



Satchell, Christine and Dourish, Paul (2009) *Beyond the user : use and non-use in HCI*. In: OZCHI 2009 : Design: Open 24/7 : 21st Annual Conference of the Australian Computer-Human Interaction Special Interest Group (CHISIG) of the Human Factors and Ergonomics Society of Australia (HFESA), 23-27 November 2009, The University of Melbourne, Melbourne.

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Beyond The User: Use And Non-Use in HCI

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ABSTRACT

For many, an interest in Human-Computer Interaction is equivalent to an interest in usability. However, using computers is only one way of relating to them, and only one topic from which we can learn about interactions between people and technology. Here, we focus on *not* using computers – ways not to use them, aspects of not using them, what not using them might mean, and what we might learn by examining non-use as seriously as we examine use.

Author Keywords

Users, non-users, non-use.

ACM Classification Keywords

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

INTRODUCTION

The central figure of Human-Computer Interaction research is “the user.” Cooper and Bowers (1995) argue that HCI derives its legitimacy as an enterprise from the presence of the user and from the kinds of problems that the user is suffering. Consequently, they present the emergence of different approaches to HCI research in terms of the rhetorical construction of different users and different sets of problems, as motivation for the application of different sets of theories and methods; a “rational actor” user, focused on task performance, can be saved from the mechanistic clutches of engineers through the application of cognitive science, while a socially constituted user, embedded in a workplace, can be saved from the mechanistic clutches of cognitivists through an intervention by social science. The problems of the user call forth the set of disciplines and methods in question. Whatever the approach, HCI needs the user.

While the figure of the user lies at the heart of HCI, it has not been without some amount of controversy. As Bannon

(1991) notes, the very idea of “the user” reconfigures a multifaceted human being as an adjunct to a piece of hardware or software; asked at a party what they do, no one has ever introduced themselves as a user of Microsoft Word (even if they are.) Others have noted that “the user” is embedded in complicated ways within the pragmatics of design. Sharrock and Anderson (1994) detail the ways in which “the user” – what the user wants, and what the user can be expected to do – is strategically deployed within a design team in order to legitimate particular approaches and strategies, and to jockey for resources; Woolgar (1991) details similar evolving notions of who “the user” might be within the context of usability trials.

Our contributions here are informed by these critiques, but our focus is somewhat different. We agree that it is crucially important to recognize “the user” as a discursive formation rather than a natural fact, and then to examine the circumstances within which it arises, the forces that shape it and the uses to which it is put. Even so, though, we feel that a focus on “the user” construes HCI’s concerns too narrowly. As interactive systems have become more pervasive elements of everyday life, the focus of HCI’s attention has similarly shifted – from the cognitive structure of interaction, to the social organization of computer-based work, to the cultural role of digital media. With this shift comes an elaboration of the forms of “interaction” between the human and the computational. The idea that we want to explore here is that interaction reaches beyond “use.” We are interested in non-use – in the varieties and forms, in the circumstances and contradictions, and in the importance of the ways in which experience may be intimately shaped by information technology outside or beyond specific circumstances of “use”. HCI has always had some kind of interest in non-users, of course, but generally has regarded them as *potential* users. Here, we want to take non-use on its own terms and examine the ways in which aspects of non-use might be relevant, conceptually, practically, and methodologically, for HCI.

Illustrative data for our argument are drawn from a range of studies, including one of blogging and smoking cessation, and another of public displays for environmental sustainability, as well as from conversations and interviews

with people exhibiting some of the behaviors that we describe. These are not systematic sources of data and we do not present them as such. The studies, for example, were conducted to examine quite different phenomena. However, the forms and values of non-use emerged as relevant topics across different settings, and so we use this to motivate particular distinctions in our work. The paper's contributions, however, are intended to be conceptual rather than empirical.

We build upon some previous work on non-use and ICTs. Wyatt (2003) explores patterns of non-use particularly with respect to those who adopt and then stop using Internet technologies, in contrast to the conventional diffusionist image of permanent adoption, and uses that to examine the policy implications for different groups. Selwyn (2003) is similarly concerned with non-use, and with the ways in which traditional rhetorics of technological progress "pathologizes" non-use. Our analysis proceeds along similar lines, but we have three goals in mind beyond those of Wyatt and Selwyn. First, we examine use and non-use as aspects of a single broader continuum, particularly as digital technologies increasingly become cultural objects; second, we use examples from recent projects to demonstrate the particular relevance of non-use for HCI research; and third, we focus especially on the ways that users and non-users feature in the discourse and the technological imagination of HCI designers.

