

# I don't get out of bed until my PIM tells me to

Stephen Viller

Information Environments Program  
University of Queensland  
Brisbane, Australia  
viller@acm.org

Ann Morrison

Information Environments Program  
University of Queensland  
Brisbane, Australia  
mnmorag@acm.org

## ABSTRACT

We are interested in how people manage their personal information across the multiple boundaries that we increasingly have to manage in our everyday lives. These boundaries exist between home and work, between digital and physical, online and offline, and so on. This position paper presents our plans for a design-research project that explores the design of technologies to support people in the everyday task that is personal information management. We present an action research-driven approach for investigating, deploying, and reflecting on appropriate designs for personal information management technologies, and methods for understanding the contexts in which they are used.

## Keywords

Boundaries, design, action research, personal information management, mundane technology

## 1. Introduction

Personal information management (PIM) refers to the activities and tools that people employ to obtain, store, and use the information they require to navigate through life's increasingly complex web of meetings, projects, schedules, communication, etc. As traditional boundaries between home vs. work activities, local vs. remote collaboration, online vs. offline activity, and individual vs. social pursuits become increasingly blurred, so the nature of everyday life becomes more complex and difficult to manage. The variety and number of tools to help support and manage personal information can be very confusing, and many tools lead to increased complexity and fragmentation of the problem, ultimately contributing to greater degrees of information overload. While dedicated tools have been developed, for many people the reality of tool support for information management is a combination of email client, calendar, to-do lists, and communication devices such as the telephone and instant messaging. The constant use of these technologies become as if routine—not noticed, invisible even—certainly rendered mundane by the

'everyday-ness' of their use. The diversity of specific solutions that people adopt is huge, and spans multiple platforms (personal computers, mobile phones, PDAs), technologies (that are critically a mixture of both digital and physical), and locations (home, work, car, airport lounge). The biggest challenge to designing successful solutions to the problem of how to support PIM, therefore, is to understand this diversity and the impact it has on the appropriateness of particular design proposals.

We are embarking on a programme of research in which we want to address a number of important questions in this space:

- How do people organise and manage information in their everyday lives?
- How do people achieve a balance between multiple competing demands for their time, attention, and presence?
- How do people make others aware of their current situation and future plans?
- How can we develop technologies that:
  - fit better with everyday life as it currently exists?
  - bring together diverse data from multiple sources and on multiple platforms in order for it to be of use?
  - support transitions between physical and digital representations of the information?

In this research we will explore how people navigate the problem space that is managing and sharing their personal information across boundaries between home, work, family, and location. We will follow a combined fieldwork/design approach, iterating between periods of study & reflection, and design & deployment (see figure 1 & section 3). In order to gain a broad coverage of the complex domain we have described, we will conduct fieldwork in multiple locations drawn from settings that include the home and workplace, in a single location, or on the move. The field work we will begin to implement lightweight design sketches and prototypes, maintaining awareness of prior knowledge and design considerations. These lightweight prototypes will then be tested by further fieldwork studies, and revised in the light of our findings until workable solutions are arrived at. This process is in its early stages of development, and we are currently seeking funding to implement this project.

