

On design artifacts as sites for intermediate level knowledge production in interaction design

Ron Wakkary^{1,2}, William Odom¹, Audrey Desjardins¹,

¹ Simon Fraser University, Surrey, British Columbia, Canada

² Eindhoven University of Technology, Eindhoven, Netherlands

{rwakkary, wodom, adesjard}@sfu.ca

Position paper submitted to the CHI 2015 Workshop 26: 'Knowledge Production in Interaction Design'

INTRODUCTION

In this position paper, we describe two design research investigations we conducted that we view as examples of producing intermediate level knowledge in interaction design research. As stated in this workshop's description, the means through which intermediate level knowledge can be developed and communicated in interaction design is varied and still emerging. In line with this, we offer our two examples as contributions to this nascent and growing discussion with a particular emphasis on the role design artifacts and their generation plays within intermediary level knowledge production inquiries.

In our own research, we largely focused on design artifacts as a primary site for theoretical articulation and intellectual argumentation. From our experience, the making and situating of finished design artifacts (rather than prototypes) into material existence articulates many nuances and qualities that can be essential in generatively embodying theoretical notions or philosophical propositions related to interaction design. In other words, the materiality of design artifacts speaks volumes—their actuality opens them up to ongoing encounters, experiences and engagements, both for the design team itself as well as people in everyday lived environments. Notions underlying this perspective build on and also closely parallel prior works describing how new knowledge can be reflectively surfaced across the making and theoretical situation of interaction design artifacts [3, 5, 6, 7, 11, 13] and, more generally, ongoing inquiries into the role of design as central means of inquiry in research and, ultimately, knowledge construction activities [2, 5, 14].

DESIGN RESEARCH EXAMPLES

Each of the two investigations we describe assumes different yet related design research approaches to placing novel design artifacts at the center of the research inquiries as opposed to human behaviors. In our first example [12]

our approach built on Stolterman and Wiberg's [11] articulation of concept artifacts and their notion of a construct. Both concept artifacts and constructs can be seen as forms of intermediate level knowledge. We developed a conceptual construct through an analytical approach aimed at surfacing design qualities that were shared across a series of three conceptual artifacts. These were drawn from different interaction design research projects, including the Indoor Weather Stations [4], the Discovery Driven Prototypes [8], and our own table-non-table [12] (figure 1). We combined this analysis with and were inspired by Christopher Alexander's theory of unselfconscious cultures and notion of goodness of fit [1]. Our construct, which we named unselfconscious interaction, describes a form of interaction with computational artifacts that is animated by incremental intersections that lead to improvements in the relations among artifacts, environments, and people—that can be described as goodness of fit. Our construct articulated the theoretical idea that goodness of fit was not something that can be designed rather certain design qualities contribute to or motivate the emergence of goodness of fit. These included the qualities of open-endedness and live-with that are linked and mutually informing. In the intermediate level knowledge sense, other theoretical notions emerged that related to our construct like tensions that are contradictory forces in design qualities that need to be balanced within design qualities, like alienness and familiarity within the quality of lived-with. Additionally, we viewed the dynamic relationships between artifacts and people, and artifacts and artifacts as intersections, a type of incremental and rarely noticeable encounter. Lastly we described a design approach of purposeful purposeless in which designers design with a high level of quality and craft as a means to support the open-endedness or lack of prescriptive use of an unselfconscious interaction artifact.

In our second example, we investigate people's lived accounts with two separate design artifacts deployed in



Figure 1. The Indoor Weather Stations [1], the Discovery Driven Prototypes [2], and the table-non-table

different settings to articulate a conceptual framing of a more implicit form of everyday creativity and to advance a tightly related set of concepts and strategies for supporting future generative investigations in this area.

In an ongoing project, we adopt a generative approach to unpacking a notion of everyday creativity that aims to move beyond direct interactions and purposed manipulations to include the implicit and incremental encounters and relations that emerge among people, artifacts, technologies, and the environment over time. Specifically, we reflect on people's experiences of living with two interaction design artifacts named the Photobox and the table-non-table that was also part of the unselfconscious interaction investigation (figure 2). Although these design artifacts were distinct, they led to a range of similar findings. The Photobox [9, 10] is an interactive technology that intends to be used over many years, which occasionally randomly selects and prints a photo from its owner's Flickr archive. The table-non-table is a domestic technology comprised of a stack of paper on an aluminum chassis that slowly moves, shifting its orientation and place within the home in short, infrequent, and randomized instances. Both the Photobox and table-non-table were deployed and studied in different households over relatively long periods of time. While these design artifacts were created and studied independent of each other, they shared many similar qualities, such as: (i) they draw on familiar forms of actual objects (i.e., a chest and a table), (ii) they do not require nor demand the attention of their owners to enact their function, and (iii) they are comprised of materials, such as wood, paper and aluminum, which arguably contrast the stuff most contemporary interaction technology are made of (e.g.,

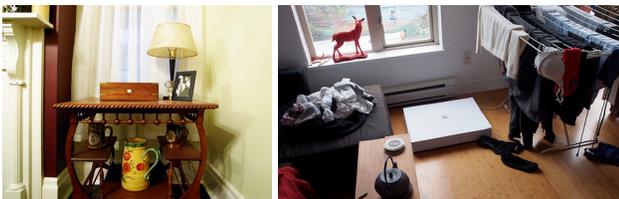


Figure 2. The Photobox and the table-non-table

plastics).

