

A Participatory Design Understanding of Interaction Design

Ron Wakkary

School of Interactive Arts and Technologies
Simon Fraser University
2400 Central City
Surrey, B.C. Canada
rwakkary@sfu.ca

ABSTRACT

In this paper I frame my past design research with the philosophical approaches of participatory design as outlined by Pelle Ehn in *Work-Oriented Design of Computer Artifacts*. The paper provides a series of related design techniques as exploration of interaction design methods and concludes by raising questions of methodologies research and evaluation.

Author Keywords

Participatory Design, Design Methodology, Interaction Design, Ethnography, Scenarios, Participatory Workshops.

ACM Classification Keywords

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

INTRODUCTION

Design methodology holds a special theoretical position that links understanding of design to practice. Design methodologies formulate philosophical understandings of design's relation to the world and seek in detail to link that understanding with the actuality of designing in the world. Fortunately, despite the specificity and rigor in formulating design methods, there is typically flexibility in both the theoretical and practical application of methods. Such flexibility can be seen as an allowance for the vagaries of practice in the practical sense, and in an exploratory manner it allows for design research to extend and further understand design through design methodology research.

This paper is an exercise in viewing my past design research projects through the lens of participatory design

(PD). More specifically, the work will be framed by the theoretical and philosophical principles of participatory design as laid out by Pelle Ehn in his text, *Work-Oriented Design of Computer Artifacts* [5]. Namely, the phenomenological view of Heidegger, the linking of skill, expertise, and transformation as found in Marx, and the transposition of Wittgenstein's language games to design games.

WORK-ORIENTED DESIGN OF COMPUTER ARTIFACTS

This section is the briefest of introductions and overview of Ehn's seminal text, *Work-Oriented Design of Computer Artifacts*, which was published in 1988. While other texts preceding this provide an overview of PD [1], this book is among the first in-depth theoretical rationales for PD. It aims to emphasize the opportunities and constraints for industrial democracy, basing its findings on one of the most cited PD examples, the Utopia Project.

Ehn formulates a philosophical foundation of the design of computer artifacts through the ideas of Heidegger, Marx, and Wittgenstein. In laying the conceptual basis for PD he strongly critiques the Cartesian rationalism of systems design. Ehn argues that design is concerned with social and creative activity founded in our traditions, but aiming at transcending them by constructing alternative futures. He states: "The dialectics of tradition and transcendence – that is what design is all about" [5 p. 7].

Ehn's inquiry is interdisciplinary, or even transdisciplinary, for while acknowledging the dual importance of the natural and social sciences he states the need to move beyond the disciplinary boundaries: beyond natural sciences penchant for relegating "social effects" to being a non-scientific concern; and for social sciences to leave behind the "pure" position of observation and analysis.

Ehn's account includes a historical overview of the collective resource movement in Scandinavian design - an attempt to make the design process inclusive of trade union activities, and to reach the explicit goal of industrial democracy in design and use. Pragmatically, Ehn discusses a tools perspective for skilled workers and designers to

design in cooperation computer artifacts as tools for skilled work.

PAST RESEARCH AND TEACHING

My research has been concerned with interaction design and methods. One thread of the research involves projects that prototype systems for play, social experiences, and learning. These include prototypes for ambient intelligence physical games [12] and museums as responsive environments [6]. Along another thread, I have been exploring the idea of *everyday design* [10]. That is the notion that every one of us designs in the course of living our lives. We exploit the materials around us, such as designed artifacts by appropriating them for different and new uses. These two threads of research intersect in the belief that future interactive systems need to be pliable, simple, and open to ongoing design in order to weave themselves meaningfully into our lives. In addition to research, the focus of my teaching has been in interaction design methods and industry-based participatory design classes.

A DESIGN METHODS APPROACH AND RESEARCH EXPLORATIONS

In the midst of designing, my approach is best understood as a set of emergent actions conditioned by reflexive awareness, what might be described as reflective practice [9]. At a more distant point of reflection, the approach is deeply informed and conditioned by the underlying ideas of participatory design. In fact, the explicit social and political goals notwithstanding, the philosophical foundation that Ehn describes can well serve as the conceptual underpinnings for a methodological understanding of interaction design. In this section, I will look at the recurring actions of *design ethnography*, *scenarios*, *participatory workshops*, and *prototypes*, components of an interaction design approach, through the lens of Ehn's PD. In addition, I will add relevant research issues in respect to each of the techniques that my colleagues and myself have explored, or what can broadly be described as methodologies research.

