signs continually scans for nearby Bluetooth devices and searches the friends of "Advert Buddy" for the names it found. If no participant is detected, it stays in the passive mode. If a participant is found, the display switches to personal mode and retrieves the name, photo and interests of the participant from Facebook. These data are then presented on the display for 30 seconds. While the prototype currently only implements personal social signs, it is planned to be extended for interpersonal social signs.

VII. Conclusion

In this paper we investigated content for social signs that retrieve data from social networking sites to show unexpected social links between passers-by in urban areas. We presented data from an online questionnaire that explored the user's view on social signs. The questionnaire revealed that people believe that such a system can increase social cohesion. About half of the participants would use social signs themselves, with favorite content being name, interests and contact options for personal social signs and common friends and common interests for interpersonal social signs. The bigger the city, the more participants would use the proposed system, and certain settings, like workplace, friends and home are more popular than truly public settings like train stations. Moreover, a number of participants had serious concerns regarding the possibility to choose and the dependence on social context and mood.

These insights informed the design of a prototype that is installed in a university context, which uses Bluetooth to identify passers-by and Facebook to retrieve relevant data.

References

[1] S. Milgram, "The experience of living in cities," *Science*, vol. 167, no. 3924, pp. 1461–1468, March 1970.

[2] J. Travers and S. Milgram, "An experimental study of the small world problem," *Sociometry*, vol. 32, no. 4, pp. 425–443, 1969.

[3] M. Foth, "Facilitating social networking in inner-city neighborhoods," *Computer*, vol. 39, no. 9, pp. 44–50, 2006.

[4] L. A. Adamic and E. Adar, "Friends and neighbors on the web," *Social Networks*, vol. 25, no. 3, pp. 211–230, July 2003.

[5] E. Paulos and E. Goodman, "The familiar stranger: anxiety, comfort, and play in public places," in *Proc. of CHI '04*, 2004, pp. 223–230.

[6] B. Davis and K. Karahalios, "Telelogs: a social communication space for urban environments," in *Proc. of MobileHCI '05*, 2005, pp. 231–234.

[7] E. F. Churchill, L. Nelson, L. Denoue, J. Helfman, and P. Murphy, "Sharing multimedia content with interactive public displays: a case study," in *Proc. of DIS '04*, 2004, pp. 7–16.

[8] S. Kuriyama, M. Ohira, H. Lgaki, and K. I. Matsumoto, "A wearable interface for visualizing coauthor networks toward building a sustainable research community," in *Proc. AVI '06*, 2006, pp. 492–495.

[9] J. F. Mccarthy, B. Congleton, and F. M. Harper, "The context, content & community collage: sharing personal digital media in the physical workplace," in *Proc. CSCW '08*, 2008, pp. 97–106.

[10] M. Koch, "Building community mirrors with public shared displays," *Proc. of eChallenges e-2004 Conference*, 2004.

[11] A. Chew, V. Leclerc, S. Sadi, A. Tang, and H. Ishii, "Sparks," in *Proc. of CHI '05*, 2005, pp. 1276–1279.

[12] Original photographs *New Station I* and *New Station II* taken by http://www.flickr.com/photos/t-loe/. Reproduced under CC 2.0.