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Personal Inventories in the Context of Sustainability and Interaction Design

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What kind of relationships do people develop with the things they have at home? What is it that makes them keep and cherish certain things and discard others? And how is it possible to study these relationships in a way that could inform the design of sustainable interactive artifacts? The behaviors implicated in connecting sustainability to interaction design are diverse, particular, and individual. As such, we have considered various methods for untangling the complex nature of these behaviors. One of the main questions that prompts this inquiry and search for suitable methods is that of why we—most of us in industrialized contexts—prefer new things to old ones.

This article summarizes research we have been conducting that focuses on collecting individual personal inventories of objects and technologies that populate everyday life. The idea of personal inventories is to inform—and improve—interaction design practice as well as our knowledge of design in the context of sustainability.

The Ensouled Design

We all know that we prefer and even love some artifacts, while we are indifferent to others. We immediately fall in love with some things on the one hand, and our affections for some other things develop over time. For designers it is a challenge to design artifacts that immediately inspire love and continue to be cherished over time. The notion of “ensoulment” can be used to describe this kind of relationship between people and arti-

facts. Ensoulment is in Nelson and Stolterman’s *The Design Way* [1], described as “going beyond the notion of quality to suggest a mechanism by which to promote an aesthetic of well-loved designs.” We have elsewhere described the principle of promoting quality and equality of experience as the idea that the design of new artifacts ought to consider quality as a construct of affect and longevity in a way that could support means of renewal and reuse, by motivating “the prolonged value of such objects or systems and providing equality of experience to new owners of such objects and systems whenever ownership transfers [2].” We have also elsewhere described the material effect of achieving heirloom status—that is, creating “artifice of long-lived appeal that motivates preservation [2].” These concepts serve as a critical lens through which we investigate the nature of human-product relationships and explore how this knowledge can inform the design of future, longer-lasting interactive technology.

These issues have been explored across various disciplines in various other forms. However, we are specifically concerned with the particular qualities and circumstances contributing to how designs become “ensouled”—and thereby achieve “heirloom status”—in a way that is most accessible to interaction designers.

Personal Inventories

As focus in the design communities continues to move toward contexts of everyday life, the home

[1] Nelson, H. G. and E. Stolterman. *Design Way: Intentional Change in an Unpredictable World*. Englewood Cliffs: Educational Technology Publications, 2003. This same quote appears in E. Blevis and E. Stolterman, “Ensoulment and Sustainable Interaction Design,” IASDR 2007 Hong Kong: November 12-15, 2007, and W. Odom, “Personal Inventories: Toward durable human-product relationships,” In *Ext. Abs. CHI '08*. New York: ACM Press, 2008.

[2] Blevis, E. “Sustainable Interaction Design: invention & disposal, renewal & reuse.” In *Proc. CHI '07*. New York: ACM Press, 2007.

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[3] Csikszentmihályi, M., and E. Rochberg-Halton. *The Meaning of Things: Domestic Symbols and the Self*. Cambridge: Cambridge University Press, 1981, 17.

[4] Nonetheless, recent HCI research has begun to explore creative human-centered approaches to designing interactive technology capable of facilitating more environmentally sustainable behaviors in and around the home—e.g. Woodruff, A., J. Hasbrouck, and S. Augustin. "A bright green perspective on sustainable choices." In *Proc. CHI '08*. New York: ACM Press, 2008.

[5] The tradition of photography specifically as a mechanism of inventory documentation played an influential role in the development of the personal inventories approach, which is discussed in *Visual Anthropology: Photography as a Research Method (revised and expanded)*. Another interesting example of photo-ethnography is P. Menzel, *Material World: A Global Family Portrait*, San Francisco: Sierra Club Books, 1994.

has emerged as a key area of interest. Nonetheless, it remains a complex and diverse setting when compared with the relatively well-explored intersection of technology and the workplace. Csikszentmihályi and Rochberg-Halton's seminal study describes human relationships with artifacts in the home: "...one can argue the home contains the most special objects: those that were selected by the person to attend to regularly or to have close at hand, that create permanence in the intimate life of a person, and therefore that are most involved in making up his or her identity [3]." At the same time, the home represents a major site of resource consumption and premature disposal of interactive technology [4].

The personal-inventories approach consists of conducting in-home contextual interviews to probe participants' reflections on the range of relationships they have with artifacts in their home and investigate the underlying reasons and motivations behind these orientations. These reflections are elicited as participants navigate their homes to demonstrate the various artifacts and spaces that arise during the interview. The interviews are therefore highly situational, since the interviewee does not necessarily remember her or his personal artifacts unless they are immediately present and can be pointed to. The "moving around" and "looking at things" in the home and the "probing" (pointing) from the interviewer is essential to the method. Photography also plays an important role during inventory sessions, in terms of providing a tool for on-site visual documentation [5]. In what immediately follows, we offer a glimpse into particular case instances encountered during our ongoing personal-inventories research.

