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DOES USER PARTICIPATION MATTER IN THE DESIGN AND DEVELOPMENT OF E-PARTICIPATION TOOLS? EXPERIENCES FROM A PROOF-OF-CONCEPT PROJECT

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This paper presents experiences from a proof-of-concept project concerning a tool for e-participation, Augment; a map-based mobile accessibility service which relies on user-generated content. Using a Participatory Design approach, the aim has been to include future users in the project from the start, so as to ensure that the resulting service will be a useful and sustainable tool for co-constructing accessibility in everyday life in collaboration among involved stakeholders. The project has been struggling with the complexities of combining academic competencies in Participatory Design and traditional project management and systems development approaches. One of the most difficult issues has been balancing widely differing experienced needs for controlling distributed end-user participation. Our experiences so far raise serious questions about how to combine models of open innovation and increased user-involvement with current mainstream user-centered software and service development models. While user-centered design seems to call for users-on-demand, user-driven innovation of e-participation tools could, we argue, benefit more from developers-on-demand.

1. Introduction

Current rapidly expanding use of social media technologies, in combination with a growing emphasis during recent years on both e-participation and end-user participation in the area of e-government, create enhanced possibilities for open innovation of public e-services through contributions of collaboratively created content and user-driven innovation. However, we argue that commonly applied methods for user-centered software development need to be problematized in relation to concepts such as "open innovation", "user-driven innovation" and "user-created content". Experiences from a proof-of-concept project concerning a tool for e-participation, Augment, show that differing understandings of how user participation should take place in e-service design and development can cause severe tensions and at worst threaten the project and thus the future of the invisioned e-participation tool.

The Augment project aims to combine the power of social media technology and geographical information systems (GIS) in order to provide accessibility information and support for community building around accessibility issues. GIS have migrated fairly recently to more openly accessible web based formats, thus allowing for distributed and asynchronous mapping of place-based information, with geographical maps as a base layer and public direct participation as one of the main content providers. This redesign of participation towards web-based participation methods, which originated in the area of urban planning but now has spread to other areas as well, has resulted, among other things, in research findings in line with those reported in the PD community 2008 by Nuojua et. al. [1], emphasizing how these

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kinds of applications are suitable for acquiring and sharing local knowledge and also a way to enlarge and diversify a group of citizens with shared interests and concerns. The introduction of mobile phones with integrated GPS contributes to addressing issues having to do with timeliness, place-based experience and experienced relevance and participation by a large, distributed group of participants.

The Augment project strives to find new ways of combining the flexibility of participation supported through social media with testing what happens when this specific type of participation becomes more or less mandatory in order to provide service content and service sustainability, and the tools provided are meant to support a more clearly defined community, i. e. the local group of physically disabled, and not only random, widely distributed users temporarily connected via issues of shared concern.

In the following, we present the background of the Augment project and give a brief presentation of our research methodology. We thereafter present the proof-of-concept development, which is (as we write this) the currently on-going stage of the Augment project. We describe how differences in situated practice around managing user participation within the framework of the proof-of-concept project have revealed clashes in assumptions about user involvement in design and development of e-services, and give an anecdotal example of this which shows how these tensions between different perspectives have surfaced during the project. In the concluding discussion, we relate our experiences to an on-going discourse within e-government research about differences between user centered design, participatory design and user driven innovation approaches concerning methods for user involvement [2] and why we believe this discourse is relevant for design and development of tools for e-participation.

1.1. Background of the Augment project

Our case study describes the ongoing practice of developing a proof-of-concept and prototype for an e-participation tool, a mobile accessibility service called Augment. The project was originally initiated within the framework of on-going R&D collaboration between Blekinge Institute of Technology (BTH) and the Indian Institute of Technology Madras (IIT-M), with a special focus on participatory design of robust and affordable ICT for sustainable development. In the IIT-M/BTH collaboration, we focused on evolving practices of participatory design in local settings, as seen in a global context.[3,4]

The Augment project started out as an initiative in a local municipality in Blekinge, Sweden, which grew into a regional initiative to develop an interactive accessibility data base and thereby fulfill the national authorities' requests to address "disability obstacles which can easily be removed" [5] by a given deadline of 2010. This was the main purpose of initiating the project. During the succession of three organized workshops in 2008-2009, it became clear, however, that the project needed to take its starting point in the issue of people's participation and then iteratively move towards refinement of technology effectiveness. In 2009, a pilot project was funded by the County Council of the Blekinge region. This resulted in a first prototype of the service [3]. In 2010, additional funding was granted by the County Council and the regional EU-funded project X-Ovation, which made it possible to initiate a proof-of-concept project of the Augment application in collaboration with BTH Innovation at the university.

