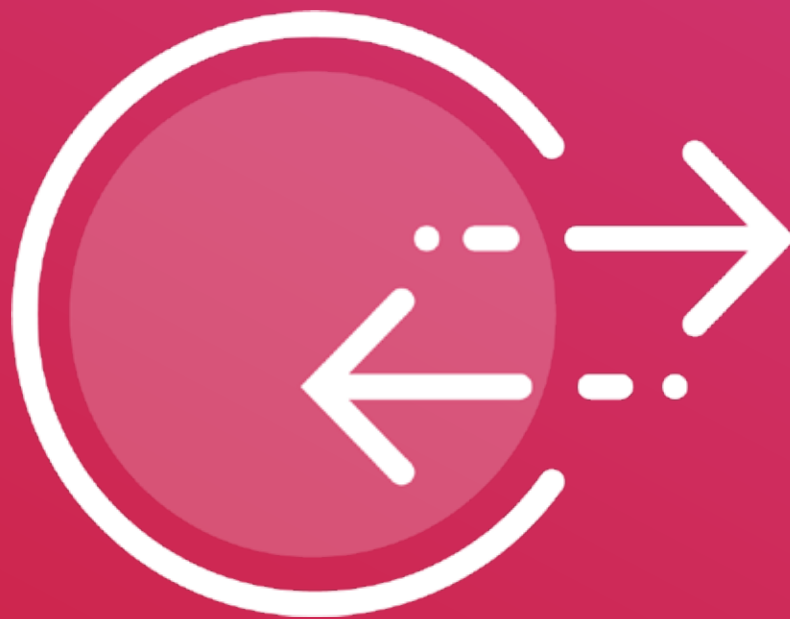




# Driving digital transformation in the NHS



# Contents

<b>Introduction</b>	<b>3</b>
<b>Enabling technologies</b>	<b>3</b>
<b>Delivering digital transformation</b>	<b>5</b>
<b>Improving health and social care today</b>	<b>6</b>
<b>Conclusion</b>	<b>7</b>

## Acknowledgements

This briefing was written by Anne-Marie Vine-Lott, UK healthcare director at Oracle. We are grateful to members of the HFMA Policy and Research Committee who contributed to the research.

# Introduction

The NHS has been going through transformation for some time and, with ongoing fiscal constraint and increasing demand, this is going to continue. The newly created NHSX and the *NHS long-term plan*<sup>1</sup> and *Interim NHS people plan*<sup>2</sup> all highlight the need for digital transformation across health and social care. However, the NHS and social care is made up of thousands of different entities, each with varying levels of information technology (IT) investment, digital skills and different funding structures. The HFMA has been working with Oracle to consider examples of new enabling technologies and how digital transformation might best be approached in a multi-organisational environment.

## Enabling technologies

Technology has revolutionised our everyday lives and we use it and rely on it day to day. However, in the workplace the adoption of new technologies has varied widely. In the private sector the focus has often been on customer experience – for example, we are all accustomed to using a website or our mobile phone for our banking. But delivery in the public sector can be more complex due to: the sheer volume, diversity and range of services; IT architectures and systems; stakeholders; funding models; and often a historic under-investment in IT. In the NHS and across social care this is magnified due to the range of unique organisations involved, each with varying practices, policies, skills and cultures – IT has developed and evolved separately within each, depending on the availability and prioritisation of funds. Embracing technology is also a key element of the vision for the finance function set out in *NHS finance: designing our future*.<sup>3</sup>

The *NHS long-term plan* focuses on collaboration because every NHS organisation has almost exhausted what can be achieved within its own boundaries. The challenge now lies in what can be developed collaboratively to drive better population health, improved service models and sustainable efficiencies. There are terms that often recur in conversations about new technology. Set out here are explanations of some of these terms and how they might be utilised within the NHS.

### Cloud computing

Cloud computing enables users to share computing resources effectively within an organisation, allowing instant access to data stored across a range of systems. This cloud computing environment is built using highly elastic computing resources, meaning that the end-user organisation only pays for what they consume – and as extra users come online, or more computing resources are needed, the system automatically scales itself. The cloud computing environment is typically run by a technology vendor specialising in cloud computing. This reduces the ‘cottage industry’ approach being taken by in-house IT departments, allowing IT systems to be run by IT experts to agreed service levels. The elastic nature of cloud also means it is a highly agile platform when new capabilities are needed – the traditional approach of installing hardware and software is removed. The use of cloud technology can improve standardisation of processes so that the same process and information is used consistently across the organisation.



