

Mobile Challenges: From Universal Access to Universal Participation

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Abstract

Mobile technologies and services offer new opportunities for eAccessibility and eParticipation. In this position paper we present three on-going projects addressing mobile user collaboration and participation, where the target groups range from physically disabled persons to neighborhood citizens. We then discuss some selected challenges in mobile eParticipation, regarding both ICT research and policy and community issues.

1. Introduction

Universal Design in the digital domain has evolved during the last couple of decades to a large and diversified field of research and development, in particular in the HCI (Human-Computer Interaction) and CSCW (Computer Supported Collaborative Work) communities. It is particularly evident in the *e** family of activities, like eAccessibility, eLearning, eGovernment, eInclusion and eParticipation. Initially, Digital Universal Design focused on developing user interfaces for all. However, gradually the scope has widened to include universal access to the information society in general, emphasizing services rather than software [7]. In the majority of efforts in this field, the users have been playing the role of information consumers. Recently, several initiatives have emerged, addressing the users as active participants in community processes, most prominently the EU umbrella project *The eParticipation Initiative* launched in January 2007 [3].

The Mobile Applications Group at Østfold University College is focusing on user collaboration and user generated content in mobile settings. The main use case is an everyday situation, where users are generating, sharing, distributing and digesting multimedia content, using off-the-shelf mobile devices (typically smartphones) in order to reach a common goal.

In the following section we present three of our ongoing projects where the main objective is to empower mobile users to improve the quality of their everyday life. The main means to accomplish this task is to leverage state-of-the-art location based methods, in addition to exploit real-time generation and sharing of content. Two of the projects are in particular targeting disabled people, and

one is aiming at citizens in general. In Section 3 we discuss selected challenges, mainly regarding social and societal aspects, but also more technical issues such as device interaction and user interfaces. We close the paper with a few concluding remarks.

2. Mobile eParticipation

Our work in the field has been practically oriented and focused on developing applications to take advantage of the rapidly evolving mobile technologies and the emerging social perspectives on software. We have produced three prototype systems exploring different aspects of mobile technology and social software.

The first prototype, dubbed OurWay, is a route planning system available on mobile devices such as Pocket PCs and Smartphones. OurWay is primarily aimed towards wheelchair users, but is designed in such a way that any user can take advantage of it. Users are able, through OurWay, to designate points on the map as uncomfortable or even impossible to traverse, and this information is immediately spread around to all other users. Route planning is performed on the basis of such information offered by anyone subscribing to the same user-group [4].

The second prototype, developed in the MoBRUK (Norwegian abbreviation for Mobile User Collaboration) project¹, is a mobile application that lets the user browse the NAD² accessibility guide and create their own annotations of areas with varying degrees of accessibility. For example, a user could create an annotation on the map for a local café with particularly good or bad access for wheelchair users. Like annotations in OurWay, these points of interest are immediately shared with every other user of the MoBRUK prototype.

Finally, in reaction to a local near-tragedy and a subsequent call for aid from the general public issued by the local municipality, we created a manhole cover web service which allows anyone to place messages of concern on an interactive map. The messages may contain images of the item the citizen was concerned about, and each such message contain its own thread of comments and possibly extra images from other citizens.

In the first two prototypes, we were primarily motivated by the opportunities present in the emerging technologies and open data we had available. In contrast, the last prototype was a direct result

¹<http://mobruk.hiof.no>

²Norwegian Association of Disabled

of vocalized need for the local government to have some way of accessing what the citizens knew and observed in their everyday lives. In all prototypes, however, the focus has been on offering opportunities for people to document their lives and then sharing that documentation freely with anyone else that uses the system.

3. Challenges and Implications

Common to the three projects mentioned above is the user as an active participant. Enabling participation for all in these systems requires not only user interfaces that work for a wide range of users, but a thorough understanding of the contexts in which the systems are used. To better understand these contexts, we have started a study looking at users' motivation for contributing to these kinds of social information systems [2]. Below we present some of the challenges we have become aware of, and use concepts such as "communities of practice" [8] and "boundary objects" [6] for discussion. We also draw on work by Markus [5] to describe possible implementation issues.

Building trust in the system is paramount for successful deployment of such collaborative systems. This is perhaps emphasized by the nature of the systems we have described, where erroneous information can have devastating, even lethal consequences. Building trust in the system is important among all the communities of practice involved in the system, however the way trust is assessed might vary across the user groups. For a contributing user, knowing how the community works and the technology that exists to facilitate quality control can build trust, as exemplified by Wikipedia watch lists [1]. A peripheral, consuming user might put faith in the system by relying on other, more active users, much like people trust Wikipedia because they see it used as a source in the media. Generally, using technology such as trust networks might be fruitful in establishing trust in the system. Preliminary findings in our study on motivation indicates that trusting accessibility information among wheelchair users is tightly linked to the personal relationship between producer and consumer, partly explained by the diverse needs and abilities in the user group. Transferring the trust on a personal level to system trust constitutes a challenge that deserves attention.

Engaging the different communities of practice becomes important as soon as the system is meant to be used as more than documentation tool within a single community of practice. A tool that allows wheelchair users to document the accessibility of their surroundings can also be used by municipality regulators or building owners to identify points of action. It is important to realize that the different communities will have different perspectives on the information. For instance, wheelchair users documenting poor accessibility in a shopping mall might be helping each other, but the mall owner might conceive this documentation as bad publicity, unless he is prepared to use this information in a constructive fashion. Related to this is the tension between traditional accessibility guides with centrally controlled and quality assured information, and systems where the users get to voice their subjective opinions. It is tempting to look at Markus' explanation for resistance in MIS implementation, where she uses a political variant of interaction theory to illuminate resistance in implementation of a new financial system in a large organization. Interestingly, the case she uses is one in which power is shifted from local branches to the center of an organization, whereas in our cases the power is shifted the other way. We see indications of such resistance

both from interviewing people associated with NAD and in working with the case on reporting faulty manhole covers. We suggest that understanding the dynamics of the different communities, and their agendas, is a prerequisite for successful system design.

The diversity of user groups has significant implications for system and usability design. Some issues are obvious, like accounting for suitable ways of interacting with mobile devices, possibly by people with physical disabilities, and technical issues such as the inherent instability of mobile devices and their network connections. Other issues might be less obvious, like securing critical user mass, and finding ways to group users into sub-sets of communities to allow sharing of relevant information.

4. Concluding Remarks

In this position paper, we have focused on allowing the concept of eParticipation to include mobile situations and devices. In particular, we are of the opinion that letting users *generate* information, hence complementing the *consumption* of content, could yield substantial benefits for both individuals and society.

As examples on such applications, we briefly reported from three ongoing projects focusing on active user participation with mobile devices. We have experienced that applications for mobile collaboration raise new and exciting challenges in the HCI field. However, we think some of the greatest challenges are posed by understanding the contexts of use across diverse communities and their agendas, thereby securing both system trust and mutual engagement.

5. References

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