



Research report May 2019

# Achieving a digital NHS

Lessons for national policy  
from the acute sector

Sophie Castle-Clarke and Rachel Hutchings

nuffieldtrust

## Acknowledgements

We are grateful to everyone at the trusts we visited who participated in our interviews and focus groups and supported the organisation of our visits. We are also grateful to all of the individuals who participated in the scoping conversations and the policy workshop.

Special thanks to the reviewers who provided comments on an earlier draft including Helen Buckingham (Director of Strategy and Operations, Nuffield Trust), Nigel Edwards (Chief Executive Officer, Nuffield Trust), Harry Evans (Researcher, The King's Fund), John Farenden (Senior Programme Lead, Local Health and Care Record Programme, NHS England), Iain Fletcher (Senior Programme Lead for Blueprinting, Global Digital Exemplar Programme, NHS England), Lorraine Foley (Chief Executive, Professional Record Standards Body), James Freed (Chief Information Officer, Health Education England), Dr Charles Gutteridge (Chief Clinical Information Officer, Barts Health NHS Trust), Dr Sarah Scobie (Deputy Director of Research) and Ann Slee (Associate Chief Clinical Information Officer (Medicines) and e-prescribing lead, NHS England).

With particular thanks to Rob Parker (Associate Chief Information Officer, NHS England) for his continued support and assistance with the project.

Finally, we are grateful for the small contribution NHS England made to the funding of this project.

# Contents

	<b>Foreword</b>	<b>2</b>
	<b>Summary</b>	<b>3</b>
	<b>Introduction</b>	<b>9</b>
<b>1</b>	<b>The role of national policy in achieving a digital health system</b>	<b>13</b>
<b>2</b>	<b>Configuring a digital workforce</b>	<b>31</b>
<b>3</b>	<b>Working with digital suppliers</b>	<b>49</b>
<b>4</b>	<b>Making use of data across the system</b>	<b>56</b>
<b>5</b>	<b>Funding and sustainability</b>	<b>65</b>
<b>6</b>	<b>Reflecting on the Global Digital Exemplar and Fast Follower programme</b>	<b>74</b>
<b>7</b>	<b>Concluding thoughts</b>	<b>86</b>
	<b>Glossary</b>	<b>89</b>
	<b>References</b>	<b>94</b>

# Foreword

Digitising the NHS has been an important goal of national policy for many years. However, as colleagues across the globe have found, digitising health care in practice is difficult.

Over the last two years we've seen exciting progress from organisations involved in, and outside, the Global Digital Exemplar programme. They're showing that NHS hospitals can deliver world-class digital systems effectively and use them to make a real difference to patient care. I'm pleased to see this report recognises the positive impact the programme is having and highlights the need for more investment to achieve the same outcomes across the rest of the country.

It also helpfully identifies other ways in which central policy and support can help STPs, ICSs and individual providers digitise and integrate their services. It rightly points to the role national bodies need to play in setting and enforcing key national standards, and the opportunity to harness the collective buying power of the NHS to make sure we get the products and services we need.

Crucially, this report highlights the importance of building and maintaining a highly skilled and professionalised digital workforce. We need to make the NHS an attractive place to start, build and progress a career in digital technology. A lot of good work is happening in this area in partnership with bodies like the British Computer Society, Federation of IT Professionals and the Digital Academy, but we can do more to make the NHS as attractive to the country's best talent as any other part of the UK's growing digital economy.

With the creation of NHSX we have a unique opportunity to accelerate this. We can streamline decision making and ensure we're using the policy and delivery levers we have at our disposal as effectively as possible. Our Secretary of State sees technology and data as the biggest opportunity for the NHS over the next decade. This, combined with the availability of proven and affordable technologies, means achieving the fully digital health care service the country needs is finally a realistic prospect over the next five years.

As we look forward to the launch of NHSX in July, this report is a timely addition to the debate about how best to make this happen.

**Will Smart**

Chief Information Officer, Health and Care in England

# Summary

**“By 2024, secondary care providers in England...will be fully digitised, including clinical and operational processes across all settings, locations and departments” – NHS Long Term Plan, p. 99.**

Creating a digital NHS is a national policy priority. It promises to improve the quality of care, reduce duplication, drive efficiencies, empower patients and support joined-up services. The NHS Long Term Plan emphasised national policy’s commitment to the digital agenda and promised fully digitised secondary care services by 2024. This follows a host of other policy and funding initiatives in recent years, totalling national investment of over £4 billion since 2016.

Now the establishment of a new organisation to lead national policy for NHS technology, digital and data has been announced. NHSX will bring together digital leaders from NHS England, NHS Improvement, and the Department of Health and Social Care to lead on setting standards for technology use, championing and developing digital training and ensuring NHS systems can talk to each other across the health and care system. This is a clear sign of continued commitment to creating a digital NHS – including from the Secretary of State.

In this environment, we sought to understand how national policy for digitisation is working from the perspective of acute trusts. We wanted to know:

- How national policy impacted on a trust’s approach to digitisation
- How national policy was helping and hindering digital progress
- What national policy could do differently to better support digitisation on the ground.

In order to answer these questions, we spoke to 72 senior digital leaders in national organisations and NHS trusts as well as frontline health care professionals. We used the latest digital maturity assessment (DMA) data to sample trusts based on their digital capability.

This report has a number of suggestions for national bodies. Many of these are likely to be most relevant to NHSX as it is considering how to fulfil its new role to best effect. However, given the uncertainty about how NHSX will operate in practice, we have resisted naming specific organisations. What's more, given the fast pace of change in this area, we have focused on broad policy lessons rather than recommendations for specific policies or policy instruments. At a time when the organisational approach to national digital policy is being refined, this report provides insight into where energy can most usefully be invested. Below we outline a summary of our key findings, alongside a series of learning points for national organisations.

## Key findings and recommendations

### Overall policy approach

Most people we spoke to felt the current policy approach was useful in achieving widespread digitisation: it is generally enabling rather than prohibitive, and is notably less prescriptive than the National Programme for IT (NPfIT). However, we consistently heard that **the national role could be improved – not least by improving coordination across central bodies.**

An important role for national bodies is setting digital standards, particularly to support access to data across the system. The Future of Healthcare – the government's vision for digitisation – recognises that as a key priority. While there is very positive work to develop these standards collaboratively, the national strategy for implementation is often lacking.

Too often, the implementation of standards is viewed as a technical rather than a technical and adaptive exercise, and frequently falls to technical specialists within trusts. **More needs to be done to communicate the purpose of digital standards beyond technical teams** – particularly in highlighting the potential benefit they offer the organisation.

- Support the implementation of standards by setting appropriate deadlines, providing clear guidance for local organisations on interpreting and delivering the standard and ensuring comprehensive piloting and testing prior to national roll-out
- Coordinate efforts to support digitisation and data collection across national bodies

## Configuring a digital workforce

Trusts were experiencing **significant challenges with recruiting and retaining the workforce necessary to support digital change**. Many felt that Agenda for Change (AfC) was inappropriate for corporate and technical roles and the structure imposed by AfC was severely hindering the ability of the NHS to compete with the private sector. In addition, a lack of professionalisation and a clear career pathway with accompanying qualifications for digital roles limited opportunities for learning and development.

Many interviewees also felt the **need to legitimise the chief clinical information officer (CCIO) role**. This extended beyond engagement with boards, and included the need for a clearer career pathway, an accreditation and significant time to dedicate to the role.

- Professionalise digital health roles
- Develop appropriate pay frameworks for the technical workforce
- Allow flexibility for local organisations to determine appropriate governance arrangements for digital programmes, rather than simply mandating board membership
- Provide best practice guidance on clinical informatics workforce configuration, including time allocation

## Working with digital suppliers

Whether trusts had one main supplier or many individual systems, **managing these supplier relationships was felt to be challenging**. Some trusts struggled to engage suppliers in making system upgrades and changes in a timely way, and this was felt to be partly due to lack of supplier resource. Trusts felt there was a greater role that the Centre could play in leveraging the

supplier relationship across the whole NHS by providing a stronger system of accountability when suppliers fail to meet trusts' needs.

We also heard about the **negative consequences of losing all central digital procurement** following the abandonment of NPfIT.

- Proactively engage suppliers about standards and mandates that require software reconfiguration
- Provide trusts with a clear avenue to report issues back to the Centre and hold suppliers to account where necessary
- Consider national procurement of standard, widespread IT systems such as Microsoft software

### Data sharing

Across the country, there are **examples of providers refusing to engage with local data sharing efforts**, often due to concerns about Information Governance (IG). While much of this can be overcome with strong local leadership, there is also room for central bodies to play a much bigger role – not only in supporting with interpreting and applying IG legislation, but perhaps more importantly in providing **clear guidance about the benefits and drawbacks of sharing particular data in certain circumstances**.

- Actively engage with patients and the public around digital, in particular data sharing
- Develop analytics capacity by ensuring there is appropriate national and regional leadership and reducing the number of projects that are outsourced
- Provide use cases and national guidance on priority areas

### Funding and sustainability

**The need for ongoing national and local investment to achieve digital maturity cannot be underestimated.** This applies for digitally mature organisations hoping to sustain their existing programmes, continue to make the most of new opportunities and spread their learning, as well as for other organisations looking to digitise. Digital transformation can also take a long time, and trusts are unlikely to see sufficient productivity gains to support



their significant digital investment in the short term. **The Centre needs to be realistic about the likely levels of funding needed to maintain and support Global Digital Exemplars (GDEs)** to spread best practice; digitise middling and weaker trusts; and join up digital efforts across the country. It also needs to accommodate a move to, or shift in relative balance between, revenue and capital funding.

- Be realistic about likely funding requirements and accommodate a switch from capital to revenue funding
- Be clear about how different funding initiatives align to deliver digital priorities
- Ensure evaluation is built into funding initiatives for digital transformation

### Global Digital Exemplar and Fast Follower programme

**The people we interviewed who were involved with the GDE and Fast Follower programme were broadly positive about the programme as a whole**, particularly when contrasted with NPfIT. They particularly liked the fact that it fostered a more collaborative environment, focused on sharing best practice and learning rather than individual trusts working in silos. However, people reported challenges with the reporting requirements and felt reporting should be more closely aligned with the programme's intended benefits.

**Trusts did not feel that reaching HIMSS level 7 (an internationally recognised measure of digital maturity) was realistic in all cases.** While this expectation is just one part of measuring the objectives expected of GDEs, trusts felt a pressure to achieve it quickly. Many outlined challenges with the lack of national infrastructure to support this at the time of the site visits.

- Ensure reporting requirements clearly relate to the articulation of benefits
- Reconsider the focus on HIMSS level 7 and ensure ongoing work on national infrastructure is effectively communicated
- Look beyond blueprints to share best practice

## Concluding thoughts

At a time when NHSX is considering its organisational priorities and how national policy to support digitisation can be improved, this report sets out a number of areas that would benefit from national attention.

**A clear theme across all of the areas is the need for better communication and engagement between national policy makers and NHS providers.**

Establishing clear avenues for two-way dialogue between all local organisations and central bodies is essential to ensure that national policy is in line with local priorities and effectively supports digital advancement, rather than serves as a hindrance or distraction. This may help central bodies strike the right balance between national direction and giving NHS organisations the space and time to lead their own change.

# Introduction

Creating a digital NHS has been a national policy priority for the last two decades.

Most recently, the Long Term Plan promised fully digitised secondary care services by 2024. This followed The Future of Healthcare, the government’s vision for putting the architecture in place to support a digital NHS. Both documents follow a string of policies that have gradually seen the timelines for creating a digital NHS pushed back, reflecting how the scale of the challenge has consistently been underestimated. Recent policy recognises the importance of creating a digitally literate workforce, open standards to enable different IT systems to talk to each other (often referred to as interoperability) and developing solutions that meet user needs.

Now, the establishment of a new organisation to lead national policy for NHS technology, digital and data has been announced. NHSX will bring together digital leaders from NHS England, NHS Improvement and the Department of Health and Social Care to lead on setting standards for technology use, championing and developing digital training and ensuring NHS systems can talk to each other across the health and care system. This is a clear sign of continued commitment to creating a digital NHS – including from the Secretary of State.

In this environment, we sought to understand how national policy for digitisation is working from the perspective of acute trusts. We wanted to know:

- How national policy impacted on a trust’s approach to digitisation
- How national policy was helping and hindering digital progress
- What national policy could do differently to better support digitisation on the ground.

While the findings in this report are not necessarily representative of the entire acute sector, we sampled to ensure a range of organisations were

represented in our work. There was strong consensus in many areas and the strength of opinion has been highlighted in the narrative and supporting quotes throughout.

This report has a number of suggestions for national bodies. Many of these are likely to be most relevant to NHSX as it is considering how to fulfil its new role to best effect. However, given the uncertainty about how NHSX will operate in practice, we have resisted naming specific organisations.

What's more, given the fast pace of change in this area, we have focused on broad policy lessons rather than recommendations for specific policies or policy instruments. At a time when the organisational approach to national digital policy is being refined, this report provides insight into where energy can most usefully be invested.

## Approach and methodology

We started by analysing the latest unpublished digital maturity assessment (DMA) data (provided to the Nuffield Trust team by NHS England) and comparing it with the 2016 DMA data. From this, we identified where acute trusts have most and least digital capability, and where they have made most progress between the two rounds of data collection.

We found that there was improvement in all capability areas. In 2017, technology for orders and results management had the highest level of use across acute trusts, while medicines optimisation, decision support and remote and assistive care had the lowest. Implementation of standards was relatively low in both years, and even some of the most advanced trusts did not fully use SNOMED-CT, the Dictionary of Medicines and Devices or the Professional Record Standards Body's standards to structure discharge summaries. This finding helped to inform a key line of inquiry about how standards and mandates work in practice (see Chapter 1).

We had 12 scoping conversations with a range of key stakeholders in NHS England and NHS Digital at an early stage in the project to help us understand the key areas to explore in our visits. We used these conversations to understand current issues and approaches to capability areas such as

e-prescribing as well as broader issues such as workforce configuration and setting standards.

We used the DMA data to sample six acute trusts for site visits. We decided to focus on the acute sector because it is arguably more digitised than community, mental health or ambulance trusts yet is still facing significant difficulties. Many of the recommendations are nevertheless applicable more widely, and we reflect on how many of them may apply to integrated care systems (ICSs) in the longer term throughout the report.

We ranked all acute trusts according to their overall capability score. We then identified three groups:

- Global Digital Exemplars
- 10 trusts clustered around the median
- The 10 lowest scoring trusts.

We also used the following additional sampling criteria to select the sites from these groups:

- type of digital solution (we aimed for a mix of sites with integrated electronic patient records (EPRs) and best of breed approaches)
- size of trust
- geographical region
- Fast Follower status.

Finally, we excluded sites in special measures since we felt that struggling trusts may be less able to identify any challenges with digitisation as distinct from related internal challenges with finances or leadership.

The site visits were undertaken in November and December 2018. During the visits we spoke to three Chief Executives and one organisational leader deputising for the Chief Executive; four Chief Information Officers and deputy Chief Information Officers; 14 Chief Clinical Information Officers and other clinical digital leaders; eight other digital leaders – such as IT directors and programme managers; one Chief Operations Officer; and 30 front line professionals and managers – including a medical director, doctors of all grades, nurses and allied health professionals. None of the organisations

we visited are named in the report and we have removed any identifying information such as unique or rare job titles. We promised anonymity to ensure interviewees felt able to speak freely about potentially sensitive issues.

We used specialist software to conduct a framework analysis of all of the interviews, identifying key themes and lessons. We then presented these themes at a policy workshop held in January 2019. Attendees included representatives from NHS England, the Department of Health and Social Care, academic health science networks and a commissioning support unit. We used the workshop to gain a policy perspective on our findings from the front line, and to test a series of policy solutions that came from our fieldwork. Findings from both the workshop and the site visits appear throughout the report.

We worked closely with NHS England throughout the project, and they made their experts and internal resources available to us to answer any queries as they arose. While we are grateful for their assistance, this is an independent project and report.

