

Pottering by Design

Alex S. Taylor
Microsoft Research
7 J. J. Thomson Avenue
Cambridge, CB3 0FB, UK
ast@microsoft.com

Susan P. Wyche
GVU Center
Georgia Institute of Technology
Atlanta, GA, USA
spwyche@cc.gatech.edu

Joseph ‘Jofish’ Kaye
Information Science
Cornell University
Ithaca, NY, USA
jofish.kaye@cornell.edu

ABSTRACT

The last decade of work in HCI has seen an increasing emphasis on the role of technology in the home, and a corresponding need for novel approaches for studying the needs, activities and relationships that constitute home life, so as to inform technology design. In this vein, we report on a particular aspect of home life in Britain: pottering. We investigate the ways in which pottering—unplanned and serendipitous tidying, cleaning, gardening and minor home improvement—can be used as a lens to understand the non-task-focused roles that technology may play in the home. We also describe the strategies we used to study this curious class of activities and hopefully illustrate how open, and sometimes opportunistic, approaches to research can have value.

Categories and Subject Descriptors

K.4.m [Computers in Society]: Miscellaneous.

General Terms

Design, Human Factors.

Keywords

Pottering, home life, domestic IT, critical design, design.

1. INTRODUCTION

In this paper, we report on a study motivated by an interest in what the British refer to as pottering. Loosely, pottering encompasses the kinds of things frittered between (usually in leisure time) with little or no purpose. For example, it is commonly used when referring to the small, inconsequential things done in our homes like sorting through papers, tidying draws or rummaging through old correspondence, photos, etc. Pottering is also often done in gardens, where one might move, leisurely, between pruning, budding, weeding, etc. with little obvious plan or intent.

Much could be said about the cultural similarities and differences between how leisure time is spent at home in different cultures, and particularly about the peculiarities of pottering in Britain. From the few informal comparisons we have been able to make, pottering does indeed appear to be something that resides in a distinctive social milieu. The British, or some of them anyway,

talk of having a “good” potter or making sure they have time to potter in the day or during their weekends. A delight is found in doing what appears to be nothing of consequence. This is something those from outside of Britain have a sense of; something like it occurs elsewhere under the guise of ‘chilling out’, ‘wasting time’, ‘doing nothing’. Yet many are amused, if not bemused, to find the British have given it a definite name and, on occasion, celebrate it for its whimsical quality.

Despite the cultural variations, however, our intention in this paper is not to compare pottering and its near-equivalents across countries and regions. Instead, we are interested in examining pottering as a way to continue to defamiliarize ourselves with aspects of contemporary and, for better or worse, western-centric home life [see 1]. Because of its distinctive and sometimes seemingly incongruous qualities, our hope has been to use pottering as a means to look beyond applying some of the more conservative criteria in interactive systems design such as productivity and efficiency—criteria that have proved to be limited in designing IT for the home [e.g., 16]. In short, by introducing the term as a rhetorical device, as it were, our hope has been that it may provide us with some useful points of comparison when set against the mainstream imaginings of what it is to live at home, with technology.

In the following, we provide an overview of related research so as to situate our work in terms of two broad themes that are being increasingly discussed in the literature on domestic technologies. After this review of related work, we discuss how we went about studying pottering and note the difficulties we had in examining it, empirically. We describe our fieldwork exercises, outlining our incorporation of a critical design approach. We explain how this mixture of approaches allowed for an opening up of our investigations and helped orient our thoughts towards design. We then turn to our empirical materials and present these alongside a collection of speculative design proposals motivated and inspired by the fieldwork. We discuss how these proposals have offered us a means to critically reflect on technology’s role in the home. To conclude, we discuss what implications we feel the presented materials have for our own work and hopefully for others designing technology for the home.

2. MOTIVATIONS AND RELATED WORK

Our interest in pottering as a research topic arose from our prolonged studies of family life in the UK. Over the course of our investigations, we found that particular members of households have established routines in which they seclude themselves socially and often physically from their families. Finding a sequestered place and time, pleasure is taken in mundane, seemingly unessential activities: loosely sorting and organizing things, tinkering with tools or equipment, doing odds and ends on personal

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

NordiCHI 2008: Using Bridges, 18-22 October, Lund, Sweden
Copyright 2008 ACM ISBN 978-1-59593-704-9. \$5.00

computers, etc. This loose assemblage of activities intrigued us because it appeared to offer a real-world example of how the home exists beyond merely being a functional or utilitarian place, and of how, in practice, it can come to be a site of insouciance, playfulness, and even whimsical pleasure.

As we have already noted, this view of pottering reflects, in some respects, a general trend in domestic technology design and research in HCI. Early publications in this area from O'Brien and Rodden [16] and Hindus et al. [10, 11] spelled out that homes had very particular characteristics that made them distinct from workplaces, the latter having been the predominant focus for HCI. From this work as well as others' [e.g., 13], two themes can be identified that prefigure our interest in pottering. One emerges from a special interest in understanding the character of the home, how it differs from the workplace and the practices and values that make it unique. The second centers on the research methods used to study domestic environments and has gathered momentum through several efforts to develop ways of investigating the distinctive features of home life.

2.1 The Character of Home

The effect of the work falling under the first theme has been to expand on the use of criteria like productivity and efficiency that were the commonly held—if often implicit [see 15]—measures applied to designing for the workplace. As Hindus put it in her effort to prioritize homes in technology research: “Family structures are complex and not hierarchical, at least not in the sense that corporate organizations are structured. Decision-making and value-setting are quite different within households” [10, p.201]. To better understand this difference, the position put forward by O'Brien and Rodden [16], and other work since [e.g., 4, 22, 23] has been to emphasize how technology becomes apart of household routines not purely for reasons of productivity, but also because they become intertwined with a household's larger systems of social and material organization.