In what follows, we begin by outlining varieties of non-use – not just different reasons not to use systems, but different ways of not using them. After that, we use examples from recent work to show how these manifest themselves in contemporary technological contexts. Finally, we reflect on the broader implications of non-use for HCI.

VARIETIES OF NON-USE

Although we have suggested that the notion of the user has dominated HCI discourse, that is not to say that non-users have never figured as part of HCI's concern. To the extent that much work in HCI is future-oriented – that is, concerned with the potential for new design engagements – then it frequently is concerned with people who might in the future be the users of particular kinds of systems but who are not yet users because those technologies have not yet been developed or deployed. With respect to anticipated future developments, we are all, to some extent, non-users (but perhaps potential users). However, we would argue that this is still a form of examination in which the user plays a central role; the user, an imaginary character here, is still the focus of attention when discussing potential new technologies; we are still concerned with what the user *will* want or *will* do.

Our concern here is with other forms of non-use, and the ways in which the discourse of use and users omits other forms of engagement with interactive systems that, we argue, are consequential for HCI research and practice. As a starting point, then, we will lay out a range of forms of non-

use that begin to stake out the space within which we will operate for the rest of the paper. We offer these as a tentative and provisional accounting of forms of non-use rather than as a comprehensive taxonomy; they are valuable, here, mainly in unpacking a set of issues for further examination.

We will focus in particular on six forms of non-use: lagging adoption, active resistance, disenchantment, disenfranchisement, displacement, and disinterest.

Lagging Adoption

Other than the unavoidable non-use of imagined future technologies, the form of non-use most typically encountered in HCI is what we call here "lagging adoption". Lagging adoption is defined with respect to some expected pattern of technology adoption and diffusion. Theories such as these describe adoption patterns of technologies and argue that they broadly follow an S-curve, with slow early adoption by a technological vanguard of "innovators" and "early adopters", a later but faster diffusion of the technology throughout society (the "early majority" and "late majority" in Rogers' (2003) terms), and then a final period of slowed growth amongst the "laggards". Notwithstanding various critiques of the adequacy and breadth of Rogers' model, the broad idea of this pattern of technological adoption is a pervasive one. Non-use is easily defined here; as the adoption "wavefront" moves from left to right across the adoption bell-curve, the "users" are on the left side of the wavefront and the "non-users" on the right.

Several things are worth noting here. The first is that this view of non-use does not tell us about people who do not use technology, but rather about people who do not use technology *yet*. Other forms of non-use – such as those we will examine shortly – are invisible in this depiction.

The second is that, in presenting a statistical argument, this view suggests that non-use is both inevitable but also, ultimately, irrelevant. While non-use is a natural consequence of the pattern of diffusion of technological adoption, it says, it is a temporary condition. While some group of people may never adopt a technology, they are, statistically, irrelevant; and even in those moments where the technology has been adopted by only a small number of people, this is a temporary condition. What we need to be concerned with, this position argues, is the steady state, which we reach at the end.

The third issue is that HCI's attention is therefore directed towards the navigation of this curve. HCI has tended to be particularly relevant in addressing the question of why a particular technology has not yet moved from the early adopters to the early majority? Usability is often presented as, first, irrelevant to early adopters (who are painted as motivated by the "core" features of a system and prepared to put up with the frustrations of life on the "bleeding edge") and, second, key to a "mass market" adoption of technology. So, given the statistical inevitability of non-use

during the adoption cycle, the role of HCI is to navigate the adoption curve, and to turn non-users into users.

This paper is motivated primarily by the intuitions that, first, there is more to be said about non-users than simply that they have not yet become users, and, second, that HCI's concerns for non-use should be greater than simply to turn it into use. Even if non-use were statistically irrelevant (and we are not convinced that it is), it is certainly not conceptually irrelevant. With that in mind, then, we introduce lagging adoption as merely one amongst a range of forms of non-use.

Active Resistance

Implicit, perhaps, in Rogers' classification – the die-hards within the laggards – are those who steadfastly refuse to adopt a technology, in active and considered ways. This is not simply a failure to adopt – i.e., an absence of action – but rather, a positive effort to resist a technology. Potential reasons abound – concerns over privacy and control over personal information, control over one's time, a preference for alternative modalities of interaction and engagement, a political stance concerning corporate or state responsibilities, educational, environmental or health considerations are all potential motivations for actively resisting technologies from social networking websites to mobile phones to video games to television.

