Design decisions and the sharing of power in PD

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ABSTRACT
The paper explores what exactly it is that users participate in when being involved in participatory design (PD). We argue that a focus on decision-making in design is important for understanding participation in design. Building on Schön we see design as involving creating choices, selecting among them, concretizing choices, and evaluating the choices and the design result. We discuss different ways for users to participate in these activities and address issues of participation as the sharing of power.

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H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
Participatory Design (PD) is an approach to the design of IT where the designers invite future users to participate in all phases of the design process. Much of the PD literature today explores and provides guidance on how to enroll (prospective) users as co-designers; how to organize the design process; how to develop a common ground and mutually learn from each other; how to develop ideas and evaluate them as a multidisciplinary team, etc. (Simonsen & Robertson, 2012). What is discussed less is what exactly it is that participants influence and how they may recognize their influence.

In this paper our aim is to find a way to discuss and evaluate how participatory a PD project is. To achieve this, we focus on decision-making in design, which in itself is a conceptually challenging issue. The core of PD is design: to make an artefact and to introduce a change in somebody's practice by means of this artefact. In design, making decisions about which changes to make is crucial for the design result. We argue that a focus on issues of choice and decision-making in design is important for understanding how and why an artefact gets its final form, and hence what the participants contribute to in the design. Going back to Schön's notion of 'design moves' we make an analytical distinction between: creating choices, selecting among them, concretizing choices, and evaluating the choices and the design result.

The next sections explain our view in more detail, addressing the question of what it is that users participate in. We base this discussion on examples from a number of PD projects that we have participated in. We then elaborate the notion of participation as the sharing of power, before concluding the paper with some reflections on what practitioners of PD can learn from the conceptual tools we propose.

DECISION-MAKING IN DESIGN
Schön's notion of 'move experiments' captures some aspects of decision-making in design (Schön, 1995). A move experiment includes the designer's evaluation of a situation, a move to change it, and an evaluation of the move. 'Seeing-moving-seeing' is a process, in which problems are set and solutions are found and evaluated. Design moves involve different kinds of seeing: seeing 'what is there' (what has been drawn, built) as well as seeing and judging ('is this how it should be', 'does it work'?), before taking the next move. Schön addresses the important insight that what we call a 'decision' is an integral part of design practice.

PD projects are intensely collaborative, with stakeholders convening to discuss, propose, evaluate solutions etc. These are activities where the 'seeing' of the solitary designer that Schön observed is complemented by argumentation and reflection from several participants, and more explicit types of 'decisions' will be taken. Moreover, in PD much effort is spent on understanding the practices of future users. This involves activities, such as observing the practice and developing shared representations of it, on which the design can build. The fact that a use practice can never be fully represented except through users themselves participating, adds a range of new criteria to the making and evaluating of design choices. Similarly, evaluating an evolving prototype (in use) involves observation, the joint critical assessment of these observations and, eventually, new 'move experiments'.

Some theorists have argued that we can only determine what the decisions were when looking back in an act of 'reflection-on action' (Schön, 1983), trying to reconstruct the process that led to a particular choice. Although both concepts, decision and choice, are used almost interchangeably in economic as well as in organization theory, we prefer to (in line with the philosopher Alfred Schütz) talk about choices, as design (and PD) is about creating alternatives to choose from. Hence, we reserve the term decision to the act of selecting between choices. Schütz argued that choice only happens in situations which 'give rise to a decisive new experience: the experience of doubt, of questioning, of choosing and

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deciding, in short, of deliberation' (Schütz, 1951, p. 169). He also stressed the relationship between 'phantasying' and 'projecting', i.e., imagining a future, in which the idea has already been concretized: envisaging the implications of a particular choice for future action. Hence, the moving from 'imaginative acts' to choices is crucial for design – so is the concretization of these choices in the form of IT artefacts and their evaluation.

