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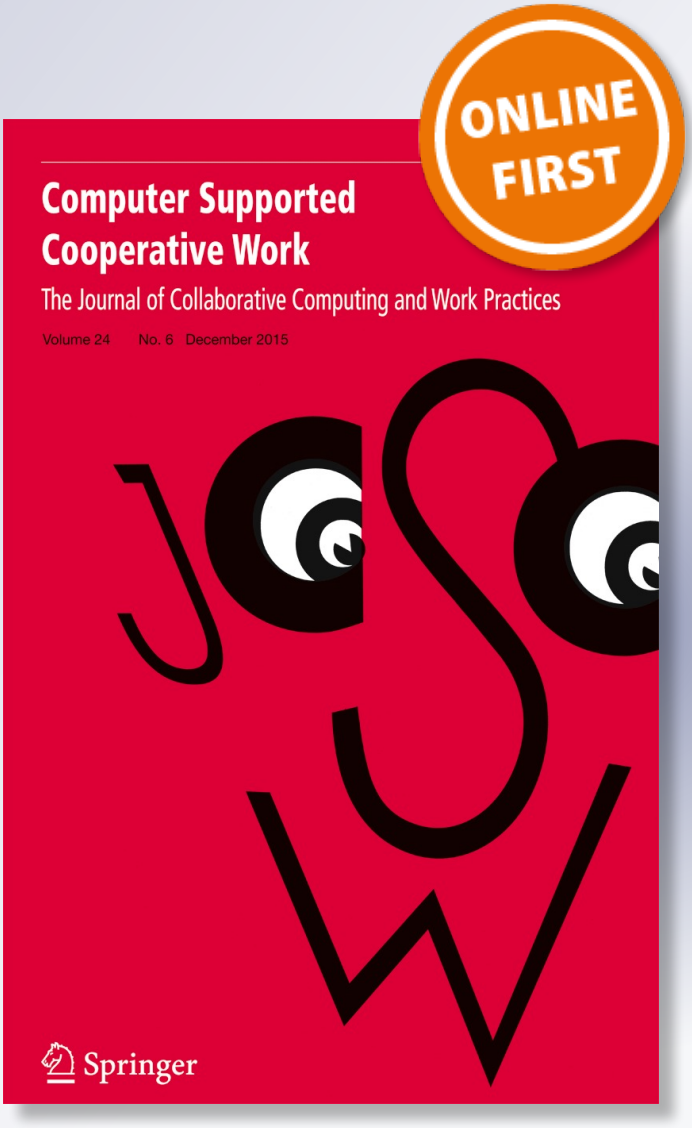

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Abstract. We report findings from a study of call centre staff working to deliver a telecare service designed to enable older people to 'age in place'. We show the steps they routinely take to produce a care system on behalf of their clients and their families that is both workable within the constraints of available resources and fit-for-purpose. In doing so, we have seen how call centre staff share with one another their experiences and solutions to problems, carry out liaison work with networks of lay carers, and generally act as the 'glue' providing the all-important link between otherwise fragmented services. We conclude with some thoughts on the significant technical and organizational challenges if the 'ageing in place' vision is to be realized in a practical, secure, dependable and cost-effective way.

Keywords: Call centre work, Co-production, Assisted living, Ageing in place, Collaboration, Telecare, Telehealth

1. Introduction

Throughout the OECD nations, an ageing population is fuelling interest in assisted living technologies (ALTs) and care services to support 'ageing in place' through 'care at a distance' (Roberts et al. 2012)—that is, measures to enable older people to live independently at home, avoid or defer institutional care in later life and remain active participants in society. These measures are seen by health and social care policy makers as a solution to the inter-related trends of ageing of the baby boom generation; rising rates of chronic illness and disability; shortfalls in health system capacity and budgets; and shifting social roles and expectations.

A range of ALTs (e.g., sensors, devices and communication systems) and service models (e.g., telehealth—remote medical care, treatment or monitoring—and telecare—remote social care services or monitoring) have been developed and are now being deployed (Lewin et al. 2010). However, uptake has fallen significantly short of levels desired by policymakers (Vasunilashorn et al. 2012). Recent UK studies show evidence of reluctance by intended users to adopt and evidence of the benefits being sustainable is mixed (Sanders et al. 2012). Despite this, recent

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initiatives such as the UK Technology Strategy Board's £23 M 'delivering assisted living lifestyles at scale' (dallas)[1] programme aim to accelerate the deployment of ALTs and services.

Our research in the ATHENE project[2] revealed a number of reasons for the gap between policy aspirations and real-world use of ALTs. One is a lack of consensus between stakeholders (policy makers, technology suppliers, service providers, groups representing interests of older people, academic researchers, older people and their 'informal' carers) as to what the 'organising vision' of ageing in place is (Greenhalgh et al. 2012). A second reason is the lack of fit between older people's day-to-day support needs, and the technologies and services on offer to meet them (Greenhalgh et al. 2013; Procter et al. 2014). We argued that these problems will persist unless policy-makers, technology suppliers and health and social care providers devote more resources to understanding and supporting ageing in place as it is achieved day-to-day by older people and their carers.

Our ethnographic investigations revealed in rich detail how ageing in place is socially and collaboratively accomplished—'co-produced'—by the efforts of both formal (e.g., ALT device installers, health and social care departments, telecare call centre workers, sheltered housing staff) and informal (e.g., family, friends, neighbours) networks of care (Bratteteig and Wagner 2013). Successful use of ALTs often depends on 'bricolage' (pragmatic customisation, combining new with legacy devices) by members of care recipients' informal care networks. Unfortunately, neither ALT design, nor the ways that care services are typically configured, acknowledge this critical dependency, making the efforts of informal carers undervalued, "largely invisible to invisible to professionals, managers and designers" (Moreira 2008, p. 102), and, consequently, of limited effectiveness. Our evidence is UK specific, but studies of other countries report similar findings (e.g., Breskovic et al. 2013), suggesting that this is increasingly global problem. If it is to be addressed, then technology suppliers and service providers must develop ways of supporting ageing in place as experienced by older people and their informal carers.

Our findings are consistent with those of other researchers who have concluded that many of the problems in delivering telecare services lie in the difficulties carers may experience in mobilising the knowledge and skills in the wider social network (family, friends and neighbours) in which the older person is embedded (Roberts et al. 2012). In this paper, we explore these difficulties by looking closely at the work of telecare call centre staff as they deal day-to-day with the people they support. We also document the role of telecare call centre staff in the co-production of telecare, showing how 'professional' (e.g., telecare call centre staff) and 'lay' (i.e., informal) carers contingently collaborate to ensure that technologies and services are better matched to people's needs and the problems they have to overcome to achieve this.