<sup>1</sup> NHS, *NHS long-term plan*, January 2019

<sup>2</sup> NHS, *Interim NHS people plan*, June 2019

<sup>3</sup> FFF, PwC, HFMA, *NHS finance: designing our future*, December 2019

## Blockchain

A blockchain is a database. A traditional database holds information in separate repositories across multiple parties and must be reconciled; a blockchain database creates a single, shared digital ledger. As new transactions (blocks) occur, they add to the chain and form a distributed database that can hold a growing number of records – a blockchain. Each block (transaction) has to be validated by every participant and changes cannot be made without the approval of all participants. This chain of transactions therefore provides a single source of up-to-date information that all authorised parties can share.



There are significant opportunities for this type of technology in healthcare, particularly with health records. There are relatively few live examples, but in the US a company called Medicalchain uses blockchain technology to enable the patient to securely control their own data. Different parties such as doctors, hospitals and pharmacies can request permission to access a patient's record and record transactions. In a finance environment, blockchain could be hugely helpful in inter-organisational settlements.

## Artificial intelligence (AI)

AI is the development of technologies able to carry out tasks that normally require human abilities. In today's world, we encounter examples of this all the time, particularly in, for example, applying for online credit, where the assessment of the data provided will be carried out by a computer, based on predefined criteria.



AI is a broad term encompassing a range of areas where tasks can be digitised. Examples in the finance function include the scanning and processing of invoices. AI enables the automation of core finance tasks, allowing finance staff to spend their time on more value-adding activities. In patient care, there are many more potential uses in areas such as record transcription, virtual nurses and image analysis.

## Machine learning (ML)

ML is a specific subset of AI that focuses on learning, reasoning and decision-making. The technologies use statistical models to make predictions (or decisions) without being explicitly programmed to perform the task. The computer 'learns' as it increases its data reference points – this is also referred to as predictive analytics. This fast-developing area of technology is hugely relevant for the NHS in view of the wealth of data it captures. The analytics capability – which enables rapid analysis of huge datasets, delivering proactive identification of unwarranted variation in, for example, patient pathways, prescriptions and cost anomalies – is an area the



health and social care sector should progress. The evidence base this technology can swiftly provide could unlock huge savings across the NHS and enable strong information-gathering to inform new models of care.

## Cognitive computing

Cognitive computing builds on AI and ML and its goal is to simulate human thought. It uses self-learning algorithms referencing pattern recognition, data mining and also natural language processing.

We all encounter online digital assistants, such as chatbots, that have a pre-programmed set of responses. Some of these can 'learn' to identify things such as fraud, but they would still deliver a pre-programmed response based on the decision criteria. Taking this one step further, cognitive computing would enable a 'real' response rather than a pre-programmed one. Areas of healthcare in which this could develop include online triage, digital mental health pathways and support, and patient signposting of services.

## Internet of Things (IoT)

IoT describes a scenario whereby resources or assets (devices, cars and buildings) are connected to a network that enables them to link, interact and exchange data. The potential for this technology in a healthcare environment is significant. Examples include:



- Connected worker device distribution – for example, to monitor community staff safety, response monitoring and travel efficiency
- Workforce monitoring – who is available at a particular site and do we need their skills urgently?
- Remote patient care – enabling monitoring for heart defects, caring for patients at home and managing populations with multiple chronic conditions.

## Infrastructure/software as a service (IaaS/SaaS)

These are examples of cloud computing in which a third-party provider hosts infrastructure or software for the customer. The benefit of such technologies is their scalability and that the service is 'evergreen' – that rather than the client having to periodically repurchase and upgrade, the technology is updated regularly and so is always the best available. Effectively the organisation becomes future-proofed.



# Delivering digital transformation

There is really no question that digital transformation can – and will – provide huge opportunities and savings for the NHS and enable collaborative work across organisational boundaries. The question is: where in the NHS does digitisation start, when there are competing priorities and a lack of ability to invest for the long term?

Oracle's view is that it is hugely important to improve and establish the right IT infrastructure quickly because interoperability, secure transfer of data and collaboration are essential in the emerging NHS vision. At the moment, the systems are so diverse that secure interoperability is challenging. NHS technologies must be modernised so that a patient's data can be available throughout the health and social care system (with the patient in control) to enable the best care. Moving to cloud technologies is a key enabler of this change because it brings the security, resilience and ability to share data that is so necessary.

From a finance perspective, the new technology will bring a shift from capital spend to revenue that some organisations may find challenging. But this also brings an opportunity to create alignment of approach. The *NHS long-term plan* emphasises the role of an integrated care system (ICS). Oracle's advice, based on its cross-sector, international experience, is that it is essential to develop a clear digital and information strategy to support change. The HFMA and Oracle, through their discussions, recommend that each ICS needs to identify its key challenges across the local health and social care system (over the short and long term) to inform prioritisation of spend in progressing digital transformation.

