

Challenges of Participation in Large-Scale Public Projects

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ABSTRACT

This paper examines challenges of participation in large-scale public projects. Taking its offset in a case-study, the development of a new public multimedia library, the paper discusses methods and values of Participatory Design in the face of the challenges that a project of this scale entails. These challenges concern how to address and manage a heterogeneous group of stakeholders and end-users, how to inform stakeholders and establish participation as a relevant activity, the development of new techniques and technologies to scaffold participation, and the interplay between iterative development and institutional transformation.

Author Keywords

Participatory Design, values, methods, large-scale projects, public projects, citizen involvement.

ACM Classification Keywords

H.5.2 [Information Interfaces and Presentation]: User Interfaces – Theory and Methods, User-Centered Design.

INTRODUCTION

This paper takes this year's PDC conference title, "Participation: the challenge", quite literally by examining the challenges for participation in a large-scale public projects through a specific case, the development of a new municipal library entitled *Mediaspace*. The scale and scope of this project extends beyond many traditional studies of Participatory Design project in that it deals not with the development of a single technological system, but with the transformation of a large public institution. In the case at hand, this transformation has a dual nature: it concerns the development of a new building to house the library, but it also deals with the transformation that the library as a socio-cultural institution undergoes. These developments are intertwined in the sense that the new building that houses the library must necessarily reflect the ways in which the library as an institution is challenged and transformed by the emergence of new digital technologies that supplement and/or supplant the existing media that the library was originally developed to house.

The challenges facing the particular library in case resonates with those facing other libraries as well as

public knowledge institutions such as museums and science centres in general: these institutions have historically held a privileged position as repositories for and disseminators of information, but new digital technologies provide access to this information and challenge the roles and positions of these institutions in society. For this reason, public knowledge institutions are thrust into an identity crisis, as well as an arguably more tangible crisis of retaining and attracting visitors and funding. This has prompted institutions to consider how to integrate emerging digital technologies into their services, as well as to elicit and articulate the roles that these institutions themselves play in society addition to being repositories of physical media and artifacts. For many institutions, the case is that they play important roles in the public sphere not only due to the materials they house and curate, but because they have also become bearers of culture and places of public engagement and participation.

The conference call for participation states that "[...] a central tenet of Participatory Design is the direct involvement of people in the co-design of things and technologies they use. A central concern has always been to understand how collaborative design processes can be driven by the participation of the people affected by the technology designed." (Robertson & Bødker 2010 p. 1) The call goes on to pose the questions: "How are new information and communications technologies impacting what participation means and how it can be enabled? What are the roles of participants?" (Ibid p. 1) In response to this call, the examination of the *Mediaspace* case in this paper is relevant to the Participatory Design community for a number of reasons:

- It addresses the complex process of *involving of citizens and stakeholders* in the co-design of the new library building, and by proxy also in the exploration of how new technologies impact the role and services of the library;
- It addresses the ways in which both *methods* and *values* of Participatory Design can play a role large-scale public projects;
- It addresses the ways in which *new technologies* can be employed to inspire and scaffold participation in the design process;
- And on a more overarching level, it addresses the *reciprocal transformation processes* that technologies and institutions undergo, in the sense that an institution such as the library is challenged by the emergence of new

digital technologies but can at the same time play a role in the shaping of such technologies.

The contribution of the paper is thus two-fold: It lays out a case in which the ideal of participation has been a core driver, and it presents and discusses a series of challenges for Participatory Design in large-scale public projects. The paper is structured in the following manner: First, in order to situate the paper, an account is given of related work concerning the methods and ideals of Participatory Design and the challenges of employing these in large-scale projects. This is followed by a presentation of the case of the *Mediaspace* project, with a particular focus on the participatory aspects of the project. This serves as the basis for presenting and discussing four central challenges for Participatory Design in large-scale public projects: how to address and manage a heterogeneous group of stakeholders and end-users, how to inform stakeholders and establish participation as a relevant activity, the development of new techniques and technologies to scaffold participation, and the interplay between iterative development and institutional transformation. The paper concludes by summarizing these challenges in the frame of the Participatory Design tradition and outlining the implications for future projects of this nature.

BACKGROUND

As introduced, the case in this paper concerns a large-scale public development project. I refrain from calling it a building project or a systems development project, because the process entails not only the construction of a new library building, but also the participatory redefinition of the role and services of the library as a public institution. This case is dissimilar to many traditional Participatory Design cases, on the one hand due to the scale of the project, on the other hand because it extends beyond the development of an information system and into the building process as well as the transformation of the library as institution.