If our view of non-use is that it is simply a state that people move through before they become users, then those who, for a variety of reasons, stage active resistance to particular technologies seem irrelevant to the concerns of HCI. However, a broader view reveals that active resistance constitutes one position within a larger collective effort to make sense of new technologies, and so, to the extent that those who resist a technology contribute to these debates and these ongoing processes of negotiation, they are deeply relevant. Eager adopters and active resisters are both responding to and shaping cultural interpretations of technology, even though they do so in different ways; their perspectives each play a role in the cultural appropriation of technologies.

Mainwaring et al (2004) highlight these concerns in talking about various forms of infrastructure resistance. They discuss four groups of people who, to one extent or another, find the conventional infrastructures of daily life insufficient for their needs – people who educate their children at home rather than in the school system, people living in gated communities, people who go above and beyond conventional habits to create a sense of security within their homes, and people who actively choose to live, in whole or in part, “off the grid” – disconnected from conventional systems of electricity, waste disposal, water supply and even economic exchange. The authors demonstrate that, in the ways in which they characterize, problematize, and orient towards infrastructure, these groups have as much to tell us about those infrastructures as those who eagerly adopt them. Their concerns highlight, for

instance, the questions of control and accountability that surround security services (e.g. amongst the security conscious and the residents of gated communities), the losses associated with infrastructure dependence (e.g. amongst the home schoolers and the off-gridders).

It is by no means a recent phenomenon that forms of active resistance, often around technology, are equated to a backward or regressive attitude towards modernity. One of the most frequently-invoked terms to describe those who reject technologies, after all, is “Luddite,” named for the nineteenth century English textile workers who, under the leadership of Ned Ludd, often broke machine looms as acts of resistance. However, as Thompson (1963) demonstrates, the Luddites were not opposed to new technologies by any means; the focus of their animosity was the social changes associated with the dissolution of existing price mechanisms in the introduction of the free market and industrial capitalism. Luddism was a product of labor alienation rather than technological resistance, but the Luddites recognized that the technology was both a symbol and a means of this transformation of their social system. In other words, their “active resistance” to the introduction of industrial looms was not a technological consideration at all; it stood for something quite different – and indeed their actions help to illustrate the relationship between technological practice and broader social trends.

Thomson's analysis draws our attention to the social relations mediated by technology and so to the social practices associated with forms of adoption and technological practice. It is important to attend to these too in discussions of ICT use and non-use. So, for example, questions of personal privacy often attend discussions of social networking and similar sorts of technologies. A commonly held position, derived in part from Westin's classic survey of privacy responses (1968), is that some people are fundamentally “concerned” about privacy, some utterly “unconcerned”, while others are pragmatic in the way they see the trade-offs. This allows a dismissal of the privacy “fundamentalist” position, especially in cases of studies of technology use that allow us to argue that “in practice, [some] people aren't too bothered.” This suggests that privacy is a concern only for the concerned. A broader view might reveal that everyone is concerned, but in different ways. Troshynski et al (2008) discuss the case of a group of people – paroled sex offenders tracked with GPS – for whom questions of privacy are not relevant (by definition) but who are still deeply attentive to the ways in which they might make themselves visible to others. Similarly, we would argue that studies in which people happily share information about their availability with friends (e.g. Barkhuus et al 2008) do not argue that “people don't care about privacy”; rather, they evidence exactly the same kind of concern about the ways in which they might make themselves visible. In other words, different groups of people – some who eagerly adopt technologies, those who have them forced upon them, and those who reject them

altogether – may take different stances towards the technologies, but their stances are illustrative of underlying concerns. Active resistance, then, is informative.

Active resistance does not always take the form of protest. While one might choose not to use, say, Facebook, because of the way in which ones activities might be broadcast to others, we can also note a different sort of resistance, in which technologies are avoided in particular moments or at particular junctures because of their connection into other aspects of people's lives. Resistance to technology might reflect not so much an avowed political statement as an avoidance of aspects of our own characters – unhealthy habits or unwanted behaviours – that we would rather deny. We will explore some examples later, after elaborating other forms of non-use.

