

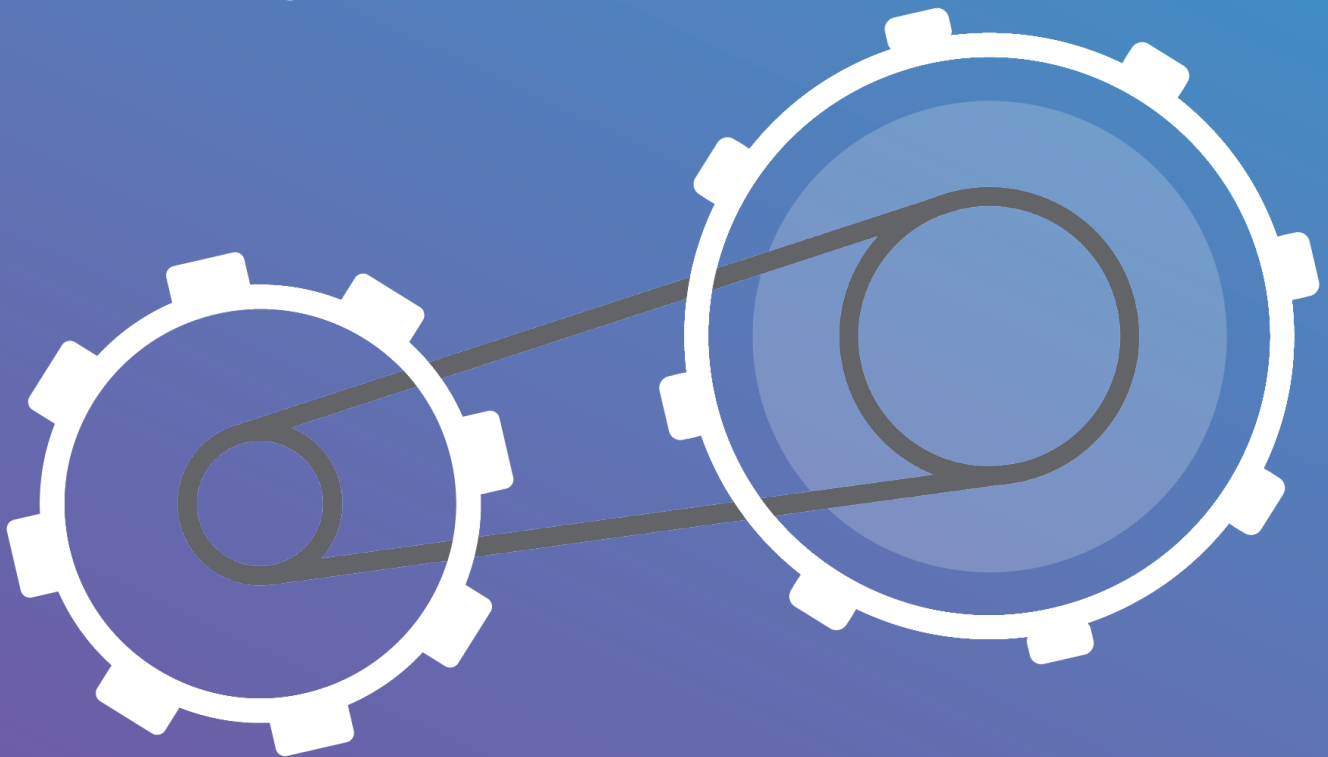


HFMA briefing
November 2020



Unlocking efficiencies with digital workers

A strategic approach to meeting the challenge of the NHS long-term plan



blueprism[®]

Contents

Introduction	3
Background	3
Strategy and role of the board	5
Lessons learned from using digital workers so far	6
Case study 1: Back-office efficiencies – agency invoice payment	7
Case study 2: Clinician support – transcribing patient letters	8
Case study 3: Supporting operations and integrated working – local government example	8
Case study 4: Innovation – implementing Covid antibody testing at scale and at pace	9
Case study 5: Innovation and planning – gathering usable clinical data	10
Conclusion	11
Considerations for boards	11
Appendix 1: glossary	12
Appendix 2: survey results	13
Further reading	15

Contributors

With thanks to:

- Andy MacDonald, director of customer services, Aberdeen City Council
- Darren Atkins, chief technology officer: the innovation and intelligent automation team, Royal Free London NHS Foundation Trust
- Graham Gornall, managing director, ELFS Shared Services
- Ian Roddis, digital director, Kettering General Hospital NHS Foundation Trust
- James Davis, director of innovation, Royal Free London NHS Foundation Trust
- Jaki Allen-Free, medical records, transcription, access to health programme manager, Alder Hey Children's NHS Foundation Trust
- Louise Wall, healthcare consultant
- Patrick Highland, programme manager for the digital enterprise, The Royal Marsden NHS Foundation Trust
- Tim Yates, neurology senior registrar and chief medical information officer, Royal Free London NHS Foundation Trust

Introduction

Prior to Covid-19, the financial challenges facing the NHS were well documented. The *NHS long-term plan* set out proposals to transform the way that the NHS works in order to meet these challenges – which are the result, in part, of increasing patient demand, as well as skills and personnel shortages in some parts of the workforce.



“We have reported on the financial and service sustainability of NHS bodies every year since 2011, and have consistently highlighted a range of challenges faced by the NHS, including rising demand, lack of capital investment, tackling trust deficits and workforce issues.”