For the practice of PD power is a central concept, since PD designers are supposed to share their power to make choices and decisions with users. We see power as an explanatory concept: it helps see *why* things are done in a certain way and not otherwise. Power in PD is about how to get a voice and a say in the many design decisions that form the artefact; studying the power relations in a PD project helps understand what the strategies and resources available to the participants in the project are.

PARTICIPATION IN WHAT

In design – as in many everyday situations – we make choices and select among them. All design moves close some choices whilst opening others. Understanding this dynamic is important for recognizing what users actually participate in: creating choices, selecting a choice, concretizing a choice, 'seeing'/ evaluating the result of a choice. While finding these distinctions useful, we want to emphasize that in practice these activities may overlap or happen in parallel. Moreover, a particular choice may be inextricably intertwined with a series of other choices. Hence, identifying participation in decision-making is a complex endeavour.

Creating choices

Many choices in design are technical features based on technically grounded imagination. In PD, some of the choices emerge from ethnographic accounts of use practices and the ways that the different participants 'read' them (e.g., Blomberg & Karasti, 2013). Other choices open up while participants together engage in imagining possible futures. PD projects use techniques that help participants widen their choices rather than close the problem/solution space too early, handling openness and multiplicity. In PD, as in design work in general, this enlarging of the design space and maintaining it open to the possibility of change is critical. How this is done and how users contribute to it, may differ considerably.

For example, in a PD project with nurses in a large hospital (*Florence*), fieldwork helped identify problems that may be solved with the help of IT (Bjerknes and Bratteteig, 1988). The nurses took part in some training sessions aimed at providing them with a basis for imagining and exploring how IT could support their work. They got some hands-on experiences with new interfaces. These activities, together with their professional knowledge, enabled the nurses to create a range of choices for design, including inventory lists, procedure overviews, lab communication, etc.

A different way of creating choices was practiced in a project, in which a mobile system (*Sisom*) for children for reporting their symptoms before a meeting with a doctor was developed, with healthy children representing very ill children (Ruland et al. 2008). Here the children acted as experts on how children talk about their symptoms. Through sketches, drawings, and stories they created ideas about how to represent symptoms and navigate the system in a playful and fun way. However, the designers practiced a rather selective approach to the children's design suggestions: only some of their ideas were selected to be 'polished' by a graphic designer before returned to the children as beautiful and finished. Hence, children were 'seduced' into making and confirming certain choices.

In a PD project (*IPCity*; Wagner 2011) with urban planners as participants, some of the choices came from the kind of professional expertise that is hard to contest for non-experts. Building on their knowledge of urban issues and how to represent these, the urban specialists opened up numerous choices that were concretized in successive versions of the prototype. Many of the prototype's features were directly inspired by what these expert users thought important to address in an urban project: how to represent activities in an urban space, the ambience of a place, mobility and connections, building types, etc.

The power of creating choices is essential to PD: the opening up of alternative choices, hence alternative designs, is fundamental to achieving a 'good' design. Users can, however, have many different roles in this process: from defining the problems the choices are an answer to, to merely delivering ideas.

Selecting a choice

While widening the design space and not closing it too early is crucial to creative design, at some point some choices have to be selected and concretized in a design artefact, such as a mock-up or prototype. When studying participation in decision-making – i.e., the selection among choices – we again see different strategies in different projects. In the *Florence* project the selection of a choice for building a prototype was arranged as a negotiation meeting between the designers and the nurses. Each of the two groups had met before the negotiation meeting and prioritized their choices. The negotiation started by presenting the two lists of functionalities to be developed, and although the nurses' first priority (support for the shift report meeting) seemed technically unchallenging, the designers understood enough of the nursing practices to acknowledge the nurses' arguments. In this project designers and nurses jointly arrived at the key design decisions.

The children that helped design *Sisom* were not included in the decision-making. Actually, the decisions about which of the features the children liked and thought were good design elements were taken in their absence, when the designer team looked at the video recordings of the design workshops and the children's drawings. In this project all decisions were subordinated to the project vision, which the project leader had defined. She was committed to improving the treatment of severely ill children; moreover, she aligned the project with the evidence-based medical tradition to get acceptance in the hospital context. The ethnographic work carried out by the participatory designer played no role.