Regarding the aspect of scale, Participatory Design approaches have traditionally been employed in projects that concern the development of a single or low number of systems within an organization. This is explored in e.g. *A Retrospective Look at PD Projects* (Clement & van den Besselaar 1993), which finds that, with few exceptions, early Participatory Design projects "... were generally small-scale and isolated from other levels of the host and sponsoring organization" (ibid p. 32), and later on in e.g. (van den Besselaar 1998) and (Oostveen & van den Besselaar 2004), which states that "Much has changed within PD since then, but the projects are still predominantly small scale, stand alone, and researcher led." (ibid p. 174) These findings are echoed in (Simonsen & Hertzum 2008): "... a review of the PD literature reveals that most PD experiments have been restricted to small-scale systems (often driven by researchers) or to the initial parts of larger-scale information-systems development followed by a conventional contractual bid." (ibid p. 2) This leads the authors to take up the challenge posed by Shapiro (2005) that "Participatory Design as a community of practitioners should seriously consider claiming an engagement in the development of large-scale systems,

and more particularly an engagement with the procurement and development of systems in the public sector" (Ibid p. 32). The *Mediaspace* case reported on in this paper represents such an attempt to place participation at the core of a large-scale public project, which, incidentally, was initiated the very year that Shapiro posed his challenge.

A useful frame for understanding the scope and frame of the *Mediaspace* case is offered by Gärtner & Wagner (1996), who address the political and organizational context of design and participation. Gärtner & Wagner outline three arenas for Participatory Design: Arena A deals with the design of work forms and systems within an individual project arena; Arena B deals with (re-)designing organizational frameworks for action; and Arena C deals with designing the industrial relations context on a regional or national arena where legal and political frameworks are negotiated. To the extent that the *Mediaspace* case can be categorized in relation to Wagner & Gärtner's arenas - the caveat here being that this project encompasses concerns beyond the workplace - it is most explicitly situated within arena B, but also encompasses Arena A and extends into Arena C: It concerns the transformation of the library as institution, both with regards to the physical relocation of the specific institution and with regards to the technological developments concerning the content that a library hosts and provides access to (Arena B); it encompasses a series of participatory design projects that inform this process (Arena A, more on this follows in the section *Participatory activities in the Mediaspace project*); and it extends into the national arena since the project addresses the changing role of the library in society, in part brought on by the development of technologies that challenge the notion of the library as a repository of physical media (Arena C).

The *Mediaspace* case is not the only example of this move towards employing Participatory Design in large-scale projects. E.g. Oostveen & van den Besselaar (2004) have explored the integration of Participatory Design techniques in political technology assessment and public debate; and more recently, Simonsen & Hertzum (2008) have explored the challenges of employing a Participatory Design approach into the ongoing development of regional healthcare systems in Denmark. This work resonates with the growing interest in *design thinking*, i.e. the articulation of what constitutes design as a paradigm of inquiry and employing insights and approaches from design in a broader context such as service design and organizational design (e.g. Cross 2007; Stolterman 2008; Brown 2009).

Although the politics of technology design have always been a key concern in the field of Participatory Design, the complexity of political and democratic concerns is arguably of a different order and nature when dealing with large-scale public projects rather than intra-institutional projects. E.g. issues of public information and citizen participation come into play as designers must relate to legislation that ensures that the public is informed about projects, have access to detailed information about them as they progress, and have the

right to influence projects through various means, e.g. public hearings and procedures of objection regarding building projects. In this field, Løssing (2005) has explored through a number of cases how new technologies can be designed to inspire and facilitate public participation and debate in the urban planning process. One of the problematic aspects of exploring issues of politics and public participation is that they are inevitably closely dependent on regional and national circumstances, not only concerning legislation, but also concerning socio-cultural norms of debate and citizen engagement. However, there is a growing interest across national boundaries in exploring how digital technologies affect the nature of citizenship and participation in public places (e.g. Ekelin 2002; Böhlen & Frei 2010; Cottam 2010). The work reported on in this paper is related to and influenced by these efforts and will emphasize findings that are deemed relevant beyond the immediate local conditions.