The remainder of this paper is structured as follows. First, we briefly describe the ATHENE study from which our ethnographic data is derived. Next, we describe the

affordances and socio-material properties of the particular technologies relevant to our study. We outline our methodology and analytic approach, and the call centres where the ethnographic observation took place. We set out key descriptive findings with illustrative excerpts from our field notes, before offering a more analytic approach. Finally, we theorise our findings with reference to the wider literature and propose some principles for practice and policy.

2. The ATHENE project

The ATHENE (Assistive Technologies for Healthy Living in Elders: Needs Assessment by Ethnography) project (Greenhalgh et al. 2011) was funded by the Technology Strategy Board under its Assisted Living Innovation Platform programme.[3] The project sought to produce a rich understanding of the lived experiences and needs of older people, and explore how stakeholders—suppliers, health and social care providers—can work with care recipients and carers to 'co-produce' ALT and service solutions.

The project consisted of three phases. Phase one involved interviews with ALT suppliers and service providers. This was followed by detailed ethnographic studies of 40 individual cases in and around the person's home to map the complex healthcare, social care and socio-cultural needs of older people and their carers from a range of ethnic and social groups. Phase two took forward exemplar cases and used participatory design methods to explore how older people and their families can work directly with industry designers to produce fit-for-purpose technologies, or adapt existing technologies, that fit in with people's lives and lifestyles. Phase three involved ethnographic studies of the work of staff in a sample of telecare call centres. Ethical approval was granted from Queen Mary University of London Research Ethics Committee (QMREC2011/38 1st June 2011), Harrow NHS Research Ethics Committee (11/LO/0737, 8th July 2011) and subsequent amendments.

3. Assisted living technologies and services

Ageing in place support covers a diverse range of technologies and care services that enable prompting (e.g., medication reminders) or remote monitoring of individuals (e.g., blood pressure and blood sugar levels, falls detection, room occupancy, location of wanderers) and/or homes (e.g., detection of smoke, heat, gas, overflowing baths and unlocked doors). Of the 1.7 million installations in the UK, all but 300,000 are pendant alarms (Clark and Goodwin 2010).

The pendant alarms that form the bulk of ALT devices in the UK are generally linked directly to local social services departments or (more commonly in our experience) to call centres, which assume some level of responsibility to interpret and respond to the signals. Care recipients may be charged for the technology and/or the service that is supported by it. With advances in Internet and mobile technologies, there has also been growing interest in using the functionality of pendant alarms

(designed for emergency use) in a more routine way to alleviate loneliness by supporting social connectivity (e.g., Wherton and Prendergast 2009), though some authors have expressed concerns that this might lead to a reduction in the provision of traditional face-to-face care and decreased social contact (Milligan et al. 2011). For example, the EU Ambient Assisted Living (AAL) Joint Programme,[4] launched in 2009, focused on developing "ICT based solutions for advancement of social interaction of the elderly".

The current generation of devices can be set up to connect with 24-hour call centres, family members or some combination of these. For example, call centre staff typically have an arrangement with the families of their clients as to who will be called, under what circumstances and what actions will be taken when an alarm is triggered. Interviews with people involved in the development of ALT devices and provision of services in the UK (for a full account see Sugarhood et al. 2014) illustrated that for the technology to 'work' effectively, this network of professional and lay carers (the technology's 'soft periphery' (Denis et al. 2002)) must be adaptable to the needs of the client, though we found that this did not always occur in practice.

Previous studies of telecare call centre work have shown how the use of the technology becomes interwoven with existing social networks and hands-on care, shaping the meaning of care and the role of call takers (Pols 2010; Pols and Willems 2011; Milligan et al. 2011; Roberts et al. 2012). The EFORTT project illustrated how call takers undertake a variety of complex tasks in their efforts to ensure that older people benefit. Call takers need to join up information and be able to call 'contacts' when a situation is unclear or ambiguous. In addition, they have been found to carry out 'emotional labour' (Roberts et al. 2012), providing essential social contact to people who are lonely or confused, and reassurance to those in crisis until help arrives.

In this paper, we will focus on the work of telecare call centre staff to deal with the complex and diverse needs of their clients. Our interest here lies in understanding the work of call centre staff as they receive calls from clients and attempt to diagnose the or triage 'the problem' and to determine 'what is to be done' to resolve it. As we document below, this typically involves *inter alia*, talking to the client, examining past records of call and client health encounters held on the system, conferring with colleagues in the call centre and making contact with external parties—e.g., emergency services, social care, sheltered housing staff and lay carers—who may be able to assist in the 'triaging' of the problem and/or be in a position to help resolve it.

A fundamental requirement for this work, of course, is that it is done in a timely and dependable way, notwithstanding the fact that this may involve telecare staff relying on the responses and efforts of distributed participants, both professional and lay. In a fundamental sense, then, call triaging and resolution is collaborative work, a co-production whose effectiveness, timeliness and dependability relies on the capacity of telecare centre staff to identify, assemble and coordinate a set of resources, both technical and social (Procter et al. 2012), through a series of situated, practical actions. Most important, in many cases, is the network of expertise, both local and distributed. This has implications for the design of ALT systems but design is not

always guaranteed to deliver systems that meet requirements. Hence, dependability is often achieved through people's capacity to work *around* rather than *with* the system. As we have seen in many previous studies of technologies-in-use (e.g., Hartswood et al. 2003a; Alberdi, et al. 2005; Clarke et al. 2006; Anderson et al. 2008; Voss et al. 2000), such workarounds often involve using systems in ways that were not intended by their designers.

In the extracts from our call centre fieldwork below, in some cases these workarounds were spontaneously crafted as ad-hoc, 'one time' only responses to problems that were subsequently set aside and, perhaps, forgotten. In other cases, through reflection and sharing experiences with professional colleagues and lay carers, these workarounds sometimes became 'routinised' (Greenhalgh et al. 2004), leading to the adaptation of procedures in order to deal with what became recognised as the 'normal, natural troubles' (Garfinkel and Bittner 1967) of telecare call centre work. Less frequently, but equally importantly, these workarounds also prompted the re-specification of services so that they more closely matched the needs of the client and the resources (technical and social) available.

4. Methodology

We carried out ethnomethodologically-informed ethnographic studies (Hughes et al. 1994) of four telecare call centres. The method observes in detail everyday working practices and seeks to explicate the numerous, situated ways in which those practices are actually achieved, and the material and other affordances that such an achievement turns upon. Our data comprised 135 pages of typewritten field notes and transcriptions of the verbatim talk of telecare call centre staff as they went about their everyday work. Such an approach is attentive to the ways in which the work actually 'gets done'; the recognition of the tacit skills and cooperative activities through which work is accomplished as an everyday, mundane, practical activity and in making these processes and practices 'visible'. The method seeks to explicate the situated character of work, the work seen as a practical production by social actors performing their activities within all the contingencies of local circumstances, to portray the variety of activities and interactions that comprise the 'workaday' of working life and the ways in which these are understood and accomplished by those who do that work.