Public Accounts Committee, *NHS capital expenditure and financial management*, June 2020

Meeting the challenge of the *NHS long-term plan* continues as the NHS determines how to meet normal demand for its services while managing the backlog built up over the first wave of Covid-19 and the ongoing impact of the pandemic. In order to do this, boards will have to think radically and transform the way the NHS works. Part of meeting this challenge will mean embracing the power of technology.

This briefing sets out the findings from our joint research with Blue Prism into whether digital transformation is high on boards’ agendas and how it is reported. The briefing will then focus on how a digital workforce can help to address some of the workforce issues facing NHS bodies through the use of intelligent automation and robotic process automation (RPA)¹.

Background

The NHS provider sector has been in a financial crisis for many years now, which impacts on NHS bodies’ ability to deliver timely, high-quality patient care. Our members have consistently reported that their main concerns include:

- **Demand management** An ageing population, people living longer with multiple comorbidities means that demand for healthcare services, as evidenced by rising waiting lists, was increasing before the Covid-19 pandemic. The pandemic and associated lockdown has meant referral to treatment waiting times are now even longer² and, despite a dip in demand for emergency care from March to May 2020, by July 2020 demand was back to around 80% of pre-pandemic levels³. New ways of working are going to be needed to meet and manage this demand while operating in a Covid-19 secure way.

“It’s not just about getting the current systems to work better – our ambition should be for the use of the best technology available for the NHS and social care sector. The potential of cutting-edge technologies to support preventative, predictive and personalised care is huge.”

Department of Health and Social Care, *The future of healthcare: our vision for digital, data and technology in health and care*, October 2018

- **Workforce issues** In some areas of the NHS, a lack of trained staff is leading to a reliance on agency staff. Covid-19 has taken its toll on staff, both physically and mentally. It has also meant that annual leave has not been taken but will need to be taken either over the winter months or during the next financial year. New ways of working need to be adopted to ensure that the NHS is a great place to work⁴.
- **Integration of care for patients** The patient must be at the heart of all that the NHS does, and an often-reported frustration is that parts of the NHS system do not seem to be joined up. Patients expect their notes and history to be available to all clinicians they meet, both inside and outside hospital, and that the care they receive is integrated across not only the NHS but also social care systems.

¹ Refer to Appendix 1 for a glossary of terms used in this briefing

² NHS England and NHS Improvement, *Consultant-led referral to treatment waiting times data 2020-21*, November 2020

³ NHS England and NHS Improvement, *Operational performance update for the NHS England and NHS Improvement boards meeting in common*, October 2020

⁴ NHS England and NHS Improvement, *We are the NHS: people plan for 2020/21 - action for us all*, July 2020

“Digital transformation is essential to the NHS’s long-term plan to improve services and will need a high-quality implementation plan. The NHS long-term plan (2019) states that digitally enabled care will be rolled out across the NHS to help transform the provision of services and it sets ambitious targets. However, there is no digital implementation plan setting out how this will be done in clear detail, including the role of national bodies, and to a realistic schedule. NHSX intends to publish a comprehensive technology plan for health and care in the autumn of 2020.”

National Audit Office, *Digital transformation in the NHS*, May 2020

In order to keep expenditure within available resources, NHS bodies must make year-on-year efficiencies, usually through cost improvement or waste reduction programmes.

Historically, the most prevalent financial risk identified by NHS bodies is non-achievement of these efficiencies. Most programmes were put on hold during the Covid-19 pandemic, but these will need to be restarted⁵ during phase 3⁶ of the NHS’s response to the pandemic.

One of the ways to resolve the NHS’s problems and to make the necessary efficiencies is to use technology and digital innovations. But these developments are many and varied:

- Telephone consultations⁷, which have seen a marked increase during the pandemic
- Electronic patient records⁸
- Using robots to perform surgery⁹ or reduce space in pharmacies¹⁰
- Artificial intelligence reviewing scans and making diagnoses¹¹



“The previous attempt at digital transformation in health was expensive and largely unsuccessful ... Many factors contributed to the failure, including the insufficient understanding of, and support from, key stakeholders such as clinicians and the need for adaptive change (changes in the way people work) alongside technological change.

For current efforts to be successful, it will be essential to avoid previous mistakes. While some high-level lessons were identified in the Wachter Review (2016), we have not seen evidence that the lessons of this and other programmes have been captured systematically. In our view, significant risks to successful implementation remain in all areas.”

National Audit Office, *Digital transformation in the NHS*, May 2020

- Using intelligent automation to implement new processes and systems (see case study 4) and RPA to link up disparate IT systems¹².

For management, it can be difficult to determine where to best focus effort and constrained resources to achieve optimum outcomes.

All these developments have advantages and disadvantages: some need expertise to implement and others do not; some will have a long lead time and need upfront investment while others are quicker to implement; some will need extensive cultural change programmes while others are more easily adopted. The focus of all innovation must be the patient – either improving patient care or the patient experience. It may be focused on back-office activities that, when streamlined, can release funds for patient-facing activities.

The NHS does not have a good track record on the implementation of large-scale digital projects, as reported by the NAO in May 2020¹³. There are no national IT systems – each NHS body has its own IT arrangements and systems. Consequently, interoperability is a big issue for the NHS as systems do not tend to work together even in a single NHS body, let alone on a wider health and care system level.

