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Have You Heard This?

Designing Mobile Social Software

Abstract

'Desktop' social networking services are migrating to mobile devices. Research into the design of mobile social software (MoSoSo), especially its communication design, is emerging. The case we present is from a collaborative, interdisciplinary research project into communicative design innovation concerning these technologies. In focus is the design of what we label the communicative prototype for an interaction and media centred view of social software development. This view is applied to an exploratory design research case that extends an established online social service to the iPhone/iPod platform. The conceptual design in the case is intended to enable the discovery of independent, non-commercial music. The projected service was developed in consultation with a national public service broadcaster. We frame the design and analysis within a sociocultural approach to mediated communication and research by design. We employ mixed methods both in design and in research. We argue that a communicative stance in early concept development offers valuable insights on the ongoing design of social software. The communication expertise of interaction designers is central to this.

Keywords: mobile social software, communicative prototyping, iPhone / iPod, sociocultural, concept development, communication design, practice-based design, RECORD.

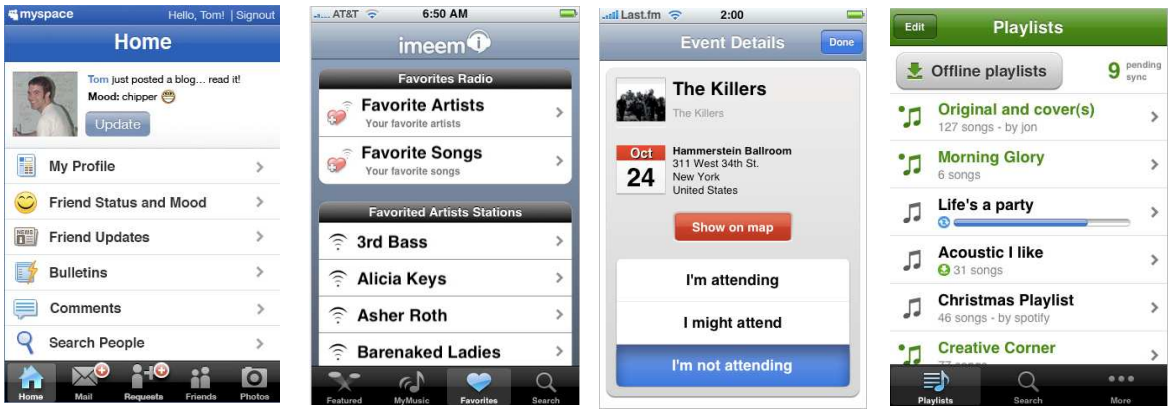

Figure 1. iPhone versions of popular desktop social services for music: MySpace, imeem, Last.fm and Spotify.

Introduction

In this article we address research by design through reflections on the development of mobile social software. We do this to engage in current challenges in designing services for participative use, in this instance that of the discovery and exchange of independent, non-commercial music. We report on development specifically for the already pervasive iPhone / iPod platform and with close reference to what we term 'communicative prototyping'. We offer this term as one that may extend the range of approaches to exploratory and practice-based modes of inquiry in design research.

Attention is placed on the communicative so as to accentuate the importance of designing integrated platforms and services for the mediation, distribution and sharing of user-generated content. Much design research centres on user and use informed study but often bypasses the overall mediational, linked and holistic communication design through and within which such inquiry is located and conveyed. In the sections below we focus on the communicative prototype as a means and as a method within research by design. We illustrate this with one case that cannot encompass all that communicative prototyping may offer designing and design research.

We present a number of core aspects in communicative prototyping and illustrate them with video. We do this to exemplify a move from concepts to actual mediations of innovations in mobile social software service design. We also do this to present readers with some access to our design activities. Analytically, we fill out some of the characteristics and contexts of the communicative prototype in an interdisciplinary frame of Communication Design.

The spread of social software

Today millions of users are using social software as a part of their daily practices. With blogs, social network sites (SNS) (Boyd & Ellison, 2007), instant messaging, discussions boards, chat rooms, collaborative filtering systems and other socially oriented software systems, the social prefix is increasingly becoming a part of the software developed today. Most popular in Norway are *Facebook.com* and *MySpace.com*, attracting hundreds of thousands of daily users.

Our interest is mainly on social software that lets the users share and experience rich media content such as images, sound or videos. The canonical state-of-the-art example is *Flickr.com* that allows users to upload personal photographs and short videos in order to share them with an online community.

As a result of ubiquitous wireless broadband technology and pervasive wi-fi presence, in addition to handheld devices with improved user-experience towards web-usage, social software that encompasses rich media become more and more relevant for mobile devices. Rich media refers to the ways in which a variety of media from the level of the interface design to the inclusion and intersections of different media types (e.g. text, photo, video, animation) may be included in social software design and its contexts of communicative use (Olsson et al., 2008). These uses are now generated by consumers through messages and media they produce themselves. This is particularly so in popular cultural contexts, such as teens' use of SMS, and also apparent in the changing relations of production and consumption by 'prosumers' (Jenkins, 2006).

Designing for participative mediation

Many of the 'sit-at-a-desk' social software services are currently extending their reach to mobile platforms. This makes them accessible through a web-browser for mobile devices or as device-specific downloadable applications, for example *iPhone* ones. However, what once suited a tethered desktop context, does not necessarily work in fluid, spatial, mobile ones. These developments in services and their infusion with mobile powers create new challenges and opportunities for interaction design to re-shape an existing service. In doing this we need to not merely adapt existing software for a smaller screen, but take into account physical movement of the body and the activities which are relevant in the world around the user, in addition to consider the potential larger implications for the overall service. We see this as an exciting area for re-conceptualisation, intervention and exploration for existing services and related research by design.

As a result, the challenges and opportunities in this area may be explored, investigated and tested from several directions so that we best understand and design for effective and yet

motivating experiences of mobile social software. This relates particularly to early phases of development of mobile services. In our work this also concerns the manner in which their design incorporates approaches to the design of services that are to do with both social and participatory mediation and its realisation via mobile devices and platforms. This demands considerable conceptual work on the part of interaction designers. They need to develop a service for socially mediated use that enables participation. To date this has not received much critical design oriented research analysis that can also feed into designing. This has implications for how we also practice and analyse research through design in relation to emerging digital communication technologies and their potential for participative use.

Studies exist of the social participation in services such as *Friendster*, yet few reflections address the challenges and processes of their overall and intersecting communication design. Rather than studying an already designed social media service or software application, such as one could for *Facebook*, we have been motivated to explore what it means to start to design for the participatory uses social media may afford. In this inquiry we have worked at the fuzzy front end of design innovation that is informed by research through design at several, interconnected levels. We draw on our own uses of social media in both professional and popular cultural settings. We have been involved in the co-design and research into a large urban social media service. We continue to take part in a collaborative development and research project into social media with public and commercial partners, together with social science researchers and consultation with users. These activities are also part of a wider ethos and praxis in our approach to design education, development and analysis that the Institute of Design at the Oslo School of Architecture and Design (AHO) adopts in attending to not only the functional and procedural needs of designing for interaction, but also their communicative and collaborative processes and enactments.

