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# **The AUGMENT Project: Co-Constructive Mapping and Support of Accessibility and Participation**

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**Abstract.** This paper presents an ongoing multi-disciplinary research-and development project in which we are exploring emerging methods and practices for participatory design of tools and content of accessibility information in India and Sweden, based on user created content. The initial development of the AUGMENT-Project also includes the production of a prototype for sharing information. The joint set up and unfolding of public digital spaces and co-operative creation of processes and infrastructure for user-driven accessibility information is making use of existing handheld mobile phones which offer the possibility to upload pictures and comments via an application with a map-based interface. The research initiative is exploring and comparing cross-cultural participatory methods for cultivation of shared transformational spaces. The paper discusses both the notion of user-driven content and co-creation of tools and methods, drawing upon the tradition of Scandinavian Systems Design, explicitly arguing for direct user-representation in systems development.

**Keywords:** eParticipation, user-driven content, participatory design, map-based interfaces, disability, social media

## **1 Introduction**

Recent Swedish research on rehabilitation engineering [1] has shown that disability is dependent on the situation, not primarily on the individuals. This means that problems are possible to jointly minimize or solve to a greater extent than the mainstream understanding of disability problems has previously assumed. Accessibility, thus, should be seen as an act of co-construction, not something which has to be provided for someone else. Accessibility information needs to be constantly re-formulated and customized, depending on the individual's circumstances and current location in space and time, rather than simply and statically presented as one-size-fits-all and relying on individuals learning generalized strategies of how to use "off-the shelf information". New solutions providing access for disabled groups are frequently

developed -this is not an issue any longer-the issue is rather: how are these new solutions communicated among those who need the information and in which way are their personalized interpretations contributing to the understanding of accessibility? How can shared spaces be opened and cultivated for co-construction of accessibility?

### **1.1 Reconfiguring accessibility**

The AUGMENT project aims to work with groups and individuals who have experience of accessibility problems and who are not satisfied with current accessibility solutions, which have primarily concentrated on regarding accessibility as a stabilized artifact [11] rather than a situation which is dependent on re-interpretation. The organization of physical places affects disabled people's possibilities of participation. The physical environment in Sweden to some extent lacks relevant customization and there are also gaps in accessibility for groups of people with various disability problems. But the picture is not one-sided. In relation to rebuilding of physical environment, a number of accessibility problems are solved over time. The issue is rather how these changes and reinforcements are communicated to the affected groups and individuals who are dependent on such information. A repeatedly formulated wish from representatives of these groups is the possibility to describe environments with the help of images and other examples of "rich pictures", where the user her/himself can decide about and evaluate the offered accessibility. In a recent charting of different EU-initiatives, HANDISAM, the Swedish Agency for Disability Policy Coordination, point out that the aim of steering development and research towards more inclusive projects and solutions has been based on the i2010 strategy, the guiding framework for accessibility issues. There are ongoing discussions about legislation of eAccessibility within EU and the European Commission highlights the importance of prioritizing a coherent, mutual and effective strategy for eAccessibility, or web accessibility, in order to boost the development of the eSociety in line with a new social agenda. [3, p12]

This is not, however, the main priority today. There is also great demand for flexibility and mobility, and a new generation of mobile web tools has been developed, contributing to supporting and enhancing this mobility and flexibility. Interactive features make it possible for individuals to contribute on various levels by posting experience based information on the web site. Providing accessibility is not simply about providing information, but also about providing means of co-construction of the expressions of accessibility as well as form and content – providing space for exploring a multitude of experiences of variations of disability in relation to accessibility issues. The visualization possibilities of for instance policy development by the introduction of map-based interfaces for a better representation of content, as for instance described in Renton & Macintosh [16], is one way of making use of computer-supported argument visualization (CSAV) tools in support of public participation in for instance public e-consultations. [15] However, there is also another perspective which takes its starting point in proactive participation orchestrated mainly by the active citizens themselves, namely the creation of both content and platforms as offered by the tools of social media. The practices of supporting and utilizing User Created Content is developing fast also entering the

arena of eGovernment, going far beyond the original personal or entertainment purposes of social media, contributing also to information sharing.[18]

The research reported in this paper describes ongoing work, which takes its starting-point in regarding disability issues as a fundamental part of the discussion of participation, rather than regarding disability as a specific condition in need of specialized participatory solutions based on seemingly more accessible versions of applications or tools. However, the core factor of the research is not solely disabilities; rather the main focus is the scope of participation. Similar research could be made in cooperation with non-disabled users and the information could also be represented by an interface not using georeferenced data, but since the research is closely related to regional development the project is firmly based in identified local needs.

