Choose and Book: A sociological analysis of 'resistance' to an expert system

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ABSTRACT

In 2004, the English Department of Health introduced a technology (Choose and Book) designed to help general practitioners and patients book hospital outpatient appointments. It was anticipated that remote booking would become standard practice once technical challenges were overcome. But despite political pressure and financial incentives, Choose and Book remained unpopular and was generally used reluctantly if at all. Policymakers framed this as a problem of 'clinician resistance'. We considered Choose and Book from a sociological perspective. Our dataset, drawn from a qualitative study of computer use in general practice, comprised background documents, field notes, interviews, clinical consultations (directly observed and videotaped) and naturally occurring talk relating to referral to hospital in four general practices. We used strong structuration theory, Giddens' conceptualisation of expert systems, and sensitivity to other sociological perspectives on technology, institutions and professional values to examine the relationship between the external environment, the evolving technology and actions of human agents (GPs, administrators, managers and patients). Choose and Book had the characteristics of an expert system. It served to 'empty out' the content of the consultation as the abstract knowledge it contained was assumed to have universal validity and to over-ride the clinician's application of local knowledge and practical wisdom. Sick patients were incorrectly assumed to behave as rational choosers, able and willing to decide between potential options using abstracted codified information. Our analysis revealed four foci of resistance: to the policy of choice that Choose and Book symbolised and purported to deliver; to accommodating the technology's socio-material constraints; to interference with doctors' contextual judgements; and to adjusting to the altered social relations consequent on its use. We conclude that 'resistance' is a complex phenomenon with socio-material and normative components; it is unlikely to be overcome using the behaviourist techniques recommended in some health informatics and policy literature.

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Introduction

'Resistance' to information technology in healthcare

Healthcare depends increasingly on information and communication technologies (ICTs), whose introduction is often characterised by limited adoption or adoption followed by abandonment, especially when part of a large, top-down change programme (see for example (Greenhalgh, Morris, Wyatt, & Thomas, 2012; Greenhalgh et al., 2010; Robertson et al., 2010; Sanders et al., 2012)). The health informatics literature tends to explain such 'failed' projects in terms of resistance (depicted as an ill-defined combination of inertia, anxiety and Luddism) and to couch solutions in terms of securing behavioural compliance without questioning ends. For example:

> "…the major challenges to system success are often more behavioral than technical. Successfully introducing such systems into complex health care organizations requires an effective blend of good technical and good organizational skills. People who have low psychological ownership in a system and who vigorously resist its implementation can bring a 'technically best' system to its knees. However, effective leadership can sharply reduce the behavioral

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resistance to change—including to new technologies—to achieve a more rapid and productive introduction of informatics technology." (Lorenzi & Riley, 2000, page 116)

Healthcare IT policy typically reflects this behaviourist framing by focusing on incentives, sanctions and training (Department of Health, 2012). In contrast, socio-technical systems theory proposes that technologies and work practices are best co-designed using participatory methods in the workplace setting, drawing on such common-sense guiding principles as staff being 'able to access and control the resources they need to do their jobs', and insisting that 'processes should be minimally-specified (e.g. stipulating ends but not means) to support adaptive local solutions' (Cherns, 1987). Socio-technical theory frames resistance to ICTs in terms of poor fit between the micro-detail of work practices and the practicalities of using technology. Brown and Duguid (2002) have shown how technologies in the workplace are embedded in networks of social relationships that make their use meaningful. The detail of how to use, adapt, repair or work round technologies is learned through membership of a community of practice; this social infrastructure strongly influences whether and how particular technologies 'work' in particular conditions of use.

In this paper we acknowledge this perspective and seek to complement it with a multi-level theoretical analysis that considers macro forces emanating from government and state agencies; meso-level networks that mediate these forces; and micro-level sites of acquiescence or resistance by human agents. We incorporate selected insights from actor-network theory (ANT), which conceptualises networks of humans and technologies that are dynamic and (to a greater or lesser extent) unstable. ANT usefully considers human actors' (and indeed technologies') behaviour as a consequence of the overall pattern of influences generated across the network.

In this study our preferred analytic lens is structuration theory, developed by Anthony Giddens (1984). We adopt a layered ontology, finding it productive to make distinctions between structure and agency, and between macro, meso and micro, which ANT rejects. We integrate technology into the picture, a dimension that is missing from Giddens' work (Greenhalgh & Stones, 2010). We also seek to go beyond Giddens' abstract concern with social structures in general and use an empirical case study approach to look at *particular* fields of social relations. This emphasis has many parallels with ANT's notion of networks. Taking a layered approach to the study of relations or networks highlights the ways in which the interdependencies and interactions that constitute these networks are embedded in hierarchical power relations, both near and distant. Unlike ANT, this 'strong' version of structuration theory carefully distinguishes the agency of humans from that of technologies (the latter, we contend, can only 'act' in a limited way). Strong structuration theory also considers how the values and knowledge possessed by both individual and organisational actors are influenced by external structures, and how this value-knowledge nexus informs and influences their actions, with or without technologies, in particular social situations (Stones, 2005b). For strong structuration theorists, resistance to ICTs stems from the human agent, who is positioned in a particular network of social relations; has a particular identity, organisational role, set of moral principles, beliefs, capabilities, and so on; and accords significance to technologies in particular contexts.

We sought to apply strong structuration theory to explore resistance to a nationally mandated healthcare ICT, 'Choose and Book' (a system for online outpatient referrals in England — Box 1), in terms of the reasoning and actions of human agents and how this was influenced both by social structures (especially social and

Box 1
Referral to hospital using Choose and Book technology.

