Acting Out the Future: A Process for Envisionment

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Abstract

It is difficult to design innovative information and communication technologies to meet needs that will emerge from future interactions between users, technologies and their situations of use. We have been using scenarios that are acted out as a way of envisioning the future. This paper describes some of the core dilemmas of innovative design. It draws on our existing work as well as ideas from a range of disciplines to present a 'light' but useful envisionment process that may be applied to commercial design problems.

Keywords

Performance, scenario-based design, technology innovation, envisionment

1. Introduction

Technological innovations are necessarily aimed at users operating in some yet-to-unfold situations of use. Approximations of these users, their desires and situations of technology use are difficult to develop. We have been using scenarios that are 'acted out' to provide a window into the needs and wants of users of future information and communication technologies (ICTs). Performance of scenarios provides a powerful means of immersing participants in a range of everyday situations as a prelude to envisioning possible future needs and situations of use. This paper presents some of the core dilemmas of innovative design and describes our research, its outcomes to date and some of its principal shortcomings. Ideas from a range of disciplines are drawn upon to enhance and strengthen our work. The outcome is a robust yet 'light' envisionment process that can be applied in commercial practice to assist designers of innovative ICTs.

2. Background

Designing innovative ICTs is an intractable problem. A typical approach employs understanding of current technology use as foundation for envisioning future use (Kensing & Munk-Madsen 1993). Methods such as interviews, observation or experiments are used to understand current use and

designer introspection, brainstorming and scenarios are used to envision future use. However, these methods provide an idiosyncratic, 'hit or miss' approach to design (Carroll & Howard 2001). The leap from current understanding to envisioning the future is creative and poorly understood, reflecting a process of conceptual design that is *"unexplained, largely unexplored, and, to a large extent, ignored*" (Ives 1993) within the information systems community.

Difficulties in designing innovative ICTs arise not only from the creative and ill-understood nature of conceptual design but also from the complex and multi-layered relationship between users and technology. New technologies are designed to afford and constrain use, both in the types of activities that users may undertake and the situations in which the technology may be used. Users adapt to these affordances and change their activities to capitalize on the technology's capabilities. This relationship between technology and use, however, is not one-way. Users do not necessarily implement a new technology as it was intended by its designers but adapt it to their particular needs, activities and situations (see, for example, the use of text messaging by young people (Carroll, Howard, Peck & Murphy 2002)). The degree to which a technology can be adapted has been called openness, plasticity (Ciborra 1996) or interpretive flexibility (Pinch & Bijker 1992). Therefore, the relationship between users and technology is reciprocal (Orlikowski 2000): technology enables new activities in new situations and, depending on its interpretive flexibility, may be adapted in unintended ways for current and new activities and situations. Technology shapes, and is shaped by, people in use.

In addition, these new activities and situations of use will lead to new demands and requirements of the technology. As users experience the possibilities of the technology and adapt it to their needs, they may reach the limits of its interpretive flexibility. They will become frustrated at their inability to further adapt the technology or they will discover needs that are related to, but not offered by, the current technology. Use and adaptation for unintended purposes leads to new requirements for enhanced or novel technologies. The reciprocal shaping relationship between users and technology, and the consequent emergent new requirements, render the design and implementation of innovative ICTs particularly difficult.

We are crafting an envisionment process that provides a more systematic approach to the creativity of conceptual design and takes account of the reciprocal relationship between users and technology. The goal is to actively provoke or trigger innovation rather than relying solely on passive introspection or individual inspiration. This work has been undertaken in collaboration with an industry partner and contributes to both IS research and practice by providing a process model for envisionment that focuses on design for future rather than current use and emphasises emergent requirements that arise from the interaction of users, technology and situations of use.

3. The Current Envisionment Process

An initial envisionment process was constructed from diverse sources including scenario-based design, participatory design, and theatre performance (Howard, Carroll, Murphy, Peck & Vetere 2002). The essence of our approach is a theatrical performance where a scenario is 'acted out'. Central to our approach is the belief that successful envisionment requires rich sensory input and stimulating interaction between the performers and design team. Scenarios are employed because they "*support reasoning about situations of use, even before those situations are actually created*" (Carroll 1994:29). However, we were influenced by the need to move beyond merely

reasoning about future situations of use to simulating, as closely as possible, users immersed in possible futures. Use of multiple senses provides the maximum creative stimulation for the participants. We aim to place users in situations where they are thinking (reasoning about a scenario as in a traditional scenario walkthrough), doing (acting in a performance of a scenario) and seeing (acting in real-life contexts as well as in a theatre) (see Mintzberg & Westley 2001). This allows a design team to examine users' actions and responses to contextual and environmental cues when envisioning future needs and technologies.