Secondly, the aim with the paper is also to contribute to the ongoing development of theories and methods for eParticipation, thus it is discussing the essence of participation for design, through the strivings of including marginalized groups and citizens' in contributing to both prototype development and content generation. At the same time the paper also problematizes the issue of designing for participation, by putting the spotlight on the fact that what we might have taken for granted as a starting point for inclusive design – adapted web tools and web interfaces – might not be the best way forward, since it is based on presumptions about disability as a non-flexible condition which has been deprived all possibilities of self-representation.

## **1.2 The Research Approach**

The research approach we have chosen concentrates on case studies, small-scale action-oriented R&D projects with a base in using qualitative ethnographic studies coupled with engineering development work. The basis for this approach is the Scandinavian tradition of workplace democracy [4] [5] [6] [9] with a deliberate use of multiple perspectives through iterative negotiation processes in ICT development. One aim is to achieve conceptualization based on the interplay of practice and theory with a focus on participatory design processes.

We acknowledge that there need to be more research studies concentrating on developing more inclusive methods for participation. We also base our approach on the strivings from people who are experiencing disability in various forms and work towards a flexible and situation-dependent re-conceptualization of the notions and practices of accessibility, disability and participation. Additionally we wish to collect material for development of a new agenda for the Scandinavian approach to systems design-also including what has been labeled PD in the Wild, [7] [8]

## **1.3 The Theoretical Basis**

In order to decompose the predefined and somewhat sealed category of participation, we make use of Hannah Arendt's theory of action [2] which once was considered a defense of participatory politics in the 1960's. Arendt's thoughts about civic humanism, morals and politics have in some sense been re-established during the late 1990's are useful as a conceptual tool when scrutinizing the reintroduction of

participatory values in the current decade, when user-generated content and user participation have become the latest writing on the wall. Arendt understands human beings as creatures who act, in the sense of starting things, and who set off chains of events. Her writings on actions in *The Human Condition* [2] were a powerful account of the human capacity for action, celebrating human creativity, stating that people have the capacity to act even in unlikely situations and under limited circumstances. In the introduction to the second edition of the book Canovan explains the basics of Arendt's theory [2, pVii-xx]. Arendt emphasized that politics takes place among plural beings, and understood activity in three forms, where action is distinguished from labor and work. Labor corresponds in her interpretation to the bodily activities of a human being, while work in her interpretation was equivalent to the artificial world of objects that human beings build on earth. Action corresponds to our plurality as distinct individuals, or our possibilities to make new beginnings and start new processes. The political features of human beings are plural, and the capability for new perspectives and actions will not fit into a predictable model unless these capacities for action are drastically curtailed. These three forms could also be used as a tool to open up the black-boxed category of participation, since participation also contains nuances and variations as well as human actions. The form labor could in the context of full-scaled user-involvement be equivalent to *automatic participation*, the second form could be labeled *dutiful or instructed participation* and the third category *proactive participation*.

## 2 The Project

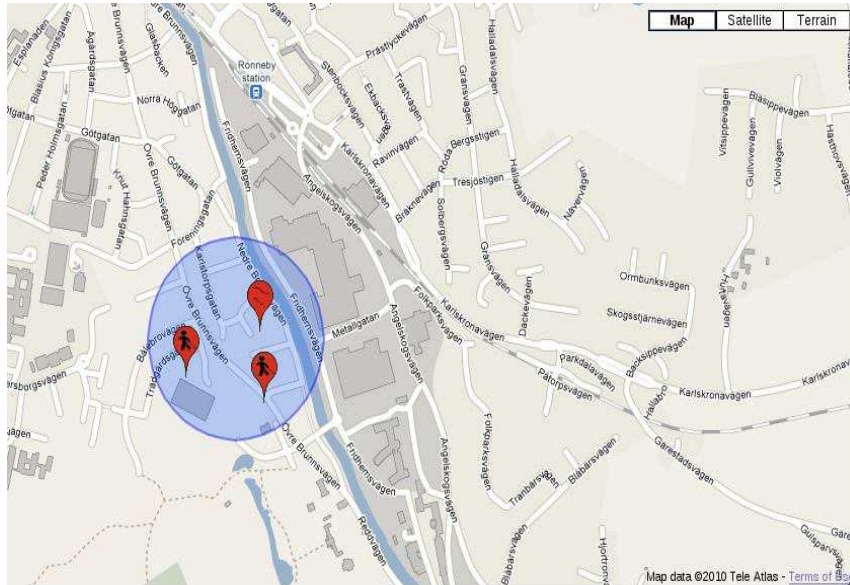
The local development has consisted of constructing a suitable interface, a user-generated database, and a wiki-solution for handling and maintaining data as well as a mobile interface together with users. The task is mainly charting of “inaccessible” places and the aim here is working with various groups of users and cases, for instance hospitals, public places, and common recreation places. The main issue is to offer possibilities for direct participation by those affected. There is also a sister project running in Tamil Nadu, India called *The Walk-on-Water project* [13] [14], which has a different focus, but which we are using for trans-cultural comparison of evolving practices of user-driven and participatory design of public e-services based on co-construction among multiple local stakeholders of databases containing current, meaningful local information.

