Deriving Requirements for an Online Community Interaction Scheme: Indications from Older Adults

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Abstract
Social media and online communication encourage social interaction but do little to strengthen community relations between people who live in the same area. The aim of this work is to develop a set of requirements, in this initial case from a group of older adults, for an online system aimed at increasing local face-to-face communication and enhancing community interaction. Eleven older adults took part in two discussion groups to develop this list of requirements. The results of these discussions are presented and come under six broad categories, these being: Security/Information, Social, Physical, Interface, Crime and Management. We also suggest additional requirements we think would benefit the system and future directions.

Author Keywords
Community; social media; face-to-face communication

ACM Classification Keywords
H.5.2 [Information Interfaces and Presentation]: User Interfaces - User centred design;

General Terms
Human Factors; Security.

Introduction

During the past few decades, communication technologies have become an integral part of our everyday lives and for many, interactions via social media are the norm and have to a great extent replaced casual face-to-face interaction.

Social media that support online communication, where people are geographically dispersed, have different requirements and expectations compared to systems for facilitating communication between people who are based in the same physical area.

An internet-based solution, "Nation of Neighbors" [9], has been implemented in the US. This site is organised into communities that are based on participants' physical location and enables people to report crime and discuss topics relating to local safety and security. Both residents and the police join this online community. HCI researchers at Maryland [10] have been researching the factors that make this network a success, including identifying reasons for participation.

The rise in social computing and focus on community participation has resulted in a shift from producing technology for a consumer culture, to producing "tools" to allow people to actively contribute to real problems in their environment. Jenkins [6] and Fischer [4] outline the role of technology to provide opportunities to engage people in worthwhile social activities. We propose that there are a number of features that may prove beneficial:

- *Exchanging information about collective issues* – being aware of changes that will impact all local residents.
- *Providing local information* – social and informal communication that is based around physical locality such as "where are the local exercise classes?"
- *Supporting sociability* – not only about information about the environment and what is on, but also about getting to know people in the local environment.

Social media, such as Facebook and Twitter, represent platforms on which social relations between people can be created and maintained online through social interactions, building virtual communities based on some common set of values and interests rather than geographical proximity. Access to these networks is becoming integrated in a variety of devices that are pervasive in our lives, including smartphones. Location-based services have become increasingly popular and our physical location has become part of the information we disclose about ourselves online. For example, we developed an iPhone application that allows friends and family to track one's location with adjustable levels of privacy depending on the trust the user has on each specific friend or family member [1].

These new technologies change the patterns of interaction among people, including how it is conducted, as well as the frequency and the nature of the interaction itself. We realise technology is required but not sufficient and has a key role to play in bridging the gap between the online and the physical and we wish to support meaningful interaction between proximate users. We are particularly interested in the use of such technologies to promote a sense of security and well being within neighbourhoods and to help build trust and a sense of community between neighbours who are no longer regularly encountering each other in

the physical world. Exploited correctly, they can make a positive tangible impact on society, e.g. they can be used to improve local communities' collaboration and interaction. In order to achieve this, a clear set of requirements must be developed.

We acknowledge that some work has been carried out in overlapping areas such as [3, 7, 8]. The contribution of this Work in Progress paper is to outline the requirements for a community interaction system that we have extracted as a result of our 'Technology Tea Parties' with older adults [2]. These older adults represent the first of a series of user groups we aim to derive requirements from.

Methods

Two Technology Tea Parties were carried out. These are older adults discussion groups, in which some form of technology is involved. These sessions are typically two hours in length and have between four and six participants. They provide an informal environment in which older adults can discuss new technology and its context of use. This "tea and cakes" approach to research has proved to be useful in building rapport with older adults, facilitating honest discussion and maintaining participation. We find that having the participants expressing their opinions over tea and in a relaxed, informal and less directed setting reveals more or sometimes even contradicts previous statements.

Each session usually revolves around some piece of technology; e.g. interactions with the Microsoft Kinect interface and the Apple iPad. For our research, we carried out two of these sessions in 2011. The first session had six participants and the second had five. Participants' ages ranged from 62 to 90 years with a mean of 77.64 years old. Three of the participants were male, eight were female.

Before each session, a protocol was prepared along with any materials needed. The sessions were aimed at deriving requirements for our community interaction scheme. In order to achieve this, we first asked general questions with the technology only being introduced at a late stage in the discussion to avoid participants being focussed on the technology rather than the relevant issues. We wished to present a particular example, which we did towards the end of the sessions so as not to bias initial responses. For this reason, we presented one particular system as we envisaged it using verbal descriptions and paper prototypes.

Sessions began with a discussion about participants' homes and their relationships with their neighbours and wider community. The needs of the participants in their neighbourhoods and those of their neighbours were examined along with what information participants shared and with whom. The sessions covered crime in general to discover the participants' thoughts on the issue and their past experiences with regard to witnessing or being aware of crime in their area.