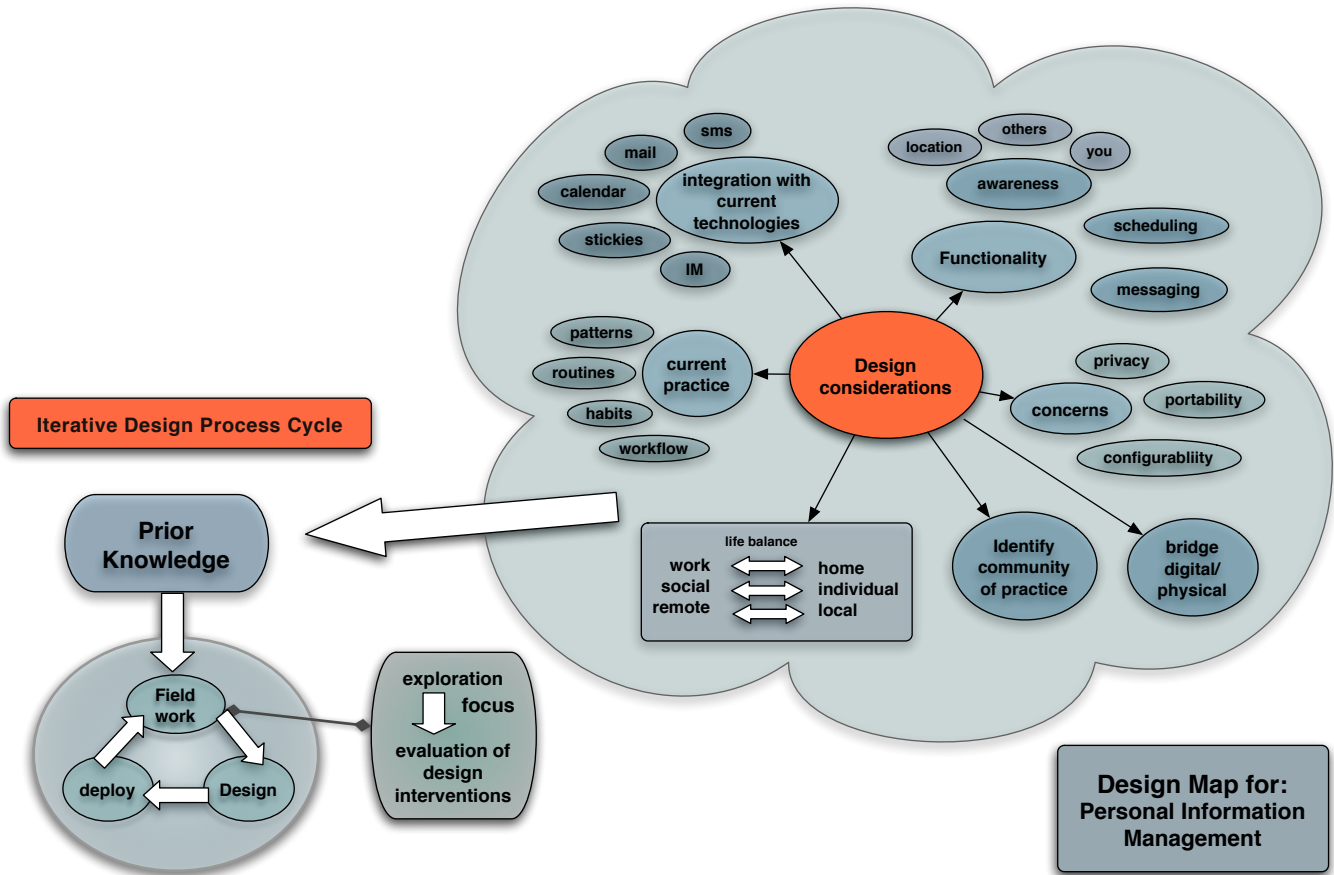


Figure 1: A design map expanding on areas of design considerations as an aspect of prior knowledge, and how they then impact on an iterative design cycle.

## 2. Background

Modern technologies are often presented as labour-saving tools which allow us to achieve more in less time (Edwards & Grinter, 2001). Yet as traditional boundaries between home vs. work activities, local vs. remote collaboration and/ or location, and individual vs. social pursuits become increasingly blurred, so the nature of everyday life becomes more complex and difficult to manage. In this research we will critically examine popular concepts such as:

- Families no longer have a single 'bread winner', with dual income more common, requiring the coordination of multiple work schedules.
- An increasing number of professionals move with their job, or change jobs to different cities and/ or countries for extended periods of time, while still maintaining solid professional and personal bases and networks in previous locations, and with other professionals working in a similar manner.
- People work longer hours, bringing more work home, which is facilitated by computers in the home, broadband networks, and increased availability of networked data storage.
- Electronic communication enables maintenance of more dispersed social networks.