However, in looking into a research by design view of the development of social software services - and explicitly for the medium of contemporary, popular music – it is the conceptualisation and projection of potential services that is also important at the level of rich media and its communicative potential. What we address is how this can be explored, criticised, discussed, and experimented with on a more conceptual design level without the constraints of technology and platforms. This is not simply a matter of 'blue sky' conceptual designs for mobile services; we are aware of existing programming and application design for mobile devices and also work with informatics specialists and developers.

Our motivation is to reach one level beyond current commercial social software services and to conceptualise not just potential but possible interaction design in the mobile domain where there is still relatively little social software design and research. Here the term mobile social software or *MoSoSo* is already in use in design and commercial arenas, such as in *Mobile Facebook* or mo'blogging. Little research into the interaction and communication design of such software and services exists.

The RECORD project

This research is a part of the research project called *RECORD*[1] in the Industrial and Interaction Design Department at the Oslo School of Architecture and Design, Norway. The project is carried out in conjunction with in collaboration with SINTEF, a large interdisciplinary research centre, and Opinion, a brand, trend and society analysis bureau. The title *RECORD* refers to the growing age of the *prosumer*. *RECORD* investigates online communities where amateur users - experience, produce and share audiovisual content (Jenkins, 2006). This is investigated across disciplines and on multiple levels such as user-categorisation, patterns-of-use-studies, user interface design and user-centred evaluation.

In *RECORD* a Living Lab (Følstad, 2008) has been set up to provide design feedback through user dialogue, study user needs and behaviour, and evaluate services in online com-

munities. Living labs are a mode of engaging actively with users in research contexts. They are based on the established concept and practice of such a space as a part of innovation processes, enabling experimentation and co-creation with real users in real life environments. In *RECORD*, the living lab consists of a panel of over 3000 Norwegian Internet users. The overall project aims to provide knowledge and methodologies as well as to improve development of online community products and services.

From Public Service to Social Networking

The case presented below refers to an exploratory design investigation and innovation into what implications a new mobile extension into the iPhone/iPod platform may have for a well established online social service called *Urørt*.[2] The case is provided by one of the project's industry partners, the Norwegian Public Broadcaster, NRK. *Urørt* is a popular place for publication and discovery of independent music in Norway.

Media related research has looked into the changing nature of digital broadcasting. The shift to mobile services has been taken up for example by leading commercial media players such as CNN. The case of *Urørt*, however, is an instance of a public service broadcaster opening out its notions and provisions of services for a traditional media broadcast mode. Importantly, this is a matter of a design development team in a project based research mode inquiry working collaboratively with a small part the broadcaster that already reaches out towards participant audience membership and engagement.

The move from broadcast mode entails a process of locating, layering and linking social software services and activities, but also in relation to prior activities and content. It further demands attention to specific meditational strategies suited to these projected and experimental services with MoSoSo. These include the design of interfaces, the sharing of applications and a wider communication design that links participants via mobile devices and on the move. Today *MoSoSo* oriented to the discovery of independent music may be designed to enable file sharing and public provision of services to cohere.

Focus of Paper

Our main design research work through this case is to do with how interaction design can assist in the exploration, investigation and evaluation of existing social services in mobile platforms, and the role of communicational artefacts in this process. The two core research questions we pose are as follows. How can social media technologies be explored better and used as a material to design with by interaction designers in the early phases of the design process? How may a communicative perspective be highlighted in the interaction design processes?

Our interest is in both devising and communicating a creative and collaborative design process, informed by user-views and related to prior contexts of mediated use on to the proposed application. In our experience, interaction designers' work in developing MoSoSo may be made manifest via prototyping, with paper, through specific interface design for small screens and particularly in video mode.

In tackling these concerns more generally, and analytically, we adopt a sociocultural approach to interaction and communication design. This is informed by social semiotics, via new media theory and by way of the transformational and developmental aspects of activity theory. In addition, we refer to current research into social media and social software design and development. We contextualise our attention to conceptual designing with reference to more sociologically and ethnographically framed inquiry into uses of social media that have so far dominated this domain.

Taken together, our approach is one that situates the collaborative design of social media in a new media and communication design framework that is centred on culturally

located mediation rather than technical computational specification. While we work with JAVA programmers and use various software applications in designing, in this article we refer to conceptual design experiments that are what we label *communicative prototypes*. We have generated this term to convey the intertwined character of using media to create narratives of projected mobile design, with critical, contextual responses by users. The resulting designs offered the service partner material for the formal implementation of social networking in open public use. Overall, we argue that the communicative prototype offers a useful means of situating the imaginative, emergent design of mobile social software for discovery of independent music.

The narrative and mediated means of both shaping and conveying design innovation in social software for mobile platforms is presented in an exploratory, developmental design case. Included are the roles of different media in the narrative of the design case – principally prototyping and video prototype – but also their role as communicational artefacts and devices. The link here between interaction and communication design shows how interaction designers may contribute to innovation and critiques in processes of conceptualising and reaching for newly framed and situated services and their significations. In terms of methods, we draw on a variety of design and research techniques. These are summarised and then applied in the exploratory design case.

Context for design

From SoSo to MoSoSo

Music is one domain in which media rich social software is developing rapidly. This is perhaps no surprise given the history of music and technology in popular culture. Technologies of music production and popular listening and exchange have influenced current trends in *MoSoSo*: the Walkman and mix tapes, file sharing applications and networked MP3 players with mobility.

There are several commercial music services that are extending to the mobile platform. *Myspace.com*, *Spotify*, *Last.fm* and *imeem* are examples of this and are currently found as applications for the *iPhone* (Figure 1). These efforts are, however, more or less a direct adaption or downscaling of the features and functionality found in their desktop versions adapted to the smaller screen and modes of interactions in the mobile device. Most of the effort has gone into finding meaningful ways of adapting and implementing as much of the functionality of the desktop instantiation as possible. This is in line with the critique Dourish makes that :

> (…) the primary concern of mobile computing designers has been to resolve the problems imposed by the new context of mobile computing, that is, the way in which mobile systems fail to match a series of expectations associated with desktop settings. (Dourish, 2007:1)

So the challenge for the designers is to free themselves from the desktop paradigm, and see the mobile not as merely another interface instance of the service. They need to take up the challenge and to envision what it means for the networked platform and service, the social structure and the interface itself on an overall conceptual level. Without such attention to this conceptual design level, developing *MoSoSo* applications and services may be stymied by inheritances of other user interfaces and information systems design.

Making connections about and around and through music is also an important part of developments in mobile music services and ‘prosumption’. *BluetunA* (Baumann et al., 2007) investigates ways to use music in order to connect people at a local scale, through the use of handheld devices. Here a physical co-location is a precondition.

