Dissolving boundaries: social technologies and participation in design

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ABSTRACT

The emphasis on participation in social technologies challenges some of our traditional assumptions about the role of users and designers in design. It also exposes some of the limitations and assumptions about design embedded in our traditional models and methods. Based on a review of emerging practice we present four perspectives on design in the context of social technologies. By presenting this 'lay of the land', we seek to contribute to ongoing work on the nature of participation and design in the context of social technologies. We draw particular attention to the ways in which roles and responsibilities in design are being reassigned and redistributed. As traditional boundaries between design and use and designer and user dissolve, design is becoming more public. In the context of social technologies design is moving out into the wild.

Author Keywords

design methods, open innovation, participatory design, social technologies, prototyping, crowdsourcing,

ACM Classification Keywords

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

INTRODUCTION

The issue of participation is revitalized in design and design research… (Binder, Brandt & Gregory 2008 p.1).

From a design perspective social technologies present challenges to designers as well as opportunities. They enable new ways for people to participate in the design of products and services and provide new channels through which businesses can communicate with existing and potential users.

As the opening quote suggests, the issue of participation in design is receiving a massive influx of energy from a range of sources. Users are being re-cast as co-designers, co-creators and co-developers. Social technologies play a critical role in motivating this discourse.

There is widespread agreement that new approaches are required to take account of the diversifying contexts of technology design, of which social technologies are a

part. However, we are still in the process of understanding and developing appropriate tactics and frameworks (Bannon 2005; Lee 2008; Sellen et al. 2009).

Practitioners and researchers alike are starting to encounter the limited capacity of existing Interaction Design methods to account for the new social spaces of technology design e.g., (Hart et al. 2008; Holzapfel 2008; Isbister & Höök 2009). In addition, success stories from social software companies that have taken a "throw it out there and see what happens approach" e.g., (Merholz 2006; Porter 2006) could be interpreted as a challenge to the value of early participation in design. Rather than suggesting a diminished role for user-focused methods, we take the position that it is as always, about asking what kinds of design methods are appropriate in this context.

In this paper we hope to contribute to a discussion on the nature of participation in the context of social technologies. The work of this paper is not to make defining statements, but rather to get 'a lay of the land'. Robertson et al. (2006) suggest that questions about participation should be sought within the context in which particular technologies are designed, built and used. In this paper we ground our discussion through a review of current trends in research and industry. By observing current shifts in practice it is our intention to contribute to a better understanding of the nature of participation and design in the context of social technologies.

This is not an exhaustive review, but rather provides a filtered view of trends and concepts that we have observed in the course of our own research and that we hope will be useful to other researchers and practitioners. We draw our examples from a review of recent Participatory Design literature as well as industry case studies. We also draw broadly from recent HCI and design literature that addresses shifts in design practice related to social technologies.

The paper begins with a definition of social technologies and the changing landscape of design they represent. We then group and describe four perspectives on design in the context of social technologies, drawing on current trends in research and practice. Each of these enables participation in design in different ways. Some of them circumvent traditional user centred design methods while others extend them. Taking the four perspectives as references points, we then reflect on the changing shape of design. We draw particular attention to the ways in which roles and responsibilities in design are being reassigned and redistributed. We also identify some of the

questions emerging out of these shifts and point to potential future work.

SOCIAL TECHNOLOGIES: A DEFINITION

Social technologies refer to the combinations of mobile and online tools and systems that enable and seek out participation and contributions by users. Examples include SMS, Facebook, MySpace, Flickr, Twitter, YouTube and Digg, personal blogs and discussion platforms as well as more localised community or campaigning sites. These systems are effectively containers or scaffolds that rely on participation and user driven contributions to take their form.

While we use the term social technologies in this paper, other popular phrases include: social software (boyd 2009a), social media (Näkki, Antikainen & Virtanen 2008) and Web 2.0 (O'Reilly 2005). In qualifying the term social software boyd (2007b) states: *"social software is about a movement, not simply a category of technologies… it's certainly not complete and as a category, it's difficult to make sense of its boundaries."*

The definition of social media provided by the Finish research institute VTT refers to social media as both a set of tools and a *modus operandi* (Heinonen & Halonen 2007). Importantly both definitions re-enforce the dual emphasis on technologies *and* social practices.

