Participatory Design in a Technology Resistant Domain

Lyn Pemberton   **Audrey Marshall**   **Flis Henwood**   **Elizabeth S. Guy**

University of Brighton
Brighton BN2 4GJ, UK
LP22@brighton.ac.uk

ABSTRACT

The staff of residential care homes for the elderly have benefited very little from developments in Information Technology, unlike their counterparts in the health services. There is little information available on which to base designs for any future technology to support the work of UK care staff. A project is under way to explore the feasibility and appropriateness of technologies to support communication and information seeking by care workers in homes for the elderly. Use of conventional desktop computers appears to be unpopular in this sector, for reasons that appear sound. Using a combination of workplace observations, a scenario based questionnaire and participatory design workshops, we intend to encourage staff to "leapfrog' the desktop PC, imagining non-PC based systems that might be genuinely useful and acceptable.

Author Keywords

Scenarios, design, workplace observation, social care.

INTRODUCTION

Designing an information system is not done in isolation, but rather in close coordination with the users and environment in which it is applied… It involves understanding the nature of information, the current information systems and the information needs of the organization (or community) being studied… When policies are criticized as being too top down, part of the criticism also has to do with the failure of policy to recognize realities on the ground. [2, p. 87]

The provision of information services for paid care workers has lagged behind provision in comparable professions such as the health services, where a multitude of initatives have been put in place [1, 12, 15, 16, 17, 18]. The spread of digital media, particularly since the advent of the World Wide Web in the mid-1990's, has resulted in health information being more widely available than ever. UK government initiatives have been developed to harness digital media to deliver health-related information to the general public, e.g. NHS Direct, Digital Surgery Door [5]. This is not to mention the volume of commercially provided Web based information. There have also been many recent initiatives to improve timely and effective provision of information to clinical and other staff within the UK's National Health Service (NHS). However this has not been matched by information provision or other services to those in the social care professions [7]. In particular there has been little in the way of extending these or similar services to care workers such as those employed in residential homes for the elderly. Indeed little is known about the day to day communication and information needs of care workers that would allow sensible, well informed design decisions to be made about such provision. As Peace et al point out, "[I]nformation about the real character of residential care is still not easy to obtain: those living and working within its boundaries are not always able, or perhaps inclined, to describe or explain their experiences" [10, p. 88]. This work in progress paper describes a study currently being carried out in response to a brief from the UK's Social Care Institute for Excellence to explore the feasibility and the appropriateness of digital technologies to support the work of paid carers in residential care homes for the elderly. Using a combination of mutually-informing methods we aim to develop a picture of current work practices across the sector and to work with care workers to create and evaluate appropriate support mechanisms using new digital technologies.

BACKGROUND

The UK has approximately 10,000 residential care homes for the elderly. They are run by a variety of bodies - local authorities, housing associations, non-profit-making institutions and private companies - and range from converted hotel buildings to purposes built complexes. Each home tends to house between 20 and 80 residents. Care work is a predominantly female domain. It has traditionally been seen as unskilled, and care assistants (the lowest level of staff) are encouraged to obtain on-the-job training to achieve a vocational qualification. Care assistants are supervised by senior care workers or team leaders, who may also take on some of the responsibilities of managing the home, although these two functions may be separated. The care home sector is distinct from the health services, care home residents being defined as those not in need of continuous medical care.

FIELD STUDIES

The first stage of the study took the form of observations of the care staff in six UK care homes. To guard against regional bias we visited two homes each in London,

Manchester and Sussex, though in fact little regional variation emerged. Typically 6-8 person-hours were spent at each site, with researchers shadowing key staff members (receptionists, care managers, senior care workers, care assistants) as they went about their normal day's (or sometimes night's) work. The emphasis was on observing communication and information seeking behaviours and, via informal opportunistic interviews, eliciting attitudes both to currently used technologies and tools and to potential future uses of digital technologies.

The observations were collated and integrated using techniques from Contextual Design [3], in particular the method's five different work models, i.e. "*flow*, representing the communication and coordination necessary to do the work; *sequence*, showing the detailed work steps necessary to achieve and intent; *artifact*, showing the physical things created to support the work, along g with their structure, usage and intent; *culture*, representing constraints on the work caused by policy, culture or values; and *physical*, showing the physical structure of the work environment as it affects the work" [3, p. 86]. The Culture Model has been particularly helpful here as it allows us a natural way of capturing the care workers' *feelings* about the type of work they are engaged in and about the place of technology in that work. The results from the six sites were then integrated at an Interpretation Workshop, to create a general model of care home work in the UK.

One (planned) result of the observation stage was that it gave the researchers enough insight into the workings of care homes to be able to create reasonably credible scenarios for use in two further strands of the study, the scenario-based questionnaire and the scenario design workshops. The questionnaire is not described here. The planned workshop is described after a brief summary of interim findings from the observation stage.