Playlists that were once the purview of the single, super-styled DJ sourcer and spinner have now also migrated across networks and between 'players'. A cultural study of mobile music (Nettamo et al., 2006) revealed that the common usage of playlist features highly on mobile devices in western culture. This relates to popular contexts of use, such as commuting.

Social Playlist (Milic-Frayling et al., 2007) has performed a field test for a service that lets friends collaboratively listen to music in a mobile context. This and related research (Jung et al., 2006) show how an in-context field test with a working prototype can elicit qualitative feedback and real-time usage information for mobile social software. This is an important point in its design for music where mobility, distribution and participation are communicatively inter-twined.

Analytical framework

A sociocultural perspective on research through design design

An approach to interaction and communication design that provides considerable purchase for the development of social software is one which places socio-cultural perspectives at it core. This view is devised from the work of the psychologist Vygotsky (1978). It has been widely adapted in contemporary educational research and in inquiries into information systems design. A sociocultural perspective on communication design - that entails the shaping of interaction - situates tools and signs in contexts of their shared 'dialogical' cultural production and exchange (Morrison, in press 2010). These are lodged in activity systems that are realised in and through dynamic collaborative engagements between people and technologies and the mediating artefacts that enable and effect shared communication. Following the work of Wartofsky on tertiary artefacts (Wartofsky 1979), mediating artefacts refer to digital platforms, commercial and open source software and diverse applications as well as the interfaces, uses of media and types of electronic expressions we enact. This is useful for the design and study of social software and services in that it allows us to centre on the co-construction of resources for engaged interaction where the texture and granularity of media, movement and shared meaning making are involved.

Activity as the core unit of analysis also allows us to follow and to critique the developmental and transformational character of this engagement and the place mediating artefacts have in our increasingly technology infused communication. A sociocultural perspective on mediated design and communication also emphasises cultural and historical aspects. At the level of design, these to need to be seen in relation to related trends in design research, principally participatory design and reflective design. However, we do not see a need to bracket off these traditions but rather relate them in the design and study of complex mediation (Bødker & Bøgh Andersen 2005) that involves the technological and the semiotic in making meaning in designed products and for the making of meaning in their contextual use.

Our developmental design work into investigating mobile social software services also draws on a reflective design approach. This approach has been described as '… a set of design principles and strategies that guide designers in rethinking dominant metaphors and values and engaging users in this same critical practice' (Sengers et al., 2005:57). Where reflective design chooses and builds upon a certain technological platform with in-situ working prototypes, we apply reflective design strategies to earlier conceptual stages of the design process, prior to technological development. The final conceptual design of the iPhone / iPod touch application is framed as an intervention that challenges the established service and explores new directions not bound to existing platforms and technologies. Within the frame of reflective design we draw more on a few of the several approaches that further influence reflective design. Central here is the tradition of Scandinavian participatory design

with its user-driven approaches to include several different audiences and stakeholders in the design process.

Also significant in reflective design is the legacy of critical design (Dunne, 2000). Here the role that our designed objects play in encouraging reflection, dialogue and opening new for design directions is important. These approaches that are located in design research are not fully connected in sociocultrual approaches to mediated communication and situated meaning making. What we do is to connect these to the key notions of activity and mediation in a sociocultural perspective on digital design: participatory design is used as a means of co-creating and encouraging shared views of reflection-in-action; critical design helps us attend to the role that the designed objects play in pushing against conventions while being mindful of them.

Our study traces developments in processes of prototyping *MoSoSo*. It conveys the communicative significations of this developmental view as an exploration based within a wider social semiotic enactment of social software and services relating to context, mediation and engagement.

Methods

Research through design

The nesting of the case within the work of a creative media industry partner offers a real-world context in which designer-researchers can carry out their practice. In this process the practice becomes the object of inquiry. The artefacts and processes that are produced as a result of this practice are objects for analysis, reflection and knowledge production. The different aspects of the outcome are therefore of relevance both to the case partner and the design practitioner and researcher.

According to Binder and Redström, this is a matter of 'exemplary design research driven by programs, experiments and interventions', where the case is a provider of frame and foundation (Binder & Redström, 2006). In our case, and concerning research through design, this refers to both interventions and experiments applied to the case itself, *and* to the actual process of carrying out the design through a user-driven design process for early stage development of mobile social software. It is important to point out that this design process and case is constructed not as an optimal or recommended design process for industry use. Rather it is a frame for the practice-based research that explores and investigates the communicative potential in the interaction design process. Overall, the concept of the communicative prototype may be extended beyond our specific case on social software into other areas of interaction design, and, potentially, the design and analysis of other relations between products, processes, interactions and services.

Design methods

Our design process has been pragmatic and exploratory. We have been open to the outcomes of a mixed process of designing. This applied to our own small design and development team. It is also reflected in they way we have involved users from the Living Lab in several stages of the process, including patterns-of-use studies, idea-workshops, online testing of early ideas and evaluation of the end result. Our design process has also been iterative; it allowed us to take a step back to evaluate and rework the material from previous stages of the process. This stance towards designing *MoSoSo* was important in that it allowed us to engage with design in the making, and to reflect on its emerging discourse.

Established methods from inside design and design research that crossed a number of types informed the multimodal character of the social software (Morrison et al., in press 2010). Methods ranged from sketching to video prototyping (see below for details). Each stage in the collaborative produced different design artefacts for a number of purposes and

audiences (Houde & Hill, 1997). In early stage concept development, idea cards, containing an illustration and description of an idea, were devised to collect, communicate, discuss and evaluate early design ideas. Prior to final prototyping production, storyboards and manuscripts were produced. This was mainly as a means for production, but also as a part of the overall iterative process in that they forced us to rethink and to plan how to communicate the design concepts to our different audiences. Interface designs were developed using software such as *Photoshop* and *Illustrator*. Ultimately, video-prototypes were created using lo-fi video production techniques and creation of interfaces for communication purpose, not for manipulation or interaction.

Research methods

The inquiry draws on mixed research methods in a practice-based mode of inquiry. A variety of methods was selected a way of capturing the processes and diverse activities involved in designing. This if often important in practice-based research where bottom-up processes of developmental designing and their ongoing analysis need different research methods and modes of research communication. The study took the form of a specific case that was developed between the project partners. The case format provided a frame for shaping and reflecting on a detailed developmental process that demanded varied documentation and means of analysis. These covered gathering, discussing and analysing design sketches and video prototyping representations. Included also were researcher observation and note making, interviews with users, and interdisciplinary project seminars at which the material was debated. Reference was also made to related published research papers from the project group. Further, various representations and mediations were stored and revisited as means to discussions and analyses. The social software objects and the developmental processes of designing them provided us with mediatised realisations for conveying the outcomes of the explorations. Elements of these have been included in video format for this article. This provides a bridge between design processes and products and modes of their analysis.