Time and again, analysis of the barriers to transformation highlights two major constraints – finance and the availability of an appropriately skilled workforce. Given that around 64% of provider bodies’ operating expenditure is staff costs¹⁴, the two are closely intertwined.

Technology that can free up staff to focus on the patient, and therefore improve the patient experience and reduce waste/inefficiencies, will go partway to addressing both of these constraints.

A digital workforce may therefore be one way forward. Digital workers are software robots – sometimes referred to as bots – that undertake work that would otherwise be done by a person, using the same interfaces a human would use and applying artificial intelligence to make decisions¹⁵.

This is the focus of this briefing.

⁵ HFMA podcast, *Cost improvement and efficiency savings across the NHS*, October 2020

⁶ NHS England and NHS Improvement, *Third phase of NHS response to Covid-19*, July 2020

⁷ Digitalhealth, *Text and telephone consultations trump video during Covid-19*, June 2020

⁸ Frimley Health NHS Foundation Trust, *FHFT seals epic patient record deal*, August 2020

⁹ BBC news, *The NHS robots performing major surgery*, December 2019

¹⁰ Royal Devon and Exeter NHS Foundation Trust, *Annual report and accounts 2019/20*, June 2020

¹¹ The Guardian, *AI equal with human experts in medical diagnosis*, study finds, September 2019

¹² East Suffolk and North Essex NHS Foundation Trust, *Robots save time and cut down on wasted appointments in Outpatients*, February 2019

¹³ NAO, *Digital transformation in the NHS*, May 2020

¹⁴ Source: consolidated provider accounts

¹⁵ Blue Prism, *Healthcare customer panel discussion (University Hospitals of Morecambe Bay NHS Foundation Trust experience from 11.14 minutes to 19.15 minutes)*, 2020

Strategy and role of the board

As part of the research for this briefing, we reviewed board papers to see whether technology and digital developments were part of the board agenda and NHS bodies' strategies. We reviewed two publicly available board papers of 23 NHS provider bodies¹⁶, one from December 2019/January 2020 and another from July/August 2020. This was so we could look at papers both before and during the Covid-19 pandemic.

We also undertook a short survey of HFMA members to identify how NHS bodies are using technological and digital solutions and how this is managed both at an operational and board level. The detailed survey results are included in Appendix 1.

All the board papers we reviewed included reference to digital and/or technology and many had a strategic aim that related to technology. However, only one of the boards received a report that was specifically about digital/technology. This trust was in the process of implementing an organisation-wide electronic patient record system and that was the focus of the paper, although other digital innovations were covered.

It should be noted that technological and digital developments may have been reported to board meetings not covered by our review and will, no doubt, have been taking place but not reported to the full board or covered in their publicly available papers. However, it may also mean that the technological developments are smaller, localised projects that are not being discussed at a strategic level.¹⁷

Perhaps as expected, most of the references in the summer 2020 papers related to the speed at which NHS bodies have established digital consultations as a result of Covid-19. Many of the other references reflected the fact that embracing technology will be critical to meeting the objectives of providing integrated, seamless services to the patient. Most of the NHS bodies had a strategic objective that included reference to technology.

However, none of the papers we reviewed provided any detail on how that would be achieved. Of the organisations we reviewed, 13 referred to a digital strategy, but we were only able to find four that were publicly available. None of these strategies referred to RPA or automation as part of their plans, although they did all refer to systems that were not connected.



“Digital medicine will require leadership with the capability to direct the agenda, which should include a board-level member, as well as new senior roles with responsibility for advising boards on digital technologies. The NHS must build skills in data provenance, curation and governance, enhance the

understanding of ethical considerations and strengthen the necessary skills to carry out critical appraisal.”

HEE, *The Topol review: Preparing the healthcare workforce to deliver a digital future*, February 2019

While most of the NHS bodies had digital issues on their risk register – such as information governance, data security, age of existing IT systems and failure to implement a new system such as electronic patient records – only one NHS body in our review was proposing to add digital metrics to their integrated board report. At this stage, none of the bodies seemed to report digital key performance indicators on a regular basis.

Almost half (48%) of the bodies we looked at referred to a senior staff member responsible for digital and technology, five of whom were board members. Others either attended board meetings but did not vote or reported to a board member.

Encouragingly, our member survey indicated more involvement at board level, with 49 of the 66 respondents indicating that at least one member of the board was championing digital transformation. Only six respondents were not able to identify any digital champions at any level in their organisation. It may be that the digital agenda is being championed by a board member whose job title does not create a clear link to the programme or that the champion is a non-executive board member.

“All health and care organisations should ensure board-level understanding of how data and technology drives their services and strategies, and take charge of the digital maturity of their organisations – in the same way that they manage their finances and the quality of their services.”

Department of Health and Social Care, *The future of healthcare: our vision for digital, data and technology in health and care*, October 2018

¹⁶ These bodies were selected to include a spread of organisations from different parts of England, providing different services, of different sizes and in different segments of the NHS England and NHS Improvement single oversight framework. Some of our selected bodies were digital exemplars, others most were not

¹⁷ Blue Prism, *The strategic intelligent automation index*, 2020

The comments in our survey indicated that respondents were not clear exactly what digital transformation was being championed or whether it was successful. Respondents were also not clear on how, or whether, they could get involved:

- ‘To be honest, I’m very unsighted on work in this area, especially since homeworking started in March. I know the finance director and chief information officer are proposing projects, and they must be supported by others, but as I equate championing to mean being proactive and out there, then I can’t see it.’
- ‘Would like to progress RPA particularly in finance but it’s finding the resource and IT support particularly when Covid-19 has diverted attention elsewhere.’
- ‘Very little information leaks out to those not directly involved.’