To demonstrate its distinctive character, recent research has emphasized specific aspects of home life such as the treatment of clutter [21] and even the technologically oriented, religious practices associated with the Sabbath [25]. Bell and Dourish [2], to choose one example, examine the garden shed arguing that it offers a counter-point from which to interrogate the taken for granted character of the home. It lies at the edges of the domestic realm, both literally and figuratively; this peripheral, arguably marginal status enables the shed to be used as a means to critically reflect on the prevailing ideas of home, and in doing so re-imagine the possibilities for design. Much as sheds, then, encourage rethinking the boundaries of physical and mental spaces in and around the home, our hope has been that pottering provide an alternative way to understand the activities of the home and emphasize those features that can be marginalized when using more task-focused perspectives.

2.2 Approaches to Studying Home Life

Not surprisingly, coinciding with this turn to the domestic have been developments in the approaches and methods to studying IT use in the home. Much of the work above, for example, aimed to demonstrate the value of ethnography and in some cases eth-

nomethodology. Research from Tolmie et al. [23] stands as a particularly good example of how ethnographic fieldwork (of an ethnomethodological persuasion) can offer a means to critically reflect on mainstream visions of domestic IT and specifically the subtitles of (in)visibility that underlie the ubiquitous computing project.

While ethnography in its different flavors has now become a mainstay in domestic IT research, other recent efforts have sought to diversify the methodological toolset. Broadly, one set of approaches has used probes or prototypes of differing fidelity, ranging from simple mock-ups [e.g., 12, 19] to fully functional systems [e.g., 12, 20]. What these approaches have in common is the aim of developing an understanding of households and their technological needs through the use of designed artifacts.

The use of probes and prototyping has also seen the increased prevalence of methods and approaches using *design* as a resource as opposed to treating it merely as an output. The heavily popularized use of cultural probes, for instance, offers an easily identifiable approach intended, initially at least, to prioritise a design sensibility over conventional empirical techniques [for excellent review, see 3]. The idea of using cultural probes was developed by Gaver, Dunne and Pacenti [8] from the Royal College of Art (RCA) with a deliberate eye to look beyond the confines of the workplace and further investigate places like the home. Projects from the RCA thus foregrounded topics that questioned conventional perspectives. Gaver promoted, for example, “ludic” or playful experience noting, “[t]here is a danger that as technology moves from the office into our homes, it will bring along with it workplace values such as efficiency and productivity at the expense of other possibilities. People do not just pursue tasks and solve problems, they also explore, wonder, love, worship, and waste time.” [6].

Cultural probes, then (as well as a small number of other forms of prototyping), have drawn attention not only to a different set of priorities in studying the home, but also a new perspective on design and its contribution to interactive systems research. Emerging from the RCA around the same time as the initial probe work and directed towards roughly similar intentions was an approach that has come to be known rather loosely as *critical design*. Less popular but possibly more controversial, critical design incorporates the careful and usually provocative design of proposals intended to stimulate debate around particular technological innovations or envisionments. Unlike conventional prototypes they are thus not meant to be formally evaluated or designed to solve specific ‘user-centered’ problems/aesthetic concerns. For example, one project, *Placebo* [5], gave rise to a set of design concepts provoking questions around electro-magnetic waves and people's possible vulnerability to their ubiquitous presence.

With examples such as this, critical design has been oriented, largely, towards broader societal commentaries and reflections on the uptake and everyday use of technology. A number of examples exist, however, that venture into using the strategy to provoke questions more immediately relevant to interaction design. Again largely from the RCA, projects have been undertaken questioning the boundaries between technology and its use in everyday life. The *Drift Table* offers an example relevant to the domestic sphere [7]. The table has no intended task for users; instead it encourages them to explore the British countryside through a portal showcasing mapped images. As a consequence the table has its audience reflect on themes like curiosity and exploration rather than the

problems of retrieving precise geographical information for specific tasks. Similarly, Gaver and Martin [9] present a collection of critical design ideas including the “Dawn Chorus,” a bird feeder that trains bird to sing your favorite songs, “Worry Stone,” a digital device that allows users to externalize their worries, and the “Prayer Device,” a mouthpiece that amplifies prayers to the heavens. Their proposals are critical of the work values imported into devices designed for the home. Instead, an alternative set of values is presented including mystery, intimacy, and ambiguity in which to embed design.

3. STUDYING POTTERING

Our study of pottering is thus set in this timeline of research into domestic IT. Aiming to build on this past work, we want to acknowledge that our early choice of topic—one that appears to slip so easily into the margins—raised unanticipated problems in our data collection and analysis. We found pottering to be slippery in that it was not easily observed, captured or described. If anything, we found the practice to engender a state of mind, or perhaps more aptly a way of being, rather than anything concrete. Mindful of these difficulties, our hope is that the overview of the methods (if they can be described as that) below captures something of the opportunism that characterizes our investigations: we came to be open to data collection strategies that suited our needs and treated the collected materials as an open-ended resource, enabling us to work through the topics we repeatedly encountered. Thus, rather than an exhaustive elucidation of pottering, it is hoped the following reflects our gradual efforts to build up a way of seeing and reflecting on life at home and how, if at all, this might guide designing for the domestic sphere.

We found getting to grips with pottering to be a challenge from the outset. Having a sense that pottering was made up of just the kinds of activities people find hard to account for, we struggled to identify an approach to our research that would not make people unduly aware of or accountable for their actions. Weighing the pros and cons of intrusive and time-intensive data collection methods (e.g., continuously video recording participants in their homes), we came to follow what might be best described as a set of stages to our research. Pieced together over time, each came to give us differing ways of making sense of pottering. The early stages helped to situate pottering amongst other everyday practices. This, in turn, gave us a purchase for further more directed investigations, which subsequently allowed us to open up a loosely bounded design space.