The story of Participatory Design seems to be the story of a field that constantly faces new challenges as methods from the field are brought into new contexts, and as digital technologies pervade ever more spheres of human interest. The aforementioned contributions to PDC by Oostveen & van den Besselaar (2004) and Simonsen & Hertzum (2008) are examples of papers that outline a series of challenges that stems from applying Participatory Design approaches in new types of projects. In related fields, Grudin (1994) has outlined challenges for the design of groupware within the field of Computer-Supported Cooperative Work (CSCW); and within the field of Human-Computer Interaction (HCI), Bødker (2006) has addressed the challenges of moving from 'second wave HCI', which is group work in well-established communities of practice, to 'third wave HCI', where HCI is increasingly being used in private as well as public spheres, and in situations related to emotional and experiential aspects of life. This paper is related to these contributions in the sense that it presents a series of challenges related to addressing participation and employing Participatory Design techniques in a new domain.

One of the reasons that Participatory Design continues to play a part in new design projects is that it is arguably more than a collection of techniques; it also represents a shared set of concerns and values which connect existing techniques, and which are vital and malleable enough to embrace new challenges and inform new techniques for addressing these challenges. The case of the *Mediaspace* project is set in Scandinavia, and it is therefore pertinent to consider it in the light of the Scandinavian systems development tradition. In this tradition, political ideals and values have permeated many early contributions (e.g. Bjerknes, Ehn & Kyng 1987; Ehn 1988). Ehn & Kyng (1987) summarize these as *quality of work and products*, *democracy at work*, and *education for local development*. In subsequent years, a series of contributions have discussed these ideals and their relevance as the arenas and conditions for systems design have changed. Of particular relevance to the case at hand, Iversen et al. (2004) revisit the values laid out by Ehn & Kyng and

argue for revitalizing them to fit contemporary challenges. On this basis, Iversen et al. formulate a triad of core values: *Quality*, referring to both to "... quality in the process of using computer artefacts as well as quality in the products produced by the computer supported production process" (Ibid p. 173); *Emancipation*, denoting that "... a design process and methods supporting users to emancipatorily transcend the given practice are ways for the political designer to accept the social responsibility of designing artefacts for the future" (Ibid p. 172); and *Democracy*, which now extends beyond concerns for workplace democracy and into society at large: "... the driving vehicle today in the work with democracy related to technology use and design does not reside with trade unions but rather with governments, counties, and municipalities" (Ibid p. 176). These concerns are particularly salient in the case of *Mediaspace*, since the steering group of the project has been given the political mandate to establish *participation* as the core driver of the project. In continuation of this, participation has been the basis for developing the visions that guide the development process; and in the development process, a number of Participatory Design techniques have been, and continue to be, employed. Some of these are already established techniques, whereas other techniques have been developed in order to explore the challenges that the project addresses.

CASE DESCRIPTION: THE MEDIASPACE PROJECT

Mediaspace is a large-scale project to develop a new shared building for the municipal library and Citizens' Service department in Aarhus, Denmark. The project, which in addition to the construction of a new central building includes the transformation of the surrounding harbourfront, has a total budget of 200 million €, making it one of the most expensive public development projects in the region. Following the city council's resolutions to realize the project in 2003-2004, the project was initiated in 2005, and will be completed in 2015. At the current stage, the project has moved through initial stages of articulating central values and visions to guide the project, idea development, process planning, establishment of stakeholder networks, development of a program for an architectural competition, and in 2009 the selection of a winning consortium to construct the building and enviroing sites. At present, the architectural proposal is being further developed and tenders for contract work are under consideration. During the remainder of the process, the construction will take place alongside continued investigations into the services that should be housed in the *Mediaspace*.

Roughly sketched, the project organization is as follows: The principal developer is the municipality of Aarhus. The project board consists of the mayor of Aarhus, city council members, and representatives of a large foundation that sponsors part of the project. The board has appointed a general steering committee in charge of the entire project including the transformation of the areas surrounding the building, and a sub-committee responsible for the building itself. The *Mediaspace* project management refers to these committees and is responsible for the planning, development and

coordination of the project. Furthermore, a strategy group involving representatives from numerous local institutions and organizations contribute to the ongoing planning and development process at a strategic level, and an idea group provides input regarding technologies, architecture, civic communication and library development.