We use the term social technologies here because it makes clear reference to the socio-technical nature of the phenomenon which we are attempting to describe. In addition, it can encompass combinations of mobile and/or online technologies, potentially indicating something broader than a single piece of software.

SOCIAL TECHNOLOGIES: A PHENOMENON

The phenomenon of social technologies can be characterised by greater social participation in mediated contexts (boyd 2007a). Terms such as *user generated content* (Pierson et al. 2008), *crowdsourcing* (Howe 2008) and *citizen media* (Cruickshank & Evans 2008) refer to emerging forms of social participation supported by social technologies.

Indeed the ease with which we can now connect, communicate, produce, share, replicate, locate and distribute information has had, and continues to have, a profound impact on our social, cultural and technological practices (Shirky 2008; boyd 2009a). This transformation has been made possible by the wide availability and accessibility of technology. Most importantly this has included the shift in technology ownership from organisations and companies, to everyday people (Battarbee 2003; Shirky 2008).

For designers, social technologies become a *tool with which* we design, the *subject* of our design and the *context within* which we design. The emphasis on participation in social technologies challenges some of our traditional assumptions about the role of users and designers. It also exposes some of the limitations and assumptions about design embedded in our traditional models and methods.

CHALLENGES TO DESIGN

Designers attempting to apply conventional methods in the context of social technologies face various challenges. For example traditional contextual methods assume the ability to identify and access the context of use. But users of social technologies are diverse and geographically distributed (Bergvall-Kåreborn & Ståhlbröst 2008); use is mobile, domestic and woven through complex, ongoing social contexts (Bødker 2006; Isbister & Höök 2009); and our users are potentially anonymous or unknown (Clement 2008; Ehn 2008). It is also quite possible that at the beginning of the design process there will be no clearly identifiable existing community of users, rather they have to be brought 'into being' as part of the project (DiSalvo, Maki & Martin 2007).

Furthermore, it is arguable that the variables of use are so complex, situated and dependent on the activities of others, that feedback about use only becomes meaningful in context. Current methods for prototyping and testing prior to the release of software may be inadequate for simulating the future contexts of use (Holzapfel 2008). This could be understood as a question of fidelity. As Isbister & Höök note *"We can't rely on re-using pre-existing interface metaphors and strategies because there are too many new variables of use..."* (2009 p.1).

Finally, User-Centred Design (UCD) methods, developed in the context of organisational and workplace technologies, cannot be expected to take into account the motivations for use to which social technologies are being put. This is particularly so when the purposes of these technologies are in themselves emergent; for example Flickr, SMS, Twitter and Facebook all perform radically different functions than those first envisioned by their designers.

Social technologies support behaviours like *hanging around* (Hart et al. 2008), *messing around* (Horst et al.), *looking at, looking up, and keeping up* (Joinson 2008). Use is often prompted by emotional or/and experiential factors such as a shared experience or shared interests (Battarbee & Kurvinen 2003; Hess, Offenberg & Pipek 2008). The focus is on connecting and interacting around social objects (Engeström 2005) and with other people, rather than with the system (Shirky 2003). As Hart et al. (2008) highlight in their research, supporting these behaviours was not the motivation behind classic UCD yard-sticks such as Nielsen's 10 heuristics

It is these kinds of challenges that prompted the following review of how practitioners and researchers are responding to some of these issues, with particular emphasis on supporting participation in design. In the following section we review trends in current design practice that are emerging as a result of, and in response to, the participatory nature of social technologies.
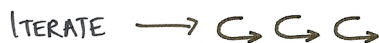
DESIGN & PARTICIPATION

The categories and examples presented below are not exhaustive. Rather they are loose groupings that overlap and intersect. Together they represent four very high level perspectives on design in the context of social technologies. In the first two, *Iterate It* and *Emerge It,*

social technologies are the *subject* of design. In the later two, *Source It* and *Open It*, social technologies are *tools* for design. We use a similar strategy for grouping and describing trends as was used in (Hagen et al. 2005). Table 1 provides a summary of the approaches and examples, with a fuller description of each given in the following sections.

