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Introduction

Digital healthcare technologies such as computers, electronic information and communication systems, mobile and Web based health platforms enable large scale information storage and processing. They can standardise healthcare work, making it faster, more efficient, more precise (West and Yaraghi 2014; Commission of the EC 2004; Department of Health 2002; NHSE 1998). They also offer the opportunity to reconfigure both the work of healthcare - the tasks performed - and healthcare workforce in terms of the numbers and skill mix of people doing the work. Much of the promise of digital technologies has centred on substitution; a familiar trope in the popular and academic literature has been the idea that 'robots' or 'computers' will undertake work and thus replace human workers (Ford 2015). As such, digital health technologies are often viewed as a solution to rising health care demand and a way to reduce healthcare costs. However the experience of trying to implement health technologies – digital and non-digital – suggests that it is not always possible to realise these benefits (Halford et al 2010; Heeks 2006; Berg 2001). A significant literature has grown around the topic of implementation, listing the numerous barriers that have been encountered in projects that sought to deploy digital technologies in health care (see for example May et al 2001; Gagnon et al 2012). In this paper we take a different path and attempt to understand how digital technologies are brought into use by reconsidering the relationship between technologies and people. In essence we ask the question – what if we stopped seeing robots and computers as replacements for human workers and instead began to understand the work entailed in using these kinds of digital technologies in healthcare?

The analysis presented in this paper is taken from our reconsideration of data from two projects looking at the deployment of computer technology in urgent and emergency care services. We employ a metaphor drawn from fiction to answer our question and generate, we hope, new insights about technologies in use. In using metaphor, we recall Morgan's (1980:612) assertion that organisational theory is metaphorical, and his sense that this encourages a spirit of critical enquiry. Our paper can be seen as a modest contribution to a wider body of metaphor-based research (Cornelissen 2005; Cornelissen et al 2008) in organisational studies and health services research, and the metaphor we deploy is deliberately imposed or 'projected' onto the organisational reality to aid and illuminate our sense-making. The inspiration for using a metaphor in this way came from Norwegian and Southampton colleagues (Lotherington et al

2016) who combined insights from a popular film with feminist theory to re-examine nursing work.

Hubots

In this paper we draw on fictional, dramatic and imagined configurations of digital and human life to consider the relationship between technology and human. The object of study is a computer decision support system (CDSS) that underpins telephone triage and prioritisation for 999 emergency Ambulance services and NHS urgent care services. In brief, it is an interactive software system that comprises an expert knowledge library and an algorithm or system of rules designed to support a health care service provider in making a decision about the care and treatment needs of telephone callers to these services. Typically in the health care context these kinds of CDSS are used by doctors or nurses to support clinical decision making but our research concerns what happens when they are used by non-clinical clerical workers to support the delivery of health services.

In order to understand how this particular CDSS technology, and other digital health technologies, are brought into everyday use we reach not to academic research or social theory, but instead to a recent television drama called Äkta Människor. Äkta Människor is a Swedish TV drama, first broadcast in 2012. Written by Lars Lundstrom, it is set in an alternative, near future reality where androids – known as *hubots* - are routinely employed in industrial and service work. Hubots closely resemble humans; they are subtly distinguishable by eye colour, and an inability to fully mimic the nuances of human behaviour and speech. Some people (humans) embrace this technological advance. Indeed some do this more literally than others, for example using these robots as sexual partners and life companions; others use them for unpaid labour – for domestic work, childcare, clerical work and healthcare. Not all humans welcome the hubots. A social movement of 'Real Humans' reacts against the rise of these machines, and engages in public protest and direct action against them.

The hubots exemplify an archetypal vision of digitised labour substitution. The television series depicts the hubots performing menial, boring and repetitive tasks such as raking leaves, parking cars, and information processing, and the kinds of care work – housework, childcare, 24 hour support for elderly and infirm - that, while much in demand, often falls to the lower skilled and lowest paid in society. The series plays out a series of encounters between different hubots and their human 'hosts' in a story that is part crime thriller and part domestic drama. If the synopsis here seems familiar it may be because the series has been widely syndicated across Europe, and

an English version of the series was shown on Channel 4 as 'Humans' in 2015. As the narrative unfolds we see humans use, detect, chase, befriend, support, hide, repair, destroy and save hubots. The narrative of this drama, whilst ostensibly concerning robots, is one that involves significant human effort. It takes considerable work to live in this future world. Not only do the hubots require substantial financial investment, they are shown needing instruction (programming and modification) and they wear out, or break requiring human intervention to repair them, or they become obsolete and need to be replaced. In Äkta Människor 'real humans' devote considerable time and energy accommodating and adapting to their hubot 'servants' and ultimately many become emotionally entangled with these machines – whether raging against them in protest or expending affection or desire.

