

TECHNOLOGY FOR THE HUMDRUM: TRAJECTORIES, INTERACTIONAL NEEDS AND A CARE SETTING

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ABSTRACT

We report on a care setting where staff looking after ex-psychiatric hospital patients used mobile and stationary communications technology (e.g. mobile phones and a messaging system) and physical artefacts (e.g. whiteboards and Post-It notes). Building on previous ethnographic investigations, we show that the concept of trajectory (or an ongoing course of action) was important when generating a particular understanding of staff's care work. We argue that sensitivity to this concept and related subconcepts was helpful in identifying the key transitions, cycles, plans and management issues in staff's ongoing work. We present verified trajectory-informed scenarios and themes emerging from fieldwork and show that the snapshots of work described in the scenarios were useful for establishing current and future interactional needs among staff and residents. We also show how trajectory helped ground a design for a situated display. Finally, we describe the strengths and benefits of trajectory as 'a way of looking' in fieldwork aimed at socio-technical system design in settings where supporting collective, ongoing, contingent care is important.

INTRODUCTION

Recent studies of new technology in situ (e.g. mobile phones, situated digital displays) recognise the problem of understanding such technology as frozen in time and place and offering an explicit, immediate and tangible set of functions to be discovered by the user and, in turn, interpreted by the investigator. The turn towards field and ethnographic studies to get at 'what is really going on' and to respond to the ever-changing role of technology has been a response to this problem in HCI. This 'turn' could trace its origins to responses to problems encountered by CSCW (Computer-Supported Cooperative Work) researchers, captured well by Kuutti's (1996, p21) comment on Liam Bannon's critique of Human Factors:

A third issue for Bannon has been the growing recognition that actual use of systems is a long-term process that cannot be adequately understood by studying just the initial steps of usage. A large part of HCI research has studied only inexperienced users and usually during a relatively short period. In real life, people develop their skills during

longer periods, and this skill-achieving dynamics and its factors have achieved too little emphasis in research.

This well-worn quotation focuses on the shortcomings of brief studies of use to understand skill development using non-representative users. Thus, this particular critique of HCI research in 1996 was mainly concerned with methods. However, our main aim here is not to make claims concerning methods, despite sharing Kuutti's view that studying atypical people in artificial settings over a short period has its dangers. Our main interest concerns how terms like 'skill' and 'task' seem less applicable to particular settings, namely those where ongoing care (e.g. Crabtree et al., 2003) and communication not governed by capital production (Crabtree & Rodden, 2004) pervade. 'Skill', and even 'task', seem to suffer from a paucity of expressive power in such settings. A goal has been defined as "a state of the system [or the world] that the human wishes to achieve" (Preece, 1994, p411) and a task as "the activities required, used or believed to be necessary to achieve a goal using a particular device" (Preece, 1994, p411). However, what if there is no system, device or easily articulatable wish for state change in the world? How can we meaningfully talk of skills to be acquired, work to be done, tasks to be modelled when the notions of achievement or aspiring to goals are somewhat hollow? What if a terminally ill patient needs ongoing, day-to-day, collaborative, negotiated and inevitably humdrum care, not short-term, goal-oriented treatment? How can HCI respond to the design problems posed by these kinds of research settings?

In this paper we attempt to tackle the problem of determining potential technology design and use in a setting where the main 'task' is the care of others. Like Pinelle et al., (2004, p3), we are interested in understanding the "work of working" and the activities of communication and coordination. We distinguish this setting from studies of hospital work or domestic environments. In doing so, we trial particular aspects of Strauss's (1993) notion of ongoing, contingent work for understanding this care setting. We argue that through drawing on this we can understand actors' "interactional needs" (Fitzpatrick, 2003) better in situations where action is purposeful, but less comprehensible in terms of fixed and stable human wishes for change. The role for technology support for medical work in hospitals, in particular on wards (e.g. Bardram & Bossen, 2005; Reddy & Dourish, 2002), in remote healthcare (e.g. Fitzpatrick, 1997) and in specialist areas such as operating theatres (e.g. Watson & Sanderson, 2004), has already been addressed to some degree. These research settings are complex and intricate, but technology has had a role there for some time at least in larger hospitals in developed countries. Our interest here is the potential role of new technologies in settings where 'work' is less about treatment and more about 'mundane' and 'everyday' actions and interactions. We are also concerned, like Reddy and Dourish (2002), with the management of important information. We report on research conducted at community facilities where ex-psychiatric patients, experiencing a variety of illnesses, lived and were cared for by staff. In doing so, like Clarke (1990, p14), we explore how the concept of trajectory (Strauss, 1993), and its accompanying subconcepts, is sensitising rather than definitive. In using it in this manner we attempt to "keep a balance between distortion and conceptualisation..." (Strauss, 1993, p12). Here we are not interested in developing "abstract, decontextualised, or general models" (Crabtree et al., 2003), but in making sense of a small slice of the sometimes "bafflingly complex" (Strauss, 1993, p12) world of social phenomena in order to orient the design technology supporting a variety of interactional needs.

