Translating Health IT Policy into Practice in the UK NHS

Wendy L. Currie
Audencia, School of Management, France
wcurrie@audencia.com

Abstract. The challenge to provide a nation-wide integrated health service is central to UK government policy. The National Program for Information Technology was launched in 2002 to transform healthcare using information and communications technology. As the largest, non-military, non-scientific government funded IT program worldwide, it was planned over a decade with an estimated total cost expected to exceed £20bn. This paper is a longitudinal study of the National Care Record Service, which was the largest part of the program, aimed to provide 50 million UK (English) citizens with an electronic health record. Using episodic interviewing techniques over ten years and secondary source material, the findings reveal a series of IT policy changes to the original Program. Delays to roll out electronic health records are linked to issues about procurement strategies with IT suppliers, benefits realisation, risk assessment and clinical engagement. This study extends academic work on the deployment of large scale, long-term publicly funded IT projects, which go beyond the technical imperative to transform healthcare. Findings suggest government agencies need to embed cultural, social and economic criteria into health IT policy-making. Tracking this Program for a decade, we observe how a centralised, top-down approach was replaced by localised IT procurement and implementation, giving NHS organisations more decision-making powers. However, the Program was beset by continuous policy changes affecting the structure, organisation and IT of the NHS, where attempts to achieve benefits finally resulted in the break-up of the Program.

Keywords: Health policy, electronic health records, NHS, National Program for IT
1 Introduction

In 2002, the largest health IT program to date was launched to provide citizens with an electronic health record (EHR) (Wanless 2002). The antecedents of the National Program for IT (NPfIT) are found in previous health policies to modernise the National Health Service (NHS). Four decades of government White Papers and reports have all impacted on present-day health service delivery. Earlier reports emphasise the introduction of private-sector style practices into UK healthcare, and later reports promote IT to transform the NHS. Part of the rationale is to reduce costs, as expenditure on the NHS now exceeds £100bn per annum. Another reason is to develop government policy to provide citizens with more choice over their healthcare. Against this background, UK health IT policy has produced mixed results, often with unintended consequences, as processes and services continue to be fragmented, rather than offered as part of an integrated health system (Brennan 2005, Greenhalgh et al. 2010, Currie 2012a). This study tracks the NPfIT over a decade to 2012. The focal technology is the National Care Record Service (NCRS) with a planned roll-out of EHRs for around 50 million citizens in England.

This research considers the vision, design and implementation of the NCRS. A key research question is: How is health IT policy translated in practical deployment of EHRs in the UK NHS? As there are few longitudinal studies on health IT policy (Scott et al. 2000), this study was planned over a decade where field work using episodic interviewing techniques, combined with significant secondary source data collection and analysis provides a rich picture of policy and practice. A significant contribution of this research is that, despite large investment in government sponsored IT, the interplay between diverse clinical and non-clinical stakeholders, coupled with such an ambitious plan to introduce IT into the NHS, all conspire to impede rather than facilitate health IT policy. Part of this problem is the poor integration of the various strands of the program. In particular, the relationship between policy makers, professionals (clinicians, healthcare managers, IT professionals and the public) and reworking the service delivery processes and practices between healthcare organisations (primary and secondary care) and external suppliers.

The paper is divided into five sections. First, we consider the background to the research study. We note that, like other countries, the UK government is keen to develop health policy which uses IT as a primary vehicle to drive through change. We draw from relevant academic studies on the development, deployment and implementation of EHRs. Second, we introduce our methodology, based on longitudinal, episodic interviewing techniques. Since the NCRS is designed for all citizens in England, the range of interviewees was large, including health and IT professionals both inside and outside the NHS. Third, we discuss the findings from the case study. We organise the data around important themes, which emerge from primary and secondary data. We then discuss our findings in relation to other studies on large scale, government funded IT projects, which suggest that adoption and integration is a highly complex and challenging process which goes beyond the technical imperative. Our study extends the body of work on health IT and offers several lessons for policy-makers and health professionals engaged in IT-related projects.
2 Health IT policy

Research on health IT policy has increased steadily over the past two decades, with academic contributions on the development of Electronic Health Records (EHRs) from many different national, regional and local settings. EHRs are an integral part of health IT policy, with most countries developing an eHealth roadmap or strategy with target dates for adoption and implementation (Ellingsen and Monteiro 2012; Geissbuhler 2013). Many studies focus on specific issues and challenges, such as, incentives to adopt EHRs (DeRoches et al. 2012) and their disruptive capabilities (Blegind-Jensen and Kjærgaard 2010; Hill and Powell 2009; Blechman et al. 2012), the digital divide across European Union Member States (Cruz-Jesus et al. 2012) patient data sharing and privacy (Jha et al. 2009; Exeter et al. 2013) benefits and risks (Goldzweig et al. 2009) clinical engagement with electronic records (Reich 2012, Wise and Bankowitz 2009), large scale health information infrastructures (Pedersen et al. 2012; Sahay et al. 2013; Melin and Axelsson 2014) and contracting (Hardless and Jaffar 2011) patient use of health information systems (Berg 2003; Suziedelyte 2012) and benchmarking eHealth performance across countries (Currie 2012b).

Over past decades, healthcare has witnessed a shift from medical professionalism, where clinicians are represented by powerful professional organisations (Currie 2012a) to market-driven policies, using an increasing number of external suppliers for outsourcing IT work (Willcocks and Currie 1997). Our interest is not therefore confined to organisational and technical issues, but towards a wider health IT policy agenda to encourage cultural change within the medical profession and public at large. Against a background of relative under-investment over several decades, healthcare was considered a late developer in IT (i.e., compared with finance and manufacturing). Recognising the potential of IT to modernise public health, the UK government in 2002 pledged to spend around £6.2 bn on the NPfIT (Department of Health 2002) to deliver four large-scale IT-enabled projects:

1. a National Care Records Service (NCRS) for capturing, storing, retrieving and modifying patient medical records on a national database;
2. an Electronic Appointments Booking system (later becoming Choose & Book), where GPs and patients can book hospital appointments using a computer system;
3. the Picture Archiving and Communications System (PACs) to capture and send digital images of x-rays and scans; and
4. an Electronic Prescription Service (EPS) to enable patients to collect their prescriptions from hospital and high street pharmacies more efficiently. These systems would be supported by a new National Network (N3) to provide a ‘rapid, secure, robust and reliable’ network across the NHS.