A variety of related social software services, and especially mobile applications were accessed. Related research, websites and popular media were consulted. Selected screenshots were made for the purposes of this paper and placed within a compressed narrative account of a larger project design and research process. Potential for synergy between design and research were motivated in the case, but so too were views about positioning and critiquing the persuasive and formative role of video prototyping in a communicatively developmental process (Lim et al., 2008). The design case format was selected as a means for describing and reflecting critically on the processes of designing and the resulting designed artefacts.

Case study and analysis

Urørt

With the Norwegian public broadcasting corporation NRK we have been working on one of their music-related services called *Urørt*. Meaning ‘untouched’ in Norwegian, Urørt is a social service site where independent musicians and bands can upload and share their music with an online community. Visitors to the site can listen to the music by streaming it directly from the site or by downloading it to their computer. *Urørt* is also a bi-daily radio show on the national radio station P3, where a jury presents highlights from the uploaded material. All musicians uploading their material to *Urørt* agree to freely allow other members of the community listen to and download their music without compensation, allowing freer exploration and use.

Process

We began with mapping out the typology of *Urørt* from the social objects (Engeström, 2005) of images, events, videos and music to devices and relevant physical contexts. The map was used as a basis for discussions internally and with the *Urørt* developers and research case partner. In these discussions we looked at several directions from which we might experiment with the existing service. Ultimately we decided to pursue the combination of mobiles devices along with connections that *Urørt* have with the local communities.

We had interest in investigating this field from a research perspective as well as a design one. *Urørt* had never had a mobile version of their service but were keen to explore the mobile platform. However, they did not have the time, resources or immediate technical knowledge to pursue a design and development related process on their own. This posed a challenge to a wider design trajectory and our role as researcher-designers working collaboratively with a media and cultural production partner. We each saw great potential in the iPhone/iPod touch platform. It offered a clear 'platform' for us to focus on matters of interface design, potential modes of representing and serving applications and an overall presentational and aesthetic finish to which we might aspire.

At this point, we agreed on an open design and development brief, with few constraints given by *Urørt*. They wanted us to explore the field of MoSoSo broadly, unencumbered by their preconceived ideas. This gave the design and development partners in RECORD a creative design space to investigate the communicative potential of a mobile *Urørt* through a variety of design generative methodologies, spanning graphic design to the interests of current users of the site. Such use by prosumers was an important design marker for us as this allowed us to coalesce knowledge from actual situations of use to the projection of potential ones. This matters in the design of new services in emerging mediated technological communication especially where so much attention in mobile domains has been given to the computational and not always the communicative. This case offered a means to avoid 'feature' shopping and concentrate instead on synthesising new design potentials.

Presented below are the intertwined stages of our design process. This begins with a user-informed production of insights and inspirational material as basis for idea and concept generation. It continues to a synthesising of user feedback and sketches, ultimately leading to production of a communicative prototype for representation and user evaluation.

User-informed Design

Patterns of Use

To investigate patterns of actual use, two of our SINTEF project partners, Petter Bae Brandtzæg and Asbjørn Følstad, performed a thorough patterns-of-use study of the existing *Urørt* website. In all, 519 *Urørt* users participated in an online survey. In addition, three different bands using *Urørt* (14 people in total) took part in group interviews. The study included information about the users, insights about user-experiences, patterns-of-use, context, preferences and suggestions for improvement.

The study showed that few users are able to look beyond features and designs previously encountered in existing services. Many users of *Urørt* referred to features in other solutions to social media such a *MySpace* or *Last.fm*. This led us to focus more on the unique parts of *Urørt* that might be taken over into designing for MoSoSo related to it. This included aspects such as strong local connection, radio shows, connection to local radio stations and physical events.

Workshop

As an additional part of the idea-generating stage, we conducted a one-day collaborative workshop to move closer into engaged use. This took place with 12 participants drawn from

the living lab already formed through our SINTEF partnership. In advance, we planned a range of activities to elicit inspirational information about practices related to music listening and exploration.

We started off with several mapping exercises where, for example, participants detailed their daily activities related to music and in the contexts in which they listen to music during the day. We ended with a collaborative concept-generation-session; here participants were asked to generate concepts or ideas around specific physical contexts i.e. cafés, festivals, band-room. This was done graphically using notes, sketching etc, as well as verbally. These concepts were presented to the group, and in the end the participants were allowed to highlight the concepts they most favoured.

Idea Cards & Survey

In designing and related research a critical phase is the externalisation of concepts via artefacts that collaborators can relate to and refer back to in the process of designing. The idea card (see Figure 2) is a way to collect and physicalise different ideas. An idea card can contain a title for the idea, a drawing or image illustrating the idea and a short textual description of the idea. In it self, this act of giving the idea a title and description and illustrating it through interface or diagram sketches, is an iteration, refinement and exploration of the idea.

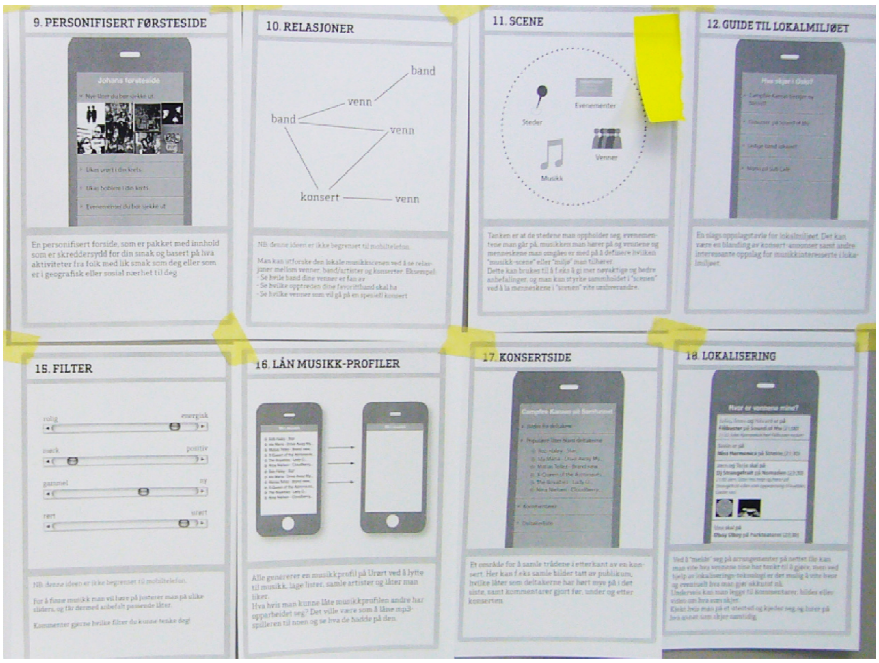

Figure 2. Collected idea cards.

The design-development team sketched a series of idea cards for a *MoSoSo* service for *Urørt*, as a way to map out and explore the design space (Gaver & Martin, 2000). The idea cards help to *materialise* the immaterial nature of social interactions through the language of interfaces and diagrams, into objects that can be viewed, read, understood and discussed externally. It also offers a range of affordances like sorting, storing combining, annotating, rating, and maybe most importantly: the ability to toss a bad idea in the garbage bin.