Durability and Transparency

Consider the typewriter and laptop. The typewriter continues to live on decades after it was created, while the laptop is unlikely to last as long. What are the underlying reasons behind one object's endurance and the other's relatively short lifespan? One writer we know said the following: "It [the typewriter] is one of my most loved things. I got it when I decided I would try literary and magazine writing on a professional level. It's special to me because I use it a lot to type out quick letters, but it has also taken on a deeper significance—it's come to represent the hard work of writing and motivates me to develop my craft

as a writer. I can easily use it and wouldn't soon give it up."

The participant's description characterizes the typewriter as an enduring device, endowed with meaning over time. Nonetheless, why is it that the typewriter took on such significance and the laptop did not? In our interpretation of these underlying reasons, a contrast emerges between the typewriter and laptops—the "ensouled" and "unensouled." The typewriter was developed with notions of quality in mind—that is, superior parts withstanding time, which consequently promotes equality of experience. Moreover, as it endures from person to person, the typewriter ties to diverse histories of use and begins to achieve heirloom status. However, the inclusion of high-quality components does not always imply a design is likely to become ensouled; the way the components of a design form its whole is similarly important. The open design of the typewriter invites maintenance and renewal, and it is relatively transparent in terms of the participant's ability to understand and engage with it on material, sensorial, and functional levels. Conversely, the closed, uniform design of the laptop presents a larger barrier to entry for participants to perceive it as anything other than a means to an end—that is, it represents a gateway to the information it provides access to, rather than a unique material entity in one's life that may shift, change, and develop new significance over time. Nonetheless, the typewriter is obsolete for most people's purposes, while the thing that replaced it—the computer—is not made to standards that would promote ensoulment or heirloom status.

Conscious Care Over Time

Consider the digital kitchen timer and the now antique manually operated three-minute egg timer pictured. The digital device is the sixth timer the participant has owned in as many years, while the egg timer represents an heirloom object in its most classic sense—created 80 years ago, it has since been passed across three generations within the same family and continues to operate the same as it did when first used. While similarities exist in this and the previous case, a key difference lies in the quality of materials. The egg timer is constructed of tin, glass, and sand, which is relatively less physically durable than the metallic composition of the typewriter. How is it that the timer



► Despite its fragility, the vintage egg timer continues to persist, while modern models are locked in a cycle of disposal [6].

perseveres across space and time given its fragile components?

When asked if the glass had ever broken when in her possession, the participant remarked that she had “never been careless with it, always wrapping it up carefully with utmost caution when moving.” This conscious care over time led to the emergence of dense experiential histories, endowing the egg timer with meaning and a rich reflective affordance. For example, when discussing the particular placement of the egg timer within her home, the participant remarked: “I attached it to a special place on the wall in the kitchen where grandmother had it. I like it better than the other timers because it can’t malfunction. I mostly use it for short things because it only lasts for three minutes, but I like it because I have to pay attention

to it while it counts down, and it makes me think about the other people [i.e., grandmother and aunt] that have had it before me.”

The simple mechanics and design of the egg timer resulted in the participant’s transparent understanding of how it works on a functional level and engaging with it as a material entity—ultimately leading to conscious consideration and care over time, across generations. When probed about whether a digital timer could ever take on the same significance, the participant responded: “No, it will never be an antique because it will never make it that long. Plastic will break and it’s not unique—just functional and will never have aesthetic meaning for me. Not that it’s about being made out of fine metal. It’s more about the quality of how it works.”

In this case, the transparent nature of the egg timer resulted in intentional care across family members and, consequently, the achievement of heirloom status. Conversely, the poor-quality components and closed design of the digital timer caused it to be viewed as a disposable entity capable only of providing a means to an end, devoid of the allure and intrigue characterizing heirloom objects.

Multimedia Installations

Consider an elaborate multimedia installations. Installation (B) has fully 10 complete sets of dedicated videogame systems and controllers, while installation (A) has 13! The ages of the different systems vary considerably, including both vintage and state-of-the-art platforms. The owner of one of these gaming emporia describes the space this way: “I invested a lot of time and money into creating this room and especially the display case. I love to display them all [game systems], and they’re all functional, but I really only use the latest ones [Xbox 360, Nintendo Wii, and Playstation 3]. ...I keep the older ones around to remind me of my memories of playing them when I was younger.”

Additionally, that same participant noted that his most frequent new purchases were add-ons or upgrade devices for this environment: “Most of the new things I buy go into this room. They’re either new games or systems—or just modifications to my display case.”

As described by one participant, older hardware was used less for functionality and largely maintained as souvenirs of times passed and memories.

[6] Timer originally photographed by authors. Image later re-shot courtesy of Don Trull.