We asked our members about digital transformation initiatives that include an element of automation or artificial intelligence that their organisation had embraced. Remote patient observation/monitoring was the most common initiative that was in place or being planned, but intelligent automation/RPA was the second most common.

Respondents were also asked about other commonly adopted digital initiatives. Unsurprisingly, MS Teams or Skype for virtual meetings was the most commonly adopted, probably as a result of the Covid-19 pandemic. Electronic patient record systems were the second most common.

However, both are much larger scale projects and while they may include an element of automation, that is not the main focus.

Lessons learned from using digital workers so far

Following on from our survey, we held a number of interviews with people who were champions of intelligent automation as well as skeptics. Those interviews focused on the practicalities of applying automation.

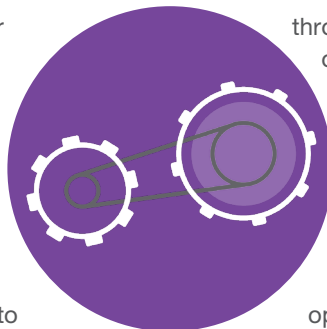
Understand what a digital worker can do

RPA and artificial intelligence (AI) systems allow a wide range of activities to be automated across functions. This enables healthcare staff to spend more of their time on the activities that need human intervention, such as direct patient care, deciding the best course of treatment and devising strategies for improving patient outcomes.

A popular place to start has been back-office processes – automating transaction processing, for example, so finance staff can focus on understanding the impact of decisions that are being made, modelling future scenarios and drawing together high-quality data to support decision-making.

NHS bodies are run using multiple disconnected systems that often require staff to transfer data from one system to another by manually re-keying information. This is time-consuming, often boring and introduces the risk of error.

Digital workers copy and emulate what humans do, accessing different systems in the same way a human does –



through the front end via a log-in. The digital worker operates at machine speed 24 hours a day and can work on different systems and processes on the same day. One person we spoke to said: ‘In simple terms, RPA stops people having to be the glue between systems that do not talk to one another.’

RPA and using digital workers can seem operational and may be overlooked as a strategic tool. However, NHS bodies often work in silos and RPA can stitch together processes and departments.

One of the unexpected benefits of automation is its impact on workforce morale and its potential to reduce staff turnover by removing the dull or repetitive data manipulation from people’s jobs so they can engage in the aspects of their role that are more interesting.

Digital workers can work faster than humans, so there are efficiency and productivity gains. However, our survey shows that uptake is not widespread in the NHS. Nearly half of the respondents to our survey (43%) who answered the question about their plans for automation had no plans to adopt intelligent automation or RPA.

Of those that have started an automation journey, 14% are using intelligent automation in both back-office and patient-

facing functions, while another 17% are using it in one or other of those areas.

Among those using intelligent automation, over two thirds reported that it is already having an impact as a driver for organisational change or they can see it will have. The remaining third said they were not far enough along in their automation programme to be able to assess the impact yet.

Identify the most appropriate processes to automate

To implement a successful RPA, it is vital that the process is thoroughly understood and documented. Triggers for initiating automation must be clearly identified, as well as the consequential actions – including any limited decision-making between options that are available before determining the next step in the process.

At its most basic, simple RPA will transfer data from one system to another in a linear workflow. Intelligent automation opens up a wider range of opportunities as it incorporates machine learning and natural language processing to read and understand information so that digital workers can be trained to make decisions within specified parameters.

For example, when an employee hands in their notice, a leaver's form is completed. Once this form is completed a

number of actions are required – the HR system needs to be updated, a leaver's interview scheduled, payroll informed, arrangements made to collect any equipment the employee has, and the employee's access to all IT systems turned off. These tasks can all be done by a member of the HR staff and it may take them 20 minutes to do.

Alternatively, the completion of a leaver's form can trigger a digital worker to pick up the appropriate information from the form. It will then log onto the HR system to add the leaving date and email the appropriate people to set up the leaver's interview. It will also log onto the payroll system to enter the leaving date, so pay can be stopped on the appropriate date.

Finally, it will either email or log on to IT systems to add the leaving date to remove the staff member's access to IT systems once they have left, and email them to arrange a time for the return of equipment. The HR staff member is then available to undertake other tasks, such as attending the leaver's interview.

This is an example of a process undertaken by the digital worker from end to end. In other processes, work will pass between the human and digital worker. The fact that a human needs to be involved does not mean it cannot be automated.

Case study 1: Back-office efficiencies – agency invoice payment

The **Royal Marsden NHS Foundation Trust** is using a digital worker to process agency invoices.

The current process is for the HR department to check the received agency invoice against the staff rostering system to validate that the person has worked that shift, on that date, for the agreed rate.

The HR operative must also capture the cost centre from the rostering system to update the record in the trust's enterprise resource planning (ERP) system where the accounting information resides.

This process involves the HR worker logging in to two separate applications and navigating multiple screens in both systems to reconcile and capture numerous information artefacts – for example, a name, date, amount, hours or rate. If everything is valid, HR will update the cost centre and approve the bill for payment.

