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Technology and homecare in the UK: Policy, storylines and practice

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Abstract

UK policy discourse presents technology as a solution to challenges facing care services, including issues of quality and the mismatch between care workforce supply and demand. This discourse characterises technology as 'transformative', homogenous and wholly positive for care delivery, eliding the diversity of digital devices and systems and their varied uses. Our paper draws on data gathered through 34 interviews with care sector stakeholders and four in-depth case studies of UK homecare providers to comparatively analyse 'storylines' of technological solutions expressed by policy (macro-level), sector stakeholders (meso-level) and homecare managers and care workers (micro-level) alongside enacted experiences of technology-in-use. The 'storylines' presented by care sector stakeholders and homecare managers converged with those of the policy discourse, emphasising technology's capacity to enhance quality and efficiency. Our case studies however highlighted several implications for care work and organisational practice in homecare provision: the technologies we observed sometimes produced additional tasks and responsibilities, undermining the efficiency and quality storylines. The experiences of care providers and workers engaging with technologies in homecare warrant further investigation and greater prominence to challenge a discourse which is at times overly simplistic and optimistic.

Keywords: digital; domiciliary care; homecare; social care; technology; UK

Adult Social Care, Homecare and Technology in the UK

Globally, care systems are challenged by increasing demand, underfunding and the lack of an appropriately skilled workforce (UN, 2018). In the UK, reduced budgets and workforce recruitment and retention issues have led to a perceived 'crisis' in adult social care (ASC) (Dayan and Heenan, 2019; Clifton, 2021; Glasby, 2021). The UK homecare or 'domiciliary'[1] care sector – characterised by fragmentation, marketisation and instability – is under increasing pressure due to the UK's exit from the European Union and the COVID-19 pandemic (Turnpenny and

Hussein, 2021). In all UK nations, people are subject to a means- and needs- test, with varying thresholds and rules regarding the types of care provided by statutory-funded services,[2] and while there are no official figures on the private care market, estimates indicate significant variation between the four nations (in England, around 30% of all people receiving homecare or day care are self-funders versus 7% in Northern Ireland [Homecare Association, 2021]). The majority of state-funded[3] homecare is 'contracted out' by local authorities (LAs) to the independent sector, including not-for-profit and for-profit companies (98% of all state-funded homecare in England, 88% in Wales, 87% in Scotland and 73% in Northern Ireland [Homecare Association, 2021]). The disparity between demand and investment has led to high levels of unmet need with the state-funded homecare model predominately focused on 'time-and-task' delivery (Bottery, 2018).

To address the above issues, technology has been a key area of UK policy focus and investment (Department of Health [DH], 2005, 2012; Department of Health and Social Care [DHSC], 2021), and across Europe (Pols and Willems, 2011). Technology has been described as 'transformative' by various Secretaries of State for Health and Social Care (Hunt, 2018; Hancock, 2018; Javid, 2021) in terms of expenditure and efficiency of the care workforce, and care quality. Funding has accompanied this enthusiasm and since the mid-2010s there have been various opportunities for homecare providers to – independently and in collaboration with LAs – explore 'digital technologies' such as mainstream 'Internet of Things' (IoT) devices, Artificial Intelligence, data analytics and assistive devices, including robotics (Wright, 2020). The long-awaited social care White Paper (DHSC, 2021) proposed £150million to *"drive greater adoption of technology and achieve widespread digitisation"* (p. 7), with emphasis on care providers and workforce skills.

In presenting technology as a 'silver bullet' (Eccles, 2021) for the perceived ASC crisis, this policy direction and discourse is accompanied by two tensions. First, the policy focus on technology as a 'solution' has been critiqued for *"ignoring the inconvenience"* of a lack of evidence of actual change and significant financial benefits (Eccles, 2021: 13; Glasby et al., 2021). A review conducted for Skills for Care[4] notes that benefits of technology for care providers and workers *"tend to be assumed rather than explicitly evidenced by research"* (Sara Dunn Associates, 2014: 16) and where studies have explored digital technologies used by care workers directly (as opposed to devices for those receiving support e.g. telecare), they have not been as positively 'transformative' as implied in the policy discourse (Hamblin, 2022). Research reports that electronic monitoring (EM) systems that record care worker entry/exit times to clients' homes provide *"proof of presence"*, ensuring care workers are not *"time thieves"* (Timonen and Lolich, 2019: 739), create a 'barrier to care' (Brown and Korczynski, 2010), are a form of work intensification (Baines and Van Den Broek, 2017), and facilitate payment of care 'by the minute' to reduce costs (Moore and Hayes, 2017). Studies have also found some providers configure digital care organisation systems in ways that prevent staff viewing schedules too far in advance as this allows care workers to plan leisure activities, which in turns renders them less flexible and *"inconvenient from the point of view of running a care agency"* (Timonen and Lolich, 2019: 740). Care worker concerns about the additional time required by digital systems to record information about care visits have been highlighted in research (McDonald et al., 2019). Others have found unintended

consequences of technology, including increased staff attrition as homecare workers gain new skills and move into sectors with greater career progression opportunities (Oung et al., 2021).

