



Northampton General Hospital  
NHS Trust

# RPA: A FORCE FOR GOOD IN HEALTHCARE



[AutomationAnywhere.com/MakeWorkHuman/NHS](https://AutomationAnywhere.com/MakeWorkHuman/NHS)

A vision of how Robotic Process Automation (RPA) can be a force for good across the global healthcare industry, its impacts, benefits, and opportunities. This paper offers a detailed perspective from the UK's National Health Service (NHS) and their RPA Centres of Excellence, and describes the value of RPA for connectivity, collaboration, and productivity across healthcare.

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## FOREWORD



Back in March 2020, I had the privilege of connecting with Neeti at Automation Anywhere, and it became clear that we have a shared vision for robotic process automation to revolutionise healthcare. We were both passionate about using tech for good; troubled by the challenges caused by COVID; and brimming with ideas.

Within the first hour alone, we had discussed how automations could support with COVID immunisations in developing nations, improve cancer treatment times in the UK, and support health insurance uptake in the USA.

This was the start of many hours of collaboration. One thing then became clear: each country and healthcare system has its own challenges. So, instead of building individual automations, let's enable healthcare leaders to solve their own challenges, no matter where in the world they are.

### **Tremaine Richard-Noel**

Head of Emerging Technology & RPA Programme Director  
(Northampton General Hospital NHS Trust, UK)

## SERIES INTRODUCTION

**Whether it's hydration, sanitation, revelation or innovation, there is nothing in our long human history like a pandemic to trigger superhuman feats in healthcare. Northampton General Hospital NHS Trust and Automation Anywhere came together in 2020, to work together to make a difference to support the work of frontline staff dealing with the global pandemic.**

One of the largest organisations in the world, the UK's National Health Service (NHS) has developed a blueprint for entering the 21st century in days, rather than weeks or months. The NHS has become a beacon for the world on how digital automation should be built and delivered to conserve precious organisation resources, and ultimately thousands of human lives. This series of papers considers how the NHS's RPA journey will change the way healthcare systems around the planet view technology, and how intelligent automation can serve their patients and staff.

Throughout this series, we're considering how RPA can, and should, be a force for good within modern healthcare systems across the globe. We're putting a human lens on how RPA can help healthcare systems work smarter, not harder. We're interrogating what RPA really means, and asking "so what?" at every level of healthcare: at an industry level, including our expectations for the future of RPA in healthcare; for the individuals and teams across the sector, and why culture change management is so crucial; across organisations and businesses, including the operational impacts of RPA and the tight cyber security measures that come into play; and for patients, and how digital transformation through technology such as RPA can impact and improve the delivery of excellent patient care and experience.

## EXECUTIVE SUMMARY

**Robotic process automation (RPA) can, and should, be leveraged as a force for good across the global healthcare industry. The COVID-19 pandemic highlighted the need for evolution and acceleration through digital transformation to expedite organisational recovery.**

Future-proofing the NHS and global healthcare systems through implementation of cornerstone digital tools like RPA will deliver efficiencies, provide opportunities for economies of scale, and enable higher productivity. It will also support global sustainability and environmental, social, and governance (ESG) agendas, helping to balance inequalities and improve employee well-being.

For digital transformation to succeed, organisations must lead the change through proactive communication, partnership, and collaboration. This must be supported by alignment with governmental policies and plans, following a strategic vision. As we see this unfold in the UK, we expect more than 80% of NHS organisations to have some form of RPA live by 2023, allowing around 1 million hours of time to be redistributed to higher value tasks, such as those that involve empathy, creativity, or decision making.

With data-heavy tasks automated across healthcare, the impact on data quality, speed and consequent analytics will result in more accurate resource forecasting, clearer decision making, improved clinical outcomes, and overall better experience for both patients and staff.

It is the responsibility of capable organisations such as the NHS to learn, optimise, and shape future innovation programmes across healthcare and the wider public sector. This guidance on innovation adoption and prioritisation will undoubtedly provide late adopters across global healthcare systems—including less affluent nations—with a roadmap to deliver maximum benefit where it's needed most.

## LARGEST EMPLOYER IN EUROPE SEES OPPORTUNITY FOR AUTOMATION TO CONNECT OVER 200 NHS TRUSTS

The UK's National Health Service (NHS) was set up in 1948 to provide the population with healthcare based on their needs, and not on their ability to pay. There are over 220 NHS Trusts (hospitals, CCGs, ambulance trusts and mental health trusts) across the UK, most of which are run and managed as separate organisations. They are not only complex individually, but they are often siloed from each other. More people work for the NHS than any other organisation in the country: over 1.7 million people—around one in every forty—making it the largest employer in Europe, and in the top ten largest employers globally.

Northampton General Hospital NHS Trust (NGH) provides general acute services for a population of 380,000 and hyper-acute stroke, vascular and renal services to people living throughout the whole of Northamptonshire, a population of 684,000. The Trust is also an accredited cancer centre and provides cancer services to a wider population of 880,000 who live in Northamptonshire and parts of Buckinghamshire. It is also the home of the NGH Automation Accelerator programme.