At the time of this study, Choose and Book software was materially accessible from the desktop of GPs and administrative staff in almost all practices in UK, but the GPs we studied did not use it themselves. By manually entering the patient's NHS number (or, more rarely, by using an automated link), the administrator called up the patient's centrally held demographic details from the NHS 'Spine'. Next, they selected the priority ('routine', 'urgent' or 'two week wait' — the last for suspected cancer) and entered a clinical specialty (e.g. 'gynaecology') and clinic type (e.g. 'infertility'). This generated a preset menu that allowed providers to be compared on three criteria: distance from the patient's postcode, key word (such as the name of a provider) and indicative waiting time (based on the last 20 appointments in the system). Clicking on any of the providers on this list would (in theory) call up information about them from a directory of services (supplied by providers), including which specific clinical conditions the clinic covered. The facility to refer to particular consultants was technically possible but not usually available in practice at the time of the study. Once a provider clinic was selected, a referral letter (typically dictated and typed a day or two later) could be uploaded onto the system.

Alternatively, the patient could be given (or sent) printed instructions, including a unique identifier and password, allowing them to access the above information themselves by telephoning a dedicated call centre or via the Internet using the 'HealthSpace' personal portal, for which they needed to register in advance by post. HealthSpace contained a link to the 'NHS Choices' website, which offered three types of comparative information on providers: performance against published indicators (e.g. infection rates, mortality rates, food quality scores), patient experiences (bulletin-board postings in similar format to travel experience websites) and distance from the patient's postcode. The website allowed the patient to generate bespoke tables to allow 'objective' comparison of hospitals against their preferred criteria.

Some services on the Choose and Book system offered 'directly bookable' appointments that allowed a time and date to be obtained immediately, but if the provider's system was not yet integrated with Choose and Book, the patient was sent a letter by the practice with a reference number and the hospital's telephone number to book their own appointment. Once the hospital service received the booking (along with the referral letter), a decision was made (usually by an administrator) to accept or reject the referral. They could also contact the patient to change the date or time of a directly booked appointment.

professional norms and values and political authority) and by the material capabilities and constraints of the technology. To that end, we undertook a secondary analysis of a rich ethnographic dataset on the use and non-use of electronic records in UK general practice.

The policy context

As with many healthcare ICTs, Choose and Book was linked to a specific national policy, described in detail by others (Coulter, 2010; Dixon, Robertson, & Bal, 2010; Jones & Mays, 2009). The first government commitment to providing patients with a choice of time and date of their hospital appointment was in 2001 with the Labour government's landmark *NHS Plan*. Choice of hospital was promised

a year later. In 2004, *The NHS Improvement Plan* promised all patients a choice of hospital at the point of referral. It predicted that introduction of 'choice' would reduce waiting times, make the service more responsive to patients' needs, promote quality improvement and increase efficiency (and therefore cost effectiveness). The plan sought to introduce competition between providers via a new reimbursement system that paid hospitals a fixed tariff price per patient seen. From January 2006 all National Health Service (NHS) patients referred to hospital for elective care were to be offered a choice of four or five 'clinically appropriate' local providers. In April 2008, patients became eligible to choose any provider nationally who offered care at the national tariff rate and met standards set by the Care Quality Commission (the government's independent quality regulator).

The assumption underpinning the introduction of patient choice in referrals was that the option for patients to take their custom elsewhere (what Hirschman called 'the power of exit') was a significantly more effective quality driver than the possibility that they might complain ('the power of voice') – and indeed, that the potential for 'exit' added weight to 'voice' (Dixon et al., 2010; Hirschman, 1970). It is worth keeping in mind the abstract, decontextualized nature of these assumptions.

Development of Choose and Book, intended to support patient choice at the point of referral in England, was funded in 2003 via a 5-year, £64.5 million contract to the commercial supplier ATOS. Its national implementation was the responsibility of a designated lead within the Department of Health. At the time of this study, its local implementation was formally the responsibility of primary care trusts (PCTs). It was anticipated that by replacing the traditional paper referral with an 'integrated' electronic system, Choose and Book would also [a] be more convenient for patients and GPs; [b] reduce the number of referral-based enquiries GPs and their staff had to deal with; [c] lessen the bureaucracy associated with referrals; [d] reduce 'did not attend' ('DNA') and cancellation rates in outpatients departments; and [e] encourage a more standardised format for referrals (Department of Health, 2004).

Recognising that 'choice' would be effective only if patients were informed of the key differences between local (and national) providers in a particular service, in 2007 the Department of Health launched a website giving details of these services to allow comparison between providers prior to referral (see 'NHS Choices', http://www.chooseandbook.nhs.uk/patients/choosing-your) and a 'Choosing Your Hospital' booklet (to be supplied to patients by the referring GP). This booklet emphasised patients' right to choice and encouraged them to report services to their GP if they were not satisfied.

Choose and Book was part of a wider socio-technical network. This included the National Programme for IT (especially the central Spine on which patients' demographic details were held); the machinery of the New Labour government (with its neoliberal agenda to 'modernise' public services); the Care Quality Commission and other national regulatory bodies; civil servants who created the performance metrics for choice (policy) and Choose and Book (technology), monitored performance of healthcare organisations against these (e.g. via league tables) and linked them to financial incentives; professional bodies (especially the British Medical Association); and local managers in PCTs.

This socio-technical network was distinctly unstable during (and indeed after) our data collection period. The Department of Health continued to produce reports and electronic updates purporting that Choose and Book was improving 'choice' (Department of Health, 2008). These were countered by letters and articles published by doctors in academic journals that documented increased workload and a rise in 'did not attend' rates following the introduction of Choose and Book (Beckingsale & Wallace, 2009;

Modayil, Hornigold, Glore, & Bowdler, 2009); patients referred under Choose and Book who had no recollection of being offered a choice of provider (Green et al., 2008); and a widespread perception that the technology was inefficient, inflexible, complicated and politically-driven (Rabiei, Bath, Hutchinson, & Burke, 2009; Rashid, Abeysundra, Mohd-Isa, Khan, & Sismeiro, 2007).