Despite a track record of poor performing large scale government IT projects, with often unpredictable outcomes (Berg 2003) the NPfIT was intended to be the flagship program that would transform the NHS into a modern healthcare system fit for the 21st century. Part of the agenda was to encourage patients to be more active in their healthcare decisions, particularly by providing them with greater choice of services (Mark 2007). Patients were encouraged to change
from ‘passive recipients’ of government run services to ‘active consumers,’ which was part of a wider political agenda to recast the citizen as a customer (Mosse and Whitley 2008). This would increase health literacy among patients where they would be more engaged with health information (Chinn 2011). In the case of the NCRS, citizens in England would be given an electronic record in the form of three distinct services. First, a Summary Care Record (SCR) would provide the essential elements of a person’s electronic record, extracted from general practice notes. This would also include other elements relating to that person from other healthcare providers where they receive care. Second, a Detailed Care Record (DCR) would contain the person’s electronic record for that organisation, and elements of all electronic records relating to that person from other organisations. Third, HealthSpace, would provide a personal health organiser and protected link to a person’s SCR provided they chose to have one. The NCRS was initially planned over a ten year period, with the intention that all citizens in England would have access to their record by 2010 (Connecting for Health 2004). Given a project of this magnitude, it was important to design a research study that would capture the key decisions, events and outcomes of the project using both primary and secondary source data collection.

3 Methods

The study began in 2002 following the launch of the NPfIT. The research was planned over an initial five year period so it was important to select a methodology to capture longitudinal data from a variety of stakeholders (Denzin et al. 2005). A longitudinal approach enables repeated observations of phenomena over several months or years, which was important in research aimed at observing the introduction of a large scale ICT program planned over several years. The study was not initially intended to be ‘theory-driven’ as theories and concepts were likely to emerge from the data (Silverman 2006). Research into a large-scale healthcare ICT transformation program necessitated an interview schedule to elicit data from several respondents including clinicians, managers, ICT providers, government agencies and patients of the system. The interviews were intended to capture the perceptions and views of respondents about the introduction of the electronic health record, and whether it would improve service delivery. So the aim was to focus on the complex relationship between health IT policy and practice, which extends beyond the organisational or departmental unit of analysis. Qualitative research methods are appropriate for policy and program evaluation and to provide an understanding of how and why certain outcomes are achieved, and also to answer important questions about relevance, unintended effects and impact of programs (Miles and Huberman 1994).

The research design was intended to capture events or episodes in the development, adoption and implementation of the NPfIT across healthcare providers, mainly GP surgeries (primary care) and hospital Trusts (secondary care). An effective technique for achieving this objective is episodic interviewing, which captures data relating to concrete circumstances (time, space, people, events, situations). So in order to study a ‘concrete issue’ (Flick 2000, p. 77) such as the implementation of technology, the interview should meet three specific criteria: (1) It should combine invitations to recount concrete events (that are relevant to the issue under study) with more general questions aiming at more general answers (such definitions, argumentation and so
on) of topical relevance; (2) It should mention concrete situations in which interviewees can be assumed to have had certain experiences; (3) It should be open enough to allow the interviewee to select the episodes or situations he or she wants to recount, and also to decide which form of presentation he or she wants to give (for example, a narrative or a description). The point of reference should be the subjective relevance of the situation for the interviewee. The interviewing schedule lasted just under ten years. With a program as large as the NPfIT, it was not possible from the outset to predict the events or outcome of the NCRS. A total of 245 interviews were carried out with key health stakeholders, including, NHS Trusts, GPs, IT service firms, government agencies and patient groups.

Many interviews were tape recorded and transcribed. Interviews usually lasted around 1.5 hours, and around one third were carried out over the telephone. A semi-structured questionnaire was used, although this was often altered as interviewees wished to digress to other issues and topics they felt were relevant to the study. While the focus of the research was on the adoption and implementation of electronic records (the NCRS) as a means of integrating healthcare services across the NHS, the questionnaire topics were inevitably changed as the project reached (or failed to reach) specific milestones. For example, the delays and supplier problems which beset the NCRS became a key issue for NHS Trusts, and so needed to be incorporated into the questionnaire design for future interviews.

While episodic interviewing aims to gather data from the same sites/respondents over a period of time, the opportunity to capture rich and detailed accounts of decisions and events enables researchers to develop a broader canvas than simply interviewing a few key personnel about an IT project at a specific point in time. By visiting hospital Trusts over an extended period of time, and re-interviewing the same personnel, it was possible to gather data about the key issues and concerns relating to the adoption and implementation of the NCRS. The results from the interviews are given in the following case study section below. Whilst qualitative methods using case analysis may provide generalisable results, the cases were not intended for comparative analysis but to give rich picture of how the NCRS was being adopted at each site and more widely across the NHS.

To supplement the primary data collection, the researcher further compiled data from various secondary sources (i.e., government publications, NHS Trust reports, media articles, healthcare websites, white papers and brochures from IT service firms, healthcare conference presentations, pressure group publications, etc). This material was invaluable as a source for providing different (and contradictory) views about the progress (or lack of it) from the NCRS planned implementation.

4 Case study: The national program for IT in the UK NHS

Health IT policy has evolved from previous decades where electronic medical records (EMRs) were used primarily for clinical purposes (Garets and Davis 2005). As a subset of the NPfIT, which aims to “help deliver a better NHS that gives public and patients services that fit the
twenty-first century” (Department of Health 2002) (hereafter the DoH) the NCRS emerged from a series of policy documents which identified key strands in government policy to introduce “lifelong electronic records of patients” (DoH 1998) Further government reports followed including the NHS Plan (DoH 2000) outlining an information strategy for the ‘modern NHS’ and Building the Information Core (DoH 2001) on how to implement the NHS plan. These publications precede the Wanless Report (2002) which spearheaded the health IT policy that launched the NPfIT in 2002.