Also *IPCity* was driven by the project leader's vision. The key idea was to support stakeholders in an urban project to collaboratively develop a vision for a site, in a direct, immediate way, using mixed-reality tools. This strongly shaped other decisions, such as building a tangible user interface, or not developing a precise simulation tool (which contradicted what urban specialists expect IT tools to be). While the participating urban planners shared the vision, they were sceptical to the value of ordinary citizens' contributions to an urban project. Hence, this part of the vision was contested and had to be 'defended'. Many decisions concerning the technical implementation of the vision were taken by the designer team and the possibilities for non-engineers to participate in these decisions were limited. Hence, in *IPCity* different types of power/knowledge (Foucault, 1982) met and some key design decisions were not taken in a participatory way.

Concretizing choices

In the context of an IT project the concretizing of choices in an evolving set of prototype realizations is mainly in the hands of the designers. This power of 'making' gives them a strong position. However, in all three projects there are examples of users contributing to designers' technical choices. After the negotiation meeting, the nurses in *Florence* quickly came up with a sketch showing how they imagined the screen. This sketch served as a specification of the prototype. The designer team first made a text-based prototype to check the layout and functionality with the nurses before they went on to program a prototype for use with real patient data. In *Sisom* the children's 'translation' of medical terms into a list of symptoms, which mixed physical and emotional symptoms in ways common to children, was used as a basis for designing the main navigation structure. In *IPCity* most of the concretizing was in the hands of the designer team: they developed the tangible user interface and the tracking mechanism. However, in one of the participatory workshops a design move was carried out by one of the users: whilst discussing and visualizing ideas for the site, the user participant suggested a choice, concretizing it spontaneously by means of his mobile phone. It was easy to implement.

Sharing the power of technically implementing choices seems to be the most difficult part in a PD project. We have seen that users can contribute in their own language with sketches and drawings, as well as with their experience with computational artefacts. But participation can also be limited to having users only select features on the surface of an already decided-on design.

'Seeing'/evaluating the results of a choice

Typical of the practice of PD is the involvement of users in the 'seeing part' of design moves, when choices are tested 'in use' and eventually questioned. In *Florence* the prototype was a suggestion from the nurses, and they also concretized the solution in a sketch. The realization of the nurses' sketch turned out to be difficult but was maintained as the 'seeing' part – the evaluation – was strongly intertwined with the implementation. *Sisom* was not really evaluated by its target group: children with cancer, until it was almost finished. However, some of the prototypes were tested by the school children when they were placed in a bed, resulting in a more realistic evaluation. Their 'seeing' confirmed the game metaphor (one of their choices) as the major navigation mechanism. In *IPCity* the 'seeing' (evaluation) was heavily influenced by the participants in the many workshops. Their use of the different features of the relatively open prototype – and how they dealt with its imperfections – influenced its design. Not only this: they also challenged the need for precision in representing objects in an urban environment at the right scale (preferred by the urban specialists). Most of the 'normal' citizen-users did not see the need for precision at the stage of vision building. Their 'seeing' clashed with the 'seeing' of the professional architects. The choice of the non-expert users strengthened the designers' decision not to prioritize 'precision'.

We conclude from this that users strongly participate in the 'seeing' part of design moves, actively contributing to how a system is evaluated, which choices are supported and further developed and which are not.

THE SHARING OF POWER IN PD

With these brief examples from three PD projects we have tried to show that there are many ways for designers to share power with users. We have also pointed out that not all design decisions were made in a participatory way. Still, all three projects ended up with participatory results. The *Florence* prototype was used by the nurses and other health professionals in the ward until the machine broke down. It later served as a requirement specification when the hospital invested in a new IT system for the nurses. *Sisom* gives children a voice in their consultations with a doctor they would not have without the tool, enabling them to use a language that is close to their own. This increases their influence on what the doctor takes into consideration when making choices about their treatment. Moreover, they also have their opinion recorded and documented in the hospital system along with other documents. *IPCity* provided lay people with the possibility to contribute to an urban project on equal footing with the experts, with arguments and choices that changed the view of the participating urban planners.