Late modernity and expert systems

NHS policy changes in the 2000s reflected the mindset of late modernity, with its emphasis on an abstract blueprint for control that lacked grounding in, or sensitivity to, the details and variety of local contexts (Giddens, 1990). The predominant frame of reference was rationalist; there was a strong sense that innovation and change represented progress, and a particular confidence in the value of expert systems – defined by Giddens (1990, page 27) as *"[a] system of technical accomplishment or professional expertise that organize[s] large areas of the material and social environments in which we live today"*; the possible negative consequences of such technical systems, including their impact on social interaction, was rarely systematically considered; and designers and policymakers were orientated to an imagined 'proximate future' – a time almost upon us when the technology is fully functional and all technical, ethical and political challenges have been smoothed out (Dourish & Bell, 2011).

The expert system is a relatively recent phenomenon, resulting from the powerful triad of classificatory systems, bureaucracy and information technology in the age of globalisation (Giddens, 1991; Stones, 2005a). Such systems, which now range far and wide (e.g. finance, energy, engineering, medicine), are driven by abstract rules and procedures designed to co-ordinate social relations across large distances.

Giddens (1991) proposed that these expert systems, using technology to encode information and store formal knowledge, have an inherent tendency to 'empty out' the content of local interactions because the technical knowledge they contain is assumed to have validity independently of any particular interaction, and to have the authority to override situational contingencies. They are designed to exert control and order – measurable, quantifiable – over distance in a way that seeks to remove (or at least, radically attenuate) the ability of distinctive people, relations and contexts to upset the uniform application of the rules and classificatory system embedded in the system. There is a powerful momentum towards general and universalising rules and processes, and away from the application of practical wisdom (what Aristotle called *phronesis*) in specific contexts.

Expert systems capture professional expertise by formalisation – deploying impersonal knowledge, classificatory systems and procedures to shape, monitor, standardise and render calculable the work they support. Anthropologist Mary Douglas, developing earlier insights from Durkheim, argued that producing lists, rankings and other classification systems helps establish and then sustain social institutions by introducing conventions that *"describe the way things are"* (Douglas, 1986, page 48). Classification systems are fiercely negotiated and defended for precisely this reason (Bowker & Star, 1999). They have long been combined with those bureaucratic forms of instrumental rationality carefully analysed by Weber (1978). It is the interweaving of these two systems with powerful information technologies that is new.

The patient as 'rational chooser' and the ideology of competition

The classificatory rules and procedures embedded in Choose and Book software and its networks assumed that the sick patient functioned primarily as a rational chooser, able and willing to

weigh up information about potential options and decide between them if provided with high-quality information and decision support. Managing illness was assumed to consist, more or less, of making a series of objective decisions based on a limited number of decontextualised indicators and then following through on these. It follows from these assumptions that provision of statistical information on the 'quality' of services in a standardised format (such as a table of hospital-level comparisons using star ratings on key metrics) will prompt the 'right' choices and that these choices will lead to the 'best' services winning out in a competitive market.

Choose and Book was also influenced by the abstract ideology of competition, and by the salutary effects that the competition blueprint was said to have on cost efficiency, patient satisfaction and patient outcomes. When the policy of choice was introduced, much attention was paid to the expert system but there was little exploration of the meso- and micro-level social interactions and processes that would convert the policy *idea* (of hospitals competing to attract outpatient referrals) into the *reality* of a more efficient, effective and responsive healthcare system that improved patient satisfaction and outcomes. Notably, the over-riding influence of national policy meant that Cherns' principles of socio-technical design at local level were not recognised or applied (Cherns, 1987).

With a view to redressing this imbalance, we sought to analyse the micro processes and interactions involved in the practice of referral using the Choose and Book technology. To this end, we used the theoretical lens of strong structuration theory introduced above. This focuses on actors who are sited within a field of position–practice relations that has a powerful presence external to them, and which imposes itself upon them in various ways. These external structures pose constraints, provide resources and possibilities for action, and are the source of pressures and forces, including those of socialisation and induction into cultural meanings and values. Strong structuration theory takes seriously the hermeneutic, interpretative frames of the actors, the ways these are built up over time, and the way these mediate perceptions of external reality. But it departs from many forms of social constructionism in framing this in terms of the ways in which *external structures are internalised* within the interpretive frames of actors.

Key to our current argument is the further division of these internal structures into two interacting aspects. First, an individual actor's *generalised dispositions*, or habitus, which refers to durable and deeply socialised aspects of embodied skills, culture, moral values and principles, and so on, built up over time as an actor is exposed to, and interacts with, their social contexts. This provides the phenomenological perspective by which events in the world are framed and perceived. Second, the actor's knowledge of the immediate strategic terrain of position–practice relations facing them at any particular time, including knowledge of the potential functionality of technologies and the sense of how this fits with other aspects of the terrain. Such *conjuncturally-specific* knowledge may be informed and fine-grained, or (especially if imposed top-down) it may be ill-informed and broad-brush, risking unintended and unwanted consequences (Stones, 2005b). Internal structures are an important part of the capabilities of actors, drawn from or worked upon — and in compliance or resistance — by actors as they engage with the everyday flow of practices.

Resistance as morally-driven human agency

The emphasis of strong structuration theory on values and norms within the habitus of actors means that humans are viewed not primarily as rational actors, nodes in a network or members of a socio-technical system but as moral beings who have commitments, desires and values (both personal and professional). It views work — especially the work of doctors — not merely as a series of coordinated tasks but as having symbolic significance in society. As Sayer put it in the title of his book, "things matter to people" — objects, actions, experiences and relationships have personal and moral significance as well as economic or instrumental worth (Sayer, 2011).

With this in mind, our analysis set out to explore the tensions between professional morals and values (inculcated by medical education, professional identity and professional communities of practice) on the one hand and the demands made on the GP or other actor in the here and now by the remote, disembedded expert system of Choose and Book on the other. In the language of strong structuration theory, this is a tension between key aspects of the GP's value-dispositions (specifically, the enduring professional values that form part of an individual's habitus) and his or her conjuncturally-specific ('here and now') knowledge of the social forces and sanctions embedded in the proximate structures of the Choose and Book technology.