4.1 Three phases of health IT policy

Understanding the history of the NPfIT is important, not only for reviewing the health IT policy, but also for gaining an appreciation of how the NHS is a political battleground which undergoes almost constant re-structuring and change. Our research begins in 2002, and concludes in 2012. It captures a series of policy u-turns relating to the NPfIT which can be divided into three distinct phases (see Table 1).

The primary aim of the NCRS is to enable healthcare professionals and patients access to an EHR. From the outset, the Program experienced a series of issues and setbacks. We discuss these challenges under five main areas which emerge from our data: implementation plan, procurement, benefits realisation, risk assessment and clinical engagement.

4.2 Implementation plan

As a highly ambitious Program to modernise health IT to achieve service improvement, the UK government initially divided England into five regions, or geographical areas. Leading IT suppliers would service one or more of these areas to deployment the NCRS. IT in the NHS would adopt a strategy of ‘rip-out and replace’ as the government pursued ‘ruthless standardisation’ in selecting both a narrow range of large IT suppliers and technologies to fulfil the plan to introduce EHRs across the NHS. Within the first phase of the NPfIT, the government set up an agency: Connecting for Health, to oversee the introduction of the Program.

Within three years, there were calls for an independent review of the program. Concerns were raised by politicians and in the media about the slow progress. Various medical and IT groups including the British Medical Association and British Computer Society voiced concerns about finance, management and technology issues. While the media emphasised the financial and IT aspects (i.e., escalating cost to the taxpayer and technical challenges faced by IT suppliers), medical and IT groups identified organisational and managerial setbacks (i.e., lack of clinical buy-in to the program, vague business benefits, poor risk assessment, unwelcome changes to working practices, poor security of patient data).

In 2006, the first of three National Audit Office Report (2006) reports was published. It highlighted shortfalls in the progress of the Program, but concluded it was still viable, despite being late. Among the concerns was the lack of progress of the NCRS as well as fears about protecting patient data, particularly where millions of patient records would be held on a large centralised database (called, *the Spine*) and potentially accessible to many thousands of NHS
staff. The issues raised were relevant and timely but did not go far enough in terms of un-pack-
ing some of the more serious structural, organisational, managerial and technical problems of
the program. This was picked up in the media where continued criticism about ongoing delays,
lack of clinical buy-in, missed targets, security and patient safety issues continued to damage the
reputation of the NPfIT.

Interviews with respondents from 2005-7 suggested that implementation problems were not
confined to technical blips, but were much broader in scale and scope. This pointed to a lack of
integration, not just between the various software systems operating within and across health-
care organisations, but also among clinical, managerial, and administrative groups, between
the NHS and IT firms, and among policy-makers and implementation teams. One clinician com-
mented:

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<td>Implementation</td>
<td>Deployment of the NCRS planned for December 2004.</td>
<td>Deployment of the NCRS extended to late 2006.</td>
<td>Further delays to the NCRS. NCRS now expected to be implemented by 2015-16.</td>
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<td>Plan</td>
<td>Entire implementation plan for 2010. Program organised around five (geographical)</td>
<td>Five regional areas in England reduced to three (larger) areas.</td>
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<td>Procurement</td>
<td>Centralised approach to ICT procurement in NHS. Procurement and development of ICT</td>
<td>Contracts with two major suppliers terminated. Department of Health only pay suppliers</td>
<td>Re-thinking of the procurement strategy, with only two major contracts with suppliers</td>
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<td>where NHS organisations maintain their own systems is seen as ‘haphazard’.</td>
<td>‘services have been proven to have been delivered and working’.</td>
<td>across the three program areas. Department of Health announces in 2009 that a more</td>
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<td>‘locally led’ approach to procurement will be allowed where NHS organisations will introduce</td>
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<td>‘smaller, more manageable change’ according to their own business strategies and</td>
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<td>Benefits</td>
<td>Primary focus on letting contracts and practicalities of getting systems deployed.</td>
<td>Enhanced focus on benefits realisation. Encourage Strategic Health Authorities and</td>
<td>The plan to abolish SHAs by 2012 poses additional risks as restructuring inevitably</td>
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<td>Realisation</td>
<td>Clinical Leads would be deployed in advocacy roles to help promote the aims and</td>
<td>Trusts to achieve benefits from the NCRS. SHA Chief Executives would serve as Senior</td>
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<td>objectives of the Program. These individuals would assist in communicating the</td>
<td>Responsible Officers (SROs) for implementation and benefits realisation of the NPfIT</td>
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<td>benefits of the NCRS to clinicians and other NHS stakeholders.</td>
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Table 1. The NCRS from 2002-2012 - Three Phases of Health IT Policy

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<tr>
<td>Risk Assessment</td>
<td>Risk mitigation through centralised control of ICT strategy, procurement and deployment. Estimated savings from prices paid for goods and services to be £4.5 million. ‘Big Bang’ approach to ICT introduction. NAO (2006) report offers 10 recommendations to Connecting for Health. These included, ensuring that a robust engineering-based timetable for delivery is introduced and capable of being met by the suppliers; better communication with NHS staff about how these changes will affect them; stronger management of supplier performance, including imposing penalties for late delivery; better quantification of the benefits delivered by the program; more understanding of how the NPfIT impacts on local NHS IT expenditure; a comparison of early adopter NHS organisations to use their experience to help identify and quantify the service and efficiency improvements of new systems; additional training and development programs, i.e. project management; the creation of more National Clinical Leads to drive through the change program; and building capabilities in NHS organisations through passing on best practices in areas like as contracts management.</td>
<td>Five management challenges to support the delivery of the program: the importance of achieving strong leadership and governance; maintaining the confidence of patients that their records will be secure; securing the support and involvement of clinicians and other NHS staff; managing suppliers effectively; and deploying and using the systems effectively at local level (NAO, 2008). Estimated cost of Program is £12.7 billion1. Report offers six recommendations offered to realise the ‘vision’ of the Program. Among them were closer communication between the NHS Connecting for Health and the Strategic Health Authorities (SHAs) with NHS organisations about the deployment plans of the NCRS. The lessons learned from the experiences of the three ‘early adopter’ sites should be better communicated to other NHS organisations, particularly as plans to develop the Lorenzo system for the North, Midlands and East areas have been considerably delayed.</td>
<td>By 2011, expenditure on the Program estimated to be £6.4 million1. Recognition that introduction of the NCRS has proven to be ‘more difficult’ than originally expected. Initial to plan to replace systems ‘wholesale’ is changed to one giving NHS organisations more control and decision-making in the selection and deployment of ICT. This move is expected to reduce risks associated with large public sector ICT projects. However, moving to a more localised approach will increase risks of lack of integration (interoperability) of ICT systems. It is recommended that interoperability will cost the Program around £220 million5.</td>
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Clinical Engagement