Thus, in the name of sense-making, we explore the usefulness of trajectory, avoiding a debate concerning the notion's ability to generate 'richer', 'thicker', more 'reliable', more 'valid' or more 'generalisable' descriptions than other sets of sensitivities. Instead we, firstly, indirectly appeal to 'higher' criteria (often applied to theories), such as 'fit' and 'understanding' (Strauss and Corbin, 1998), to make a judgement concerning trajectory: Do the findings map onto the reality being described? Do they promote understanding or comprehensibility to respondents and practitioners?

We, secondly, trace particular findings into technology designs, through the presentation of an, albeit completely non-functional, design (Figure 1 below). Finally, we reflect on and consider the work that trajectories did in generating the findings we got and present an account of how they helped and what they were good for.

TRAJECTORIES AND THE SETTING

The appeal to trajectory for application to this setting was based on the knowledge that the care workers there, who were to be the focus of the study, were engaged in the primary activity of caring for ex-psychiatric patients, suffering from a variety of illnesses, in community housing facilities. Previous applications of the notion of trajectory include chronic illness (Strauss et al., 1984) and the articulation of project work (Strauss, 1988). The fact that illness trajectory describes not only the physiological (e.g. the disease process itself) and the temporal (e.g. day-to-day activities) aspects of the disease, but also the sentimental (e.g. emotions concerning confrontation of the disease) and the social (e.g. the social consequences of dependency) promised to provide insights into the complexities of the setting. Strauss's notion of "articulation work" has already been applied to develop a notion of "mobility work" in hospital settings (Bardram & Bossen, 2005). Mobility work attempts to deal with the "spatial aspect of a work trajectory" (ibid, p137) in settings where the configuration of the environment is crucial to ongoing work. For us, Strauss's notions promised to fit the phenomena observed promote understanding (Strauss & Corbin, 1998) of the care work itself: trajectory has already been used to describe chronic illnesses (Strauss et al, 1984). We were less concerned with the ecology of space and the material environment, which was a key concern for Bardram & Bossen (2005). Trajectory also promised to enable us to identify the key concerns at the setting and attend to how these concerns played out through the contingencies of everyday care work.

Strauss (Strauss, 1993, p53) defines a trajectory as: "(1) the course of any experienced phenomenon as it evolves over time (an engineering project, a chronic illness, dying, a social revolution, or national problems attending mass or "uncontrollable" immigration) and (2) the actions and interactions contributing to this evolution."

Strauss also noted how trajectory describes interactions among multiple actors that contribute to a course of action that is contingent and sometimes unmanageable. This could include the management of an individual's psychiatric condition. Thus, trajectories are stretched over time and space, can operate at different levels of abstraction, involve many people and may change course in unanticipated ways. These trajectories are engaged in by actors who belong to particular social worlds.

A social world is defined as a "universe of regulated mutual response [whose boundaries are] set neither by territory nor formal membership but by the limits of effective communication" (Shibutani, 1955, p524). Strauss (1993, p159) stresses that Shibutani was referring to "action" or the act of communicating when referring to "communication". A social world could be a group of carers looking after a psychiatric patient. Here, we are primarily concerned with supporting human action and interaction over time when we consider new technology design and thus we will discuss different kinds of interactional needs (Fitzpatrick, 2003) emerging from notions of social world and trajectory. We are also concerned with how the ongoing membership of a social world is maintained through communication stretched over space and time. Strauss (1978, p122) identified four main aspects of a social world: a primary activity, such as researching, with associated clusters of activity;

sites where these activities occur; technology used to carry out the activities; and evolving divisions of labour.

From prior work at this setting (Crabtree et al., 2003), it was clear that the care workers were very much part of “the...unfolding of a sick person’s disease”, “the total organisation of work done over that course” and “the impact on those involved with that work and its organisation” (Strauss et al., 1984, p64), all important aspects of trajectory. Thus, we approached this research with an acknowledgement that certain trajectory subconcepts may be more relevant than others to the care workers working at both sites. We hypothesised these would be trajectory phasing, trajectory scheme and trajectory management.