The second tension relates to the policy discourse's lack of nuance in depicting 'digital technology' and care providers as overly homogenous (Sara Dunn Associates, 2014; Rolewicz et al., 2021). There is currently no representative, sector-wide data available on the digital technologies used by UK homecare providers. The range of potentially diverse technologies being deployed, numerous ways care workers may interact with them (Højlund and Villadsen, 2020) and varied implications for care relationships, roles and tasks are therefore largely unknown. Technology also can be viewed as a 'complex intervention' (Pawson et al., 2011; Hamblin et al., 2017) and the overly simplistic presentation of it as a 'silver bullet' also underplays the importance of *context* in mediating outcomes of devices and systems (Pols and Willems, 2011). While frameworks have been created to better understand and address factors affecting technology's use and outcomes (e.g. Greenhalgh et al., 2020), policy discourse underplays these complex issues. In addition, as highlighted by Science and Technology Studies (STS) and in this journal (Henman, 2022), technologies are accompanied by 'scripts' (Akrich and Latour, 1992) and 'directives', encouraging users – care workers in this case – to act and reshape their practice in certain ways through the creation of new tasks and responsibilities. However, as with all technology users, care workers are not passive and can alter technologies by reconfiguring, 'taming' and 'tinkering' (Pols and Willems, 2011). The policy discourse therefore fails to a) disentangle the diversity of devices and systems that comprise 'technology'; b) acknowledge how, when deployed, technologies can produce different outcomes in different contexts; and c) grasp technologies' social and contingent nature. These issues, and exploration of digital technologies' implications for social policy more broadly (Henman, 2022), warrant further exploration and critical engagement.

Methodology

This paper addresses three questions:

1. *What* digital technologies are UK homecare providers using? What examples do care sector stakeholders cite? What are homecare providers using in practice?
2. What storylines do care sector stakeholders and providers use to explain *why* digital technologies should be used in homecare? Do these converge with policy discourse?
3. *How* do digital technologies' 'scripts' affect care work? Is there alignment between policy and sector stakeholder perspectives and the experience of using technologies in care work?

The paper builds on research that has applied Argumentative Discourse Analysis (ADA) to explore discourses that attempt to define technology's role in social care (Greenhalgh et al., 2012) and critically contrast policy rhetoric of technologically-

Table 1. Case studies

Provider Pseudonym	Business and Care Model	Fieldwork
Pine Care	Franchise model, self-funded clients; planned person-centred care, minimum 1-hour care visits	Interviews: 5 managers; 10 care workers; observations: 6 hours
Oak Care	Largely LA-commissioned service; planned time-to-task care organised in 15-minute blocks	Interviews: 7 managers; 9 care workers; observations: 10 hours
Cherry Care	Outcomes-led, self-funded clients; flexible person-centred care, self-managed teams, minimum 1-hour care visits unless agreed	Interviews: 3 managers; 6 care workers; observations: 4 hours
Maple Care	Online platform introductory model, self-funded clients 'matched' with self-employed care workers, minimum 3-hour care visits	Interviews: 3 managers; 6 care workers; observations: 4 hours

enabled efficiencies and quality improvement with the experience of people using services (Lynch *et al.,* 2019). Here we use ADA to examine whether macro-level policy 'storylines' or narratives argued to *"provide actors with a set of symbolic references that suggest a common understanding"* (Hajer, 1993: 63) are adopted by care sector stakeholders and enacted in the context of organisational practices, thereby examining if a *"discourse coalition"* has formed, i.e. *"a group of actors who share a social construct"* (Hajer, 1993: 46). ADA is an approach that can identify storylines and how they are used to impose certain social positions and practices on others; we use it here to address how different actors in the care sector articulate similar or divergent arguments for technology and contrast these storylines with the implications of technology's use in practice.

We used a multi-phased, multi-method research design, gathering meso- and micro-level data. We began with an 'orientation phase' (Greenhalgh et al., 2012) where we conducted informal 'helicopter interviews' with key informants to provide an overview of issues related to policy, technology and homecare (n = 5) and desk research of academic, grey and policy literature to identify key policy-level storylines. This provided the context for the data collection at the meso and micro-levels. In 2020 we conducted 34 interviews with UK stakeholders drawn from the homecare sector (providers, their representative bodies and membership groups); the technology sector (designers, manufacturers, providers of technologies used in care); and LAs (LA commissioners/ technology-enabled care service managers).