The first stage involved informal conversations and observations undertaken by a member of the research team. Given that she was from the United States and new to living in Great Britain, she used the research project as a way to learn more about the local culture. The approach taken was akin to the “design ethnography” [12] and “rapid ethnography” [14] used in past field research in that the researcher used a variety of in-the-field strategies to gain a reasonable understanding of the topic under study in a short period of time. The strategies used included visiting the local library and asking libraries about reference to pottering, field trips to a gardening shop, conversations with colleagues, observations at shopping centers, and reading threads on British websites devoted to gardening and shed culture (e.g., readershed.co.uk). This stage thus helped shape the researcher’s sensibilities, knowledge, and understanding of the topic and gave shape to the more directed subsequent work.

In the second stage, we directed our efforts towards finding people to talk to specifically about the topic. Participants were found by asking colleagues and friends and by posting recruitment flyers throughout our local city. Some were also invited through the online forums visited in the project’s first stage. In total, we were able to find 12 self-professed potters to participate (Fig.1). Initial interviews took place at informants’ homes but, as our informants became more geographically dispersed, we conducted some on the phone. The interviews began with asking participants how they defined pottering, then to describe how they potted, and ended with questions about why they did so and what thoughts and feelings it evoked.

Age	Sex	Examples of pottering given
64	M	Gardening
62	F	Gardening, tidying up
40	F	Gardening, tidying up
30	M	Spending time in shed
34	M	Gardening
37	M	Spending time in shed
65	F	Looking through photo albums
41	F	Organizing things, surfing internet
31	M	Gardening, surfing internet
37	F	Gardening, surfing internet
21	F	Tidying-up, thinking
30	F	Tidying-up, thinking

Figure 1. Break down of participants.

As we carried out these interviews, we realized how valuable it would be to capture people’s potters, *in situ*. Although enlightening, the interviews often felt like we were asking participants to over-think the taken-for-granted aspects of pottering. We wanted to compliment this more reflective data with observations and thoughts captured in the moment, so to speak, and were thus fortunate to come across one-time-use video capture cameras available from the US (Fig. 2). Once ordered and delivered, we asked participants to record themselves using the cameras. Partly inspired by the “dream recorder”, a probe-based activity Gaver et al. [7] included in their original cultural probe pack, the aim was to allow participants to use the cameras to capture fleeting moments and thoughts while pottering.

The cameras were sent to participants following the initial interviews. Included with each camera were instructions on how to use the device, questions about pottering, and directions to place the camera in a part of their home where they regularly potted. As with the original disposable cultural probes, we removed the recorder’s commercial packaging and gave participants a self-addressed stamped envelope so they could return the camera at their convenience. The camera allowed a maximum of 20 minutes to be captured either at one time or through consecutive recordings.



Figure 2. Disposable Video Camera

As part of this second stage, interviews were transcribed and annotated by the research team. Inline with how others have analyzed probe returns, we worked together with the video recordings; we watched them looking for “inspirational data” or “fragmentary clues” about their feelings towards pottering that could motivate design ideas. These served as a starting point for reflection and brainstorming among the research team.

It was in an effort to articulate these findings *vis-à-vis* design that we eventually took on a critical design perspective (making up the third stage). Originally, we had thought we would merely use the findings to orient the ongoing work we have as a team and individually undertaken to design IT for the home. We found the collected materials to provoke provocative design ideas, however. As will hopefully become clear, our findings were easily set against characterisations (albeit simplistic ones) of frequently touted technological visions.

In short, we came to see a critical design position to be a particularly useful way to characterize and engage with our subjects’ experiences and, in a fashion, think through their ideas in material form. Moreover, the critical design sketches we produced offered a way to actively relate to and build upon the data, and tie pottering back to the larger questions of domestic HCI. A number of ideas emerged from brainstorming and a dozen were translated into design sketches; five are presented here.

4. Findings

Below, we present reflections on five topics that consistently arose in our fieldwork and analysis: the unplanned; pottering-time; accountability; satisfaction; and emotional flux. Accompanying each is a critical design proposal—informed and inspired by the fieldwork—that we found helped us develop our thinking, as we have described above.

4.1 The Unplanned

Something that immediately struck us in considering pottering was its whimsical character. Informants regularly described pottering as consisting of tasks and activities that had not been carefully planned. Andy, a retired businessman, expresses this nicely:

Pottering is when one walks around, you don’t run when you potter, you walk around, not necessarily doing anything you have planned. You do something spontaneously, so if I was pottering in the garden, I’d be wandering around the garden and say “oh gosh” I meant to move that from there to there. I hadn’t planned it before I went out in the garden. Then I’d go around to the side of the house and see a branch hanging and say to myself that I have a quarter of an hour to spare, oh yeah I will cut that down now. So pottering is an activity done when you are walking and when you do things that aren’t pre-planned.

Andy’s own verbal meanderings, as it were, capture how pottering can be guided by the unforeseen. Adopting a leisurely pace as he potters, he is distracted by happened-upon-things or things he sees to be out of place. However, as opposed to frustration or annoyance—that might be the imagined response—Andy implies an openness to this. He explains how his openness to such distractions is loosely circumscribed; in his example, Andy’s potters are bounded in terms of the 15 minutes he has spare in his garden—that is, in terms of time and space.

We’ve sought to be playful with this seemingly capricious quality to pottering with our first design proposal, the *Growth Detector* (Fig. 3). A surveillance camera is placed on the outside of one’s home that strictly monitors shrub growth. In order to keep them immaculately trimmed, the sensors alert homeowners when a leaf is out of place. Users are notified via a text message sent to their cell phone.