Collectively known with Kettering General Hospital NHS Foundation Trust as University Hospitals of Northamptonshire NHS Group, they aspire to be the most Digital Hospital Group in England by July 2023. The Group aims to take advantage of their combined resources to make improvements to their digital maturity and create a shared infrastructure on which to build.



Our ambition is to be the Most Digital Hospital Group in England by July 2023. Achieving that would mean clinicians are given excellent tools that give them back time to care, patients are in control of their treatment, managers have instant information to drive decision-making and all staff have access to amazing training and support.

### **Andy Callow**

Group Chief Digital Information Officer  
University Hospitals of Northamptonshire NHS Group, UK

Across our NHS Group, we recognised that there were inefficiencies in our ways of working and processes that would benefit from digitisation: automation was identified as a key technology to support our strategic objectives, and to enable future digital innovations.

Following selection by NHSX to become an NHS RPA Centre of Excellence (CoE) in January 2021, Northampton General Hospital's RPA CoE has so far enrolled more than 28 NHS organisations across the UK to their Automation Accelerator programme. By September 2021, the team had identified over 500 potential automation opportunities, or "ideas", across multiple NHS organisations. After assessment for complexity and benefit (return on investment, or ROI) by the Business Process Discovery team, roughly 25% of these ideas have been verified as viable for progression. To date, the potential opportunities identified are projected to repurpose c.115,000 hours—around 50 FTE (full time equivalent)—via automations that's over half a million hours over the next 5 years. We expect this to increase exponentially as more organisations adopt automation and begin cross-pollinating ideas, documentation, and automation components.

In tandem, the NGH Automation Accelerator programme provides teams across the NHS with ongoing education, training, and support to enable, engage and inspire. This generates improved employee morale; promotes and enables the sharing of knowledge, data, and successes across the wider NHS, leading to economies of scale and ultimately higher return on investment (ROI); and offers personal development opportunities for our colleagues through upskilling, with a focus on next-generation skills.

As an RPA CoE, we have been able to unify and connect the individual organisations within the NHS, and influence and rapidly upscale automation capabilities both in our Trust and across the wider NHS. This has given us the opportunity to develop best practice recommendations for RPA adoption and development across the organisation nationwide, in partnership with leading software vendors such as Automation Anywhere.

## LEVERAGING RPA TO HELP HEALTHCARE WORK SMARTER, NOT HARDER

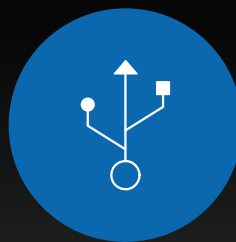
Simply put, Robotic Process Automation (RPA) is a form of business process automation using software robots, also known as automations or virtual / digital workers. These digital workers interact with the “back end” and the “front end” of a system. A front-end digital worker can do everything a human can, such as opening documents, clicking, and typing, etc.—allowing data to be transacted between systems, databases, digital forms, or even many Microsoft Office products. Based on predefined rules and process steps, an automation can mimic the way a human completes a process.

This technology not only mimics exactly what you do on your computer, but also runs 24 hours a day, any day of the week, and often finishes the task faster with fewer errors. Think of automations like additional team members, here to support your existing team.

**Automation is typically applicable to stable, rule-based, repetitive processes that require standard input, such as processes that involve:**



Data movement from one spreadsheet/system to another



Heavy data manipulation, sorting and formatting to create an output



Completing one part of a bigger process + passing it over to someone else to do the next bit



By allowing tasks like these to be completed by automation, you will be able to repurpose the time otherwise spent. Employees are freed up to fully focus on high-value or high-priority activities, such as complex strategising, patient care, or face-to-face interactions, which require cognitive input.

Although many industries focus on RPA implementation to reduce costs and overheads, [the UK government has acknowledged](#) the need to increase staff numbers, noting that the biggest shortfalls were in nursing. Even before the pandemic, by the start of 2020, there were nearly 40,000 nursing vacancies in the NHS, a rate of 11%. For the NHS, and much of the wider healthcare industry, RPA allows us to “work smarter, not harder” to optimise the services we provide, and improve our staff well-being.

## RPA allows us to “work smarter, not harder”.

Long term, automation is relatively low-cost and easy to implement, with no need for deep system integration. It offers fast and reliable integration into processes and digital assets.

Designed to be scalable, automation software can easily adapt to your requirements. Crucially, the software vendors also offer future proofing, with the capability to handle the technology of today and tomorrow. RPA is gaining awareness and traction across the healthcare sector, and rightly so: it plays an important role in supporting and enabling the adoption of further technological developments and improvements.