Because of the variation of IT investment across organisations to date, there will be different starting points, and there is no single, clear way forward for all. However, in developing a strategy there are some key stages to consider. These are set out below.

- Clear ICS-wide financial plan that is affordable for the vision
  - Identification of baseline KPIs
  - **Stabilisation**
    - 'De-risking' any significant problem areas
    - Agreeing alignment of data and taxonomies across ICS systems
  - **Enabling and Transforming**
    - Focus on improving data quality
    - Ongoing review of service models of care
    - Realisation of benefits and improved health and social care outcomes, including KPIs
- As with any significant change programme, leadership and engagement from the board and senior managers are essential, as are communication and engagement with patients and staff. Digital transformation will not happen without major cultural change, which is where many organisations fail to realise the planned benefits.
- **ICS digital transformation**
    - A clear, shared ICS-wide articulation of the vision
  - **Gap analysis**
    - Baselining and documentation of IT estate including associated contracts
    - Understanding the IT challenges for individual functions and the front line
    - Identifying the barriers to change
    - Are there systems and/or best practice that can be shared or integrated?
  - **Planning**
    - Establishing a clear timeline for change, in the short and medium term

# Improving health and social care today

Identifying best practice in a bewilderingly fast-moving environment is challenging. The following provides some practical examples of where technology is providing transformational change.

## Cloud technologies

**Lambeth Council** recently implemented cloud technologies across finance and human resources, reducing expenditure on hardware and staff through standardised processing. Moving from an on-premises solution to Oracle cloud and digitising paper documents helped the council to reduce its workspace from 14 buildings to two and deliver £4.5m in savings. Moving to cloud technologies has enabled more flexible forms of working, with traditional patterns still supported. The staff of today want to be able to flex their working patterns and work arrangements. This is consistent with the NHS needing to reduce its estate and enabling

any remaining on-premises storage to be focused on patient data needs. Moving the back office to cloud technologies supports this requirement, releasing savings and expensive estate to the frontline.

*Scan the QR code with your mobile phone to read an article on Oracle cloud technology or [click here](#).*



## Telemedicine

Babylon provides a telemedicine service enabling the patient to remotely access a doctor using video chat (or audio-only) on a chosen date and time, 24/7. The benefits of this to patients are viewed to be immense, enabling faster access to care and remote diagnostics, as well as the potential for auditable patient records, strong and shareable data sets and voice transcription.

## Big data and analytics

**NHS Business Services Authority (NHS BSA)** has saved in excess of £1bn to date using Oracle data analytics, identifying unwarranted variation and spotting trends to help detect fraud and error. NHS BSA has been internationally recognised as a leader in data insight, enabling resources to be re-invested in patient care. The focus is on business intelligence and how it can inform both the organisation and the wider NHS.

*Scan the QR code with your mobile phone to watch a video on data analytics or [click here](#).*



## Robotics

**Seismic** provides clothing that includes robotics and sensor technology to help provide the body with strength, stability and power. Originally developed to support veterans and reduce injury risk, wearable technology is being utilised in other sectors, Ford, the car manufacturer, has introduced exoskeleton vests in several countries to lessen worker fatigue and injury.

## Chatbots

**Turning Point** provides support to people suffering from substance misuse and mental health conditions. It offers advanced technology that enables secure, highly accessible services. Part of the technology (built on Oracle Mobile Cloud) uses chatbots to offer patients advice in between conversations with a healthcare provider. For example, a patient who begins to experience an anxiety attack while in a meeting can have a text conversation on their phone with a chatbot that reminds them to apply relaxation techniques and other coping measures.

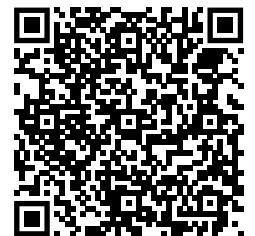
*Scan the QR code with your mobile phone to watch a video on Turning Point's technology or [click here](#).*



## Integrated services

**West Midlands Police** has adopted a shared services model for back-office operations, centralising its various functions on Oracle cloud technologies (including human resources, finance and procurement) and creating £36m in net savings. Central to its success is how the staff access the system; it now has a common look and feel that is much more intuitive and designed for the staff to make activities such as ordering their kit faster and more accessible.

*Scan the QR code with your mobile phone to read an article on West Midlands Police's new system or [click here](#).*



## Modernising finance

The **University of Morecambe Bay NHS Foundation Trust** and **University Hospital Southampton NHS Foundation Trust** are two of the NHS organisations who have deployed Oracle finance cloud technologies to streamline procurement, automate transaction processing, introduce collaborative tools and automate

transaction processing, introduce collaborative tools and automate reporting. This has released staff to actively support strong decision-making for the organisation using real-time data and predictive analytics techniques. The emphasis has been on 'one touch' or 'no touch' transacting to minimise data input and free up resources.