In order to be able to concentrate on design of an easy-to-use solution with the user as co-constructer, the development process in the pilot project is focused on a specific modification (or module) of an existing and established application. An example of a basic similar solution is Google maps Street View (<http://maps.google.com/>) where you can walk around on the streets virtually and examine pictures and surroundings by assessing information on the map. In real life, use of GPS-based technology with positioning makes it possible to contribute to the map content with personal photos and comments.

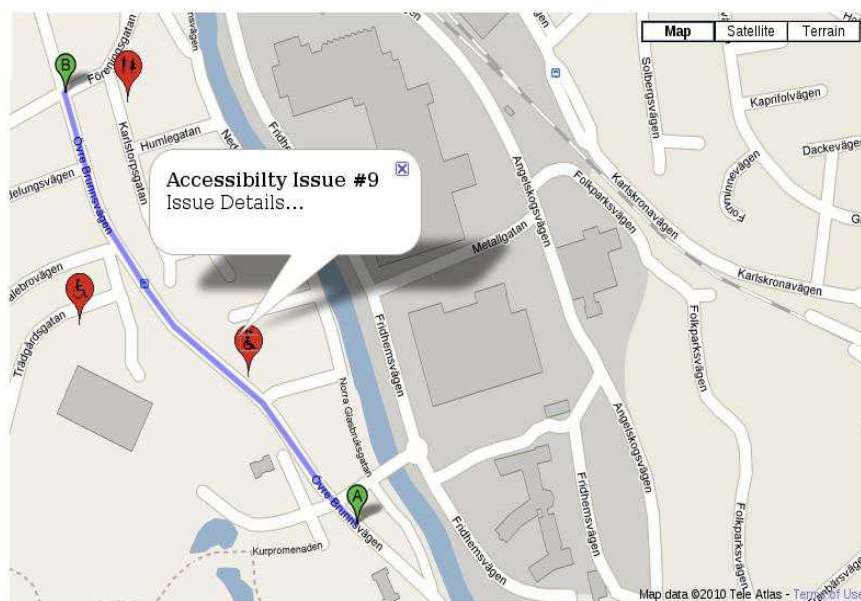
The locally developed prototype contains a set-up of a user-driven accessibility database combined with a wiki solution in order to handle different versions of

information (the information could be exemplified by possibility of scaling a specific environment, individual evaluations, and location of for instance toilets and so on). The aim of the project is to find new methods for continuous up-dating and ways to secure accurate, up-dated and high quality of status of accessibility in the local area. The content generation has hitherto concentrated on upload of pictures and comments. The use of the content is made searchable by issue name and also includes a rating possibility which draws upon socially responsible enactment of citizenship by individuals. Some of the basic functionalities developed so far are the possibility to place oneself on the map and plan a journey and also to identify any possible obstructions in the way. The project benefits for the involved group of stakeholders are primarily practical: to jointly develop new ways of working around co-constructive provision of accessibility information. It is also a way to gain goodwill for local authorities by the introduction of a user-driven accessibility database which makes use of the implementation of a Wiki-solution in order to handle information. This is in line with recent development of new methods for accessible update of information and visions of creating good governance as well as shared responsibility for the quality of accessibility information. For the region, the suggested project is a way to offer improved accessibility for citizens at the same time as the affected groups are given a possibility of greater influence on the content of accessibility data as well as the presentation form and management of the data.