The benefits of automating processes across any organisation are near-endless, and apply to all sectors, not just healthcare. We'll dive deeper into these as we address the potential impacts and benefits of RPA across healthcare, from an organisational level, to patients, and to staff:



**Hard return on investment (ROI)**

Capacity repurposing, cost reduction, economies of, scale etc., maximising the productivity of your existing workforce



**Improved clinical outcomes and patient experience**

Reduction of clinical risk/harm through increased data accuracy and tracking, increasing patient visibility of processes + quicker turnaround times



**Growth of global knowledge + resources**

Increasing accuracy of data + analysis (digitisation of data as a precursor)



**Improved regulatory compliance**

Data is easily tracked, analysed, + audited



**Improved data security**

Data handoffs require less manual handling, reducing exposure



**Increased efficiency**

Maximising the productivity + capacity of existing workforce



**Improved staff morale and experience**

By enhancing human value + reducing task inundation



**Improved data quality human error removal**

Providing improved reporting, analytics and decision making



**On-demand scalability with endless opportunity**

For improvement and application of further innovations, such as AI





Technology serves but one purpose: human enablement. RPA + AI fulfils the promise of putting patient and front-line-worker experiences into clear focus. This technology saves time, improves process accuracy and makes the impossible, possible for folks everywhere. This is especially important in healthcare, where its impact is most profound.

**Neeti Mehta Shukla**

Co-founder, Social Impact Officer at Automation Anywhere

While the adoption of RPA across the NHS has been staggered, and varies hugely from organisation to organisation, the overall message is clear: RPA can help support the ongoing growth and development of healthcare services and their associated data pools both nationally and globally. Within the NHS to date, we've seen a wealth of RPA use cases, including many across HR, IT, Finance and Clinical areas. NHSX and the RPA Centres of Excellence have predicted that if the current rate of adoption in the NHS continues, up to 579,727 hours a year **could be saved in non-clinical staff time by 2025, the equivalent of 66 years.**<sup>1</sup> This would in turn allow those staff to support more patients or focus on other work to improve patient care, instead of spending hours manually processing backlogs of admin—which have grown more extensive thanks to COVID-19.

Back in March 2020, our team at NGH developed a digital automation for 24/7 oxygen monitoring during the pandemic, because of the increase in demand driven by COVID-19. We needed to ensure that we had constant, consistent, and accurate oxygen readings. The existing process required staff to manually log into a system and physically collect a reading from our two tanks every six hours, which was about to shift to more frequent checks. With the pandemic increasing in intensity, the team at NGH knew that we needed to free up resources and increase data quality to provide the best quality patient care. Although there were no anticipated issues with the supply, in just 12 hours, and by working through the night in conjunction with technology companies Automation Anywhere and boxxe, the team created an automatic process which allowed them to **monitor the oxygen levels 24 hours a day without human intervention, and with 100% data accuracy. This enabled the hospital to repurpose over 1,500 hours of staff time over the course of the year.**

<sup>1</sup> Source: NHSX Value for Money (VFM) projection assessment. This assumes an annual uptake of RPA by the NHS in England based on the current rate of adoption.

# OXYGEN BOT

NHS HOSPITAL IMPLEMENTS FIRST-OF-ITS-KIND BOT FOR 24/7  
MONITORING OF CRUCIAL OXYGEN SUPPLY FOR COVID-19 PATIENTS



24/7

Monitoring of oxygen  
levels without human  
intervention



1,500

Hours of capacity  
redirected to value-added  
activities



100%

Data input accuracy,  
eliminating clinical risk



Launch of the Oxygen Bot gave us confidence in automation and proved that innovation doesn't need to stop in a crisis. Delivering precious time back to our colleagues at the height of the pandemic gave us the courage to explore RPA and other technologies further, and to prioritise automations that can be shared with other NHS organisations.

**Tremaine Richard-Noel**

Head of Emerging Technology & RPA Programme Director  
(Northampton General Hospital NHS Trust, UK)

Since the launch of our first automation at NGH, the NHS has increased its interest in RPA and the potential impact. We've seen organisational awareness, confidence and empowerment grow—both in the technology itself and in the speed of implementation, which is often prohibitive for digital transformation. It is examples such as this that have enabled widespread adoption. Our "Oxygen Bot" has since been repurposed into other NHS Trusts, driving economies of scale, and—importantly—proving that innovation doesn't need to stop in a crisis.

## COVID HAS HASTENED HEALTHCARE'S DIGITAL TRANSFORMATION

It's no secret that the global healthcare industry has had a tough few years. A 2020 World Health Organisation (WHO) report confirmed that we are experiencing rising costs of healthcare worldwide, to more than 10% of global GDP. This is driven by increasingly complex patient needs, legislation compliance requirements, and continuity / integration of care on a level that's never existed before. At a time when healthcare spending had stabilised and the industry could make relatively accurate forecasts and predictions, COVID-19 threw the world into uncertainty, and exacerbated the challenges of already overburdened staff, systems, and resources. Now, the world is recovering from the pandemic, working to regroup, and further improve delivery of care and experience, both for patients and staff.

### We can and should embrace digital innovations, to enable and deliver benefits across healthcare systems globally.

As an industry, we can and should embrace digital innovations, to enable and deliver benefits across healthcare systems globally. A digital transformation revolution will empower both staff and patients, lifting the burden on archaic or obsolete systems, many of which hinder interoperability. RPA—being relatively simple to understand, and not requiring deep system integration—is a fantastically placed foundation for this revolution.

Across the global healthcare industry, there are common issues and hurdles: inefficient processes, less-than-optimal productivity, and lack of economies of scale. We experience this across the UK's NHS to varying degrees—as other large organisations will also—which is further compounded by limited funding for digital transformation.