Mode	Description	Examples
Social technologies as the subject for design		
Iterate It	Software is released and iterated based on implicit and explicit feedback.	(Porter 2006; boyd 2007b; Sinha 2007; Burka 2008)
Emerge It	Seed prototypes are released to enable community co-evolution through use and feedback.	(Botero & Saad-Sulonen 2008; Redhead & Brereton 2008; Twidale & Floyd 2008)
Social technologies as a design tool		
Source It	Social technologies support the (out-)sourcing of design ideas from members of the public; user contributed ideas can form the basis of design.	(Füller et al. 2006; Brabham 2008; redesignme 2009; threadless 2009; WEPC 2009)
Open It	Social technologies are used to open up the traditional UCD design process, allowing a form of community design as users contribute design ideas and feedback at various stages.	(Boulton 2008; Näkki et al. 2008; Hess et al. 2008)

Table 1. Summary of approaches to design

Iterate It

Figure 1. Design is iterated through participation in use

In the *Iterate It* approach participation in design takes place through members of the community using and providing feedback on a system after its release. Changes in design may occur in response to user requests or as a result of observing how users appropriate or interact with the technology (boyd 2009b). Myspace (boyd 2007b), Netflix (Porter 2006), Digg (Burka 2008) and Slideshare (Sinha 2007) are all major social web services that have developed and iterated their software in this way.

The *Iterate It* approach could be described as an incidental or naturally occurring form of participation resulting from the nature of social technologies and recent shifts in technology practices. Contributing factors are the emergence of web services (of which social technologies form a part), the prominence of open source software and a shift towards rapid or agile programming. In contrast to waterfall methods which have a big upfront design phase, the emphasis is on deploying early and continuing to rapidly add or remove features and fixes (O'Reilly 2005).

Users become co-developers and systems are treated as services not products (ibid).

Participation in the design iterations can be actively sought and planned for through methods such as beta releases (or even perpetual beta) (O'Reilly 2005). There might also be other persistent online and formal feedback channels e.g., forums, Twitter accounts etc. Alternatively, they can occur in response to feedback that comes via a public backlash to company design decisions. Some 'user-revolts' have occurred on a historic scale, for example on Twitter (Corbin 2009), Facebook (Spool 2007) and Friendster (boyd 2005). In part as a result of these incidents, companies have come to better understand the need to work with their community on design changes. While an iterative approach might have initially been a technical response to the nature of webservices, in many cases this has transformed into more sophisticated forms of user participation and consultation post release.

Emerge It

Figure 2. Design emerges through participation

The *Emerge It* approach is also inspired by the philosophy of rapid development, but focuses on the use of experimental prototypes as the start point for exploring potential practices and uses (Botero & Saad-Sulonen 2008; Redhead & Brereton 2008; Twidale & Floyd 2008). Design phases are blended into the implementation phases (Twidale & Floyd 2008). For example Redhead & Brereton (2008) deployed an electronic-notice board prototype into a community. The prototype was then evolved *in situ*, in response to use and community feedback.

Patchwork prototyping takes a similar approach, relying on the combination of open source tools, local code and mash ups of existing services (Twidale & Floyd 2008). Rudimentary prototypes are pulled together and immediately integrated and used as part of daily practice; an easy way of supporting real user participation in actual use (Twidale & Floyd 2008). Importantly Jones et al. (2007) note that patchwork prototyping was observed as a phenomenon emerging out of practice, rather than being a method designed *a priori*. The researchers have since formed a research program around the approach.

Botero et al. (2008) also took a similar but deliberate 'living research' approach in the development of the Urban Mediator software. Seed prototypes were used in a co-discovery process with the community. Rather than undertaking traditional usability evaluations of isolated software components, Botero & Saad-Sulonen (2008) re-purposed existing software to create 'concrete interventions' that could be co-evolved.