### Big thinking

**Estonia** has revolutionised its healthcare system. Each person has an online e-health record that can be tracked and uses blockchain technology to ensure data integrity and minimise threats. Finland

is on a similar path, enabling the cost of each patient to be understood irrespective of where they are in their patient journey.

There are many more examples, large and small, of technologies that can support digital transformation across health and social care. Small changes can achieve large benefits and sharing best practice and information from all sectors is helpful.

One key barrier to change is information governance in the UK. It is important to acknowledge this area, and progress made, so that each patient is encouraged to be in charge of their own data and access to it.

## Conclusion

The amount of information available to support NHS organisations in driving change can be bewildering. It is important that the NHS is open to new ideas and does not attempt to drive forward change individually in each organisation as this will only further the fragmentation. Collaboration and transparency across organisational boundaries are essential in this environment.

The NHS finance function has taken an increasingly central role in decision-making over recent years due to budgetary constraints and the developing skills across the profession. Finance teams will be pivotal in supporting the prioritisation of resources in delivering digital transformation and the *NHS long-term plan*. Technology is continuously creating new opportunities in health innovation, so it is important for all to understand the art of the possible and how digitisation can improve health and social care outcomes.

The HFMA will continue to focus on this area and share practical examples of technological change via its training programmes, conferences and briefings.

Finance directors and their staff need to embrace new technologies to appropriately support frontline change. Support will be necessary to ensure that the NHS is addressing the needs of its patients in the way that we all want for the future.



## About Oracle

Modern, integrated cloud applications from Oracle help you re-imagine your organisation. The best-of-breed software as a service (SaaS) applications in Oracle Cloud provide mobile, analytic and social capabilities that help you to deliver the experiences that your patients expect, your employees require and with the performance that the wider public and the taxpayer demands.

A unified Oracle cloud suite brings together your data to provide you with a deeper and consistent view into your organisation. This can include multiple information sources, such as finance; operations; supply chain; payments and purchasing; human resources; estates; patient and staff experience; and project data. Providing high-quality information, in a timely manner, accessed using the device of your choice and with an engaging consumer-like user experience, will dramatically enhance personal and operational productivity.

Your executives and managers will have access to cross-functional data from across the enterprise, thereby enabling much better decision-making. As a result, your operations can be simplified and streamlined, and be better able to support policy initiatives, ultimately assuring transparency and accountability across the health and care system.

Oracle is currently supporting several NHS trusts and ALBs in their IT modernisation (in both back office and frontline) and their health team, led by Anne-Marie Vine-Lott (ex-finance director from the NHS) would be happy to hear from HFMA members and to explore what resources Oracle can offer to support and inform organisations. To contact Anne-Marie email her at [anne-marie.vine-lott@oracle.com](mailto:anne-marie.vine-lott@oracle.com).

[www.oracle.com](http://www.oracle.com)

## About the HFMA

The Healthcare Financial Management Association (HFMA) is the professional body for finance staff working in healthcare. For 70 years it has provided independent support and guidance to its members and the wider healthcare community.

It is a charitable organisation that promotes the highest professional standards and innovation in financial management and governance across the UK health economy through its local and national networks. The association analyses and responds to national policy and aims to exert influence in shaping the healthcare agenda. It also works with other organisations with shared aims in order to promote financial management and governance approaches that really are 'fit for purpose' and effective.

The HFMA is the biggest provider of healthcare finance and business education and training in the UK. It offers a range of qualifications in healthcare business and finance at undergraduate and postgraduate level and can provide a route to an MBA in healthcare finance. The association is also an accredited provider of continuing professional development, delivered through a range of events, e-learning and training. In 2019 the HFMA was approved as a main training provider on the Register of Apprenticeship Training Providers and will be offering and developing a range of apprenticeships aimed at healthcare staff from 2020.

© Healthcare Financial Management Association 2019. All rights reserved.

## HFMA

1 Temple Way, Bristol BS2 0BU

**T** 0117 929 4789

**F** 0117 929 4844

**E** [info@hfma.org.uk](mailto:info@hfma.org.uk)

Healthcare Financial Management Association (HFMA) is a registered charity in England and Wales, no 1114463 and Scotland, no SCO41994. HFMA is also a limited company registered in England and Wales, no 5787972. Registered office: 110 Rochester Row, Victoria, London SW1P 1JP

HEA.FIN.067 03/17

[www.hfma.org.uk](http://www.hfma.org.uk)