COVID-19 was an unexpected crisis which threw not only a huge amount of pressure upon the existing healthcare workforce, systems, and operational capabilities, but also led to shortages in multiple resources, including staff. For us, this triggered an unbelievable burden on our National Health Service, impacting patients and staff alike.

## FUTURE-PROOFING THE NHS

The UK is continually searching for ways to support delivery of the [NHS Long Term Plan](#): a plan to “make the NHS fit for the future, and to get the most value for patients out of every pound of taxpayers’ investment.” This includes the optimisation of our ways of working, systems, and processes to free up precious time from our busy colleagues. This time can be repurposed towards higher value work that only humans can do, such as tasks requiring face to face interaction, empathy, creativity, problem-solving, and decision-making. In turn, this will improve patient care, outcomes, and experience, all whilst ensuring that every pound is spent effectively and wisely.

Time can be repurposed towards higher value work that only humans can do, such as tasks requiring face to face interaction, empathy, creativity, problem-solving, and decision-making.

As a publicly funded entity, the NHS faces a constant struggle to balance the NHS budget amidst the rising cost of healthcare globally, which is further compounded by the UK’s aging population and increasingly complex healthcare needs.

The UK government is continually working to secure further funding for the NHS, and in [September 2021 promised an additional £5.4bn for NHS COVID-19 response](#) over the next 6 months to help manage England’s backlog and aid recovery of services and resources. In addition, NHSX (the digital innovation and transformation arm of the NHS) recently announced a [Unified Tech Fund](#), which brings together several national technology funds [and a £250 million Elective Recovery Technology Fund](#), which has been established to help implement digital solutions that will make a real difference to elective recovery. This amounts to a further £930 million available to NHS organisations throughout the financial year 2021 to 2022 to build a better future for the NHS.

Digital innovations and improvements have incredible potential to transform the way that the NHS and other large scale healthcare providers deliver care. These innovations provide an opportunity to help meet some of the key priorities of the NHS: supporting the health and well-being of staff—which we will study in more detail in a later paper—[transforming the delivery of services](#) and expediting organisational recovery.

Faced with a never-ending stream of new demands and challenges, the NHS had to adapt and evolve. The pressures of COVID-19 triggered a redirection of resources, including the redistribution of front-line and back-office staff, producing impacts such as postponements in the [collection and publication of some official statistics](#). COVID-19 also caused significant backlogs across the healthcare sector—the result of cancellation of non-emergency operations, patients waiting longer before seeking treatment, and other complicating factors.

**Innovation does not need to stop in a crisis. We are in a new era of technology—the digital transformation era—where we can communicate, innovate, and create digital solutions quicker than ever before.**

Importantly, the NHS learned that innovation does not need to stop in a crisis. We are in a new era of technology—the digital transformation era—where we can communicate, innovate, and create digital solutions quicker than ever before. For our team here at NGH, we not only launched our Automation Accelerator RPA programme within the space of a year and built our first automation within a day, but we did this during a global health crisis.

If you asked us a year ago, we would not have thought this was possible, but here we are with an active national RPA programme at Europe's largest organisation, sparked by NHSX—the innovation arm of the NHS. Now, we know that nothing is impossible with the right team, strategy, ambition, and skills. If it can be done within the uniquely complex, mammoth organisation that is the UK's NHS, then I ask: what's stopping you?

At NGH alone, there are currently over 220 clinical IT systems in use across the Trust, many of which are archaic and/or cumbersome and therefore aren't interoperable, making it difficult for clinicians to have access to the right information at the right time. This lack of system and data cohesion is reflective of most NHS organisations nationally.

Despite this adversity, the NHS has successfully initiated great innovation in response to the COVID-19 pandemic, such as a substantial increase in virtual outpatient appointments and the roll out of several remote patient monitoring technologies that support care. In March 2020, because of the pandemic, NGH implemented our first [automation within the Trust: to automate the monitoring of oxygen supply](#).

The use of RPA is reducing the number of repetitive tasks, and machine learning is revolutionising the way we use the wealth of data that the NHS collects. Automation Anywhere RPA has been deployed in multiple NHS organisations across the UK, with other RPA technologies live also, totalling 40+ NHS organisations. It is applicable to multiple processes, particularly administrative tasks.

A [recent NHSX study](#) indicated that 52% of NHS Trusts had implemented some form of automation technology to varying extents, although limited due to cost. We at NGH have also observed that Trusts may not understand that automation requires longer-term commitments—including maintenance, optimisation, the actual investment and effort, and the skills required to deliver.





## RPA JOURNEYS WITHIN THE NHS AND HEALTHCARE

Within the NHS, we identified that it was beneficial and efficient to begin automation adoption within a single department, and so identified “key departments” (IT, HR, Finance) to drive the change, rather than aiming for Trust-wide adoption initially.

This enabled us to quickly build up a bank of key departmental automation ideas to share with other NHS organisations. The NGH Automation Accelerator Community Hub—an online platform designed to support, educate, engage and inspire our NHS colleagues as they progress their automation capabilities—will house these ideas in a digestible format. This bank now consists of more than 500 ideas, each of which is assessed for complexity, benefits, and ROI, with about a quarter of these deemed viable for progression.