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<th>Theme</th>
<th>Phase I: 2002-2005</th>
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<td>Connecting for Health</td>
<td>(the agency responsible for implementing the NPfIT - ‘the Program) has appointed</td>
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<td>Clinical Leads to help secure engagement among clinicians and other relevant</td>
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<td>stakeholders. Despite the 1.2 million NHS staff, clinical engagement proves to</td>
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<td>be a difficult task. Many clinicians claim they have not been ‘involved’ in the</td>
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<td>decision-making process for the NPfIT, and that Local Service Providers (LSPs)</td>
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<td>charged with the implementation of IT systems, work closely with government</td>
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<td>agencies (i.e. CfH) rather than front-line clinicians who are ultimately</td>
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<td>expected to adopt the systems in their working lives. A culture of distrust</td>
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<td>develops which results in clinical resistance to the NPfIT. The NHS IT</td>
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<td>director-general, also recognises the need for enhanced clinical engagement.</td>
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<th>Phase II: 2006-2008</th>
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<td>Connecting for Health</td>
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<th>Phase III: 2009-2012</th>
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<td>From 2015-16 NHS trusts</td>
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<td>will take over</td>
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<td>NCRS. Stakeholder</td>
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<td>fully engaged about the</td>
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<td>potential future costs of</td>
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<td>the NCRS. Currently, the</td>
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<td>NGS Trusts have no direct</td>
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<td>the future cost of using</td>
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| (the agency responsible for implementing the NPfIT - ‘the Program) has appointed Clinical Leads to help secure engagement among clinicians and other relevant stakeholders. Despite the 1.2 million NHS staff, clinical engagement proves to be a difficult task. Many clinicians claim they have not been ‘involved’ in the decision-making process for the NPfIT, and that Local Service Providers (LSPs) charged with the implementation of IT systems, work closely with government agencies (i.e. CfH) rather than front-line clinicians who are ultimately expected to adopt the systems in their working lives. A culture of distrust develops which results in clinical resistance to the NPfIT. The NHS IT director-general, also recognises the need for enhanced clinical engagement. |

“A program of this magnitude requires the full support of doctors and nurses, hospital managers, administrator and patients. There has been a lack of communication from the Department of Health about the purpose of electronic health record. What we need is a demonstration of how it will work in practice, not a full scale, nationwide IT program. I would like to see the clinical and business case for the NCRS.” (Hospital Consultant, Foundation Trust, London region)

The NCRS had an initial phased deployment timetable running from June 2004 to December 2010. This target proved difficult and encountered political and practical problems. Our data from 2003-5 raises many issues about a lack of co-ordination and co-operation between the major parties (i.e., the government agencies, NHS Trusts, IT suppliers and patient groups). Interviews with clinicians during this period revealed serious concerns with many claiming they were not fully up-to-date with government and hospital plans to introduce a nationwide electronic record to store patient data. A Chief executive summed up the main issues:
There is pressure to work with IT suppliers to develop the NCRS but I have serious budgetary constraints. I have therefore agreed to delay the implementation because I have other priorities. If local people have to wait a long time for a hospital appointment and read in the newspapers that we are spending hundreds of thousands of pounds on IT, they will think we have got our priorities wrong. I am a bit concerned about the targets and timescales, particularly as the IT suppliers are also learning on the job.” (Chief Executive, South region, NHS Trust)

From an initial ‘go-live’ implementation plan for 2010 to revised plan for 2014, a decision was taken in 2011 to relax the plan where NHS Trusts would be given more flexibility and control of their own IT systems (NAO 2006; 2008; 2011). Following the election of a coalition government, the health minister Simon Burns in 2010 remarked, “a national approach is no longer required” and a procurement “more locally-led” “modular” systems approach will be promoted” (www.e-health-insider.com). The IT policy shifts are discussed in the following sections.

4.3 Procurement

As a major IT policy initiative to transform healthcare services in England, the introduction of the NCRS was a far-reaching goal for the NHS. Our findings show the initial strategy from 2002 to 2008 focused more on procurement of technology rather than identifying business methods and tools to measure benefits and risks. An issue that was repeatedly raised by interviewees was the relationship between the NHS and third party IT suppliers. The NPfIT was an ambitious outsourcing initiative with large IT providers and their sub-contractors developing and implementing the NCRS across large geographical regions. The infrastructure of National Application Service Providers, Local Service Providers and independent software vendors amounted to a risky strategy where problems reflected the scale and scope of the work around the IT architecture and applications. The focus of Connecting for Health to enter into tough negotiations with suppliers to procure systems at a discounted rate was only one part of the jigsaw. Another part was evaluating the level of maturity and capability of suppliers, not only to work with the NHS but also to co-ordinate and co-operate among themselves. Unfortunately, the burden of meeting ambitious performance targets proved too challenging for some IT suppliers. First, Accenture, then, Fujitsu, terminated their contracts with Connecting for Health. This was met with more negative media coverage about the Program, and questions about whether it was too large to be fully implemented.