The new process will employ a digital worker to log on to all systems, validate the information artefacts between the two trust systems, update the accounting information and present the invoice for approval and payment by a human worker.

The digital worker frees significant amounts of time for HR staff to perform more value adding activity rather than checking data between one system and another.

A digital workforce provides resilience and helps minimise the everyday reality of downtime.

A human employee works 150 hours per month, whereas the digital worker can work 360 hours per month and does not take holidays, get sick or become tired.

Whereas people may get frustrated or demotivated by having to work through volumes of repetitive and dull tasks, a digital worker is designed to repeat the same actions over and over again without any mistakes creeping in.

Digital workers also provide flexibility as they can work in whichever department or process they are needed. A human employee works in a single department – the staff member in HR cannot input data from a clinical system if they have nothing to do, whereas a digital worker can switch between systems so that it is being used all of the time.

What a digital worker cannot do is empathise with a patient, understand the implications of outliers or trends in data or answer the phone. All these things need human intervention and demand concentration of staff time and talent.

Case study 2: Clinician support – transcribing patient letters

One of the automation projects that is under way at **Alder Hey Children’s Hospital NHS Foundation Trust** relates to transcription.

Clinicians dictate patient letters, and the dictation is sent to the transcription pool for a medical secretary to type it up. Currently, there is a backlog of letters that need to be typed, so some of the work is outsourced at an additional cost to the trust.

To reduce the backlog and save outsourcing costs, the trust is building a digital worker to remove the need for outsourcing. The digital worker will transcribe the dictation and the transcription typists will review the letter and ‘top and tail’ it.

The second part of the project will be to teach the digital worker to ignore the white noise in the dictation – if the phone rings or the consultant sneezes, for example, the digital worker will learn to ignore that noise and not include it in the transcription.

Talk about digital workers and automation

To implement RPA or intelligent automation successfully, there needs to be engagement with staff at all levels in the organisation to understand the parts of their jobs that have routine processes. These are the parts of the role that it may be possible to automate (see case studies 1 and 2).

This requires investment to ensure that the business flows and processes are properly documented and understood.

Processes that have exception rates of less than 5% are best for automation. The exception rate is the number of times that the next step in the process is not immediately obvious because the data is not in the right format or does not conform to the usual rules.

Engagement with staff will work best if automation is seen as an opportunity to free up time to do the interesting parts of the job rather than as a threat to the role (see case study 3).

Case study 3: Supporting operations and integrated working – local government example

Aberdeen City Council has used digital workers in several areas of finance but is now using it in operational areas.

For example, in education, digital workers are used to free up teachers’ time. Across the whole city the equivalent of 14 teachers’ worth of time has been released. Teachers are required to prepare a children’s plan for each child in their class – the teacher has to write the plan and would then have to go into a national portal to input the plan. The digital worker now does that transfer of the plan into the national education management information system (SEEMiS) that holds the full student record¹⁸.

The council is currently working on a project that will help partners, including police and the local health board, to access important information in a timely and accurate manner.

Police raise concern requests – vulnerable person details (VPDs) – for individuals or families (adults and children). These reports are manually progressed in the social care system and passed to the relevant social worker or team to be dealt with further. The information contained in the system details specific actions to be carried out.

Automation is expected to deliver both quantitative and qualitative benefits. Quantitative time savings will come from the reduction in staff hours spent locating clients within the council’s principle line of business care systems and entering new basic VPD details such as contact details or address changes, and, crucially, passing the VPD document to the relevant social worker or care team. Qualitative benefits will come from VPD updates being logged almost immediately, ensuring the information is available rapidly to care staff, as well as from staff themselves having more time to focus on clients in need.

This project therefore potentially yields both financial and harm reduction improvements.

¹⁸ Agilisys, *RPA saves time for teachers in Aberdeen*, 2019

It is unlikely that RPA or automation will immediately result in a reduction in staff numbers, but it is an opportunity to make jobs more satisfying and improve patient care by freeing up staff time. It also may mean that roles do not have to be filled as staff leave.

To maximise the benefit of digital workers, they need to be used all day, every day – so NHS bodies need to invest in training and informing staff so they can identify systems that could be automated, and can document the systems and put together the business cases. This is not the role of the IT department, it could be staff working in change management or transformation, or anyone with an interest in the NHS body.

Those who are using digital workers tend to start with one process and have a pipeline of processes to develop. It may be easier to start with existing processes that can be reviewed rather than, as in case study 4, automating a completely new process.

What is clear from the interviews we have undertaken as part of this work is that once staff understand what a digital worker can do, they are hugely enthusiastic about their digital colleagues and the benefits they will have for patient care. This enthusiasm means they will quickly identify the new as well as existing processes and systems that can be automated (see case studies 2, 3 and 5).

When integrating systems or organisations consider automation

It is also important to consider the use of digital workers when new processes are being developed or current working practices improved (see case studies 4 and 5).

Some of those we interviewed went as far as to say that whenever a new band 2 or 3 post is being considered, a digital worker should be the first option before adding to the staff establishment.

Certainly, as NHS bodies start to work in a more integrated way as part of integrated care systems (ICSs) with other NHS bodies or with local authorities, digital workers should be considered as a way of integrating the different IT systems that those entities will use (see case studies 3).