Our ideas were mixed with those from the workshop and later formalised into more polished cards. The cards were also developed to provide a means to evaluate the ideas on the part of potential users in an online survey that was to be carried out next. From a pool of diverse ideas, we detailed 24 distinct image cards to undergo further evaluation.

In collaboration with Asbjørn Følstad, a social scientist partner at *SINTEF*, we then conducted an online survey with 136 potential users (Følstad, 2009). To give these users access to our designs, we made image files out of each idea card, which we embedded into an online survey tool that was designed to elicit qualitative responses. In total we evaluated 24 idea cards. Each card received between 10 and 24 responses, giving a total of 417 qualitative textual responses. By the first day we had received 80% of the responses.

This type of feedback can be quickly and tightly integrated into the design process. While this may indicate we were connected to motivated users, the actual comments showed that these users were open to a design process that included them in investing in a potentially participative service to which they could contribute.

Interface Sketching

After the feedback from the survey was processed, we started a new round of sketching that considered the comments and suggestions from the qualitative feedback. Crucially, we paid attention to the role of stories (Erickson, 1995) at the outset so that they were implicated in the sketching and not appended to them.

We sketched mostly on paper, drawing out different features of the interface (see Figure 3). The importance was now on creating interfaces that clearly communicated our overall concept, and the underlying implications in it. So, the graphical interfaces are sketched and designed not for actual use, but to embody the larger concept and as means of *communicating it through them.*

The stories first allowed us to place features in the context of a story, and reflect on how the features fit together and how they together created a consistent concept. This approach also saved us considerable time by not creating unnecessary interfaces and functionalities that would not be needed to communicate the chosen concept.

With paper sketches in hand, we elaborated the sketches in *Adobe Photoshop* and *Illustrator*. We picked out key interface designs and elements. We then experimented with placement, order, size, colour etc of the elements. Little research to date has looked at the communicative character of mobile interfaces related to social software. In our case this was a matter of designing the interfaces to convey the potential articulations levels of such a socially situated and media rich service. These interface designs thus symbolised a mode of communicating the very concept of mobile social software in the domain of music and emerging practices of self-publication. Soon this led to a discussion of how we were to communicate our final concepts to audiences on the outside.

Prototyping

Mediating artefacts

A vital stage in the design process of interactive systems is a communicative shift from the symbolic and technical intricacies of the interface to a variety of artefacts that mediate. In collaborative, reflexive design concerning emerging technologies such as *MoSoSo*, this is an important task for interaction and communication designers. They need to collect and convey concepts and ideas and to make them visible to the world through the use of different types of design artefacts. These may include demos, prototypes and proofs of concept.

These are mediating artefacts in that they are a means of also projecting the designed and the design affordances and potential further (Wartofsky 1979). They may be employed as boundary objects (Huybrechts et al., 2009) to engage the design team and users in additional iterative contributions and trailing, often informing subsequent support for and the development of a fully functioning application or service.

The prototype is such a design artefact often used in catalysing communication between various audiences and stakeholders in the design process. It provides a frame through

which to also provide a narrative and context for situated uses of a projected product or service. This is a key aspect that interaction and communication design may bring to the shift from static to mobile screen-based communication. Contexts and scenarios of use and interface and interaction design need to be intertwined communicatively so that future users and sponsors have insight into applications they may not have envisaged or used similarly elsewhere.

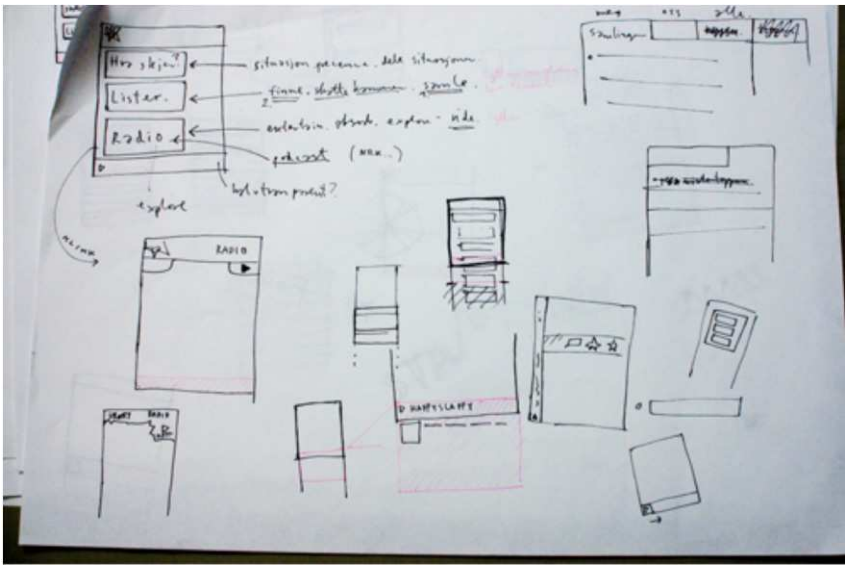

Figure 3. Interface sketching with pen and paper.

Prototypes

A prototype may be used in various ways throughout the design process to communicate and facilitate discussion around different aspects of the design in progress. Lim et al. (2008) write that prototypes lack a formal discourse; they argue we may approach them as filters and as manifestations. We coin the term communicative prototype to refer to specific focus on the nature and character of mediating artefacts in design processes. The communicative prototype may be used to address both the exploratory nature of designing and critical, contextual responses to it by users. In this case we go on to refer to video prototyping and its potential in projecting, representing and mediating processes and products of designing with emerging technologies, such as mobile social software or RFID.

The inherent paradox in early phase design development for social technologies is the fact that the essence of the material - the interaction between users over a longer stretch of time - is non-prototypal and non-testable without a technological platform together with people using and adopting it over time in their everyday lives. In a multi-disciplinary and participatory design processes this problem becomes quite apparent when ideas and concepts need to be mediated and communicated between different audiences in the design process (Buchenau & Suri, 2000). However, we believe this is the point the designer can make use of a skill set consisting of graphical interface design, storytelling and communicative precision.

Mobile prototyping

In the domain of mobile software various prototyping techniques, ranging from low-fidelity paper prototypes (Burns, 2006) to high-level pieces of software, have been investigated (Jones & Madsen, 2006). These efforts are often on usability and graphical user interface issues such as placement and size of buttons; they tend to overlook creative prototyping as an exploratory

design and communication tool in early phase design processes - as in much other software development that tend to bypass the pre-production phases (Buxton, 2003).

Prototyping and Urørt

One of the main challenges facing the further design of the service was how to convey our designs to a diverse audience (Erickson, 1995). It had to clearly explain all our ideas and concepts in a clear manner to the mixed interest and skilled *Urørt* development team, including designers, engineers and journalists. The communication needed to explain the core ideas and their implications for *Urørt* as a service and an organisation. We also needed to show how the software and rich media would be used, and how these would look and feel in use. We also had to prove that the concept was technologically feasible. In addition as an experimental and inspirational artefact for the *Urørt* developers, the service was also be used for the executives of the national broadcaster NRK as promotion for a continued effort in developing *Urørt* for mobile devices.