Through a reflective analysis and synthesis of the design qualities of the two design artifacts and also people's lived experiences with them, we surfaced the related concepts of unaware objects, intersections, and ensembles. Unaware objects are a type of interaction design artifact that is intentionally designed to enact their respective behaviors without requiring or demanding the attention of their owners. These objects have no explicit output functions based on interaction with them and they lack any kind of traditional 'interface' or control mechanisms. We found unawareness led to a series of intersections—ongoing incremental encounters with a design artifact in which a

modification or transformation may or may not occur that we reinvestigated in more depth with this study. Intersections ranged from experiences of being mindful of the artifact, to crossing paths with the artifact that may be only briefly noticed (or go unnoticed), to piecemeal re-situations of the artifact within its physical context, and to momentary engagements. Additionally, as intersections accumulate, qualities emerge that go beyond the individual artifact, often becoming experienced with an ensemble of things and people within their local environment, such as the home. In this sense, we found the quality of everyday creativity manifested at the level of ensembles through the holistic relationship of artifacts, contexts, and human actions. An ensemble is a dynamic collection of social and material elements within an environment that can become increasingly unique and nuanced over time.

Collectively, we surfaced and articulated concepts through a high-level analysis across two interaction design research projects to strengthen the conceptual foundation for future investigations aimed at generatively investigating and supporting a more implicit notion of everyday creativity in everyday life. In these case examples, people's lived experiences with the design artifacts provided a crucial way for better understanding the actuality of things and the ways in which their theoretical and material qualities produced new insights into refining and expanding the rich yet underexplored space of the everyday.

QUESTIONS WE WANT TO ASK

Based on those two examples, we are curious to dive deeper into questions such as the following. More importantly, we believe that those questions can further nourish the various discussions that will take place during the workshop.

- How will designers and researchers use the constructs and concepts created in both projects?
- How can we orient intermediary level production to be more speculative? More generative?
- What are the methodological concerns in generating conceptual constructs or concepts?
- If the reasoning is that intermediate knowledge will eventually be built on to 'advanced' knowledge, then what would this even look like? How do the various intermediary level knowledge concepts and notions inter-relate and build upon each other?
- What are the benefits and downsides to framing our thinking and intellectual pursuits in design in this way?

WHO WE ARE

Ron Wakkary is a Professor in the School of Interactive Arts & Technology at Simon Fraser University (SFU), in British Columbia, Canada and a Chair in Interaction Design and Everyday Life in the Faculty of Industrial Design at the Technical University of Eindhoven (TU/e), in the Netherlands. He leads the Everyday Design Studio and is Director of the SFU Interaction Design Research Centre.

William Odom is a postdoctoral research fellow at Simon Fraser University in the Everyday Design Studio. He leads a range of research projects themed within slow technology, the growing digitization of people's possessions, and design-oriented methods to envision potential technological futures. He recently completed a Ph.D. in HCI from Carnegie Mellon University, and previously was a Fulbright Scholar in the design department at Griffith University's Queensland College of Art in Brisbane, Australia.

Audrey Desjardins is a PhD student at Simon Fraser University in the Everyday Design Studio.

REFERENCES

1. Alexander, Christopher. *Notes on the Synthesis of Form*. Harvard University Press, 1964.
2. Binder, T., Ehn, P., De Michelis, G., Jaccuci, G., Linde, G., Wagner, I. (2011). *Design things*. MIT Press.
3. Bowers, J. The logic of annotated portfolios: communicating the value of 'research through design'. In *Proc. DIS'12*, ACM (2012), 68–77.
4. Gaver, W.W., Bowers, J., Boehner, K., et al. Indoor weather stations: investigating a ludic approach to environmental HCI through batch prototyping. In *Proc. CHI'13*, ACM (2013), 3451–3460.
5. Gaver, W. What should we expect from research through design? In *Proc. CHI'12*, ACM (2012), 937–946.
6. Höök, K., Löwgren, J. Strong concepts: Intermediate-level knowledge in interaction design research, ACM TOCHI 19, 3 (2012).
7. Löwgren, J. Annotated portfolios and other forms of intermediate-level knowledge. *interactions* 20, 1 (Jan. 2013), 30–34.
8. Lim, Y., Kim, D., Jo, J., and Woo, J. Discovery-Driven Prototyping for User-Driven Creativity. *IEEE Pervasive Computing* 12, 3 (2013), 74–80.
9. Odom, W., Sellen, A., Banks, R., Kirk, D., Regan, T., Selby, M., Forlizzi, J., Zimmerman, J. (2014). Designing for Slowness, Anticipation and Re-visitation: A Long Term Field Study of the Photobox. In *Proc. CHI'14*, ACM (2014), 1961–1970.
10. Odom, W., Selby, M., Banks, R., Kirk, D., Regan, T., Sellen, A. (2012). Photobox: On the design of a slow technology. In *Proc. DIS '12*, ACM (2012), 665-668.
11. Stolterman, E. and Wiberg, M. Concept-Driven Interaction Design Research. *Human-Computer Interaction* 25, 2 (2010), 95–118.
12. Wakkary, R., Desjardins, A., Hauser, S. (2015). Unselfconscious Interaction in the Home: A Construct. *Interacting With Computers*, (Submitted for publication).
13. Zimmerman, J. Forlizzi, J. 2008. The Role of Design Artifacts in Design Theory Construction. *Artifact*, 2(1), 41-45.
14. Zimmerman, J., Forlizzi, J., Evenson, S. 2007. Research through design as a method for interaction design research in HCI. In *Proc. CHI '07*, ACM (2007), 493-502.