Figure 1. Rendering of the future *Mediaspace* building

The author, together with research colleagues, became involved in the *Mediaspace* project in 2009 when the process had already been underway for four years. Our research group has thus not taken part in the initial planning process. Rather, we have orchestrated a subset of Participatory Design workshops concerning the development of *Mediaspace*, primarily with regards to the integration of interactive technologies into the building; these are explained in more detail in following sections. Our knowledge of the project and the process comes from a series of sources: First, we have ‘insider’ insights from the Participatory Design activities that we have orchestrated within the project; second, as part of these events we have held a number of meetings and conducted interviews with the *Mediaspace* project management and stakeholders, including citizens, architects, contractors, library staff and management, and others; third, we have to various degrees taken part in a number of other citizen involvement activities in the project before and during our own involvement as researchers, and we have discussed many of these activities with the responsible organizers; and fourth, due to the public nature of this project, we have had access to the extensive documentation of the project that is available to the public (Aarhus Municipality 2010). On this basis, we approach the project from a Participatory Design perspective in order to use it as a case for studying the challenges of participation in large-scale public projects. In the following, I will present aspects of the project that are of special relevance from this perspective: first by exploring the notion of participation as a core value and project driver; second by accounting for a series of Participatory Design activities in the project.

Participation as a central value and project driver

The decision to establish the *Mediaspace* project rests on the municipality’s political visions to establish Aarhus as a city of knowledge, in conjunction with the awareness that emerging digital technologies are transforming the role of libraries in society. Since its inception in 2005,

citizen involvement and participation has been articulated as a central value and driver of the project. Regarding the role of participation in the process, the manager of the *Mediaspace* project management presents the participatory agenda in the following way: “*Mediaspace* must be built, established and formed by the people who are going to use it in the future. And those people are all of our users, it is all the citizens of Aarhus, its our staff, its our stakeholders, our network and partners... *Mediaspace* should be a remarkable icon of collaboration.” (translated from Danish, <http://www.multimediehuset.dk/sw3056.asp>)

The *Mediaspace* project in itself cannot be considered a Participatory Design project in a traditional sense of the word, since the legislative and political frames for the project necessitate a planning and execution structure that is not compatible with the iterative process characteristic of Participatory Design projects. However, *Mediaspace* is a project in which both techniques and values from Participatory Design play a central role. I shall turn to techniques in the following section, but first consider the roles of articulating and eliciting values as key project guidelines. One of the first steps in the project was a series of participatory events involving citizens, experts, cooperation partners, networks, employees and other interested parties. These events resulted in the articulation of a line of seven core values that should be explored as part of the development process, and ultimately be incorporated into the *Mediaspace* institution: *The Citizen as Key Factor*; *Lifelong Learning and Community*; *Diversity, Cooperation and Network*; *Culture and Experiences*; *Bridging Citizens, Technology and Knowledge*; *Flexible and Professional Organisation*; and *Sustainable Icon for Aarhus* (Aarhus Municipality 2007). In addition to the central value of participation, this set of articulated values resonates well with the aforementioned values of quality, emancipation and democracy inherent in the Participatory Design tradition (Ehn & Kyng 1987, Iversen et al. 2004). E.g. *The Citizen as Key Factor* and *Diversity, Cooperation and Network* emphasize the democratic ideals of the library; *Lifelong Learning and Community* and *Culture and Experiences* point to emancipatory potentials for citizens through learning and cultural development; and *Bridging Citizens, Technology and Knowledge*, *Flexible and Professional Organisation* and *Sustainable Icon for Aarhus* address the concern for quality in process and product. The seven values have subsequently served as guidelines for the development of the project. In every contractual step of the project, potential contractors have had to detail how they would involve the stakeholders and potential end-users of the project in their specific development processes, and these proposed involvement processes have played an important role in the selection of contractors. For example, the competition brief for the architectural competition explicitly states that competition proposals will also be judged on the basis of how these values are addressed in the architectural process: “The values will be parameters in determining whether the project and *Mediaspace* are conducive to the realisation of the vision.” (City of Aarhus 2007).

Participatory activities in the *Mediaspace* project

Given the emphasis placed on participation by the *Mediaspace* developers, a large number of participatory initiatives have been undertaken through the course of the project, and yet more are planned for the following years. These initiatives concern both the building process and the changes for the library as institution brought on by new digital technologies. The initiatives fall into different categories: Some of these initiatives are conventional events for involving stakeholders, e.g. public hearings. Other initiatives employ established Participatory Design techniques, e.g. *Inspiration Card Workshops*, or new participatory techniques developed specifically for the *Mediaspace* project, e.g. *Living Blueprints*. In relation to the latter, there has also been a series of initiatives in which new technological systems have been designed to inspire and facilitate citizen participation, e.g. *Voices of the City*. And yet other series of initiatives can be construed as sub-projects in that they have defined goals in relation to the overarching *Mediaspace* project, are comprised of a series of events, and employ a number of techniques for involving stakeholders; the *Transformation Lab* is an example of such a sub-project. A complete list of these sub-projects is available at (<http://www.multimediehuset.dk/sw3442.asp>)

In the following, I briefly introduce examples of these different types of participatory initiatives.