The nexus of ethical values embedded within the habitus of a healthcare professional is not static or unproblematic. Indeed, it may be variously ambivalent, fragmented or conflicting, reflecting the ethical tensions and inherent conflicts of healthcare practice (Mol, 2008; Schei, 2006). In this paper, we show how an understanding of these values and how they inform professional notions of excellence are a useful point of departure for illuminating those practices that are framed as 'resistance'.

Professional values and medicine's internal goods

If resistance is to be investigated at the micro level in terms of what matters to human agents (what do they care about; what do they see as good or bad practice?), we need to consider what macro-level influences, shared among members of a professional community, shape these values and perceptions. MacIntyre depicted these influences as the 'internal goods' of a domain (MacIntyre, 1981, p. 216). The internal goods of medicine would include the Aristotelian virtues, along with the dispositions and capacities, that are valued by doctors and which they believe are necessary to sustain standards of excellence in their profession.

It has long been argued by sociologists that because they bear a commitment to the refined knowledge, ethics and values of their specialised community, professionals act as a bulwark against the impersonal march of capitalist and bureaucratic forces (Parsons, 1964). More recently, French sociological theorist Luc Boltanski has called for policymakers to go beyond 'neomanagerialism' and engage with the moral and normative positions taken by individuals and groups on particular issues, notably the ethically-motivated concerns of professionals and lobbyists (Boltanski, 2011).

Medicine's internal goods are clustered, broadly speaking, around the themes of caring, curing, and comforting, and are embedded in the formal and informal codes of practice of the medical, nursing and other related professions. In the analysis that follows, we use these internal goods as a benchmark against which to consider not merely the *means* by which a referral to hospital is made (traditional letter or Choose and Book technology) but also the *ends* that are in mind when it is made. A GP's judgements about referral to hospital have traditionally been directed towards a range of ends such as access to restricted tests or procedures, specialist advice in diagnosis or treatment, confirmation that nothing has been missed, symbolic affirmation of a serious illness, and respite from a patient whose chronic incurable illness has become wearing. GP referrals are informed by [a] knowledge of the patient's personal history (both medical and social), [b] knowledge of the workings of their own health system (including the various incentives, disincentives and practicalities of different options), and [c] knowledge

of local social relations, including the character of local hospitals and the clinical interests and personal style of particular consultants. The 'expert system' character of Choose and Book militates against using such knowledge, placing constraints on the scope of professional judgements.

A professional framing of medical work sees doctors as wielding their symbolic power with integrity and commitment with the patient's best interests in mind. Patient empowerment notwithstanding, there are aspects of the unequal relation between doctors and patients whose legitimacy is socially conferred, due largely to the fact that illness makes people (in a range of ways) vulnerable and in need of society's help (Schei, 2006). Referral decisions are not merely 'rational' (that is, based on the best available medical evidence) but also practical and ethical, asking whether *this* referral, to *this* specialist at *this* hospital, is the *right* thing to do (Montgomery, 2006, Sayer, 2011). As Dixon et al (2010) showed in both UK and Netherlands, patients' choices do not follow the narrow economic rationality that policymakers anticipated, but reflect practical and symbolic influences that are perceived to matter in particular circumstances (Dixon et al., 2010).

Professional judgement, particularly in primary health care, relies on being rooted in the immediacies of context. As a strikingly top-down form of expert system, Choose and Book imposes abstract and generalised protocols that have limited capacity to take account of local circumstances and contingencies. As Boltanski's critique highlights, this socio-technical network crystallises a tendency to ignore or dismiss the skills, concerns and situated judgements of professionals. This is especially troubling in healthcare, since medicine is inherently exception-filled (most cases differ in some way from the 'textbook case') and medicine's internal goods are not, in large part, reducible to formulaic rules and protocols.

Neither technologies, nor the policies and processes in which they become embedded, are morally neutral, and to be able to judge the appropriateness and adequacy of particular policy initiatives and linked technologies, it is necessary to assess how well they allow patients to receive the levels of care, cure, comforts and so on they can reasonably expect from the healthcare system – and support doctors to provide them. Having a clear sense of 'what good might look like' allows us to begin to open up policies and their socio-technical networks to critical scrutiny.

Research questions

Our research questions were: [1] When referring patients to hospital, how does the tension between the systemic demands of Choose and Book as an expert system and the situated application of local knowledge through practical and professional judgement play out? [2] To what extent can 'resistance' to Choose and Book be explained in terms of the structure-agency dynamic (specifically, the dynamic between attempts to control behaviour from a distance on the basis of abstract criteria and the local values, judgements and practices of GPs and their staff)?

Methods

The HERO study and the secondary dataset on referral

The idea for this secondary analysis emerged during the Healthcare Electronic Records in Organisations (HERO) study, conducted in 2007–10 and funded by the Medical Research Council, which explored the use (and non-use) of electronic records in English general practice (Swinglehurst, Greenhalgh, Myall, & Russell, 2010). It occurred at a time when a number of networked technologies were being introduced as part of national IT policy.

The original HERO dataset covered four practices (anonymised as Dale, Beech, Elm and Clover) and included around 200 clinical consultations either directly observed or videotaped (with screen capture of the electronic record), as well as ethnographic field notes, documents (emails, letters, business plans, protocols, practice leaflets) and naturalistic interviews – that is, asking people what they were doing and why as part of ethnographic observation (column 1 of Table 1). Naturalistic interviews provide particularly useful data in the study of work, since people can best describe and reflect on their work when doing it (Barley & Kunda, 2001).