[7] Kinsey, A. C., W. R. Pomeroy, and C. E. Martin. *Sexual Behavior in the Human Male*. Bloomington, Ind.: Indiana University Press, 2003.

[8] Collier, J. and M. Collier. *Visual Anthropology: Photography as a Research Method (revised and expanded)*. Albuquerque: University of New Mexico Press, 1986.

[9] Nelson, H. G. and E. Stolterman. *Design Way: Intentional Change in an Unpredictable World*. Englewood Cliffs, N.J.: Educational Technology Publications, 2003, 29.

[10] Stolterman, E. “The nature of design practice and implications for interaction design research.” *International Journal of Design 2*, no. 1 (2008).

[11] The general mode of inventory-type inquiry has also appeared in HCI and design literature including (but not limited to): R. Strickland, "Portable effects: A survey of nomadic design practice," *Tech Report TR1998-003*, Interval Research Corp., 1998, <http://www.portablefx.com>; The "Personal Inventory" method card found in IDEO, *IDEO Method Cards*, ISBN 0-9544132-1-0, 2003; M. Ludvigsson, "Energy objects: Reflection through interaction," in *Proc. of 'In the Making' the First Nordic Conference on Design Research*, 2005; S. D. Mainwaring, K. Anderson, and M. F. Chang, "What's in your wallet?: implications for global e-wallet design," in *Ext. Abs. of CHI '05*, New York: ACM Press, 2005; J. Chipchase, P. Persson, P. Piippo, M. Aarås, and T. Yamamoto, "Mobile essentials: field study and conceptualizing," in *Proc. of DUX '05*, vol. 135, New York: AIGA, 2005. Additionally, previous design ethnography research—such as T. Salvador, G. Bell, and K. Anderson, "Design Ethnography," *Design Management Journal* 10, no. 4 (1999) and R. Wakkary and L. Maestri, "The resourcefulness of everyday design," in *Proc. of C&C '07*, New York: ACM Press, 2007—has ties to the general aim and spirit of our development and use of the personal inventories method. P. Menzel's *Material World: A Global Family Portrait* is an additional influence, however, while his work represents a fantastic photographic treatment of global cultural differences in attitudes toward materialism—it is reductive in its approach. In other words, Menzel attempts to reduce each country to a single representative photograph, where our aim is quite the opposite—to display the range of practice and phenomena with respect to the durability of digital and non-digital artifacts.

[12] The concept of "redirective practice" is owed to Fry in Fry, *Tony* (2008, in press), *Design Futuring*, Berg Publishing.

In contrast, the newer systems were left in standby mode to allow for fast startup of new game play and to preserve place in game sessions. While these hardware components are not of particularly high quality or durability, we consider that these entire installation spaces are ensouled—tied to dense, enduring archives of game media, hardware systems, and the associated memories by people who are self-described as enthusiastic videogame hobbyists. One of the primary reasons to keep these game consoles around is to be able to play early versions of game software that does not run on newer systems.

Origins, Inspirations, and Redirective Practice

Our ongoing collective research involving personal inventories aims to examine human relationships with the materials and phenomena that construct the fabric of everyday life—with emphasis on how objects become ensouled. The purpose is to establish a method that makes it possible to unpack these complex processes in a way that could inform and inspire designers. The development of this approach owes to a variety of prior work and inspirations spanning multiple disciplines.

As initial inspiration, we drew on the applied taxonomic approaches used by Alfred Kinsey to collect thousands of inventories of male (and later female) behavioral histories [7], Csikszentmihalyi and Rouchberg-Halton's extensive survey of domestic objects and their role in construction of the self [3], and Collier and Collier's proposition of the "cultural inventory" approach and, more broadly, photography as a research method [8]. While the diversity of disciplines and endeavors reflected in these approaches was influential to the construction of personal inventories as a method, each one remains different in its ultimate aim. Fundamentally, these are modes of scientific inquiry concerned with the search for "truth" or holistic understandings of entire cultures or groups. Conversely, the personal inventories method is concerned with "that which is ideal and that which is real [9]," improving interaction design practice based on a nuanced and reflective understanding of the nature of design [10], and, ultimately, producing intentional change in the world. Our purpose is in spirit and ambition the development of a designerly method of gaining knowledge and understanding of the real and situated complexity of people's everyday lives [11].

We see the development and application of personal inventories as part of a larger discourse within HCI calling for methods better suited to aid designers in facilitating actual change in the world, apropos of a rigorous understanding of the nature of design practice. We have made the case for the importance of constructing individual inventories, particularly in terms of the role products play in mediating between us and the world, and, in turn, the impact this has on our experiences, actions, and relationships. This type of approach is parallel to the first step of "redirective practice"—the concept of designing to encourage the substitution of sustainable behaviors for unsustainable ones [12]. We must first take stock of what people have, how they use it, and what constitutes durability, in order to understand how to design things in a more sustainable way.



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