Methods

The data in this paper come from eight years of research about digital technologies in urgent and emergency care, funded by the NIHR Service Delivery and Organisation, and the Health Services Development and Research programmes examining the implementation of this new digital technology in different NHS settings in England. Our initial project (SDO 08/1819/217) sought to compare the use of the CDSS in different health care settings and the second (SDO 10/1008/10) focussed in more detail on work and workforce reconfiguration associated with its deployment. Both projects used a comparative mixed-methods case study design because this allowed us to study implementation processes and understand context. In all we studied eight different English NHS settings which included a 999 emergency ambulance service, a single point of primary care access service, an out of hours general practice service, and five sites for the NHS 111 urgent care service. The selection of study sites was purposive, designed to reflect differences in organisational features such as size, type of workforce, and location both geographically and in the healthcare local economy (for example co-location with other emergency or urgent care services).

We used ethnographic methods of direct observation, informal interviewing and focus groups, and questionnaires. The data from these studies comprise approximately 900 hours of observation of call handling and urgent care service delivery, semi-structured interviews with 64 individuals (service staff and a range of other stakeholders including national policy makers and local service managers and care providers), 6 focus groups with a further 47 staff in call centres and urgent care, and surveys of nearly 700 NHS staff including call handlers, managers and clinicians. These data were analysed together, via a mixture of independent reading and coding, team development of codes and themes, computer assisted

data archiving and retrieval using Atlas.Ti 6.2 (Scientific Software Development GmbH, Berlin) and a series of 'data clinic' team discussions to develop themes and interpretations. More details of data collection and analytical approach are published elsewhere (Turnbull et al 2014; Pope et al 2011).

Findings

We use the metaphor of the hubot here to reconsider the relationship between technology and people, and to think about the implementation of the CDSS technology. Two features of these imagined robots resonated with our research about CDSS, and with the wider debates about deploying digital technologies in health care settings. These are i) the substitutive potential of technologies and ii) the labour associated with deployment, including the emotional work that surrounds their use. We will use these two thematic headings to present our analysis in the sections that follow, but first we outline the insights we draw from the metaphor of the hubot to frame these themes.

Hubots and digital technologies as labour substitutes.

Hubots are able to perform tasks that require precision or standardisation. They are also able to undertake activities that are repetitive and perhaps boring. In this respect they are rather like the androids employed in contemporary car factories and production lines. This is an important feature of digital technologies: they perform tasks that humans no longer want or which we can no longer perform through lack of skill, time or inclination, or they are seen as more cost effective because they replace labour. This is the labour substitution promise of digital technology. Of course this promise comes with a significant threat – these technologies can replace human employment, threatening identity and income. The threat is not new, it has accompanied the introduction of technologies since the birth of industrialisation; a contested but popular view of the 19th century Luddites was that they resisted new automated weaving technology because they saw it could replace their labour and destroy their precarious livelihoods (Grint and Woolgar 1997) . As we will show below the CDSS we studied offers a clear substitutive promise to replace expensive doctors and nurses with a combination of technology and cheaper, clerical staff. However this substitutive capacity appears to contain a second, paradoxical feature which is that the technology increases the overall burden of labour, it introduces additional work that is required to bring and keep the technology in use.

Hubots and digital technologies as generative of work.

The fictional drama series highlights many forms of undertaking required to bring hubots into everyday use. Hubots require considerable investment, both financial and physical. The robotic technology is expensive, and like so many modern digital technologies it requires adaptation and personalisation to be enabled for everyday use. Hubots are, like other digital technologies, subject to continual refinements, adjustments and upgrades, and eventually they need to be expensively replaced. Work is required to make these adaptations and adjustments to the technology, but also in the background to generate the resources to pay for upgrades and new technologies. It seems that human effort and labour, far from being erased or superceded by robots, proliferates and becomes necessary *because of them*. We will see below how this applies also to the introduction of the CDSS.