The Augment project is, more specifically, working with the task of developing a mobile location-based service which allows reporting, tagging and rating of obstacles to accessibility

by and for people with physical disabilities or reduced functionality due to for example a stroke. The Augment application is envisioned as a community-based service for sharing data, opinions, reviewing and rating and also personalized peer-to-peer advice concerning for instance route planning and accessibility among those who share a concern for these types of information.

The mobile application has gone through a first round of prototyping and is now being further developed in the form of new iterations of prototyping and trials within the framework of a proof-of-concept project, where keeping track of end user wishes, ideas and opinions in the development process are essential for the whole development process and the resulting service.

1.2. Research Methodology

In the Augment project, the involved researchers are using a Participatory Design approach, based on the Scandinavian Approach to Systems Development [6,7,8,4,9], emphasizing principles of mutual learning, shared responsibility-taking of the design process and collaborative prototyping and design of software systems.

The research is also grounded in the approach of design ethnography, in the sense that we are mapping out and following an on-going process of development rather than placing the main effort on summing up, packaging and presenting the results, in order to open up the black box of systems development while it still is possible to make interventions and improvements to the actual development. Our methodology here is inspired by Suchman [10], with the aim of mapping and exploring the working relations of technology production and use – always with an eye towards what these working relations might mean for the design process and its results.

2. The Proof-of-Concept Development

The aim of the process of developing a proof-of-concept is two-fold. It is on the one hand part of an attempt to institutionalize the pre-commercialization process for innovative ideas coming out of university/industry collaborations. The driving institution here is BTH Innovation at BTH, an early stage pre-incubator run by the university in close collaboration with a number of industrial partners. The main aim of BTH Innovation is to support and enhance practical innovation at BTH and in the region. The idea is to work with internal and external stakeholders to strengthen and clarify the role of academia in the regional innovation system. Secondly, the aim of developing a proof-of-concept is to test new product and service ideas at an early stage in relation to the needs and requirements of the intended future users, the market etc, by involving relevant stakeholders early in the design and development process.

For the Augment project, one of the goals of the proof-of-concept development is to contribute to developing a new framework concerning technical preconditions for open innovation and public e-services based on user-created content. This includes elaborating upon and exploring issues such as the following; negotiating a sustainable balance between different stakeholder rights and obligations, levels of user-involvement in terms of both participating in the proof-of-concept project and - seen in a wider context - in terms of participation when it comes to inviting the public to create content and contribute actively to continuous further development and customization of the service. We are also exploring what alternative business and management models might be appropriate for services that

municipalities are obliged to provide for citizens but which ultimately depend on content generated by the citizens/users themselves.

The proof-of-concept stage of the Augment project is being run by BTH Innovtation within the mobile arena (wi.se) at the university. Wi.se conducts business in an experimental form through short "proof-of-concept" projects (typically 3-6 months in duration). In these projects, the aim is to work according to a structured and proven process model through which an initial idea is further developed and tested from three perspectives: technical, user, and business. The initial ideas for the proof-of-concept projects are gathered from students, researchers or from entrepreneurs and companies in the region.

BTH Innovation and wi.se have by now run nearly 70 projects in this way. Each proof-of-concept project is, in its implementation, similar to a start-up situation for a new company. The explicit vision of wi.se, as articulated on their web site, includes the following statement:

> "Those who work with the projects must be independent and be able to rapidly adapt their resources depending on feedback from the end users and customers. Right from the first day of the development project, customers should be part of the development process. Without their involvement there is a risk that too much time is spent on technology development before one really understands the customer requirements. Early visualization in the form of mock-ups, sketches etc. allow for an early customer dialogue."

The projects last for 3-6 months and are staffed with a systems development team that can produce a first prototype for market testing. The aim is to help new ideas take the first steps towards functioning business concepts. The ambition is that all who take part in the projects should acquire new knowledge and training in what it means to be in a start-up situation.

2.1 Differences in Situated Practice

However, in the case of the Augment project, it has become clear during the proof-of-concept development process that the concept of active user participation and structuring of iterative processes is understood and applied differently by the research group and the system development team. Despite the visions of collaboration across boundaries between research and development, which was highlighted in a presentation by the manager of BTH Innovation early in the process, the proof-of-concept has hitherto been run as a stand-alone project. From the start, there was an ambition in the software development team to apply the SCRUM method [11] during the process. The use of the SCRUM method in the proof-of-concept development process came up early in the negotiation process, which included stakeholders such as representatives for the researchers, people representing management and technical developers of BTH Innovation, a local business incubator, and a representative of the disabled persons (in this case the user representative has a double role, being also involved as a researcher in the Augment project). The official argument for applying the SCRUM method of systems development was to secure a continuous close connection to the users' needs and wishes through iterative software development in short, efficient sprints.