Trajectory phasing is “the researcher’s conceptualization of phases, in accordance with changes in the interaction occurring over time “around” the phenomenon as it evolves” (Strauss, 1993, p54). Strauss describes how phases “are properties of the sequence of interactions” (Strauss 1993, p54). Fitzpatrick (2003), in her Locales Framework, fleshed out Strauss’s notion of phase to include temporal rhythms in her conceptualisation of phasing: “the temporal-related concepts of phase, rhythm, and schedule” (ibid, 2003, p127). Her notion of phase is similar to Strauss’s. Trajectory rhythm describes the “periodicity of actions” (ibid). or “cycles of regularly occurring patterns of activity” (ibid, 2003, p128). Trajectory scheduling describes “the way in which actions are related together in temporal work order” (ibid, 2003, p128). Rhythms have gained considerable attention recently in studies of medical work (e.g. Reddy & Dourish, 2002) and domestic settings (e.g. Crabtree and Rodden, 2004). Here we will use phase to capture important stages, changes and transitions in activity. We will use cycles to describe regularly occurring ‘rhythms’ of activity imposed by people acting and interacting at a setting as opposed to reoccurring events. The difference, although subtle, is an important one of perspective: cycle stresses people’s actions and interactions, whereas rhythm stresses history’s patterns and repetitions.

Trajectory scheme describes “the plan consciously designed to shape interaction as desired, given the content of a trajectory projection [or a vision of the expected course of interaction]” (Strauss, 1993, p55). A scheme is “essentially envisioned as an overall strategy that when acted on becomes translated into actual actions” (Strauss, 1993, p55) and could include the written plan for a psychiatric patient’s care. A scheme is “deliberate” and therefore available to the actor and other actors and may result in disagreement and debate. These schemes may be continually revised and reinterpreted and are contextualized by other schemes involving other actors. It is important to both acknowledge the multiple possible interpretations of a trajectory scheme and that these schemes are contextualized by “some organization of strategies” (Strauss, 1993, p56). This notion resonates with the finding that an “abiding concern” (Crabtree et al., 2003) for residents was ongoing planning and monitoring of their medication and that this responsibility was shared with staff at the setting and care professionals in the community.

Trajectory management is “the entire process by which the course of the phenomenon is shaped by actors, through all of its phases and perhaps subphases, by the carrying out of the trajectory scheme” (Strauss, 1993, p56). Strauss described how issues of influence, power, chosen modes of action, preferred interactional styles, spontaneous and deliberate action are all relevant here. Management involves “a negotiated order (negotiation plus the remaining interactional processes)...whereby interactants must come to terms with the goals and actions of each other” (Strauss, 1993, p57). The potential importance of this subconcept emerged from the finding that the environment at the care setting had to be carefully managed through the administering of medication by the residents themselves or by staff for example. This required “knowledge of the setting’s daily routines”

(Crabtree et al., 2003) by the resident and the care worker alike, communication and sometimes ongoing negotiation among a care team operating in the community.

RESEARCHING CARE WORK

Sites and participants

We examined the work of health care workers operating across two sites. One site is staffed all the time, even at night, whereas the other is staffed at regular working hours. At the former site staff live and work alongside the residents, whereas at the latter site staff have a separate office and visit the residents in their semi-independent living flats, although residents regularly visit staff in the staff office. The permanently staffed site was a converted house where residents were free to roam around shared spaces. Residents had their own rooms. The lounge room of this setting formed a communal area for staff and residents alike. Adjoining the lounge there was a small office containing two computers, a fax machine and phone, bookshelves filled with paper files, a whiteboard containing information on residents and a safe to store residents' money and medication. One participant pointed out this site was primarily the home of ten residents that also happened to be the care workers' place of work. The same participant described how legal requirements at this setting demanded the existence of an office and the need to lock things away. The semi-independent living quarters consisted of terraced flats for residents and an office area for staff and residents alike. The office was similar to the space at the permanently staffed site: it also had two computers, a fax machine and phone, bookshelves, a whiteboard and a safe. Staff moved around as part of their work at both sites. Technology, at the time of this study, had already been designed and deployed at both sites based on prior ethnographic studies (Crabtree et al., 2003). The SPAM (SMS Public Asynchronous Messaging) system was developed to support communication and coordination. Specifically, the SPAM system was designed to run an SMS messaging application, allowing staff at the two sites to communicate easily by composing messages using an on-screen keyboard displayed on a touch sensitive screen. One SPAM unit was deployed at each office in October 2002 and since then the units have been used regularly mostly by staff. The care workers themselves, and therefore the participants in this study, were aged between 25 and 58, with education varying from high school education (Certificate of Secondary Education (CSE) qualifications in England) to university degrees. Staff tended to have work experience from unrelated fields and had a varying degree of experience with technology and computers. Approximately half the staff were female.