We also undertook in-depth case studies of four homecare provider agencies during 2019-2020, sampled to reflect a range of business and care models typical to the UK ASC sector. The organisation of services provided in each of these models varied, as did the costs and source of funding or income (see Table 1). The case study fieldwork included 49 individual semi-structured interviews (lasting on average 60 minutes); researcher observation of training/induction sessions, team meetings and office organisation; and analysis of company-produced documents including policies, handbooks and newsletters, web-based company marketing and workforce recruitment materials.

We received ethical approval from the University of Sheffield Research Ethics Committee (reference numbers: 026350, 022375; 021052); ADASS endorsement (reference number: RG19-08) and University of Sheffield research governance sponsorship (reference number: 148644) and followed relevant LA research governance procedures where applicable. Participants received information sheets and provided informed consent to take part in the research; all names included are pseudonyms.

Our analytical approach combined ADA with thematic network analysis (TNA) (Attride-Stirling, 2001) to identify storylines expressed by different participant groups. Broadly speaking, TNA involves the initial identification of 'Basic Themes', arranged around 'Organising Themes', and finally, a 'Global Theme', which in combination produce a thematic network. First, the transcripts were grouped by stakeholder (homecare, technology sector and LAs), and coded to create a corresponding network map for each group. Following this we examined the maps for convergence/ divergence with the policy discourses identified in the orientation phase, but also points of departure and fracturing (i.e. different storylines expressed by different stakeholder groups). For the case studies, we grouped the transcripts by care provider, and in turn separated care managers/owners and care workers into subgroups to allow a comparison of different work-based perspectives and experiences. The resulting TNA maps were compared within and across the two datasets. We elaborate our analytical approach in the relevant findings' sections and the cross-dataset analysis in the Discussion and Conclusion, presenting illustrative examples grounded in the data.

Findings

### *Unpacking 'Technologies' in Homecare: Policy and Stakeholder Storylines*

The 'orientation phase' (Greenhalgh et al., 2012) of our ADA approach determined that the 'technology is transformative' discourse outlined in the contextual sections of this paper included two storylines: i) quality and ii) efficiencies/ resource savings. These storylines align with findings of research[5] which has used ADA to explore the use of technologies in care (Greenhalgh *et al.,* 2012; Lynch *et al.,* 2019). Discussion in policy documents as to what types of technology might be part of these storylines was largely limited to brief examples or case studies (e.g. in the 2021 White Paper [DHSC, 2021]), with scant exploration of how they could be used differently to varied effect in a fragmented homecare sector. We did not, therefore, approach the stakeholders with a predefined definition of 'technology'; rather we coded the data related to our first research question inductively, producing categories of technologies grounded in the data. We drew out examples of technology deployment in the homecare sector (Basic Themes), which were clustered around the purpose of the technology (Organising Themes). As such, the types of technologies cited reflect a wide range of devices and systems, providing detail absent from the policy discourse on the variety of technologies-in-use in homecare. Stakeholders broadly presented digital technologies as being used for two main purposes: to (1) plan and organise care work and (2) deliver care, acknowledging variation, with some homecare providers *"embracing digital"* whilst others were characterised as having *"huge distances to travel"* (technology sector stakeholder 11) (Table 2). Organisational capacity was

Table 2. Stakeholder interviews: types of digital technology used in homecare

Technology to facilitate . . .	Types of technology

. . . care work planning and organisation	*Recruitment apps and platforms*
	  - To facilitate recruitment/ shift cover
	  - Online introductory agencies

	Digital care management systems - ICT-based rostering systems, some linked to payroll functions; some 'Cloud-based', accessible remotely

	Training
	  - Online platforms
	  - Virtual reality to simulate conditions like dementia

. . . care delivery	*Electronic Monitoring* to log care visit duration

	Digital care records
	  - Recording care visit content
	  - Medication compliance

	Telecare and technology-enabled care services
	  - Monitoring client wellbeing
	  - Collecting and using data for prevention

	Mainstream IoT technologies
	  - Online care 'visits'
	  - Reminder systems
	  - Wearables to record and monitor activity
	  - Environmental controls- lighting, heating etc.

	Robotics
	  - 'Cobots' worn by care workers to assist with lifting
	  - Robotic 'pets'.

an influencing factor, as one stakeholder explained, "*85% of providers have fewer than 50 employees, so the larger providers tend to have their own IT specialists in house*" (homecare stakeholder 1) as well as whether providers relied upon LA contracts.