Twidale and Floyd (2008) argue that such an approach only exists as a result of the current ecology of information technologies; social software lends itself to the deployment of simple prototypes that can be modified

and evolved through feedback itself (Brereton & Buur 2008). As predicted by Lievrouw (2006), re-configuration of existing tools is becoming a key theme in design in the new media space.

Methodologically the *Emerge It* approach can also be linked to participatory design (Schuler & Namioka 1993) and movements to support end-user development e.g (Fischer & Giaccardi 2006). Embedded within the approach is an intention to develop the software *with* users, in use. Design is led by emergent community needs which become articulated and visible through use.

(out) Source It

Figure 3. Initial design is (out) sourced to members of the public

Source It emphasises a shift to public involvement in design ideation and innovation. The emphasis of *Source It* is on the open call format of crowdsourcing, a distributed problem-solving model (Brabham 2008). Crowdsourcing makes use of the interests and effort of everyday people to achieve activities that might otherwise have been performed by suppliers or contractors (Howe 2006).

For example T-shirt's, sold by the company threadless.com, are designed by members of the public. Anyone can submit a design and those rated most highly by other online community members are put into production (threadless 2009). redesignme.com and WEPC are corporate versions that encourage design contributions from members of the public. Contributions may be discussed and rated by other members and potentially go on to influence future designs. Doritos and Converse have taken a similar approach leveraging the popularity of user generated video by having members of the public create product commercials (Howe 2008).

Methodologically *Source It* approaches are tied to the open innovation business model which encourages businesses to seek ideas from external sources (Chesbrough 2003). Open innovation promotes a form of co-design or co-creation with users and encourages companies to tap into user-driven innovation (Von Hippel 2001). The scale and availability of social media is reducing the barriers to public participation in innovation processes. It is also disrupting and in some cases circumventing traditional interaction design process and practitioners.

Open It

Figure 4. Community participates throughout design

Open It approaches also leverage the potential for crowdsourcing and open innovation enabled by social technologies. The emphasis of *Open It* is on the appropriation of social media as a way to open up the traditional UCD process to the community. Members of the public are invited to participate in and contribute to design, discussion, decision-making and evaluation. Asynchronous participation in design iterations such as ideation, cardsorting, wireframing and prototyping are mediated and facilitated through online platforms.

For example SOMED (Social media in the crossroads of physical, digital and virtual worlds) is a Finnish research project that has identified the potential to use social media to support open and distributed forms of participation in design (Näkki & Virtanen 2007). Their online lab, Owela, makes use of various social media tools to enable participation in different phases of design (Näkki et al. 2008).

The community redesign of drupal.org (the website representing open source content management system Drupal) undertaken last year was a radical example of opening up the design process through the use of social technologies (Boulton 2008). Boulton and Reichelt were contracted as designers to lead and facilitate the process, however the design itself needed to be open in keeping with the community ethos. Boulton and Reichelt worked with the community, experimenting with different ways to create an open design process.

While standard UCD methods were used, the nature of participation was quite different. Community members participated in mass, distributed, asynchronous, and remote design activities (e.g 70 card sorts in 2 days). In addition, rather than just giving feedback on designs, community members contributed their own wireframes. In order to facilitate collaboration and discussion around both concepts and process, Boulton and Reichelt used their personal blogs as well as platforms such as Twitter, Flickr, YouTube. They found that different tools significantly changed the scope of the conversation and allowed different kinds of input and conversation to happen (Reichelt, personal communication).

Open It examples are characterised by a commitment to enabling greater, more transparent participation in the design process through mediated means. *Open It* combines the commitment of participatory design (Schuler & Namioka 1993) with the transparent and community driven approach embodied in the open source software movement. As Ehn states (2008), this movement is a growing source of inspiration for those concerned with participation and opening up design.