Design Ethnography: Understanding the actions and situations of people has been a critical starting point in many projects. Our approach to design ethnography has included informal studies of play [12], systematic inquiries into museums [11] (see figure 1), and lengthy ethnographic studies of design in the home [13] (see figure 1). Ehn sees beyond the political strategy of inclusion to “a cultural and anthropological understanding of human design and use of artifacts” [5 p. 5]. And so a focus on human *practice* is a central concern, as such “practice is our everyday practical activity” [5 p. 60]. Practice in Ehn's terms incorporates a Heideggerian understanding of phenomenological embodiment of skill and knowledge.

In our recent methodological research, we have incorporated embodied performance through informance design into part of the ethnographer's techniques of



Figure 1 Design ethnography in a museum studying play, and in the home studying *Everyday Design*

reporting [13]. This research into techniques and methods explores the adaptation of informance design to ethnography [2]. This adds to the incorporation of design techniques to new forms of reporting and representation in ethnography such as the use of pattern language [3].

Scenarios: Donald Schön argued that the design process is led by “frame experiments” [9]. Scenarios are exemplary frame experiments, the goal being to envision a possible outcome or future as a response to the design situation. The different forms of scenarios include, role-playing, storyboarding, scripts/narratives, sketches, videos, and interactive works. Our process utilizes scenarios often and typically early in the process (see figure 2). The scenarios acts as experiments and representations of future steps that becomes deconstructed through participatory design workshops. The link between scenarios and participatory workshops has been critical in our experience. Ehn stated “from a design point of view the challenge was to develop really participative design methods that allowed both professional users and professional designers to be creative in the design process. To this end we came to focus on what we called ‘design-by-doing’ methods, using simulations like prototypes, mock-ups, and organizational games, which allowed the graphic workers to articulate their demands and wishes in a concrete way... in the simulated future environment” [5 p. 18].



Figure 2 A video still from an early scenario for an adaptive audio museum guide



Figure 3 A participatory workshop exploring movement and gestures



Figure 4 A participatory workshop exploring narrative through simple games

Scenarios can be understood as documentaries of the future. Recently, we have been exploring the use of documentary film within a participatory approach as a representation of current and future situations. This work is on the heels of recent research on the role of documentary filmmaking as a tool in creating design personas [8].

Participatory Workshops: Workshops are another form of a “frame experiment,” however based on participatory design. In our case, engaging participation of potential end-users and stakeholders in open but structured workshops, allows for exploration of design responses to situations generated by scenarios. Our workshops can be in response to other workshops and are therefore only planned one at a time in a responsive fashion. Each workshop arises out of the previous design inquiry. Ehn saw a pragmatic imperative along with a political one, “for democratic control and changes, [which] is only one side of the coin. The other is the role of skill and participation in design as a creative and communicative process” [5 p. 6]. Ehn utilized what he called “design games” as a method of enabling this process, transposing ideas of Wittgenstein’s language games.

In our own approach, we have been exploring categorizing different workshop strategies. For example, in an ambient intelligent museum project a participatory workshop explored movement, gesture and its relation to space utilizing metaphors, such as “catching butterflies” as the concept to explore (see figure 3). In another project of an ambient intelligent multi-user game we explored narrative through simple game structures (see figure 4), in what might be considered a metonymic relationship between our workshop activity and workshop goals. Our categorizations are exploring literary theory concepts of metaphor, metonym, and allegory as representing different strategies, each with its own potential for outcomes.

Prototypes and prototyped environments: Prototypes and technical workshops serve an enabling and evaluative function. Early in our process they act generatively, supporting design responses with technology or exploring them through “wizard of oz” approaches. As the design outcomes emerge, components of the eventual system become prototyped and together are evaluated and help to evaluate the interaction through participatory workshops. In certain cases they satisfy a necessary requirement as in the case of a prototyped or simulated environment (in one instance we simulated in full scale a responsive version of an exhibition display within our lab, see figure 5) or as a stand-in for an eventual artifact component of an overall system as in our exploration of tangibles in an ambient intelligence environment. In PD, prototypes are central to the notion of *design-by-doing* and theoretically buttressed by Heidegger’s concepts of *ready-to-hand* and *present-at-hand* in which a phenomenological presence is explored and understood. This is demonstrated in the oft-cited case of Ehn’s use of cardboard and plywood mock-ups of workstations and printers in the case of a design workshop in the UTOPIA project [5 p. 335]. As Ehn stated, “artifacts can support both *communicative* and *instrumental* activities. Artifacts can *mediate* our activity towards other humans or towards *objects*” [5 p. 162].

The concept of prototypes and prototyped environments in



Figure 5 Large scale posters attached to frames were used to simulate a museum exhibition in full-scale in the lab

the context of design research raise issues of clarification and purpose that often are not addressed methodologically. Distinctions exist between prototype artifacts that are the outcome and subject of research; prototypes that are enablers in a participatory approach but do not serve as the outcome; and prototypes as necessary components or environments for simulating situated environments or what has been referred to as "natural experiments" [7]. Often in the case of design research, combined uses of prototypes exist that are themselves outcomes and conditions for experimental research.