The fieldworkers took notes and discussions with call centre workers were recorded and subsequently transcribed. Transcribed interview data and fieldwork notes were analysed to identify recurrent themes, which were refined in an iterative and inductive way (Strauss and Corbin 1990). For confidentiality reasons, all data has been anonymised.

5. The call centres

Three of our field sites were telecare call centres and one a combined telecare/telehealth call centre. We spent up to six hours in each centre observing the work,

listening in to calls and talking with staff about how the systems operate and how they make decisions. The aims were to understand the kinds of issues callers have, how call takers resolve them and the resources they call upon to do this. We have used pseudonyms for all service staff, organisations and technology suppliers/products to preserve anonymity.

The Big Town community alarm monitoring service is located (after several changes over the years) in the Big Town Social Services department in a suburb. It is a 1960s office block in the midst of boarded-up council houses. In the monitoring room there are 4 computer stations in a semicircle, each with a board behind the computer but not obscuring the view of the other officers, so they can freely talk to each other. There are other desks and computers against the walls. There are two community alarm officers taking the calls. Two more are out of the office returning keys to clients and wardens and being on hand to respond to emergency calls.

In the following fieldwork extract, a Big Town telecare centre staff member explains details of the information displayed on the system when a call is received.

> The screen is divided into boxes, noting the calls made, contact details of the person and their carers and family members and a box for medical information. An example of the medical information on the screen is
>
> "Depression, stroke, left side weakness"
>
> There are 10 numbered lines for inputting information. They may start off with basic information for a new person but the information will build up as the monitoring officers get to know people. The monitoring officers always have a look at what has previously happened when they get a call.
>
> Fieldwork extract 1: Big Town telecare call centre.

The responding officers are primarily based in the community to respond to calls from the Ambulance Service to lift people who have fallen and called 999. In these cases a paramedic triages the case over the phone and, if there is no injury, calls the community alarm responding officers. This collaboration with the ambulance service was developed because of the long waiting times for ambulances (it could be up to 4 hours). The community responding officers can be there in minutes. Staff calls are monitored and they are accredited with the Telecare Services Association (TSA), a nationally recognised (UK) standards body. To be accredited, service providers must demonstrate compliance with a code of practice that covers, *inter alia*, call response times.[1]

The 'East City' call centre provides a call answering service to 128 (mostly warden-controlled) sheltered housing schemes in various districts within a large

[1] See http://www.tsa-voice.org.uk/standards/telecare-code-of-practice

conurbation. This is mostly an out-of-hours service for when there is no warden on-site. The call centre provides a call answering service to almost 9000 individuals, including private homes, and a home response service (i.e., actually visiting the home of the client if required when no-one else is available).

The centre is one large open plan room, with a kitchen and toilets off one side. There are desk spaces for six staff—four on one side where the call takers sit, and two on the other where the managers sit. It's very tidy with lots of space. There are filing cabinets and trays/pigeon holes around the walls, as well as a large map of East City, a whiteboard (on which staff sign in/out, write where they are) and a framed TSA membership certificate.

A total of 16 staff are employed full time (all women), with a bank of casual staff called upon as well. Some staff only work the day shift (Monday–Friday 08:00–16:00) but others rotate for 1 week periods (e.g., 1 week at 08:00–16:00, the next at 16:00–00:00 and so on). The staff like this as they get paid extra for evenings and weekends (one third above basic salary). However, this is about to change in a cost-cutting exercise—there will be fixed shifts and the casual workers (who get paid less for night-work) will cover more of the expensive night shifts. There has also been some downgrading of posts when staff left.

On the shift observed there were four staff—one manager (Caroline, who has worked here for 14 years) and three call responders. There are usually six or seven staff on the rota during the day shift, which is the busiest as it includes going on home visits for assessments of new clients, complete maintenance, trigger test calls, etc.

The system used by the East City call centre is Alphatec 'Responder'. When on shift, all staff have the same screen in front of them. When a call comes in, any one of the staff members can answer it. They appear to cooperate well in taking turns. On this shift, the operators allowed the service manager to answer some of the calls so that the fieldworker could listen in.

The computer screen is split into two halves—the top half is 'Alarm calls', triggered by a telecare device, and the bottom half is 'Voice calls', triggered by someone telephoning the service. As soon as an alarm call is answered, the specific device that triggered the call and the client's details appear on the screen. Lots of data is available e.g., contact numbers, GP details, medical and medication history, information about the client's habits (e.g., "often lets strangers into the house"). There is also a log of all past calls and contact (device, date etc.), shown on screen in table form.

All calls are automatically audio recorded, stored and can be played back. The logs are (very) occasionally used in social work case reviews, e.g., in a safeguarding situation, or reviewing a complex 'heavy user' of telecare who is frequently making calls to the centre. Certain actions on the screen trigger a 'safety' box to appear. e.g.,: ARE YOU SURE YOU WANT TO DIAL 999? and ARE YOU SURE YOU WANT TO END THIS CALL?

At the end of each call, the call centre worker enters some details of what happened—usually tick boxes about the reason for the call and sometimes some free text. The free text seems to be used if it will help clarify the situation the next time this person calls. If no further action is being taken as a result of the call, then this is the end of the 'episode'. Most calls are over and done with very quickly (see below).

If further action is being taken (e.g., an ambulance has been called, a referral to another service) then the call is 'parked'. At the bottom of the screen is an icon recording how many current parked calls there are (this varied between 3 and 8 during the observation period). Every now and then someone looks at the parked calls and checks on progress where appropriate (e.g., the client has unplugged the telecare control unit for some reason and the call is parked awaiting a home visit by a relative to reconnect the unit). If a parked call cannot be resolved the same day, then the action is transferred to a paper log book in the office.

Small Town telecare is located in a single storey, purpose built office on the outskirts of the town, in a residential area. Staff say this is convenient as there is plentiful and free parking, so they can come and go easily. The call centre provides call answering service for the whole of the region, 21,000 individual connections, including lots of sheltered housing schemes. It also provides the assessment, installation and mobile response (home visit) service for Small Town council.

There is a main call centre area, with four desks/cubicles facing each other—these are the four main response desks where the staff sit. They have the phone and PC (with Totaltec software), which brings up information about the caller once the call has been initiated. The system also provides prompt reminders to the call taker—e.g., at times when a client must be called to be reminded to take their medication. One client is called daily to use their dialysis machine, and then is called again two hours later to stop using it.

There is also an administrator on a separate desk in the corner of the room, and an unmanned desk for the 'WatchMe' (GPS locating) service on a spare desk at the side of the room. This system is not linked to the main telecare computer system, and no particular person takes responsibility for this desk. If all staff are on a call, then spill over calls come through to other telephones (e.g., administrator's desk, manager's desk)—which the other staff (e.g., administrator, managers, technician) will take—this means that everyone within the organisation must know what to do and say when taking the calls to enable a high degree of flexibility.