As healthcare was a ‘follower’ in IT adoption, rather than a ‘leader’, the years of under-investment in IT, particularly in secondary care (Brennan 2005, Currie and Guah 2007), pointed to low IT maturity (both at the supplier and customer levels). Assessing the maturity of both the customer and the IT supplier is critical for large scale IT initiatives, as low IT maturity usually results in resistance from staff and low morale, with the outcome being low adoption. Also, evaluating IT supplier capabilities to deliver on promises is important, particularly given the ‘hype’ surrounding IT. Respondents voiced mixed views about the capabilities of IT suppliers, especially during the selection phase,
“Two large IT suppliers tendered for the contract. It was common knowledge that since one had already been given a large contract in another region, it was unlikely they would be awarded this contract. I think the decision had already been made when they came to give their presentation to staff. My concern was that while the supplier was knowledgeable about technology, they didn’t appear to understand much about the workings of the NHS.” (Hospital Doctor, NHS Trust, Southern region).

Our findings suggest that, as a ‘late adopter’ of IT compared with other sectors like financial services and manufacturing, IT capabilities across the NHS varied greatly, making the introduction of electronic records highly challenging. The NHS was playing ‘catch-up’ with IT, yet centrist, top-down health IT policy appeared not to win hearts and minds of key stakeholders, particularly clinicians’ with concerns about patient safety. Criticising the centrist approach, clinicians commented:

“Having worked in general medicine for thirty years, I think the best IT systems are those that are developed and introduced locally, particularly with partnerships between clinicians and technology firms. A centrist strategy is designed to achieve uniformity and standardisation of the technical solution, but healthcare is a complex business, unlike banking and airlines.” (Hospital Doctor, NHS Trust, North West region).

“At our hospital, we have traditionally implemented IT at the localised level. I am not sure that central planning for IT is the way forward. You need to get everybody on board, clinicians and administrators alike.” (Hospital Consultant, North West region, NHS Trust)

4.4 Benefits realisation

One area which was given less attention at the outset of the Program was benefits realisation. Lack of communication about the business benefits of the program was evident, despite the Department of Health employing Clinical Leads in advocacy roles. Against a background of constant restructuring of the NHS organisation, an important question was: Who is responsible for implementing the Program? In 2006, the Acting NHS Chief Executive stressed that SHA Chief Executives would serve as Senior Responsible Officers (SROs) for implementation and benefits realisation of the NPfIT. They were expected to put into place, implementation programs to identify benefit streams. This was a move to ensure senior support for the NPfIT in the hope of reducing further delays. In addition, the centrist approach to procuring IT services was modified to include the National Local Ownership Program (NLOP). This was designed to align governance arrangements with the SRO roles; to clarify roles and responsibilities; strengthen local governance and ownership to achieve the right balance between national and local needs; establish structures and processes to ensure mutual accountability; reinforce the value from NPfIT; define and implement clinical engagement; and improve NHS Connecting for Health program decision-making capability. The NLOP was intended to encourage ‘buy-in’ to the program from managers and staff at local level. The NLOP aimed to clarify the issues around accountability and responsibility for the NPfIT. More senior level NHS engagement in the program was
sought, yet Connecting for Health would continue to be responsible for the NPfIT commercial strategy and contractual negotiations. SHAs in three groups (London, South, North East and Midlands) would work together to achieve the strategy.

In 2008, a second National Audit Office report was published which evaluated the progress of the NPfIT in the previous two years. It stressed that, “the context within which the Program is being delivered is complex and constantly changing, with new requirements arising from policy and operational changes in the NHS” (National Audit Office 2008, p. 7). Since 2006, there had been many centrally imposed structural changes governing the Program, such as the planned reduction of Strategic Health Authorities (SHAs) from over 28 to only 10, and a reduction in the five regional areas or clusters to only three.

Restructuring of the NHS led one senior consultant to comment:

“If the SHAs are now to be reduced, then I am not sure how the NHS will manage the introduction of the NPfIT. AT my hospital, we have good IT systems and are not in any hurry to replace them. I think we should have more control over our IT strategy and the end game is about patient care, not replacing IT for the sake of it.” (Senior consultant, NHS Hospital, Southern England).

4.5 Risk assessment

From the outset of the NPfIT, data security and confidentiality became central to the adoption and implementation of the NCRS. Clinicians currently generate records for encounters or episodes of care. These records are accessible to, and shared by, the immediate team (primary and secondary care). For the NCRS to work, it would need to be supplemented by key information from other organisations that provide care to patients. The combined patient record from one organisation (i.e., GP practice) with information from other healthcare providers (i.e., secondary care) would comprise the Detailed Care Record. But where two providers shared an integrated local record, a care professional at one provider would not be able to access the whole record held by another provider. Data capture, input, retrieval, manipulation and sharing are all part of the NCRS, but who has access to a patient’s record is a critical element in the data security and confidence of the system. For example, in addition to NHS staff, a patient attending an NHS appointment at one provider (i.e., hypertension clinic) would expect that all health professionals who provide care may contribute to their record by inputting data. A receptionist may record the date/time of an appointment. A clinician may upload clinical notes to the record. The record will be available to that organisation on a need-to-know basis (i.e., through role based access and a legitimate relationship). When a patient is referred to another NHS provider, unless he or she chooses to limit participation, that provider would have access to all or part of their NHS Care Record. The organisation may choose only to access the SCR on the basis of ‘implied consent’

When the patient attended several NHS appointments for more complex care, it would be necessary for all these organisations to access all or some parts of the aggregate contribution to the Detailed Care Record. This data would facilitate NHS staff to carry out clinical and non-clinical activities enabled by shared access to the record (i.e., ordering tests/monitoring results). Wider access to the record would require ‘explicit consent’ of the patient, although in
time, this level of access may become implicit (The implied/explicit patient consent issue became highly contentious in the media as health professionals and pressure groups increasingly raised concerns about data security and confidentiality). As the program continued, the policy became increasingly blurred with the government finally agreeing to contact all patients whose NHS care record would be stored electronically. However, little attention was placed on those patients who opted out, and how this would impact the NCRS overall. The British Medical Association commented that,

“Whilst the BMA supports the sharing of information to improve patient care, we are disappointed that the architecture of a system, which will have huge implications to the delivery of healthcare, was commissioned and built prior to stakeholder consultation” (www.BMA.org.uk).