INTERIM RESULTS FROM OBSERVATIONS

Staff in care homes have developed sophisticated and effective systems that rely on formal and informal face-to-face contact, augmented by paper documents and telephone communication. Every home has diaries and daily record books that are seen as key to their functioning. Senior workers tend to carry small personal notebooks. All homes contain a plethora of different types of notice board and these are actively used throughout each shift. A large number of files are maintained, ranging from the permanent and "official", typically directly related to resident care, to those containing information of local interest only, such as record of chiropodist visits and health and safety officer meetings. The vast majority of these are paper based.

This was very useful to staff in that it made for easy access to information, for instance in response to a family member's phone enquiry. The need for ease of access to information for all staff is a recurring theme.

Information is transferred from shift to shift via "handover meetings" when the person in charge of one shift reports to the senior worker on the next. This may be combined with a task meeting, where work is negotiated between the senior care worker and the team of care assistants. Information *during* a shift is typically relayed face to face. Communication with the world outside the home is overwhelmingly managed by telephone.

Digital technology of any sort is little used. Some variant of devices such as bleepers, buzzer alarms and baby intercoms are used in most homes, but these are simple alerting devices. When terms such as "digital media" and "technology" were mentioned, the tendency was to interpret this as a reference either to distance learning, typically for the NVQ2 award in care, now demanded of 50% of staff at each home, or more frequently to desktop PC's on which residents' long term files were held. Only one or sometimes two PC's are used per home, and they are often kept in a separate, sometimes locked, room, to which only senior staff have access. Some homes use email, but this is not widespread. The view was frequently expressed that the sorts of people who chose to work in care were by nature unlikely to be enthusiastic about computer technology. They were people-oriented and had often had low achievement at school, which they saw as a barrier to competent computer use. However natural antipathy and lack of confidence amongst care workers do not seem to be the primary reasons for the lack of technology in care settings. The drawbacks and inconveniences of the desktop PC in the care setting simply seem to outweigh any advantages it might have. Several senior staff we interviewed had clearly debated more extensive adoption of desktop computer technology and decided against it on what appear to be well-justified grounds of difficulties of physical access to machines, speed and ease of access to information and the lack of visibility of this information when stored in a central machine.

The care home is a domain where there is positive, thoughtful and well-founded resistance to digital technology as currently conceived, i.e. the beige box on the manager's desk. This prompts the speculation that newer technologies such as palmtops or wearables in a ubiquitous computing paradigm might be of more interest.

At this intermediate stage we see three areas where care homes could leapfrog current technologies, avoiding the centralised deskbound PC by using a mixture of personal technologies and public displays.

- *Communication and record keeping* Much work in the care home currently goes into recording snippets of information (e.g. Mrs A wants to go out in her wheelchair this afternoon; Mr B's general practitioner is visiting at 11.30; Mrs C didn't eat much for breakfast…) and either communicating them verbally or transferring them to one or more documents. There was little complaint about this as it was seen as good practice to record every detail of

residents' lives and of the care workers' activities: "if it isn't written down, it hasn't happened" as one manager put it. In other words, recording information is not seen as a problem to which an IT solution is sought, possibly because of the negative connotations of current PC's. However, a combination of handheld input and display device, and a shared whiteboard to display and store notes might cut down on redundancy and trap any stray messages, in a way that might be acceptably easy to use and unintrusive. This would also avoid the physical work of manually entering the information in centralised files.

- *Training support.* Many care assistants are undertaking work-based training for vocational qualifications. This involves gaining credit for competence in activities such as feeding, bathing, communication with residents and so on. At the moment these activities are logged on paper "witness statements" stating that a senior worker has seen them take place. A service that prompted assistants about the credits they needed to have assessed and kept a record of achievement could usefully be provided on an unobtrusive handheld device. This might be similar to the student organiser being developed by Corlett et al [6].

- *Community building.* Intranets seem to be used to some extent in homes that are currently part of groups – at least in the voluntary and not-for-profit area. Email is also used to a limited extent within these groups, e.g. to negotiate staff movement from one home to another to cover a shortage, in preference to using agency staff. They are little used by non-managerial staff and do not exist in the private homes we visited. An information and discussion site could usefully be developed for care staff, to be accessed by conventional PC but also through the more familiar technology of the mobile phone [11].

However, care workers tend to be uninterested in what they refer to as "gadgets" and would, we think, find it very difficult to engage in Future Thinking around new technologies like these without support. We plan to provide this support in a series of scenario based design workshops using variations on techniques familiar from work in other participatory design projects [4, 8, 9, 13, 14].

SCENARIO-BASED DESIGN WORKSHOPS
It is only now that we have developed a good understanding of the work rhythms of care homes and the attitudes of the people who work in them that we feel able to embark on the more conventionally participatory phase of the project. We have two objectives; firstly to encourage participants to engage in some Future Thinking themselves and secondly to give participants an opportunity to react to design ideas we have generated ourselves in response to the findings of the observation phase.