This proposal aims to eliminate chance distractions. Instead, one is forewarned of the potentially unanticipated—the rogue leaf that demands the garden shears. By exaggerating the orderly conditions one might aspire to and the efforts put into planning for contingencies, the Detector encourages us to think, critically, about designing for planfulness. It highlights how we are, at times, open to being waylaid and that in their right and proper place distractions have their appeal.

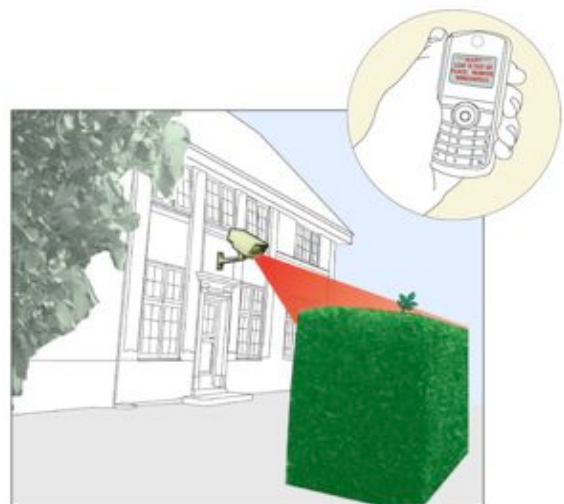


Figure 3. Growth Detector.

4.2 Pottering-time

What we don't wish to do here is characterize pottering as totally unplanned. Indeed, as Andy exemplifies, it was regularly described as something assigned to a certain place and/or time. Pottering is thus done in the garden shed, the attic, the basement, the clutter drawer, and so on. As for times, weekends can be reserved for pottering or some leeway might be given once the chores have been done, and so on. In the following, Steve, provides an example of how time is apportioned for pottering:

In general I don't sit down and plan an afternoon and just say I am going to sit around and not do very much. [Pottering] generally comes as a result of doing something else and finding something else halfway through that is more interesting to do or having sort of dead time, unstructured time, in which I like to fill it with doing something.

Notice how Steve describes when he potters relative to some other time. Pottering-time is dead, unplanned, unstructured, or as other informants described, insignificant. Borrowing a phrase from the sociologist Zerubavel's [26], it would seem pottering-time is a *residual category* in that it is defined in relation to other types of time: not planned, not structured or not significant. Pottering is thus set in relational terms with respect to other structured activities or set periods so that it is largely defined by when it isn't done rather than when it is. In effect, pottering-time takes on a marginal status where it continually falls to the periphery of some other sense of time.

As a design concept, the *Pottering Manager* (Fig.4) offers a provocative position from which to reflect on this distinctive quality of peripheral or marginal activities. This desktop application schedules pottering-time for busy individuals. By searching through users' online calendars it tallies how much time can be devoted to idleness during a week. The application also allows users to schedule where they want to potter and to specify exactly what they want to do with their free time.



Figure 4. Pottering Manager

Immediately unsettling is the proposals rendering of time as homogeneous. Not only does the Manager conflate work and personal time, it also represents time as something simply divided into equivalent and interchangeable units. Less pronounced, but possibly more illuminating is the way in which the Pottering Manager succeeds to juxtapose calendar-time and pottering-time. There is an immediate uneasiness with the desktop calendar that calculates free-time and then assumes one might want to inscribe, in advance, what to do with it. Calendars enable us to manage our time in some consistent fashion so that we can arrange meetings, remember birthdays, etc. In short, the calendar ensures we are accountable to some normative measure of time so that we can arrange our own schedules against those of others.

The Pottering Manager is 'broken', because the collective sense of time embodied in the calendar is fundamentally at odds with the temporal rhythms bounded by pottering-time. The short engagement with one thing and then the movement on to another that characterize our informants' potters, indicates that time can pass along individual trajectories and rhythms and not in coordination with the carved out, linear rendering of collective calendar-time. The point to emphasize here is that time is deeply bound to particular ways of being, so that its reckoning and passing is constituted in and through experience.

4.3 Accountability

As we've suggested, pottering is made up of those things we find hard to account for. Its slipperiness as well as the way it is regularly referred to in negative terms seems to attest to this. In this next example, we want to take this idea further by suggesting that it is, in part at least, our sense of availability and thus accountability to others that makes our experiences of time and space distinct when pottering.

In our fieldwork, one of the ways pottering was regularly defined was to contrast it with activities done for others (childcare, work, bill-paying, etc.). An informant, Mary, explains she is disrupted from pottering when she has to do something for someone else, when the phone rings, or when people want time from her. Indeed, pottering dissolves into something else when it becomes purposeful for others. Jamie, another informant, captures both the difficulty in articulating what it is to potter and also this sense of doing something for oneself in one's own time:

If I've got some stuff to do in the greenhouse I will just go and do it. You know I'll have enough time cleared that it doesn't matter what time I stop... Usually there is just me there so it is quiet, everything I do I do for myself, not somebody else. It's quite hard to pin down exactly why it is relaxing, but it is. I guess the peace and quiet is the most important thing...

What we want to suggest is that there is some notion of accountability that weaves through Jamie's and our other informants' ideas of where and when they potter. It is as though, when pottering, they clear particular times and spaces of accountability.

The *Plant Care Monitor*, shown in Figure 5, aims to provoke questions around technology and its relationship with these moments and places apparently free of accountability. Inspired by Tamagotchis (the hand-held, virtual 'pets' made popular a decade ago), the device uses sensors to measure how much water and

sunlight a plant has received. A virtual representation of the plant's 'health' is indicated on a small display using a simple animated flower. This is augmented with audio feedback so that when the plant is in poor health the monitor beeps.