A similar note of caution was expressed by the Information Commissioner’s Office who claimed to receive a number of enquiries from the public relating to the introduction of EPRs in England. Thus, “Many of these individuals have expressed concern at the plans and are worried that their health records will be available to everyone across the NHS” (Information Commissioner’s Office 2007). These sentiments were raised in our interviews:

“The policy seems to be very confused. I think patients should be given clear guidance about their electronic record. I think some patients are likely to opt-out because they don’t know enough about what data is being collected about them.” (Hospital Doctor, London).

“I don’t want my records on a computer. I am worried that anyone can get hold of my health records if they want to. I know it may never happen but the fear is still there. Also, I don’t feel that either have strength or time to learn technology. I am too old for this.” (A patient from West Midlands’s region).

An academic evaluation of the summary care record looked at the early adopter sites focusing on the organisational issues, rather than business and technical issues (Greenhalgh et al. 2010). The study identified low adoption and usage of the SCR, with few citizens accessing the Healthspace government website. It further stressed that much of the work around patient consent about their record, should have taken place much earlier, i.e., prior to IT suppliers being commissioned to develop the system.

4.6 Clinical engagement

An ongoing theme from interviewing clinicians was their feeling that politicians and NHS executives had not consulted them in the decision-making process on the NPfIT. One clinician said,

“I am very used to working with electronic medical records, but the NCRS needs to be more fully explained if clinicians are to use it. My concern is patient safety. I am not as interested in the cost reduction aspects of it...if there are any...but I am concerned about who has access to the electronic record and how data inputs can be changed. I have never seen a clinical or business case for the Program”. (A Hospital Consultant, London.)
Clinical engagement was a theme in two NAO reports. First in 2006, an NAO report proposed 10 recommendations. These included, ensuring that a robust engineering-based timetable for delivery is introduced and capable of being met by the suppliers; better communication with NHS staff about how these changes will affect them; stronger management of supplier performance, including imposing penalties for late delivery; better quantification of the benefits delivered by the program; more understanding of how the NPfIT impacts on local NHS IT expenditure; a comparison of early adopter NHS organisations to use their experience to help identify and quantify the service and efficiency improvements of new systems; additional training and development programs, i.e., project management; the creation of more National Clinical Leads to drive through the change program; and building capabilities in NHS organisations through passing on best practices in areas like as contracts management.

Second in 2008, an NAO report identified five management challenges to support the delivery of the program: the importance of achieving strong leadership and governance; maintaining the confidence of patients that their records will be secure; securing the support and involvement of clinicians and other NHS staff; managing suppliers effectively; and deploying and using the systems effectively at local level. Six recommendations were offered to realise the vision of the Program. Among them were closer communication between the NHS Connecting for Health and the Strategic Health Authorities (SHAs) with NHS organisations about the deployment plans of the NCRS. The lessons learned from the experiences of the three ‘early adopter’ sites should be better communicated to other NHS organisations, particularly as plans to develop the Lorenzo system for the North, Midlands and East areas have been considerably delayed.

Interviews with clinicians suggested a change in emphasis between the earlier years of the Program (2002-5) and the later years (2006 onwards) where clinical engagement became a priority. A clinician suggested,

“I think my clinical colleagues are very supportive of electronic records. But it is critical that we are involved in the implementation of IT. Otherwise, we won’t use it. The problem with this Program is that clinicians were virtually left out of the political process, and the media has picked this up”. (Clinician, North of England.)

5 Discussion and analysis

Tracking the NPfIT over a ten year period using a longitudinal case study method raises several issues about how health IT policy is translated into practice. Our study contributes to existing longitudinal IS research on the adoption and implementation of large scale IT programs into national healthcare settings (Greenhalgh,et al. 2010, Mark 2007; Currie and Guah 2007; Hendy et al. 2005; Hendy and Barlow 2013). Within the IS field, many studies have utilised the organisation or department as the unit of analysis for investigating health IT implementation. Our study extends this work by looking at how government policy is translated into practice at multiple levels of analysis, including, NHS organisations (hospitals and GP practices) IT consultancy firms and patient representative groups. Our findings reveal that, rather than following a linear pathway from program design to testing and implementation, the NPfIT was charac-
terised by many unforeseen policy changes and ‘u turns’ as key decision-makers faced a series of challenges, notably, unrealistic implementation timescales, the breakdown of contractual relationships between contractor and suppliers, disappointing benefits realisation, inadequate risk assessment, and low clinical engagement. These issues were raised in many government reports which evaluated the progress of the NPfIT. However, the solutions put forward were largely designed to address the symptoms of the problem and not its underlying cause. We now present further analysis to the issues which emerge from our case study data under three broad themes: health IT policy and practice, health IT stakeholders, and health IT auditing.

5.1 Health IT policy and practice

The ten year study revealed many shifts in policy-making as key stakeholders, particularly clinicians and patient representatives, became more vocal in their criticism of the NCRS. From a centralised approach beginning in 2002, the well-documented implementation challenges of the NPfIT (Hendy et al. 2005) resulted in the government announcing in 2011 the Program would be ‘dismantled into its separate component parts’ (NAO 2013). Each component program would have its own senior responsible owner who would deliver and assess the benefits. The move from centralisation to de-centralisation coincided with large-scale structural and organisational change within the NHS, as strategic health authorities (SHAs) were abolished. Implementation plans were thwarted as two large IT contracts with Accenture and Fujitsu were terminated. While many commentators saw the NPfIT as ‘too big to fail’ as vast resources were allocated to the Program, the situation which emerged suggested one which was ‘too big to succeed’, particularly as governance arrangements for delivering the various systems became increasingly complicated, with suppliers not being paid until NHS Trusts confirmed they were deployed and working satisfactorily. While the challenge of translating health IT policy into practice in the NHS is discussed in the IS literature (Clegg and Shepherd 2007; Currie 2012a) this study raises further issues about the cultural conditions underlying high visibility programs in a risk-averse civil service setting, where problems become compounded by conflicting agendas among key stakeholders (Currie and Guah 2007).