Finally, the proposed system was discussed directly with the participants to gain their initial reactions and to see what improvements could be made. Apart from descriptions and paper prototypes, this was occasionally aided by showing some related feature on a tablet computer. Very broadly, the system as described would allow participants to send messages and status reports to selected groups of their neighbours; request certain things from neighbours (such as 'I need milk if anyone is going to the shop');

present what things they were available to do to help their neighbours (such as 'I'm going to the shop soon - does anyone need anything?'); present local information such as local events newsletters, recent local crime reports, police notices; and to anonymously report crimes or suspicious behaviour to the police.

Results

After examining the data from the two tea parties using thematic analysis, it was possible to extract a number of clear requirements. Table 1 summarises the requirements derived to develop a local online community interaction system.

Security/Information

While participants were willing to be quite open with their trusted neighbours, there was some concern that their personal information might be observed by visitors to the house of one of their neighbours. As such, participants did not wish for the system to be presented on an unsecure computer or a photo-frame like device. In addition to the information leakage, participants also did not want to have an 'always on' mains-powered device. A mobile device would be easy to conceal and does not need to be mains-powered at all times. Participants wanted to be able to switch the device on or off easily and to be sure that when they had switched it off, it was definitely off.

Social

There was a slight concern that the introduction of any such technology in this area would lead to a reduction in face-to-face communication. As such, it is important that any technology introduced in this area does not seek to replace face-to-face interaction but rather should facilitate it. For example, a feature to invite visitors would increase personal interaction, as would the communal shopping option, since the goods would have to be delivered to the person at which time face-to-face interaction is likely to happen.

Participants mentioned that when new neighbours moved into the area, it was often quite difficult to get to know them. These new neighbours were typically younger than themselves and spending most of their time working; and whilst friendly, it was difficult to have casual meetings with them as they were often out all day at work. As such, there was a desire for any system to encourage intergenerational communication.

Participants wanted to be able to easily share their needs with selected people in their community under a variety of topics. One such example was if a person had some desire for social interaction, they could show themselves to be open for visitors or that they would like a visitor. This is another point that would encourage face-to-face interaction in the community.

There was also a need to share information differently depending on the type of contact, e.g. a user may wish to show one particular group of contacts a general message but would prefer to show the 'I could use some company' message to a smaller group of people.

Physical

In a similar way to the social needs, participants would also like to have a way to show if they had a physical, non-urgent need. For example, one participant mentioned that she had a sliding door which had fallen off its runner and she was unable to lift it back on by herself. In this case she would have liked to be able to get help doing this.

Area	Requirement
Security/Information	Secure device Definite switch off Newsletter of local events
Social	Face-to-face Intergenerational Desire for visitors Group-specific information
Physical	Shopping needs Physical help
Interface	Remote access Easy to read Easy to use
Crime	Anonymity Minimising false reporting Local crime information
Management	No one person responsible

Table 1. Table of requirements by group

Interface
Participants stated that they wanted the system to be remotely accessible so that they could access it from outside of their house (e.g. whilst shopping). Another participant mentioned that a feature for checking on things when they were away on holiday or out of the area would also be useful. Participants unanimously agreed that the system must be easy to use with a clear, easily legible and simple interface.

Crime
Participants wished to be able report crime and suspicious behaviour through the system but wanted to be certain of their anonymity. For example, one participant stated she had previously reported a crime and did not wish to leave her details, and was surprised later when the police called her back to thank her for her help. Participants did note that having a purely anonymous system could cause problems in itself as it may be open to abuse. As such they wanted some way of preventing people from making many hoax reports whilst still being anonymous.

Additional Requirements
In addition to the requirements gathered directly from the participants, a number of requirements were also developed by the research team as a result of previous research. These included a local newsfeed comprised of local events information, local crime figures and police notices.

One final point is that it became clear that the system should require that no one or two people are responsible for its maintenance. In this way, the system would be better able to survive changes in the local neighbourhood when existing organizers move away or die.

Conclusion
This Work in Progress has outlined the requirements (as extracted from our Technology Tea Parties) for a socio-technical solution to facilitate community interaction schemes. The aim of this is to increase social participation in these schemes by utilising the latest communication technology to remove some of the barriers to participation which currently exist.

By utilising these requirements and developing a community interaction scheme, we can aid place-based community interaction, remove barriers to getting to

know people (particularly across generations) and find people with common interests or supplementary needs. The system would also aid the community by providing relevant information from local authorities and police and allowing secure and anonymous reporting of crime.

A key aim of this system is to establish trust between participants and understand the privacy implications and willingness to disclose different types of information to neighbours. Privacy plays a significant role: an online directory of residents may be useful, but must be securely available only to registered users. Foth [5] has already established that residents in his Australian study were willing to disclose contact details for a number of communication channels to other residents in the area.

We will follow this work by examining issues surrounding privacy and information disclosure as well as examining how people from different age groups define their communities and what they want from them. Once requirements are gathered from a more representative sample in further discussion groups, these can be added to the requirements already gathered here to develop the community interaction system.

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