On the political level, the issue of inclusion of all citizens is crucial, and the establishment of more well informed and democratic decision-making concerning accessibility issues is in line with visions of good governance. For the involved researchers, the project is expected to contribute to the development of more inclusive methods for participation, and a re-conceptualization of notions of accessibility and disability, as well as providing material for development of a new agenda for the Scandinavian approach to systems design with an even broader scope of direct participation than previously. We are also exploring differences between the related research traditions of end-user innovation and participatory design, and what we can learn from these differences, concerning how to provide useful feedback efficiently and effectively to software providers, software engineers and interaction designers, and thus support the development of sustainable infrastructures for inclusive design-in-use (Dittrich et al, 2002; Dittrich et al, 2009). Steinman, Krek and Blaschke [17] examined in a previous paper whether online map-based applications can contribute to improvement of citizen participation or not and found that the users in 12 projects, mainly from the United States of America and Germany, had little or no possibility to contribute actively in any part of the planning process. The applications lacked two-way communication and real-time statements from the users. This is also in line with experiences of previous work with the Komindu-project [10] for spatial planning in southeast of Sweden and the development of a national support-system for local planners in Sweden, the Planning Portal of which the latter had a distinct top-down perspective and the first one was more open to those discussions, but at the time being, not yet ready to make the switch and let through user-driven development.



**Figure 2:1** Obstructions within a given radius for a specific category of disabilities



**Figure 2:2** Obstructions for getting from A to B for a specific category of disabilities

### 3 Discussion and Conclusion

The discussions and workshops in the AUGMENT project have hitherto circulated around three basic issues:

- 1) The need of a pro-active approach among the involved user-groups of disabled people. Simply, they need to be able to judge in beforehand whether this is a viable road to travel, if the path is too steep or the stairway is too long – but not based solely on facts and measurements but also on experiences of finding out local workarounds by people in the same situation. The best way to do this is by judging several opinions from people who have experienced similar situations and preconditions and solved them in creative ways. The need for a collective accessibility memory has therefore to be visualized and represented besides the suggestions on possible choice of road to travel and the actual hindrances to overcome. Technically this could be achieved by calculations based on frequency of suggested solutions as well as spaces for visualization of others creative mode-thinking and possibility to compare this to own planning.
- 2) To what extent is user-driven content co-constructed or built on the pre-described understanding of in what way users are supposed to drive or present their descriptions and statements? Is it possible to redefine user-driven content based on how the users' wants to define the tools for achieving this?
- 3) Finally, the instrument of rating is not the best tool in order to assure timeliness and credibility since it is easily manipulated and relies on the principle that "everyone wants to contribute" in a user-driven context. However, being pro-active, active and even passive is also part of a socially responsible citizenship, as interpreted by an individual.

Those variations are acknowledge as subject of interest in a project like AUGMENT where we aims to put more effort on individual, local action and whatever comes out of it rather than trying to apply a pre-defined model of participation. In that respect, projects which put emphasis on supporting user-driven content creation can come closer to what Arendt emphasized as creative action, but there is also a risk of it becoming a new variation of dutiful and instructed participation, since it tries to capture the very essence of individual creativity and formalize this as a prescribing method. Several ways of creating and representing a collective opinion as for example in the rating system must be developed and visualized in order to give the full nuances of what user-driven content might look like-from the perspective of those who are supposed to be driving it.

Trials of direct participation in co-construction of accessibility creation are thus a possible way to test the connection between proactive citizenship and effective local agency, as well as these trials of participation are a way to test the democratic basis of these initiatives. The provision of a tool for co-creation of accessibility information is also an opportunity for people to experience their own effective agency. Such an approach emphasizes the learning aspects, specifically learning how to act in order to keep control over an initiative that takes place outside the boundaries of the pre-defined and categorical activities of participation such as given the tools of a map-



based system but not the possibility to redraw the maps or jointly judge not only the accuracy of the displayed information, but also the accuracy of user-drivenness; as automatic participation, i.e. in the form of handing in and displaying information, or as in the second form, dutiful or instructed participation as taking part in a rating system, which easily could be manipulated by those who want to lobby actively for a specific solution, or as in proactive participation where all participants are not only negotiating the accuracy of the provided information but also actively re-constructing the problem into a possibility based on individual place-based and timely understanding.

However, there are many more layers which are not visible within the given frames for how a user-driven approach or a socially responsible citizenship is supposed to be performed. In that respect this project comes closer to what Arendt once emphasized as creative action, but it is also close to becoming a new variation of dutiful and instructed participation, when formulating what user-driven content might look like compared to traditional accessibility information. Issues raised during the initial work in this project, which only recently begun, has hitherto raised the following critical issue: how is it possible to create this link between individual, creative performance and “one and a half centimeters of basic accessibility information” which always is needed, as one of the workshop participants expressed it during the work of defining the limits of individualization and self-representation in relation to accessibility information?

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