Inspiration Card Workshops - an established collaborative design method employed to develop design concepts

An *Inspiration Card Workshop* (Halskov & Dalsgaard 2006) is a collaborative design event involving professional designers and participants with knowledge of the design domain, e.g. users and/or experts, in which insights into domain and technology are combined to create design concepts. This technique is primarily used in the early stages of a design process, during which designers and their collaborators narrow down potential future designs. During the workshop, design concepts are developed by combining Technology Cards and Domain Cards. A Technology Card represents either a specific technology or an application of one or more technologies. Domain Cards represent information about the domain, pertaining to e.g. situations, people, settings, themes, etc., from the domain. Several of these workshops have been conducted in the frame of the *Mediaspace* project. One of these concerned the development of dynamic surfaces in the future building - e.g. interactive facades and interiors - and included a wide range of stakeholders, including project management, architects, contractors, city architects, library staff and user representatives.



Figure 2. Concept development in an *Inspiration Card Workshop*

Living Blueprint - a new collaborative design method developed to envision the future building

The *Living Blueprint* is a collaborative design technique developed in the *Mediaspace* project for the purpose of bringing a future environment alive by acting out scenarios on blueprints with small cardboard-characters representing future users. The technique addresses the problem that it can be very difficult for users and stakeholders to envision what the unbuilt future building will be like, and therefore also difficult for them to become involved in the process of voicing opinions and developing concepts for it. In a *Living Blueprint* workshop, participants take on the role of a card-board character - this can either be a persona (Grudin & Pruitt 2002) or a representation of the participants themselves - and move them through the building in order to explore and comment on it. The act of moving the cardboard-characters around on the blue print prompts reflections on many levels, and these inputs can be gathered to get a richer understanding of what the future building means to stakeholders and potential users, and what wishes they have for it.

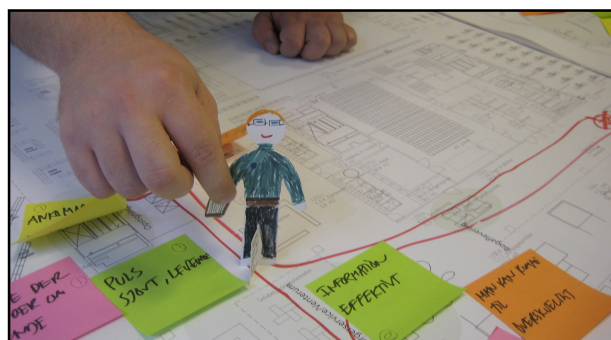


Figure 3. A participant navigates a cardboard figure on during a *Living Blueprint* workshop

Voices of the City - a new interactive system designed to scaffold citizen participation in the Mediaspace project

Voices of the City (Nielsen 2006) was an interactive exhibition that allowed users to move a table-like setup with an embedded screen. By doing so, they could maneuver around maps representing Aarhus, Denmark or the world. Users could choose between the three maps and by physically moving the table pan the digital section of the map. On each map users could find and hear context-specific scenarios related to the role of the

library and the future *Mediaspace*. In addition, users could add comments to specific locations on the map by talking to a microphone embedded in the table. Hereby users could share their opinions, listen to what other users had to say, and comment on this. For one month in the spring of 2006 one table at the Main Library in Aarhus and one table in a local arts centre gathered users' opinions and synchronized them with a dedicated website (www.byensstemmer.dk). The installation was developed with the specific intention of scaffolding the citizen involvement process focussing on gathering values and ideas for the future *Mediaspace*. Furthermore the project covered a range of experiments with experience-centred design and spatial interaction design in order to inform the *Mediaspace* project.



Figure 4. A group of library visitors experiment with *Voices of the City*

Transformation Lab - a sub-project exploring the impact of digital technologies on the library as institution

The *Transformation Lab* project, which ran from 2004 to 2007, was developed to explore and experiment with how the physical library space can support present and future user needs in the library. In particular, it focused on how flexible physical settings, interactive elements and ubiquitous computing could be used and developed in order to support knowledge dissemination and activities in the physical library. The main activities of the project were carried out in the foyer of the current municipal library. In this setting, five experimental sub-projects were carried out: *the Literature Lab*, *the News Lab*, *the Music Lab*, *the Exhibition Lab* and *the Square*. In each of these labs, different configurations of interactive technologies and physical spaces were developed and tested. Since the projects were located in the library foyer, this meant that all library visitors were exposed to the experiments and were invited to take part in shaping the future library. The project yielded a number of insights regarding the physical space and materials, the role of users and librarians, and the potentials for external cooperation (Aarhus Public Libraries 2007).