To examine the rationale for the use of technology in homecare (our second research question), we drew on the storylines identified in the policy discourse during the orientation phase to abductively analyse the data (Timmermans and Tavory, 2012). Using TNA, initial coding for each stakeholder group focused on identifying the Basic Themes related to the rationales for technology's deployment in the sector, and how these clustered around the 'Organising Themes' of the 'quality' and 'efficiency/ resources' policy-level storylines identified in the orientation phase, with the option to generate new codes identified from the data where applicable. Finally, we then examined how these Organising Themes in turn aligned with a 'Global Theme' ('technology is transformative'). The network maps for the three stakeholder groups were contrasted. Figure 1 outlines how the key stakeholder group's responses aligned with the storylines from the policy discourse, highlighting areas of agreement between the groups and with the discourse, which will be explored in more detail below.
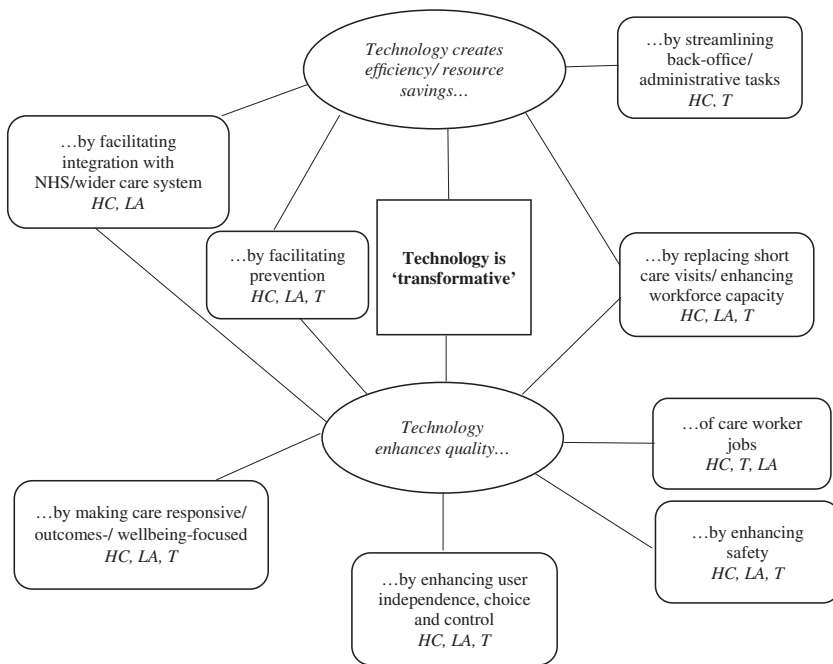
Key: HC- homecare stakeholders; LA- local authority stakeholders; T- technology sector stakeholders; square- Global Theme; oval- Organising Theme; rectangle- Basic Theme (Attride-Stirling, 2001).

Figure 1. Stakeholder Interviews Thematic Network Analysis Map.

The 'efficiency/ resource savings' storyline

Stakeholders' explanations of how technologies could enhance efficiencies in care provision aligned in several ways; for example, in the organisation of care, digital care management systems that could be accessed remotely by providers and care workers were commonly cited as a way to reduce administrative costs. Stakeholders also discussed the emergence of introductory platform care agencies, which connect people in need of support with self-employed care workers, as generating efficiencies and resource savings by "*strip*[ping] *out the middleman* [you] *actually bring down the price by about 30%*" (homecare stakeholder 4). Online training was also commonly seen as saving resources by removing the need for care worker travel time and venue costs.

Stakeholders also cited examples where technologies could create efficiencies in 'hands-on' care delivery. For example, some argued EM systems were used to contain costs by facilitating payment for care 'by the minute': "'*you were only there for thirteen minutes and thirty-four seconds, so therefore we'll pay you for that*'" (homecare stakeholder 1). Other stakeholders argued short 'checking' visits could be replaced with 'virtual' care using online video-calling services (including via mainstream IoT devices) or passive sensors to remotely monitor wellbeing. In turn, the

data produced by these devices could be analysed in ways to facilitate preventative measures, saving on future costs. Stakeholders in all groups, however, argued that the ability of technology to completely replace care workers in care delivery, even with the use of robotics, was an unlikely and undesirable scenario. One commissioner argued technology should be *"augmenting rather than replacing the workforce . . . we free people up to do the stuff they need to do"* and that *"if you do something that, with a piece of equipment rather than a human being it's cheaper, immediately, however what you then have is the impact around social isolation and everything else that kind of bites you later on"* (LA stakeholder 6). Where robotics were discussed, this was largely in terms of 'co-bots' or exoskeletons to assist with lifting, removing the need for 'double-handed' care visits. For example, *"a piece of kit that costs £25K saves you having to use two care workers. It's not going to take that long before you've got a return on that investment, before that's cheaper than having a second person"* (homecare stakeholder 1). Stakeholders also emphasised how technologies could collect and relay data between different parts of the health and social care system, promoting integration and efficiency.

The 'quality' storyline

The Basic Themes that contributed to the Organising Theme of 'quality' included 'independence, choice and control' and 'safety' for people receiving care, and 'wellbeing/ outcomes-focused', 'responsive' care delivery. Some examples were cited as enriching quality in more than one way. For example, stakeholders working in platform introductory services felt this model promoted care and job quality as both care workers and care recipients could set their own rates for payment and select who they wished to engage, enhancing their choice and control.