The process was created conceptually and then applied by a team of researchers and designers. Our areas of interest were young people and innovative mobile ICTs. In the first case, the team worked with a professional film director and two professional actors. The tentative conceptual process was refined through collaboration and discussion with the director and actors; the refined process is detailed in (Howard et al. 2002) and presented in Figure 1. A second case replicated the process but involved the team working with the same professional film director and four young people (users).

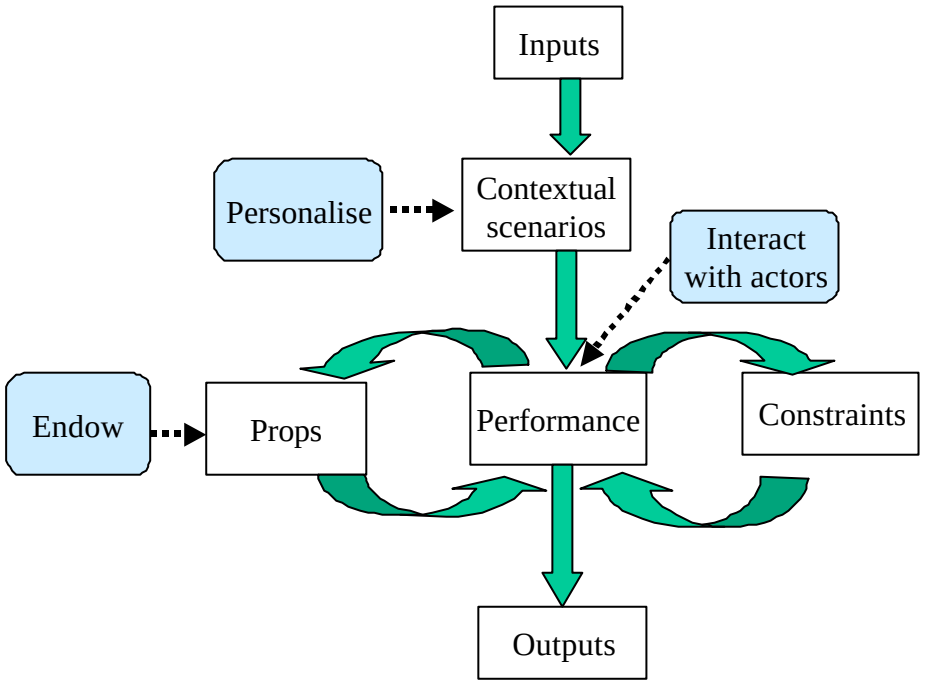

Figure 1. The envisionment process

The envisionment process comprises key elements, roles and activities.

The key **elements** of the envisionment process are its inputs, the tools and techniques used within the process, and the expected outputs.

- Inputs are understanding of current practice (derived from our previous research) and understanding of likely future form factors and functions (derived from a panel of technology experts). These inputs ground the innovation process in actual use and plausible rather than fantastic form factors of future technologies.
- The main tools and techniques are contextual scenarios, props and constraints that are brought together in a performance. Contextual scenarios (Howard et al. 2002) are skeletal descriptions

of actors and contexts used to trigger performances rather than textual vignettes that allow users to verbally 'walk through' a description in text. The emphasis on context rather than goals is intended to assist performers to react to their context and discover new activities and goals. Props are bare representations of the candidate technology forms. Constraints are hurdles that must be overcome; they intensify the urgency of the performance. A performance involves acting out the contextual scenarios using props and constraints; we have used both theatre spaces and real-life contexts for our performances.

- The expected outputs include fragments of understanding of possible future technologies and their uses, situations of use and impacts. This understanding is always partial and incomplete: the ways in which a future technology and its use may be shaped can never be completely forecast (Carroll & Howard 2001).

The key **roles** within the envisionment process are actors, director, designers and researchers.

- In the first case, professional actors trained in improvisation were used rather than representative or surrogate users. We believed that this would reduce the cognitive burden of acting out and heighten the focus on context and issues rather than the performance. However, the second case involving young people produced similar results, suggesting that this assumption was incorrect; both actors and young people focused on the performance rather than the context or issues.
- A film director facilitated the performance, motivating and managing actors.
- The designers and researchers worked together in the design team.