Figure 5. An event at Transformation Lab in the library foyer

DISCUSSION: CHALLENGES FOR PARTICIPATION IN LARGE-SCALE PUBLIC PROJECTS

As outlined in the *Background* section, the field of Participatory Design is continuously faced with new challenges as methods from the field are brought into new contexts, and as digital technologies move into new domains. Of particular interest to this paper, recent contributions such as (Oostveen & van den Besselaar 2004) and (Simonsen & Hertzum 2008) examine the challenges that arise from employing Participatory Design approaches to large-scale projects. Where (Oostveen & van den Besselaar 2004) primarily discusses the challenges in establishing Participatory Design as a viable component in policy making, (Simonsen & Hertzum 2008) points out a series of specific challenges identified in a large-scale effort to employ a Participatory Design strategy in the development of the healthcare sector: obtaining appropriate conditions and focus for Participatory Design; managing a multitude of stakeholders; managing stepwise implementation processes; and conducting realistic large-scale Participatory Design experiments. These challenges are, to some extent, all present in the *Mediaspace* project and are clearly issues that have been and continue to be highly relevant for the project management group. E.g. as the outline of the organizational structure and involved stakeholders in the case description suggests, the challenge of managing a multitude of stakeholders is very pertinent. The same holds true for the challenge of orchestrating and conducting Participatory Design experiments as part of the project, e.g. the *Transformation Lab* experiments. However, the *Mediaspace* project differs from these earlier projects in a number of ways, most prominently by being a public project aimed at the entire city population. For this reason, I will in the following use the case to describe a particular set of interrelated challenges that apply to large-scale public development projects as seen from a Participatory Design perspective.

Heterogeneous stakeholders

As briefly introduced above, there is an obvious challenge in managing the multitude of stakeholders involved in or related to a project such as *Mediaspace*. These include politicians, sponsors, various steering committees and project management members, architects, contractors, local institutions and organizations, and perhaps most

importantly library staff and citizens, who can be considered the end-users of the project. What is most striking about the challenge is the heterogeneity of the citizens as end-users. In Participatory Design projects in workplace settings, the main part of involved stakeholders can immediately be identified and can themselves relate to a development project. Although they may not readily conceive of how a development project may change their future practice, they are most often very familiar with their current practice. This was the case in e.g. the renowned *UTOPIA* project (Ehn & Kyng 1992), in which Participatory Design methods were employed to give typographers insights into how digital technologies could influence their future work practice. In this project, the typographers were easy to identify as participants in the project, and they had a very deep understanding of their current practice. In the case of *Mediaspace*, the role of the librarians mirrors that of the typographers, in that they are easily identifiable and are very familiar with current workplace practices. In addition to this knowledge, many librarians have a grasp of how new technologies may alter their work practices, and perhaps even more importantly, some are experienced in adjusting their practice to keep up with technological developments. However, things are not so straightforward when it comes to the citizens who will be the future users of the library's services. Since this group is potentially comprised of all of the citizens of Aarhus, it is a highly heterogeneous target audience. Barring cross-regional and international projects, this is likely the most heterogeneous user group that a project can address. The issue is compounded by the fact that even though it is possible to identify different types of users and involve them, their needs are likely to change in the future, perhaps even before the *Mediaspace* project is completed, and likewise the library services may also be transformed in ways that are not yet known. Some potential users of the library may not at the present have any relation to the library, or may not think of the library as a place for them because it is disjoint from their current practices and the ways in which they access information and media. These issues makes the task of addressing and involving users in the process highly complex.

One of the ways in which the *Mediaspace* project management has addressed this issue is through establishing participation as a central value, and to further articulate the seven core values of the project as ongoing guidelines for the process. An example of how this affects the process can be found in the explication of the value entitled *The Citizen as Key Factor*: "It is important to retain a changeability that reflects the citizen's varied and changing needs. Therefore, the building must contain versatile and flexible learning environments and open spaces." (Aarhus Municipality 2007 p. 2) In this case, the awareness that users' needs are heterogeneous and may change over the course of time results in specific demands for the future building and services that are reified throughout the process in e.g. the architectural competition brief.