The main system at Small Town is Totaltec. Differences from the Alphatec system (in East City) include that alarm calls are automatically prioritised by the software, so the call taker just picks up the next call and the screen only shows incoming calls triggered by telecare devices. Voice calls to the service are separate from the system and not recorded. On one wall is a TV screen showing a graph with live data hour by hour over the past 48 hours. There are 3 lines showing number of calls, average response time and average call length. The target response time to answer a call, which is set by the TSA is 98.5 % within 60 s and 99.9 % within 90 s.

CallCo is a private sector telecare service provider based in Gardenshire, and covers 120,000 connections nationally—this includes telecare and lone worker monitoring. The telecare component is one of the largest UK providers of personal telecare alarms. The team recently moved to the new headquarters building in Gardenshire, on a large industrial estate. The main section of the building is open plan, where all staff are based (management, sales, technical support, call takers, service design). It consists of over 100 desks/computer stations.

The office is divided into two areas—call takers on one end and management on the other. They have 80 call takers in total. Approximately 20 were on shift during the observation period. A large TV screen on the wall at the call takers' end—presenting calls in progress calls and calls waiting to be answered (each as a separate row). If a call was in progress, the row would be shaded grey; if the call was waiting, it would be white. The shared display allows call takers and managers to keep an eye on the ratio of answered and waiting calls (i.e., only 1 or 2 calls should be shaded white).

The call takers use the 'UNP' software platform to manage calls. CallCo recently invested in this platform as it is open to a broad range of suppliers (unlike many other telecare monitoring platforms, such as the Totaltec software platform which they previously used). The UNP interface displays the caller details, record of previous calls, and key information/procedures to manage the call (e.g., family contacts, hearing impairments, mood swings), which the call taker scans for relevant information while answering the call.

Once a call has been answered and closed, the staff member writes a brief note for the client's records, e.g., nature of call, whether it was a false alarm, etc., as well as any other information gathered, e.g., if the client is not feeling well, complained about a noise next door, etc.

6. Findings

We provide below a series of selected extracts from fieldwork records. In accord with our ethical protocol the names of participants and other identifiable information have been anonymised. The extracts illustrate a range of themes reflecting the daily work of call centre staff, *inter alia*: 'triaging' and call resolution; emotional labour; the importance of local knowledge; collaboration with lay carers; adaptation of technologies and services—all of which is analysed in greater detail in the following section of the paper. Presenting these extracts en masse, as a block, provides a reflection of the everyday, continuous and persistent work of telecare centres, exemplifying Sánchez-Criado et al.'s (2014) notion of 'instauration', suggesting not only how telecare operators and users work together to establish and maintain the 'felicity conditions' of the technical and relational processes of telecare but also the ways in which such concerns go well beyond the installation phase but are a permanent and ongoing feature of everyday telecare work. The extracts taken together also serve to highlight some more general aspects of the design and co-design process: in particular, practices of engagement, articulation and translation; connecting and

reconnecting with users of various kinds, developing and articulating requirements and translating these through the process of co-design into eventual improvements to the service.

6.1. Responding to calls and tracking resolution

In the following two extracts, we see how call centre staff respond to a call, mobilising the network of professional carers to go on site and provide assistance.

> Shane answers a call. The details of the client have appeared on the screen. It's a 97 years old man.
>
> "Hello Mr Johnson"
>
> No answer
>
> Shane shouts.
>
> "What's the matter Stephen?" (changing to using the person's first name to try and get a response).
>
> No answer.
>
> Shane shouts again,
>
> "Have you hurt yourself?"
>
> He shouts again.
>
> "Have you hurt yourself?"
>
> Eventually there's a reply. Mr Johnson says he isn't hurt so he doesn't need an ambulance, he just needs lifting up off the floor. Shane puts Mr Johnson on hold and alerts Marion, one of the responding officers in the community. He tells Marion that there are two key safes (where copies of residents' keys are kept securely), one for the porch door and one for the front door. Shane gives her the codes for the key safe boxes. He gets back to Mr Johnson and tells him help is on the way.
>
> Later, the responding officers phone the office to say they've lifted Mr Johnson, it's taken them 12 min from him calling to him being picked up. If one of the responding officers is not available because they are busy with Ambulance Service calls, then one of the office-based officers will go out to the call. And if one of them goes out then the duty manager comes in to help in the monitoring room.

Fieldwork extract 2: Big Town telecare call centre.

Mr Smith presses his pendant alarm. He says he is on the floor and cannot get up. Caroline asks if he is hurt—he says no. She tells me that if he was injured she would call directly for an ambulance. He says he is on the floor and just needs someone to get him up again; he laughs and appears not to be distressed. He is from an outlying area, so Caroline calls the response team there. Someone does answer after just a couple of rings. Again, he and Caroline are on first name terms. She tells him Mr Smith's details (name, identification number), and he is found quickly on their system. The notes on the screen indicate that he is large and needs two people to lift him from the floor, even with equipment.

The response team for the area say they are on the case. Caroline then tells Mr Smith (who has been left on hold) that someone will be with him shortly. The call is then parked, to be followed up in half an hour or so to check that he has indeed been helped up from the floor. What actually happens is that the responders press the alarm as they are about to leave the home, to let the call centre know that the situation has been resolved. Caroline ticks the relevant boxes on the client's record and makes some comments, and the case is closed (for now).

Fieldwork extract 3: East City telecare call centre.

6.2. Dealing with technology installation problems in the home

As the following two fieldwork extracts illustrate, installing the technology can sometimes demand practical, hands-on effort and commitment on the part of the staff and service users:

"We had this gentleman, he was quite technology savvy and he was getting it installed in his house. And he was like, "No, I can install it, it's fine." So we sent the equipment out to him by postal pack and he was like, "It's not working." So we sent a technician out to install it all for him. And on site he had loads and loads of stuff plugged into his phone line. He had so many different technical things—fax machine, printers, broadband. And it was just literally a case of unplugging each one and seeing which one was taking up the telephone line—because he literally didn't have enough telephone line use to be able to actually call through to us. So it was literally a case of unplugging—not his broadband but something else that was connected to it. It's fine now because there's technically enough room on the phone line for the lifeline to actually call through. It was mad, he even sent us a diagram because there was so much that was plugged into it. There was loads. It took us a lot longer to figure everything out, what he actually had plugged into the thing."

Fieldwork extract 4: CallCo telecare call centre.

"There was one existing client and he had one specific type of unit first and it was working fine. And then there was a fault on it and it wasn't calling through. So we replaced it with a new unit. The user had a Totaltec piece of equipment that was quite old, so we sent out a new piece of equipment that we use. It wouldn't work at all. We even sent someone out and they were like, "It's not working." So we sent out another device. Still not working… So we were like, "Right, okay, let's sort this all out." So we did all the testing here [in the call centre], it worked fine here, absolutely fine. So we sent it out again and then it was like, it's not working. So in the end we sent someone else out and they managed to get it working. Through discussion with the client, we found out that the one he had before was in a different position to where he was putting the new one. So it was literally that… We literally sent someone out with both the pieces of equipment, programmed with what he needed. And it was only through asking questions like, "Where did you actually have it before?" I don't know what was in the wall. I think they tested it and there was—it was a really old—I don't know if it had a different kind of lead in it or something. It was just really bizarre. It was this certain part of the room that when he was testing it all in, there was something there that just wasn't working. So when we actually put it outside that room, he could use it all over the house, it was absolutely fine."