Method of inquiry

Broadly, this research involved understanding the setting through field methods (Schatzman & Strauss, 1973) and collaboratively sketching the design of new technologies through participatory design (Schuler & Namioka, 1993) methods. The phases of the research are described in detail in Graham et al., 2005b. We were influenced by participative inquiry approaches (Reason, 1994) and co-realisation (Hartswood et al, 2002): we asked participants to confirm our interpretations of their work; we involved participants actively in possible technology design; we adapted our methods of data collection to the sensitivities of the setting; and we coupled a study of participants' work with a technology design process. In addition, this project built on previous ethnographic work, demonstrating a long-term engagement with the setting. The aim of the work was to provide details of the everyday practices through which work was accomplished, identifying the contingencies that could arise, how they were overcome and accommodated, how the interdependencies of a division of labour were actually achieved, how technology was incorporated into work activities, and so on. It was, at least in part, 'being there' which enabled us to identify the cooperative aspects of real time,

real-world work, such as the small-scale constellations of assistance and the awareness of others supporting the actual performance of work activities as actually done in real-time. Thus, the sensitivity to trajectory operated in tandem with the fieldwork, enabling a particular account of the setting to emerge.

The particular techniques we used for understanding participants' work included analysis of server logs recording text interactions between the two sites using SPAM (Cheverst et al., 2004), site visits, semi-structured interviews with researchers involved in the earlier ethnographic investigations, and semi-structured interviews with staff and management. A preliminary phase of the research involved examining the logs of interactions between the two sites using SPAM. This resulted in the selection of quotations from this data (e.g. "mu 2 bol 0 cheeky", "im at the house talking to...") to provoke discussion in the design phase of the research and to refine questions for semi-structured interviews, discussed below.

The initial fieldwork reported on here involved site visits to familiarise one of the research team with the setting and a series of semi-structured interviews. The two semi-structured interviews with researchers and five semi-structured interviews with staff were informed by the concepts of social world and trajectory. Thus, with regard to social world we asked open-ended questions like:

How would you describe your key responsibilities? Do you often work alone, or do you work with others?

With regard to the concept of trajectory we asked open-ended questions such as:

Does your work have particular stages during the day? Are you often aware of planning ahead...?

The sketching of possible new technology designs involved the use of a participatory design workshop to discuss our observations and interpretations of participants' work and to jointly envisage possible technology design through a focus group approach. This phase aimed to confirm that our observations made sense to the participants, making these interpretations public and providing the participants with vignettes around which they could build narratives, much in the way that Gaver et al. (1999) conceive of cultural probes operating within a design process. We wanted to capture and represent some meaningful shards of staff's work, informed by the three trajectory subconcepts discussed above (trajectory phasing, trajectory scheme and trajectory management) so that these 'stories' could be confirmed or disconfirmed, refined or elaborated on. This method involved generating vignettes that resembled 'Daily-use' (Cooper, 1999, p180) scenarios and presenting these 'stories' at the beginning of the design workshop. We then addressed each story's typicality (how authentic the story was), frequency (how often the story occurred) and criticality (how potentially dangerous the consequences could be) in two multidisciplinary groups comprising one technologist, one HCI researcher and two staff members. We also discussed current and potential use of communication technology using these narratives as a starting point.

Data collected & analysis performed

In the preliminary phase of the work reported on here, a segment of the SPAM logs were perused and used to inform subsequent data collection. The first phase of the research, studying the participants, involved the collection of field and interview notes. This mode of data collection was largely driven by the sensitivity of the setting. We conducted a rapid analysis of the field notes and SPAM logs to generate six scenarios for use in the design workshop. This involved structuring 'stories' describing typical activity around the subconcepts of phasing, scheme and management. We also, through interrogation of the logs, field notes and the workshop video transcript (audio only),

evolved a series of Strauss-informed themes descriptive of staff's work. We also photographed visuals describing possible new technology designs generated during the design workshop.