Even if the different members of the system choose not to fully integrate their IT systems, the Blue Prism digital exchange¹⁹ will allow NHS bodies that use Blue Prism Cloud to share the code that sets up each digital worker so that other organisations can adopt the same automation (see case study 4).

Case study 4: Innovation – implementing Covid antibody testing at scale and at pace

As Covid-19 struck, the government set a target for staff antibody testing to be turned around within a week. For **East Suffolk and North Essex NHS Foundation Trust**, this was too much for administrative staff to manage, so it was agreed that the solution was to use a digital worker from the start.

This meant that the process was developed alongside the automation – a change from previous experience, as usually existing processes are automated.

An MS Teams online form was developed, and this was accessed by the staff member who wanted an anti-body test. The digital worker picked up the request, verified the data and entered the request into the pathology system, then sent a booking form to the member of staff, with a date and time to have blood taken. The digital worker then monitored the pathology system for the test results and passed them back to the staff member.

The advantages of this system were that there was no paper involved, the capacity of the phlebotomists and the pathology system was maximised and the results came back in a timely manner to the staff. And because the capacities were built into the process, the digital worker managed the capacity of the system and the throughput of patients, as well as stock levels of the necessary reagents.

The system was then expanded to cover the ICS, as well as including military staff and care home staff. The software code that was developed to make the digital worker/RPA work in this foundation trust was also applied by a neighbouring NHS foundation trust to its systems.

¹⁹ Blue Prism, *NHS DX - delivering more time to care across the NHS*

Case study 5: Innovation and planning – gathering usable clinical data

The chief medical information officer at the **Royal Free London NHS Foundation Trust** is working on a project to use digital workers to gather usable data about outpatient clinics.

Currently, the information gathered about outpatient clinics is limited, partly because the way that NHS bodies are paid for this work means that the detailed clinical coding that happens for in-patient work is not required. So NHS bodies can identify the number of clinics that have been held but not necessarily the patient's diagnosis – it would be difficult to answer the question 'how many patients with Parkinson's have you seen?' or 'how many with type 1 diabetes?'. This information would be useful for planning purposes, for forecasting demand as well as for clinical audits.

It would be possible to ask clinicians to record that information on the patient record system but it would be an additional task and they may not see the benefit for them in doing it and doing it well. However, following outpatient clinics, letters are written to the patient and their GP. These letters tend to follow a standard format with the diagnosis in the title or heading of the letter.

This data is semi-structured so can be read and analysed by a digital worker. So, the proposal is that a digital worker will 'read' the letters to identify and record the diagnosis. At first, the work will need to be reviewed and checked but the digital worker will be programmed to flag when it is not sure about a diagnosis. These flagged items will be reviewed, and the digital worker will learn so the number of flagged items will reduce over time.

If this works at the Royal Free, then it will be usable by other NHS bodies via the Blue Prism NHS Digital Exchange.

Understand the business case

In terms of a business case, all of the people we interviewed for this briefing said that reducing costs is not the top priority when implementing this technology.

The business case should focus on the problem that needs to be solved and the advantages of using automation to solve that problem.

For example, a digital worker might be used to cleanse data by monitoring patient-initiated follow-ups. This will ensure that patients who have not initiated a follow-up after a period of time agreed with their clinician are discharged from the system. The case studies in this briefing illustrate other problems being solved by automation.

Intelligent automation is a solution to the problem because it will free up staff time, make their working lives more efficient and effective and improve data quality. It will also meet strategic aims relating to technology.

The business case needs to be realistic that, initially, digital workers may not be working to full capacity while

systems and processes are automated. However, the enthusiasm of staff who have digital colleagues suggests this is unlikely to be the case for long as the automation workstream will not dry up.

Automation is relatively new in the NHS but, as this briefing illustrates, it is being used more widely and it is transferable between NHS bodies. It is therefore important that business cases include KPIs that will allow NHS boards and senior management to assess the success of their initial digital workforce and provide the data needed to support future case studies.

Most automation systems will be a revenue cost as they are implemented as software as a service and do not require capital investment in hardware or servers.

Conclusion

Digital workers need to be part of any organisation's digital armoury, and automation should be considered and championed at a strategic level if it is to make an organisation-wide impact.

NHS bodies work with a 'vast array of IT systems'²⁰ that will need substantial investment in time and money to update and integrate. Digital workers are a relatively inexpensive way of integrating systems quickly to improve both the patient experience and the working lives of NHS staff.

Considerations for boards

Boards may want to ask the following questions:

Digital strategy

- Are we assessing our performance against our digital strategic regularly?
- What digital performance metrics do we want to be regularly reported to the board?
- Is automation one of the tools available to us to achieve the objectives in our digital strategy?
- If not, have we considered automation and assessed its capability?

Performance management

- How can automation help us report our current KPIs more easily?
- Which of our KPIs require staff time to collate from different systems?
- What information would we like to have but cannot easily collate at the moment?

Transformation/organisational change

- Do we consider the technological implications of any transformation project/proposed change in working arrangements?
- Where do we have information/data flows between departments/parts of the organisation? Can they be automated? Where should there be data flow but currently is not?

- Do we consider whether there are opportunities to embed automation into the system at the development stage?
- Does automation provide us with a way of progressing a project without incurring capital expenditure?