Fieldwork extract 5: CallCo telecare call centre.

6.3. Using knowledge of clients' routines to triage calls

In the next two extracts, we see how call centre staff draw upon knowledge of clients' daily routine to help them triage calls. This first extract also highlights how system adaptations are necessarily driven by accumulated experience of their use, the technical challenges of adapting the system to the needs of a particular client and how call centre staff recognise the value of teamwork.

A bed sensor has gone off. The person likes to get up about 10.30 but if he's in bed longer than that the bed sensor will alarm. So Shane has to ring to see if he's just having a lie-in. Yes, everything is OK, he's just having a lie-in. It's difficult to re-set the parameters to take account of this, Shane says, you need a degree, it's rocket science. He says the person should just be able to press a button to say he's having a lie-in.[2] Shane makes a general point, "You can't improve something until it goes wrong".

[2] For a related example, see Finken and Mörtberg (2014). Performing Elderliness: Intra-actions with Digital Domestic Care Technologies. ICT and Society: 11th IFIP TC9 International Conference on Human Choice and Computers, HCC11 2014, pp. 307–319.

He gives another example of not thinking of the 'next steps'. When a door alert goes off (indicating that the resident has gone outdoors) and the monitoring officers call the police to the house, the police officers don't know who they're looking for and the monitoring officer doesn't know either.

Shane points out that he's just one of the monitoring team and each member of the team has their own strengths. He says some are expert at lifting and that Tim, sitting in the next cubicle, is expert at the computer technology.

"We've all got strengths and a basic level of competence, and we have preferences." He says that having these strengths and supporting each other means that the officers increase in confidence.

Fieldwork extract 6: Big Town telecare call centre.

Being knowledgeable about the client is particularly important when the incident requires staff to work outside of standard protocol and 'make decisions' about resolving the situation as the following two extracts illustrate:

"It's funny, the new staff all come through the door thinking that the most challenging bit is going to be the 999 calls, everybody thinks, calling the ambulance, they're terrified. Actually the ambulance calls are the easy ones, because the decision is made, the client is having breathing difficulties or chest pains or symptoms of a stroke, or something like that, and it's just 999 and it's simple. It's the ones where maybe it's not a kind of life threatening emergency but it's still quite serious but the back up's not there and the GP won't go or the district nurses aren't going for four hours, the family aren't interested. And it's those calls that are actually more challenging… And people talk about decision trees and things like that and it's really difficult to do that, because it's just too varied. It can be so many different things. We do have to give the operators the skills to be able to make those decisions."

Fieldwork extract 7: CallCo telecare call centre.

"Because we're often the people that do see the deterioration of somebody's condition or something like that. We'll suddenly notice that somebody is calling more frequently or calling more about the same thing… One night where a lady, there'd been some kind of a fire risk and they'd taken her cooking facilities away. And the family really didn't want to know, and this lady called through about ten o'clock at night and it turned out that she'd had no hot food for about 3 days. And the only thing in the property was bread and cheese and things like that. So I spoke to the duty social worker and said, "Look, we're not happy about this, the family just don't want to know." And they got a proper care package in place so that

somebody was actually going in and providing her with hot food. But somehow or other she just dropped through the net."

Fieldwork extract 8: CallCo telecare call centre.

6.4. Role of informal support networks

The extract below illustrates the importance of collaboration between the service and clients' informal support networks. In this case, the client could not speak English, and it was thanks to the involvement of a neighbour that the appropriate action could be taken.

Jill takes an emergency call from the neighbour of a lady who has fallen outside and cut herself. Jill can hear the neighbour translating what she's saying to the lady. Jill establishes that the cut is on her head. She asks if she needs an ambulance. The neighbour says the cut is swelling so Jill advises that she calls 999. She explains that it's easier if the neighbour calls the ambulance because they will be asking questions over the phone that Jill couldn't answer because she's not there. When the call has finished, she comments that she doesn't know what the lady would do if the neighbour hadn't been there. Jill rings back a little while later and asks if an ambulance has been called. Yes it has. She then asks if the neighbour could call by pressing the alarm button to let them know if the lady has gone into hospital.

Fieldwork extract 9: Big Town telecare call centre.

6.5. Emotional labour

In the following four extracts, we see the emphasis that call centre staff put on doing 'emotional labour' (Roberts et al. 2012).

Shane emphasises the importance of being nice to the people they are helping. "I know there's a corporate way and a PC way but we're dealing with people here." He says it's important to build a relationship with people.

He gives some examples of the things people say, which indicate a good relationship with them.

"I was just waiting for this phone call."

"I'll do it now then, for you."

Shane says it's lovely when you get people saying things like that. He says that sometimes if it's late he says "Good night God bless". He says he knows there are times when they have to be 'PC' though.

Fieldwork extract 10: Big Town telecare call centre.

Similarly, the following extracts highlight the importance of building trust between service staff and clients for helping provide a more effective service:

> "They tell us things that I'm sure they don't tell everybody… They will tell you the problems that they're having with their families. I suppose because we're kind of anonymous."

Fieldwork extract 11: CallCo telecare call centre.

Although important, empathy and pro-sociality (going beyond formal job requirements and procedures) is difficult to formulate through training or standardised protocols and procedures. But it is considered to be a key characteristic for effective telecare support in order to deal with task complexity, uncertainty and emotional needs of the care recipient.

> "The bit we say we can't train is the empathy. You have to come to the job with that, if you haven't got that then you're not the right person for us."

Fieldwork extract 12: CallCo telecare call centre.

6.6. Negotiating service boundaries

In these next two extracts, call centre staff reflect on the different kinds of use made of the service by clients. These include so-called 'regulars'. It is also evident that call centre staff themselves are open to the value of re-configuring the parameters of the service where they can spot an opportunity to improve the client's quality of life. The second extract illustrates how familiarity with 'regulars' enables call centre staff to prioritise responding to calls when the workload dictates this is necessary.

> Small Town call centre staff remark that there is a spectrum of clients, ranging from those who call all the time to those who seem reluctant to use the service during the night or weekends. Of the former, staff confirm that they deal with a number of well-known 'regulars'—people who actively call or trigger a lot of calls daily. One client called on numerous occasions during our visit to ask what the time was. Each time the call taker would tell him the time, as if he had never called previously. This particular client had made 1500 calls in the last month. Staff are unclear as to why this is happening: he lives in sheltered housing, and so his calls during the day should go through to the warden before it goes through to them, which makes staff suspect that the warden may not be answering.