## Structure of the report

In what follows we present an overview of the policy approaches taken to support a digital NHS to date, and reflections from interviewees on how well policy initiatives are working at the moment – with a particular focus on standards and mandates. The rest of the report is structured according to key themes from our visits:

- Configuring a digital workforce
- Working with digital suppliers
- Data sharing
- Funding and sustainability
- The Global Digital Exemplar and Fast Follower programme

Each section ends with learning for policy makers. We bring all of these learning points together in the final chapter and present our overall conclusions.

# 1 The role of national policy in achieving a digital health system

There are many approaches that national policy can use to encourage digitisation, and these operate at different levels of the system. We refer to ‘macro policies’ as those which aim to achieve wholesale digitisation across the health system as a whole; ‘meso policies’ as those which aim to promote digitisation within a single organisation; and ‘micro policies’ as those which focus on a particular type of technology or part of the system. These categories are to some extent arbitrary given that they all feed into each other. That said, they provide a useful framework for thinking about how policy is currently working and where it could be improved.

This chapter broadly sets out the national policy initiatives to achieve digitisation across the NHS at each level. In the chapters that follow, we focus on relevant policy to the theme discussed in that chapter.

## The policy framework

### Macro policy initiatives: a focus on the system

The largest attempt at system-wide digitisation to date came in the form of the National Programme for IT (NPfIT) in 2002. It was the world’s largest civil IT programme, costing over £10 billion. It aimed to implement integrated EPR systems across the NHS – accessible to 30,000 general practitioners and authorised health care professionals in 300 hospitals (Justinia, 2016). However, despite some successes, NPfIT was officially dismantled in September 2011 after it failed to deliver its intended vision. Subsequent reviews have found the programme was overly centralised, prescriptive and focused on technical solutions at the expense of adaptive change; understanding local needs and

engaging clinicians. What's more, the timelines for the programme were overly ambitious and unrealistic (Hendy and others, 2005), and many felt it was driven by political priorities (Department of Health, 2016).

In the press release announcing the end of the programme, the Department of Health recognised that top-down decisions on behalf of local organisations were not appropriate (Justinia, 2016). Since then, policy-makers have taken a different approach to system-wide digitisation. The National Information Board (NIB) was established in 2014 and brings together national health and care organisations from the NHS, public health, clinical science, social care and local government, along with appointed independent representatives to develop the strategic priorities for data and technology. Its first publication, *Personalised Health and Care 2020* (National Information Board, 2014) – which set out a vision for better use of data and technology in the NHS – talks about ‘fostering and encouraging transformation by initiating and supporting developments that demonstrate the potential of technology and...establishing exemplars to catalyse widespread adoption’ (p. 22) – a far cry from prescribing a national electronic health record. Perhaps the most important part of the vision was a commitment to digital, interoperable carer records by 2020.

The NHS Five Year Forward View (FYFV), published in October 2014, stated that ‘exploiting the information revolution’ was one of the key steps to achieving the goals set out in the document. This included moving towards new care models, which focused on integration, ‘getting serious about prevention and population health’ and giving patients greater control of their care. The Five Year Forward View also recognised the need for an approach to digitisation which was somewhere between over-centralisation and ‘letting a thousand flowers bloom’. To help enable the vision of the FYFV, NHS England has developed the Health Systems Support Framework (HSSF) to support the new ICSs access technological solutions through an easy route to procurement. Suppliers have been accredited on this framework since 2018.

In 2016, the Wachter Review (Department of Health, 2016) – a report produced by an advisory group chaired by Professor Robert Wachter to advise the Department of Health and NHS England about supporting digitisation in secondary care – concluded that any new attempts to digitise the NHS would need to win back the hearts and minds of ‘sceptical stakeholder groups’ bearing the scars from the NPfIT. It also found that the digital health workforce



– both clinical informatics experts and non-clinical health technology experts – would need to be replenished after being ‘thinned’ as a result of the approach adopted by NPfIT. Finally, it found that anything overly centralised was likely to be rejected – while recognising the benefits that centralisation offers in some areas. The report called for staged digitisation, and suggested a shift from achieving digital care records by 2020 as suggested by Personalised Health and Care 2020. It stated that all trusts should be largely digitised by 2023 (Department of Health, 2016).

More recently, The Future of Healthcare set out the government’s vision for digital, data and technology in health and care. It has four guiding principles – user need; privacy and security; interoperability and openness; and inclusion. The narrative emphasises the need to create the right environment for digitisation while maintaining local flexibility. It recognises that it should be a national role to set standards<sup>1</sup> that enable interoperability across the system; build a workforce fit to support a digitally mature NHS; and ensure the NHS is equipped to develop and test innovations locally. This seems to be a clear acknowledgement of the failings of the NPfIT and an effort to take a more enlightened approach through emphasising user need.

Finally, the NHS Long Term Plan published in early 2019 states that all providers across acute, community and mental health settings will be expected to have core digital capabilities by 2024 – highlighting how timeframes for digitisation have continued to shift. This will ‘cover clinical and operational processes across all settings, locations and departments and be based on robust, modern IT infrastructure services for hosting, storage, networks and cyber security’ (p. 96). This will be supported by accelerating the roll-out of EPR systems and associated apps.

1 The establishment of the Professional Record Standards Body (PRSB) in 2013 underpins the commitment to developing national standards. PRSB is an independent membership organisation comprising, among others, medical royal colleges, social care, patient bodies and vendor representation via Tech UK, which feeds into the development and use of standards needed for good care records.

The plan also sets out a number of broader initiatives needed to create the right environment for digital advances, in a similar way to those highlighted in The Future of Healthcare. These include creating a digitally literate workforce; requiring every technology supplier in the NHS to comply with published open standards to enable interoperability; and making solutions that are commissioned and developed by the NHS available as ‘open source’ to the developer community, among others.

The Long Term Plan also sets out ambitions for local health and care records (LHCRs) to operate as data platforms for developers to create new solutions that can compete with – and, where appropriate, replace – traditional systems used by the NHS. The idea is that the LHCRs would provide open application program interfaces (APIs) which enable developers to write new software to work with existing systems. Historically, APIs have been proprietary, with little incentive for commercial organisations to open them up to other companies or bodies. This has stifled innovation and, in some cases, allowed a small number of companies to dominate a market. The LHCR initiative was announced in June 2018 and brings together multiple sustainability and transformation partnerships (STPs) and ICSs to enable data sharing across an entire geography. Central funding of £7.5 million has been awarded to each of the five LHCRs, which together cover 40% of the population in England.

In addition to these broad ambitions, there are also system-wide funding and implementation initiatives. The Health System Led Investment (HSLI) fund has seen £412.5 million allocated to STPs in order to support local digitisation. Within limits, STPs are able to choose how the money is allocated within their area – either further strengthening advanced organisations or bringing weaker trusts up to speed.

### **Meso policy initiatives: A focus on the organisation**

The Global Digital Exemplar (GDE) programme has seen 17 acute trusts and three ambulance trusts receive £10 million and seven mental health trusts receive £5 million – with the amount matched by the organisation in each case, to advance their digital agenda. Acute trusts were invited to submit expressions of interest if they achieved high capability and readiness scores on the digital maturity assessment; they were involved in innovative digital health care initiatives; they had a range of different solution types and NHS

Improvement confirmed that they would not be hindered in their digital ambitions by other issues.

All acute trusts working towards GDE status are now paired with Fast Followers who have received £5 million, also matched locally, to learn from the GDEs and increase their digital maturity. All GDEs will produce blueprints in order to share learning and this – combined with a GDE and Fast Follower learning network, as well as Fast Followers learning directly from their GDE – is intended to achieve scale and spread across the NHS.

The approach grew out of the Wachter review, which recommended that NHS digitisation should be phased, and should start with the most digitally advanced organisations first. Part of the rationale for this was to demonstrate the potential of a digital NHS in places most likely to realise the benefits first. However, some have expressed concerns that this policy risks increasing the divide between digitally advanced trusts, who will continue to mature, and weaker trusts who have not received as much funding to achieve digitisation.

While we have classified the GDE approach as a ‘meso policy’ given its focus on organisations rather than systems, it should be noted that once they have become digitally mature, GDEs are expected to support organisations in their local health economy – and the approach is therefore not solely organisation-focused. The development of GDEs in other sectors also shows the potential of the approach to support digitisation across the system.

### **Micro policy initiatives: A focus on the technology**

In addition to the approaches set out above, a number of areas of practice have been singled out for widespread digitisation. For example, e-prescribing for adult chemotherapy is mandatory given the precise dosage measurements required and the potential for serious and life-threatening outcomes if a dosage error is made (Elsaid and others, 2015). In specialist areas such as these, standalone digital solutions are often required, given that large integrated systems are often inferior to purpose-built solutions.

Similarly, discharge summaries from inpatient care; mental health services; A&E and outpatient clinic letters must now be sent to GPs digitally. They should be sent via structured message (as opposed to a PDF file sent via

e-mail), and use the PRSB standards to structure the summary (see ‘Setting standards’ below).

There are also a host of financial incentives supporting the uptake of particular innovations. The Innovation and Technology Tariff (ITT)<sup>2</sup>, for example, has several funding models to encourage the uptake of six innovations, and the Innovation and Technology Payment (ITP)<sup>3</sup> is now building on this.

Taken together, these examples show how the policy approaches being used can create the right overall environment for digital technologies while simultaneously prescribing specific solutions in discrete areas that stand to benefit. The challenge, then, is knowing when and where to deploy these kinds of policy interventions.

2 [www.england.nhs.uk/pay-syst/development/tech-tariff-17-19-technical-notes](http://www.england.nhs.uk/pay-syst/development/tech-tariff-17-19-technical-notes)

3 [www.england.nhs.uk/ourwork/innovation/innovation-and-technology-payment-itp-2019-20](http://www.england.nhs.uk/ourwork/innovation/innovation-and-technology-payment-itp-2019-20)

## Timeline of major digital policy developments in health care



## Reflections on the policy framework from the frontline

The vast majority of people we spoke to felt the current policy approach was useful for achieving widespread digitisation. Many commented that, at the macro level, the lessons from NPfIT had been learned and current policies were generally enabling rather than prohibitive. Many agreed with the sentiment of *The Future of Healthcare* in that national bodies should be creating national infrastructure to achieve digitisation at scale by, for example, setting standards, particularly for interoperability, rather than telling NHS organisations what to do.

However, we consistently heard that the way in which that national role is fulfilled could be improved. Here the underlying issues with NPfIT – particularly the observation that it provided technology-driven rather than problem-driven solutions focused on defined user needs – are worth reflecting on.

### Setting standards: ‘There’s something that’s not quite right’

It is essential that national standards underpin data sharing between different digital systems – so-called ‘interoperability’. Various things can be standardised in order to achieve this aim, such as how the data is communicated (often a technical solution); clinical content for a particular use case; and coded terminology to ensure all organisations have a common language or ‘code’ – for example, for diagnoses and medications. As set out above, setting standards is a key national priority and all of the trusts we spoke to agreed that this should be a central responsibility for national bodies.

However, there was widespread frustration across trusts with the way some standards have been mandated and implemented.

**“Somehow or other, NHS Digital, I don’t think, is in line with its customers. So I don’t know how it actually comes to a conclusion about what these programmes should be or what timescales they should go over and whether they can**

do their preparation work in a fashion that means that the trusts can keep to the timescales there. There's something that's not quite right." Digital leader 2, Fast Follower, middling trust

A good example is mandating NHS organisations to implement Fast Healthcare Interoperability Resources (FHIR, pronounced 'fire') APIs. FHIR is an industry standard open API to enable health care data to be transferred between different systems. FHIR resources are being developed by NHS Digital specifically for an NHS context, with engagement from other organisations such as INTEROPen and the PRSB.

---

### **Box 1: Stakeholder engagement to inform standards – INTEROPen and the Professional Records Standards Body (PRSB)**

INTEROPen is an independent action group made up of individuals, industry, standards organisations and health and care providers who have agreed to work together to accelerate the development of open standards for interoperability in the health and social care sector. It is actively involved in developing, testing and demonstrating interoperability standards such as FHIR.

The PRSB is an independent membership organisation comprising – among others – medical royal colleges, social care, patient bodies, and vendor representation via Tech UK. The organisation was created in light of some of the challenges of NPfIT, and has the support of NHS bodies and the Department of Health and Social Care.

The PRSB is responsible for developing and supporting the adoption of standards for health and care records including referrals, discharge summaries and inpatient and outpatient letters. They apply a comprehensive engagement process which involves consulting with clinicians and other stakeholders through their membership about the content of the standards they develop. These are also subject to review and independent assurance. After publication, there is an online support process that can be used for feeding back queries and suggestions.

---

The vast majority of the people we spoke to felt that the FHIR standard was necessary and that producing FHIR resources was exactly the sort of thing NHS Digital (along with others) should focus on to enable data sharing at scale. Initiatives such as INTEROPen demonstrate the cross-sector commitment to interoperability and the PRSB also fielded a team of expert clinicians, professionals and patients to ensure that FHIR message specifications were developed with clinical and professional usability in mind.

However, positivity for the standard itself was offset by concerns that all acute trusts had originally been mandated to comply with FHIR standards by 31 December 2018. For many, this reflected a poor understanding of the system for several reasons.

First, GP systems were not equipped to receive FHIR-structured data, so mandating acute trusts to implement FHIR standards in that timeframe was of limited use.

**“NHS England are pushing a whole bunch of standards saying that NHS trusts must have APIs in place by 31st December this year [2018] and yet why? Because there is no one to connect to them, it’s a completely pointless exercise...if they talked to NHS Digital they know full well that December next year [2019] would be a much more sensible target because at the moment nobody in the country can comply with that requirement” CIO, GDE 1**

Second, suppliers were unlikely to be able to make the necessary changes to systems in such a short timeframe. Third, the EPR standard is still in beta development, and asking suppliers to integrate an unfinished standard was considered wasteful and unrealistic.

**“If you are a vendor, whether you are a big, big vendor like Cerner or Epic or a small start-up, you cannot invest all the time to start developing something that NHS England hasn’t got round to finalising...they just need to finish some of it instead of talking about...it.” CCIO, GDE 1**



And fourth, it does not take into account individual levels of digital maturity: some trusts do not have a functional EHR in place, so mandating an open API for data sharing is unachievable.

Overall, there were concerns that the policy had been driven by the technical solution itself, rather than starting with (and clearly articulating) the problem it was trying to address. The problem was not with the FHIR resources themselves – which have been carefully devised with a range of stakeholders – but rather expectations around implementation.

We heard similar concerns in relation to PRSB standards. The PRSB has developed standards for the way electronic discharge summaries should be structured. These have been mandatory since December 2016, when they were included in the NHS Standard Contract.

PRSB standards define the detailed structure and content of the information needed in digital records for different situations (known as ‘use cases’). While interviewees generally acknowledged that a standard structure can be useful, most felt that the PRSB standards made discharge summaries too long and subsequently too unwieldy for both GPs and hospital staff.

**“I think [PRSB standards] are overly prescriptive and too complicated; I think they are focused upon the document and producing documents and not actually on the information... you can end up with a very long document where you can’t see the wood for the trees and they don’t necessarily want all those standards in there.”** CCIO, GDE 1

**“If you spoke to the GPs, GPs actually in the short and medium term just aren’t interested...in receiving it [PRSB structured discharge summaries]...for us it’s a diversion.”**  
Digital leader 1, Fast Follower, middling trust

Despite a rigorous process of clinical and patient engagement in developing these standards, they still presented problems in practice. It is clear that comprehensive piloting is necessary before full national roll-out is attempted.

In actual fact, a relatively small number of the standards are mandatory, and those have been identified through extensive engagement with clinicians. Our research shows, however, that more needs to be done to effectively communicate this process to trusts, alongside the online process of feeding back comments and suggestions to PRSB (see Box 1).

Ultimately, both the FHIR and PRSB standards examples show that the significant collaborative engagement and investment put into developing these standards can be undone at the implementation stage – either by unrealistic timeframes, poor local testing and piloting or misinterpretation of the requirements. This echoes research carried out by the PRSB themselves about the discharge standards (PRSB, 2018), which found that implementation can present a host of challenges for trusts distinct from the standards themselves. The way particular standards are implemented can also be subject to interpretation, either by large vendors or local informatics teams.

The PRSB report set out a series of recommendations to address some of these issues, such as clearer implementation guidance (given some found implementation guidance for individual standards was lengthy and complex); better education about why the standards are important; and more comprehensive local testing, as there was wide variation in how the PRSB standards were tested due to lack of time, resources and tools (PRSB, 2018).