As a connected national organisation, we can all learn from each other’s experiences, including both successes and learnings. The more organisations that adopt automation or develop their capabilities, the more efficient our learning journey as a national organisation has the potential to become, and the more valuable automation becomes as a tool for growth.

## USE CASES



**Omer**  
IT Department  
Records Merger  
0.6 Organisational FTE

### Automation Accelerator

Omer merges patient records on ICE platform.

#### The Solution

The automated solution would:

1. Identify patient record exceptions on ICE by their exception classification code.
2. Validate the records that could be merged by criteria (name, date of birth, address, gender).
3. Merge the records if the qualifying criteria are achieved.
4. Communicate any records that could not be matched back to the Clinical Apps team for investigation.

#### Additional Benefits

- Capacity released back into the Clinical Apps team.
- Removal of human inaccuracy by automating strict qualifying rules.



**Del Conroy**  
Outpatient Process  
Administrator  
6.94 Organisational FTE



Northampton General Hospital  
NHS Trust

Del populates a spreadsheet with clinic appointment outcomes and transfers data to the Lorenzo (PAS) system.

#### The Solution

The automated solution would:

1. Pick up the emails from the inbox.
2. Open Lorenzo.
3. Input the correct outcome for the 6 scenarios that take up a majority of the outcomes.

#### Additional Benefits

- Gives back a significant amount of time to admins so they can get on top of the backlog.
- Provides up-to-date data that feeds into the national returns reports.

# AUTOMATION IN GLOBAL HEALTHCARE



**Daniel Kennedy**  
Intelligent  
Automation  
Services Manager



Technology like RPA has been available for years and the benefits are huge for businesses. Get started. Absolutely don't wait.

## The Solution

Using Mindfields Consulting, an RPA and artificial intelligence (AI) advisory firm, St John of God Health Care chose the Automation Anywhere platform because of its high Gartner rating and substantial partner network. In less than nine weeks, the first bot was put into production. To date, 12 bots are in production with 12 processes automated: 5 in billing, 4 in receipting, 2 in accounts payable and 1 in management accounting.

## Processes Automated



Billing



Receipting



Accounts payable



Management accounting



**Mohit Sharma**  
Founder and Executive  
Chairman, Mindfields  
Consulting



We are a proud partner of St John of God Health Care's intelligent automation journey to optimize operation costs. It aligns with our vision to help our clients 'grow for tomorrow'.

## The Solution

The company also plans to implement Automation Anywhere's Bot Insight, a platform that automatically generates dashboards and provides ROI analysis. The framework is currently being developed to reduce the requirement to manually create reports.

## Processes Automated



Clinical documentation



Scheduling



Patient appointment reminders

## AUTOMATION IN GLOBAL HEALTHCARE



**Russell Olsen**  
SVP of Innovation and  
Product Management  
at WebPT

**WebPT**



The Automation Anywhere platform has helped us fulfill our mission by increasing our data processing capabilities and automate time-consuming manual tasks.

### The Solution

Since WebPT is fully cloud-based and serves a highly-regulated industry, the company required a secure, web-based solution that would not only streamline employee workflows but also deliver a better customer experience by eliminating the strain on resources that often comes with switching EMRs.

As the world's first web-based and cloud-native RPA-as-a-service, the Automation Anywhere platform was the clear choice.

### Processes Automated



Clinical  
documentation



Scheduling



Patient  
appointment  
reminders



**Richard Mendoza**  
Automation  
Capabilities Leader

**Lilly**



We're excited to see the quick wins automation has delivered to the business. Now, we're leveraging those wins to drive automation deeper into customer-facing processes.

### The Solution

In June 2018, Eli Lilly Japan began deploying RPA from Automation Anywhere in its HR, sales, marketing, and clinical functions. The processes automated include personalized honorarium payment notifications to sales representatives, congress seminar-related operations for marketing, doctor visit suggestions to sales representatives, as well as document generation and notification for the clinical development function.

### Processes Automated



Sales  
processes



Marketing  
processes



HR processes



Clinical development  
processes

## THE FUTURE OF HIGHER EDUCATION WITH RPA INTEGRATION



Dr Patrice Seuwou  
Senior Lecturer at University of Northampton:  
Business Systems and Operation, Faculty of Business and Law

Universities and colleges worldwide are facing one of the most challenging periods of their history due to disruption caused by Coronavirus (COVID-19). This has forced various levels of change that have affected employees' life at every level. This industry is becoming increasingly competitive, driven by flat enrolment and a changing student demographics.

With students at the centre of the education system in the UK, senior management teams are under massive pressure to innovate and improve students' experiences in this process. They are re-examining their operations, with a growing interest in digitalization. We are seeing spending growing faster than revenues, students paying higher fees and expecting quality service. This is encouraging most higher education providers to seek alternative technological solutions to decrease expenses, improve the service they provide and boost up their revenues.

With students, employees (academic staff and administrative staff) and partners all working remotely, more and more institutions are eager to accelerate their digital transformation. As in numerous sectors and industries, RPA is increasingly being leveraged as a potential efficient solution for cost savings and to boost productivity, modernising administrative operations and pursuing academic excellence. The research firm Forrester predicts that the worldwide market for RPA services will grow to \$12 billion by 2023 (Joseph et al, 2019). This reference represents a convincing argument for higher education providers and their stakeholders to adopt the RPA-based solutions.