> Although emergency response is the core part of the service, it appears that what the manager calls 'mundane things' (e.g., telling clients what time it is, reminding to take medication, contacting carers, linking them up with services) appear to take up much of their time. In the ways that they orientate to such calls, call centre staff recognise that though much of the work of living with illness and impairment is mundane, its contribution to quality of live can be very important. The call itself also offers opportunity for everyday support. For example, in one example, the staff member initiated the call to remind a client to take his medication. The client said that he was in the garden (it was a hot sunny day), so the staff member told him to remember to put on sun lotion as well.
>
> Fieldwork extract 13: Small Town telecare call centre.

There are about 12 frequent callers that all the staff know well. Caroline names a few and asks the others for ideas—everyone chips in with one or two. One example is 'Ethel', who has moderate dementia and keeps pressing the button to ask for a cup of tea. They say they have to take these callers seriously every time, however, because there can always some doubt as to whether there is a genuine problem. They build up rapport with these regulars, as well as some others—they become familiar with their details and the reasons they trigger calls to the centre.

> If more calls come in at one time than can be answered immediately, Caroline says that staff prioritise them, which seems to be more a question of common sense than a formal procedure. Higher priority is given to alarm calls over voice calls, clients over wardens, a smoke detector, for example, over a medication reminder, and known vulnerable people.
>
> Fieldwork extract 14: East City telecare call centre.

6.7. Co-producing service solutions

In these final three extracts, we see examples of how, in some instances, staff are able to meet the needs of a particular clients by adapting devices, systems and service protocols. In the first extract, CallCo staff discuss how they try to standardize procedures, as this makes it easier for them to follow. However, they acknowledge that users have particular requirements that relate to personal preference/anxiety about the technology, as well as physical/sensor capabilities.

> "The vast majority of our clients, it's fairly standard and we have standard procedures provided by the authorities. But having said that, there is a percentage who have completely bespoke procedures for situations that are just entirely particular to them. And we're quite happy to do that. Even down to really basic stuff like some of our clients, they don't want to be spoken to over the 'lifeline', it

> frightens them. If they set a call off they don't want a voice coming out of the lifeline box, that's scary. So the procedure may be, no, actually you don't speak to them, you don't ring them back on the phone, you call a family member or a carer and just really basic things like that. Because the last thing you want to do is put a bit of kit in somebody's house that they're terrified of."

Fieldwork extract 15: CallCo telecare call centre.

In the second example, a staff member in Big Town telecare call centre explains how, with the cooperation of the system provider, they re-configured a bogus caller alarm to serve as a fall alarm.

> Shane says that it's about adapting technology to the individual. He gives a recent example of a lady who regularly fell in the shower. The normal panic button is too small for her to find if she is on the floor. So the independent ALT consultant proposed an adaptation of a bigger, red, bogus caller alarm to replace the normal pendant alarm. The call centre software had then to be adapted so that the system would correctly recognise the call from the re-purposed device—i.e., it indicated a fall in the shower.
>
> Totaltec agreed to change the protocols on the system so that pressing the bogus caller alarm comes up on the system as "panic alarm in bathroom area." If the lady presses the adapted bogus alarm it flashes up.
>
> Shane remarks that Totaltec don't ask about the adaptations the monitoring service make. He also thinks the ALT companies need to share protocols more often so that equipment is interoperable. This might be cheaper for the customer if they have a choice of device.

Fieldwork extract 16: Big Town telecare call centre.

This adaption required changing the way the system displays this type of call for the individual concerned. The extract is also noteworthy for the apparent lack of interest on the part of the system suppliers to learn from this and other adaptations. In this second extract, we see an example of how a particular service type—a GPS 'geo-fence'—has been re-specified as a 'geo-tracker' so that it better meets the needs of the client.

> The call centre staff member clicks on another call—she tells me that it is a GPS ('Geo-fence') device to track a gentleman with dementia. The 'geo-fence' alarm detects if the client has left a set perimeter around the home. The staff member logs into a secure website with a password, which opens up a Google Maps display and the client's location. It turns out that this particular client goes for an afternoon

stroll down to the nearby beach, at the same time every day. In this case, therefore, the procedure is to watch his location for a few seconds (to check he is actually heading for the beach), and then check 1 hour later that he has arrived home. She sets a reminder on the UNP system, for herself, to check his location in 1 hour (which is how long he usually takes). This reminder will pop up on her screen—as well as the other call takers' screens (with her name on it)—to check his location. If she was not at her desk, another staff member will pick this up/deal with the procedure (if necessary), and mention it to her when she returns to her desk. In this particular case, if the gentleman wandered away from the route home, then she would call his wife's mobile, who goes looking for him (she can remain on the phone with the call taker (who will watch his location). This can be difficult with fast walkers, as the GPS tracker presents a two-minute delay and so does not provide the exact location.

Fieldwork extract 17: CallCo telecare call centre.

It will be clear from extract above that this adaptation represents quite a radical change—a re-specification—of the use of the technology by the client and the service. The geo-fence is intended to define a perimeter that the client is not supposed to cross and will cause the alarm to be triggered—and an intervention—if it is. Its re-specification as a 'geo-tracker' is used to notify the call centre staff member that the client is taking a walk, which then sets in motion a process for monitoring the situation. The result of this re-specification is that the service goal of protecting a potentially vulnerable person from harm is maintained but the client enjoys greater freedom.

7. Discussion

We see in our fieldwork extracts some of the diverse ways in which telecare call centre staff work to support their clients to 'age in place'. The one feature of the work that drives all other activities, of course, is responding to calls and alarms (fieldwork extracts 1–2, 6). As the initial point of contact, it is the call taker's responsibility to identify the nature of the underlying problem (fieldwork extract 6) and then mobilise the appropriate response team (fieldwork extract 2). The call taker continues to track the call and only closes it when notified by the response team that it has been resolved, updating the client's record before closing so that it is up to date (fieldwork extracts 1, 3). When the call centre is busy, calls must be prioritised; at CallCo, this is done automatically by the computer system; at the other three sites, this is left to staff's discretion to devise their own 'common sense' rules for deciding in what order calls should be answered (e.g., fieldwork extract 14). Each site must do endeavour to meet the call answering time set by the TSA or risk losing their accreditation.

Providing telecare services necessarily requires coordination and collaboration, most evidently between call takers, responders—some of whom are co-located with the call takers (fieldwork extracts 2, 5), whereas those in outlying areas, ambulance

services, etc. are not (e.g., fieldwork extract 3)—and managers, around a formal division of labour. The fieldwork extracts reveal how, in practice, this teamwork also exhibits ad-hoc working across divisions of labour between call takers and managers (Small Town field notes; fieldwork extract 2), where managers will step in to answer calls if call takers are overloaded (e.g., fieldwork extract 2). Only in the largest of the sites (CallCo) was a more rigid division of labour observed, which was reflected in the physical layout of its office.