The need for better support to implement standards was also raised in relation to SNOMED-CT – a standard terminology developed for sharing information across an electronic health record. All acute trusts in England are required to use SNOMED-CT in their patient care systems by April 2020.

While many interviewees saw the benefits of SNOMED-CT, it is a highly technical standard, and trusts were having difficulty finding the right skills to support the transition.

**“Within this organisation there isn’t really anybody who understands SNOMED so what support is there out there that can help with that?” Deputy CIO, GDE 2**

Given the challenges of recruiting and retaining a technical workforce in the NHS (see Chapter 2), the need for support when implementing and interpreting technical standards is even more pronounced.

As with digital change more generally, implementing standards is an adaptive change as well as a technical one (see Heifetz and others, 2009; Department of Health, 2016). The significant cultural shift required cannot be underestimated. It usually requires clinical and non-clinical staff changing the way they work – often in significant ways. This will always take time, and staff engagement at all levels is essential to the process.

The need to better support implementation and to move from viewing standards technically was acknowledged by policy-makers at our workshop. We heard that responsibility for implementing standards often falls to a technical expert in the organisation, and central bodies agreed they did not do enough to explain the importance of standards in non-technical language, to ensure buy-in from the wider organisation. Some felt that this issue was exacerbated by tribalism (and the associated technical jargon) within local and national organisations, which can hinder communication.

### **Balancing national standardisation with local variation**

Deciding what requires national standardisation, and the associated deadlines for achieving that standardisation, is not straightforward. While national standards are being developed, local organisations have to carry on as normal.

We heard one example of a trust that had developed its own electronic discharge summaries before the PRSB standards were mandated, and felt that some of their good local work was undone when they came into force. It should be noted, though, that given PRSB's extensive consultation process, attendees at our workshop felt that it was also the responsibility of the trust to feed in how their approach was currently working.

There is a significant timing point here. Trusts either have the option of developing their own solutions where national infrastructure is lacking (and risking those local efforts being undone later on) or waiting for national infrastructure and stalling their digital progress (see Chapter 6 on Global Digital Exemplars for an example of the latter).

An example of the former is NHS Digital’s delayed development of the e-referral service, which requires consultants to log in to a new system to triage patients, rather than working in their existing EPR system. We heard that while waiting for this, trusts were forced to develop their own solution, creating local variation, and that when the national solution finally arrived it was not fit for purpose since it is unfeasible to expect consultants to log in to a new system.

**“I have been waiting for more years than I’ve been in this trust or the previous trust for a simple, straightforward, industry standard, electronic feed of referrals so that suppliers...can say, ‘We will get this feed.’... You would create a workflow and a process to support [triage].... The net result of not doing that is that trusts, in the meantime, have to carry on. I’ll put money on the fact that all the Cerner sites are, actually, doing something different. So the Centre says, ‘Do it the same way’: NHS Digital’s behaviour means everybody does it a different way.”**

Digital leader 1, Fast Follower, middling trust

Where trusts are forced to develop their own solutions, national mandates often undo their work later on. This was also an issue with the implementation of NPfIT and must be carefully managed. It suggests a need to take account of existing local solutions and start with the problem that the standard is trying to address, rather than the technical solution. If some organisations already have appropriate local solutions that address the problem at hand, blanket mandating of particular standards within a short timeframe may not be appropriate. In those instances, a softer, more iterative transition may work just as well. Where complete standardisation across the NHS is required (for example to enable interoperability) the reasons for implementing the national solution over local variations need to be clearly articulated and communicated.

None of this is simple and the tension between national and local responsibility runs throughout this report.

## Micro policy solutions: ‘It depends whether you achieve them with tactics or strategy’

Feelings about micro policy initiatives, which tend to be prescriptive, were mixed. Where there was a clear rationale (supported by robust evidence) for mandating the digitisation of a particular capability, such as e-prescribing for chemotherapy, interviewees generally felt the policies were useful and enabled digitisation in ‘bite-size chunks’. This was particularly the case where the mandate related to specialist areas that required their own digital solution anyway.

In general, though, many interviewees expressed concern about particular technologies or capabilities being mandated – particularly in the light of perceived challenges with regard to FHIR and PRSB standards, as noted above.

“It depends whether you go over the line by achieving that with tactics or strategy. If it’s partly your strategic approach, and you’re able to deliver it because that’s part of your overall holistic system development, then that can work. If you get over it just by some tactical... that can actually create more problems...Is..[it] scalable and sustainable...and truly future-proofed?” CCIO 1, GDE 2

When mandating technology for a particular clinical area, good evidence is needed as well as a keen awareness of potential unintended consequences. Financial incentives, rather than mandates, for example, may be more appropriate in some cases depending on the evidence for uptake to improve care.

## Conflicting messages from national bodies

We heard several examples of trusts receiving conflicting messages from different central initiatives as well as different national policy bodies – particularly NHS England, NHS Digital and NHS Improvement. These most frequently related to cyber security and funding guidance – including where efficiency initiatives such as the Model Hospital (a tool to support trusts to monitor their efficiency) interfered with organisational board-level support for large IT investment.

“[I]n June...NHS England wrote to everybody saying about Cyber Essentials Plus and wanting to know...where we were in terms of compliance. That was NHS England, then NHS Digital became involved – fair enough – you see why they would need to be involved. Then NHSI started getting involved, then the DH started to get involved, and then we had this situation where you were sending a set of returns to one organisation, to, say, NHS England or NHSI, and then the others were saying ‘Well we don’t have these.’”

CIO, Fast Follower, weaker trust

“[I]f you took all the advice and guidance in terms of the percentage of money that should be spent on different attributes of the service, unfortunately it comes to more than 100%. So the Centre...in itself isn’t joined up.”

Digital leader 4, GDE 3

“The other thing that’s causing us all grief is blooming Model Hospital and them trying to drive down IT costs at a time when we’re trying to do the biggest change in IT that the NHS has ever had...being the lowest cost IT trust isn’t necessarily the place where everybody wants to be at the moment...”

Digital leader 2, Fast Follower, middling trust

## Lessons for national policy

**Support the implementation of standards by setting appropriate deadlines, providing clear guidance for local organisations on interpreting and delivering the standard and ensuring comprehensive piloting and testing prior to national roll-out**

Many of the issues highlighted above relate to the implementation of standards, rather than the standards themselves. While a lot of good work has been done to collaboratively develop standards to ensure they meet user need, there is a risk this will be undermined if there is little support or guidance on

how to implement these standards effectively. Key to this – as with all digital transformation – is acknowledging that the development and implementation of standards requires a cultural change, rather than simply a technical one.

There are several components of this. First, central bodies need to articulate the benefits of particular standards and secure buy-in from local provider organisations in order that standards are implemented appropriately. Clinical and digital leaders need to understand what the standard is trying to achieve and what impact it will have on their current way of working. The PRSB has already had some success in working with royal colleges to build standards into college curricula, which is one route to articulating the benefits of standards and embedding them in routine care. Better supporting implementation also includes providing clearer guidance about how standards should be interpreted and applied at a practical level – as this is often open to debate.

Second (and perhaps most simply), central bodies need to set deadlines for standards and mandates with a good understanding of what suppliers and the system can realistically achieve. Where this is not done, there is a risk that NHS providers and system suppliers will not be able to appropriately prioritise them.

Third, despite significant collaborative effort in developing standards, the same level of attention is not always paid to piloting and testing standards in a real-world setting. This is essential for ensuring they are fit for purpose and aligned with system needs.

By paying greater attention to implementation, central bodies will be able to apply standards and mandates more effectively, and make better use of one of their most important levers.

### **Coordinate efforts to support digitisation and data collection across national bodies**

The lack of coordination between central bodies has a range of consequences, from duplication and wasted effort caused by responding to multiple overlapping reporting requirements, to struggling to achieve board-level buy-in to digital investment due to conflicting funding messages. Given the

significant effort required to implement digital systems as well as the need for sustained board engagement, the importance of a coordinated approach to digitisation cannot be overstated.

Bringing those responsible for digital leadership together under NHSX may help with this, but it will still be important to ensure digital policies are in complete alignment with other areas such as quality improvement and realising efficiencies. Reports of the Model Hospital initiative undermining board-level buy-in to digital investment serve as a good reminder as to why a cohesive policy approach is needed. Ensuring digital policies are co-ordinated with the development of ICSs is also essential.



## 2 Configuring a digital workforce

“You need an organisation that understands innovation and opportunity that could be delivered by a digital agenda... but of course you also need a workforce to deliver this.”

Digital leader 4, GDE 3

### Policy context

Developing a workforce capable of delivering wholesale digital transformation, as well as making the most of digital tools and services, has been a policy priority since 2016, when the Wachter review (Department of Health, 2016) set out a series of recommendations for roles in clinical informatics. These are set out in more detail on page 42.

The Building a Digital Ready Workforce programme soon followed. Led by Health Education England, the programme comprises a series of workstreams focusing on leadership and culture, professionalisation, the Digital Academy (which provides specialist training to CIOs and CCIOs), and digital literacy. The programme also funds and supports the Faculty of Clinical Informatics, the professional body for health and social care professionals working in informatics. It is also working on campaigns to attract people with digital skills to the NHS.

Fostering the right skills and the culture needed for them to develop is also one of the priorities of The Future of Healthcare. The document sets out the vision not only to equip existing staff with the expertise they need to incorporate digital into their work, but to recruit more people with these skills into the NHS. It also acknowledges the importance of strong leadership, and states that improving digital maturity should be seen as the same level of

significance within a trust as managing finances and the quality of health care. This vision has been reflected in the NHS Long Term Plan (see Box 2), which echoes the importance of digital leadership and preparing the workforce for the future.

---

### **Box 2: NHS Long Term Plan 2019: recommendations on the digital workforce**

- We will also invest in enhancing the digital leadership of the NHS by further expanding the successful NHS Digital Academy programme.
- We will expect informatics leadership representation on the board of every NHS organisation, with chief executives capable of driving the transformation of their organisations and non-executive directors able to support and demand increasing digital maturity over the next five years.
- We will increase training in digital capabilities for the health and care workforce and focus on attracting excellent technical expertise and skills, particularly in ‘newer’ digital fields so that our workforce can continue to deliver our technology strategy.

---

The Topol Review (published in February 2019) was commissioned specifically to explore how to prepare the clinical workforce for the digital future, including how to enable NHS staff to make the best use of new technologies such as genomics, digital medicine and artificial intelligence (AI). The report advises on areas where technology will change or adapt clinical roles, and how to prepare the workforce for those changes. This includes the implications for educating and training new health care staff, workforce development and the importance of leadership. In response to the report, Health Education England launched the Topol Programme for Digital Fellowships, which will support clinicians to improve their knowledge and expertise in using digital health.

## Getting the basics right

In order to deliver on a digital strategy, the right people with the right skills need to be in place to develop, deploy and embed digital projects. Many trusts we visited had made significant changes to their workforce in order to deliver their digital strategy, including recruiting new roles. These ranged from project and programme managers to a new multi-disciplinary team of CCIOs. This was particularly true of some of the GDEs and Fast Followers, who had decided to use a significant amount of their funding to invest in the workforce and therefore develop the internal capability required to deliver change at the scale and pace they needed.

We heard that workforce requirements within trusts are changing as digital becomes ‘business as usual’. There is increasing focus on optimising existing solutions and using analysts to interpret data. There was an acknowledgement that analysts need to be more embedded within operational clinical divisions to support them to make decisions informed by organisational data (see Chapter 4).

Trusts also recognised that clinicians should be involved in ongoing digital development, and some had initiated systems that allowed for this feedback loop. As the digital programme of the trust grows, so too does the need for technical support staff and project management functions to ensure that the programme runs effectively and any issues can be addressed quickly. Developing this workforce is also important for cultivating organisational knowledge and capability that could support the sustainability of the digital programme beyond initial deployment.

Although this was important for all trusts, where the trust had a home-grown digital system, this organisational knowledge and skill was one of their key attributes. Not only did it support with the technical development, but also with getting buy-in from the wider workforce for the digital programme.

**“We are an organisation that has grasped the in-house development approach, and that’s reflected in terms of the size, the scale of the department and the skills that we’ve got in here.”** Digital leader 4, GDE 3

As noted in Chapter 1, trusts may struggle if they do not have staff with specialist technical knowledge in, for example, standards such as SNOMED-CT. It is also becoming apparent that leaders in trusts need a working knowledge of such standards so they understand the importance of them and the potential benefits they offer. Increasingly, there is a pressing need for staff with both clinical and specialist technical knowledge – combined skill-sets in very short supply.

Every trust felt that the digital strategy should be embedded within the wider trust strategy. They also noted the need for board support and engagement, and the importance of leadership in driving digital change forward. However, almost universally, they did not believe that this necessarily required a senior digital member of staff such as a CIO to have a seat on the board, which is stated as a future ambition in the NHS Long Term Plan. While the intent of that policy is to ensure genuine board-level oversight and input into informatics issues, some expressed concern that mandating specific governance arrangements may not be the best way to achieve this.

**“As long as you have a board who is fully engaged with the digital agenda and are standing together, then the CIO is in a much freer position if they can work in a trustful relationship with the executive directors but don’t have to attend every board meeting.”** CCIO, Fast Follower, weaker trust

**“Similarly, if you just say ‘You’ve got to put a CIO on the board’, will that really... what’s the demonstrable change going to be in the short term? Similarly, if you said to CEOs, ‘You’ve got to have the CIO reporting direct to you’, what is the intended outcome from that? Say, for instance, there might be chief execs who aren’t particularly**

interested in IT, are they suddenly going to become interested in it because the CIOs are reporting directly to them, because I guess the intended consequence...is that IT and digital is such an integral part of our business, the way it would be seen in other businesses where IT is seen as an integral part, that, given the importance it deserves, it's given the forum and it's given the influence.” CIO, Fast Follower, weaker trust

## Recruiting and retaining a digital workforce

Identifying the skills that are required is just the first step: recruiting and retaining the people with those skills is also a significant challenge. Cyber security in particular was an area that multiple trusts had struggled to recruit to, where demand across all sectors (although made worse in the NHS since Wannacry) is outweighing supply. Other specialist and technical skills such as integration and data analytics are particularly hard to attract to the NHS.

“Integration – that’s a particular area which requires a particular set of knowledge, which not a lot of people have, you have to understand the technology and the information itself, and there are very few people who understand it.” Digital leader, weaker trust (no GDE/FF involvement)

Challenges with recruitment and retention were not limited to individuals with technical skills. Most trusts also noted difficulties in recruiting project and programme managers with experience in transformational change as well as experienced senior digital leaders, who are particularly vulnerable to more lucrative offers from the private sector.

“I’m lucky here because the [senior digital leaders] are loyal to the organisation and want to see it through; they could have gone for £30,000 or £40,000 more with the

offers they got. [They are] inundated with offers of jobs... the private companies are onto him all the time and I can't compete with those salaries." COO, weaker trust (no GDE/FF involvement)

An already-limited skills market was being exacerbated by Agenda for Change (AfC), which all trusts noted as a significant limitation. This was primarily because of the restrictions imposed on pay. Many felt that AfC was inappropriate for corporate and technical roles, and had been constructed with clinical careers in mind. Higher AfC bands often require academic qualifications such as Master's degrees, which many technical staff do not have – despite possessing desirable skills for both the NHS and beyond. Most felt that the structure imposed by AfC was severely hindering the ability of the NHS to compete with the private sector.

---

### Box 3: Agenda for Change (AfC)

AfC is the grading and pay system for NHS staff (excluding doctors, dentists, apprentices and some senior managers). The purpose is to harmonise pay scales and career progression arrangements. There are currently nine numbered pay bands, and a set of national job profiles has been agreed to support matching posts to pay bands. The aim of AfC is to ensure equity between similar posts in different areas.