The key **activities** are personalising scenarios, endowing props and interacting with the actors.

- Actors personalise a scenario by adding personal understanding; for example, a shopping scenario may be personalised by the actor imagining that a present is being bought for her boyfriend.
- A prop is endowed with features, functions and forms that may be appropriate for a scenario; for example, a tablet may be endowed with video, audio and GPS capabilities.
- The design team observes the performance and interjects, further endowing the prop or adding constraints to mould the theatre according to their aims. At the end of a performance, its members question the actors about their actions, goals and motives.

4. Shortcomings

Shortcomings of the process have been identified (Carroll 2002) of which several are discussed in this section. Reflection on these shortcomings led to further examination of the literature and, in particular, different processes and techniques used in a range of disciplines to trigger creative and innovative activities. These have been evaluated and techniques that address the specific shortcomings of our envisionment process are used to strengthen it as outlined in the following section of the paper.

The most serious shortcomings relate to the performance and the roles played by the participants. The primacy of theatrical performance over envisionment was evident with both user cohorts. Actors are trained to take ownership of a situation and then produce a theatrical performance. Some of the young people tried to act a character rather than expressing their own needs and wants. Also, the director was an expert in theatre performance and his focus was on producing an excellent

performance rather than stimulating creative envisionment. Both the actors and young people felt under pressure to 'perform' and generate ideas for innovation as part of that performance. Enjoyment, satisfaction and a sense of fun encourage creativity (Cooper 2000) and so the pressure to perform limited rather than opened-up the opportunities for creativity.

This pressure on the actors and young people to perform was related to a lack of clarity about the goals of the acting out. The dual goals of exploring the use of innovative mobile technologies by young people and refining the envisionment process were clearly understood by the design team. However, this was not communicated successfully to the director and the performers and so they were unclear about the responsibility for achieving these goals. It was planned that the interaction between the performers and design team would trigger creative and innovative ideas but in the acting out sessions the actors and users performed and the design team observed. The separation between performers and audience resulted in the performers bearing the responsibility for envisionment. This shift in responsibility limited the input of the design team. The interjections of designers and researchers, so crucial to the envisionment process, either did not occur or were 'lost in the show'. Therefore, clear articulation of the goals of the acting out are needed and the focus of 'acting out' needs to shift from performance to envisionment. The roles of the participants should be clearly specified and the responsibility for generating ideas shared amongst all participants.

In addition, the inputs had little influence on the envisionment process. The richness and realism of current situations of use collected through intensive research (Carroll et al. 2002) were lost in the scenario-writing process as detailed textual descriptions were reduced into skeletal contextual scenarios. This was exacerbated by the personalisation process whereby the descriptions of current use were translated into contexts, activities and interactions familiar to the actors. In addition, the outcomes of the expert panel, in outlining some of the likely form factors of future technologies, were not harnessed in the process of endowment. In many instances we were unable to 'stretch' the actors beyond familiar and well-known form factors; when this did happen, it was implausible such as ICTs sensing the actors' feelings or emotions. Overall, 'endowing the prop' usurped the importance of context: the prop became the dominant focus of the performance while technology use and situations of use received less attention.

5. Improving the Process

A key challenge is to remove the pressures of performance, for which we turn to the work of Brazilian theatre director Dr. Augusto Boal and his Forum Theatre technique (Boal 1979). Initially Boal developed a process where audience members could stop a performance and suggest different actions for the actors. However, an audience member became frustrated by an actor's inability to understand her suggestion so she went onto the stage to show what she meant. This transformed the 'monologue' of traditional theatrical performance into a 'dialogue' between audience and actors. This dialogue is mediated by a 'joker' or impartial facilitator who sets the rules, facilitates participation and summarises the essence of each instance of a performance. Audience members in Forum Theatre are welcome to demonstrate their ideas on the stage, and so can develop an active relationship with the performance: they become 'spect-actors' not spectators. This provides a means for all participants to work together on an issue and generate unexpected creativity.