Almost immediately, the hierarchical ordering of the project development team caused problems, mainly due to the allocation, a month after the proof-of-concept kick-off, of a new project leader who had not been involved in the process from the beginning. The ambition of keeping close and continuing contact between the development team and the researchers and user representatives was subordinated under internal project administrative procedures and milestones almost immediately after the new project leader took over. There was also a separation and division of labor concerning the different work tasks which indicated that the work on the UI (user interface) and the main architecture of the application were neatly

separated – as in most traditional software development processes. This raises a specific issue of relevance for both research and practice: what depth of user participation is allowed and supported in this kind of proof-of-concept projects, in theory and in practice?

Thus, we experienced a need for studying and articulating the tensions which rapidly escalated within the proof-of-concept project due to differing approaches to *in what way, to what extent* and *in what stages* the end-users (we refer here to citizens experiencing disability) should be involved in the process of testing the concept and producing a prototype which could function as a technical probe for further iterations and future refinement of the service.

2.2   Clashing assumptions about user-involvement in design

The research team has been working for a number of years with what could be defined as *incremental user involvement*, in line with the ideals of participatory design. [4] This includes a life-cycle approach to service development, taking the use and the varying use situations as a starting point for planning and running the design process. BTH Innovation took a different approach, emphasizing the structure and processes of a traditional systems development project, although in compressed form to fit the "sprint" metaphor the proof-of-concept projects aim to emulate. The researchers' aim was to support what we call situated innovation [12], putting emphasis on user involvement through informal contacts, making use of user-created content, focus-group discussions and design workshops and discussions arising out of the use situations. The communication was envisioned as originating in cross-communication in various interest groups such as the local interest organizations for disabled people. The strategy was to support them in building a community which could become a source for self-organization. The researchers nurtured the idealistic view that the development team then could function as "developers-on-demand".

The systems development team had the opposite picture in mind; they saw user-centered design as having access to "users-on-demand", with whom they communicated preferably at a distance via surveys, in order to fulfill their proof-of-concept assignment. Their goal was commercialization of the idea, rather than taking in account the life-cycle approach of incremental development of an interactive service. Their goal was product oriented, while the researchers in their turn focused on the design process. This contributed to the experienced problems in communication within the project, where the researchers felt they as well as the users were being left out of the design and development process entirely, while the development team felt they were not being given access to users to the extent they had anticipated. This set off a chain of further misunderstandings and negative reactions on both sides which almost caused the project to capsize.

2.3   The Snake-Charmer Dilemma

The planning of user interaction within the proof-of-concept project was conducted by a special interaction design expert, employed by BTH Innovation, who had a fixed scheme for the user activities. The expert´s aim was to send out a survey to a chosen group of users, asking general questions about their needs in relation to a mobile device for reporting hindrances and accessibility issues via a smartphone. This was a first attempt from the development team to get feedback on use context which in turn could guide further prioritizing of functions. There was an ambition to arrange design workshops with invited users, workshops that were to be carried out in a later phase of the project. This plan, including the formulating of survey questions and sending out of the survey, was set up without any communication or collaboration with the researchers beyond the initial

communication of addresses to user representatives whom the researchers had been working with in the earlier phases of the Augment project and some new contacts who had indicated that they were interested in taking part in the project as potential users. The result was a very low response rate on the survey. This caused a crisis in the development and the project was put on hold until the situation was solved. The problem with the lack of user representation was then handed over to the researchers who had not been consulted about how to go about the survey and other contacts with the users directly related to the development process. What, we asked ourselves, had gone wrong here?

At this volatile stage of the proof-of-concept project, the researchers contacted their network of user representatives and found out that there were unexpected circumstances which had got in the way of the planned user participation in the project. Several of the people in the chosen user-group had recently been hospitalized due to accidents caused by difficult weather conditions and icy roads or due to other kinds of illness. The weather – heavy snowfall, storms and extremely low temperatures for months – did not encourage users to become adventurous on the streets either, especially as they were all dependent on vehicles such as permobiles or wheelchairs as well as personal assistants to get around. The researchers started to search in a wider circle of contact persons. Could for instance the assistants of the disable persons be included in the user-group? Could other support groups for disabled be contacted? Could a test group of disabled people living in Stockholm be involved? These suggestions were turned down by the project manager of the proof-of-concept project.

At this point, the manager of BTH Innovation came up with an anecdote, illustrating the unfortunate situation of invisible users in a project dedicated to user-driven development: "Have you ever heard of the snake-charmer who forgot to bring the snakes to the market place and ended up with the dilemma of trying to seduce the audience to imagine how dangerous the snakes are?" His point was that the researchers were the snake-charmers and the users were the invisible/non-existent snakes, in this case. However, the use of this anecdote in the situation we were all involved in, where the proof-of-concept project risked being prematurely ended due to the lack of active users, underlines both a lack of functioning communication between researchers and developers, and a one-sided perception of the situation by the story-teller. Who might the snake-charmers be in this story; the ones who want to make a neat package of the users or the ones who are in dire need of a manageable package of efficient developers? And what is really invisible in this anecdote? Could it be that there is a need for various user groups or networks – serving different purposes and engaged along different time-lines – in development processes of new public services that rely entirely on active and motivated users providing content for their very existence and sustainability?