To digress for a moment, let us consider the digital technologies that in use in our own lives, the personal computer linked to the internet, or the smart phone, for example. We expend effort learning to use these technologies, in downloading and attending to software updates, incorporating additional features, which in turn require us to learn and attend to them in the same ways. And we see too how these technologies have extended the boundaries of other forms of work such as email, diarising, communication. Digital technologies have enabled a 24-7 world and with it the capacity to work more, for longer, and possibly harder. In order to keep up with the rapid pace of technological change it becomes necessary to expend further human effort to acquire the next generation hardware and software just to 'keep up'. Thus, labour or work proliferates and becomes necessary the more we use digital technologies. This is the paradox of digital technologies, the digital labour substitute makes human work.

Related to this, an important feature of technology revealed in the television series, is that much of the work engendered by hubots is *emotional labour* (James 1992). The responses displayed by the 'real human' resistance movement in Äkta Människor are the complex neuro-biochemical reactions that occur as hormones are rapidly released from the hypothalamus: hubots evoke strong emotions of fear, anger, and rage. Elsewhere, other interactions between hubots and humans are shown as engendering positive emotions ranging from enjoyment and pleasure, to desire, lust and love. Again this resonates with some of our 'real world' interactions with digital technologies, vis the desire and enjoyment emotions displayed in the advertising and consumption of digital technologies, and the contrasting frustration or anger that accompanies technical failures (for example when my PC software hangs up mid-sentence or the wifi router crashes).

To summarise, in Äkta Människor, a fictional futurescape, robot technologies are shown as substituting for human labour, whilst paradoxically making more work. These twin phenomena which we can refer to by the shorthand terms – labour substitution and labour intensification - re-appear when we examine the CDSS used in NHS urgent and emergency care, as the paper will now show.

The CDSS as labour substitution.

The CDSS that underpins telephone management of callers to urgent and emergency care in the NHS was heralded as an opportunity to change workflows and workforce configuration to improve health services. A core promise of this technology was that it could enable labour substitution:

…if you can handle this with call-handlers and just a few nurses, adjust that skill-mix, you could save a shed load of money. Interview, key stakeholder

The CDSS allowed cheap, non-clinical staff to substitute for expensive clinically trained staff. Its introduction was also welcomed as a chance to standardise triage practices and offer – at last – a service that could "*give the same disposition to every patient who presents with the same condition"* (Interview, 999 manager). The system allowed clerical workers to give clinical advice, which was built into the scripts offered by the algorithms and included advice ranging from self-management of minor ailments, through to lifesaving cardio pulmonary resuscitation (CPR) techniques. The technology simultaneously proposed to reduce costs, reduce pressures on clinical services, encourage self-care and even save lives. There were occasional dissenters who questioned the value of this substitution, but even they accepted the labour substitution and cost saving premise of the system:

Call handler: But my understanding of it was, I thought the government have brought it in, so we don't have to pay as much to the nurses, we could pay call handling rates, so it saves money for the government by not paying the nurses, but the bit of money you've saved, like you've just said [overtalking] …it's costing more, definitely ….
Call centre manager: So then they decided to cut costs and put nurses on, and the nurses generated a lot of appointments, and a lot of visits, that meant you needed more doctors. [Laughter]. And now, they've like, split the cake again, so now it's just bigger than ever. Focus group, NHS 111

The CDSS as labour intensification.

By introducing the CDSS clerical staff were successfully brought in to do a job once seen as preserve of doctors and nurses. However the services did not only use clerical staff, each site employed clinical supervisors – nurses and paramedics, and sometimes general practitioners to support call handlers and dispense advice directly to patients. All of the sites we studied expanded their workforce over the period of our study in order to meet demand for the services they supplied. Counterintuitively, it seemed that labour substitution involving digital technology required more staff, both clinical and non-clinical. In the context of NHS 111 this seemed in part because the new service attracted more calls on a wider range of health issues compared with previous calls to out-of-hours providers, and partly it seemed this was because calls answered by clerical staff using the CDSS took longer than the kinds of 'expert' clinician triage previously provided by doctors.

Using the new CDSS technology to deliver urgent and emergency care required considerable human work. Call handling involved multitasking by human call handlers – reading prompts and scripts, talking through a headset, clicking a mouse, and typing text. The call handler had to control the pace of the call, establish a working rapport with the caller and ensure that the right information was obtained.