## How Can RPA Automate Education Processes?

RPA application in higher education could bring multiple benefits to all stakeholders, for example, bots could carry out a variety of manual processes to help ensure that the institution systems run efficiently. The main objective would be to help administrative and academic staff in all departments as highlighted in table 1. This will enable them to focus on providing students a high quality and interactive education rather than wasting time on repetitive manual processes.

**Table 1.** RPA in HigherEducation perspectives (Adapted from Turcu and Turcu, 2019)

Administrative staff perspective	Academic staff perspectives	Students' perspectives
<ul style="list-style-type: none"> <li>Tracking the admissions and applications processes</li> <li>Tracking payments</li> <li>Course registration</li> <li>Attendance management</li> <li>Data updates and validation</li> <li>Handling of various student records, reporting and even data analytics</li> <li>Extracting data from emails, forms and documents of various formats (PDFs, Scanned documents, etc.)</li> <li>Generating mass emails</li> <li>Creating and delivering invoices</li> <li>Producing of periodic required reports</li> <li>Enabling easy performing of IT operations</li> <li>Managing meeting schedules</li> <li>Updating inventory records</li> </ul>	<ul style="list-style-type: none"> <li>Attendance tracking</li> <li>Student assessment and grading</li> <li>Enabling efficient communication with administration and students</li> <li>Extracting data from emails, forms and documents of various formats (PDFs, scanned documents, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Fast performing of IT operations</li> <li>Extracting data from emails, forms and documents of various formats (PDFs, scanned documents, etc.)</li> <li>Extract necessary data from the web</li> </ul>

The university admissions, finance and HR process are great examples where the implementation of RPA can be highly beneficial, with it being a very long and manual process, including course registration, shortlisting and enrolment. The development of the RPA-based bots will simplify the process of downloading and organising the online learning material including lecture notes, slides, and test papers.

### References

C. Turcu and C. Turcu. (2019) ["On robotic process automation and its integration in higher education," International Conference of The Future of Education \(ICT4777\), pp. 1-5.](#)

## RPA AS A FORCE FOR GOOD

We are entering an era of digital transformation acceleration, and consequent improvement of care and healthcare services globally. We're beginning to see the adaption of governmental focus towards digital transformation and expect there to be further funding in the coming years as return on investment and economies of scale become clearer and more comprehensively proven. RPA is making strong headway across the NHS in the UK, transforming the organisation as we know it, and in doing so, enabling future technological advancements through digitisation of data and workflows.

### RPA is making strong headway across the NHS in the UK, transforming the organisation as we know it.

We believe that data, analytics, and knowledge sharing will become increasingly valued in this era of digital connectivity, both within the NHS and across the global healthcare industry. A collaborative, global approach is likely to lead to broader clinical advancements; prioritisation of precious resources; quicker analysis of data; faster turnaround times; and therefore, improvements to clinical outcomes and patient care experience.


As the healthcare industry increasingly values digitisation and adapts, evolves, and develops beyond its archaic current systems, staff, teams, and organisations will experience improved outcomes.


## SHAPING FUTURE HEALTHCARE INNOVATION: NHS CoEs AND AUTOMATION HUBS


The creation of the RPA Centres of Excellence, kickstarted by NHSX, means that we can centralise the process of automation adoption and roll out across the wider organisation, increasing efficiencies, in terms of time, resources, and associated implementation costs.


Additionally, we're aiming for the NGH Automation Accelerator to become a hub for information and knowledge, capturing quantitative and qualitative data throughout the adoption process. Our aspiration is to learn, optimise, and help shape future innovation programmes across healthcare and the public sector.


## Blueprint on a page: NGH areas of expertise


- 


**1.** Building a business case **for RPA**
- 


**6.** Business process discovery: **Envision + Ideation**
- 


**2.** Software procurement and **economies of scale**
- 


**7.** Business process discovery: **Assessment**
- 

**3.** Governance and **leadership**
- 

**8.** Automation **build, test and delivery**
- 

**4.** Building **a team**
- 

**9.** Automation **optimisation and maintenance**
- 

**5.** **Change management** and impact
- 

**10.** Automation **change management**

## LEAD CHANGE THROUGH COMMUNICATION, PARTNERSHIP, AND COLLABORATION

The impact of RPA adoption on individual colleagues and teams cannot be underestimated. Backing our workforce as they adopt innovations and providing them with the tools for successful culture change is crucial.

The roll out of RPA in any organisation can be a daunting experience for impacted colleagues. Resistance is normal, and can stem from a multitude of misconceptions, myths, and fears stemming from misunderstanding or mismanagement of digital transformations in the past. Creation of a strategy and plan to encourage adoption, education, and engagement is critical in ensuring automations will effortlessly fit into the existing or amended processes within a department and will increase the chance of acceptance and utilisation by the team. Change impact assessments, assessing the level of impact that the change is likely to have within the organisation or team (including identification of people, processes, systems, etc. involved), will allow colleagues to prepare in advance of the changes happening. Assessing this change impact will also support a smooth go-live, as everyone will know their part in the new “to be” process and will feel confident that they have all the tools/ access in place to perform the new actions that relate to their role.