This led us to reconsider the role and importance of users in the wider design process. As a part of the project's work on *Urørt* we had wanted to explore ways to obtain feedback, in the form of opinions and suggestions to enhancements, on early stage design concepts in an online context. We knew then that we had to create a communicative prototype. Its focus would be on the communicative potential of the service, not only the structural character of the software. Such a prototype would tell potential end-users about how these concepts would affect their use of the service, and how it would be integrated into their daily activities. For this audience it was important to focus more on intended uses and content, than technological and structural aspects.

In addition, the overall remit of the RECORD project was to provide concepts for further development by large industry, commercial and communication partners. The in-house design-researcher development team do not possess high-level programming and mobile development skills. In addition, some of the ideas for communicative exchange and mediation we wanted to promote might have had fundamental implications for how the social engine and overall service of *Urørt* would operate. We were in contact, however, with mobile programmers working for example in JAVA and online social networking software and systems design for the Norwegian service *Underskog* (Morrison et al., 2009). We knew, though, that given our project-based resources and the state of our concepts, we would not be able to create a fully working prototype but would instead have to develop one that functioned communicatively if not procedurally.

Video prototyping and Urørt

After considering different ways - photo scenario, cartoons, stories - to present our work we decided to produce several short videos as our main mean of communication. Video prototyping refers to the use of interface simulations using animation and video techniques. It is one effective mean of externalising the details of an interdisciplinary design process that have already been achieved. Video has a long tradition in interaction design as communicative (Dubberly & Mitch, 1987; Löwgren, 2004) and prototyping tool (Vertelney, 1989; Bonanni & Ishii, 2009). However it is now gaining new importance as production methods, hardware and software are more easily accessible. Also adding to this is the rise of the Internet as communicational platform with rich media. Videos can spread quickly, gain lot of views and feedback from viewers. In 'the age-of-point-at-things', the prototypes are linkable, making them referable in conversations without the designers' presence, taking on a life of their own.

Through their *iPhone* mobile device, Apple introduced a way of communicating its features within the device, via iPhone *Fingertips*.[3] Fingertips are short online videos up to a

minute in length. The mobile device is placed on a white background, and a finger manipulates the user interface with a voice-over explaining the actions being performed. The video is totally removed from a physical context. However, the combination of the graphic user-interface itself, the content, the actions performed and the audio, tell a rich story about possible uses, leaving it up to the viewer to imagine the surrounding context. These videos have become embedded in popular culture through the use for marketing and demonstration purposes. However, the level of clarity and richness of the communication helped us as interaction designers to discuss and imagine the possible uses of the device and its software, even before having handled it.

On the design of *MoSoSo* for a music domain and innovative public service broadcaster, we wanted to make use of this way of telling stories about new features and possible uses, already embedded in popular culture. These would be drawn from our design experimentation, related inputs from users of *Urørt* as well as information gathered from their imagined uses of a future service.

Before starting the actual production of the videos it was important to elaborate on the stories we had already written and to make sure they were possible to convey through our means of communication. In the process the graphical user interface from here onwards needs detailing, down to the last pixel.

Without the technical skills to produce a completely operational prototype we had to find agile ways to work around mediating our wider designs for communication and interaction. In the team we had basic html and CSS (cascading style sheets) skills, but had not applied these to a mobile device or the *iPod Touch*, nor did we have the time to begin to do so. Here we needed to think like many hands-on interaction designers with training for example to often select professional tools and knowledge of others, and perhaps programming, through actual development work or collaborations. To aid us we dug out as much code as possible from existing services for the *iPod/iPhone* platform, and we located a Java/CSS library for the *iPod/iPhone* that simplified user interface coding for the platform. The combination of tweaked 'appropriated' code and the Java/CSS framework made it possible for us able to mock up simple and basic user interfaces quite easily and quickly.

Figure 5. Behind the scenes of the lo-fi video production

These were not for actual use or sale yet reflected common practices in web design bureaus and digital design teams.There were features that we were not able to create in this manner. In

these cases we had to resort to using still images that we integrated into the code. If there needed to be interactive elements, we overlaid specific areas with invisible buttons, giving the impression that interface was indeed interactive. All these interfaces were carefully developed according to our storyboard, with us only developing parts that were absolute necessary. Such strategies were applied, for example, in the walk-through genre used in early CD-ROM design, but have not featured greatly in relation to mobile interface and interaction design, nor MoSoSo.

What interested us here was the mix of an elaborate and multi-level design process and the utilization of low-fi technologies that allowed for seemingly professional mediation on a top level mobile device. The affordances of the mobile device could assist our communicative intent in mediating our designs for *MoSoSo*. Even though video production tools (see Figure 5) and software have become easier and faster to use, video as a medium offers few possibilities for change or manipulation, thus making it hard to test and evaluate on a usability level. The production itself must be carefully planned. This allows the designer to re-imagine the design in several contexts, and to focus the communication and consequently the viewers attention and feedback and, at this stage, not primarily usability-driven views.

As way to communicate to the viewers that this was work in progress and open for feedback we invented an 'underground development team' called *Urørt Labs* that would use these videos as way of telling the world about their ongoing experimentation in their experimental communication laboratory. Any material we produced from this constructed lab setting had to look professional, and give the impression of being fully functional and working. Attention to such a level of polish is important in providing a believable and professional communication design that in many respects may prefigure investments in time and money in detailed and elaborate programming. Further, attention to the communicative is not to disregards the computational, but rather to offer it a more elaborate environment of projected communication design that may both be fully visible from within earlier sketches and design process representations.

Final MoSoSo representations for *Urørt*

Introduction to videos

Below is a walkthrough of the content of four individual videos that present, as part of a set, the complete proposed design. The videos are one to two minutes in length, a format widely popularised in online services such as *YouTube.com*. Each video focuses on a particular feature in the interface. We split the videos into several short videos due to a proven short attention span amongst online viewers and user-testers, and their ability to focus on one area of the interface at a time both in an online context, but also in face-to-face presentation contexts.