Disenchantment

One variant on the notion of “active refusal” is a form of reluctant or partial use that we here label “disenchantment” and which is associated particularly with nostalgic wistfulness for a world passing out of existence. In information technology circles, this often manifests itself as a focus on the inherently inauthentic nature of technology and technologically-mediated interaction, with a nostalgic invocation of the way things were. It is one irony of the pace of technological change that today's horrifyingly inauthentic experience is tomorrow's nostalgic memory – think of the successive waves of disenchantment about human communication as we move from letters to email to Instant Messaging to Twitter.

The idea of technological experience as inherently inauthentic has a long and problematic history (Verbeek 2005) but it is also suggestive of a particular line of analysis. Nostalgia is analytically useful in qualitative analysis but the anxieties that it expresses about “now” are often more telling than any appeal to the historical; as Stephanie Coontz (2000) terms it, nostalgia is often an appeal to “the way we never were.” We find these nostalgic invocations that accompany reluctant, grudging, or avoided use to be useful not so much as accounts of how things have been, but perhaps as symptoms of the range of anxieties about changing sociotechnical relations.

Disenfranchisement

Perhaps one of the clearest – and yet least observed – areas of non-use is the ways in which particular social groups are simply disenfranchised by particular kinds of technological arrangements. This disenfranchisement may take many different forms. Interest in universal accessibility has largely focused on physical and cognitive impairments as sources of technological disenfranchisement, but it may also have its origins in economic, social, infrastructural, geographical, and other sources.

Geographical disenfranchisement is a familiar issue for many who review conference contributions, where study subjects from the Western nations are acceptable as “unmarked” participants, while those from other nations

must be explained. Relatedly, many systems and evaluations suffer from similar problems in which particular localized considerations – cultural values, infrastructure availability, and so on – are presumed to be universal. Examples include studies that presume the structure of houses (e.g. Nagel et al 2001) or the nature of civic participation (e.g. Paulos et al 2008).

Socioeconomic disenfranchisement is perhaps more problematic, and often arises implicitly as a consequence of the sorts of technologies being developed or the problems being solved. For instance, current interests in the use of information technologies to encourage environmentally sustainable action is, in many cases, skewed towards middle-class users, for several reasons. Perhaps the most significant is that environmental responsibility often comes at the expense of financial outlay, making an overriding concern with environmental sustainability something that only the well-off can afford. To the extent that environmental sustainability is strongly connected to issues of identity politics, these concerns are not uniformly distributed through society (Cronon 1995, O'Connor 1998, Macnaughton and Urry 1998).

Similarly, studies of mobility and mobile technology use have generally focused on the needs of a young population with discretionary mobility and disposable income, interested in navigating a city conceptualized as a zone of entertainment and consumption (Williams and Dourish, 2006). Arguably, much of urban life and urban mobility is of a quite different sort, in which mobility is forced upon people rather than something that they actively seek out, raising questions of the implications of the very particular focus of research (Dourish et al 2007). A narrow focus on use – typically a focus on consumption, and consumption of high-end digital systems and services – inherently renders significant populations analytically invisible.

Displacement

The characteristic picture of the user is of a person sitting in front of a computer. Any number of images and diagrams, going back to the image of the model human processor in Card, Moran and Newell's seminal text (Card, Moran and Newell 1986), invoke this idea. Further, the kinds of theories that HCI has developed about technology use are, largely, theories about people sitting within arm's reach of computer systems (Carroll 2003).

Studies of rural telephone use, particularly in developing regions, have painted a different picture of technological diffusion – one in which primary use of a technology becomes a service (e.g. Parikh and Lazowska 2006). For instance, when only one or a few people in a village own a telephone, then the relaying of telephone messages can become a service performed on behalf of others. This is a sufficiently common form of non-use that microfinance systems, such as those broadly associated with the Grameen Bank, are often based on this sort of service/technology relationship, although the pattern is also characteristic of

earlier stages of technology deployment in developed nations (Fischer 1994).

These kinds of arrangements imply a destabilizing of the notion of “user”. What does it mean to be a “user” of the telephone, and does it make sense to suggest that someone is not a “user” when they have all the capacities of the telephone available to them, albeit at second hand? The technology clearly has much of the same impact upon their lives and their imaginations of themselves and their world, even if they do not press the buttons. If we are interested in the encounters between people and technology, might these cases of displaced use not also be important?