Boal's ideas are particularly suited to our envisionment process. We suggest that a performance commences with a dialogue between designers and actors to communicate the goals of the session,

set the rules of the session and discuss the responsibilities of each role. This dialogue continues into the performance as participants – be they actors, users, designers or researchers - 'act out' a scenario and try to overcome a constraint. The facilitator (or joker in Boal's terms) invites the rest of the participants to interject and suggest alternative actions, endowments to the props or introduction of novel ideas. It is crucial that participants feel safe to interject and that no penalties, disapproval or censure arise as the result of interjection (Cooper 2000); this is enabled by the role of the facilitator who does not represent any one participant's viewpoint (as the joker in a deck of cards has no suit or value, see Schutzman & Cohen-Cruz 1994). Use of an impartial facilitator overcomes the issues arising from using a professional film director to manage the envisionment process.

Participation is not limited to interjection but may range from observing as an audience member to interjecting and acting out in the performance to demonstrate ideas. This removes much of the pressure noted in our acting out as it empowers the participants by providing them with a choice of the level of involvement in the performance. Acting is not a role solely for actors or users and there is little distinction between the person(s) acting and those not acting. This builds empathy between the design team and users and also shifts the responsibility for envisionment from the actor to all the participants in the performance. Creativity in groups is enhanced where participants are drawn from diverse fields or backgrounds (Cooper 2000); group responsibility for envisionment builds on the various viewpoints, experiences and skill sets of users and actors, designers and researchers. Just as Boal drew unexpected creativity and novel ideas by removing the barriers between actors and audience in order to encourage dialogue between them, so we aim to blur the distinction between user and designer to capture their creative ideas about the needs associated with future technology and its possible impacts.

We suggest that it is important to have some preliminary preparation for all participants prior to a performance. One approach is to use video, a powerful tool for picturing 'what is' as well as triggering thought about 'what might be'. Videos of users and their current technology use in context can be viewed in several ways (Buur, Binder & Brandt 2000): as snapshots of current practice that provide rich, non-textual background details about the users or that capture gaps in practice to be addressed by the design team. If users are participating in the performance, then the videos can act as a mirror for users to encourage them to reflect on their practice or trigger dialogue with designers before the performance starts. Similarly, participants may be informed about likely form factors prior to endowing the prop. Video or textual snippets from the expert panel; mockups, prototypes, graphical and textual descriptions of imminent technologies; and briefings using information on the Web can inform the participants about likely future form factors. Not only does this 'priming' of participants reduce the likelihood of pure science fiction, it also enhances the envisionment process because "*people are able to envision futures both more 'realistically' and more imaginatively after they have had their awareness of the possibilities raised*" (Dator 1993).

The personalisation of scenarios can be further strengthened. Firstly, personalisation as a group process in the initial dialogue can build negotiated understanding of the context and issues presented in the scenario. Secondly, actors and users can personalise scenarios in actual situations of use rather than on stage or in laboratories. Thus, the scenario ceases to be an acontextual story and becomes an integral part of a real 'time and place'. If users are participating then performing in 'their' context shifts power to them. This acts to redress the power and control typically exercised by designers in participatory design sessions. The result is true participatory design, where both designers and users are participating in each others' worlds.

Our aim is to examine not only future technology's forms and functions but also users' experiences of them in different situations. As a result, we have looked at the role of emotion in human experiences (see Sanders 2000). Our focus is on design and so we sought an approach that includes emotion in the design process. A premise of Postdesign (Sanders 2000) is that tapping into users' emotions and accessing people's feelings, dreams and imaginations can provide designers with the ability to transcend the past and present and move on to *potential* experiences. It assumes that feelings, dreams and imaginations are another form of tacit knowledge that can reveal *latent needs*, that is, needs not recognizable until the future (Sanders 2000). We apply this use of emotion to tap into potential experiences and latent needs that may be supported by future technologies.

Users' experiences have traditionally been studied with observational and market research to provide researchers with views of what people do and say. Approximating the future and accessing people's dreams requires different tools. Postdesign tools focus on what people *make*, that is, what they create in order to express their thoughts, feelings and dreams. Make Tools use everyday materials such as scissors, glue, scrapbooks, cameras and stickers; Lego and building blocks are used for 3D representations (Gage & Kolari 2002). These are either emotional or cognitive. Emotional Make Tools are used to create artefacts that show or tell stories, for example collages or diaries. Users explain their artefacts to express feelings, dreams, fears and aspirations. Cognitive Make Tools include maps, mappings, 3D models and diagrams of relationships that express how people understand (and misunderstand) their world. Make Tools involve non-verbal modes of expression that build on users' experience to discover hitherto unknown or unanticipated needs. Make Tools can be supplemented by other 'wishing' tools such as a crystal globe (to see anything that the participants desire), a magic wand (to do anything that participants wish), a magic box (to store anything) (Brandt & Grunnet 2000) as well as a magic wheel (to take participants anywhere they want).