On the face of it, the Plant Care Monitor reminds us of the attention technology can demand. Whether an alarm clock, unexpected mobile phone call, or microwave alerting that its finished cooking, technologies frequently "beep", "buzz", and "vibrate" in order to alert their owners that they need attention. Of course, we all know such feedback can be disruptive and annoying, sometimes extremely so. More interesting here, we think, is something the plant monitor's on-screen representation hints at. Reflecting on Jamie's potterings and his moments of piece and quiet, we can imagine how various elements of a technology's interface might have us feeling especially accountable for our actions. Sensor-based warnings or reminders and even UI's with simple, life-like qualities might lessen the cognitive burden, but by the same token they require us to act on someone or something else's terms, and in some sense be accountable for tending to the technology.

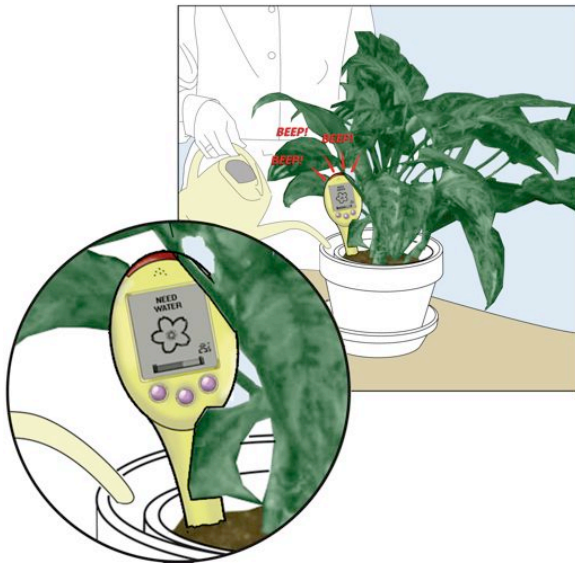


Figure 5. Plant Care Monitor

The Plant Care Monitor, then, suggests that we must be mindful of technologies that incorporate forms of automation and pseudo-intelligence. It is not that technology should be removed from activities where we seek time and space on our own, activities like pottering. Rather, it is to be aware that these apparent innovations might have us feel accountable at times and in places we wish not to be.

4.4 Satisfaction

Participants discussed the sense of pleasure had from pottering. Whether it be putting stamps on envelopes or organizing their CD's alphabetically, many described it as enjoyable or simply satisfying. A video recording made by one participant, Alistair, offers a nice feel for this. In the midst of gardening and, as he describes it, having a potter, Alistair talks us through how he tends to his vegetables and plants before work. We see him to-ing and fro-ing between the garden, greenhouse and kitchen, moving

things between the different places, sweeping, arranging and so on. Summing up his efforts, he explains how he finds it rewarding.

Relaxed would be a good word to describe how I feel about a good potter in the garden... I think most people who spend time gardening often say it's relaxing even though... buying vegetables or whatever would probably be a lot cheaper, quicker, less hassle. It's not really the point why people do it. It's more just a sense of accomplishment and watching something grow that you've nurtured is very rewarding.

As Alistair suggests, it's often the easy and mindless activities that can be delegated. They are also often the ones most amenable to automation. Indeed, dozens of gadgets exist to automatically organize our lives. What we find, though, is that there are times where one finds satisfaction and delight in doing the seemingly burdensome.

We've designed the *Automatic Spice Organizer* (Fig. 6) to explore this idea further. Sorting spice jars that are placed into it, the design proposal highlights how automation can appear perverse, if a little absurd, when applied to particular activities. It also has us reflect on when and where we might want to build automation and time-saving solutions into technology. As Alistair's reflections on pottering indicate, we cannot assume that criteria such as cheap, quick and hassle-free should be applied *carte-blanche*. Indeed, it's evident that automation and time-saving solutions should not necessarily be applied purely on the basis of distinct activities. Instead, we might consider how people might be given the opportunity to meander through and ponder on their things, and painstakingly organize them if they chose to. Automation might be seen as an available option rather than the default.

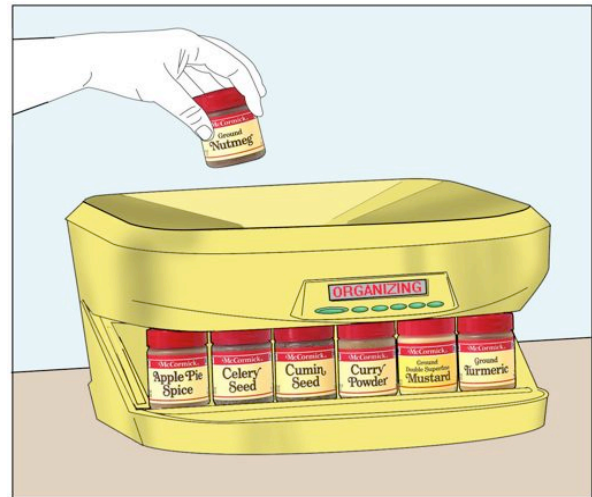


Figure 6. Automatic Spice Organizer

4.5 Emotional Flux

Pottering was associated with a range of emotions, some occasionally conflicting. For example, we found that for some it elicited a mixture of emotions including pleasure but also guilt. In her

video clips, a participant, Jane, goes between sorting her digital photos on the family PC and gardening. Although she considers both to be pottering, one—the photo organization—instills a lingering sense of duty (being in some ways an accountable activity). The gardening, though, she depicts as a relief to sorting the photos. Pottering, it would seem, is not made up of activities that trigger discrete feelings. It appears that it can be about allowing for emotional transgressions.