Call handler 1: it's quite technical and stressful,
Trainer: Although they've got, they passed the [unclear] exams very well, interviewed very well, and then the reality...
Call handler 2: of multi-tasking.
Trainer: Yes.
Call handler 2: Listening, doing, watching, thinking, learning the process...
[ ] .. sitting with three/four screens, listening one ear for your dispatcher, one ear for this, one ear for that, and knowing what's happening there, it's difficult.
Trainer: And also there's that sense of urgency about it as well, which is very important, and just, um, confidence, and...
Call handler 1: It's also being able to talk to people, it's very important. Focus group, NHS 999

The vignette below describes the work involved in managing a 999 call:

Male and female 'body maps' have opened. The call-handler 'clicks' with the mouse to select a body area and asks where the problem/symptom is located. Clicking on the chest area opens a series of chest pathway questions designed to narrow down the diagnosis. The call hander runs through the

questions, sometimes using prompts from the screen, or versions of these. As the caller responds the call-handler clicks answers – sometimes backtracking, sometimes ticking an answer without asking a question because the information is supplied unasked and sometimes typing in a short phrase. Working rapidly through the questions the call-handler may also complete demographic details or supply notes for the ambulance crew in another window, whilst the caller is talking. Call-handlers are encouraged not to waste time getting patient's names before crucial clinical information has been entered, but many do ask and use this information throughout the call. Alongside the CDSS questions, the call-handlers insert explanations to the caller about why the questions are important: callers may be told "an ambulance is on it is way but taking this information now is useful for the ambulance crew in treating your son" for example. Often the call-handlers have to probe for information, asking the caller to speak up, or clarify an answer, and sometimes the call-handler has to explain the clinical language and/or translate the callers' responses into one that fits the options offered on the screen in front of them. All the while, the call-handler is aware that an ambulance has already been sent by the dispatchers; she is racing against the clock to reach a disposition before the ambulance arrives. Observation, 999 ambulance call centre

This work appeared intense. Call handlers with experience of previous systems suggested that the content of the job had grown and that it was exhausting:

Call handler: After a shift, I'm going home, and I'm just, like, [sighing]. [Laughter]. …it's mentally draining. …it's not like somebody's ringing up to book a car for something, , … what I'm finding hard, as well, some of the calls, they can last for 20 minutes, and you finish that call, and then the phone rings again, and bang, you've got to go straight on to the next one, and just put that one behind you, and start again. Focus group. NHS 111

This labour intensification was not only noticed by the call handlers. One of the doctors we observed said that the new system had doubled the workload for general practitioners (Observation, Urgent care centre). In addition to increasing the everyday work the new system required new training activity for the system to be brought into use. Call handlers received six weeks' formal training in the early sites we studied, and as the NHS 111 service expanded this was condensed into two more intense weeks in the classroom. Delivering this training was made complex by the presence of a largely part-time workforce, so that formal training sessions were often duplicated to ensure that all staff were able to attend. This intensified the work for those staff engaged in training.

Moreover, training was not a one-time activity: there were continual updates to the computer system prompted by new evidence guidelines from NICE, changes to contracts for services, and larger policy changes and adaptations to improve operability. In one site we observed an additional afternoon of training introduced when a single national safeguarding policy changed. As well as this formal training necessary to do the job we found that the call handlers undertook a variety of formal and informal training. This included such things as taking evening classes to learn anatomy and participating in ad hoc lunchtime 'seminars' from paramedics to learn about symptom presentation and disease management. Surrounding all of this there was a continual exchange of knowledge and experience in everyday interactions with other call handlers in between calls which call handlers used to learn how to use the technology and manage the calls. It seemed that introducing this digital technology entailed more tasks and required more intellectual and organisational effort. The work was subjectively experienced as intense and objectively appeared to entail considerable effort.