Despite this study commencing in 2002, with the expectation that a national health policy would be translated into a practical outcome, with clinicians and patients using EHRs, the key observation from this research finds that EHRs failed to be rolled out. As late as 2013, a NAO memorandum (NAO 2013: 4) “total costs (for the NPfIT) were significantly greater than total benefits”. In fact, the percentage of total estimated benefits still to be realised at March 2012 divided into specific programs showed that, ‘additional services including Electronic Prescription Service and Summary Care Record” was as high as 98% (i.e., yet to be realised). Such a large figure is noteworthy given the length of time (10 years) the program had already run. For IS researchers, the lessons from this study suggest that our longitudinal approach has identified many ebbs and flows in health IT policy where translation into practice is not guaranteed, despite the numerous financial and human resources allocated to the program. While it is possible to identify specific causes of ‘the problem’ such as relatively low IT capability in government and the NHS resulting in poor decision-making, loosely defined (and changing) performance metrics (benefits and risks), conflicting political and managerial agenda among powerful stake-
holder groups distributed within a federated network of complex organisations, these issues by themselves to not explain why significant parts of the NPfIT failed to be fully implemented.

5.2 Health IT stakeholders

The NPfIT was made even more complex as government policy changes extended beyond the NHS IT strategy to include a root and branch restructuring the entire NHS organisation. The focus on user engagement by NHS Connecting for Health as a partial reason for low adoption became a key issue for those promoting the NPfIT. However, our findings concur with other studies which caution against framing research questions around ‘user engagement’ rather than focusing on how ‘infrastructures can be nurtured to support the co-production of service environments within which such systems and artefacts might be better appropriated by their users’ (McLoughlin et al. 2012:19).

A survey conducted three years into the NPfIT Program found that out of 1500 GPs in England, the majority of respondents knew little or nothing about the Choose & Book system designed to be used as an electronic appointments booking system for GPs and patients (NAO 2005). NHS staff continued to report a lack of knowledge about the NPfIT. As a response, much attention was placed on user engagement of clinicians. Successive NAO reports (2006; 2008; 2011) promoted the need to do more work on winning the hearts and minds of users. Even as late as 2008 a survey found that only one fifth of NHS respondents knew a ‘great deal’ about the Program, with three in ten reporting they ‘knew nothing’ (NAO 2008, p. 45). The response by NHS Connecting for Health was to develop more effective user engagement strategies. This approach involved hiring seven national Clinical Leads to win support from four occupational groups in the NHS: GPs, hospital doctors, nurses and allied health professionals. Despite these efforts, a more nuanced understanding of clinicians’ concerns was aligned to issues of privacy and security, particularly in regard to access to patients’ health data. These concerns are increasingly documented in the IS literature (Angst and Agarwal 2009) particularly as health data is increasingly moving across different regulatory jurisdictions as a result of cloud computing (Seddon and Currie 2012). Engaging users was not simply a mechanical exercise of ensuring that NHS staff was better informed about the NPfIT, but a much wider issue which necessitated a deeper understanding of the cultures and practices of clinical information systems design and implementation (Rivard et al. 2011).

However, we extend the notion of ‘users’ in this study to include health IT stakeholders. Our findings suggest that, while lack of user engagement was indeed a serious issue, the question of ‘who is a user?’ was not adequately addressed by policy-makers and those charged with selling the benefits NPfIT throughout the NHS. With regard to EHRs, the ‘user’ of this technology was not only restricted to clinicians who would transition patient records from paper-based and/or other electronic storage to the NCRS, where the records would be stored on a national database. In addition, the users would also be patients, their health professionals (doctors, nurses, administrators) insurers, and potentially many others (i.e., persons caring for elderly, disabled friends/relatives/guardians). The notion that more ‘user-engagement’ would lead to increased adoption of the NPfIT was therefore misguided. As the program gained more publicity in the media, so too did calls for greater involvement of potential users, i.e., patients. This debate became increas-
ingly linked to patient data privacy and security, and the right to ‘opt-in’ by citizens to having their data stored nationally, as opposed to ‘implied consent’ which meant that, unless they formally ‘opt-out’, their data will be transferred to the national database automatically. As leading advocacy groups among the medical profession called for greater rights for patients and their data to be kept private and secure, the concept of ‘users’ became much more politically loaded extending beyond the boundaries of NHS staff. This finding is important for IS researchers, not only because it suggests lessons about managing expectations within large-scale (or mega) IT projects but also for understanding the concepts of users and stakeholders, which may have very different roles and influences within the health IT domain.

5.3 Health IT auditing

Throughout the ten year period, the NPfIT underwent a series of audits. At the end of the program it was reported that, “total costs were significantly greater than total benefits” (NAO 2013, p. 4). Measuring the benefits of the Program was problematic as benefits were perceived to ‘go beyond simple cost savings’ to include those which were more difficult to identify, quantify and value. Statements of this nature suggest that NPfIT was launched without full knowledge or understanding of how information technology would improve health service delivery. Tracking the NPfIT from its inception in 2002 to 2011 found a shift in emphasis by NHS Connecting for Health. The initial thrust was to develop more effective procurement of IT in public services, particularly as this was perceived as an important area for building capability (Brennan 2005). This shifted towards benefits realisation ‘to drive benefits’ from the new systems as opposed to focusing only on ‘the practicalities of getting the systems deployed’ (NAO 2008, p. 30). The concept of benefits realisation emerged as concerns about poor return on investment from the NPfIT was raised by politicians, NHS staff, media and other groups. Again, the solution put forward by NHS connecting for Health was to better communicate the realised and potential benefits of NPfIT. This was done by NHS Clinical Leads by visiting health organizations, speaking at conferences and workshops and developing supportive material. Our findings support other IS studies which show that decentralised or local support for health IT is likely to generate more benefits than a top-down, centralised approach (Aarts 2012; Damtew and Aanestad 2012). As it became more difficult to demonstrate realised benefits from the NPfIT, as delays and further delays were announced, an interesting observation is the shift in emphasis to potential benefits, i.e., those that are currently unrealised but will be achieved in the future.