Care workers have been invited to a number of workshops, each for workers of approximately the same grade, so as to avoid inhibitions cased by the presence of superiors/juniors. They will be introduced to a range of props – some real, e.g. keyboards, in-trays, some constructed for the purpose

from cardboard and polystyrene. In small groups they will be asked to use the props to build themselves a mockup of a care setting (corridors, desks, beds and so on) to a level of detail they find useful, and then to act out the likely steps, under current conditions, of a scenario developed from the observations. This is a preparatory stage allowing the group members to discuss their own work practices with people from other settings and to build up trust.

The groups will then be asked to imagine a future, say five years hence, when, as a result of huge Government investment, their environment is saturated with as much digital technology as they care to imagine. Props representing mobile phones, palmtops, iPods, interactive TV's, interactive whiteboards, digital cameras, wearables and embedded devices will be emphasised at this point, to underline the idea that desktop PC should not limit their imagination. They will also be encouraged to imagine "magic' devices that may not yet exist, e.g. gesture-controlled artefacts or robust intelligent Natural language understanding systems. Participants will then be asked to create dramatisations of scenarios using any technology that seems appropriate and to act out the dramatisations to the other groups.

In the third stage, we will act out some scenarios involving the three possible services described above and invite the participants to critique our own Future Visions. They should by this stage of the workshop be confident enough to react freely to our dramatisation. Following the workshop the contributions of the participants and our own design ideas will be integrated and passed to the funding body for consideration for development.

CONCLUSIONS
The project described here is currently at its half way point and we cannot yet draw any firm conclusions. However this does seem to be a domain where resistance to conventional technology is widespread. The danger is that, if staff are unwilling or unable to engage knowledgeably in discussions about the potential of digital technologies, they may find that unsuitable systems are imposed top down. We hope that participatory design workshops, seeded with realistic scenarios drawing on workplace observations will be a means by which they can make voices heard.

ACKNOWLEDGMENTS

REFERENCES
1. Ammenwerth, E., Buchauer, A., Bludau, B. & R. Hau. 2000. Mobile information and communication tools in the hospital. In International Journal of Medical Informatics 57 (2000) pp. 21–40

2. Berg, M. 1999. Patient care information systems and health care work: a sociotechnical approach. In International Journal of Medical Informatics. 55, pp. 87 – 101.

3. Hugh Beyer & Karen Holtzblatt. 1997. Contextual Design: A Customer-Centered Approach to Systems Designs. Academic Press, Inc., 1997

4. Brandt & Messeter, 2004. Facilitating Collaboration through Design Games. Proceedings of PDC 2004, Toronto, pp. 121 – 131.

5. CIBER 2004. Digital consumer health information and advisory services in the UK: a user evaluation and sourcebook. A summary report of the research project: the web, the kiosk, digital TV and the changing face of consumer health information provision: a national impact study. April 2000 – March 2004

6. Corlett, D., Sharples, M., Chan, T., Bull, S. (submitted) A Mobile Learning Organiser for University Students. To appear in Journal of Computer Assisted Learning.

7. Harrison, J., Hepworth M. & P. de Chazal. 2004. NHS and Social Care Interface: a study of social workers' library and information needs. Journal of Librarianship and Information Science, 36/1, pp. 27 - 35.

8. Iacucci, G., K. Kuutti & M. Ranta. 2000. On the move with a Magic Thing: Role Playing in Concept Design of Mobile Services and Devices. Proceedings of Designing Interactive Systems, 2000, pp. 193 – 202.

9. Maze, R. & M. Bueno. 2002. Mixers: a participatory approach to design prototyping. Proceedings of Designing Interactive Systems 2002, pp. 341 – 344.

10. SM Peace, LA Kellaher, DM Willcocks. 1997. Buckingham; Philadelphia: Open University Press

11. Preece, J. 2000. Online Communities: Designing Usability, Supporting Sociability. New York, John Wiley.

12. Smith, Richard. 1996. What Clinical Information do Doctors Need? In BMJ: Information in Practice 7064/313.

13. Strömberg, H., Pirttillä, V. & V. Ikonenen. 2004. Interactive Scenarios – building ubiquitous computing concepts in the spirit of participatory design. In Personal and Ubiquitous Computing. 8, pp. 200 – 207.

14. Svanaes, D. & G. Seland. 2004. Putting the Users center Stage: Role Playing and Low-fi Prototyping Enable End Users to Design mobile Systems. In Proceedings of CHI 2004, pp. 479 – 486.

15. Thompson, D., Williams, P., Nicholas D. and P. Huntington. 2002. Accessibility and usability of a digital TV health information database. Aslib Proceedings, 54, 2, pp. 127 - 141.

16. TOPPS, 2004. The State of the Social Care Workforce 2004. http://www.topssengland.net/

17. Williams, P., Nicholas D., Huntington P. & B. Gunter. 2002. Doc.com: reviewing the literature on remote health information provision. Aslib Proceedings, 54, 2, pp. 127 - 141.

18. Williams, P., Huntington P. & D. Nicholas. 2003. Health Information on the Internet: a qualitative study of NHS Direct Online users. Aslib Proceedings, 55, 5/6, pp. 304 - 312.