Disinterest

Finally, here, another form of non-use – and perhaps the most difficult to deal with as researchers and those with a fundamental concern with novel applications of interactive technology – is simply disinterest; that is, when the topics that we want to investigate are those that turn out not to be of significant relevance to a broader population. It is inevitable, perhaps, that any research community begins to focus its attention on specific problems in terms of their research depth rather than in terms of their broader relevance, and it is similarly inevitable that, in a field that changes as quickly as digital technology, sometimes those problems persist in the research community long after their “sell-by date” in the world at large. The problems of dealing with four-function calculators, ATMs and VCRs somehow persisted in the research field long beyond any periods of commercial innovation.

The introduction of Apple’s iMac computer in 1998 was an interesting moment in various ways, but one of them was the response from the technical community. The iMac was a major commercial success, rescuing Apple from considerable financial distress, and yet this success was puzzling to many in the technical community. The computer’s specifications were largely pedestrian; it had little to distinguish itself other than its shape and the fact that it was sold in multiple colors. This seemed, at first, deeply confusing, but what it signaled was a significant transition in the user experience of computational technology – the point at which the determinant criterion might not be how fast the processor was but rather how closely the computer matched the curtains.

There are two points we want to make here. The first is that the fundamental problems upon which HCI, like any research area, might fix its attention are not necessarily those to which its ostensive audience feels connected. The second is that the problems to which that audience feels connected are not necessarily those that the research community recognizes as relevant or interesting. In a consumer society, the use of technology needs to be seen as an act of consumption within a symbolic structure, rather than simply task performance within an instrumental one (Baudrillard 1970).

THE PRACTICE OF NON-USE

In one sense, HCI studies “use” rather than “non-use” because “use” seems easier to find. However, non-use is highly visible too. Drawing on the framework elaborated above, we present here some examples of contexts of technology non-use that might be useful.

Avoiding Public Displays

Our first example comes from the research project “Swarms in Urban Villages: New Media Design to Augment Social Networks of Residents in Inner City Developments,” in which one of us (Satchell) participated in a study to help understand the complexities of different types of residential users whose needs would be addressed through the design of technologies for urban spaces (Satchell et al. 2008).

Although the emerging themes, user needs and design implications identified in the study lead to the development of a prototype for an urban screen, the prototype was not aimed specifically at those willing to embrace the technology. Rather, the most compelling user group was made up of those residents opposed to the introduction of digital screens.

Potential users wanted localized, mashed up and personalized content that was streamlined and relevant to their day-to-day lives. For these participants, convenience trumped privacy and there was limited concern for personal information being shared.

There was also a sense of a suburban nostalgia for the sort of 1950’s community where you said “hi” to your neighbors. The study indicated this could take the form of a ‘green’ community bonding where users participated in the shared discourse of sustainability. Digital displays, featuring feedback loops that provided information about environmental issues could help facilitate these sorts of interactions.

Potential non-users, on the other hand, wanted to avoid digital screens that reminded them they that were surrounded by other people. There was a need for technologies that allowed them to blend in and go unnoticed by other people and by the technology itself. Instead of suburban nostalgia there was more of an urban nostalgia, characterized by a desire for the anonymity of the city.

Although there was no specific objection to digital information aimed at sustainability, these non-users drew attention to the need for personal data that was not presented as stand alone information, but hidden through its integration into mass representations. If interfaces were going to provide information such a water usage, they must do so in an ambient manner and avoid making reference to personal consumption.

For the non-user, ideally the display would just shut down when they walked past; however, if this was not possible, subtle or escapist displays were preferable and ambient and organic interfaces less offensive than high tech interfaces.

The design prototype aimed to meet the needs of both users and non-users. It featured an urban screen of a city scape that appears to have a primarily aesthetic appearance; however, the display is embedded with rich data feedback that has meaning to those that wish to engage with it. The data takes the form of feedback loops that represent the changing state of the local environment. The color of the sky represents air quality, the temperature is represented by the sun, an UV levels, by the clouds. Users can download data from the screen to their mobile phones via Bluetooth. To enhance the feeling of suburban nostalgia, the stylistic quality of the display references an Art Deco era suburban Australia. A sense of being there in real time is evoked with the nighttime sky fading to black and lights appearing in the buildings.

Avoiding the Blog

A second example of the complexities of non-use and the importance of taking it seriously came from a study that attempted to use life-blogging technology in support of health-oriented behavioral change – in particular, smoking cessation (Graham et al. 2007). Four participants used mobile-phone based blogging software to maintain a blog site at which they would document progress in their attempts to stop smoking.