RESULTS

Strass-informed findings

Social worlds and the care teams

From the field data it emerged that staff participated in two main social worlds. The first social world, the Everyday Care Social World was driven by the primary activity of the everyday care of residents within the context the two sites forming the organisation. This activity involved other clusters of activities (Strauss, 1978, p122): visiting, spending time and interacting with residents; manual labour; and clerical duties. Report writing, for instance, was essential to the care of the residents and involved recording residents' mental health issues and documenting particular resident behaviour (e.g. a resident laughing). This 'world' exploited particular technology. This technology was essential for enabling actions and interactions which established and maintained membership and an ongoing division of labour. Land and sometimes mobile phones were used for staff to solicit advice from management. Documents and notices described legal requirements and organisational directives. Staff used a medication book for recording the receipt and distribution of medication. A shared diary was used for recording important information, such as residents' appointments. Carers recorded important events during a work shift in a Communication Book. Word processing applications were used for daily report writing. PostIt notes transferred important information from one care worker to another. CCTV monitored events at the sites. SPAM, was used for social interaction (Graham et al., 2005a), but also had an important role in maintaining particular divisions of labour and "communication zones" (Nardi et al., 2000), particularly when a staff member was alone at one site. Within this social world there was a deliberate attempt to share information about residents through ongoing talk and use of these technologies to sustain residents' care.

In the second social world, the Community Care Social World, multiple individuals were involved in the management of each resident's community care. Individuals with overlapping roles were involved in a Multidisciplinary Team (MDT) responsible for the care of each resident: a Key Worker or staff member allocated to a resident (one staff member oversaw 2-3 residents); a Consultant overseeing the resident's care; a Community Psychiatric Nurse (CPN); a Social Worker; and a General Practitioner (GP). The staff at the setting described distinct roles and even a "lack of integration" within this social world. The membership and allocation of work seemed quite stable and these were less influenced by regular communication. There were also dependencies and particular divisions of labour within this social world: a CPN could not change a resident's medication without contacting a GP for example.

The care trajectory (described below) spanned both these social worlds, but was mainly contextualised by the Everyday Care Social World because the focus of this work was the care workers at the setting.

The care trajectory scheme

There was a sense of a shared scheme among staff that aimed to promote activities among residents that would support an eventual move into the community. This was captured in a Care Plan for each resident. It was important for staff to be aware of these plans which involved the promotion of

routines such as healthy eating and consciously cultivating independent living skills such as being able to cook, adequately manage personal hygiene, manage money and self-medicate. Medication and money management often required agreement: the former involved negotiations between the MDTs and the residents and the latter discussions between staff and residents. On a more mundane level, staff were given a list of tasks to complete, written by the manager, supporting the everyday work of the care trajectory.

Management of residents' care trajectories

Residents' care trajectories were regarded as a shared responsibility among management and the staff: there was a genuine view of shared care. Most of the practices at the setting were designed to shape a trajectory scheme, captured in the Care Plan for each resident. As already noted, this 'trajectory scheme' not only involved the everyday work of caring but also an attempt to progress residents' psychological conditions positively. The everyday work of caring involved cycles of activity, which had key transition points, such as a change of shift (see below). Care beyond everyday work was achieved through a shared awareness of residents' current states and behaviour. This involved continuing vigilance and record-keeping. There was also an attempt, by many staff, to shape the care trajectory in a positive way. For example, staff tried to enable residents to become more independent through encouraging routines of personal hygiene.

Phasing of the care trajectory

There were distinct phases in the trajectories of residents' illnesses that involved collective management and planning. On a day-to-day basis, the care trajectory was supported by regular temporal rhythms (Zerubavel, 1985) and cycles in staff's work. Staff had particular phases to their days, marked by the changeover, or handover between shifts. On a weekly basis, staff tended to work at different times. The three key phases during any shift were the handover from the last staff member, the activity and tasks during the shift itself (e.g. cleaning, giving out reminders to residents), and the handover to the next staff member. This process of handover was managed using talk and the exchange of PostIt notes and involved one staff member informing another of important events during their shift and referring to reports. The staff were also very much aware of residents' phasing so they could react to any changes. A striking reality was that, in many cases, residents' conditions were likely never to improve, but that, for many, they would cycle between being well and unwell. Staff expressed the importance of their knowing about a resident's current phase in her condition in order to manage their care effectively.

Strauss-informed scenarios

In order to describe the routine and everyday work at the setting we wrote six scenarios. Our intention was to capture the richness of the stories that emerged from the fieldwork so that these could be handed back to and confirmed or disconfirmed by participants. We were also concerned with embedding staff's preoccupations with resident care in these narratives, their work's collective and contingent nature and the negotiation of actions and interactions that could span over shifts. In the scenarios the staff's social worlds (mainly the Everyday Care Social World) operated as a backdrop to the particular actions and interactions captured by each trajectory subconcept. In writing the scenarios we consciously created an opportunity for reflection concerning possible new technology design.