DISCUSSION

Each of the perspectives on design presented above envision and enable participation in different, potentially complementary ways. *Iterate It* and *Emerge It* emphasise design in use, while *Source It* and *Open It* suggest a more public design process. These trends and activities can be interpreted in various ways. In the following discussion we reflect on the shifting shape of design and the impact of corresponding changes to roles and responsibilities of designers and users. In doing so we draw together some of the questions being raised by the researchers and practitioners using these approaches.

Relations of design and use

$$Design \rightarrow Build \rightarrow Use$$

Figure 5. Linear phases of design, build and use

Figure 5 represents a traditional interaction design process that follows a linear process of design, build and then use. Although this is of course an overly simplistic view of the design process, embedded within it are some assumptions about design that have had a significant influence on many of our current approaches. The first is that design precedes use (Ingbert et al. 2007; Hess et al. 2008). The second is that the goal of the design phase is to develop a relatively final product (Davis 2002) (see Figure 6). These assumptions create certain conditions around how we might go about supporting participation in design.
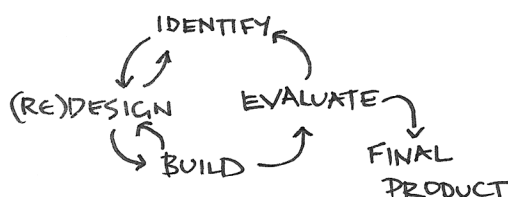
Figure 6. Authors' interpretation of User-Centred Design process sourced from Preece et al. (2002).

Iterate It and *Emerge It* approaches disrupt the notion of design as a linear process by merging the phases of design and use. Design activities are redistributed throughout the design life cycle (Ye & Fischer 2007). As this happens the conventional boundaries between design and use dissolve.

Extending design in use

As designers, we may have always conceptually understood design to be what Dourish (2001) describes as, 'actualised' in use. Indeed this notion is central to HCI literature grounded in phenomenological positions on interaction e.g., (Suchman 1987; Ehn 1988). Furthermore the idea that design is completed in use is a basic principle of Participatory Design (Henderson & Kyng 1991).

Social technologies bring a renewed attention to the notion of *design in use* because so much of their form is constituted *through use*. *Iterate It* and *Emerge It* approaches extend the notion of design in use by shifting significant portions of the design activity into use phases. Rather than develop final products, designers configure seeds that can be co-evolved (Botero & Saad-Sulonen 2008), deliberately *underdesign* (Fischer 2008) or aim to refine products *in use* (Redhead & Brereton 2008).

An *Iterate It* approach requires the development of interaction design methods that emphasise participation in design, post-release. While agile has been a significant catalyst to shifting design towards iterating in use, work is still being done to establish the integration of an interaction design perspective to this development approach e.g (Haikara 2007). In addition new models for

evaluating and measuring value and impact over-time, that better account for the embedded, personal and social nature of technology use, are also needed.

Emerge It approaches are relatively new and methods are still being investigated. The emergent nature of the approach means there is no clear outcome. Ways to articulate this as an opportunity rather than a risk, particularly in a commercial context, still need to be better understood.

Roles and responsibilities

Figure 7. Design activities redistributed

The notion that design activities take place in use highlights additional responsibilities for designers beyond the point at which designs reach communities (Binder et al. 2008). Figure 7 suggests a more continuous state of design as boundaries between phases collapse. While this might better reflect the nature of design and participation in this context, Ehn challenges us to consider the role of the professional designer and just how such ongoing relations might be managed (2008).

What shifts are necessary in our own practice to support these emerging forms of participation and collaboration? What new responsibilities, skills and roles do we take on as professional designers? According to Reichelt and Boulton their responsibilities extend to 'skilling-up' the user community to eventually take control of the design process (Reichelt 2009). Brereton and Buur talk of "*fostering appropriate engagements and championing and guarding core values that underlie the design philosophy*" . (2008).