Our original analysis produced findings relating to how the work of GPs (Swinglehurst, Roberts, & Greenhalgh, 2011), nurses (Swinglehurst, Greenhalgh, & Roberts, 2012) and receptionists (Swinglehurst, Greenhalgh, Russell, & Myall, 2011) is shaped and constrained by technologies in use and by prevailing expectations about who should use them and how. One technology in particular – Choose and Book – was rarely if ever used as its designers had intended. Its embedded scripts (the assumptions held by its designers about how people would use it (Akrich, 1992)) were ignored and/or deliberately subverted. When it was used, the consequences were not as predicted. Most referrals were still dictated, typed and sent in the traditional way. Furthermore, GPs and administrators often had strong feelings (usually but not universally negative) towards Choose and Book and there was much talk of 'clinician resistance'. We decided to seek funding for a secondary analysis of our dataset to explore these impressions further; we obtained this from the National Institute for Health Research Health Services and Delivery Research Programme (ref. no. 10/1011/01).

Data analysis

Commencing with the entire HERO dataset (over 800 type-written pages), we selected a much smaller dataset for further analysis (column 2 of Table 1). This mainly comprised direct observations of work practices relating to referral, whether undertaken manually or with Choose and Book (hence, it afforded a 'symmetrical' analysis of both the *use* of Choose and Book and its *non-use* (Wyatt, 2003)). The extracted dataset also included some videotaped consultations, and documentation produced nationally and locally over the time period of the original study. In an initial familiarisation phase (column 3 of Table 1), we produced first-order interpretations in which we sought to describe and offer preliminary explanations of observed practice and to summarise the assumptions that underpinned policy and were embedded in the Choose and Book technology.

In a further analytic phase (column 4 in Table 1), we used strong structuration theory, whose application to the use and non-use of ICTs has been described previously (Greenhalgh & Stones, 2010). We focused on the conjuncture – that is, a critical combination of events and circumstances in which the human agent draws on both habitus (i.e. their internal dispositions, beliefs, values, norms and so on) and knowledge of the here-and-now situation (i.e. their assessment of the particular strategic terrain and how they are expected to act within it), and is supported or constrained by the available technologies, to inform, execute and justify a particular course of action.

We considered two kinds of conjuncture: clinical consultations in which outpatient referrals were initiated and administrative activities in which staff sought to follow through on such referrals. In both kinds, the actor (clinician or administrator) either used or chose not to use (or, sometimes, was prevented from using) Choose and Book to support the referral in particular ways. We considered how the actor's habitus (for example, the doctor's professional identity and code of practice, or the administrator's efforts to do a good job) combined with their assessment of external

Table 1
Overview of data structure and analysis.

Original dataset from HERO study 2007—10	Raw data selected for secondary analysis	First-order interpretations	Higher-order theoretical categories
Field notes from ~200 directly observed clinical consultations. 54 videotaped clinician-patient consultations, including screen capture from computer.	25 observed consultations in which the GP offered or discussed a referral. 6 video excerpts in which a GP offered a referral. Striking 'silence' in the data: no examples of GPs directly accessing Choose and Book with patient present.	➢ Why GPs refer people to hospital ➢ What GPs and patients talk about when discussing whether and where to refer ➢ Why GPs do not use the Choose and Book software during consultations	External social structures ➢ Political authority ➢ Medicine's 'internal goods' ➢ Economic context Internal social structures (what actors 'know' and how they interpret the strategic terrain) ➢ GPs' professional identity, values, morals ➢ Administrative staffs' perceptions about 'doing a good job' ➢ Skills and techniques for using the technology
Field notes from directly observed administrative work by GPs (~40 h) and practice staff (~330 h), including naturalistic interviews: total 800 pages of typewritten notes.	1 case in which a GP attempted to make a Choose and Book referral without the patient present; 3 where referral letters were dictated with no such attempt. 58 cases of administrator processing referrals manually (*n* = 12) or via Choose and Book (*n* = 46). 45 examples of naturally occurring talk where referral was mentioned (13 GPs, 31 administrators, 1 practice manager)	➢ Material properties of Choose and Book and challenges of using it ➢ Knowledge, skills and workarounds used by staff to make Choose and Book 'work' ➢ Why even experienced staff sometimes find it impossible or unhelpful to use Choose and Book ➢ What GPs and practice staff care about when making a referral	
Field notes from practice meetings (~20 h). 15 national policy documents on electronic records. Information for professionals and public on these. National audits and surveys on electronic record use.	Notes from one meeting between supplier and practice staff (Elm). 7 policy documents in which electronic referral was mentioned. Sections of 'NHS Choices' website relating to referral. Referral guidelines and DVD for GPs. Annual surveys on 'choice' and Choose and Book use.	➢ How and why national policymakers think 'choice' will improve quality of care ➢ Benefits anticipated from Choose and Book ➢ How much Choose and Book is actually used and how much 'choice' achieved	Social structures inscribed in Choose and Book technology ➢ Restricted nature of choices ➢ Assumptions about GP's role and purpose of referral ➢ Financial incentives, rewards, costs Dynamic interplay between all the above
>30 semi-structured interviews with local policymakers on use of electronic records. Local documentation on electronic record use.	One (joint) interview with two primary care trust managers charged with implementing Choose and Book locally. 4 practice protocols, 10 newsletters, one PCT patient choice survey, one letter from PCT to GPs.	➢ How local managers think referral works ➢ Why they think GPs do not use Choose and Book ➢ How much 'choice' is achieved locally	
Correspondence and emails among clinicians in field sites on electronic record use.	Email exchange among GPs and PCT leads (1 thread, 15 participants) including doctors from Beech and Clover practices.	➢ Advantages and limitations of choice policy as perceived by GPs ➢ Advantages and limitations of Choose and Book as perceived by GPs	

circumstances (including the incentives and reward systems linked to Choose and Book and their perception of what would happen if they did or did not use this technology). The purpose of this was to focus in detail on the extent to which, and the ways in which, actors felt enabled and constrained by the material properties and capabilities of Choose and Book (including the role assumptions, categories, values and other social structures inscribed in the software).