Scenario 1: Changing shift

You are coming to the end of your shift and are talking through the day's events with the next member of staff. A resident enters and wants to talk to you desperately. You ask politely for the resident to wait until you have finished talking to the staff member. The resident seems anxious. You stop the changeover and walk to the pool room to talk to the resident.

This scenario captured transition in phasing and the need for management of the resident's care trajectory despite the regular cycles of the day, in this case handover, being disturbed. This scenario was described to be "typical", "irritating" and "vital".

Scenario 2: Forgetting something...

You have come to the end of your shift and walk out of Site 1. As you are on your way out you realise you forgot to write something in your daily report. It wasn't urgent, but it was important for the resident's long term care plan. You make a mental note to write it in a report tomorrow.

This scenario captured transition in phasing and how care workers used an individual scheme (in this case making a mental note) to manage the residents' trajectory of care. This scenario was confirmed as realistic, frequent and critical as the consequences of not recording or sharing important information about residents when staff did not sometimes come in for several days could be very serious.

Scenario 3: Starting the day out...

You start your shift, have your changeover, and then go straight to the table in the lounge room to see what your tasks for the day are. You turn to the other staff member on duty and say: "D'ya want to sort through what we are going to do?" Your colleague nods and you work through the allocation of duties.

We captured the subconcept of scheme here. We wanted to address how plans operate at the setting and who was responsible for them, and find out more about how staff managed the division of labour after the handover transition. The focus group addressing this scenario felt that this scenario was realistic and frequent and could be critical if it involved information pertinent to the provision of medication.

Scenario 4: Next week's fun...

You are taking the residents to the cinema this afternoon and some of them are pretty excited about going. However, some residents don't seem that enthused and have not indicated they are going. You have a chat to a few of them to encourage them to go. They seem a little interested, but seem to need more encouragement.

Here, we captured how staff could help manage resident's care trajectory through a particular scheme that involved residents. The focus group discussing this scenario felt it was realistic, quite frequent and, although not critical in the short-term, very important for the resident's longer-term care trajectory.

Scenario 5: Keeping an eye out

During changeover you are told that Resident1 received some money the previous day and that he had popped out in the afternoon for several hours. After the changeover the resident approaches you

during medication time and asks for some additional medication and money. You are concerned and gently ask what the resident wants the money for.

This scenario addressed trajectory management – the specifics of day-to-day management of resident spending in this case. This scenario was confirmed as “realistic” and quite frequent. The focus group discussing this scenario decided that it could be critical, but that it did not “necessarily have to be”: it being critical or not was determined by if this marked a change in the resident’s patterns of spending and/or medicating and the underlying reasons for this change.

Scenario 6: Out of synch...

You are trying to organise a day trip to Blackpool for a few weeks’ time. During your morning routine when you check on residents you notice that one seems really excited about the trip as she has been to Blackpool before and has some good memories of the place. This is the first time you’ve seen her as excited about something in a long time.

In this scenario we wanted to explore the important phases and cycles of the activities supporting the care trajectory and how cycles of resident activity can sometimes change. The focus group that discussed this scenario agreed that it was infrequent but realistic and very important: they described how it was rare that residents actually had good feelings about themselves. The discussion in this focus group was less concerned with the everyday work of care and the most concerned with the personal nature of care.

INTERACTIONAL NEEDS AND TECHNOLOGY

Although detailed technology design is beyond the scope of this paper (a more detailed discussion is presented in Graham et al, 2005b), we wish to explore how these trajectory-informed scenarios bridged into the design of new technology. The ‘stories’ presented above were successful in ‘provoking’ a response from workshop participants within a process of co-realisation. The notion of trajectory enabled us to capture some of the “temporal order” (Barley, 1988) of the care setting in scenarios that acknowledged the particular nature of care work. We now wish to consider how these ‘stories’ helped describe issues important to technology design.

Analysis of the workshop transcript showed that participants discussed particular interactional needs through the scenarios: informational needs; broadcast needs; and therapeutic needs.

Informational needs, evident in Scenario 2 for example, concerned the exchange of messages supporting the trajectory of residents’ care at the setting. These kinds of needs are similar to those reported by Reddy & Dourish’s (2002) on hospital wards and regarded the need for awareness of cycles of residents’ behaviour and patterns of residents’ spending and medication in particular for the purpose of care. Information about medication was especially important: two residents at the setting had attempted to commit suicide. In both cases information concerning their trajectory of medication was essential. Thus, these needs seemed to emerge from the description of trajectory phasing in the scenarios.