This is further illustrated in a description from another of our participant's where she recounts an unplanned diversion into pottering:

The other day I got distracted by an old photograph album. I spent an hour looking through it and you know just sort of wasting time. Then I saw a photograph of a friend who passed away. I realized I hadn't thought of her in some time and it made me feel a bit sad.

We found examples such as these then to offer a reminder of the multi-faceted character of the things we do at home, things like pottering. It's not that we potter with the intention of feeling guilt or sadness. We do though find ourselves moving between moments of delight, poignancy, sadness and so on. If anything, it appears that our potterings can leave us open to the potential for flux, open to meandering through an emotional geography, if you will.



Figure 7. The Smart Album

The *Smart Album* (Fig. 7) provides an intentionally controversial means to reflect on technology's role in this openness to emotional flux. The system tracks when family and friends die, or partners divorce and searches through users' digital photograph collections to delete those who would elicit feelings of sadness or distress. Adopting this 'smart' but clearly perverse editorial mechanism, the album immediately provokes questions around what kinds of things technologies should be left to interpret and the sorts of automated judgments that might be made from those interpretations. Reflecting on the proposal, we find ourselves wondering how technology might be designed to interleave with those moments and spaces where we are open to being influenced. The closer we get to building technical solutions that anticipate our thoughts and feelings, the keener we seem to alter our artifacts and environments to reflect mood. What the above suggests is that

people can at times be open to things in the world influencing their emotional valence. For us as designers of IT, the question seems not to be one of intentionally eliciting emotions, but how and when things that are evocative might be made available.

5. DISCUSSION

As we described at the beginning of this paper, we set out to study pottering to examine something we found in our ongoing field research to be a recurrent feature of home life (in the UK at least). We came to be particularly interested in the topic because our cursory investigations indicated that pottering was difficult to define for people and yet they protected, often vehemently, the practices associated with it. We also felt pottering offered an interesting contrast to many of the activities studied under the rubric of HCI and interactive system design. It appeared to lack the clearly defined tasks and goals of activities commonly studied and wasn't restricted to particular sets of (inter)actions. Having undertaken the investigatory study presented above, we have not come to any concrete conclusions, nor any definitive ideas of what pottering is or the role interactive systems should play in people's potterings. Indeed, we're not particularly convinced that technology has any place in people's potterings. We believe though that we have drawn out a number of issues that will contribute to the various research and design projects we participate in, specifically those aimed at informing interactive system design in the domestic realm.

Generally, the research and the ideas presented above have been instrumental in two broad ways. First the work has sensitized us to a curious range of practices, practices that have forced us to reflect on some common perspectives in interactive systems design. This sensitization has opened up design spaces for us and offered an informed basis from which to consider them. The second broad contribution has been towards our methods of investigation. The nature of pottering—being hard to define and even harder to observe—has led us for no better reason than convenience (if not desperation) to blend a number of research strategies together. However, our experiences don't so much prescribe a systematic method (or methodology) for empirical study. Rather, they've fostered an openness to opportunistically taking on and combining different approaches to tackle empirical problems.

In the remains of this paper, we develop specific aspects of these two broadly encompassing contributions. In doing so, we hope to illustrate how we intend to direct some of our future research, as well as offer some insights for others aiming to engage in similar work.

5.1 Living at home with Interactive Systems

As we continue to reflect on computing's ubiquitous presence in domestic (and work) environments, our examples have, we've found, emphasized the importance of broadening the concerns that are relevant to design and the kinds of issues we might be sensitized to. As well as offering a further example of the general arguments presented in past research however, there are two results we have gleaned that seem, to us, to open up potentially interesting areas. These can be summarized as follows:

Residual time

Something our investigations have drawn attention to is the notion of residual categories and specifically residual time. As we've noted, the latter are times that fall outside of our common mechanisms for defining time and its reckoning. In the case of pottering,

time doesn't appear to be defined in terms of what is achieved or any sense of procedure. If anything there is a propensity to lose oneself in time, to figuratively meander between different doings at will, almost irrespective of time's passing.

Turning our attention to such proclivities *vis-à-vis* design, questions have arisen around how, if at all, we should conceive of and situate technology with respect to residual categories? The pottering manager teasingly juxtaposes the structured arrangement of time in our working lives against the vagaries of time's passing when pottering: the normative and collective measure of calendar time as against a person's far more contingent, individual temporal flows and rhythms. How though might the objects we design actually accommodate moments and times that are, in effect, characterized by the looseness and porous quality of their boundaries? By that we are not interested *per se* in how our personal moments might easily slip into our work time or *vice versa*. Rather, we're prompted to think of technologies that might allow for a fluidity in categorical distinctions, where tasks, actions, goals, and the allotment of time are not the defining or rigid markers of what one does. So what might a technology be like if it allowed for or even promoted the erratic passing of time, the fluid movement between categorically different activities, the absence of any fixed goals, a pondering on nothing in particular, and so on?

Perhaps unsurprisingly, these questions have had us return to two now long-standing research programs (among others), Weiser's calm computing [24] and the web-related information foraging concept originating at PARC [17]. In quite different realms, both promote the unhindered or smooth transition between discrete actions and activities whilst supporting serendipitous discovery. Similarly, we've reflected on how many of us often use PC-based applications or services we lose ourselves in, whether they be our photo editing/management tools, eBay, Facebook, etc. What we've found interesting from the perspective above is that these technologies (e.g. ubicomp devices, apps, services, etc.) can, at times, lend themselves to less purposeful forms of interaction. For example, when asked to explain what we've spent the last two hours doing 'in' iPhoto or 'on' Facebook, it's not always easy to account for our time. It appears that such technologies enable transitions into and operations within less formal, less structured periods. In short, they allow us to reside in the hard to define categories of time (i.e., residual time) that nevertheless appear important to us.