Resolving calls and alarms quickly and successfully depends on call centre staff having access to information about clients in a timely and effective way. Through the telecare computer system, call centre staff are able to see and update a log of the client's previous calls, a summary of their medical condition(s), their habits and routines, the services they receive and the people involved in their care (both formally and informally) (e.g., fieldwork extracts 1, 3). The information available ranges from items generated from pre-defined lists of tick boxes for recording medical conditions, call resolution, etc. (e.g., field extract 2), contact numbers of healthcare professionals (e.g., GPs), family members and neighbours, to free form text where staff can record what they feel is relevant information about e.g., the client's habits ('often lets strangers into the house'; 'likes to get up at 10.30'). Call centre staff evidently make building up over time a rich and individualised picture of each client's circumstances a high priority as they recognise that this will be invaluable when dealing with future episodes (e.g., fieldwork extract 6). It also means they are in a position to 'join up' what otherwise are often fragmented networks of care. Nevertheless, in practice, the work of 'joining up' may entail a lengthy and not always successful process of ringing around different people (e.g., family members, neighbours) in an attempt to 'fill in' information about a client's current status (fieldwork extracts 7, 8). For all the sophistication of the technologies and the professional care networks, our study suggests that it is often the tacit knowledge and persistence of call centre staff in liaising with clients, their family members and neighbours (e.g., fieldwork extract 9) on which the telecare service depends.[3]

Apart from providing the means for call takers to access and update client information, the call centre computer systems typically provide a number of other functions that are designed in various ways to regulate service provision and decision-making. At Small Town and CallCo call centres, current call answering times are prominently displayed on large screens to make staff aware of—and enable management to monitor—their performance. We have already noted how the system in CallCo decides on the prioritisation of calls. The system at Small Town call centre provides prompts to call takers to e.g., remind clients to take their medicines, do their daily dialysis (e.g., Small Town). At East City call centre, the system will alert the call taker at certain pre-defined critical decision points (e.g., calling 999,

[3] Jansson et al. (2007) discuss similar findings but they use the concept of 'situated knowledges'.

ending the call), It is evident, however, that call takers' skills and knowledge remain of paramount importance for timely and effective service provision (field extract 7).

Our fieldwork shows that clients call for a diverse range of reasons: emergencies such as falls in the home (field extract 2); reporting professional or lay carers not turning up (fieldwork extract 8); telling clients the time (fieldwork extract 13); having someone to confide in (fieldwork extract 10). This is evidence for how what constitutes a legitimate reason for calling the centre is negotiable and not rigidly defined; the key criterion for staff seems to be their intuitive understanding of the likely impact on the client's quality of life. Staff end up giving out lots of advice and find themselves, as a consequence, undertaking various forms of 'emotional labour' (fieldwork extracts 10–12). As Roberts et al. (2012) observe, telecare services are providing more than just 'disembodied care'.

Our fieldwork also shows how telecare call centre adapt protocols (fieldwork extract 15), technology configurations (fieldwork extract 16) and services (fieldwork extract 17). It shows that telecare service delivery is sometimes achieved despite the need to work around the limitations of assisted living devices deployed in the home. We saw call centre staff taking the initiative to persuade the device supplier to re-purpose a different device (bogus caller alarm), which involved reconfiguring how it interfaced with the call centre computer system (fieldwork extract 16). Sometimes, staff will also take the initiative to re-specify service definitions, for example, re-specifying a GPS 'geo-fence' as a 'geo-tracker' service so as to match the client's needs more closely (fieldwork extract 17). These findings stress the importance of telecare technology providers taking an interest in learning from the experiences of call centre staff (fieldwork extract 16). As one staff member remarked, "You can't improve something until it goes wrong." This resonates with findings from Participatory Design, of the importance of 'design-in-use', which emphasises that design does not end after a IT system or service has been implemented (Henderson and Kyng 1992; Procter and Williams 1996; Hartswood et al. 2000; Voss et al. 2000; Hartswood et al. 2002, 2003b, 2008).

Call centres of various kinds, as well as related settings such as command and control centres as an increasingly pervasive organizational arrangement, have long been a focus of interest in computer-supported cooperative work (CSCW). They have been studied in order to understand, for example, aspects of the collaboration and coordination of work (e.g., Luff et al. 2000), as well as the impact and achievement of various forms of categorization work (e.g., Bowker and Star 2000), and where call centres are prime examples of the ways in which categorization is part and parcel of modern organizational life. Our studies of telecare work similarly provide some empirical detail of such coordination and classification work 'in action'. They reveal the importance of a flexible division of labour for maintaining a dependable level of performance, which has become a recurrent theme of studies of teamwork (e.g., Luff et al. 2000). They also show how telecare staff utilise their knowledge of individual clients and everyday or mundane reasoning, to mediate between client

perceptions, requests and demands, and how such requests need to be formed for the organization to respond adequately. Telecare call centre work is a shared practice, relying on the "know-how" or "tacit knowledge" based on personal and shared experience. While explicit protocols and instructions are important, it is often the call takers' intuitive grasp of the situation that allows them to resolve issues in the face of uncertainty and ambiguity. As one call centre manager commented, explicit protocols cannot accommodate the variety of possibilities and situations, and so the biggest challenge for telecare call takers is to develop the skill of decision-making. It is this tacit knowledge that allows the call taker to take the initiative; working around problems and aligning the service with the needs of the user.

These findings of telecare call centre work are significant in three ways. First, they corroborate other recent studies of telecare call centres, which have documented and drawn attention to the multiple and complex tasks of call takers to ensure that services are delivered in a timely and effective way (Pols 2010; Roberts et al. 2012). Collectively, these studies of telecare service provision provide a rich body of evidence of how telecare becomes interwoven with existing care practices and networks and for the proposition that the technology should be understood as a reshaping, rather than replacing, of hands-on care. Roberts et al. (2012), for example, document how telecare is interwoven with other forms of care and how "successful telecare relies on the existence of social networks and the availability of hands on care." (p. 490) As they argue: "… in getting close to the work undertaken in monitoring centres and spending time with the staff, we also came to understand a key paradox of telecare: these systems, intended to work at a distance and to be of particular help to people who do not have robust networks of co-present caring others, only function well *when they are situated within such networks*." (p. 493, emphasis in the original) As they note, telecare staff, working in an uncertain situation and with limited knowledge, have to mediate between clients and care services. As such, telecare provides a 'reshaping' rather than any reduction or diminishing of care (see also Pols (2010)).