Development of theory and analysis of data occurred concurrently, each feeding into the other and informed by interdisciplinary discussions. Two authors (TG and DS) are medical doctors with an interest in the sociology of professional practice and clinical interaction; the third (RS) is a professor of sociology who has developed strong structuration theory, and is an acknowledged authority on the work of Giddens (Stones, 2005a).

Main findings

At the time our primary study began (2007), Choose and Book had been available for two years. Many practices had invested in training and additional staff and begun to use it for referrals but had subsequently reduced their use of it. Of the four GP practices we observed, anonymised as Dale, Beech, Elm and Clover, the percentage of referrals being submitted via Choose and Book was reported to us as 50—60%, 0%, 25% and 80—90% respectively. We never saw a GP use Choose and Book directly during a consultation — even in Clover practice, which described itself as 'top of the [local] league table' for percentage of referrals made using the system.

Our secondary analysis revealed four analytically distinct but empirically overlapping foci of active or passive resistance to adopting the scripts, implicit in the system design, that actors were required to follow if Choose and Book was to be a success (Akrich, 1992). Each focus highlights a different aspect of GPs' (or administrators') refusal fully to comply, because they believed that Choose and Book threatened to subvert a dimension of valued professional commitments. The four foci of resistance were: to the policy of choice that Choose and Book symbolised and purported to deliver; to finding ways to accommodate the technology's sociomaterial constraints and implications; to interference with doctors' contextual judgements; and to adjusting dutifully to the altered social relations consequent on its use. We consider these below. In each case, we summarise and illustrate data from our direct observations of situated action, then consider the relevant *internal* structures of human actors (what actors valued and 'knew') in conjunction with what was manifest in the material properties of the technology-in-use, and also the corresponding *external* structures (political influences and expert norms that were inscribed in the technology and/or shaped actors' practices).

Resistance to the policy of 'choice'

One of our most consistent findings when observing GP-patient consultations was that choice of hospital was either not offered at all or was presented to the patient as an external requirement (something the GP "had" to do), with GPs often highlighting the

perceived absurdity of the situation by expressing humour or exasperation (*"we're supposed to offer you St Joan's [hospital 20 miles away] or Timbuktu"* — GP, Beech practice). We observed a number of examples in which the offer of choice introduced a distinct note of confusion into an otherwise smooth conversation, since the patient could not understand why they were being given the option of travelling to a distant and unfamiliar hospital. Indeed, GPs appeared to invoke "the government" or "the computer" as a third party in an attempt to reduce this confusion. In all cases where choice of provider was offered, it was recorded on the electronic record using a distinct code that could later be used to audit the practice's performance.

Our informal discussions and naturalistic interviews with GPs suggested that this recurring pattern appeared to be driven by three things that GPs 'knew': first, that the overwhelming majority of patients wished to attend their local hospital (hence there was no genuine reason to offer them choice); second, that the government was mistaken in assuming that choice of hospital would act as an effective mechanism to promote competition and efficiency in the NHS (they described the policy as "pointless", "political" — and even as "bollocks"); and third, that offering choice was linked to a financial incentive, embedded within the technology, for the practice (hence there was a *perverse* reason for offering it). Thus, GPs were 'resisting' the policy of choice by presenting it to patients as an absurd demand of the system, at odds with their judgement, and refraining from the active investment of energy that its design relied upon, while most were also 'complying' with it at a superficial, pragmatic level in order to gain the reward.

GPs' perceptions were, broadly speaking, borne out by our data. We did not encounter a single example of any patient choosing to go anywhere except their local hospital, and only one example of a member of staff who recalled (on a single occasion) such a choice being made. Neither did we encounter any examples of either doctors or patients seeking or using comparative performance data when considering their referral preferences. Tellingly, the capacity of the technology to generate 'personalised' lists of options depending on whether patients wished to choose by distance, car parking, food quality and so on was never instantiated. A facility for patients to access such data in their local library in the district where Dale and Elm practice were located had no takers in six months. Beech practice stopped using Choose and Book when financial incentives ceased.

In terms of the wider social structures impacting on choice of hospital, our dataset included substantial evidence of attempts to lever political authority. Locally, PCT managers described the PCT as being "beaten up" by the Strategic Health Authority, which in turn was (they said) being "hammered", "bashed" and "kicked" by the Department of Health. Monthly bulletins from the Department of Health reported on progress in implementing the policy, and annual large-scale National Patient Choice Surveys were commissioned by the Department of Health in an attempt to demonstrate that the technology had been instrumental in achieving the policy goal (Department of Health, 2010). In these, around half of responding individuals recalled being offered 'choice', but the response rate was very low.

Resistance to the socio-materiality of Choose and Book

The process of referral was severely constrained in real time by the material functionality of the Choose and Book technology, whose operation at the time of our data collection (2007—10) was cumbersome, unreliable and time-consuming. Our ethnographic observations confirmed estimates of practice staff that a Choose and Book referral took, on average, twice as long as a manual referral. They recounted numerous examples of the technology

freezing, crashing, running slowly, failing to supply the necessary password for the patient, requiring manual data entry for some fields and (commonly) failing to identify a suitable appointment slot at the preferred (local) hospital.

Choose and Book referrals were far from 'paperless'. On the contrary, they generated large amounts of printed paper, including internal memos and request sheets, sticky notes, protocols, flowsheets, instructions and passwords for patients and — in three participating practices — a paper ledger of all 'paperless' referrals sent (the fourth entered these manually onto an Excel spreadsheet). In this and other ways, Choose and Book was viewed by practice staff as worsening the service problems it had been introduced to solve (e.g. referral bureaucracy, high 'did not attend' rates) and as generating negative knock-on effects (especially, taking time away from patient care or generating potential security breaches).