DISCUSSION

In an abstract for the National Science Foundation Workshop on Human-Centered Systems held in 1997, Ehn described three *worlds* of information technology design [4]: the objective, the social and the subjective. He continues that the languages of these worlds are very different. The objective world is rationalistic in its understanding of design, where quality is a question of prediction and control. The social world formulates an understanding of design through interpretation and communication, and quality is a question of ethics. The subjective world is centered on emotional experiences and creativity, and as one might expect, quality is a question of aesthetics.

Quality as described above is a central concern of design methodologies. An inspired understanding of design and embedding this understanding in practice is what leads to quality. Ehn provides a multi-dimensional notion of quality, which provides clues for a diverse understanding of the roles of methodologies. Equally importantly to design, it raises the issues of evaluation or validation of methodology along the varying axis of prediction and control, ethics, and aesthetics, all dependant on which *world* of information technology design one is in. Incorporating such epistemological framings could help support the range and types of methodologies research. Each is enabled by methods of validation and evaluation that are unique to the quality measurements each *world* values.

CONCLUSION

This paper presented a discussion of my past research through the lens of participatory design as laid out by Ehn in his seminal text, *Work-Oriented Design of Computer Artifacts*. The research discussed, included ambient intelligence environments for museums, multi-user games, and ethnographic inquiries into the concept of *everyday design*. I provided a brief introduction to *Work-Oriented Design of Computer Artifacts*, and discussed recurring components of interaction design in light of Ehn's PD. These components included *design ethnography*, *scenarios*, *participatory workshops*, and *prototypes and prototyped environments*. In addition, relevant methodological research

explorations were introduced including the furthering of representational tools in design ethnography through the use of generative design techniques like informance design; the exploration of a participatory approach to documentary filmmaking as a form of representing current and future design situations; the use of literary theory concepts of metaphor, metonym, and allegory for describing strategies in participatory workshops; and the issue of distinguishing types and roles of prototypes in design research. The paper concluded with a discussion of different epistemological framings in information technology design that could be considered in addressing the question of evaluation and validation in design methodologies research.

REFERENCES

1. Bjerknes, G., Ehn, P., Kyng, M. and Nygaard, K. *Computers and democracy: A scandinavian challenge*. Avebury, Aldershot Hants, England; Brookfield Vt., 1987.
2. Burns, C., Dishman, E., Verplank, W. and Lassiter, B., "Actors, hairdos & videotape - informance design," in Ext. Abstracts CHI 1994, (1994), ACM Press, 119-120.
3. Crabtree, A., "Pattern-based support for interactive design in domestic settings," in DIS, (2002), 265-276.
4. Ehn, P., "Seven "classical" questions about human centered design: Position statement to the nsf workshop." <http://www.ifp.uiuc.edu/nsfhcs/abstracts/ehn.txt>. 1997, Last viewed Jan. 22, 2007.
5. Ehn, P. *Work-oriented design of computer artifacts*. Arbetslivscentrum, Stockholm, 1989.
6. Hatala, M. and Wakkary, R. "Ontology-based user modeling in an augmented audio reality system for museums," *User Modeling and User-Adapted Interaction, The Journal of Personalization Research*, 15 (3-4). 2005, 339-380.
7. Hollan, J., Hutchins, E. and Kirsh, D. "Distributed cognition: Toward a new foundation for human-computer interaction research," *ACM Transactions on Computer - Human interaction*, 7 (2). 2000, 174-196.
8. Raijmakers, B., Gaver, B. and Bishay, J., "Design documentaries: Inspiring design research through documentary film," in *Proceedings of the 6th ACM conference on Designing Interactive systems*, (2006), ACM Press, 229-238.
9. Schön, D.A. *The reflective practitioner: How professionals think in action*. Basic Books, New York, 1983.
10. Wakkary, R., "Exploring the everyday designer," in *International Workshop on Studying Designers '05*, (2005), 277-282.
11. Wakkary, R. and Hatala, M. "Situated play in a tangible interface and adaptive audio museum guide," *Journal of Personal and Ubiquitous Computing*. 2006, 22.
12. Wakkary, R., Hatala, M., Lovell, R. and Droumeva, M., "An ambient intelligence platform for physical play," in *ACM Multimedia 2005*, (2005), ACM Press, 764-773.
13. Wakkary, R., Poon, M., Maestri, L., Kirton, T., Juhlin, C. and Betts, R., "How informances can be used in design ethnography," in *Proceedings of the conference on Human factors in computing systems*, (2007), ACM Press, In Pres