Staff engagement

- Who are our digital champions?
- Do we have digital champions in all departments? How do they work with each other and our IT department?
- Can we identify the parts of peoples' jobs that they do not enjoy/find frustrating? Is that an opportunity for automation?
- Do staff see automation as a threat to their job? And is that because they do not understand what it can and cannot do?
- Can we use automation to improve existing processes?
- Have we engaged staff in our digital agenda?
- Do staff know that some processes, especially those that include processing structured or semi-structured data, can be automated?
- Do staff know who to approach where they have identified an opportunity for automation?

²⁰ Public Accounts Committee, *Digital transformation in the NHS*, November 2020

Appendix 1: glossary

Term	Explanation
Artificial intelligence (AI)	<p>The development of technologies able to carry out tasks that normally require human abilities. AI is a broad term encompassing a range of areas where tasks can be digitised, such as scanning and processing invoices.</p> <p>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.</p>
Applied artificial intelligence	<p>Embedded in IT systems, applied artificial intelligence enables machines to take in information, reason within a rules-based structure to reach conclusions and take action.</p> <p>An applied AI system can also learn from the decisions it is making as it takes in more information and therefore corrects if the actions are unsuccessful. As applied AI systems learn from the information they are fed and the rules taught, it is important the information and the rules do not contain biased data.</p>
Application programming interface (API)	This is a computing interface between multiple software programmes. Unlike RPA, API does not access the programmes in the same way that a human would but is programmed into both systems to allow them to interface.
Automation	The process of taking the human out of a process – replacing it with a software robot that does the process automatically.
Cognitive technology	This is a broad term that encompasses algorithms, RPA, machine learning and artificial intelligence.
Digital medicine	Products and services that are intended for use in the diagnosis, prevention, monitoring and treatment of a disease, condition, or syndrome. It includes technologies such as telemedicine, smartphone apps, wearable devices and software used in clinical settings (such as e-prescribing).
Digital worker	A software robot undertaking work otherwise be done by a person. RPA and intelligent automation are examples of digital workers.
Electronic health record/electronic patient record (EHR/EPR)	Digital records of a patient's health and care.
Electronic referral service (eRS)	A computer system that is used to refer patients from their GP or local surgery into the hospital or another healthcare service.
Information artefact	Any data item on a screen, page or form that can be used to provide information about the transaction or process under review – names, dates, amounts, hours, rates, bands, authoriser.
Information management and technology (IM&T)	The management, procurement and maintenance of computer hardware and software as well as the design of IT systems.
Intelligent automation	<p>A combination of applied AI and RPA, where RPA follows the processes usually done by a person and applied AI simulates human intelligence.</p> <p>It means processes that do not have a rules-based structure can be automated as the digital worker can handle unstructured data and provide answers based on subjective probability.</p>
Interoperability	Sharing data so all parties understand it in the same way. Interoperability between IT systems sometimes requires system-to-system integration – can be achieved using automation or APIs.
Machine learning (ML)	A subset of AI, ML focuses on learning, reasoning, and decision-making, using statistical models to make predictions (or decisions) without being explicitly programmed to perform that task. The computer 'learns' as it increases its data reference points (also referred to as predictive analytics).
Natural language processing	The application of computational techniques to analyse the written and spoken word. It is a subfield of linguistics, computer science and artificial intelligence. It includes speech recognition.
Paper switch off (PSO)	An initiative in the NHS to move to electronic referrals from paper/faxed referrals. The 2018/19 standard NHS contract required the full use of eRS for all consultant-led first outpatient appointments.
Robotic process automation (RPA)	Software robots that carry out tasks and activities within systems or applications using the same interfaces a human would use. The robot can work with several different systems in a process, so manual, repetitive tasks that would otherwise have to be done by a person can be automated.
Structured data	Data organised and formatted in a standard way, so it is easily searchable and movable between systems. It is usually found in databases and spreadsheets. RPA deals with structured data as it is straightforward to process.
Unstructured data	Unstructured data has no predefined format or organisation. Letters, handwritten patient notes or information in free text fields are unstructured. RPA can also deal with unstructured data using machine learning and natural language processing, but will need data sets to 'learn' from.

Appendix 2: survey results

As part of the research for this briefing, in October 2020 we undertook a survey of our members to better understand their organisation's use of technology and digital solutions.

We had 66 responses to the survey:

- 8 CCGs or CSUs in England
- 50 provider bodies in England
- 2 local health boards in Wales
- 3 non-NHS providers
- 3 did not say

Most of the respondents (90%) had someone championing the use of digital in their organisation. In the vast majority of cases (82%) that person was at board level (table 1).

Table 1: who is championing digital transformation in your organisation?

Term	Yes, just one	Yes, more than one	No
A non-executive board member	17%	53%	30%
The director of finance	46%	32%	22%
Another executive board member	41%	49%	10%
A senior staff member reporting to the board	32%	56%	12%
A member of the programme/change management team	11%	70%	18%
A member of the IT department	19%	67%	14%
A clinician	14%	68%	18%
Another senior staff member not reporting to the board	14%	66%	21%

We wanted to understand what was driving digital transformation initiatives, so we asked respondents to rank the importance of outcomes, with 1 being the most important and 5 being the least. Efficiency and creating a better patient experience were the top two drivers (table 2).