Pottering then has led us to consider what it might be like to design technologies that enable one to move into and inhabit the times (and spaces) we find hard to label. Although technologies definitely exist that are appropriated for these marginal times and spaces, it seems they're still largely designed (and marketed) around ideas of productivity, better organization, sociality and so on. Is there, then, the scope to design for the residual, so to speak? To celebrate people's tinkering, meanderings, potterings, etc. for no other reason except they delight in them? For the time being we leave this as an open-ended design question. Our hope is to explore it in further detail by deploying playful and sometimes provocative prototypes as others have done.

Accountability

The second aspect of our research we've found useful to give further thought to is accountability. We've suggested above that people's ideas of pottering hinge on whether they see themselves as accountable to someone or something else. Being accountable

for one's actions appears to diminish the pleasure felt when pottering. If pottering is about a movement into residual categories of time, then it appears (a perceived) accountability is what shifts us back into normative, collective ideas of time.

This is hardly surprising. Most of us are familiar with the relief felt from 'escaping' at times—switching off our cell phones, email and IM clients, and engaging in something on our own terms. What we've found useful by focusing on accountability, however, is that it allows us to consider specific aspects of interactive system use. The Plant Care Monitor, for example, offers a simple means of illustrating how technology can disrupt us at unsuitable times. By thinking of this in terms of accountability, we see how the annoyance might be caused by finding oneself accountable to some externally imposed set of rules: accountable to what the monitoring system deems as an (un)healthy plant rather than what is evident to us, if and when we want to see it.

The thing we've learnt here is not that we should be aiming to remove accountability from our actions and activities. Arguably that would be impossible. What we believe offers us some purchase in designing technology is to consider how interactive systems make us accountable in ways that are insensitive to the situations we find ourselves and choose to be in. This position is emphasized when reflecting on the kinds of activities associated with pottering, but could also offer a basis for reflecting on interactive systems use more generally. Implicit in much of the empirical research in CSCW, for example, are issues of accountable action and the accountabilities that arise through different forms of computer-mediated communication. What has received little direct attention, however, is how computer systems might be designed with the specific intent of minimizing what or whom we are accountable to. How, for instance, could we design systems that remove us from the social environments we find ourselves in, but in ways that are sensitive to our personal flows and rhythms? Such a question stands in stark contrast to the preponderance of research focused on collaborative or social-networking technologies. It is meant however, not to nullify this work, but to recognize that there are times that are very important to us when we don't want to be accountable to others.

5.2 Opportunism in field research

Beyond these results, our presented work, as we've suggested, has helped us to be open about working opportunistically with different approaches to studying real-world phenomena. We found the slippery nature of pottering that originally appealed to us forced us to adopt and adapt to approaches that usually fall outside of conventional requirements gathering and field study methods. In coming from different disciplines to analyze our field materials, we were also persuaded to be less rigid about adhering to specific methodological stances. As a consequence, we found our results to reflect a diverse set of perspectives from which to examine pottering. The interviews were a source of people's personal accounts, the short videos small glimpses into their routines, and the designs slightly provocative ways to examine the margins and boundaries to pottering, as well as how pottering might be considered in terms of common technological paradigms. This diversity allowed us to 'thicken' our descriptions of pottering. Our materials were not necessarily complete, but they allowed us to probe into, reflect on and question particular features of a phenomenon largely illusive in any concrete sense.

To offer an example, we found that using disposable digital recorders provided insights into activities as our informant's experienced them rather than having them framed using conventional task-based criteria, such as actions, goals and so on. The twenty-minute videos we asked informants to create allowed insights into aspects of what they do when alone, daydreaming, or simply pondering on something. They engaged in a dialogue with the camera about the most mundane aspects of their lives whether it be caring for a plant, making a cup of tea or being bored, in a level of detail that would have been difficult to capture by interviewing alone. In essence, they acted as mini "design documentaries" [see 17] in that they allowed us to see informants in-action rather than merely focusing on their potential technology needs.

Our collection of design ideas were equally revealing, but from a very different perspective. Originally conceived of because we were struggling to find a way forward, they offered relatively quick and "inexpensive" ways of juxtaposing technological concerns against the empirical materials we were collecting. In doing so, they also helped renew "dialogues" with our materials, guiding us to press on and develop particular points we felt to be salient. For example, several of the concepts have raised questions around where the automated organization of time and pseudo-intelligent sensing of human behavior might lie with respect to everyday action.

On a superficial level, then, our research provides an example of how things like distributing video recorders and using design concepts can compliment fieldwork techniques. What we've found is that the use of more methods doesn't necessarily provide more accurate or "true" renderings of the things people do in their homes. They do though allow for different ways of engaging with material and developing richer ways of seeing and interpreting it.

An arguably more substantial aspect to our work is the value we found in adopting a fluid and open approach when confronted with empirical problems. After our initial efforts, the general emphasis was placed on finding an assortment of ways to engage with people as they pottered. Our approach was broadly one led by opportunism, considering what might work best for particular difficulties we faced. So the disposable video cameras overcame the need for possibly over-the-top video capture solutions. The sketching of provocative concepts gave us quick and playful ways to engage with our materials and provoke discussion amongst ourselves. Moreover, it promoted discussion around technological themes, but at the same time kept us away from thinking about technical details or building anything before we had had the opportunity to properly work through our research.

As well as introducing ourselves to new approaches, the overall lesson we've had here then is in being honest about the opportunism we're often forced to adopt in empirical research and to actually use it as an asset when tackling seemingly intractable topics.

6. CONCLUSIONS

Our study of pottering has given us the opportunity to engage with two significant trends in HCI: one, the growing body of research investigating home life and, two, the development of methods used in such investigations. To the first of these trends, we have, we believe, contributed to on-going efforts to re-work some established ways of thinking about interactive system design and use. Like others, we've raised questions around the playful character of some of our domestic doings, and also the different (and changing) emotions we have towards what we do and interact with at

home. Our reflections on residual categories and accountability develop two themes that we hope may contribute more to this space.