---

“Agenda for Change was built for nursing, not for other things, and also part of the problem is that whilst there has to be some sort of grading structure, in the outside world if you're in industry there is a parallel stream, so you could earn a lot of money as a very skilled technician – up to £70,000, £80,000 a year, but you can't do that in the NHS: there are no technicians that are on bands 8A, B and C, not outside London. The NHS is not structured to do that. So yes, the Agenda for Change is quite a problem.” CIO, GDE 1

**“...Agenda for Change kind of left what I call corporate services at the back of the queue, as a consequence of that we recognise that we may not be sufficiently competitive to attract the appropriate talent into the NHS...”** Digital leader 4, GDE 3

Some trusts we spoke to were attempting to circumvent the barriers imposed by AfC, but these are neither sustainable across the organisation or the NHS as a whole. For example, spot salaries were used in one trust for senior members of the leadership team, but there was a clear acknowledgement that this would not work for all roles and risked creating an internal market, which is what AfC was designed to avoid. What’s more, it requires a significant amount of effort across provider organisations to negotiate these salaries with internal human resources departments who are following national guidance.

**“All [of our digital leaders] are on spot salaries; we’re not on Agenda for Change because you wouldn’t be able to pay us on Agenda for Change, it doesn’t work, but that’s kind of okay with managers but for ordinary staff it’s much more difficult because then you get into the what band would they be if they were banded, oh well, 8A, so if that 8A person over there compares themselves to you, how can you justify you’re paying this person £20,000 a year more.”** Digital leader 1, Fast Follower, middling trust

Other trusts had used contractors, but this was also not wholly satisfactory as these contracts were short term, and therefore unsustainable, and did not support the need to develop organisational capability and knowledge. Also, given NHS Improvement’s caps on contractor spend, several trusts reported difficulties in hiring appropriate contractors with specialist knowledge in their EPR. Some tried to circumvent the rules by purchasing a ‘managed service’ which included contractor support, although this is a more costly solution.

Others were examining the possibility of sharing employees across organisations, not only to address the issue of the limited market, but also to

encourage closer working between organisations using the same data and information. Notably, workshop participants also proposed sharing roles across the infrastructures provided by the STPs or ICSs. Participants felt that this would not only help to relieve some of the pressures caused by the limited skills market, but it could also foster greater collaboration and integration across organisations (also see ‘Pooling resources’, Chapter 5).

## An NHS career in digital

It was clear from our interviews that pay was not the only factor limiting the ability of trusts to recruit the necessary workforce. A lack of professionalisation and a clear career pathway with accompanying qualifications for digital roles within the NHS also played a role.

People felt that, unlike other areas, informatics as a field has not been professionalised, meaning there is a lack of coherence around job descriptions and the skills and qualifications required – leading to significant variation across the NHS. This lack of a clear career pathway is accompanied by limited opportunities for learning and development, which people we spoke to felt exacerbated the existing recruitment challenges. In the case of data analysts, for example, there is an over-emphasis on routine reporting and performance management, at the expense of more sophisticated analytical projects which are often outsourced (see Chapter 4). Stakeholders at our policy workshop also felt that professionalisation of the informatics field is essential, and drew comparisons with financial and clinical roles, which are necessarily highly professionalised.

**“What often happens in IT, and of course this is the IT industry everywhere, not just the NHS, traditionally it hasn’t been as professionalised... no one kind of ever went out and said ‘I want to become a CIO or an IT Director and this is the path to do this and these are the qualifications I need to do’. So I think in the NHS it’s more about saying ‘How do we actually professionalise that to make sure that we’ve got the right staff at the right skills?’”** CIO, Fast Follower, weaker trust



“We certainly experience situations where it has taken us nearly a year to go through a process of recruiting staff of the right level and competency you need to support some of the activities that we’re engaged in, and that’s become a problem. Will money partly fix that? Yes. I think the bit that will improve that more so is to provide sort of career development and opportunities in terms of further enhancement of their ability, yes.” Digital Leader 4, GDE 3

Some believed this was partly because, in comparison to other areas, clinical informatics in particular is a relatively new profession. People we spoke to consistently recognised this as an area for central bodies to play a more active role, particularly as digital becomes a greater priority for the NHS.

“I think there is something that the Centre can consider, which is, as the whole NHS becomes more digitally mature, as we deploy more and more functionality in organisations, varying levels of digital maturity now, if we start connecting systems up through population health management and capability and analytical skills that are needed to draw the data out from our systems, then we’re going to need a digitally adept workforce, particularly also within the technical side of IT.” CEO, Fast Follower, middling trust

“Our problem historically has been: it’s an NHS job description, where does it get advertised? In NHS Jobs, you know, outside of the NHS who looks in NHS Jobs?... So we’re trying to break that mould, to say ‘Look, we need to get outside of that’, and we actually need to make sure that if we’re going outside of those parameters that we are providing something that is translatable to somebody who could work in, say, the manufacturing industry or utilities or banking...” Digital leader 4, GDE 3

There are already initiatives that attempt to address some of these issues. Interviewees and workshop participants felt it was essential that the NHS draw on existing digital skills frameworks, such as the Skills Framework for the Information Age (SFIA) to provide greater alignment with other sectors. Targeted recruitment campaigns such as the recent 'We are IT, We are Support' advert are also being promoted to encourage people to apply to digital NHS roles.<sup>4</sup>

---

#### **Box 4: Skills Framework for the Information Age (SFIA)**

The SFIA is a model for describing and managing competencies for information technology professionals for the 21st century, and is intended to help match the skills of the workforce to the needs of the business. It was created by a consortium of 30 organisations from business, education and government over 22 years, spearheaded by the British Computer Society. The Framework is designed to articulate the skills and the level of responsibility needed for organisations using digital technology in the 21st century, but is not limited to a particular sector or profession. The Framework is continuously refreshed to keep up to date with developments in technology.

---

Many people felt that a career development pathway, supported by a clear process of accreditation would help to legitimise the roles and also attract more people to them, thereby helping to address the recruitment challenges. However, workshop participants felt it was essential to ensure that this process was agile, and could be flexible to account for the rapidity of digital development. It also needs to be tailored for different types of roles and to recognise the various skills required, such as project management, clinical informatics and data analytics. There are already pockets of good practice here, but they are not widespread across the country.

4 [www.youtube.com/watch?v=hpyDLMS1QNE](http://www.youtube.com/watch?v=hpyDLMS1QNE)

---

### Box 5: Initiatives to support digital learning and development

- The Faculty of Clinical Informatics (FCI) is the professional membership body for health and social care professionals working as informaticians in the UK. The aim is to support the establishment of clinical informatics as a recognised and respected profession through providing professional standards, accreditation, learning and development and recruitment.
- The North West Informatics Skills Development Network (NWISDN) was launched in 2011 and is part of the larger Skills Development Network which supports NHS staff. The NWISDN is a membership organisation, funded through contributions from members. The purpose is to support the learning and development of the informatics workforce through training, sharing best practice events and fostering professional networks. The NWISDN does not just focus on leadership, but covers the whole workforce. While other similar networks are emerging across the country, access to training and development programmes is not equitable across the country.

---

Creating a clear career pathway requires a continuous approach to learning and development. Ensuring that everyone is able to access the same training, networking and learning and development opportunities will help to develop informatics within the NHS as a desirable and sustainable career choice.

## The role of the CCIO

The Wachter review (Department of Health, 2016) contained detailed recommendations on the role of the CCIO, and the clinical informatics workforce more widely.

---

### Box 6: Wachter review recommendations on clinical informaticians

- There must be a major effort to place well-qualified clinicians with advanced informatics training in every trust. For a large trust, there must be a senior clinician-informatician (chief clinical information officer, or CCIO), reporting at the level of the board or the CEO, whose primary job (>75% time) is to lead and manage the purchase, implementation, and evolution of the clinical information system. These individuals needed to be supported with the appropriate staff, budget and authority to be able to successfully deliver on digital transformation.
- Reporting to this person must be a cadre of clinician-informaticians (whose clinical background may be medicine, nursing, or pharmacy, depending on the needs of the unit). To implement and optimise an EPR effectively, trusts must make such individuals available to major clinical and service areas (such as medical, nursing and pharmacy).
- The Advisory Group estimates that an average-sized trust needs at least five such individuals on staff.

---

Several trusts felt that the CCIO held the key to their success, and that the role was a bridge between the technological aspects of going digital, and needing to make that work in practice.

**“I think that has been the single biggest success of the work done here ... I think that’s been instrumental in what we’re trying to do which is turn it round to digitisation, IT enabled model.”** Organisational leader, GDE 2

### A dynamic and ever-changing role

Many of the trusts we spoke to had a CCIO role in place prior to the Wachter review, but all now acknowledged that the CCIO role was essential for developing a digital hospital, and had since developed the role into something much more formal. One trust, for example, had decided to use some of its Fast Follower funding specifically to expand their CCIO-body.

Although all trusts we spoke to had a CCIO role, there were differences in the way this role was construed. It was accepted that what the role required very much depended on where the trust was in its digital journey, moving from a ‘digital cheerleader’ and clinical digital lead in a digitally immature trust, to making best use of a wide range of data in a more advanced trust. The number of people required to perform the role will likely change too.

**“So what was right for us at the start of my project? Effectively two roles in the CCIO. Effectively some form of digital cheerleader and the clinical lead for an implementation project... Once you have got to a more digitally mature place like we are now, the things that are needed from people like me is a whole lot more, so do we reap the benefits of digitisation? The optimisation I talked about, the utilising the data to improve the quality of care and reporting and informatics side of it and I don’t think ... one person either would have the time or the...skill set to do that.”** CCIO, GDE 1

Many trusts had also adopted a multi-disciplinary approach to the CCIO role, which ensured representation for nursing, pharmacy, surgery and allied health professional roles. Having multiple CCIOs also helped to address some of the concerns that individuals had around the time that was required to do the role successfully. People we spoke to said they would like to devote more time to the CCIO role, but getting the time to do this while maintaining their clinical responsibilities was a challenge. Importantly, some people felt that the amount of time they were able to spend on the role relied on other colleagues seeing the work as important.

**“One of the things you find as the CCIO is everyone battles to be released from clinical duties to spend time in informatics. This is an essential role and I think a little bit of national guidance on what the expectation is in terms of the priority that that role is given, the time it’s given.”** CCIO, weaker trust (no GDE/FF involvement)

## Getting the influence right

The influence that the CCIO had across the wider trust, both with senior leadership such as the board and across the clinician body, was understood to be essential for successful digital change. This was especially true for nursing, with most of the trusts recognising the need for senior nurse involvement in their digital programme to ensure buy-in. Ensuring that the CCIOs were seen as embedded in the clinician body rather than within IT was also important for getting this level of engagement – which also has implications for the desirable amount of time that should be devoted to the informatics role.

**“I think that’s really, really important because I know, in other trusts, other nurses in the CNIO role don’t feel as connected to the wider workforce and to nursing in general. They still feel quite ... just within informatics and IT. And, actually, that isn’t what we’re trying to achieve: it’s about bringing the two together.”** CNIO, weaker trust (no GDE/FF involvement)

Although CCIOs agreed that it was essential for the board to be engaged and supportive of the digital project, as with other digital leaders in the trust, the majority did not feel that it should be a requirement for CCIOs to have a seat on the board. This view was reflected by people at the policy workshop, who were concerned that mandating a board seat could lead to a ‘tick-box’ exercise, and was not enough for guaranteeing strong leadership and support for the digital project.

In trusts where the board was less engaged, some CCIOs felt that board membership could ensure their role had greater legitimacy. People at the policy workshop also emphasised the strengths of joint working not only between the CCIO and the CIO, but with others such as the Chief Operating Officer too. But there is a risk that the more the role becomes one of management and strategy, the less CCIOs will be able to maintain their clinical role.

Where CCIOs felt that they did have influence, this tended to be a result of having clear avenues of communication with senior leadership, as

well as strong relationships. For many, the role of the Medical Director in understanding and representing the role of clinicians within the digital project at a senior level was also key. Two of the CCIOs we spoke to had previously held this role, and felt that this was a significant factor in ensuring they were able to influence the senior leadership as well as the wider clinician community. It also helped them to understand, and communicate to others, the value of digital in improving patient care.

**“I feel that I have the ear of the senior leadership, whether it’s the CEO or the Finance Director, I have ways to influence without necessarily requiring me to be sitting through endless board meetings... you probably might have to bear in mind you can spend your life going to board meetings and that’s time you are not actually doing something else, you are either not doing clinical work or not actually doing the CCIO. I don’t think it can actually be mandated exactly how that works but you do need to end up with a situation where the CCIO has the ability to influence the organisation both up and down.”** CCIO, GDE 1

**“I think the way we’ve got representation and the way we have with divisional board meetings, professional group meetings, to present updates, take their concerns, have a presence around when it’s roll-out time during the projects that we’re present on in the clinical areas is really, really important, actually. You get to know people; they get to recognise you and they feel confident to raise any issues. They don’t just feel that IT and informatics is abstract from clinical: we’re actually working to really bring the two together.”** CCIO, weaker trust (no GDE/FF involvement)

## Legitimising the role

Many interviewees were concerned with the need to legitimise the CCIO role. This extended beyond engagement with senior leadership and other clinicians, and included the need for a clearer career pathway, an accreditation and dedicating significant time to the role. Some CCIOs we spoke to were members of the Digital Academy and felt this was a really positive initiative for helping them develop in the role and convey this learning back to colleagues. Networks were seen as a really strong element of this too, and people valued the opportunity to be able to speak to others working in the area across the system to share learning and best practice. It was felt that these were much more visible than a few years ago, and helped to strengthen the CCIO community.

**“I think things like the Digital Academy are fantastic, and I think that gives the professional qualification and I think that that’s probably something again with the CCIO roles, what are the essential qualifications that you need in the role so maybe, a bit of guidance nationally again on things like you should have a project management qualification, you should be aiming to get on the Digital Academy, it’s the professionalisation of the role – a lot of people come into this just like I did; right place, right time, but what we actually need to do is develop that role as an essential role.”** CCIO, weaker trust (no GDE/FF involvement)

The recommendations put forward by the Wachter review are evidently consistent with what is required by people working on the frontline. As discussed previously in the context of the wider workforce, a more comprehensive approach is required from the Centre to ensure this becomes the norm, and so that more people are able to benefit from initiatives such as the Digital Academy. People felt that this would be achieved most effectively through a framework for skills development, networking and sharing best practice.



## Lessons for national policy

### Professionalise digital health roles

Non-clinical digital roles have historically been undervalued by the NHS and overlooked by national policy (a point highlighted by the fact that the recent Topol review only focused on clinical staff). Professionalisation of the entire digital workforce (not just leadership or digital clinical roles) is required. This should be achieved through a unified approach to training for all digital roles, clear career pathways supported by learning and development opportunities, and accreditation where appropriate. Although positive and useful work is already happening, a more concerted effort is needed to make sure that these initiatives are co-ordinated so that, regardless of region, people working in the digital health sector have access to the same training, learning and development opportunities. Building on existing informatics skills frameworks such as the SFIA could help here.

In relation to CCIOs, a mandatory accreditation may give more weight and status to the role, supporting legitimacy, recruitment and individual skills development.

### Develop appropriate pay frameworks for the technical workforce

Once the roles are professionalised, they need to be aligned with an appropriate pay structure recognising the skills and wider career development required to perform those roles effectively. Actions that trusts are currently taking to attempt to address the limitations within the existing pay structure (such as using spot salaries) are unsustainable, risk increasing variation within the digital health sector, and require significant effort to negotiate locally. Although there may be some individuals willing to work in the NHS at reduced rates compared to the private sector, providing a more coherent career pathway with appropriate financial recognition of those roles is essential for sustainable recruitment and retention of digital health roles in the NHS.

## **Allow flexibility for local organisations to determine appropriate governance arrangements for digital programmes, rather than simply mandating board membership**

The NHS Long Term Plan calls for informatics leadership representation on the board of every NHS organisation. There is no doubt that buy-in to the digital programme at a senior level is essential. Senior organisational leaders, including the CEO, COO and Medical Director, need to understand the importance of digital change.

While informatics board membership might be one way to achieve this, it is important to take on the lessons set out in Chapter 1 and ensure good local practice is not lost to a mandate that does not reflect local needs. Much of this is already being achieved by implementing a governance model that ensures digital work is seen as a fundamental part of the wider hospital strategy; digital leaders and the wider workforce are supported with the time and resources to build digital into their day-to-day roles; and there is a clear system of accountability.