In common with frontline health care we found that call handling required considerable emotional work. Some staff reported the new system using the CDSS was highly stressful they described it as "*frenetic and frantic"* and described staff being in tears or visibly stressed (Interview, 999 senior manager). Call handlers had to establish rapport with each caller and manage the pace of the conversation. They also needed to translate what the callers were saying in order to make life saving decisions:

Now, if mum's saying they are floppy and lifeless . . . we need that ambulance, but sometimes, an interpretation of floppy and lifeless, it might just be a listless, lethargic baby who doesn't need an ambulance. How do you decide which one is life-threatening and not? You chat to the mum as much as you can . . . you know, [probe] "is it like a ragdoll?" Focus group, NHS 111

The job also required negotiation skills and callers did not always want the care option offered. Some call handlers managed this by presenting treatment options as a series of choices, as in these examples:

The call handler says to the parent "I can take you through assessment to decide the appropriate care if you would like"? This is a choice for the caller. I notice this element of 'choice' a lot on this visit. A disposition of seeing the GP within 24 hours is reached. He offers the parent a choice of alternative courses of action. The child can either be seen during out of hours tonight at the

Urgent Care Centre or the parent can see their own GP tomorrow. The parent opts to be seen this evening. Observation NHS 111

A patient calls back. She has been waiting 5 hours now for the ambulance. It is getting late, and the patient doesn't want to wait any longer - she doesn't want to go to hospital tonight. She tired and fed up. The clinical advisor says "if we arrange an ambulance for you tomorrow - would that be more acceptable?" She explains that she cannot pre-book an emergency ambulance for more than 6 hours ahead, so tells her that a clinician will phone her tomorrow morning after 10 so that an ambulance can then be called for her. Observation NHS 999

In other cases the patient refused an option offered and this had to be resolved

The triage finishes with a disposition of 'A&E department- 4 hours' I believe the caller asks if she can take the child somewhere else. The call handler reiterates 'I think it's saying go to A&E because it's a child' and calls over the supervisor for clarification. ... the call is now put through to a nurse adviser, essentially because it is a 'refuse disposition'. The call handler explains to me "it's a big loop; it will just come back to us. It was and ED 4 hour, but they didn't want that". Observation NHS 111

In dealing with callers, as in many customer facing occupations, the call handlers often bore the brunt of callers' anger and frustration. The nature of healthcare work was that they had to manage anxiety and distress, and could be subject to hostility or abusive language:

Call supervisor 3 reports that a patient also gave her 'loads of abuse'. Call taker joins in with conversation, remarking 'I took the original call, yes lovely young girl she was! She can't have been that ill, she was leaning out of the window calling [out], she can't be that ill'.
Observation NHS 111

The call handlers were exposed to some of the traumatic aspects of health care and this had emotional repercussions for them. One call handler described the emotional difficulty of dealing with a 999 call for a child who had stopped breathing, and explained that she had cried about this in the toilet at work. Another explained that dealing with people with depression was difficult:

Some of the mental health calls are particularly hard to deal with . . . A newer call adviser (CallA4) says, 'after training, every time I shadowed people, they had people with mental health problems and that really panics you. Observation, NHS 111

This emotional labour might sometimes be viewed positively as in this focus group exchange:

Call handler 11 describes some of the more rewarding aspects of the job to me saying 'the job can be rewarding'. Call handler 10 adds 'I'm not sure about that!' Call handler 11 however continues 'it's rewarding when you get a hunch that someone is really ill, you can chat with the Clinical adviser or nurse and sometimes they are listening in and they can upgrade the case and get an ambulance despatched…. It's a nice feeling when you know you have helped someone'. Focus group, NHS 111

To recap, the introduction of the CDSS substitutes for some clinical jobs, allowing tasks to be performed by (mainly) clerical workers. Yet at the same time it appears to intensify the work, and despite being spatially removed from the patient this work is emotionally demanding. This is work which at first sight, for the individual call handler, might seems to consist of simply following the questioning logic of a pre-set algorithm. Yet in practice the work interweaves complex processes of multi-tasking, interpretation, negotiation, and emotional labour. The workforce has also grown (it did not exist in this form before the introduction of these services) and the range of roles within it has expanded to include call handlers, clinical advisors of various grades and training and auditing staff as well as managers. What interests us, given these features, which on the face of it do not seem to adhere to the promissory rhetoric of digital technologies, is why? What is it that makes this combination of computer and human, of technology and people, work?