- The volume of electronic data & communication leads to information overload.
- Computers are situated in the home, but often not where they are needed most to support coordination activities, such as at the kitchen table, or by the front door.
- Information arrives at home and at work in both digital and physical media.
- An increasing amount of work is conducted whilst mobile.
- International and national locations that form extensions of the work place may be visited on a regular basis.

## 3. Mapping the design space

In figure 1 above, we map out the problem space in terms of our primary design considerations, and give a high level description of the process we will follow. Our existing knowledge of this space, based on various published sources and first-hand experience, provides a starting point for the design interventions we will make, and indicates the key areas we will be addressing. It is important that the form and function of any tools which claim to support how people actually manage their personal information are informed and inspired by knowledge of current practice. Existing fieldwork has pointed to the importance of routine

and habit in everyday life, both at work and in the home (e.g. Crabtree et al, 2003b), and our fieldwork will aim to confirm and extend such findings. It is equally important that this understanding of current practice addresses the technologies and applications that are currently used, such as calendars, paper sticky notes, email, and lists; and that designs are capable of supporting transitions between them. We are particularly interested in how to address the issues of complexity discussed as background in recognising the nature of contemporary lifestyles, in bridging and extending digital-physical modes of tracking and input/output, and how support can be developed for PIM which help people as they balance their lives between home and work, coordinating with people nearby and afar, and managing their own as well as family and other social group information.

To further expand upon these concepts, the following is one of many potential scenarios which illustrates the kind of design context we are exploring:

*The Simpsons family manage the coordination of their home, work, and school lives via a large calendar on their fridge door. The calendar presents a weekly view which covers both regular occurring events along with one-off appointments and other special occasions. It has a row for each of the family members, and is on a magnetic, write-on/wipe off surface which allows for items to be added and removed. Other calendars are used in the Simpsons' family coordination system, including a similar calendar for next week; Bart & Lisa's school schedules; as well as both parents maintaining separate work calendars for their business meetings and other appointments—Homer in a traditional paper diary, and Marge online in Google Calendar. Information from multiple sources has to be assimilated into this system: notes from school; party invitations in the mail; special offers from local businesses; notes taken about events taken while on the phone, as well as various online interactions and appointments from face-to-face meetings. Alterations to all of these entries can, and do, occur frequently, and have to be accommodated. While Marge is seen as being 'in charge' of the main calendar—even though this has never been discussed or agreed upon—these changes are made by anybody.*

#### 4. Discussion

In exploring this problem space, we are trying to employ multiple methods and approaches from design, social science, and HCI, using an iterative action research-inspired process to combine them through periods of deployment, fieldwork, and design (or alternatively, intervention, observation, and reflection). While domestic technology is not our sole focus with this research, we clearly need to design technology that is equally at home in the home, as it is at work and elsewhere. We therefore need to consider appropriate choices of methods for potentially sensitive settings

The list of questions identified in the introduction imply a holistic approach to understanding the complex nature of information management in the home. Rather than looking at one specific activity in isolation, we need to examine

how multiple activities are accomplished. Many studies and prototype systems have already been made in domestic settings. For example, studies of paper-based list making in home and child-care management (Taylor & Swan, 2004), and building and maintaining family calendars (Neustaedter & Brush, 2006). Elsewhere, prototype systems have been built to explore applications such as displaying reminders on leaving/entering a location (Kim et al, 2004), and tools for social communication (Hindus et al, 2001).