Unfortunately, none of the four was successful. However, where one might imagine that this was just the circumstance in which the blog might be a useful tool – a medium for public support, well-wishing, and encouragement from their mates – the result instead was the blog use fell drastically away. One participant commented, *“I’ve got a reason to not use the technology anymore because I’m still smoking. Blogging – why would I want to share this with the world?”* The sense of failure and disapproval was provocatively captured by another participant who portrayed herself using a photograph of Jane Fonda sitting on a North Vietnamese tank during the “Hanoi Jane” scandal – a vivid indicator that there was a great deal at work emotionally in this entire process.

When we approach this case from the perspective of the productive analysis of non-use, our attention is drawn to the role that the system plays in the broader forms of social engagement within which it plays a part. As part of the way that a particular kind of self-presentation is constructed, the blog must also play a role in a way that other forms of self-presentation are downplayed or avoided. The blog is a means by which responsibilities to oneself and to others may be carried out. Pointedly, again, the way to fulfill those responsibilities may be to avoid particular forms of technological use, in much the same way that one’s obligation to friends and family might require going beyond the occasional Facebook status update, when face-to-face contact is valued.

THE MILIEU

Our fundamental argument here is not that non-use is a new area that we need to examine alongside technology use. Rather, our argument is that use and non-use are

systemically related to each other as part of a broader framework, what we might call the “cultural milieu”¹. That is, technology enters into a broader cultural setting and people “interact” not least in how they position themselves – or find themselves positioned – with respect to the technology.

For one of us (Dourish), this was brought vividly home, quite literally, watching British television in the 1990s. “The Chart Show” was a music program that aired weekly in Britain until 1998, highlighting music in that week’s charts. The unusual characteristic of the show was that it featured no presenters at all, being built entirely around the videos for the singles. The video for a particular single would start to play, with a brief notation of the song title and artist. Around a minute into the video, a series of green icons would appear around the edge of the screen, depicting a truck, a CD, a microphone, and other objects. Next, a cursor would appear in the middle of the screen. It would move towards one of the “icons” and, with an audible double-click sound, select it, causing a text box to appear in the screen with some information – information about the band’s tour if the truck had been selected, about the lead singer if the microphone was selected, and so on.

What is striking about this example is non-use at work. Clearly, the viewer is not “using” a computer; they are watching a television program. It is possible, indeed, that the viewer has never used a computer employing a graphical user interface. Nonetheless, the graphical user interface comprises the foundation of the visual experience here; it provides the logic by which the visual experience makes sense. The suggestion is that, to be culturally literate in early 1990s Britain was to be familiar with the concepts of cursor, icon, window, and double-click.

Only in the most abstract sense is this an example of the “desktop metaphor” at work; indeed, the desktop metaphor has become, itself, a metaphor for locating and managing information. Yet, the desktop metaphor is critical here – unfamiliarity with it would render the model deeply confusing. More relevantly, here, the question of “use” – what it means to be a user of technology, or perhaps more particularly, a consumer of the products of HCI research – is called into question. The technology is a site for social and cultural performance in more ways than simply its use, but rather in how patterns of adoption, choices, and orientation around technologies manifest cultural issues.

Sometimes these emerge as practical concerns, and sometimes as moral ones, as information systems become part of the broader milieu that determines expected use. When stores or trades people apologize for not having an email address or a website, the very fact that this is presented apologetically underscores the moral structure of technology adoption (of which more below).

¹ We owe this term to Annette Adler.

The significance of the milieu as an approach to understanding use and non-use is it focuses our attention on the contexts within which use and non-use emerge as different aspects of broader phenomenon of cultural production around technological artifacts. Technological systems and devices take on their meaning from the broader systems of meaning within which they are dynamically enmeshed and in which their significance arises as an outcome of the action of designers, researchers, and consumers.