Discussion

We have previously argued that the software and the worker are both necessary to the accomplishment of the task of call handling and that this might be understood by using the metaphor of the cyborg (Pope et al 2014). This metaphor, of the cyborg, draws on sociological and philosophical literature about the connections between humans and technology, and the work of the feminist sociologist, Haraway (1991), and the organisational studies scholar Nyberg (2009) seem to be especially helpful in considering the relationship between technology and humans. Nyberg says that we need to see the unity and interdependence of human-machine

conjunctions as an "assembly of actors, together, performed". Haraway, in her famous cyborg manifesto argues against essentialist polarities and she uses the idea of the cyborg to reject distinctions between men and women, human and machine and instead to embrace technologies as liberating and emancipatory. Both writers offer positive visions for a future where humans and machines are intertwined. The fictive vision offered by Äkta Människor and the analysis of call handling in emergency and urgent care using the CDSS we have presented here appears less progressive. Yes digital technologies, hubots or CDSS, can substitute for human labour but, at the same time, they appear to intensify the human work required.

In the case of NHS call handling for urgent and emergency care services technology has enabled labour substitution (Turnbull et al 2012). The call handlers are un-, or semi-skilled, workers, paid at the lower grades of the pay scale, minimally trained, lacking the kudos and power of their clinical colleagues. This is a new, and growing occupational group, supported by the existing clinical workforce and it seems that the threat of 'machines taking jobs' is dissipated by the paradoxical 'make work' of the introduction of the digital technologies. There are more tasks, and more learning, and more workers in this brave new world of computer decision support: the labour is intensified. Moreover this work, demands the very thing that (thus far) computers have not been able to replicate – emotional labour. Beyond the examples presented in this paper the introduction of the CDSS also required considerable effort by NHS policy makers, stakeholders in the Royal Colleges and the like, and by Trust Executive Boards and local service managers. And before that there were years of development work by the technical team to design and test the software. What we see when we examine NHS call handling using the CDSS is labour, effort, work, by human beings.

One of the questions raised in Äkta Människor is: do the synthetic humans displace humans? In the drama the hubots need humans to understand them, to repair them, give them power, (and at the end of the first series at least) to protect them. Even in this fictional world, technology needs humans. The Swedish version of this story appeals in particular because of the lovely word hubot. A conjunction of hu (man) and (ro) bot, this word puts the human aspect first and foremost. In thinking about how we implement digital technologies in health care, we could appropriate the concept of hubot to understand how digital technologies are brought into use. We need to recognise, right from the start, that human effort, physical and emotional labour, is essential. This may be true of all human-machine interactions – perhaps not - but it seems especially true of the kinds of digital technologies we deploy in health care which simultaneously substitute for, *and* intensify labour. The problem with implementing digital technologies is that all too often we fail to recognise or support the human effort necessary to

bring them into use and to keep them in use. The hubots in the Swedish television drama and the CDSS currently in use in urgent and emergency care services in the UK require human effort to function. Implementing digital technologies requires human work, not as a one off, but as a sustained co-constitutive engagement.

Conclusion

The introduction of the CDSS studied in the projects reported here has been a success in as far as it has fundamentally changed the way urgent care is delivered and has done this by combining digital technology and greater use of non-clinical workforce. Our projects did not set out to evaluate the impact of this new mode of service delivery on patient or health outcomes but work elsewhere has demonstrated that the service is safe (Turner et al 2008) and that patients are largely satisfied with this provision (NHS England 2015). This paper has taken a deliberately novel approach to examining the relationship between technology and human beings. As with all ethnographic and case study work the usual limitations apply - the analyses presented here may be transferable to other similar settings, but are not generalisable in the statistical sense. We studied the services at particular moments in their trajectory and they have no doubt evolved and altered since fieldwork was completed. Nonetheless the interpretations offered here provide useful insights about call handling for urgent and emergency care in the NHS.

We have attempted to use the narrative arc of a science fiction story as an analytical resource to reconsider the data from our studies. We do not claim to be film scholars, literary critics, or to have done justice to Äkta Människor as a work of dramatic fiction, but we hope we have provided a way to reconceptualise the work entailed in using digital technologies in healthcare. We have also contributed to metaphor-based research in the study of health care services and organisations, providing an example of how we can fruitfully project metaphors from fictional narratives to facilitate a deeper understanding. Future research on human-technology relationships may not require repeated watching of TV series (enjoyable though this can be), but will benefit from attending to the human effort entailed in digitisation and computerisation. If digital technologies are to deliver their promise of transforming health care this will only be accomplished *with* human action, not in place of it. If we want to figure out how to embed digital technologies in health care maybe we should could learn something from hubots.

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