Table 2: survey respondents were asked to rank their priority outcomes for digital transformation initiatives

Rank	Outcome	Total score ²¹	Percentage of responses saying this is most important	Percentage of responses saying this is least important
1	Increasing efficiency of processes	190	48%	2%
2	Creating a better patient experience	164	26%	13%
3	Reducing the amount of time clinical/nursing staff spend on administration	141	11%	18%
4	Cost reduction	113	8%	39%
5	Cutting waiting times	112	7%	28%

²¹ This is a weighted calculation, items ranked first are valued higher than the following ranks. The score is a sum of all weighted rank counts. A total of 48 respondents answered this question

We asked two questions in relation to the types of technology that organisations are working on. The most common was remote patient observation and monitoring, followed by automation (table 3). However, nearly half of the respondents (43%) who answered this question had no plans yet to adopt intelligent automation/RPA.

Of those that were using intelligent automation/RPA, more than two thirds (71%) said that it is already having an impact as a driver for organisational change or that they can see it will have. The rest said they were not far enough along the process to be able to tell yet.

Intelligent automation/RPA is being used by 85% of those who replied to the question in back-office functions and by 48% in patient-facing functions.

Table 3: has your organisation embraced, or is it working on, any of the following digital transformation initiatives?

	In progress	In current plans	No plans as yet
Intelligent automation/robotic process automation (RPA)	32%	20%	48%
Artificial intelligence diagnostics	14%	24%	61%
Remote patient observation/monitoring	43%	26%	31%

In terms of wider initiatives, the adoption of virtual meetings and collaboration had been embraced by the vast majority of respondents – no doubt because of the Covid-19 pandemic.

Unsurprisingly, electronic patient records either for the whole organisation or the wider system were the next commonly adopted technology. Most of the innovations we listed in the question, had been adopted in full or in part by respondents and those who had not adopted them yet were actively looking at them.

There were very few technologies that respondents did not have on their radar (table 4).

Table 4: has your organisation embraced, or is it working on, any of the following initiatives?

	We have completely embraced this and are using it across our organisation	We are using this in parts of our organisation	We are looking at this	This is not on our radar
Electronic patient record system across the whole organisation	51%	27%	19%	2%
Electronic patient record system across the system	24%	24%	40%	7%
Voice recognition software	4%	46%	17%	28%
MS Teams/Skype for virtual meetings/ collaboration with colleagues	86%	9%	3%	-
Remote access to patient records	29%	34%	26%	3%
Electronic 'at a glance' boards updated in real time	21%	37%	19%	15%
Electronic discharge summaries	35%	31%	10%	7%

Further reading

- Blue Prism, *RPA and intelligent automation: a glossary*, updated July 2020
- Blue Prism, *East Suffolk and North Essex NHS Trust prevents wasting unwanted appointments with digital workers*
- HEE, *The Topol review: Preparing the healthcare workforce to deliver a digital future*, February 2019
- HFMA and Oracle, *Driving digital transformation in the NHS*, December 2019
- Horses for Sources, *RPA is dead. Long live integrated automation platforms*, 2019
- Houses of Parliament Office of Science and Technology, *Electronic health records*, February 2016
- ICAEW, *What is cognitive technology?*, 2020
- ICAEW, *AI for accountants: science fiction or fact?*, 2020
- National Audit Office, *Digital transformation in the NHS*, May 2020
- NHS Digital, *Paper switch off implementation pack*
- NHS England and NHSX, *NHS launches accredited suppliers for electronic patient records*, August 2019
- NHS Improvement, *Robotic process automation*, October 2018
- Oxford Internet Institute and Google, *The A-Z of AI*



About Blue Prism

Blue Prism is the global leader in intelligent automation for the enterprise, transforming the way work is done. At Blue Prism, we have users in over 150 countries in more than 1,800 businesses, including Fortune 500 and public sector organisations, that are creating value with new ways of working, unlocking efficiencies, and returning millions of hours of work back into their businesses. Our Digital Workforce is smart, secure, scalable and accessible to all; freeing up humans to re-imagine work.

Our award-winning SaaS platform, Blue Prism Cloud, simplifies scaling, giving companies access to a pool of cloud-based intelligent digital workers. Pre-configured with all the tools and AI capabilities needed to get digital workers delivering business value at speed, Blue Prism Cloud leaves you free to focus your resources on delivering outcomes and rely on us to make sure your digital workforce is available 24/7.

To learn more visit www.blueprism.com or follow us on Twitter @blue_prism and on LinkedIn.

About the HFMA

The Healthcare Financial Management Association (HFMA) is the professional body for finance staff in healthcare. For 70 years, it has provided independent and objective advice to its members and the wider healthcare community. It is a charitable organisation that promotes best practice and innovation in financial management and governance across the UK health economy through its local and national networks.

The association also analyses and responds to national policy and aims to exert influence in shaping the wider healthcare agenda. It has particular interest in promoting the highest professional standards in financial management and governance and is keen to work with other organisations to promote approaches that really are 'fit for purpose' and effective.

The HFMA 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 qualifications are delivered through HFMA's Academy which was launched in 2017 and has already established strong learner and alumni networks.

© Healthcare Financial Management Association 2020. All rights reserved.

While every care had been taken in the preparation of this briefing, the HFMA cannot in any circumstances accept responsibility for errors or omissions, and is not responsible for any loss occasioned to any person or organisation acting or refraining from action as a result of any material in it.

HFMA

1 Temple Way, Bristol BS2 0BU

T 0117 929 4789

E 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