So we didn't feel comfortable with the anecdote as it was applied in this case. Yet it did provoke us to address the problems of user participation and drop-out of users that we were experiencing in the project as an instance of a systemic problem that needs further exploration and articulation. The anecdote was, from our point of view, a slightly malicious mal-packaging of the problem. Obviously, it needed unpacking and repacking in ways that could promote user participation in similar projects in future. Through the proof-of-concept project and the tensions that rapidly escalated within it, materializing as anecdotal snake-charmers (whoever they are) without snakes (whoever they are), we began to perceive the need for seriously rethinking stakeholder representation and stakeholder roles in life-cycle design, development and management of public e-services. From users-on-demand to developers-on-demand, the latter being what we researchers perceived as the obvious solution for getting users more actively involved. Which remains to be proven, through continued research and development of the Augment application, beyond the 6 month proof-of-concept experience.

4 . Concluding Discussion

There is an on-going discourse within e-government research concerning methods for user involvement, in which differences between user centered design, participatory design and user driven innovation approaches have been high-lighted. [2] So far, however, we have mainly heard these distinctions used to identify different approaches used by different projects, as a way to categorize how user involvement has been managed in different e-service development projects. Our experiences in the Augment proof-of-concept project show that approaches to user involvement may differ widely within the same project. If project participants are not aware of such differences, this can lead to serious conflicts and problems which may actually put the whole project and the aimed-for services at risk. We believe the discourse about different approaches concerning user involvement is at least as relevant for design and development of tools for e-participation as for e-government services in general, and that the different assumptions about methods for user involvement within design and development projects need to be made explicit and that the actual methods chosen and applied should be negotiated among relevant stakeholders. This is not only recommended as good practice to avoid unnecessary tension and misunderstandings, but also as a way of moving forward towards a new generation of frameworks for user-centered design and development of e-services and e-participation tools, frameworks that are supportive of and encourage user participation as well as user generated content and user driven innovation.

Our methodological approach of mapping and exploring working relations of technology production and use [12] has revealed something of the complexity of matching different communication patterns in cooperative projects built on what we had initially percieved as a shared visionary approach towards opening up the practice of innovation for a variety of stakeholders. It has also revealed the possibility of regarding innovation as a concept which needs to be understood as a concept of diversity. One of the initial questions in this paper raised the issue of what extent of user participation is allowed and supported, in this kind of proof-of-concept projects, in theory and in practice.

The rhetorical view on user involvement and participation seems often to be that the users are more or less self-going, eager to participate and ready to contribute with their informed opinion in order to reach the democratic ideal of co-determination and consent. In our case, the technical development team nurtured an ideal of having the user experiences neatly packed in a box, ready to access whenever needed according to their own development scheme. The metaphorical image of the snake-charmer's dilemma is in some sense amusing - but also necessary to challenge as to who and what is actually being depicted as the problem.

An important finding is that both demands and solutions need to be openly negotiated and co-created in an open innovation environment in order to find a shared meaning of the common activity. But how could this come true when different innovation cultures and practices are constantly clashing? And what does it mean for the effectiveness of a short-term proof-of-concept project, if it becomes a part of a project which from the beginning was seen as a long-term initiative, and thereby also included a multi-faceted understanding of user involvement and customization as part of the whole project life-cycle?

The inherent nature of a project, built on cultural assumptions, is that it must have a defined deadline. However, in an open innovation environment there is also a need for iterative development over long time periods, a need for repeated technical probing and a trial period for finding appropriate methods which suit all partners (including users), but also a variation

of situations, and contexts and most certainly a need for division of groups and networks serving different purposes.

When designing and developing services based on user-created content, the project development approach would benefit from including a bottom-up approach, where growing, self-organization, mutual learning and respect as well as sharing are at the core, instead of what the developers for the moment need to get hold of in terms of user feedback. A short-term proof-of-concept should be able to play an important role as a way to reach beyond the given dichotomy between different views on how innovation will occur, by focusing more on the preconditions and support for innovation, i.e. 1) providing space for negotiation of shared meaning 2) collaborative concept development, and 3) creation of a common communication infrastructure, thus becoming 4) a pre-incubator for how to accomplish mutual respect between different practices of innovation rather than ending up as a traditional pre-incubator for managerial utilization of various competences and groups. Cultivating a network of future users, who will later be contributing content to the mobile service being developed, is also about customer relationship management.

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