Administrative staff considered Choose and Book highly temperamental, and spoke of having to get to *know* the system through accumulated experience and trial and error. We observed many examples of staff helping one another across a shared office in this regard. They spoke of not *trusting* the electronic system (or the organisations and/or individuals with whom it connected), and of being unable to navigate the system comfortably even when highly experienced in using it. They spent considerable time on the telephone to a helpdesk or to their counterparts in the hospital service trying to over-ride or work around glitches in the system.

An aspect of this sociomateriality was resistance to the expense of the Choose and Book system. A few GPs in our sample identified positive aspects of Choose and Book (e.g. fewer queries to the practice about the referral's progress) but commented that the technology was a cumbersome and expensive way of achieving that goal.

In this focus of resistance, the key external structures impacting on human actors were, on the one hand, the modernist ideal of a reliable, touch-of-a-button automated system and, on the other, the *reality* of technologies-in-use: invariably messy and (in numerous ways) less than ideally fit for purpose (Brown & Duguid, 2002; Dourish & Bell, 2011).

Resistance to interference with the doctor's contextual judgement

> "I suggest you go to Mr Z [local eye surgeon] because I have [same eye condition] too and he looks after my eyes" (field notes from observation of consultations, Dale practice).

Our observations showed that when considering whether and where to refer a patient, the GP routinely drew on his or her personal knowledge of that patient, both clinical and social, and of local services, including the scope of particular clinics in particular localities; the patient's own history of being treated at a particular hospital; transport services and the patient's ability and willingness to use these; the expertise and interests of local consultants; personal experience of referring patients to that service previously; and even — as in the above quote — personal experience of being treated by particular consultants themselves.

In the single example we observed of a GP attempting to use Choose and Book, he abandoned the attempt because he could not find a suitable service (the local one was not listed and he was unsure whether clinics at other hospitals provided the particular procedure needed). GPs and administrative staff explained to us that services in other localities tended to be organised differently — for example, they called the 'same' clinic by a different name or subdivided the work of the specialty in a different way, so a GP was typically very knowledgeable about a local hospital service but much less knowledgeable about comparable services in other localities.

Importantly, the kind of knowledge the GP needed to select the best option for the patient (*personal, relationally situated* and *professional* knowledge such as the trust and regard which this GP held for a particular consultant and how that consultant was likely to manage this condition in *this* patient) was not the kind available on the 'NHS Choices' website (which provided *formal, regularised* knowledge such as scores that had been allocated by a distant third party for 'food', 'parking', 'infection rates', 'mortality' and so on, and which pertained to the hospital as a whole rather than to a particular service).

The policy of offering choice of hospital assumed that in different localities, similar service models with similar names would be available for a limited menu of diseases or conditions, allowing the 'best' service to be selected easily using a dashboard of performance metrics. The reality was that patients invariably presented not — or not merely — with a 'textbook' clinical condition but with a unique illness along with a unique set of comorbidities, personal priorities and social circumstances. The abstracted criteria embedded in the Choose and Book software and NHS Choices website were far less nuanced. Many GPs described how they gave up using Choose and Book because it rendered them unable to apply their knowledge and skills to obtain the best outcome for their patient. As one observed, *"the choice is only of the crudest kind"*.

In terms of external structures, this locus of resistance reflected a wider mismatch between what we have called 'medicine's internal goods' (the emphasis on professionals drawing skillfully and with wisdom on personal and contextual knowledge to make practical, ethical judgements) and neoliberal policy (in which the choices offered are 'rational' but lack granularity). The pressure from policymakers on the medical profession to comply with a restricted taxonomy of readily classifiable disease states that map unproblematically to particular investigations or treatments reflects the kind of technology-work mismatch described by Brown and Duguid (2002) in a range of work settings. In a more layered sociological analysis, such mismatch in relation to medical work is depicted as having political origins and been termed 'conceptual commodification':

> *"External control over medical care requires something more than literal commodification. Rather, it requires conceptual commodification of the output of the medical labour process: that is, its conceptualization in a standardized manner. Such commodification facilitates control over the production of services, not just over the arrangements for their exchange…. The basic strategy of commodification is to establish a classification system into which unique cases can be grouped in order to provide a definition of medical output or workload."* (Harrison, 2009, page 190)

Resistance to the altered social relations consequent on use of Choose and Book

In the consultations we observed directly, most discussions about referral took a traditional format, with the GP suggesting a consultant and a course of action, and the patient accepting the suggestion. One reason why they did not use Choose and Book during consultations was a reluctance to take on what they viewed as a more technical (and less professional) role. As one GP put it on an email exchange about Choose and Book, *"We seem to be moving away from curing, caring and comforting to robotic automata"*.

As with the other forms of resistance described above, this can be explained in terms of internal social structures — specifically, professional identity. GPs considered it their professional duty to recommend a clinically appropriate outpatient clinic, including any necessary dialogue with the patient about their needs and

preferences. But they defined the technicalities of booking appointments as outside their scope of practice and associated these with a loss of status and autonomy that was often deeply held and strongly expressed (as in the quote above).

This resistance was played out at locality level, between GPs (largely opposed to Choose and Book) and PCT staff (who were responsible for implementing the technology locality-wide). PCT managers did not question the ends of Choose and Book but presupposed that it was fit for purpose, attributing its low uptake to Luddism and even "spite" (they alleged that GPs' resistance to the system was to punish the PCT for financial cuts elsewhere). But when the PCT sent GPs a letter that spoke of "failure" against the "standard" of Choose and Book and described low uptake as a "threat to good quality care", the GPs responded vociferously by challenging this definition of quality and the legitimacy of the metrics being applied. On the contrary, they claimed, they had abandoned Choose and Book because it was a *threat* to professional standards.

Our observational data revealed that the tension between the professional and the technical was perceived by some administrative staff as well as by most doctors. One administrator in Clover practice, BN, told us she had decided to take early retirement as a direct result of Choose and Book. She associated professionalism in her role with qualities such as knowledge of the services available locally, and with the 'family doctor' relationship that was built between patients and particular staff through continuity of care: *"The patients have always been my main concern here. I don't know where patients are these days — lost under piles of paper and in the Choose and Book system"*.