Informing stakeholders and establishing participation as a relevant activity

Closely related to the challenge of heterogeneous stakeholders is that of informing the stakeholders of the project and establishing participation in the project as a relevant activity for them. As stated by Kensing (1983), three key requirements for participation are access to relevant information, the possibility for taking an independent position on the problems, and participation in decision making. The task of informing about the *Mediaspace* project can be relatively easy when it comes to some stakeholders, e.g. librarians and frequent library visitors, but very difficult when it comes to citizens who are infrequent library visitors, or who do not use the library at all. As an anecdote of the difficulties of disseminating information the project, the author employed *Mediaspace* as a central case for an interaction design class at the local university. Even though the project is of a massive scale in relation to Aarhus, had been underway for five years, had had strong coverage in local media, and had carried out a wide variety of citizen involvement events, including many that dealt with the potentials of interactive technologies, only ten to twenty percent of the students were aware of the project. This points to the difficulties of informing citizens about these types of projects, even when it comes to user groups that could be considered to have a special interest in them.

In continuation of the challenges of raising awareness of the existence of the project comes the issues of informing about how the process is organized, who the stakeholders are, and how to influence it. The latter is particularly pertinent in relation to the issue of participation: establishing participation as a relevant activity for citizens to engage themselves in is not straightforward. The *Mediaspace* project is of such a scale that future users, especially casual or infrequent library users, may feel overwhelmed by it and find it hard to conceive that they can influence the process. If we once again consider the *UTOPIA* project, the stakeholders in the project could readily see the relevance of the project for their practice: they could potentially lose their jobs due to the introduction of new technologies in their workplace; and if they resisted change through e.g. strikes, they would run the risk that their workplace might have to shut down. Again, the position of librarians is analogous to this. However, when it comes to the citizens who will use the library in the future, they might not recognize that this process is of immediate relevance to them, or indeed how they can become involved in this process. As stated by the manager of the *Mediaspace* project: "The big dilemma is that you have to know the project is there before you can influence it. And many people don't discover the existence of the project until construction of the building commences." (Marie Ostergard, personal communication May 05 2010)

Developing techniques and technologies to scaffold participation

One of the ways in which the *Mediaspace* project has addressed the challenge of informing and involving citizens in the project is through projects such as *Voices of the City* and *Transformation Lab*. In these projects,

experimental prototyping has played an important role in on the one hand presenting users with installations that inspire engagement and involvement, and on the other hand exposing stakeholders and users to assemblies of technologies that may come to play important roles in the future library. *Voices of the City*, as an example, was developed specifically to inspire users of the installation to voice their opinions about the future *Mediaspace* and its relationship to the city, the country, and the world; at the same time, the installation was an experiment into how new forms of interaction in public places can establish dialogue between authorities and citizens, as well as in between citizens.

Related to these types of experiments are techniques such as *Living Blueprint*, which have been developed specifically for the purpose of scaffolding participation in the development process. *Living Blueprint* addresses the concern that it can be very hard for stakeholders to envision and relate to the future building on the basis of architectural renderings and blueprints. This holds true even for stakeholders with extensive insight into the project such as library staff and researchers involved in the project. The development of this technique to improve the understanding of the building and consequentially also improving the basis for participating in informed dialogue about it thus echoes the development of participatory systems such as *Voices of the City*. These techniques and technologies to scaffold exploration and participation can be understood as *inquiring instruments* (Dalsgaard 2009). The concept of inquiring instruments emphasizes the reciprocal and dialogical process by which instruments are developed to facilitate a process of inquiry and at the same time come to guide what aspects of the process are explored, thus shaping the ongoing process. In *A Retrospective Look at PD Projects* (Clement and Van den Besselaar 1993), the authors extend Kensing's (1983) aforementioned list of requirements for participation by adding that there should also be an availability of appropriate participatory development methods and room for alternative technical and/or organizational arrangements. The development of inquiring instruments in *Mediaspace* in this regard play the role of offering stakeholders methods for experiencing and engaging with the project, and they furthermore yields insights into how technological and organizational arrangements of the library may shift.

In addition to using existing methods for inquiry, a large-scale development project that emphasizes participation is likely to result in the development of new inquiring instruments, on the one hand because the challenges of participation require new techniques and technologies, on the other hand because a project such as *Mediaspace* is to a certain degree aiming at a moving target, i.e. the future library that is in part shaped by emergent digital technologies.