Broadcast needs, evident in Scenario 2 and 4 for example, concerned the visibility of information supporting aspects of residents’ care trajectory. Participants described how this information could include the staff on duty at a particular time, cinema information and advice on healthy eating. This information, as well as supporting awareness of ‘temporal rhythms’ (Zerubavel, 1985) and cycles,

could help manage residents' conditions through allowing them access to information, such as film times, in a "non-confrontational" manner, while allowing filtering of information that "may not be good for their condition", such as pornography. Making information public concerning the phasing of people involved in residents' care trajectory not only made work cycles visible but also served to support residents' trajectory of care: one participant noted how residents "love to know who's on duty" and want "to know who is going to be with us [them] for the next twenty-four hours". These needs seemed to emerge from the description of trajectory phasing, scheme and management in the scenarios.

Therapeutic or more 'phatic' (Vetere et al, 2005) needs, evident in Scenario 6, concerned how social interaction, and, specifically, the act of sharing something, could support the trajectory of residents' care. This could involve the sharing of photos by staff and residents alike. One participant described how it was essential to utilise a positive experience of a resident and how sharing a photograph meant sharing "a life story, of being someone, of being somewhere". Participants felt this could actually serve a therapeutic role: a positive memory could be used to make a resident feel better about herself.

Discussions of the scenarios revealed important aspects of message exchange that should be supported by any communication technology. These findings show there is a potential role for technology in exchanging and highlighting important information about residents over a period of time (such as information on their spending habits) and information concerning residents' point in their care trajectory. These needs contributed to understanding trajectory beyond the singular notion of process towards a more complex, multi-dimensional flow of coordinated events and situations involving support for the psychiatric condition itself, the temporal aspect of the work supporting the condition, and the social consequences of these trajectories.

Participants described how interactional needs were being met currently by the technology in staff's social world, such as printed reports on residents and terrestrial phones. The main focus of these 'technologies' was on meeting informational and broadcast needs, supporting residents' care trajectories. One of the technology solutions that emerged from this discussion and a subsequent desktop design exercise was a situated display, meeting all three sets of needs. One of the focus groups described a large, flat touchscreen placed in a communal area. This display could support the receipt and display of filtered text and picture messages from staff and residents, as well as planned content. The 'planned content' could include information on healthy eating, pictures of staff and residents at different points in their lives, scheduled daytrips, and the staff rota. The potential design of this display is presented below (see Figure 1) and described in more detail in Graham et al., (2005b).



Figure 1: Sketch of Possible Situated Display Design

The participants in the design workshop felt the messaged content would have to be governed by a policy or inappropriate images, such as residents' bottoms, could be sent to the display. The positioning of the display also emerged as important: if the emphasis was on supporting broadcast and therapeutic needs, then the display should be placed in a communal area for residents; if the emphasis was on informational needs, the display should be placed in a communal area for staff.

CONCLUSION: THE WORK THAT TRAJECTORIES DO

“In comparison to the notion of the disease progress, trajectories provide a general analytical view of understanding the broad patterns of the way that people work together. The analytical power of trajectories lies in the ability that it provides us to examine the activities related to taking care of a patient, and the peoples and technologies with which a patient will come into contact during the course of treatment. As the illness unfolds, the work of managing that illness also unfolds.

Trajectories present us a way of examining this management from a number of different perspectives: the patient, nurse, physicians, family and other health-care providers. Although activities and events re-occur during the course of an illness trajectory, the focus is on the work over time for a given patient rather than the re-occurrence per se.” (Reddy and Dourish, 2002, p351).

The notion of a longitudinal, ongoing trajectory of care which is sustained by phased and cyclical actions and interactions, planned for, managed and somewhat contingent was useful for understanding care workers’ interactional needs in particular situations. The perspective of trajectories provided guidance during data collection (e.g. in interview question design), carved out a perspective on the phenomena during analysis (e.g. when generating scenarios) in this setting and provided a basis for enriching an understanding of staff’s interactional needs. The perspective also informed the description of particular features of new technology (e.g. information on staff work cycles) and issues pertinent to the implementation of this new technology (e.g. supporting sharing of information to engender trust). For example, a resident who was in the ‘high’ cycle of manic depression would require particular attention, monitoring, plans and actions depending on how her condition progressed. The care workers also would require particular alertness to the phase of this resident’s condition and the resident herself may feel she particularly needs to know which staff are on duty and how these staff could best be contacted – these describe particular broadcast needs which can be met using situated display technology.