In homecare delivery, digital care records utilised to send information about care visits in 'real time' including medication compliance and fluid intake were viewed as improving quality by enhancing safety and enabling more 'responsive' care. In addition, there was some overlaying of arguments related to care and job quality. Some stakeholders, for example, argued replacing short care visits with virtual appointments or technology to remotely monitor clients (either specialist 'telecare' or mainstream devices) could be a way of providing 'good', less intrusive care and improving job quality, as *"they are 'eyeballing' somebody, closing the curtains, making sure they're taking the tablets. They're not exciting* [care visits]*"* (homecare stakeholder 5). Similarly, 'co-bots' were presented by several stakeholders as a means of safeguarding care workers' musculoskeletal health and physical wellbeing as the device bears the weight of the client.

There were examples of where the policy storylines of efficiency and quality were blended in the interviews demonstrating 'discursive affinity' (Hajer, 1993), i.e. where discourses not only *"sound right"* together, but *"flow into each other"*. For example, narratives related to the use of technologies to remove the need for 'in-person checking' and 'double-handed' care visits were blended to propose these could be a way to save resources but also provide 'good', less invasive care and ameliorate physically hard aspects of care work. A further example is the narrative that EM systems could facilitate the precise payment of time-based costs to the minute, but also safeguard against vulnerable people not receiving timely care. Technologies to facilitate

prevention and integration between health and social care were also cited as ways to reduce unnecessary costs, but also to contribute to good quality care. As such, some uses of technology were presented as a 'win' for commissioners, providers, care workers and users of homecare.

Technologies-in-use: Homecare Case Studies

In the following sections, we focus on technologies-in-use in four case study home-care agencies, exploring the related storylines expressed by their management and care workers, contrasting their aspirations for the devices and systems with the experience of using them in practice. As such, our case study analysis allowed for a deeper, contextualised exploration of technologies-in-use within organisational practices and care workers' enacted experiences, including of the scripts that accompanied the devices and systems. To address our first research question, we inductively coded the case study data to identify which technologies were being deployed and how these were used by care workers in their everyday practice. For the second research question, we again took an abductive approach to TNA, exploring the extent to which care providers and care workers' accounts echoed the storylines of policy discourse identified in our orientation phase, whether there was alignment within the management and worker subgroups and generating new codes where applicable. We addressed the third research question through an examination of how technologies' scripts influenced care work, identifying when they did and did not deliver on the storylines related to quality and efficiency.

Pine Care – Franchise Model

Pine Care's overarching franchise directed the agency's approach to technology, advising caution that its use should not detrimentally impact care quality or brand reputation. Pine Care used an EM system integrated with payroll and invoicing, and a digital care management system that emailed monthly rotas to care workers. The EM system's scripts required care workers to dial in and out from the client's landline phone to record their time of arrival and exit from the property. Late arrivals or departures triggered calls from management to care workers' personal mobile phones to check for issues. Managers drew on the 'quality' storyline to explain how the EM system would alert them to deviations from the allocated time with a client, enabling them to adjust care plans and packages accordingly. EM was also viewed as a means to monitor if deviations from the time schedule were a consequence of care worker behaviour; care managers stressed the need to adhere to the franchise model meant they did not want to employ *"mavericks . . . the kind of people who are always going to do it their own way"* (Pine Care Manager [M]1).

The care workers' storyline, on the other hand, presented EM as a safeguarding tool: *"it triggers off a phone call to us to say why are we late, because we're not providing a duty of care to the client, and it might be that we might in a traffic accident, things like that, or it might be that you've forgotten. So that telephone system works for both the client and the caregiver"* (Pine Care Care Worker [CW] 2). A care worker told us about another provider where an ex-colleague had claimed to have made 14 care visits in an hour and a quarter, to exemplify how the EM system

guards against poor practice: *"there is no way that she could have gone in, asked them how they were, prompt medication"* (Pine Care CW8). However, in use the EM presented issues for some care workers, as this quote illustrates: *"that login system is pretty lacking. Sometimes I get a phone call to say, 'have you logged out?', 'yep', 'well, it's not recorded'"* (Pine Care CW7). The integration of the EM system with payroll meant errors could have financial repercussions. Care workers also had to immediately engage with its scripts as opposed to the person receiving support, as one care worker explained: *"sometimes you walk into a client's home, and you're talking, and you forget to log in"* (Pine Care CW1).

For the digital care organisation system, managers used the efficiency storyline, arguing the emailed rotas removed the cost of printing and posting hard copies. Some care workers felt the system's simplicity was an advantage, as it did not require them to engage with an additional platform or app but acknowledged it could also be a source of stress when incorrect rotas were amended, resulting in multiple emails when not at work. Revised rotas only included shifts from the date of amendment onwards, requiring care workers to keep accurate records: *"I've got an Excel spreadsheet which is helping me log all the hours that I've actually done, because we also have to submit a sheet in with our travelling expenses. If I'm going to do a tax return, I've got to be clear, it's got to be auditable"* (Pine Care CW7). Therefore, while the technology contributed to efficiency from an organisational perspective, it simultaneously created additional tasks for care workers.