Iterative development and institutional transformation

Although the *Mediaspace* project is not, as previously stated, a Participatory Design project in the traditional sense of the word, it reflects the epistemological standpoint of Participatory Design: designers need insight into practice, users need insight into technological

potentials, and the best way of developing this reciprocal knowledge is collaboratively through joint practice-based experiments. An aspect of the *Mediaspace* project of particular interest in a Participatory Design perspective is that the development process extends beyond the development of a system or building, since it also concerns the development and potential transformation of the institution through the project. There is more to Participatory Design than an iterative process model; there is also the understanding that iterative development in large-scale projects go hand in hand with institutional transformation. As stated by Bødker & Iversen in (2002), Participatory Design aims not just to design technological systems, but to “design conditions for the whole use activity.” (Ibid p. 12) In the case of *Mediaspace*, this extends into the overarching question of how digital technologies will influence the role and services of the library in society. This is a challenge that designers, and in this case also the *Mediaspace* project management, must embrace. In the words of Bødker & Iversen, it is the responsibility of designers to “confront use with new ideas, as design is not a step-wise derivation of the new from the existing, neither is the new coming unexpectedly. Design is not a process heading towards a predetermined goal, but a process of which the vision is shaped in continuous interaction with the use practices that it originates from as well as with other uses, other technologies serving as guiding lights”(Ibid p.12). This speaks to the responsibility of designers and project management in large-scale public development projects to address how changes in the envioning society affect the ongoing project, and to explore these changes through participatory initiatives.

One of the challenges that follows from such a participatory approach is that of synthesizing multiple sources of knowledge to inform the development process. The long list of participatory initiatives in *Mediaspace* implies that there is an extensive series of inputs from a wide variety of stakeholders; there are no easy solutions as to how this information can productively be analysed in order to inform the future process, but it nevertheless remains the responsibility of designers and project management to do so. In some public developments projects, this task may never quite be complete, in that institutions will continue to evolve concurrently with society. Regarding the future *Mediaspace*, the vision for the institution is that it should support and be open towards ongoing development of both users and the institution: “*Mediaspace* should be a flexible and dynamic sanctuary for everyone in search of knowledge, inspiration and personal development. An open and accessible learning environment supporting democracy and unity.” (Hapel & Ostergard 2007). How this can be realized in practice will be a compelling area of study.

CONCLUSION

This paper has examined the role of values and methods of Participatory Design in large-scale public projects, and in particular what challenges related to participation arise in such projects. The four challenges discussed here do not represent an exhaustive list of the topic, rather they are the most salient concerns that stem from approaching

the *Mediaspace* project from a Participatory Design perspective. The underlying premise of this examination has been that Participatory Design is more than a set of techniques - it encompasses a set of ideals and values that extend beyond the individual techniques. In the same line of thinking, the library can be construed as a socio-cultural institution that serves as more than a repository of physical media - it is also a bearer of culture and an arena for participation and democracy. These ideals are particularly salient in relation to the *Mediaspace* project, since it is a project paid for by citizens and sanctioned by elected politicians that strives towards empowering citizens and strengthening democracy. One may argue that the *Mediaspace* case is an overly obvious a case to study, given the project's inherent emphasis on values that are well-aligned with those of Participatory Design; however, the counter-argument is that it represents a rare attempt to place participation at the centre of a large-scale public project and to employ Participatory Design techniques to inform the project.

It has to be taken into consideration that this paper is written in a Scandinavian context, in which there are both legislative and socio-cultural conventions related to participatory concerns that may differ in other contexts. An interesting avenue for future work would be to explore if and how the four challenges discussed here present themselves in large-scale public projects in other contexts, or whether other challenges may be more pertinent. Another line of future work in relation to this paper will be to consider the role of Participatory Design in relation to the increasing interest in designing for public places in the city, so-called *Urban Computing* (Foth 2009), since public places become increasingly contested territories as stakeholders with differing agendas for developing digital technologies enter this arena.

Approaching the study of *Mediaspace* from a Participatory Design perspective has provided insights into the challenges facing designers and project managers in the project, both with regards to drawing upon knowledge from the field about how specific participatory techniques work, and with regards to how values inherent in Participatory Design can inspire and help understand efforts in this type of domain. In return, the study of *Mediaspace* can hopefully contribute to the further development of Participatory Design in large-scale public projects. As a concluding remark, it should be stated that although the study presented here has resulted in a relatively well-developed understanding of central challenges in this domain, it is less obvious what the solutions are. Addressing these challenges is an ongoing task, and it will be of great interest to see the results of this work in the future, both in the continuous development of *Mediaspace* and in related projects.

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