To date the only tools used in our envisionment process have been props that are endowed with likely technology forms and functions. We augment our approach by including Make Tools and wishing tools that allow participants to express their dreams, visions and desires. This adds an emotional aspect to our process and helps to shift the focus of the envisionment sessions away from technology towards latent needs. The combination of functional props and emotional tools helps designers to explore what people do, say, make and wish.

A final influence relates the outcomes of the envisionment process. Performance of scenarios is a means of extending participants from 'what they know' to 'what they can conceptualise about the future' (Carroll & Howard 2001). Rarely can humans leap from current knowledge to understanding of hypothetical future situations because "*what we understand is based on what we already know*" (Winograd & Flores 1986:30). Scenarios enable design teams to create a series of 'what ifs' that help users move beyond their current experiences by acting out some of the possibilities provided by technology. We are using scenarios to stretch the users, step by step beyond what they have experienced to what they can comfortably conceptualise. However, the outcomes of this process to date have been refinements in the process itself rather than any specific visions or ideas about future technology and its use.

In order to address this lack of specific outcomes, we build upon Futurist Studies (Bell 1995). Futurists argue that although it is impossible to make accurate predictions about the future, it is possible to construct a well-informed vision or series of visions of possible 'alternative futures'. These visions help to shift people beyond the constraints of current realities and open up the

possibilities of new opportunities. In Scenario Methods, a Futurist technique, a number of scenarios are prepared and presented to subjects to set up a 'possibility space' in which the future is likely to unfold. In our work we prepare contextual scenarios and participants act them out; as yet, we have not harnessed the resulting visions of the future. Boal's concept of a joker who summarises the essence of each instance of acting out provides an effective way to collect and feed these visions back into the performances. Consequently, participants can act out and debate a range of possible futures and thus construct a possibility space (Schultz & Dost 1997).

There is a connection between Futurist work and our desire to inject emotion into the envisionment process. Futurists recognise that visioning has an emotional component: scenarios are futures for the head and ask participants to consider 'what if?' Visions are futures for the heart (Bezold 1997, in Schultz & Dost 1997) and answer the question 'what are our desires?' in this possibility space.

6. The Revised Process

The revised process (see Figure 2) starts with the design team defining and articulating the goals of the envisionment session; this may include stating the commercial problem or issues, the type of participants (for example actors, users or surrogate users) and tools (for example props, Make Tools or wishing tools), and the intended outcomes. All the participants are then prepared, using rich media to inform them about current practice and likely technology form factors. The facilitator or joker then communicates the goals of the session to all participants, outlines the rules and describes the roles and responsibilities involved in the performance.

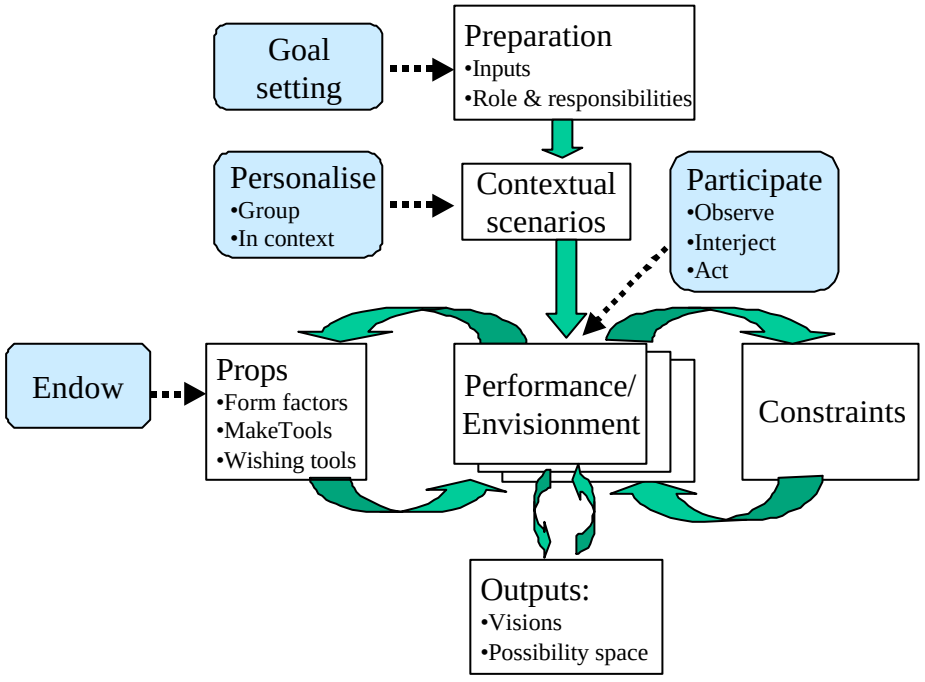

Figure 2. The revised envisionment process

The performance starts with dialogue between the participants about the scenario, the context in which it will be performed, the tools to be used and the constraints to be overcome. The performance commences. The facilitator asks for inputs from the 'audience'; these may include