For technology such as RPA, we believe that engagement must work both from the top down, and the bottom up. We are committed to providing our colleagues across the NHS with ongoing education, training, and support to enable, engage, and inspire. Our hope is that this generates improved employee morale, opportunities for personal development, and active sharing of knowledge and successes across the wider NHS. Communication, partnership, and collaboration will play a large part in the successful adoption of RPA: we expect those organisations that acknowledge and act on this to succeed with implementation quicker, to a higher standard or degree, and/or see more complete adoption across their organisation.

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## RPA TO DRIVE ESG AND SUSTAINABILITY WITHIN HEALTHCARE

RPA has the potential to play a role in the global sustainability agenda. There are many facets to sustainability: environmental, societal—including equality—and the comprehensive governance structures that support the agenda.

The United Nations (UN) has specified a bank of [17 tangible goals](#) to deliver sustainability globally. In addition, NHS England has set an ambitious goal to be the [“world’s first net zero national health service”](#). There are two targets that underpin this:

- For the emissions we control directly (the NHS Carbon Footprint), we will reach net zero by 2040, with an ambition to reach an 80% reduction by 2028 to 2032.
- For the emissions we can influence (our NHS Carbon Footprint Plus), we will reach net zero by 2045, with an ambition to reach an 80% reduction by 2036 to 2039.

We are already seeing how data can be a force for good and transform the public sector by shaping policies and plans. However, when considering the global sustainability agenda, it’s important to recognise that the playing field is not equal. Lack of resources—including funding, skills, and technical capacity or [hardware](#)—are a limiting factor for many [underdeveloped nations](#). This means that their ability to gather high quality data, process it, and act on the results is limited.

Therefore, at an industry level it is the responsibility of “those who can” to ensure that data is used wisely to improve global healthcare, and for RPA to support by ensuring the consistency, continuity, and quality of this data. If organisations like the NHS can connect their data fully, they have the power—and the duty—to steer the prioritisation of data in less affluent countries, so we can ensure maximum ROI and benefit where it’s needed most. There are opportunities to explore tools such as Automation Anywhere’s AARI to minimise some of the limiting factors mentioned above.

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Not only does the tracking and measurement of sustainability metrics involve a huge volume of data across multiple sources, but the impact of successfully sharing, analysing, and learning from the data at our fingertips is incredibly powerful and exciting.

Consider the role of RPA for improving equality. Automations are capable of being built without inherent bias—the key word here is “capable,” as there is always a danger that bias can be inadvertently introduced into an automation. That is why we at the NHS impose strict governance surrounding each individual build. For decisions where systemic or unconscious bias could come into play, RPA automation can deliver greater equality in areas where discrimination might have been an issue in the past.

A recent NHS report—[A fair experience for all: Closing the ethnicity gap in rates of disciplinary action across the NHS workforce](#)—revealed that, in 135 out of 223 NHS Trusts, the relative likelihood of a BAME (black and minority ethnic) staff member to be adversely impacted by the formal disciplinary process was higher than 1.25. With the use of RPA, we aim to balance this inequality by implementing more stringent and centralised processes, which require higher quality data input for the case to be delivered to a senior member of staff, before a decision can be made. We expect that RPA can play a role in equality relating to gender, race, disability, and across other protected characteristics.

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## 2023 PREDICTION: NHS RPA WILL REPURPOSE 1 MILLION HOURS OF TIME

We predict that 80% of NHS organisations will have some form of RPA live by 2023, with more than 50% of those having multiple live automations. Assuming a minimum benefit of 2 FTE (3,900 hours combined annually) per automation in each organisation, this would result in nearly 1 million hours of time—equivalent to an additional c.535 staff—repurposed each year across the NHS.



**2 FTE**

Per automation in each organisation  
(3,900 hours combined annually)



**1M**

Hours of time—equivalent to an additional  
c.535 staff—repurposed each year across the NHS

As RPA increases data accuracy and quality, we would expect to see a rise in accuracy of the consequent analytics. This means that the healthcare industry, and the individual organisations within it, will be better able to accurately forecast their requirements for resources and funding, as well as spot patterns and anomalies easier. We expect RPA to deliver a better understanding of past and current (real-time) business processes and capacity, better supporting decision making, and improving efficiency and performance. This will undoubtedly increase as more data is gathered.

At present, many organisations have never considered their individual or cumulative processes, and the resources currently used to perform data-driven, rules-based administrative tasks. As a result, we believe that not only will RPA deliver direct improvements to efficiency and productivity, but it will also lead teams and organisations to critically evaluate their current work processes and make improvements. For example, the NGH team have built a single web form to replace the use of up to 11 previously individual paper-based HR forms.

The digitisation of information also opens many doors: for example, with the support of RPA we can make use of global resources, using skills where they are available—anywhere in the world. We could analyse data in areas such as cancer pathways, where the NHS has been limited by the number of specialists available in the UK.