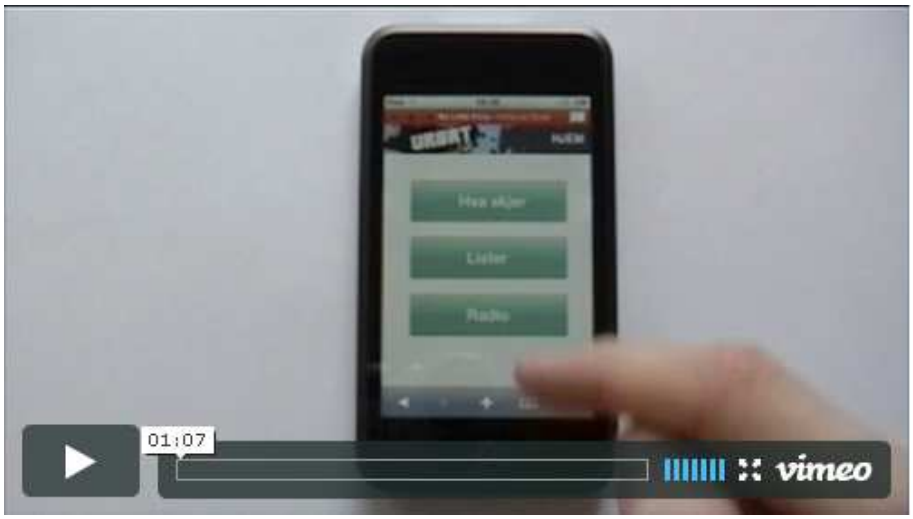

Figure 6 A: Introduction and Music Player – Video #1 (LINK TO VIDEO: http://vimeo.com/1111108)

Video #1: Introduction and Music Player

In this video we tell the story about the possibilities of the music player to lower your efforts for participation and continuous play, in addition to giving a small teaser of the underlying features. The player is minimised in an always-on-top box above the logo and navigation area. In the minimised state, the player displays the track currently being played, and offers s pause/play button, previous and next buttons and a button that lets you add a comment to the track currently playing. By tapping the player, it expands and reveals an image and more textual information about the artist (Figure 6 A). More buttons are also revealed, letting you add the song to a playlist and recommend it to a specific person. In addition there is a slider that allows you skip to any time in the track.

This video sets the scene for the following videos, and the three big buttons boldly communicates the features found within the application. This communicates *through the interface* that this is not simply a downscaled version of the desktop version that offers a variety of functionality where search, browsing by tags, band profile viewing and editorial content are the central activities. On the contrary it introduces a carefully selected set of new activities such sharing, music listening, users' activities and list browsing as the central objects for interaction.

Video #2: What's up?

Figure 6 B: What's up? – Video #2 (LINK TO VIDEO: http://vimeo.com/1111087)

Here we introduce a new social space where the *Urørt* user can share their experiences and access those of others around *Urørt* activities, i.e. listening or going to a concert. When entering the feature, you are presented with a question 'Hva skjer?' ('What's up?'), and an input area where you are can answer the question (Figure 6 B). Underneath are the most recent contributions from you and people in your scene. We have limited the commenting system, so that you can only comment when you are actually performing an *Urørt* related activity. This is to restrict the noise and to keep the conversation more connected to the content. This is a feature not unlike popular micro-blogging services such as *Twitter* and *Google Buzz*, but specifically oriented towards a community connected by *Urørt* activities and objects.

This video raises the issue about how *Urørt* users socialise using the service and how they can discover and share new music and activities relevant on a mobile device. Since this functionality is not present in the existing service, this story contains interventions and explorations regarding the social structure of the service and new forms of interaction between users.

Figure 6 C: Lists – Video #3 (LINK TO VIDEO: http://vimeo.com/1111138).

Upon entering the list feature, you are presented with the most recent playlists created by the people your 'scene' (Figure 6 C). Below that is a section with the playlists that you have actively chosen to follow. A red dot with a number in it indicates new entries to the list that you haven't listened to yet. The playlists are presented with a title explaining its content, and the name and avatar of the owner.

You enter the playlist by tapping it. Here you are presented with the option to follow (adding it the list of playlists you follow) this playlist, followed by the actual content of the playlist. By tapping any of the entries, the track starts playing.

In the top-menu there are two more options. 'Dine' lets you administrate and access the playlist you have created yourself. Each list is annotated with number of followers, indicating how popular they are. By entering the list you are presented with its content. You can remove entries or start listening to individual entries or the list as a whole. Lastly there is the 'Toppers' option that presents your 10 most listened to tracks, and the 10 most popular tracks in your 'scene'.

This video further explores models for Urørt users to engage with the content by introducing low threshold ways of sharing through embedded use such as collecting and organising your music collection. The users can become a musical scavenger by browsing and subscribing to other user's lists. They can also see a section where they can collect and share their treasured items with the community through the playlists. This video introduced discussions and reflections around how content is structured, organised and shared among the users.

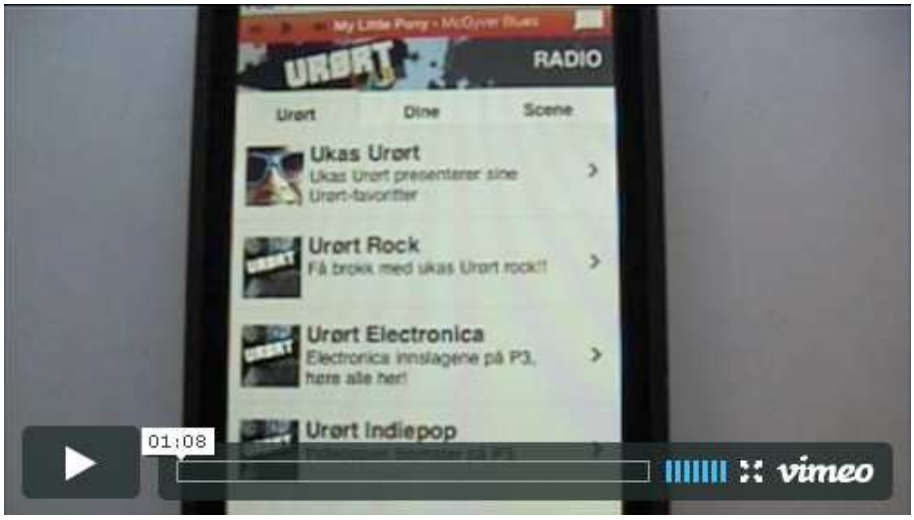

Figure 6 D: Radio – Video #4 (LINK TO VIDEO: http://vimeo.com/1068406)

In this last video we tell the story about place where you can sit back let yourself be entertained by *Urørt* through different channels of content. This can be seen as a podcast extension of the content presented on the actual fm-radio show. Pieces of the radio show are archived and sorted by genre. There are also shows where external people can sift through the *Urørt* content and pick out their favourites (Figure 6 D). As in the playlist feature you access the content by tapping the title. You can choose to follow channels. All the channels you choose to follow are collected under the 'Dine' tab. Under the 'scene' tab you find the most popular channels in your "scene".

This video raises a wider discussion about how *Urørt* treats their fm-radio content and how that can be made available in subscription mode relevant to mobile use. Further it also

encourage reflection around how *Urørt* can make use of external authorities to sift their vast libraries to make it more available to the wider public sphere.

Synthesis

Each of these snippets of video adds up to a synthesis of new design potential - they all relate to the mobile activity of listening and sharing in the discovery of independent music. Combined, they tell a complete and coherent story of the imagined possible uses of the service.