ideas and interjections, endowments to the props, or demonstration of ideas. The dialogue between participants may lead to another acting out, the making of artefacts that express dreams or fears or the use of tools to express wishes for the future. At the end of each rendition of a scenario, the facilitator summarises the key outcomes or visions generated; these may be extended in the next performance or new possibilities explored.

7. Conclusion

In seeking to enhance the current idiosyncratic approaches to envisionment, we have designed and documented an envisionment process. At the same time we are aware that although clear goals are vital for any creative activity, there should be some uncertainty about the path to achieving these goals (Cooper 2000). A prescriptive, step-by-step process that must be followed rigorously is unlikely to be successful: there is no recipe for envisionment. Managing the envisionment process too tightly will reduce the autonomy, motivation and therefore creativity of the individual participants. What we are seeking to craft is a supportive and collaborative environment in which trust, participation and enjoyment are melded with creativity tools and techniques into a robust but usable envisionment process. We suggest that this may be achieved through careful articulation of the goals, thorough preparation for all participants and flexibility to negotiate the path to these goals.

As a result of analysis of two applications of our envisionment process (Howard et al. 2002) and ideas and experiences presented in literature from a range of disciplines, we argue that a successful envisionment process has several key characteristics.

Preparation of participants is necessary so that they have some understanding of current users' needs, technology uses and situations of use. Understanding the opportunities for adding technology to users' lives in identified gaps or unsatisfied needs, situations where technology could provide lifestyle support and unexpected uses of technology are valuable in preparing all participants for envisionment. Such preparation invites designers and researchers into the users' worlds, issues and concerns. Information about imminent technological forms and factors educates participants about technological possibilities and restricts prop endowment to plausible rather than fantastic fictions. As well, building trust amongst the participants prior to the start of the performance is essential for successful creativity.

Concepts from Boal's Forum Theatre are valuable in converging performance and envisionment. Performance becomes a means of immersing participants in a context from which envisionment may be triggered. The roles played by the participants are fluid and flexible so that all can choose to observe, interject or act. Blurring the roles equalises all participants, forcing the design team to face the embarrassments and uncertainties of performing while providing the actors and users with power in designing. This ensures true participatory design where designers and users enter into each others' worlds as they collaborate in the design process. It also spreads the responsibility for creativity amongst all participants. Input from multiple participants from different backgrounds, mindsets and disciplines adds to the richness of the envisionment as does immersion in a range of possible futures by thinking, acting, seeing and wishing.

The activities of the process encompass emotional as well as functional aspects so that users' dreams, visions and latent needs are included alongside their needs for technological features and functions. The props currently employed in our envisionment focus on possible forms and functions of future technology; we augment these with emotional tools that can express participants' dreams,

fears, feelings and wishes. Finally, the intended outcome of the envisionment process is not new technological features or functions; rather, a possibility space is constructed from the complex and emergent relationship between these features and functions and users' likely activities and situations of use.

We have strengthened our existing work with resources from Augusto Boal's Forum Theatre, Postdesign and Futures Studies. These techniques are not novel nor are they the only possible resources suited for use in envisionment. We have selected these particular resources to overcome specific shortcomings observed in our work to date; it is their combination that differentiates our approach. Together, these influences provide the basis of a 'light' but useful envisionment process with a generic structure that is ready to be applied to a commercial problem situation. We are currently examining the needs of business people in transit to out-of-office meetings (Carroll, Kjeldskov, Tobin & Vetere 2003), using the refined envisionment process in conjunction with more traditional methods (interviews and observation). Outcomes have been a description of users' social, personal and business needs as well as those related more immediately to meetings and several high-level designs for mobile devices and applications that could satisfy these needs. Although our focus to date has been on mobile technologies, there is a need for future research on applying the envisionment process to ICTs in general.

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