

# Situating UbiComp in the Home

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## UBICOMP AND THE SOCIALITY OF THE HOME

The domestic environment is predicted by market analysts to be *the* major growth area over the next decade and a prime site for the development of ubiquitous computing. The home is a poorly understood domain however [10], particularly with regard to its socially organized character, which designers in the workplace have recognised as critical to effective design [8]. As part of the Equator project ([www.equator.ac.uk](http://www.equator.ac.uk)) we have undertaken a series of ethnographic studies [2] of the social organization of technology in the home as made available in the ‘interactional work’ of household members [1]. Following Venkatesh and Nicosia [12] we employ a broad notion of ‘technology’ to include such everyday things as paper-mail, noticeboards, tables, etc., as well as more sophisticated electronic devices. Our focus on interactional work is concerned to make visible, and available to design reasoning, the socially organized ways in which technology is ‘made at home’ by household members [11]. As Sacks puts it,

Here’s an object introduced into a world. And it’s a technical thing which has a variety of aspects to it. Now what happens is, a culture secretes itself onto it in its well-shaped ways [and it develops] into something with its own social structure. And that’s a thing that’s routinely being done, and it’s the source for the failures of technocratic dreams that if only we introduced some fantastic new machine the world will be transformed. Where what happens is that the object is made at home in the world that has *whatever organization it already has*. (Edited and emphasis added)

Our studies set out to explicate the organization that the home already has in order to inform and sensitise designers to the social circumstances ubiquitous computing will be situated in, and to root the development of ubicomp in the day-to-day reality of domestic life. Our approach might best be articulated by example.

### A Practical Example: The Interactional Work of Mail Handling in the Home

Handling mail is a commonplace activity in the home and of great importance to the day-to-day running of the household. Through handling mail household members orient to, arrange, concert, and accomplish a diverse range of activities including, for example, the timely payment of household bills, attending important meetings, to more ludic pursuits such as going to concerts and parties. The timeliness of such accomplishments is not accidental but provided for and guaranteed through the social organization of mail in the home [4]. The following, somewhat condensed, ethnographic report elaborates key organizational features.

Mail is typically collected from some central point, whether that point is located at the front door, in the grounds outside a house, or from a post box located elsewhere in an apartment block. Mail may be collected by any household member - in some homes the same person might do the job all the time, whereas in others it simply depends on who gets up first or who is home first. The point to note here is that the collection of mail by household members is not coordinated through the nomination of a ‘collector’ but through the public availability of a *shared* collection point (Figure 1). The person acting as collector has certain taken for granted rights and expectations attached to their position. It is assumed by members that persons acting as collectors who are also ‘householders’ - i.e. persons who are responsible for the running of the household - have the right to open mail concerning the maintenance of the home (e.g. bills) and formal matters concerning junior household members (e.g. letters from school concerning children). The opening of mail is not necessarily ordered by recipient name on an envelope, then, but by *entitlement* to open mail. The point here is that there is often a visibility to mail that displays and so announces its practical character: what it is about, who it is from, and who may thus be an appropriate recipient and so be entitled to open it. This is often conveyed by a logo, organizational stamp, postmark, or the printing of the sender’s name on the outside of the envelope. The visibility of the practical character of mail allows the collector to make judgements as to the relevance of mail to the home and to household members. It is in this respect that members come to categorize certain mail as ‘junk’, to do so at-a-glance, and to respond to the categorisation by throwing the designated mail away. Junk mail is not always so easily spotted however, as categorisation is a matter of judgement rather than given in advance. Consequently, the collector may open mail and browse through it to establish its relevancy status. Mail that is deemed relevant to other household members is organized in a variety of *recipient designed* ways. The person who opens

mail may decide that it is also of relevance to other household members. The relevance of mail to other household members is ordered through particular *assemblages of display*, with each assemblage articulating particular relevancy statuses.