## IMPROVED PATIENT EXPERIENCE

RPA can improve both the speed and accuracy of information for clinicians, which should result in faster turnaround times for patients and more accurate diagnoses. Clinicians currently use a vast amount of patient data, including personal information and previous care records. RPA can support in keeping these records up to date, maintaining data integrity, and optimizing data archives. Connecting RPA with analytics software could mean that valuable insights are more readily available.

In addition, RPA may also help increase the visibility and transparency of individual patient care. Automations can speed up many patient-centric processes, such as scheduling of appointments and approval of referrals, or automatically communicate the correct information directly to the patient, often instantly.

The NGH team have recently identified a process that could save over 1,400 FTE (over 2 million hours of time) across the NHS: patient e-referrals. This process uses the same system across much of the NHS network (which is rare) and processes around 70,000 patient referrals daily—around 25 million a year. A built-in triage system will automatically prioritise patients based on their healthcare needs. The potential impact for patients—both in terms of experience and, most importantly, clinical outcomes—is huge, particularly for those on the “2-week wait” cancer pathway or similar.

### RPA will likely have a positive impact on the way patients are treated, both medically and socially.

We also expect that some individual automations that have a minor impact on patients and their experience will collectively accumulate benefits over time. For example, automation of HR, finance, and IT processes may not directly impact patients in the short term, but the impact on staff well-being, including job satisfaction and overall morale across the organisation, will likely have a positive impact on the way patients are treated, both medically and socially. In addition, the automation of patient-centric and clinical processes will undoubtedly have a positive impact.

Although difficult to track, we hope to see these benefits reflected in patient survey data across the NHS over the coming years. We are interested to see whether organisations with a higher digital maturity level—including but not limited to automation implementation—will correlate to overall happier, healthier patients. Another area we’d expect to see an impact is in complaints and volume of incoming service and support communications. For example, if a patient is automatically being updated with information on their next appointment, we expect to see a decrease in incoming calls, emails, and other forms of appointment inquiry.

## HOW TO LEVERAGE RPA AS A FORCE FOR GOOD

Public sector organisations are gathering momentum on the journey towards comprehensive digital transformation. As with any innovation, we expect there to be varying degrees of RPA adoption, with some organisations taking the leap early—which we’re already seeing now—and some organisations holding back and waiting to see clear, tangible evidence of the benefits before they change their current ways of working.



The world is changing rapidly and in the 21<sup>st</sup> century, automation will not only be the problem of people working in manufacturing but a challenge cutting across all sectors. Our objective as educators will be to harvest the power of robotics, AI and automation to eliminate repetitive tasks and focus on activities that humans are uniquely positioned to accomplish. Therefore, these adjustments should not be feared but should be embraced.

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There is opportunity for the early adopters, such as the NHS, to construct a clear adoption model for RPA across healthcare, indicating the best places to start and the key areas for improvement linked directly to their own strategic objectives.

## Act now: to lead the journey, and share knowledge, insights, and learnings.

The healthcare industry is facing new challenges daily, and readily available funding is critical to fully support digital transformation. The alternative is an increasing backlog and lack of data coordination, leading to poorer patient outcomes and staff well-being. The UK government's pledge of billions of pounds to support this places the NHS in a unique position. As one of the largest organisations in the world, we have access to a wealth of skills, resources, and data that smaller, less advantaged healthcare systems globally would normally not enjoy. It is our duty to act now: to lead the journey, and share knowledge, insights, and learnings as we progress our own digital transformation. It is also the duty of governments to support the digital transformation agenda in any way possible, either through funding or legislation.

## We believe that we can change the way patients and staff experience and are serviced by healthcare organisations globally.

In this series of white papers, we will cover each of our hypotheses discussed in this paper in more detail, and work to provide a roadmap of learnings and recommendations for other healthcare organisations so they can better support and serve their patients and staff, and experience the benefits of RPA across their organisation. We recommend that organisations consider what "good" looks like for them: for the teams and individuals working with RPA on a day-to-day basis; their organisations and how RPA can help them reach their strategic goals; and the potential for RPA to improve clinical outcomes and patient experience. With a holistic approach to RPA as a foundation for digital transformation within healthcare, we believe that we can change the way patients and staff experience and are served by healthcare organisations globally.



## ABOUT AUTOMATION ANYWHERE

Automation Anywhere is the world's leading cloud-native automation platform on a mission to help millions of organizations to grow better. We built automation that empowers businesses to transform the way they adapt, innovate and scale.



**Northampton General Hospital**  
NHS Trust

## ABOUT NORTHAMPTON GENERAL HOSPITAL AND THE AUTOMATION ACCELERATOR PROGRAMME

Northampton General Hospital (NGH) NHS Trust's Automation Accelerator programme forms one of two Robotic Process Automation Centres of Excellence in the UK's National Health Service (NHS), with a team of dedicated experts leveraging technology to transform the way we work across the NHS.

In 2020, Northampton General Hospital and Kettering General Hospital announced the formation of a Group Hospital Model: University of Hospitals Northamptonshire (UHN). NGH alone provides general acute services for a population of 380,000 and hyper-acute stroke, vascular and renal services to almost 700,000 people living throughout Northamptonshire. We are an accredited cancer centre, providing services to 880,000 people who live in Northamptonshire and parts of Buckinghamshire.