Second, our findings reveal the important role call centre staff play in helping to sustain a wider care system with and for their clients and their families that is both workable within the constraints of available resources and fit-for-purpose. This emphasis on 'the work to make the network work' (Bowers 1994) is consistent with that of Sánchez-Criado et al. (2014), who convincingly demolish any perceptions that telecare systems are simply a matter of 'plug-n-play'. Of particular interest and relevance for our findings is their documenting of the complexities of 'being a user' and the often very different forms of engagement or disengagement involved. Sanchez-Criado et al. utilize a socio-technical systems (STS) approach to 'user configuration' and implementation to document and understand aspects of (successful or 'felicitous') telecare installation and use, or what they term the 'instauration of usership': "Through installation practices and their *technical*, *relational* and *contractual* requirements (placing the devices in the home and showing how to use them; choosing the contacts to be called upon in an emergency; and signing the

service contracts) both services and users appear as the concrete yet embryonic outcome of a heterogeneous composition process." (p. 3)

Third, our findings extend those of Sanchez-Criado et al. in that they reveal the important role that telecare call centre staff play in this 'heterogeneous composition process'. We see that in their efforts to resolve problems and ensure that clients benefit from the service, call takers routinely challenge the systems and protocols in use. Telecare call centre staff display considerable knowledge and skill in using and adapting devices, systems, procedures and protocols as part and parcel of the assembly and coordination of a 'bricolage' of care (Procter et al. 2013; Procter et al. 2014), delivered through a socio-technical assemblage, which is co-produced through the joint efforts of diverse range of actors but where telecare call centre staff play a pivotal instrumental and enabling role. For example, we have seen how call takers work directly with technicians to reconfigure technologies that fall short of clients' needs and wishes (e.g., adapting the bogus caller alarm to function as a fall alarm) and even re-specify services (e.g., GPS geo-fence service re-specified as a 'geo-tracker' service). This emphasises the importance of having technologies that afford customisation and are interoperable. In turn, this points to the need for telecare technology providers to take an interest in learning from the experiences of their users. However, the perception of the call centre staff in our study is that technology providers are currently reluctant to do this, a finding that is consistent with our related studies (Sugarhood et al. 2014).

8. Conclusions

Our research in the ATHENE project has shown that if assisted living services are to meet the needs of their users—clients, professional and lay carers—their design and deployment must be grounded in users' lived experience (Wherton et al. 2012; Procter et al. 2014; Greenhalgh et al. 2015; Wherton et al. 2015a, b).

In a previous paper we explored the contribution of lay carers as 'bricoleurs', as they attempt to deal with frequent mismatches between ALTs and the needs of older people, revealing their role as co-producers of fit-for-purpose solutions in the home (Procter et al. 2014). In this paper, we have reported on the role telecare call centre staff play in this co-production process, helping to sustain a wider care system with and for their clients and their families that is both workable within the constraints of available resources and fit-for-purpose. We have seen the steps staff routinely take to identify and resolve clients' problems quickly and effectively. In doing so, we have seen how, inter alia, call centre staff share with one another their experiences and solutions to problems, coordinate the responses of care services, carry out liaison work with networks of lay carers, seeking or passing on information to them, work to build knowledge of clients' routines and build their trust and generally act as the 'glue' providing the all-important link between otherwise fragmented services and networks.

In this paper, our aim has been to document the practices of assisted living from the perspective of telecare call centre staff. Its findings highlight the importance of the

interpersonal skills and social resources of staff to make the technology work. In effect, call centre staff are part of the care practice, not merely providing monitoring and emergency response. In this respect, telecare redefines what it means to care, and should not be understood simply as a replacement to hands-on care practice. This is rarely acknowledged within policy discourse but raises important policy implications if call centre staff are to carry out their 'hands-off' caring role most effectively. It draws attention to the emotional cost to staff and need to consider the training to properly equip them to meet these demands. It also illuminates the importance of interpersonal communication and relationships between staff and clients, which need to be considered within organizational structures and processes (Pols 2010; Milligan et al. 2011; Roberts et al. 2012).

Delivering programmes for telecare in a cost-effective yet dependable way requires that we understand ageing in place as the product of collaborative networks, tying patients, technology suppliers, lay carers, health and care service providers together (Procter et al. 2014). CSCW research has shown how designing to support collaboration affords more dependable, safe and secure healthcare systems (e.g., Procter et al. 2006; Fitzpatrick and Ellingsen 2012). It also emphasizes the importance of understanding and feeding users' experience of technologies back into design processes so that dependability can be seen in its socio-technical context. What we believe is novel about the challenges of delivering dependable telecare is its reliance on collaboration between professional and lay carers, and their mix of formal and informal knowledges and expertise. This raises a number of complex organizational and policy issues, such as the kinds of governance structures that would be need to enable professional and lay carers to work together more effectively.

Whilst our empirical work has emphasized the practical aspects of how telecare is routinely accomplished, we are mindful that there is clearly an ethical dimension involved in the provision of care and telecare—telecare is not just about technology but is a moral issue. As Pols (2010) and Coeckelbergh (2013) point out, telecare technologies manifestly impact on practices of care and the concern is that such technologies and their associated practices discourage or prevent conventionally skilful and caring engagement with patients, effectively 'deskilling' carers and consequently resulting in a lower quality of care. With a particular interest in the 'craftsmanship' (sic) of care, Coeckelbergh's concern is that: "… health care technologies and medical technologies are never mere 'tools', are never ethically neutral, but change the perception of patients and their problems, change how patients are treated, and in the end change the entire practice." (p. 808).

Our study suggests that rather than promoting 'deskilling' or loss of 'know-how', telecare practices are producing various subtle forms of reskilling and re-engagement. In other words, new technologies, and their classification and coordination functions are not replacing traditional forms of caring but, instead, are being combined with and being used in association with traditional forms of interaction and care to produce what Coeckelbergh (2013) terms 'e-care': "Instead, it seems that care workers develop new skills. They learn how to use the equipment and how to

communicate with the patient in such a way that the quality of care is maintained or enhanced. There is distance, maybe, but physical distance is not necessarily distance in terms of personal contact or skills. Perhaps there is room for a new kind of craftsmanship (sic), for an 'art of e-care'." (p. 815).

Taking forward Coeckelbergh's notions of 'craftsmanship' and 'e-care' within telecare call centres, we must consider how to create the right organizational, and inter-organizational, conditions to promote the 'know-how' to resolve unique problems and improvise in new situations. This will increase capacity to deviate from protocol, devise new solutions and negotiate service boundaries effectively. We argue that part of the solution must be for technology providers to follow a more robustly user-centred approach, based on co-design principles, where telecare call centre staff are able to play an active role, feeding their insight and tacit knowledge back into design and supported by monitoring and evaluation of the ways in which devices and systems are actually used (Procter et al. 2014). This would, of course, necessitate considering how this role can change the dynamic and interactions with clients and the ethical implications of routinely capturing and sharing this knowledge with relevant parties.

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Notes

1. http://www.innovateuk.org/content/competition/dallas-delivering-assisted-living-lifestyles-at-sc.ashx
2. www.atheneproject.org
3. https://connect.innovateuk.org/web/assisted-living-innovation-platform-alip
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