## **Provide best practice guidance on clinical informatics workforce configuration, including time allocation**

The Wachter review has already provided recommendations on the clinical informatics workforce (for example the configuration of the team and the amount of time required). However, our research demonstrates that people are still struggling to get enough time to do their role effectively. Although people felt that prescriptive requirements on what trusts need for the CCIO role were neither necessary nor desirable (as what is required depends very much on the trust's level of digital maturity), they did feel they would benefit from further guidance on how much time should be allocated for the role, based on the size and level of digital maturity of the trust. Further understanding the current variation in CCIO roles across the NHS and how they are working would be a good starting point.

# 3 Working with digital suppliers

## Policy context

It is well established that a strong relationship with a supplier is an important factor in achieving successful digital change in the NHS (see, for example, Boonstra and Broekhuis, 2010). This is not only important in health care; it is an enabler for digital transformation across other sectors as well (see, for example Daub and Wiesinger, 2015). Infrastructure is one of the four priorities in The Future of Healthcare, and enabling the NHS to buy and make use of the best technology available on the market is key to delivering this. The document sets out a vision which provides a framework that suppliers should operate in to meet the needs of the NHS.

## Managing the relationship

We sampled trusts who had an integrated EPR (and therefore one main digital supplier with a handful of additional specialist systems) and trusts who had taken a best-of-breed approach and therefore had different systems for each specialty which were (to a greater or lesser extent) integrated with each other. These trusts had many more relationships, usually with smaller companies. Whether trusts had one main supplier or lots of individual systems, managing these relationships could be challenging.

**“My personal feeling about the supplier IT market is that it’s a broken market... If you don’t have levers, you can’t say ‘If you don’t provide that, we can go to someone else’ because it’s absolutely impossible: it’s such a big piece of work to move from one provider of functionality to another provider of functionality. So you don’t have many levers.**

**And, if you had the national paymaster – because all the funding comes centrally, obviously, ultimately – saying that ‘This needs to be achieved’ and waving the appropriate sticks, that seems to be a little bit that we’re not using.”**

CCIO, GDE 1

Some trusts had engaged in development contracts<sup>5</sup> with suppliers in order to enable innovation. As there were no specific products or services they were contracted to deliver, trusts weren’t paying for these services. This was intended to enable the co-development and testing of new solutions, but the fact that trusts were not paying the supplier meant they were particularly vulnerable if the supplier did not deliver. That said, even where trusts were paying for products and services, we heard numerous examples of change requests not being delivered or long delays to suppliers engaging with the trust.

Sometimes it seemed that these challenges were the result of the supplier having limited resources: if the solution used is a global product, the UK forms only a small amount of their market. For example, only 11% of Cerner’s market sits outside the United States, and for Allscripts this drops to 2%.<sup>6</sup> Conversely, smaller companies have limited resources and agility when meeting deadlines.

**“They’re a big, American company and, at the bottom line, it’s about money. So you’ve always got to know that you’re dealing with a corporate entity: that there’s a bigger picture and you’re just a very small part of that cog.”**

Clinical digital leader, Fast Follower, middling trust

5 Development contracts are put in place when a provider and a supplier are developing and testing a product together, rather than a provider simply buying an existing solution.

6 Figures supplied to the research team by NHS England.

**“We’re working with generally a number of companies that are towards the smaller end of the market and that gives us a challenge in terms of working at the pace that we need to and also the scale that we need to so in global IT terms they are a small organisation which means that they can struggle to leverage their results sometimes.”**

Organisational leader, GDE 2

Fast Followers that we spoke to told us that they needed to rely more heavily on the support of their GDE partner when implementing projects as a result of this limited resource.

These problems were experienced across all trusts, and people felt that central bodies could play a greater role in leveraging the supplier relationship across the whole NHS by providing a stronger system of accountability when trust expectations were not met.

Against this background, trusts felt that some form of central involvement – for example, through a supplier framework – was helpful. While acknowledging the need to avoid the overly restrictive GP Systems of Choice (GPSoC) framework, which has effectively resulted in a duopoly of suppliers in primary care, they felt that some standards would help to provide a more level playing field when working with suppliers.<sup>7</sup> Ensuring that all systems meet basic standards on functionality and interoperability would not only help trusts with their existing supplier relationships, but would also help trusts to procure new solutions as well, and limit the possibility of local organisations needing to reinvent the wheel.

These issues are acknowledged in *The Future of Healthcare* and there is ongoing work to try and address these concerns. The EPR ‘lot’ of the Health Systems Support Framework (HSSF) looks to adopt this approach, by providing a minimum level of standards in which suppliers must operate, while providing more flexibility for others to enter the market.

7 This approach is also being revisited in primary care, with work progressing around replacing the GP Systems of Choice (GPSoC) contract.

Determining the most appropriate way to address ongoing complicity, in particular to ensure suppliers are able to respond in a timely way, will be an important area to consider as the Framework continues to be developed and refreshed.

---

### **Box 7: The Health Systems Support Framework (HSSF)**

The HSSF has been developed by NHS England to provide support to local organisations when procuring digital solutions, with a particular focus on supporting integrated care. The Framework provides a mechanism for holding suppliers to account by accrediting suppliers to ensure their products are high quality and meet certain standards of functionality. The HSSF includes numerous ‘lots’ focusing on different areas such as population health, patient activation and solutions that support the Local Health and Care Record programme.

The draft scope for a lot focusing specifically on EPR solutions has been developed, with a view to being finalised in summer 2019. Suppliers will be required to demonstrate a particular level of functionality, as well as a commitment to the latest standards on interoperability. Their accreditation will relate to either the acute, mental health or dual settings. The HSSF also provides a route for the Centre to engage with suppliers through communicating future policy direction, including any upcoming standards.

---

Suppliers failing to engage with trust requests caused particular challenges where the implementation of a standard or mandate was at stake (see Chapter 1). Health and social care organisations are required to conform to Information Standard Notices (ISNs) but people told us that issues with their supplier often limited their ability to implement the standard in the required timeframe, rather than their own unwillingness or inability.

---

### **Box 8: Information Standard Notices (ISNs)**

ISNs are published under the Health and Social Care Act 2012 by NHS Digital to announce new information standards and data collections. When they are received, organisations must ensure that they and their contracts are able to comply.

---

As noted in Chapter 1, the implementation of standards is often open to interpretation by different suppliers, and attendees at our policy workshop emphasised the need for suppliers to be part of a consultation process on standards.

**“Setting the standards is really dependent on what the suppliers in the market can deliver, and not all are able to run at that pace.”** Deputy CIO, weaker trust (no GDE/FF involvement)

**“The mandate goes down to the trust to deliver this by October. It was supposed to be by October ‘18. But, from a supplier perspective – and we’re beholden to them delivering the functionality – for them, it’s not on their road map, certainly, for this year and we’re struggling for it next year both from an acute system provider, but also, from a primary care provider.”** CCIO, GDE 1

## A role for national procurement?

Following the failure of NPfIT, central bodies made a conscious decision to move away from procuring national digital solutions. The need for a balanced approach between enabling local procurement and relationship management and national support is clear.

That said, there were areas where trusts felt that there would be some value in centralised procurement for particular solutions. People we spoke to felt that losing NHS-wide procurement of widespread digital products such as Microsoft licences was a negative consequence of disbanding the national programme. The Wachter review also noted that it is important not to ‘overlearn the lessons of NPfIT’, stating that ‘centralisation sometimes makes sense, particularly in the context of a national health system’ (Department of Health, 2016, p. 3).

Completely abandoning centralised procurement could risk the NHS missing out on things that practically and financially make sense to come from the Centre.

**“I think the benefit would be in potentially moving back to a number of national contracts like the Microsoft licencing, those kind of things that are universal across the NHS and also give a level of protection and assurance.”**

Organisational leader, GDE 2

## Lessons for national policy

### **Proactively engage suppliers in developing and supporting the implementation of standards**

There is a clear link here with the lessons outlined in Chapter 1 regarding the implementation of standards. Making sure that technical standards set by the Centre (such as those articulated through ISNs) – and the associated deadlines to deliver them – are more aligned with a realistic view of supplier resource and capability would help to address some of the challenges encountered by trusts.

There is already good work taking place to engage with a range of stakeholders – including suppliers – when developing standards, and this should continue. However, there is also a wider need to provide an overarching, forward-looking roadmap to suppliers about the upcoming standards (and deadlines) they should expect so that they can allocate resource most efficiently – particularly given the challenges outlined in Chapter 1 regarding mandated standards in beta development. Suppliers also need some reassurance that trusts’ requirements will have longevity. Providing clear communication on policy direction through tools such as the HSSF in order to support suppliers to take a longer-term approach will help to support this.



### **Provide trusts with a clear avenue to report any issues back to the Centre and hold suppliers to account where necessary**

The Centre needs to have an effective means of ensuring that suppliers comply with any standards that are set and meet the needs of NHS providers at the desired pace. Where there are issues with suppliers, trusts need to have a clear understanding of the recourse they can take to address this, as well as reassurance that suppliers will be held to account by a national authority if concerns are not addressed. Plans within the HSSF to ensure suppliers comply with the standards set may address some of these issues. This is important not only for trusts who hold existing relationships with suppliers, but for others who are considering going out to procurement for particular digital solutions.

### **Consider national procurement of standard, widespread IT systems such as Microsoft software**

The Centre should consider areas where national procurement would be beneficial. Although it is important to balance the requirements of the system with avoiding market lock-in, where leveraging the buying power of the NHS makes sense, there is clear appetite to do so.

# 4 Making use of data across the system

## Policy context

Enabling data sharing across health and social care is a national policy priority. As noted in Chapter 1, The Future of Healthcare emphasises the importance of national bodies enabling interoperability between different regions and systems. Similarly, the NHS Long Term Plan states:

**The NHS is made up of hundreds of separate but linked organisations, and the burden of managing complex interactions and data flows between trusts, systems and individuals too often falls on patients and clinicians. Digital services and data interoperability give us the opportunity to free up time and resources to focus on clinical care and staying healthy. The NHS Long Term Plan, 2019 p. 92.**

The NHS Long Term Plan also set out ambitions for NHS health organisations to move to ICSs, with a particular focus on population health. The idea is that ICSs will develop out of the current network of STPs and by 2021 will cover the whole country. They will work with local authorities at ‘place level’, and through ICSs commissioners will make shared decisions with providers on how to use resources, design services and improve population health (NHS Long Term Plan, 2019, p. 29).

Sharing clinical and non-clinical data across different health settings – enabled via digital systems – is absolutely fundamental to achieving this vision. Chapter 1 set out some of the technical policy initiatives to enable data sharing such as FHIR standards, as well as how the process of setting them could be improved. Our work also revealed a number of other lessons with regard to data sharing.

## Engaging the whole system

In Chapter 1 we set out the risks of not taking a system-wide approach to digitisation, given that GP systems are not ready to receive FHIR-structured data. This was not only an issue in relation to FHIR, but also in terms of local data sharing initiatives and achieving digital maturity more generally.

This point was particularly salient given that one GDE we visited had been unsuccessful in its LHCR bid due to the lack of digital capacity in its neighbouring health care organisations. This underlines the need to strike a balance between taking an organisational and sector-specific approach to digitisation while simultaneously aspiring to enable data sharing across the system.

That said, most of the sites we visited already had a local data sharing initiative in place with other acute and primary care providers in their area. Some had also recently become part of the Local Health and Care Record (LHCR) programme, although at the time of the site visits, the LHCR initiative had yet to get off the ground in most areas and very few people were sighted on what the initiative would involve and how it might fit into their existing joint records or data sharing initiatives. While everyone could see the benefits of data sharing in particular contexts, some had reservations about the LHCR initiative. They felt that the specific use cases of sharing data within the programme had yet to be defined and articulated. They felt this was crucial for achieving appropriate buy-in and organisational representation.

**“I worry that the LHCR Programme may have suffered from a...lack of involvement...from the community, and therefore may under-deliver because it’s not being as well represented as it could be... if there are not enough people that have got time dedicated in their week to really think about this and make sure we do a good job of it, well who else is going to do it?”** CCIO, weaker trust (no GDE/FF involvement)

**“And I guess for us, it’s where it sits in the priority, isn’t it? We’ve got what we need to deliver here and we’ve got [our local joint record] that we’re a bit closer to, and then LHCR sits almost outside of that.”** CCIO 1, GDE 2

In reality, use cases will vary according to local transformation priorities, so much of the work to develop them needs to be done at a local level. However, national LHCR leaders need to be aware that while most agree on the need to share data more effectively, buy-in to the LHCR programme should not be considered a foregone conclusion.

Several sites reported difficulties in setting up local data sharing initiatives. This was usually caused by one or two GPs in the area refusing to join the initiative due to information governance (IG) concerns – but also due to a lack of shared vision more generally. They also talked about the challenges of working with other parts of the system, including local government and social services, two areas where The Future of Healthcare acknowledges the need for further work and engagement.

**“We are trying to get pathology data shared between primary care and secondary care, [and it] has been tortuous because...just the odd one or two... had an issue with it but we don’t really know what the issue was and it has put the whole thing on hold. We are aware of different arrangements around the country around what is acceptable and what is not acceptable to be viewed so I think that’s absolutely fundamental to making this work because otherwise we’ll end up with a care record that is incomplete at best and possibly dangerous.”** Organisational leader, GDE 2

**“I went to one of the launch events for how we integrate all this stuff and... it fell apart within three hours because not everybody was on the same page in terms of ‘Should we be sharing health information with the police operation services, with other partners?’ It very quickly fell apart**

because nobody could agree, and that's it, it's not thought through the information sharing at the outset." Digital leader, weaker trust (no GDE/FF involvement)

These are not new problems. Again, they particularly highlight the tension between local and national responsibility. However, several attendees at our policy workshop in central and regional leadership positions were surprised at these problems and could point to examples of local data sharing initiatives working well. For them, these issues were consigned to the past – far removed from the latest wave of data sharing programmes across the country.

This is important because we know these issues can and have been solved, and yet best practice has not been spread consistently across the country. Much of this is down to local leadership and engagement – particularly in realising the culture change required (see Maguire and others, 2018 for examples of how local organisations have overcome the barriers). However, it is not something that central bodies should lose sight of. Finding out what GPs are worried about – particularly with regard to their indemnity for example – and engaging with the whole community could help here, rather than relying on local efforts across the country.

Several people thought it would be useful for a national data sharing agreement to be put in place to avoid variation in local interpretation of IG legislation and to provide clarity on what could and could not be shared in various contexts. NHS England is developing an Information Governance Framework for Integrated Health and Care, for organisations involved in the LHCR programme, which could allay some of these concerns. Following an extensive consultation process, the aim is to move to a more consistent view of IG, and reduce levels of variation.

It will provide a structured approach for LHCR participants to legally plan, prepare and deliver data sharing, and outline the IG considerations and requirements for the five purposes of information. Through the LHCR programme the Framework will contribute to the development of ICSs in which patient data is protected as it flows through the system. Existing initiatives such as the Information Sharing Gateway may also help here.

---

### Box 9: Existing support to enable data sharing: The Information Sharing Gateway

- The Information Sharing Gateway has been developed to improve the administration and risk assessment of information sharing in the public sector. Originally developed by a sub-group of organisations in the Lancashire and Cumbria IG Group, it is now in use by over 1,000 public sector organisations across the country.
- When organisations sign up to the gateway, they sign a memorandum of understanding which means they must abide by 10 IG principles to ensure data is transferred and handled safely and securely. The purpose is to provide assurance that information sharing, managing and processing is Data Protection Act 2018 (DPA) and General Data Protection Regulation (GDPR) compliant.
- The gateway enables organisations to manage data sharing agreements and sign off new data flows, without the need for new agreements each time. Given that NHS trusts may have more than 100 agreements, this is a necessary solution to support data sharing at scale.
- Read more about the Information Sharing Gateway here: <http://atlas.ahsnnetwork.com/information-sharing-gateway-sharing-made-simple>

---

## Supporting data analytics

Making better use of data provided by digitisation supports better planning, quality improvement and population health. It is fundamental to the NHS becoming a learning health system (see Scobie and Castle-Clarke, 2019). Some of the trusts we visited described clinicians viewing their own performance data, as well as placing analysts in operational teams to monitor trends. This helps individual departments, and the hospital more widely, to reduce clinical variation and improve operational planning.