Fig 1. Shared collection point



Fig 2. Front: mail for others in general  
Back: mail for particular other



Fig 3. Aesthetic displays and reminders

Mail which a recipient deems to be of relevance to others in general is displayed in a public location, again shared and known in common, where it is plainly visible (Front of Figure 2). The precise location for such displays varies from household to household as the construction of displays is contingent upon the particular material arrangements of domestic space. Common places include mantelpieces, bureaux, or tables, but other places may be used as the contingent arrangements of domestic space allow. Mail that is deemed to be of relevance to a particular household member is often displayed in a different location that is relevant to the member in question. Typical sites for displaying mail of relevance to particular others include the person's place at the kitchen table (Back of Figure 2), the place he or she usually sits in the living room, and such mail may even be placed outside a bedroom door. The recipient designed and accountable character of mail 'displays' enable members to see at-a-glance that mail has arrived that requires their attention and action. Opened mail that has been viewed is also displayed according to its relevance to practical action. Greetings cards and the like may find themselves displayed on the mantelpiece (as in Figure 5), windowsill or some other visible location where they both 'decorate' the home and their visibility reminds recipient's of a social obligation to be fulfilled: to reply to the sender, for example, and say 'thankyou' (Figure 3). The display of more mundane mail that has been opened and viewed is ordered by the temporal flow of sorting work and the ordering of mail into discrete groupings that reflect the actions required at-a-glance. Again, the construction of these displays is contingent upon the material arrangements of domestic space. Mail for external use, such as they payment of bills, is placed in a location that reflects the need for external action: e.g. on a desk in the hallway, at the front of the kitchen table (Figure 4), or next to a bag that is routinely taken along when a person leaves the house. Mail for internal use is displayed in an alternate location: e.g. on top of the stereo, on top of the bureau, or at the back of the kitchen table (Figure 5).



Fig 4. Mail for external use



Fig 5. Mail for internal use



Fig 6. Mail of short-term relevance

While particular locations vary from home to home, this latter arrangement is effectively a 'pending pile'. It may contain mail for external use if it is not of immediate relevance. Opened mail may accrue in the pending pile until it is felt that some further action should be taken. Further action may lead to the display or movement of mail to other discrete sites that are tied to the *projected relevance* of mail. Accordingly, mail may be displayed on a noticeboard (which may be nothing more than a designated space on a wall). Noticeboards are used as a place to display mail of short-term relevance: things like invoices, concert tickets, appointment cards and invitations, and longer-term information that is frequently consulted, such as school term dates, restaurant menus, etc (Figure 6). Mail of longer-term relevance, such as mortgage statements, legal paperwork, financial affairs, etc., is filed away in dedicated location organized for storage and retrieval: e.g. in a bureau, drawer, or filing cabinet.

### Informing The Development of UbiComp For The Home

Ethnographies of mail use show that mail is socially organized through its spatial and temporal distribution at various sites throughout the home. These sites combine to form an *ecological network of displays* constructed by household members to ‘mark out’ and ‘track’ the status of ongoing tasks at-a-glance [5]. That network contrasts sharply with the current possibilities offered by electronic mail, which are typically restricted to the corner of a room or some other outpost, and opens up the play of possibilities for ubiquitous computing. As Harper et al. [9] put it,

a letter in the geography of the home is a marker of what point a job-to-do has reached. Email might support this if the screens are located in places that equate to locations within the domestic workflow.



Figure 7. Organization of electronic mail

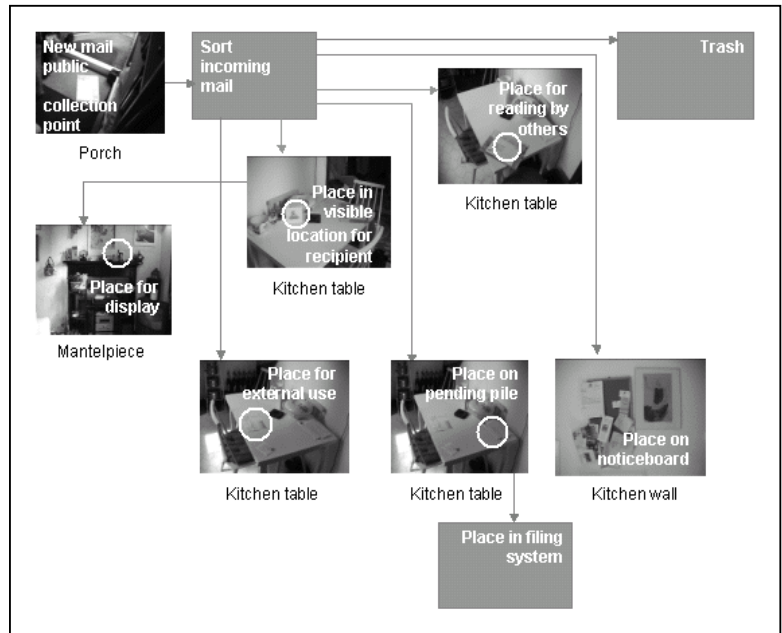


Figure 8. Organization of paper mail

The ecological ways in which domestic technologies are socially organized extends beyond mail handling and serve to identify ‘prime sites’ for situating ubiquitous computing in the fabric of the home [6]. Prime sites are articulated by the recurrent sequences of action made visible by the interactional work implicated in technology use [3]. These sequences are identical with the domestic routines that researchers in the field have identified as crucial to the development of ubiquitous computing for the home [7]. They make visible the socially organized ways in which technology is organized and structured by household members to meet the day-to-day needs of domestic life.

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