Oak Care – LA Commissioned Model

Oak Care's marketing cited 'technology' as one of the organisation's core pillars and they had employed a Business Development Manager to oversee the piloting and implementation of various technologies. In practice, however, the tech-focused approach was frustrated by the relationship with the LA who would not commission technology-enabled care from Oak Care, encouraging instead a time-and-task approach to care in 15-minute blocks. As such, technology was primarily limited to 'back office' tasks, such as scheduling, invoicing and payroll with a digital care management app to allow staff to view rotas and limited client information (name and address) in 'read only' mode.

Despite the LA's commissioning approach, Oak Care aspired to introduce digital care records because the care management app in situ caused frustration for senior care workers responding to emergency situations without ready access to information, such as next-of-kin details. In addition, Oak Care had piloted a digital care records system in the hope it would facilitate the communication of 'softer' care outcomes and enable the collection of data to make *"better management decisions"* (Oak Care M2). More specifically, it would reduce care workers' informal use of 'WhatsApp' to share information about client visits with each other. The ability of managers to access information being transferred via this medium was a cause for concern, as a manager explained: *"WhatsApp groups are fantastic and you know thankfully it's all encrypted but it's difficult to control the messages that go on there and difficult to extract the information out of those platforms . . . people may walk out the door with that knowledge in their heads and you know that is value to this organisation and value to our clients and our other care staff, we have to be able to*

protect that" (Oak Care M2). Care workers however told us WhatsApp helped them provide 'good care' by quickly relaying information directly to other care workers, rather than the slower method of sending messages via area managers: *"It's good to text like, 'Mrs X has erm a bruise on her shoulder can, can you just keep an eye on it?' or like a rash or something like that . . . it takes loads of pressure off the area manager . . . Because we would have, I mean, we would be ringing her a hundred times a day to report stuff"* (Oak Care CW3). The managers' storyline that the piloted digital care records would deliver efficiency was frustrated in practice by the commissioning LA's requirement that care workers maintained hand-written records in addition to using the digital system. Managers spoke of reticence among care workers to undertake this additional task and raised concerns about the staff attrition that may result. When we re-interviewed a manager during the COVID-19 pandemic, we learnt Oak Care had formalised the use of WhatsApp as a communication tool, utilising it to disseminate information on infection-control measures. Thus, the wider context of commissioning arrangements thwarted the Oak Care's aspirations for technology, and at the practice level, care workers were able to resist the imposition of certain technologies in favour of those they felt enhanced care.

Cherry Care – Outcomes Model

A technological system for scheduling, invoicing and payroll was an integral part of the organisational model at Cherry Care- its 'paperless' and 'premise-less' approach (hiring a local hall for team meetings) had reduced overhead costs. Care workers were provided with smart phones with two apps: one for care plans, recording incidents and information related to visits (including medications and photos to document 'softer' outcomes); and another for communication between care teams. The apps were used in a creative way by the organisation in a *"kind of hacked together tool"* (Cherry Care M1) to meet the company's requirements; a manager explained that 'off-the-shelf' apps and platforms are: *"all designed around having a manager in an office, telling individuals in the field what to do. It doesn't fit with our self-managing team set up"* (Cherry Care M1).

The storylines presented for the use of technology by Cherry Care managers and care workers were in sync: technology provided administrative efficiency for 'back office' functions and record keeping and created conditions for quality care by facilitating communication between care workers. The care organisation app was seen by management and care workers to enable more responsive care delivery for clients, with care plans amended in real time. The communication app was also reported to be easy and efficient to use and care workers said the flow of information meant they felt supported by their colleagues, as a care worker explained: *"we use the* [app] *to keep each other upbeat"* (Cherry Care CW3). While this app facilitated interaction, care workers told us the ease of communication created a sense of always being 'tuned in'. Some care workers, for example, reported that they were never 'unavailable', which had implications for their personal lives; several said they had looked at the app or responded to messages or calls during family holidays, explaining this was necessary to manage the volume of messages and to avoid information overload on their return to work. While some care workers viewed this to be their problem to solve, others expressed there was an unwritten expectation among

team members that they needed to regularly check the communication app: *"there's slightly funny comments that people aren't checking* [the app] *and they're not replying to these messages, and even if they can't cover a shift, they should at least be saying no, and I'm thinking well, what if I've just not seen the message in the first place? And I think the expectation is that people should be looking at it most days. It is the main negative of this job to me, because it's very hard to switch off when you're not supposed to be at work"* (Cherry Care CW5). The use of technologies in practice therefore was felt by both managers and care workers to deliver on the storylines of quality and efficiency, but with the unintended consequence of blurring boundaries between work and free time.