However, as outlined in Chapter 2, good data analysts are in short supply. Our recent report on Learning Health Systems (Scobie and Castle-Clarke,

2019) highlighted that analytical and informatics roles are often seen as low status. They are part of the clerical and administrative workforce, rather than members of scientific grades such as lab technicians. Analytics projects are often outsourced, meaning that analytics capacity is never properly developed. The lack of professionalisation and barriers caused by Agenda for Change (see Chapter 2) also cause major barriers to recruitment and retention.

**“It just needs somebody to process the data and then give me the analysts who say ‘have you seen this trend, it looks like we’re going to have a problem this week’, ‘have you seen a rise in this’, referral selective or not, it’s screaming for analysis and there are very few good analysts in my experience.”** COO, weaker trust (no GDE/FF involvement)

Trusts we visited talked about prioritising data analytics as they become more digitally mature, and the need for the NHS as a whole to do the same. As we argued in our recent report, ensuring there is effective analytics leadership in national NHS organisations – for example through appointing a national Chief Analyst, as well as regional analytics roles to support local service transformation could help here (Scobie and Castle-Clarke, 2019). Ensuring analytics requirements are built into local digital plans will also be important.

In some cases, the GDE/Fast Follower relationships form a comprehensive grounding for focusing on local populations, and for working together to develop solutions that address population health. Some trusts we spoke to were integrating population health into their own internal strategy and employing people with expertise in public health to support this vision.

**“Ultimately, if we want to get to population health, if we want to get to AI, we need to have all of that data in a structured format, so that we can actually use that data, to improve patient care.”** CIO, Fast Follower, weaker trust

The move to ICSs via STPs as set out in the NHS Long Term Plan provides further opportunities to analyse data across a whole population to improve health and care.

## Engaging with the public

While interviewees within NHS organisations particularly focused on gaining buy-in to data sharing from the GP community, some participants at the policy workshop pointed out the need for greater engagement with the public. One participant commented that the national policy narrative around data sharing is that it is a foregone conclusion. The NHS Long Term Plan, for example, hardly mentions securing public buy-in to data sharing – only briefly outlining that the NHS app will enable patients to update their data sharing preferences (see Box 10). One workshop attendee was concerned that this had the potential to undermine efforts to engage with patients about data sharing at a local level.

---

### Box 10: Initiatives to better support public engagement

- The NHS app will allow patients to check their symptoms using the health A-Z on the NHS website and provide a triage function via NHS 111 online. If a patient’s GP practice is connected, patients will also be able to book and manage GP appointments, order repeat prescriptions, view their medical record, register as an organ donor and update their data sharing preferences. The app is available to the public on app stores now. All functions of the app should be fully available across England by 1 July 2019, after all GP practices are connected.
  - At the workshop we also heard other examples of apps that enable patients to update their data sharing preferences in real time, such as the Orca consent app, which is still in beta development, and the SystemOnline patient health management app – an offshoot of the System One GP record developed by TPP. However, participants expressed concern over enabling patients to turn their preferences on and off so easily given safeguarding requirements. As a result, a ‘break glass’ option has been built to enable clinicians to override patient preferences where there is cause for concern.
-



## Lessons for national policy

### **Actively engage with patients and the public around digital, in particular data sharing**

Many interviewees and people at the workshop highlighted the importance of engaging with the public over the issue of data sharing. While some felt that public acceptance of data sharing was a given, others felt that there was still some scepticism among the public about how their data would be used in a health care context. While recent evidence shows that people are generally happy for their data to be shared between professionals who are caring for them – and indeed many assume that this is already the case – views about sharing data for other purposes tend to be mixed (National Data Guardian, 2016). Although the NHS App has been noted as a tool to support patients to share their data sharing preferences, a wider commitment from central bodies to continually engage the public around the benefits of data sharing, not only to improve their own care but the quality of the system as a whole, would be beneficial. Engaging patients and the public about particular use cases for sharing data (as per the recommendation above) would be one way of doing this. Organisations like the PRSB have already set a precedent of including a patient lead on every project, providing learning for other national bodies such as NHSX to build on.

### **Develop analytics capacity by ensuring there is appropriate national and regional leadership and reducing the number of projects that are outsourced**

In addition to professionalising digital roles and ensuring appropriate pay (see Chapter 2), national bodies could better support the development of analytical capacity by ensuring there is effective national and regional analytical leadership to support service transformation, provide appropriate methodological tools and spread best practice. Ensuring that every effort has been made to use internal NHS capacity before outsourcing analytical projects would also help.

### **Provide use cases and national guidance on priority areas**

We heard from several interviewees that while data sharing can be beneficial, sometimes initiatives are started without clear use cases identifying what data will be shared and why. It is crucial that organisations work closely with their local population and wider health economy to develop appropriate use cases. However, central bodies could also support this by giving clear guidance about the benefits and drawbacks of sharing particular data in certain circumstances based on learning from across the country as well as identifying key priority areas for sharing data. Ensuring all parties interpret IG legislation in the same way is also important and the forthcoming IG Framework for Integrated Health and Care is likely to be particularly important here.

# 5 Funding and sustainability

## Policy context

There are various funding initiatives in place to support the digitisation of the NHS. The most significant is perhaps the GDE and Fast Follower programme. In September 2018, a further £200 million was announced to fund a second wave of GDEs and Fast Followers. There is also STP-wide funding in the form of the £412 million Health System Led Investment programme and the £100 million Local Health Care Record Exemplar programme. Separately, the Estates and Technology Transformation Fund is a multi-million pound investment in revenue and capital funding in general practice facilities and technology across England, running between 2015/16 and 2019/20.

However, despite central investment in digitisation, lack of (and poor use of) funding (along with an under-developed digital workforce) is one of the biggest limits to successful digitisation. The importance of appropriate funding for digitisation was highlighted in all of the trusts we visited. This related not only to the amount of funding that should be invested in digital, but also the implications of using capital rather than revenue funds; sustainability post-GDE and Fast Follower funding and ensuring that all central funding initiatives are joined up to avoid duplication and waste.

## Current levels of digital investment are not enough

There was consensus across the trusts that the current amount of money invested in digital is not sufficient to create and sustain a digitally mature NHS. Several people acknowledged that the NHS falls far short of digital investment in other industries, although they recognised the financial difficulties that the

NHS is facing. A recent Health Foundation report highlighted that IT makes up a very small proportion of the total value of NHS capital, at less than 5%. It concludes that “[i]t is unrealistic to expect the NHS to be a world leader in health technology when its capital spending on health care is much lower than in comparable countries, only a very small proportion of this is spent on IT, and spending on plant and machinery is declining” (Kraindler and others, 2019).

**“Virtually none of us invest anywhere near what the target would be if you benchmarked it against the rest, you know, wider industry.”** CIO, Fast Follower, weaker trust

**“Part of the problem that the NHS suffers from; if you look at the best performing organisations in the world they spend between 3.5% and 4% turnover on IT – the NHS spends about 1%, so we are never going to close the digital gap in health care until we address that issue.”** CIO, GDE 1

In order to address this, some people thought it would be beneficial to have central guidance on how much individual trusts should invest in their IT programmes, to secure local board-level buy-in.

**“I think it’s really interesting there’s no set turnover or capital as part of the GDE programme, as far as I’m aware, that says ‘You need to spend this much money on this much IT infrastructure’, and so, when you look at the corporate world, like banking spends, what, 15% of its turnover on IT, we would spend, what, 1%, 2%, it’s not set. That is because we’re in a financial difficulty as the NHS, but if you want to have a digitally enabled NHS then you need to spend the money on it.”** CNIO, Fast Follower, middling trust

However, others felt that the problem was more about overall availability of funds and that setting a percentage of funding on digital would probably conflict with other guidance and organisational priorities, and may exacerbate the challenges caused by separating digital from other objectives. The fact that initiatives such as the Model Hospital have already affected board buy-in to digital investment in some cases suggests that they are probably right.

## Sustaining digital maturity: From capital to revenue

**“[I]f we’re going to use technology to facilitate all the improvements that we know are possible within health care... [then] we [need to] find a way to fund it. Because capital funding is such a short sighted way of doing it.”**

CIO, GDE 1

The issue of sustainability post-GDE or Fast Follower funding was raised at numerous sites. People were concerned about being able to maintain all the work they have done and also resource spreading their learning and best practice to other trusts around the country.

**“Ultimately, when the GDE stops we will have to cut back our resource ... I’ve been keen that we continue to share our learning ... So I think there’s an element at which we’ll be able to continue that, whether we’ll be able to continue it at the level and pace that we’ve been able to do so far... probably not I would suspect.”** Organisational leader, GDE 2

Funding digital transformation through revenue rather than capital funds was consistently suggested at every site we visited. Interviewees felt that shifting to revenue funding would mean digital maintenance is factored into business as usual, making it more sustainable in the long term. The pressing need to move to a revenue funding stream was felt strongly by all trusts, although it

was particularly emphasised where capital funding was supporting digital workforces. As noted in Chapter 2, many GDEs invested their GDE capital into workforces to support digital advancement. This often meant employing teams on fixed-term contracts, which caused challenges with recruitment and exacerbated concerns about sustainability post-GDE.

**“The money is going to run out at the end of this financial year. Now we are looking to other opportunities to continue to fund the work that we’re doing, but if we don’t, then at that point a lot of the good work that we’ve done will come to a halt and we’ll not be able to afford to continue to employ a hundred people to work on just this project.... Quite often you get capital but no revenue, and that again is about the longevity and about the sustainment, as business as usual.” CIO, GDE 1**

Timing is also very important here. Digital transformation – both to embed new technologies in routine care and to successfully use the subsequent data to reduce clinical variation and improve performance – can take a very long time. It involves redesigning pathways, developing new roles, engaging staff and patients and re-skilling existing members of the workforce, among other things. Implementation is not a one-off event – it is a continuous cycle of adoption, testing and improvement. That means that not only is ongoing investment needed to fund this cycle (underscoring why one-off capital injections of funds are not overly helpful), ongoing investment is also needed to keep up with new technologies that will become available in the meantime. This needs to be factored in to both ongoing funding allocations and measurements of digital maturity. Crucially, the more capital that is invested in digital systems, the more funding will be required for maintenance and upgrades in the future.

“One of the conundrums that we have found with the recent spate of central monies that have been provided... they’re largely capital based, I think for us the big problem is the sustainability model. So it’s nice to take the capital to some extent, but actually it’s time limited.” Digital leader 4, GDE 3

The cap on capital spending also inhibited digital advancement in some cases. It meant that trusts had to compete against other hospital requirements for capital spending such as buying new theatre beds and maintaining the wider hospital estate and infrastructure. As a result, some trusts felt unable to bid for capital technology funds they were eligible for. So even where significant capital funds are made available for digital transformation, they are not always available to all trusts.

It should be noted, however, that some representatives at our workshop felt that an over-reliance on national funds may signal that digital transformation is not being prioritised locally. They felt it was up to local organisations to build appropriate digital and informatics resource into their run rates and to ensure they had a solid sustainability plan before embarking on large-scale digital projects.

In practice, creating a digital NHS will need financial commitment both locally and nationally. Where programmes require a national approach, or where local funding is not available, national funding has a role to play in initiating or accelerating strategic investments that support the system as a whole.

At the same time, it’s essential that local organisations also understand the level of investment required for maintaining and advancing their own digital maturity. Directors of Finance must have a thorough understanding of how funding for digital projects works, and the need for revenue funding during and beyond implementation to maximise optimisation.

## Pooling resources

One way of managing costs (and the workforce challenges outlined in Chapter 2), is for organisations to collaborate and pool resources for digital services and transformation. One trust we visited had recently started sharing its informatics function with its clinical commissioning group (CCG), so the lead for informatics was a dual appointment across both organisations. The trust also saw potential benefits to merging that function with local authority business intelligence in the future as well, to better support place-based planning.

Workshop participants felt that opportunities such as this should be explored more widely, and look to implement digital solutions at a larger scale beyond individual organisations. This could apply to sharing digital workforces across ICSs or STPs, and sharing digital functions or services. Examples might include shared service desk functions, data warehouse infrastructure or even a full EPR, which can be expensive to set up. Sharing services has the potential to drive standardisation across an area, which should also make interoperability cheaper and quicker to deliver.

Sharing services across existing infrastructures such as ICSs or STPs may help to foster an overall environment for greater collaboration, further supporting organisations to identify useful areas for sharing resource based on capacity, skills and technical infrastructure in the organisations.

One trust argued for a more collaborative procurement process more generally (though not necessarily locality based) to help spread best practice, speed up both procurement and implementation and reduce implementation costs. NHS organisations would approach a more digitally advanced trust and implement all of their systems and pathways.

**“If you have an [NHS trust deploying our plan], then suddenly you have got people using the same system, then the pathways become so much easier. So make it worth their while because it saves the NHS a fortune. To be brutally honest it saves the vendors money because**



what costs them money is their people having to rebuild an implementation from scratch...they can use the same data centre, the same domain ...don't go out to the market yourself, go to a GDE...and say can we share in your domain, share it, do the same things, localise it for what you need and make it work....It's not the blueprinting..."  
CCIO, GDE 1

In order for this approach to be adopted at scale, nationally set incentives for both the approaching and the approached trust would probably be needed.

There are also several examples of collaborative working as a result of the GDE and Fast Follower programme (see Chapter 6).

## Investing in robust evaluation

Large amounts of money have been invested in digital transformation, both locally and nationally. But this has largely been done without formal evaluation. Local organisations have forged ahead with large-scale transformations without a clear idea of what works and in what contexts. The GDE programme is being independently evaluated, and all GDEs are required to produce blueprints in order to share the learning from their implementation efforts (see 'Sharing the learning' in Chapter 6).

However, there is an urgent need for embedding both process and impact evaluation in all large-scale change efforts. We need a better understanding of how technologies have been implemented, the underpinning skills and workforce required for each element, the necessary capacity and resource, and the impact – including how that impact might change according to all of those factors. There should be an evaluation element of all large digital funding initiatives.

## Lessons for national policy

### **Be realistic about likely funding requirements and accommodate a switch from capital to revenue funding**

All of the sites we visited raised concerns about funding their digital endeavours. Importantly, those who had received most funding to date (that is, the GDEs) were perhaps most concerned about required funding and how they would support their digital programme once the funding ran out. This is not surprising given that the more digital capacity a trust has, the more money is required to maintain and update it. Most trusts are unlikely to see sufficient productivity gains to support their significant digital investment in the short term. The Centre needs to be realistic about the likely funding needed to maintain and support GDEs to spread best practice; digitise middling and weaker trusts; and join up digital efforts across the country, even if resources are shared regionally – particularly given the commitment to digitise all acute, community and mental health trusts by 2024. It may also need to accommodate a move to, or shift in relative balance between, revenue and capital funding.

### **Be clear about how different funding initiatives align to deliver digital priorities**

Interviewees expressed concern about organisational or sector-specific funding initiatives for digitisation – such as the GDE or Estates and Technology Transformation Fund, resulting in duplicated effort due to lack of alignment. With the NHS Long Term Plan bringing the focus of the future of the NHS back to system-wide integration, joining up these initiatives is essential. In future, a growing number of STP-wide funding initiatives such as the current HSLI funding will likely be needed, to ensure appropriate system-wide governance. In the longer term, as ICSs start to emerge, digital costs may need to be funded through the wider ICS funding settlement. This may also help to support the resource pooling that will be required to achieve advanced digital maturity at scale.

## **Ensure evaluation is built into funding initiatives for digital transformation**

Evaluations of digital change efforts in the NHS have been sorely lacking. While there is an ongoing independent evaluation of the GDE and Fast Follower programme, and LHCR includes a 'learning from local' workstream to address this, significant investment and transformation has happened locally across the NHS, and the ensuing lessons from these projects have not been disseminated. This risks other organisations making similar mistakes or beginning a project with sub-optimal processes. An evaluation component should be built into all digital transformation funds. Determining what the evaluation looks like in terms of resource and methods should be in line with the initial amount dedicated to implementation and the extent of transformational change.

# 6 Reflecting on the Global Digital Exemplar and Fast Follower programme

## Policy context

As discussed in Chapter 1, the GDE programme adopted following the recommendations for staged digitisation in the Wachter review is currently the main policy tool being used for NHS digitisation. Supported by a proactive learning network, GDEs have the opportunity to share learning through webinars, events, online forums and developing blueprints.