#### 4.1 Prime time carer

In adopting the approach we have outlined here, we hope to be in a position to not only learn from such studies, but also to build and expand upon the findings. For example, studies show that while we design for public/private and single/multi-user concerns, we also need to ensure we design for the single or main user, the lead time keeper as it were. In a family it is most often the mother, or in an organisation this may be an administrator or the secretary—for example it is the secretary of the board who contacts and organises scheduling for members to attend any non-regular meetings. This time carer will be the one who will align and revise the scheduling, list making, etc., so while we are designing for multiple users, we need to consider this one primary stakeholder in their functioning role for many situations (Taylor & Swan, 2004; 2005; Neustaedter & Brush, 2006)

#### 4.2 Visually mapping

When it comes to developing prototypes for deployment in our design cycle, existing systems will provide conceptual starting points for our own design work. For example, Krishnan & Jones (2004) suggest a *TimeSpace: activity-based temporal visualisation* system as a means to integrate our distributed personal information in order to simplify managing and sharing that personal information in our everyday interactions. Certainly the visualisation of that information, not only the means of gathering, but also the means to easily visualise 'our' time schedules, (where our may involve a family, and also various groups or clusters of people) is important to consider in any future design. This will assist in the first instance of making immediately obvious any conflicts for each person, or cluster of people, involved in certain activities in managing competing and multiple demands for each person's time, attention and presence. For these clusters to then be arranged according to events is a beginning step in some form of over-riding time-space meta-level visualisation process.

For, in order to achieve some kind of balance between multiple competing demands, firstly there needs to be an easy means to become aware of them. This calls for a method to easily visualise potential time conflicts and then some kind of ranking system (that includes flexibility—allowing that schedules are often forming in these early stages of planning). As in, some events are moveable, for example a planning meeting for a new project with a new group of people "can we make Wednesday 9am?", whereas others are set, e.g. a weekly swimming class for 10 weeks at school at 3pm. The design of such a visualisation

system would also enable others to be continually aware of each individuals and each clusters (for event-based activities) current situation and future plans.

### 4.3 Messy deployment

Integrating designs with the messiness of everyday life is another concern for us. Much ubicomp research has progressed through 'smart home' developments, where purpose-built environments are used to explore technologies. However, it is important to note that most homes and workplaces are not 'smart' and are only likely to become so in a piecemeal way. Future design then, needs to consider how to deploy into this ad hoc environment where integrating non-standardised technologies (that have difficulties communicating with each other will be a continual problem (Grinter et al, 2005).

### 4.4 Methods

Returning to the earlier comment about methods for sensitive settings, we are particularly interested in how methods can be matched to the design context. In some situations, this will mean following others in the field and supplementing observational study with cultural probes (Crabtree et al, 2003a; Gaver et al, 1999). In others, for example where we have discussed prototype development, our intent as designers in some situations may prompt us to use the terminology of technology probes (Hutchinson et al, 2003), or even sketches (in the sense that you can sketch an idea or concept through a piece of interactive technology) instead. Our approach is one that allows us to combine a series of methods to be adopted sensitively to each individual context—people's personal environments that include their private information. We all operate with different sensitivity levels, what is precious to some may be of little or no concern for others. Adopting an iterative, reflective design cycle for our work is pivotal to successfully engaging in the methodological challenges faced in this research.

## 5. Conclusion

Personal Information Management has typically been treated as a workplace activity, but we believe that there is a real problem to be addressed in understanding how it happens across the multiple boundaries in everyday life—at work, at home, and elsewhere—which makes it very difficult for us to neatly partition and manage our activities. Our approach is to engage with the problem space via an iterative fieldwork-design-deploy cycle within which we can explore multiple contexts with methods selected as appropriate to the setting and design intent.

While we have considered current technologies that bridge the digital-physical divide, we wish to look at the larger problem space before forging ahead on technologies. There is recurrent messiness in all aspects. Plans change ... the knock on affect of one change somewhere may affect many further down the track ... and the technologies don't talk to each other. A key feature of the space that we have to contend with, therefore, is the messiness of everyday life, and how this impacts on appropriate designs that can be

successfully appropriated.

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