Maple Care – Introductory Model

Maple Care's marketing material used words like 'revolutionary' to describe its 'simpler system' to allow 'families' and care workers to connect via an online platform. While it appeared be an automated process to people using the website, the matching of care workers to customers relied on human input to 'tame' the technology. The algorithm would produce a longlist of care workers matched to each customer, from which the office staff then created a shortlist. The decision to adopt this hybrid approach was viewed as important to navigate factors such as *"personality . . . that's really hard to put into an algorithm* (Maple Care M2), and had evolved: *"when we started we were very keen on it being very automated, a bit like ordering an Uber, but it's a very personal purchase, you want to be able to speak to someone . . . you're talking about really crisis moment in your life, so you don't just want to be going to a bot"* (Maple Care M2). The company automated several 'back-office' processes: care workers' timesheets were pre-populated based on their schedule for them to check and submit via the platform which sent an invoice (including the service's commission) to the customer for approval, and then the care worker would be paid.

Cost savings produced by automated back-office processes was a key storyline expressed by Maple Care's management who argued these were passed on to families and resulted in higher wages for care workers, compared to 'traditional' providers. Quality through choice was also a storyline used in marketing materials and by managers, with the platform removing the traditional 'middleman' care agency, allowing care workers to set their own wages and be selective about their work; customers also chose their own care worker/s. The platform was integral to Maple Care's operational model and its scripts placed additional responsibilities on care workers (and those receiving care): one of the company's 'golden rules' observed during 'on-boarding' training sessions was that care workers *"engage with the platform regularly"*.

Reflecting on this Basic Theme of 'choice' and corresponding storyline of 'quality', all care workers interviewed appreciated the control they had over working hours – for example, *"essentially, you're your own boss . . . I like the flexibility. I like the control; I find that quite empowering"* (Maple Care CW1). The promised freedom to set their own wages was limited in practice as managers felt care workers had unrealistic expectations. In response, Maple Care had introduced guidance charging 'reasonable' rates. Ultimately however, the technology was viewed to have

facilitated customer choice at the expense of care workers' wage levels and work opportunities as some were lowering their rates to ensure they attracted work. Managers told us this pattern was related to discrimination *"we have a problem with racism, as does every single care agency probably, so we were seeing a slight trend in that people were paying more for a white carer, which just isn't what we want at all"* (Maple Care M1). This resulted in Maple Care at the time of the fieldwork introducing a new system of standardised rates based on the level of care required, which a manager explained would make *"it fairer, it's making it more about your experience, your skills and the match, rather than the cheapest person"* (Maple Care M1). The choice the technology was supposed to facilitate had become unbalanced towards the customer and therefore Maple Care was becoming more prescriptive for both care workers and those receiving support.

Conclusion and Discussion

While the policy discourse related to the digital 'transformation' of ASC broadly and homecare specifically makes limited distinction between the types of technologies used by homecare providers and workers supporting people with different needs, in different contexts, as our above findings and Table 2 illustrate, care sector stakeholders reported a variety of digital technologies are being deployed by homecare providers in two key areas: 1) the organisation and planning of care; and 2) the delivery of care in people's homes. In Table 3, however, we highlight the relatively modest range of technology-in-use in each case study (column 2). As has also been reported by Pols and Willems (2011) and Greenhalgh et al. (2020), wider contextual factors mediated change and curtailed further deployment of technology in these contexts; Pine Care was constrained by its franchise agreement, and Oak Care's aspiration to use more technology was frustrated by LA commissioning arrangements. At Cherry Care, in contrast, though digital technology was a key facilitator in delivering the model, keeping operational costs low and aiding communications between care workers in self-managed teams, the tools they used were a compromise as they had been unable to find a technological solution aligned to their organisational values and care approach. Maple Care's online introductory model was highly reliant on technology, but the organisational aim of a fully automated matching service had been scaled back due to the personal nature of care and care work.

Through the cross-comparative analysis, we sought to identify the formation of 'discourse coalitions' (Hajer, 1993) (i.e. groups of actors expressing the same sets of arguments), or instead whether a fracturing of arguments had occurred. The storylines emerging from stakeholder interviews and case study owner/managers (Table 3, columns 1, 3 and 4) aligned with the macro-level policy storylines regarding technology's potential to save costs, increase workforce capacity and promote care quality, evidencing a discourse coalition. We also explored whether technologies in practice delivered on these storylines, acknowledging how enacted experiences align theoretically with the view that technologies are social phenomena, shaped by the conditions of their creation and use (Williams and Edge, 1996; Henman, 2022). While a discourse coalition had formed at the macro and meso levels, there were notable areas of disconnect and 'fracturing' at the in practice micro-level