BN was concerned that patients often phoned the practice because they did not understand instructions for booking their appointment. She bemoaned the introduction of a standard accompanying letter sent to patients with Choose and Book paperwork (which began 'Dear Patient' and was signed 'Practice Secretary') as impersonal (*"I could be anyone"*), and insisted on adding her own name and signature to it. But the new system discouraged such personal touches. As BN commented while doing a Choose and Book referral: *"I need to save this [letter] in Choose and Book …now what I'm going to do in my capacity as 'absolutely nothing', I'm going to attach it…."*.

A few administrative staff, however, were positive about Choose and Book. The lead administrator at Clover practice, XY, for example, was a 'super user' of the system: skilled, confident and keen to help others learn it. She saw Choose and Book's technical idiosyncrasies as a challenge (*"I won't be beaten by it"*) and felt that its complexity made her job more interesting (*"not just mindless typing"*). She took particular pride that the practice was outperforming all other practices locally for use of Choose and Book. When some GPs in the practice had advised her to *"hold off a bit"* on using the Choose and Book technology because of its questionable cost effectiveness, her response was *"I can't do my job 50%"*.

In terms of dispositional values, BN aligned strongly with the values of the traditional family doctor service (reflecting the wider social structure of 'medicine's internal goods' described above). In contrast, XY could be viewed as having positioned herself as a bureaucratic cog within the expert system, reflecting the 'new professionalism' of what Harrison has called scientific-bureaucratic medicine (Harrison, 2009), overly detached from the professional values of the locally embedded general practice, and focused primarily on the efficiency of means rather than the value of the ends.

Both national and local policymakers were characterised by a striking lack of engagement with the values, identities and relationships of general practice. The PCT managers we interviewed, for example, saw referral as the same administrative process whether achieved via Choose and Book or a traditional referral (*"it's*

just two or three more mouse clicks"). This framing did not account of the wider changes in roles, responsibilities or identities associated with the Choose and Book system.

Discussion

This case study of referral to hospital in the English NHS in 2007–10 has revealed a contested social practice driven by national policy and linked to the use (and non-use) of a nationally mandated technology. The combination of strong structuration theory, Giddens' conceptualisation of expert systems, and a hermeneutic and ethical sensitivity to professional values has allowed us to do the following. Firstly, we have theorised this phenomenon in relation to wider social changes in late modernity, as resistance to an expert system. Secondly, we have constructed an ideal typical conception of the professional values of those involved in general practice that articulates the moral bases for their resistance. Thirdly, we have explored the tensions between these value-dispositions and the specific forces and pressures introduced by the abstract system of Choose and Book.

The various hierarchical orderings (e.g. lists, ratings and rankings) inscribed within Choose and Book and on the NHS Choices website created potential for policymakers to influence social relations and practices beyond immediate face-to-face interaction ('action at a distance'). But expert systems can produce such action only to the extent that the people intended to use them actually do so. If they refuse (for example, because a professional engagement with the activity depends on embedded knowledge, or because it reallocates tasks in a way perceived as demeaning and/or irrational), or are prevented from doing so (for example, when the system does not 'work' or its functionality does not fit the time or space constraints of the social situation), the intended action at a distance does not occur.

Our findings reveal a mismatch between the model of clinical work underpinning the 'choice' policy and inscribed in the Choose and Book technology and the more complex, granular and exception-filled nature of real-world clinical practice. The choice policy pursued by the English Department of Health depicted clinical care in transactional rather than relationally situated terms: it harboured a model of GPs' input as taking place within artificially bounded, unconnected episodes and in relation to overly simple scenarios. It also used the term 'quality' mainly in relation to discrete and abstractly conceived structures, processes and procedures. A contextual and professional framing, in contrast, would emphasise the quality of relationships between patient and doctor and between GP and consultant (including such things as trust and positive regard) and the value of continuity of these relationships over time.

A striking finding in this study was policymakers' and managers' limited understanding of the detail of clinical work and the knowledge that informs referral practice. It was assumed that GPs (who, like patients, were depicted as 'rational choosers') could be prompted to use the system through two behaviourist mechanisms: [a] financial incentives and [b] disclosure of performance data ('naming and shaming'). Policymakers were either unaware of, or dismissed, the influence of institutional structures such as the norms of professional practice, which defined quality in ethical and relational terms rather than in terms of a state-imposed metric of compliance with a policy. They also under-estimated the extent to which the technology's material properties would prove limiting.

The framing by PCT staff of Choose and Book use as a 'quality standard', and their refusal to engage with the GPs' concerns about threats to quality, is an example of the silencing effects that Boltanski (2011) writes about in criticising neo-managerialism's concerted, ill-advised, constriction of the space for meaningful conversation and debate about the role of normative values in guiding policy. The managers' perspective reflects a situated frame of meaning, in which their role is defined in such a way that they deal solely with implementing means. Theirs is a bureaucratic form of professionalism, which entails a refusal to question ends and the values that inform these (Weber, 1978).

We conclude that overly top-down, abstracted approaches to reducing resistance to information technology are not the best way forward. Rather, resistance to such technologies and the expert systems of which they are part would be reduced if there was, firstly, a greater recognition and dialogue with the world of professional values within its design and implementation, and secondly, a greater willingness to seek degrees of balance between such virtual, remote, systems and the exigencies of the local sites in which professional values are performed. Choose and Book is one of many expert systems being introduced, top down, in the English NHS. It is surely time for academics and policymakers to heed Boltanski's call to open up debate with a view to acknowledging the tension between normative values and forms of order and authority (Boltanski, 2011) (page 155). While coming from a different theoretical perspective, such an approach would align with sociotechnical theorists' longstanding call for technologies to support rather than over-ride the micro-detail of professional work (Cherns, 1987).

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