To the second trend, we have, again, built on past research. We have illustrated how lightweight fieldwork strategies can be combined to help thicken the description of things like pottering that lack any real, concrete form. Something we've found valuable is the use of provocative design proposals used not just as outputs to our fieldwork, but also as ways to further engage with and elaborate on our findings. Another especially important thing we've learnt when it comes to method has been to find value in just trying and seeing. An openness and opportunism appears, in this sense at least, to have allowed the space to explore and not get bogged down in what we 'should' have been doing.

Overall, and perhaps most important to the work we present here is that it has helped us to (re-)see what, of course, we already know. That, in our homes, we give ourselves over to times (and places) where it feels safe to potter, safe to whimsically meander between this or that without the threat of being too long, too slow, too inefficient, too engrossed in our own worlds. No doubt our obligations and duties always loom, but it seems that these moments are deeply important to us and, some might say, keep us sane.

7. ACKNOWLEDGMENTS

We are indebted to those who participated in the fieldwork. The research would have been greatly impoverished without their willingness to reveal and discuss their potterings.

8. REFERENCES

- [1] Bell, G., Blythe, M., & Sengers, P. Making by making strange: defamiliarization and the design of domestic technologies. *ACM TOCHI*, 12, 2 (2005), 149-173.
- [2] Bell, G. and Dourish, P. Back to the shed: gendered visions of technology and domesticity. *Pers. Ubi. Comp.* 11, (2007), 373-381.
- [3] Boehner, K., Vertesi, J., Sengers, P. & Dourish, P. How HCI interprets the probes. *Proc. CHI '07*, ACM Press (2007), 1077-1086.
- [4] Crabtree, A. & Rodden, T. Domestic routines and design for the home. *JCSCW* 13 (2004) 191-220.
- [5] Dunne, A. *Hertzian Tales*, MIT Press, Boston, MA, 2006.
- [6] Gaver, B. Designing for Ludic Aspects of Everyday Life. *ERCIM News*, 47 (2001).
- [7] Gaver, W. W., et al. The drift table: designing for ludic engagement. *Proc. CHI '04*, Ext. Abs. ACM Press (2004), 885-900.
- [8] Gaver, B., Dunne, T., & Pacenti, E. 1999. Cultural probes. *Interactions*, 6, 1 (1999), 21-29.
- [9] Gaver, B. & Martin, H. Alternatives: exploring information appliances through conceptual design proposals. *Proc. CHI '00*, ACM Press (2000), 209-216.
- [10] Hindus, D. The importance of homes in technology research. *Proc. CoBuild '99*, Springer-Verlag (1999), 199-207

- [11] Hindus, D., Mainwaring, S. D., Leduc, N., Hagström, A. E., and Bayley, O. Casablanca: designing social communication devices for the home. *Proc. CHI '01*, ACM Press (2001), 325-332.
- [12] Hutchinson, H. et al. Technology probes: inspiring design for and with families. *Proc. CHI '03*, ACM Press (2003), 17-24.
- [13] Mateas, M., T. Salvador, Scholtz, J. & Sorensen, D. Engineering Ethnography in the Home. *Proc. CHI '96*, ACM Press (1996), 283-84.
- [14] Millen, D. R. Rapid ethnography: time deepening strategies for HCI field research. *Proc. DIS '00*, ACM Press (2000), 280-286.
- [15] Newman, W. M., Taylor, A. S., Dance, C. R. & Taylor, S. A. Performance Targets, Models and Innovation in Interactive System Design. *Proc. DIS '00*, ACM Press (2000), 381-387.
- [16] O'Brien, J. & Rodden, T. Interactive systems in domestic environments. *Proc. DIS '97*, ACM Press (1997), 247-259.
- [17] Pirolli, P. & Card, S. Information foraging in information access environments. *Proc. CHI '95*, ACM Press (1995), 51-58.
- [18] Raijmakers, B., Gaver, W. W. & Bishay, J. Design documentaries: inspiring design research through documentary film. *Proc DIS '06*, ACM Press (2006), 229-238.
- [19] Rode, J. A., Toye, E. F. & Blackwell, A. F. The fuzzy felt ethnography—understanding the programming patterns of domestic appliances. *Pers. Ubi. Comp.* 8 (2004), 161-176.
- [20] Sellen, A., Harper, R., Eardley, R., Izadi, S., Regan, T., Taylor, A. S. & Wood, K. R. HomeNote: Supporting Situated messaging in the home. *Proc. CSCW '06*, ACM Press (2006), 383-392.
- [21] Swan, L., Taylor, A. S. & Harper, R. Making place for clutter and other ideas of home. *Proc. HOIT*, Springer, New York, NY (2007), 171-184.
- [22] Taylor, A. S. & Swan, L. Artful systems in the home. *Proc. CHI '05*, ACM Press (2005), 641-650.
- [23] Tolmie, P., Pycocock, J., Diggins, T., MacLean, A. & Karsenty, A. Unremarkable computing. *Proc. CHI '02*, ACM Press (2002), 399-406.
- [24] Weiser, M. & Brown, J. S. Designing Calm Technology. *PowerGrid Journal*, v1.01, <http://powergrid.electriciti.com/1.01> (1996).
- [25] Woodruff, A., Augustin, S. & Foucault, B. Sabbath day home automation: "it's like mixing technology and religion". *Proc. CHI '07*, ACM Press (2007), 527-536.
- [26] Zerubavel, E. *Hidden Rhythm*. University of California Press, CA, (1992).