In their funding agreements, GDEs were required to agree a series of milestones that they would deliver by the end of the programme, and are now working towards the 'Definition of Done' (see Box 11). The Definition of Done will support the wider work of the programme including the blueprints (the models for replicating the outcomes) and the learning network (the vehicle for disseminating experience and learning). The programme is being independently evaluated by Harvard Medical School and the University of Edinburgh.

---

### Box 11: Definition of Done

The Definition of Done for Acute Trusts outlines the level of digitisation that GDEs are expected to achieve by the end of the programme, and provides a framework to support the planning and delivery of the deliverables which will support this. Broadly, it is split into two areas. The first is output and activity measures, which relate to core technical capabilities (such as transfers of care, decision support and medicines management), interoperability

(such as PRSB, FHIR, SNOMED) and system transformation (integrated care, population health management, patient activation and empowerment and reducing unwarranted variation). The second is outcome and value measures, which relate to improvements in safety and quality (such as reducing adverse events), clinical outcomes, staff and patient experience and resource sustainability.

---

## Reflections on the GDE programme

The people we interviewed were broadly positive about the GDE programme as a whole, particularly when compared with NPfIT. They were particularly positive about the fact that it fostered a more collaborative environment, focusing on sharing best practice and learning rather than individual trusts working in silos. People liked the networks and the fact that they were able to speak with other trusts about the issues they were having (not only within their own GDE-Fast Follower relationship), but more widely across the NHS community as a whole.

**“I think the whole sharing and awareness and openness and interest that each of the trusts have in each other was hugely enhanced with the GDE programme, I think not only are the aspirations of the programme exciting – everybody has gone into it quite warily initially, but it’s developed into something that’s a really strong network.”**

Digital leader 2, Fast Follower, middling trust

Many felt that the funding enabled them to progress at a much faster pace than would otherwise have been possible. People also talked about how GDE status gave the digital agenda a better profile within the organisation (and in the wider NHS), which could support getting clinicians and other individuals on board with their plans.

**“We wouldn’t be sat here, talking to you today if we hadn’t been part of the GDE and it hadn’t freed up the resource to have a proper, full-time CCIO role which is what – between us – we occupy. We wouldn’t be on this accelerated journey to improve our digital maturity score without the milestones, the benchmarks and the timelines: we wouldn’t be striving for such record development.”**

CCIO 1, GDE 2

**“The opportunity that GDE gives in terms of the actual cash boost, the support in terms of being able to talk with peers, but also, if you like, in terms of the pump priming that it...[offers]to really do digital change.”** CIO, Fast Follower, weaker trust

The main challenges that the GDE sites in our sample experienced related to reporting. Although people acknowledged that reporting was necessary when spending public money, the reporting requirements were demanding and required a lot of time. It was especially challenging when reporting requirements changed. There was a concern that too great a focus on reporting against the milestones limited the scope for testing new ideas or innovations and meant that some of the ‘softer benefits’ of their digital work could be missed.

**“The other difficulty I have is really about the reporting and the constant change of reporting. I suspect we’ll get to the end of the GDE programme...without really being clear around what we’re reporting against and clear definitions of benefits...We’ve hit the letter of the law on reporting benefits but we’ve missed a lot of the softer benefits that are actually probably the most important, which is what does this mean for the patient, what does this mean for the way our clinicians work and what does this mean for safety and some of those you can’t actually have a metric against.”** Organisational leader, GDE 2

**“We’ve got a number of things and they’ll say we need this and we say isn’t that in [the reporting tool], and they’ll say no, you need to fill this in. So we’ve got the Definition of Done, we’ve got [the reporting tool], we’ve got something else, we’ve got the quarterly return and then they’ll say the quarterly return isn’t good enough, we want to come in and you need to do a site visit where you evidence.” Digital leader 2, GDE 3**

It should be noted that some participants at the workshop challenged the idea that the milestone approach had limited flexibility as trusts are able to change their plans if they need to. However, they did acknowledge that the need for such strict accountability can lead to the reporting becoming overly bureaucratic, and that there needs to be close communication between NHS England and GDEs to ensure that they understand why particular reports and data items are required.

One of the original criticisms levelled at the programme was that it risked widening the divide between digitally mature and less digitally mature trusts, and this concern was reflected in our interviews. People also felt that there was good work happening in trusts that are not part of the programme, and there was a risk that this was going unnoticed because of the focus being placed on GDEs and Fast Followers.

**“So whilst I understand the need to sort of fund pilots, how sure are you, when you’re funding these things, that you’re getting spread, and I think there’s a real risk in that... you need to be careful, centrally, on how you progress these, because it’s like any other funding, if you progress the people who have got the capability, that’s a good reason to do it, but you’re leaving others further and further behind.”**  
CEO, weaker trust (no GDE/FF involvement)

“With all the trusts, there is a real risk of a digital divide emerging but you don’t want everyone to be the lowest common denominator either. You want to show what’s possible and you want to bring people to a certain level.”  
CEO, GDE 1

## Expecting too much? The challenges of achieving HIMSS level 7

Achieving the milestones is just one part of GDE deliverables. Interviewees did not always feel the expectations of GDEs were clear. While that may not be surprising given the evolving nature of the programme, it did mean there was space for confusion. Trusts were aware that they are expected to achieve HIMSS level 7 status – which reflects the Centre’s desire for the NHS to achieve ‘world class standards’ for digitisation (see Box 12). However, according to NHS England, this is just an international metric to measure the ‘Definition of Done’, rather than an end in itself.

---

### Box 12: HIMSS

- The Healthcare Information Management Systems Society (HIMSS) is an international not-for-profit organisation originating in the United States which works to improve health care through the use of information technology and management systems. HIMSS Analytics® has created the EMR Adoption Model (EMRAM), an eight-stage model that allows organisations to track their progress against others in Europe and the rest of the world.
- This eight-stage (0 – 7) maturity model measures the adoption and use of functions required for digitisation to support patient care including security, electronic documentation, data analytics and clinical decision support. One issue of particular importance is ensuring closed-loop medicines administration – a fully electronic process from ordering medication to dispensing it which is designed to eliminate medication errors and improve patient safety. A fully electronic process requires electronic identifiers for the patient and the provider (such as a nurse) and a system such as barcoding for drugs.



- Stage 6 of HIMSS requires this process to be in operation in 50% of the hospital (excluding ED) and Stage 7 requires 95% coverage (excluding ED). Only three hospitals in Europe are currently at Stage 7.

While interviewees generally felt that using the internationally recognised HIMSS framework in the NHS was a good thing, and that aiming to achieve HIMSS level 7 status was desirable, some were concerned that the over-focus on HIMSS level 7 in the short to medium term could detract from more important issues such as embedding digital tools and services to improve patient care. In particular, trusts were concerned about the expected pace of change, and some commented that they would like time to ‘bed in’ the good work they had been doing rather than feeling pushed to reach HIMSS level 7 in the fastest time possible.

**“Sometimes trying to achieve digital maturity and HIMSS levels etc. can detract away from what is the most important thing which is patient care... we’re driven so quickly to achieve things like HIMSS 7 that actually it would be nice to spend a couple of years embedding what we have, making it work really well and then...HIMSS 7 would probably be a doddle but we are kind of doing it back to front at the moment.”** CNIO, GDE 1

**“The HIMSS accreditation in terms of ‘hotel four or five star’ is not necessarily what we need. I would argue what we need is the right teams, constructs, precepts, professional expertise, to try and then give a really, really good – in a sense – ‘service’, just to continue that hotel analogy – so that, then, we’re actually making the most of what we’ve got.”** CCIO 1, GDE 2

Perhaps more pressing, though, was the fact that the people we spoke to did not think it was possible for any trust in the UK to reach HIMSS level 7 at the time of the interviews. This is because reaching HIMSS levels 6 and 7

requires closed-loop medication, which depends on a comprehensive drug dictionary that the medication barcodes are linked to (see Box 12). Trusts understood that the barcodes should also appear on the medication blister packs rather than the boxes (which does not currently happen in the UK), to avoid medication errors caused by tablets being in the wrong box. However, following national pressure, HIMSS has accredited organisations at levels 6 and 7 without this unit dose dispensing in the past.

“The HIMSS level 7 in my view is something that the GDE is not going to reach. The closed meds requires action from the Centre which has been sorely missing... In most cases when they are faced with a problem they come and ask us what we should do rather than having any grip on it in the middle, and the need for a national drugs database which has been known for quite some time is just an example of that...” CIO, GDE 1

In reality, it was technically possible at the time of the interviews for organisations to implement closed-loop medication, but it would have required them to develop their own comprehensive drug database. While there is a national Dictionary of Medicines and Devices (dm+d) (see Box 13), at the time barcodes were not yet linked to it in a complete manner – and people did not feel sighted on its progress.

---

### Box 13: Managing medicines

The NHS Dictionary of Medicines and Devices (dm+d) is the current recognised NHS standard for identifying medicines and medical devices used in patient care. The aim is to ensure consistency in communicating and recording information. It is an interoperability standard and is designed to provide a common language through which different systems can talk to each other about medical information.

---

Asking every organisation to develop its own database linking barcodes to medication – something that should ideally be standardised across the NHS

– would have been a huge waste of resources. As of March 2019, a national solution mapping the majority of medication barcodes (although not all) to dm+d has been made available. However, despite significant progress in this area, trusts were not aware of the work that was being done or when they could expect a solution to be in place.

**“They have been working on the dm+d for at least five years, longer than that, and we’re still no closer to getting that established as a national database than we were five years ago.”** Digital nurse leader, GDE 1

Again, this issue highlights the tension between local and national action. It is another example of trusts waiting for national infrastructure, but in the meantime having to carry on with their digital programmes. The trusts we visited were very reluctant to create their own drugs database, and with good reason. But perceived inaction from the Centre and poor communication risks trusts developing their own solutions, which could lead to undesirable local variation and/or good local work being undone when the national solution arrives.

## Sharing the learning

**“We’re all inventing the wheel, every single trust is inventing their wheel and some trusts have a slightly rounder wheel than others.”** Manager, GDE 1

In order to create sustainable digital change, making best use of resources and spreading best practice across the country is essential. We heard several ideas of how this process could be improved.

Blueprinting is built into the GDE programme. The idea is that GDEs and Fast Followers will create detailed plans of their implementation efforts, in order that other organisations can learn from and replicate them. However, concerns about this process were raised from multiple sites – including those inside and

outside of the GDE and Fast Follower programme. People felt unclear about how the blueprinting would work in practice and were anxious that blueprints should provide insight into things such as workforce configuration or strategic direction, as well as the technical capabilities.<sup>8</sup>

“My understanding is that we’ve been fairly heavily focused on blueprinting the technical solutions, so blueprinting the build of an EPA, electronic prescribing, blueprinting aspects of some of the digital workflows and things like that. Actually I think there’s opportunity to blueprint some of the other benefits that come out of the digital programme, like where you start to look at that workforce transformation...” CEO, Fast Follower, middling trust

“Blueprinting to me is about something that will articulate for another organisation, what questions do we need to ask, what is the framework that we need to be working in and what does the journey look like that we need to go on, around strategy and implementation and all of that sort of thing, lessons learnt. But what they’ve tended to develop is things along clinical pathways and they’ve started to really get down in to the detail around micromanaging the sepsis pathway or the fractured neck of femur pathway, and I actually think that’s too low level and that where people need the inspiration and need their direction is at a more strategic level.” Digital leader 1, GDE 3

8 Note that site visits were undertaken at the end of 2018, before the first wave of blueprints were published.

Weaker trusts in particular felt that they would benefit more from gaining an understanding of how to get the basic framework right before embarking on complex digital projects – and they felt the GDE blueprints could do more to help them to do that.

“I think some frustrations are that...[GDEs are] doing some really great innovative things, and yes, it would be good to aspire to that, so you might be...[using] robotics...which is exciting...but actually how can you blueprint that to others when we haven't got an EPR? Then, by the time we've got our EPR and we're looking at robots... it will be something else.” CIO, weaker trust (no GDE/FF involvement)

There is also an issue of timing. People outside of the programme were frustrated that they had not learned anything from the GDE programme at the time of the visits and in the meantime had to carry on with implementation. They were concerned that by the time blueprints became available, it would be too late.

That said, those working on the blueprinting process at the policy workshop felt that there were adequate blueprints to address some of these issues. They felt the blueprints are designed to detail the important components needed for sustainable digital transformation such as organisational leadership and culture; technical and configuration guidance; clinical and staff engagement as well as the people and processes required to successfully deliver the benefits of technology. As noted above, we undertook the visits before the first wave of blueprints was published.

The GDE and Fast Follower programme should not be the only source of learning and spreading best practice, and some were concerned that an over-emphasis on GDE blueprints may result in good practice in other parts of the system being lost. Innovative procurement models such as the collaborative procurement process outlined in Chapter 5 provide another example of how learning and best practice can be shared.

Ultimately, it is important not to rely on the blueprinting process as the sole vehicle to achieve scale and spread. There are other inputs and support mechanisms needed to ensure broader learning is captured and implementation efficiency is improved.

## Lessons for national policy

### **Ensure reporting requirements clearly relate to the articulation of benefits**

Where trusts are required to report or submit data (whether as part of a funding initiative or for another standard), this must be accompanied by a clear explanation of the purpose, what the programme is trying to achieve and the intended benefits both for digital and for wider improvements in patient care. Our research has shown that demands from the Centre often do not align with the practical realities on the ground, nor the needs of the organisations attempting to achieve them. Where the purpose is clearly articulated, and the Centre works more closely with its users around what they require, the requirements are more easily understood and put into action. This also means that all of the data that is generated is being used for a clear purpose. Given the NHS Long Term Plan's ambitions for the digitation of all core competencies by 2024, it will be important to clarify how this will be measured in a way that captures service transformation and the associated benefits.

### **Reconsider the focus on HIMSS level 7 and ensure ongoing work on national infrastructure is effectively communicated**

As outlined above, the purpose and expectations of programmes or standards must be effectively communicated. This includes the expectations that all GDEs reach HIMSS level 7, and to drive the move to the NHS reaching 'world class standards of digitisation'. Although using established standards is welcomed, our research has highlighted that too great an emphasis on things like HIMSS level 7 (at least in the short term) could risk a focus on the wrong things. Arguably, the issues around HIMSS level 7 and the concerns around closed-loop medicines administration in particular became a distraction from other important aspects of digitisation for the GDEs we visited. If improving patient care and safety are the main purposes, getting the basic infrastructure

and workforce in place, embedding and refining existing digital work and highlighting more localised innovation and best practice are perhaps more important.

Where good work is being done at the national level, this could be better communicated. While the Centre has now developed a barcoding solution covering most, but not all medications, many people we spoke to felt frustrated by the lack of information on how that process was progressing. Some interpreted that as a complete lack of progress and a barrier to their own ability to mature. A much greater focus on communication is needed both with regard to expectations of local organisations and the impact that ongoing work at the national level will have.

### **Look beyond blueprints to share best practice**

Blueprints from the GDE programme will likely spread useful learning. However, there is only so much a blueprint document – focused on a particular aspect of digital change – can provide. Weaker trusts expressed interest in broader strategic support, released in a timeframe that is relevant to them. This is particularly important given the fast pace of technological change and the rate at which it becomes out of date. It is also important to look for ways to capture and disseminate best practice from outside of the GDE programme. Central bodies should think beyond blueprinting to achieve successful digitisation – perhaps through innovative procurement models as outlined in Chapter 5, enabling rapid implementation, testing and learning.

# 7 Concluding thoughts

This report has set out some lessons for national policy in six distinct areas, which give insights into where greater policy attention is needed.