Thus, we mostly agree with Reddy and Dourish (2002) concerning trajectory’s strength in describing the way people coordinate and work together, although it is easy to mistake the temporal aspect of trajectory for what Reddy and Dourish (2003) describe as a rhythm. We believe that the difference is one of perspective: trajectory offers a personalised and subjective view on the various aspects and consequences of, in our case, care work surrounding ex-psychiatric hospital patients living in a residential care facility, whereas rhythm draws attention to a more event-driven view on the repetitions and patterns in such care work.

Our key argument regarding the usefulness of trajectory is threefold. Firstly, the concept of trajectory itself helped alert us to aspects of everyday care work that might otherwise be missed while doing fieldwork, such as care work being shared (in a Multidisciplinary Team for example) and being both routine and contingent or unpredictable: certain jobs had to be negotiated and performed during a shift and unexpected emergencies could also occur. Secondly, particular trajectory concepts and subconcepts helped tune the fieldworker to important segments and cycles of ongoing work (phasing), plans, procedures and rules (scheme) and the detail of how these are carried out (management) when reflecting on the fieldwork. Thirdly, the descriptions that emerged from this particular orientation are longitudinal, multi-dimensional, and have multifarious granularity. The care trajectory describes how care continued from one shift to the next, one day to the next, one week to the next and so on. It also describes care for the physiological, temporal and social aspects of care: residents had good and bad days and some residents’ conditions were more acute or degenerative than others; medication had to be distributed at particular times; and residents and staff alike needed to talk to someone at particular times. The trajectory-oriented descriptions can also be quite general, illustrated by the finding that there are three main phases in a day, or quite specific, illustrated by the finding that the main part of a shift, in turn, had its own set of phases such as an initial phase of task allocation. Finally, and not unrelated to the last point, trajectory was important for evoking descriptions of needs beyond the ‘work’ aspect of care. Scenario 4 and 6, for example, centred on supporting residents’ therapeutic needs and seemed the least ‘work’ oriented: there was little sense of goal, task or management of the physiological aspects of mental illness or negotiated, temporal order in either. Instead, they reflect the sentimental and social aspects of carers’ day-to-day interactions dealing with an ongoing illness trajectory (Strauss et al., 1984) and the need to cultivate

an organisational context to support the healthy progression of a psychiatric condition through its phases.

The sensitivity to trajectory alone does not magically provide technology designs, but coupled with knowledge of the sites, clusters of activity and divisions of labour at the setting gained through fieldwork, the chance of technology design grounded in the key concerns of the setting is increased. This sensitivity and the fieldwork do not eliminate the need for the particular design approaches: for example, we used a design workshop to bridge into design. But part of the challenge here was making sense when the nature of the setting meant that limited proximity to participants was possible. Thus, for instance, handover, and thus important conversational exchanges, could not be observed due to reasons of resident confidentiality, although the visits to the sites that necessarily surrounded the in-depth interviews informed the findings. This ‘distance’ was mitigated through the deployment of concepts and subconcepts used to describe not dissimilar contexts, i.e. trajectory, phasing, scheme and management, as well as particular research techniques such as repeated member checking (Guba and Lincoln, 1989) and discussions within the research team during data collection.

Randall et al., (2005) suggest that there are disciplinary “sensibilities” in CSCW that describe “the kind of things that we often find” and provide us with “a way of looking”. These “tropes” are not exhaustive but instead offer a guide to doing design-oriented fieldwork while offering a compromise between thick ethnographic descriptions and the non-indexical categories and, at times, dehumanised descriptions emerging from approaches such as grounded analysis (Glaser and Strauss, 1967). Like Reddy and Dourish (2002) we believe trajectory established an analytical focus for the work at the setting that evolved as it progressed: What were the important work groupings? What important patterns of work occurred and recurred in a work day? What concern did the carers have? What mechanisms did the carers have for continuing resident care? How did the carers carry out management plans and directives? What knowledge did the carers have that enabled them to do their jobs? What did the carers use particular technologies (e.g. the phone) for? These questions, like the ‘tropes’ described by Randall et al. (2005), provided important guidance for presenting the non-linear threads of the design-oriented fieldwork described here. These same questions also offer the possibility of being used in other settings where collective care is important and ‘work’ is multi-dimensional, ongoing and contingent in nature.

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