Recognising that measuring the benefits was not straightforward, an assessment was made that two-thirds of the total estimated benefits were future benefits that would be realised at a later date (NAO 2013, p. 5). Further, as much as 98% of benefits for some of the programs were expected to accrue in the future (NAO 2013, p. 6). As a methodological challenge for IS researchers, it is noteworthy that official government documents identify three categories of benefits from health IT (cash-releasing benefits; non-cash releasing benefits and societal benefits) (NAO 2013, p. 15). However, defining how these benefits are realised in the context of almost continuous shifts in policy-making, impacting on almost all aspects of NHS service and IT delivery, poses a serious challenge, not only to NHS staff responsible for benefits realisation, but also for academic researchers making sense of the mis-match between health IT policy state-
ments and IT implementation. While regular auditing of the NPfIT was seen as good practice, it is noteworthy that such exercises may activates deep tensions between clinical and professional groups within healthcare (Vikkelso 2007).

One observation from our findings for IS researchers is that policy-makers were keen to make the link between health service delivery and IT suggesting that technology would play a major role in improving the NHS. However, little understanding of “who benefits?” from the NPfIT was understood in the wider context of incentives for different stakeholders. Interviews with a wide range of NHS personnel suggested that different stakeholders, i.e., clinicians, hospital managers, administrators, etc, tended to voice different opinions and views about the likely benefits of the NPfIT. This varied across the different projects, where more support was given to electronic systems for data storage of x-rays and scans (the picture archiving and communication/PACs) than for EHRs. Clinicians were also concerned about privacy and security issues about who can access patient data, and NHS executives showed concerns about the cost of the NPfIT in a climate of cost-cutting and restructuring. These findings suggest a more complex picture surrounding the issue of benefits realisation, where itemised benefits need to be matched against stakeholder interests and incentives for supporting change. Our findings therefore point to more emphasis on benefits incentives (and risks) as the failure to realise intended benefits was not directly a function of poorly configured technology.

6 Conclusion and future research

As one of the few longitudinal studies on health policy and IT, this research builds on the IS literature by demonstrating the various policy u-turns over a decade. It further questions the viability of large-scale, long term government IT projects. As the NPfIT became routinely referred to as a ‘computer failure’, our findings suggest that policy-makers need to develop a more integrated approach to IT if some of the pitfalls are to be avoided. While many academic studies advocate the socio-technical approach to health IT (Mantzana et al. 2007) where stakeholder roles are considered, our findings extend this work by including a policy dimension.

This study found that government-led health IT policy failed to win supporters among key stakeholders for a variety of reasons. At the political level, the gap between policy development and implementation of the NPfIT grew larger as policy-makers failed to win support. Clinicians were not fully engaged in the decision-making process, and this made policy implementation increasingly difficult. This was a missed opportunity and proved very serious as clinicians mobilised their supported through professionals organizations. At a business level, the case for support was not well made, and the emphasis on IT systems procurement initially obscured other considerations which emerged later, i.e., user engagement, benefits realisation and risk assessment. Organisationally, the fragmented structure of the NHS, coupled with almost continuous reorganisation, was not helpful in translating health IT policy into practice. Management changes and the allocation of responsibility for the Program changed many times. At the technical level, poorly developed software design and implementation strategies with potential unforeseen consequences (i.e., where patient safety could be compromised) (Bate, and Robert 2006) led clinicians to become more ‘risk averse’ to the NCRS.
For IS researchers looking to extend work on health IT policy and implementation, this paper offers four potential areas. First, the policy-practice relationship is a fruitful area, particularly as single-site case studies are unlikely to generate results which extend beyond narrow management practice. This research points to the mismatch between the original policy statements for NPfIT and the outcome. A longitudinal approach offers a robust and fruitful way to capture the many ebbs and flows in policy-making (Berg 2003) often resulting from factors like economic pressures for cost-cutting. Second, the tensions between medical professionalism and market driven healthcare show that change management programs need to gain support by clinicians and patients (Currie 2012a). Our study shows that ‘user engagement’ became important, but this was pursued mechanically where health policy-makers and managers used a simple logic that, if users knew more about NPfIT, their support for the Program would increase. However, a more nuanced approach to user engagement was required to unpick the more complex political and professional motivations among health stakeholders (McLoughlin et al. 2012). Third, research is needed on the development and deployment of EHRs particularly as evidence from around the world shows that despite government investment and adoption levels remain relatively low (Jha et al. 2009; DesRoches et al. 2012). Comparative-country analysis work on adoption and diffusion of eHealth is likely to identify areas where eHealth, for example, is gaining traction, and also examples where more resources are needed (Berg 2003). As eHealth benchmarking is becoming more important, IS researchers can offer policy-makers a more nuanced and detailed account of health IT implementations, recognizing that success and failure factors are more likely to be politically-driven rather than resulting from IT failures (Currie 2012b). Fourth, ethnographies may capture the priorities and views of clinicians and patients in moving towards consumer-driven healthcare. As health and social care becomes more closely aligned across many countries, IS research is needed on how health consumers engage with new technologies, i.e., mobile devices and cloud computing.

Our longitudinal approach to evaluating the policy-technology intersection of the NPfIT provides an illuminating example of how government health IT policy underwent a series of re-evaluation as initial targets and deadlines proved increasingly difficult to meet. As health IT policy in the UK NHS has now shifted from ‘top-down’ to ‘local ownership’, new problems of lack of integration and interoperability of health technologies will re-emerge (Berg 2003). By 2012, the NPfIT had cost around £7.3 bn (NAO 2013) and was several years late. As health IT policy now allows for greater flexibility and control of IT systems at local level, with more choice of IT suppliers, new challenges lie ahead. With citizens increasingly encouraged to exercise more choice about their health, policy-makers will need to recognize that patient data will increasingly move with the individual, possibly across different legal and regulatory jurisdictions (i.e., national borders). Health policy-makers and providers will therefore need to address these new challenges where the current localized approach becomes conflicted with pan-European or even an international health environment suggesting a move back to centralization.
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