Table 3. Storylines and practice examples of technology use in homecare

1. *Why* technology as solution - macro & meso storylines	2. *What* technologies – case studies	3. *How* technology delivers solutions – meso storylines	4. *Why* technology deployed in case studies - micro storylines	5. *How* scripts affect care work practice – case studies
Efficiency	EM	Facilitates payment 'by the minute'	*Pine*: facilitates invoicing & payroll	*Pine Care*: added tasks; unreliable
	Digital care management systems	Reduces administrative costs, office space	*Pine*: costs (printing/postage), efficiency *Oak*: efficiency *Cherry*: cost savings (virtual office)	*Pine*: increased emails as rotas often amended *Oak*: limited access to information via app; doubled workload as commissioners required written records *Cherry*: access 'live' rota via app
	Introductory platforms	Cuts out 'the middleman', reduced costs	*Maple*: easier for 'clients' to find care workers; better pay, cheaper for clients	*Maple*: system used algorithms & human review
Quality	EM	Ensures safety of clients	*Pine*: refine care plans; safeguarding & care quality	*Pine*: added 'technology-focused' tasks
	Digital care records	Safety (medication compliance); recording of care activities/ tasks/outcomes	*Oak*: record information and communication via 'official' channels *Cherry*: quality, responsive care; capture 'soft' outcomes; support for care workers.	*Oak*: care workers continued to use WhatsApp *Cherry*: care workers supported by good communication, but always 'on duty'.
	Introductory platforms	Autonomy & choice for care workers & clients; better pay for care workers	*Maple Care*: quality care & care work through choice.	*Maple Care*: 'golden rule'- regular engagement with platform.

(column 5). Tensions exist within the storyline of efficiency; for example, we have shown how the deficiencies in the EM system used at Pine Care frustrated care workers and lead them to keep their own records of completed shifts. At Oak Care, digital care records pilot created additional tasks for care workers who were required to also meet the LA preference for paper records. Even at Cherry Care, where provider and care worker storylines aligned regarding the benefits of technology, its use led some workers to feeling they were always 'on duty'. At Maple Care, the platform's scripts created several dependencies on the technology itself as it mediated how work was secured and subsequent payments processed (as well as scripts for people seeking ways to organise their own care). Its 'tech-enabled' promise required the 'human touch' to regulate the matching system and while managers' accounts blended the storylines that technology facilitated quality through promoting choice for both people arranging and providing care, in practice choice was curtailed by rate setting 'guidance' and the proposed introduction of pricing bands. The requirement that care workers engage with the platform and follow its scripts was one of the organisation's core rules, yet those who did so were subject to increasingly restrictive work arrangements despite the company's aspiration to facilitate choice and therefore quality for both care workers and clients.

Based on these findings, we argue the unintended consequences of technology use must be considered, including the challenges generated for care workers and those they support. By illuminating the storylines and contrasting them with enacted experiences of technologies-in-use, our paper offers a challenge to policy discourse and associated discourse coalition that present the transformative potential of technology as self-evident or uncomplicated. The discourse coalition we show to have formed around policymakers', care sector stakeholders' and care providers' shared view that technology is capable of increasing workforce capacity and efficiency in homecare sits at odds with care workers' enacted experiences of technology-in-use; through our comparative examination of workers' experiential accounts, we show how the dominant storylines articulated at the macro and meso-levels are failing to be realised in practice.

Though care workers are directly subjected to the practice-based implications arising from the 'technology is transformative' discourse, their perspective and enacted experiences are often neglected by policymakers and technology developers. While technology is presented as both homogenous and 'transformative' in UK policy discourse and has been an area of investment to address ASC crises, this paper contributes important insights into the diversity of technologies, the various reasons for the mundanity of their deployment, and in ways that ultimately undermine the rationales for their use. It is, we propose, care workers' knowledge of technology-in-use that can contribute important practice-relevant caveats to the policies promoting technology as a 'silver bullet' solution (Eccles, 2021) and thereby reopen debates as to alternative strategies for change.

Competing interests. The authors declare none.

Notes

1 Assistance provided to people in their own homes to support them with activities of daily living (e.g. personal care) and instrumental activities of daily living (e.g. housework, taking medications).
2 https://www.nuffieldtrust.org.uk/comment-series/adult-social-care-in-the-four-countries-of-the-uk
3 Responsibility for policy, legislation and the allocation of funding for ASC is devolved to the four UK nations where local councils, trusts or authorities are responsible for the delivery of services; we use 'LA' as a shorthand in this paper (Gray and Birrell, 2013).
4 An independent registered charity and the English strategic body for ASC workforce development.
5 Lynch et al. (2019: 51) identified the 'better outcomes storyline' related to specific subset of technology used in ASC (telecare), which included "'maximising choice, control and independence' or 'making efficiencies'". Greenhalgh et al. identified a 'modernist' discourse, used by "policymakers, the technology industry and researchers from biomedical and health informatics disciplines" (2012: 10), attributed efficiencies and 'empowerment' outcomes to technology.

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