What we want to argue here is that even a process with limited – not 'full' – user participation can result in a design that increases the 'power to' of users. With 'power to' (Pitkin, 1973) we mean agency: the capacity to shape action, which partly depends on access to organizational resources, partly on 'power/knowledge' in the Foucauldian sense (Bratteteig & Wagner 2014). On the other hand, a participatory result always depends on and refers to user participation in the process.

In *Florence* the nurses' 'power to' came from their intimate knowledge of work practices in the hospital. In *IPCity* the urban experts' power/knowledge on how to represent an urban site and the issues at stake dominated the design result. *Sisom* is interesting as an example of 'normalizing' a practice: doing things in the right way was defined from the start as complying with medical evidence, e.g., the list of symptoms that the children were invited to translate. However, the fact that children were involved (and taken seriously) made way for a participatory design result.

The 'power of making', which is grounded in highly specialized skills and competencies privileges the designers' discourse in technical decisions. However, specialized technical expertise can also be enormously vulnerable: things may not work, and a solution may not be ready at hand. In *IPCity* the incompleteness of the early prototypes and the vulnerability of some of the technical solutions created conflicts with the urban team: they expected something perfect. In *Florence* the nurses' solution challenged the programming skills of the designers and their ability to work around a technical environment not suited for implementing this particular solution. The 'power of making' can be counterbalanced by the 'power to' of users, which rests upon their 'material' ways of using a design or their refusing to use it in the way that had been envisioned.

CONCLUSIONS

Looking at power from the perspective of decision-making gives a rather complex picture of this power. We have seen examples of different ways that users can have a voice and a say in a PD project. Users can contribute to creating choices, selecting a choice, concretizing choices, and seeing/evaluating a choice. Users do not need to participate in *all* these (parts of) design moves to contribute to a participatory result. Creating choices and 'seeing'/evaluating give the strongest possibilities for participation. Concretizing/making is the arena, in which the technical skills and competencies of designers often dominate. Selecting is the point where one can see how much users' contributions, their choices and observations, are taken into account: hence, designers' understanding of the users is crucial. Only if the users can see their position represented in the participatory result will they recognize their influence.

We find that the concepts outlined in this paper help becoming aware of the different ways participation in design can happen and also how these pave the way for design results that are participatory. The concepts can be used for planning more or better participation, and for a more thorough evaluation of the degree of participation. This can be achieved by articulating in more explicit ways how the different design moves are accomplished, addressing questions such as: how can the 'space of possible choices' be widened; which of these choices are selected, which are not and why; were the choices participants created respected as valid choices in the decision-making? An explicit focus on how users may recognize their contributions to the design result can contribute to making them more visible; or even help document the important design moves in ways that makes them open to scrutiny.

The project vision is often defined in advance, as early as in a project proposal. Reflecting on the influence that a strong vision has on all design decisions should be made a more explicit part of the practice of PD, thereby making the vision subject to discussion and change, without compromising important commitments and values. This should include the decision to aim for an IT solution.

In a design project designers are in a powerful position, which derives from their power of 'making'. Hence, it is important to emphasize and facilitate non-technical ways of making, strengthening their influence on the technical implementation. Moreover, more systematically planning the 'seeing' part of a project can contribute to increasing users' influence on the design result. The evaluation method should allow the users to probe their own design moves, which requires a certain level of openness of the tool they are supposed to 'test'.

A better conceptual understanding of participation in PD can enable participatory designers to achieve more and better participation through more competent organizing, planning, and selection of methods, tools and techniques replacing unwanted and unproductive practices. A focus on choices and design decisions may also improve the sustainability of the PD results by giving both designers and users' contributions to them more emphasis.

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