## Overall policy approach

- Support the implementation of standards by setting appropriate deadlines, providing clear guidance for local organisations on interpreting and delivering the standard and ensuring comprehensive piloting and testing prior to national roll-out
- Coordinate efforts to support digitisation and data collection across national bodies

## Configuring a digital workforce

- Professionalise digital health roles
- Develop appropriate pay frameworks for the technical workforce
- Allow flexibility for local organisations to determine appropriate governance arrangements for digital programmes, rather than simply mandating board membership
- Provide best practice guidance on clinical informatics workforce configuration, including time allocation

## Working with digital suppliers

- Proactively engage suppliers about standards and mandates that require software reconfiguration
- Provide trusts with a clear avenue to report issues back to the Centre and hold suppliers to account where necessary
- Consider national procurement of standard, widespread IT systems such as Microsoft software



## Data sharing

- Actively engage with patients and the public around digital, in particular data sharing
- Develop analytics capacity by ensuring there is appropriate national and regional leadership and reducing the number of projects that are outsourced
- Provide use cases and national guidance on priority areas

## Funding and sustainability

- Be realistic about likely funding requirements and accommodate a switch from capital to revenue funding
- Be clear about how different funding initiatives align to deliver digital priorities
- Ensure evaluation is built into funding initiatives for digital transformation

## Global Digital Exemplar and Fast Follower programme

- Ensure reporting requirements clearly relate to the articulation of benefits
- Reconsider the focus on HIMSS level 7 and ensure ongoing work on national infrastructure is effectively communicated
- Look beyond blueprints to share best practice

A clear theme across all of the areas is the need for better communication and engagement between national policy makers and NHS providers.

We consistently heard examples of central bodies setting unrealistic timeframes for solutions to be implemented – which often reflected a poor understanding of the supplier market or NHS organisations themselves; reporting requirements which did not clearly articulate anticipated benefits; lack of communication about national work and how it may impact on local plans; and in all areas, poor communication of why a particular solution has been suggested, what benefits it will bring and how organisations can make best use of it.

Establishing clear avenues for two-way dialogue between all local organisations and central bodies is essential for ensuring that national policy is in line with local priorities and effectively supports digital advancement, rather than serving as a hindrance or distraction. That said, while this report has particularly focused on areas for improvement, it is important to recognise that there is a lot of very

positive work happening nationally to support digitisation. The NHS is experiencing the benefits of digital more than ever before, and improvements in communication and engagement between policy-makers, suppliers and providers could see digitisation flourish even more.

This report has highlighted the ongoing tension between national standardisation and local flexibility in several different areas. The National Programme for IT was overly prescriptive (which ultimately led to its demise) and the policy approach taken since its abandonment has been one of creating the environment for digitisation while consciously avoiding direct involvement in local change efforts. In general, this approach has been welcomed by NHS providers. But it is worth noting that all of the sites we visited could point to areas they would like more central support and involvement in. In turn, some national policy-makers involved in our research were frustrated with attitudes locally – particularly around national funding expectations – and felt that local organisations should be able to take more responsibility for their digital transformation.

Getting the balance between national standardisation and local flexibility right is fundamental to successful change. Despite some discordance about what that balance should be, our work has revealed clear priorities for national action. At a time when NHSX is establishing its organisational priorities, this report gives important insight into the areas national bodies should focus in order for a digital NHS to flourish.

# Glossary

<b>Best of breed</b>	This refers to separate digital systems for clinical areas, which link together to form a cohesive electronic health record.
<b>Beta</b>	If a digital product is in 'beta' (or the beta stage) it is in its second phase of testing. There is usually a private beta stage first, to refine the product, and a public beta stage for public testing before the product goes live.
<b>Blueprinting</b>	Blueprinting is a key deliverable which has been built into the GDE programme. The idea is that GDEs and Fast Followers will create detailed plans of their implementation efforts, in order that other organisations can learn from them.
<b>Chief Clinical Information Officer (CCIO) – also, Chief Nursing Information Officer (CNIO)</b>	The CCIO role combines clinical knowledge and experience with the IT knowledge of a CIO role. CCIOs work with the CIO and wider IT teams on delivering technology products and programmes that improve the overall patient journey and quality of care. The CCIO brings a clinical perspective to the strategic use of technology in the organisation. The CCIO is also involved in supporting wider clinical engagement with the digital programme.
<b>Chief Information/ Informatics Officer (CIO)</b>	The CIO is a senior person within a organisation who leads the digital and technology work programme. In healthcare, the CIO is usually responsible for leading the IT department, planning how to use the data for the overall running of the organisation and working on issues such as interoperability. They are also involved in decisions about what technology solutions to purchase and what resources are required for successful deployment and sustainability.
<b>Closed-loop medication administration</b>	Closed-loop medication administration is a fully electronic process from ordering medication to administration which is designed to eliminate medication errors and improve patient safety. A fully electronic process requires electronic identifiers for the patient and the provider (such as a nurse) and a system such as barcoding for drugs.

<b>Digital Maturity Assessment (DMA)</b>	The DMA is a self-assessment tool which measures how well secondary care providers in England are making use of digital technology. Maturity is measured in a range of areas including readiness, capability and infrastructure. The DMA provides an overview of progress across the healthcare system as a whole, as well as support organisations to identify their own strengths and gaps.
<b>Electronic Medical Record Adoption Model (EMRAM)</b>	EMRAM was created by HIMSS Analytics®. It is an eight-stage model that allows organisations to track their digital progress against others around the world. This eight-stage (0 – 7) maturity model measures the adoption and utilisation of functions required for digitisation to support patient care including security, electronic documentation, data analytics and clinical decision support.
<b>Electronic Patient Record (EPR)/ Electronic Health Record (EHR)</b>	An EPR or EHR is the collection of patient and population health information which is stored digitally. It is the basis for advanced digital health functions such as e-prescribing.
<b>E-prescribing</b>	Connecting for Health described e-prescribing as the “utilisation of electronic systems to facilitate and enhance the communication of a prescription or medicine order, aiding the choice, administration and supply of a medicine through information and decision support and providing a robust audit trail for the entire medicines use process”. The main aim of e-prescribing is to improve patient safety by reducing errors in drug administration and adverse events.
<b>Fast Healthcare Interoperability Resources (FHIR)</b>	FHIR is an industry standard open API which is being adapted to create APIs suitable for sharing data in health and social care – known as Care Connect FHIR APIs. FHIR builds on the previous HL7 standards.
<b>Health Systems Support Framework (HSSF)</b>	The HSSF is a procurement framework developed by NHS England to support NHS organisations access third party suppliers. It focuses particularly on services that support integrated care including digital technology and innovation, and tools which enable population health and risk stratification. Suppliers on the framework have been accredited to ensure their products are high quality and their financial position is stable. A Lot specifically focusing on EPR providers is currently being finalised, with a view to being published in summer 2019. Suppliers will be required to demonstrate a particular level of functionality, as well as commitment to the latest standards on interoperability, and their accreditation will relate to either the acute, mental health or both settings. The Framework also provides a way for central bodies to communicate policy direction to suppliers, such as upcoming standards.

<b>Healthcare Information Management Systems Society (HIMSS)</b>	The Healthcare Information Management Systems Society (HIMSS) is an international not-for-profit organisation, originating in the USA, which works to improve healthcare through the use of information technology and management systems.
<b>Health System Led Investment (HSLI)</b>	The Health System Led Investment (HSLI) fund has seen £412.5 million allocated to Sustainability and Transformation Partnerships (STPs) in order to achieve a digital system. STPs are able to choose how the money is allocated within their area, either further strengthening advanced organisations or bringing weaker trusts up to speed.
<b>Information Standard Notices (ISN)</b>	ISNs are published under the Health and Social Care Act 2012 by NHS Digital to announce new information standards and data collections. When they are received, organisations must ensure that they and their contracts are able to comply.
<b>Integrated Care Systems (ICS)</b>	ICSs are an even closer working relationship than an STP. In an ICS, NHS organisations, in partnership with local councils and others, take collective responsibility for managing resources, delivering NHS standards, and improving the health of the population they serve. ICSs are crucial to the delivery of the NHS Long Term Plan, with NHS England wanting the whole of the country to be covered by ICSs by 2021.
<b>Interoperability</b>	Interoperability refers to the ability of different IT systems to work together without restrictions. Significantly, it requires systems to be able to share information. Interoperability is key enabler to delivering new models of integrated care.
<b>Local Health and Care Record Programme (LHCR)</b>	The LHCR initiative was announced in June 2018 and brings together multiple STPs to enable data sharing across an entire geography. Up to £7.5 million has been awarded to each of the five first wave LHCRs, which cover 40 per cent of the population in England. The NHS Long Term Plan contains a target for LHCRs to cover the whole country by 2024 as part of achieving a core level of digitisation across the whole healthcare system.
<b>The Model Hospital</b>	The Model Hospital is a tool developed by NHS Improvement to support Trusts improve their efficiency by enabling them to compare their productivity and identify areas for improvement.

<b>National Programme for IT (NPfIT)</b>	NPfIT began in 2002. It was the world’s largest civil IT programme and cost over £10 billion. It aimed to implement integrated electronic patient record systems across the NHS – accessible to 30,000 general practitioners and authorised healthcare professionals in 300 hospitals. Despite some successes, NPfIT was officially dismantled in September 2011.
<b>NHS dictionary of medicines and devices (dm + d)</b>	The NHS dictionary of medicines and devices (dm+d) is the current recognised NHS Standard for identifying medicines and medical devices used in patient care. The aim is to ensure consistency in communicating and recording information. It is an interoperability standard and is designed to provide a common language through which different systems can talk to each other about medical information.
<b>Open Application Program Interface (API)</b>	An API is a set of requirements that govern how different applications interact with each other. The purpose is to allow different parts of software to communicate and work together.
<b>Professional Record Standards Body (PRSB)</b>	The PRSB develops standards for healthcare records including the way records and discharge summaries should be structured, and the context of the longitudinal records for the LHCR Programme
<b>SNOMED-CT</b>	SNOMED-CT is a standard terminology developed for sharing information across an electronic health record. All acute trusts in England are required to use SNOMED CT in their patient care systems by April 2020.
<b>Sustainability and Transformation Partnerships (STP)</b>	In 2016, NHS organisations and local councils came together to form 44 sustainability and transformation partnerships covering the whole of England. The purpose of the STPs was for areas to set out their proposals to improve health and care for patients by providing more integrated care.
<b>Transfers of Care</b>	NHS Digital’s ‘Transfer of Care’ initiative aims to support data sharing across the NHS. The transfer of care specifications are part of the NHS Standard Contract with the initial set of specifications covering discharge from inpatient care; discharge from mental health; discharge from A&E and outpatient clinic letters. Mandates to use the Fast Healthcare Interoperability Resources (FHIR) standards and Professional Record Standards Body (PRSB) headings for discharge summaries are part of this initiative.

---

**WannaCry**

WannaCry was a May 2017 worldwide cyberattack. Computers running the Microsoft Windows operating system were targeted by a ransomware encrypting data and demanding ransom payments in the Bitcoin cryptocurrency. A report published by the National Audit Office (NAO) following their investigation suggested that 81 Of the 236 NHS Trusts in England were either directly or indirectly affected by the attack.

---

# References

Boonstra A and Broekhuis M (2010) 'Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions', *BMC Health Services Research*, 10 231.

Daub M and Wiesinger A (2015) 'Acquiring the capabilities you need to go digital', McKinsey Digital, March 2015. [www.mckinsey.com/business-functions/digital-mckinsey/our-insights/acquiring-the-capabilities-you-need-to-go-digital](http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/acquiring-the-capabilities-you-need-to-go-digital) [Accessed 4th March 2019]

Department of Health (2016) *Making IT work: harnessing the power of health information technology to improve care in England*, National Advisory Group on Health Information Technology in England chaired by Professor Robert Wachter. [www.gov.uk/government/publications/using-information-technology-to-improve-the-nhs/making-it-work-harnessing-the-power-of-health-information-technology-to-improve-care-in-england](http://www.gov.uk/government/publications/using-information-technology-to-improve-the-nhs/making-it-work-harnessing-the-power-of-health-information-technology-to-improve-care-in-england) [Accessed 8th February 2019]

Department of Health and Social Care (2018) *The future of healthcare: our vision for digital, data and technology in health and care*. [www.gov.uk/government/publications/the-future-of-healthcare-our-vision-for-digital-data-and-technology-in-health-and-care/the-future-of-healthcare-our-vision-for-digital-data-and-technology-in-health-and-care](http://www.gov.uk/government/publications/the-future-of-healthcare-our-vision-for-digital-data-and-technology-in-health-and-care/the-future-of-healthcare-our-vision-for-digital-data-and-technology-in-health-and-care) [Accessed 8th February 2019]

Elsaid K, Garguilo S and Collins C (2015) Chemotherapy e-prescribing: opportunities and challenges. *Integrated Pharmacy Research and Practice* 2015, 10.2147/IPRP.S84232

Faculty of Clinical Informatics (no date) About (webpage). [www.facultyofclinicalinformatics.org.uk/#about](http://www.facultyofclinicalinformatics.org.uk/#about) [Accessed 8th February 2019]



Health Education England (no date) 'Building a digital ready workforce'. Web page. [www.hee.nhs.uk/our-work/building-digital-ready-workforce](http://www.hee.nhs.uk/our-work/building-digital-ready-workforce) [Accessed 8th February 2019].

Heifetz RA, Grashow A and Linsky M (2009) *The practice of adaptive leadership: Tools and tactics for changing your organization and the world*. Harvard Business Press.

Hendy J, Reeves BC, Fulop N, Hutchings A and Masseria C (2005) 'Challenges to implementing the national programme for information technology (NPfIT): a qualitative study' *BMJ (Clinical Research ed.)* 331, 7512 (2005): 331-6

Justinia T (2017) 'The UK's National Programme for IT: Why was it dismantled?', *Health Services Management Research*, 30(1), pp. 2-9. doi: 10.1177/0951484816662492

Kraindler J, Gershlick B and Charlesworth A (2019) *Failing to Capitalise: Capital spending in the NHS*. The Health Foundation.

Maguire D, Evans H, Honeyman M and Omojomolo D (2018) *Digital change in health and social care*. Report, The King's Fund. [www.kingsfund.org.uk/publications/digital-change-health-social-care](http://www.kingsfund.org.uk/publications/digital-change-health-social-care) [Accessed 8th February 2019]

National Audit Office (2017) *Investigation: WannaCry Cyberattack and the NHS*. [www.nao.org.uk/report/investigation-wannacry-cyber-attack-and-the-nhs](http://www.nao.org.uk/report/investigation-wannacry-cyber-attack-and-the-nhs) [Accessed 8th February 2019]

National Data Guardian (2016) *Review of data security, consent and opt-outs*. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/535024/data-security-review.PDF](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/535024/data-security-review.PDF)

NHS Digital (no date) GP Systems of Choice. <https://digital.nhs.uk/services/gp-systems-of-choice> [Accessed 8th February 2019]

NHS England (no date) Information governance resources and FAQs. [www.england.nhs.uk/ig/ig-resources](http://www.england.nhs.uk/ig/ig-resources) [Accessed 6th February 2019].

NHS England (2019) *NHS Long Term Plan*. [www.longtermplan.nhs.uk](http://www.longtermplan.nhs.uk)  
[Accessed 8th February 2019].

Professional Record Standards Body (2018) *Findings from exploratory meetings with NHS organisations on their progress in implementing the discharge summary standard*. <https://theprsb.org/wp-content/uploads/2018/11/Site-Visit-Report-2018.pdf> [Accessed 25th March 2019]

Scobie S and Castle-Clarke S (2019) *What can the NHS learn from learning health systems?* Briefing, Nuffield Trust. [www.nuffieldtrust.org.uk/files/2019-05/learning-health-systems-v3.pdf](http://www.nuffieldtrust.org.uk/files/2019-05/learning-health-systems-v3.pdf)

SFIA Foundation, *Skills Framework for the Information Age (SFIA)* (no date) Website. [www.sfia-online.org/en](http://www.sfia-online.org/en) [Accessed 8th February 2019]

**Nuffield Trust is an independent health charity. We aim to improve the quality of health care in the UK by providing evidence-based research and policy analysis and informing and generating debate.**

**59 New Cavendish Street  
London W1G 7LP  
Telephone: 020 7631 8450  
[www.nuffieldtrust.org.uk](http://www.nuffieldtrust.org.uk)  
Email: [info@nuffieldtrust.org.uk](mailto:info@nuffieldtrust.org.uk)**

Published by the Nuffield Trust.  
© Nuffield Trust 2019. Not to be reproduced without permission.  
ISBN: 978-1-910953-66-2

Design by Soapbox: [soapbox.co.uk](http://soapbox.co.uk)

**nuffieldtrust**