Consider an example from a different domain. Japanese artist Takashi Murakami is a proponent of 'flat art' and his work collapses traditional boundaries between 'consumer goods' and 'works of art'. This is evident in his partnership with fashion house Louis Vuitton which resulted in a range of handbags featuring Murakami's signature multi-coloured, manga-esque designs. Retailing at well over US \$1000, these exquisitely designed pieces were snapped up by high-end shoppers. The result was that Murakami's art was not consumed in traditional gallery spaces, but rather could be found dangling from the wrists of elegantly dressed women as they traversed inner city clubs and restaurants. The transformation of the Murakami bag from artwork to fashion item does not end here, though. The distinctive multi-coloured bags have extended their reach deeper into the commercial realm as millions of fake copies flood the market. It is interesting to note that, unlike the majority of fake Channel or Gucci handbags that attempt to stay as close to the original as possible, the Murakami/Vuitton reproduction flourished in many forms, deviating from the original both in the style of handbag and in the colour and form of the icons in the design. It was as if the original concept of flat art as one that erodes the boundaries between high and low art was being extended by consumers to include the erosion of the boundaries between the original and reproduction with the "rip-off" handbags sometimes eclipsing the originals in desirability. It is just this property – the way that practice can eclipse product and objects take on their own identities when embedded in circuits of use, adoption, and meaning-making that we have been exploring throughout this paper.

CONCLUSION: THE MORALITY OF ADOPTION

From the perspective of system developers, a utilitarian morality governs technology use. The good user is one who adopts the systems we design and uses them as we envisioned (Redmiles et al., 2005). Similarly, the bad or problematic user is the one who does not embrace the system or device. This creates a moral problem, a stain to be eradicated. Agre (1995) provides a fascinating dissection of a paper on privacy problems in an early ubiquitous computing application for tracking individuals in a workplace. The authors of the paper are primarily concerned with the privacy problems that the system throws up, but these privacy problems are not interpreted as threats to the privacy or security of the individual users, but rather as threats to the success of the development project. The

problem to be addressed is not how people's privacy can be maintained, but rather, how they can be turned from truculent refuseniks into eager and compliant participants. The problem is the creation of moral subjects.

The questions that this raises are those of our responsibilities towards "users" or, more broadly, towards people in the worlds into which our technologies are introduced. This is not the responsibility of "first do no harm" (though that's not a bad idea), but rather, the responsibilities for taking people – their actions, their statements, and their interpretations – seriously. This responsibility is both an ethical one but also a methodological one. As an ethical concern, it suggests that we should take people's concerns as primary rather than attempting to interpret them as providing support for one sort of potential product or another; and as a methodological one, it highlights the important things that we might miss if we are attempting to read all responses to technology purely as expressions of potential interest or potential adoption.

After all, what we have tried to show here is that non-use is not an absence or a gap; it is not negative space. Non-use is, often, active, meaningful, motivated, considered, structured, specific, nuanced, directed, and productive.

This approach has, we believe, some important implications for the scope and the practice of HCI design and analysis. While HCI has been arguing for the importance of paying attention to users, it has rather neglected non-users. Although some approaches draw attention to secondary stakeholders and their role in design, our argument here is different. First, we argue that digital media are cultural objects, and so we need to understand technology use as a cultural phenomenon. Second, we suggest that HCI might learn a good deal about technology use by placing it in the context of non-use, because when we do so, we see it not as simply an inevitable response to some inexorable march of technological progress, but rather as a creative, complex, and contingent act of its own. Third, we hope that this might provide us as researchers with new ways of taking seriously the ways that technology and practice mesh and fail to mesh in real-world deployment.

ACKNOWLEDGMENTS

Many users and non-users of technologies have inspired our thoughts on this topic. We particularly thank Annette Adler for her discussions of the cultural milieu, Gillian Hayes for her reluctance to use Facebook, and Marcus Foth for his skepticism towards nostalgia. We thank James Balmford, Peter Benda, Genevieve Bell, Connor Graham, Mark Rouncefield, Ronnie Schroeter, Irina Shklovski and Janet Vertesi for their contributions. This work was supported in part by the US National Science Foundation under awards 0712890, 0838499, and 0838601. The research was also supported in part by the Australian Research Council.