If as Ehn (2008) suggests we are moving beyond the traditional notion of a project, what kinds of contracts or periods of involvement are appropriate? How should we as design agencies and consultants model our services and relationships with clients and users? Commercial contexts could be informed by Fischer's (2008) suggestion that we rework the traditional "maintenance" model to better reflect the significant amount of design work that takes place once a system is released. Merholz (2006) argues that for design agencies who only consult on design in a 'project by project' capacity, the emergent nature of social technologies poses different challenges. In our own projects we have looked to research into community Participatory Design to better understand these issues (e.g., (Karasti & Syrjänen 2004; Merkel et al. 2004; March, Jacobs & Salvador 2005).

Questions about the role of design and the skills required of designers are further complicated by the use of existing platforms as starting points. Traditionally designers have been responsible for the creation of a range of artefacts. In this case design becomes an act of reconfiguration and composition of existing software, rather than creation from scratch (Twidale & Floyd 2008). Traditional boundaries between design and use are dissolving such

that it is difficult at times to tell who, or where, design is being done (Balka 2006).

Design in the wild
Another way in which the shape of design is changing is through the opening up of the design process. Design has moved into the wild (Hutchins 1995). *Source It* and *Open It* approaches support voluntary, mass, distributed participation in design by members of the public. Individual and community level discussion about design occurs within the context of people's daily lives. Design is moving out from the studio and into what Lee (2008) describes as the places that people live.

As this happens users are being assigned, or taking up, design activities once tasked to designers. For those facilitating such activities understanding how to motivate people to participate is becomes a key subject for research e.g. (Antikainen & Väätäjä 2008). All of the approaches raise questions about the ownership over design and design decisions. According to the information available, Threadless.com appears to be the only example where participants control the final design output. It is also the simplest product, being a T-shirt. In all other cases professionals of some description are managing and filtering contributions. The motivations and design philosophies of the specialised 'crowdsourcing' companies is also something to consider. How equitable is the collaboration being proposed?

In *Open It* examples there was a commitment to enabling users to participate in design (rather than react to design). The work of (Hess et al. 2008 ; Reichelt 2009) highlights the true scale of effort and time required for co-design and co-creation. In addition to new tools to facilitate communication with the community, professional designers also need new skills to avoid 'design by committee' when coordinating mass participation e.g., (Reichelt 2009). Future work includes understanding both the potential roles played by users in these contexts and the development of strategies for managing these complex aspects of participation.

A deeper understanding of the commitments to participation embedded within the four different perspectives presented in this paper would also be critical to informing strategies around the value of various approaches at different times.

CONCLUSION
In this paper we have sought to investigate how practitioners and researchers are responding to the new landscape of social technologies. We have paid particular attention to how participation in design is being managed and supported. We have attempted to get a "lay of the land" through a review of current practice. In doing so we have identified four approaches to design and participation that respond to, or are enabled by, the nature of social technologies.

The overall effect of these shifts in design practice is an opening up of the design process. Design activities are being reassigned and redistributed, and design is becoming more public. Traditional boundaries between design and use and designer and user are beginning to dissolve as our roles and responsibilities are changing. While we have presented examples across all four perspectives significant work is still to be done in developing new methods and models of design that recognise both the ongoing nature of design as well as its increasingly public and collaborative nature.

Our intention in this paper was not to present an exhaustive review but rather to offer a filtered view of current trends in a way that we hope will be useful to other researchers and practitioners. Social technologies are promoting participation as a core concern in design and this is manifesting in a myriad of ways. For those of us committed to participatory design, this is very exciting!

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review process

The OZCHI 2009 conference held in Melbourne, Australia 23-27 November 2009 received 60 long paper and 88 short paper submissions. From these submissions, 32 long and 42 short papers were selected to appear at the conference. All submitted long and short papers were subjected to double-blind peer review by an independent international reviewing committee of 131 people. Long and short papers were reviewed in their entirety by at least three peers. Industry case studies, panels, and workshop and tutorial proposals were reviewed by their respective co-chairs.

The OZCHI 2009 Proceedings is published by CHISIG and will be available from the ACM digital library shortly after the conference (http://portal.acm.org/dl.cfm). Additional copies can also be ordered from the CHISIG secretary (secretary@chisig.org)

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