Presentations and Evaluations

In a meeting with the project partners and the *Urørt* developers we presented the videos. The immediate reactions to the concepts were very positive. "I definitely think we should make this!" was the first reaction by the lead developer. Further, the video catalysed fruitful discussions about the concepts we had drawn together to date as well as discussion of future development. An evaluation of the proposed concepts and ideas was conducted shortly after the videos were produced, this is written about in detail in another publication (Følstad, 2009).

By making the video publicly available in online video services, the videos also took on a life of their own, appearing in blogs such as NRK's popular technology and social media blog *NRKbeta*.[4] Here they gained views and comments from prominent industry leaders. This shows the potential of communicative prototypes to act as *probes* in online environments where they can spread into new and unexpected spaces. What may be garnered are insights, comments and proposed improvements from potential users, whom normally are out of reach, and have other motivations and desires for engaging than a recruited user through a living lab.

Findings

Earlier we posed two key questions: How can social media technologies be explored better and used as a material to design with by interaction designers in the early phases of the design process? How may a communicative perspective be highlighted in the interaction design processes of developing a mobile social software application for independently authored music? We have explored these questions through our 'exemplary' design research case. In answering these questions we now list a number of core findings that pertain to a design focus in developing the communicative potential of mobile social software. While we offer some critique, our motivation is to also offer some of the benefits of communicative prototyping so that they may be considered and applied selectively by other designer-researchers.

Communication prototyping. In addition to the range of media and approaches to prototyping in design, attention may be placed on how prototyping is used to communicate a complex, iterative and collaborative design process, and how this is done through the language of interfaces. Where this refers to working with emerging technologies as 'materials', placing weight on the communicative in prototyping serves to accentuate the intersections between tools, materials, mediation and the potential for meaning making by users. However, communicative prototyping adds an additional level of risk in that it demands designer-researchers pre-figure a holistic design space that is connected to overall goals and projected outcomes. The emerging designs ought not to be squeezed into a pre-given frame; their value may be in their processes of development and challenges to revising that initial motive for designing.

Video as design and prototyping tool. This is especially so for communicating re-imaginations of services for mobile social software and other emerging technologies where the aspects of time and social behaviours is of the essence. Video is particularly powerful as a presentation tool in an online evaluation context. Complex design concepts, including ideas

that range from larger overall structural ideas to smaller detailed interactional features, can be conveyed combining moving images, sound (speech and feedback sounds) and alternatively additional written text to supplement the content of the video. The very production process of the video allows the designer to invent as he or she makes. Yet, video needs to be acknowledged more critically as a representational medium that involves the selection and editing of material. Its visual force may need to be balanced by reference to other modes of conveying communicative prototyping in the process, alongside formative evaluation of mixed methods inside a project team.

Video as means to popular access to design innovation. The videos posted online through the online service Vimeo gained about 700 views in a week, without little publishing efforts. Video may also function as a mean for embedding ideas in the popular imagination. Video prototyping with polished presentation qualities may be used to communicate to several different audiences in different contexts and levels of 'authority' (see Arnall & Martinussen this issue).

Informing decisions in interaction and communication design. We involved users in the design process as a way of opening up the design space and being open for external views in the early stages. We faced several challenges in involving and translating the input from the users in meaningful ways; an explorative design process is not linear. New directions arise as the process goes on, leaving others behind. As the users were involved only sporadically during the process this meant that much of their input became irrelevant for the direction the project had taken. As another example, the online user evaluation yielded quite split feedback, ranging from positive to negative on all ideas. At this point the competence and judgment of a professional designer is important for deciding which feedback to take into consideration, and to decide on further action. It seems clear that the creative design process cannot be reduced to a scientific method of qualitative analysis, comparative analysis and verification of solutions. However, such input can still be useful in informing and enriching the design process. The most rewarding outcome of this stage of the process, is not necessarily the actual feedback, but the *feed* itself - the act of making and communicating our thoughts, ideas and concepts to an external audience.

Tinkering in communication design. Interaction designers do not have to handle all technical wizardry to be able to create interfaces that explore and communicate new concepts for mobile social software. We can avoid technical barriers by crafty 'hacking' together of various techniques into seemingly functional interfaces that can be communicated via video.

We suggest that experimentation at this level is needed to further understand the applicability of communicative prototyping in other design cases and domains.

Conclusions

We have presented a communication perspective on interaction design and its developmental dynamics concerning mobile social software intended to enable participation concerning the self-release and mediated exchanges concerning independent music. We have shown how video prototyping may be utilised in this activity. We have attended to its persuasiveness in mediating an apparently completed service as one part of a larger research and design process. Innovating within both mobile interfaces and communication design processes as mediated and communicative artefacts allow others access to the unfolding projections on the part of interaction designers. The communicative prototype thus offers mobile design a means for working close to the edge with emerging technologies and related mediated design.

In assessing video as a tool for designers, we return to a distinction made by Buxton between sketching and prototyping (Buxton, 2007). Writing from informatics, he sees the sketch as close to what designers are engaged in. That is, it is to do with exploring ideas, asking questions, provoking discussion and offering tentative solutions. In contrast, through

the prototype ideas may be tested by being refined and specified more closely. On the basis of the work presented above as research through design, we argue that the *communication prototype* allows us to interrelate these two otherwise distinct techniques and genres of design activity.

One potential criticism of the communication prototype is that it simulates the real to such an extent that it is hard not to see it as a completed, functioning product, falling into what Holmquist describes as a form of 'cargo cult design' (Holmquist, 2005), pretending that functionality is real, when it actually is not. The high production quality status it conveys may be said to obscure its tentative, exploratory character. This may also be troubling for some people who have expectations about sketching and prototyping that are tied to and are results of other media, such as pencil and paper. We appreciate these concerns. However, we do have other tools at our disposal that allow us to build on such digital mediations and to take them into forms that more closely simulate finished products and services. This too can be part of conceptual design in which the imagined and projected may be offered not as evidence aimed to hoodwink test users and participants in iterative and participatory design processes, but rather to give them more refined and believable communicative experiences of the potential being suggested. This too means that the designers may meet sharper criticism and expectations of professional functionality and what is meditated. These are ones that users of social software and services already expect from the many tools and offerings in public circulation.

Further, to argue that such mediations of interface sketches and prototypes should remain more abstract, and thereby more open to interpretation and potentially varied views from users, is also valid. However, users may be given more access, via social media, to processes of designing and the layers and iterations of conceptual design as it unfolds. In our view, this means we may not need to keep users so remote from the unfolding processes but acknowledge that they may suggest a wide range of needs and views in the processes of refining the designs. This was shown to be the case in the reflection on research by design of the social calendaring and network service *Underskog* (Morrison et al. in press 2010). Yet, in a design view decisions still need to be made as to how many and which of these wishes, needs and demands to accommodate, delay or pass over. A wider sociocultural perspective on design asks that we consider these in concert, over time and as part of the making of meaning via digital technologies and related mediating artefacts that social software and media allow for producer-consumers.

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