REFERENCES

1. Bannon, L. 1991. From Human Factors to Human Actors: The Role of Psychology and Human-Computer Interaction Studies in System Design. 25-44. In *Design at Work*. LEA.
2. Barkhuus, L., Brown, B., Bell, M., Sherwood, S., Hall, M. and Chalmers, M., From awareness to repartee: Sharing location within social groups. In *proceedings of the SIGCHI conference on human factors in computing systems*, (Florence, Italy, 2008), ACM.
3. Baudrillard, J. 1970 (tr. 1998). *The Consumer Society: Myths and Structures*. Sage.
4. Card, S., Moran, T., and Newell, A. 1986. *The Psychology of Human-Computer Interaction*. CRC.
5. Carroll, J. 2003. *HCI Theories, Models, and Frameworks: Towards an Multidisciplinary Science*. Morgan Kauffman.
6. Coontz, S. 2000. *The Way We Never Were: American Families and the Nostalgia Trap*. Basic Books.
7. Cooper, G. and Bowers, J. 1995. Representing the User: Notes on the Disciplinary Rhetoric of HCI. In Thomas, P. (ed.), *The Social and Interactional Dimensions of Human-Computer Interfaces*. Cambridge University Press.
8. Cronon, W. 1995. *Uncommon Ground: Rethinking the Human Place in Nature*. Norton.
9. Dourish, P., Anderson, K., and Nafus, D. 2007. Cultural Mobilities: Diversity and Agency in Urban Computing. *Proc. IFIP Conf. Human-Computer Interaction INTERACT 2007* (Rio de Janeiro, Brazil).
10. Fischer, C. 1994. *America Calling: A Social History of the Telephone to 1940*. Berkeley, CA: University of California Press.
11. Graham, C., Satchell, C., Rouncefield, M., Balmford, J., and Benda, P. 2007. Lessons from failure: re-conceiving blogging as personal change support. *Proc. ACM Conf. Designing For User Experiences DUX '07* (Chicago, Illinois), 2-17.
12. Macnaughton, P. and Urry, J. 1998. *Contested Natures*. London: Sage
13. Mainwaring, S. Chang, M., and Anderson, K. 2004. Infrastructure and its Discontents: Implications for Ubicomp. *Proc. UbiComp 2004* (Nottingham, UK), 418-432.
14. Nagel, K., Kidd, C., O'Connell, T., Dey, A., and Abowd, G. 2001. The Family Intercom: Developing a Context-Aware. Audio Communication System. *Proc. UbiComp 2001* (Atlanta, GA), 176-183.
15. O'Connor, J. 1998. *Natural Causes: Essays in Ecological Marxism*. New York: Guilford Press.
16. Parikh, T. S. and Lazowska, E. D. 2006. Designing an architecture for delivering mobile information services to the rural developing world. *Proc. Intl Conf. World Wide Web* (Edinburgh, Scotland) WWW '06, 791-800.
17. Paulos, E, Honicky, R., and Hooker, B. 2008. Citizen Science: Enabling Participatory Urbanism. In Foth, M. (ed), *Urban Informatics: Community Integration and Implementation*.
18. Redmiles, D., de Paula, R., Wilensky, H., Kosaka, K. 2005. What Ideal End Users Teach Us About Collaborative Software, *Proceedings of the 2005 International ACM SIGGROUP Conference on Supporting Group Work* (Sanibel Island, FL), 260-263.
19. Rogers, E. 2003. *Diffusion of Innovations*. New York: The Free Press.
20. Satchell, C., Foth, M., Hearn, G., and Schroeter, R. 2008. Suburban Nostalgia: The Community Building Potential of Urban Screens. *Proc. OzCHI 2008* (Cairns, Queensland), 243-246.
21. Selwyn, N. 2003. Apart from Technology: Understanding People's Non-Use of Information and Communication Technologies in Everyday Life. *Technology in Society*, 25, 99-116.
22. Sharrock, W. and Anderson, R. 1994. The User as a Scenic Feature of the Design Space. *Design Studies*, 15(1), 5-18.
23. Thompson, E.P. 1963. *The Making of the English Working Class*. Vintage.
24. Troshynski, E., Lee, C., and Dourish, P. 2008. Accountabilities of Presence: Reframing Location-Based Systems. *Proc. ACM Conf. Human Factors in Computing Systems CHI 2008* (Florence, Italy), 487-496.
25. Verbeek, P. 2005. *What Things Do: Philosophical Reflections on Technology, Agency, and Design*. Pennsylvania State University Press.
26. Westin, A. 1968. *Privacy and Freedom*. New York: Atheneum.
27. Woolgar, S. 1991. Configuring the User: The Case of Usability Trials. In Law (ed), *A Sociology of Monsters: Essays on Power, Technology and Domination*.
28. Wyatt, S. 2003. Non-Users Also Matter: The Construction of Users and Non-Users of the Internet. In Pinch and Oudshoorn (eds) *How Users Matter*, 67-79. MIT Press.