



RPA in the NHS

Guidance for designing, delivering
and sustaining RPA within the NHS

Foreword

The successful and sustained implementation of Robotic Process Automation (RPA), and wider automation capabilities, presents an incredible opportunity to make a meaningful difference in delivering improved patient care, enhanced staff experience and increased process efficiency across the NHS and Social Care. One of the Secretary of State's missions is to tackle the impact of the pandemic on waiting lists by building a more efficient healthcare system through rapid digital transformation. Automating mundane and repetitive tasks, such as patient registration and data uploads, will save time on administrative work, which then enables staff to redirect their expertise to more value-added tasks and spend more time with patients.

Automation, specifically RPA, as a transformation enabler can accelerate the adoption of digital technologies within health and care. This technology can play a key role in elective recovery by freeing up capacity and significantly improving productivity and efficiency in the NHS and Social Care.

We are delighted to offer this first ever national guidance, developed by the NHS Transformation Directorate and Atos, to support you in your automation journey. In this guidance, we have shared good practice on planning and delivering RPA solutions, how to sustain delivery and key considerations with regard to clinical safety, and standards that should be a key feature of all RPA programmes. We hope this guidance enable organisations to not only consider RPA as a technical solution, but as a tool that is part of a wider transformation agenda, with our people at its centre, that can support the digital transformation of service design and delivery.

Our mission is to continue to support you in your digital transformation journey by providing the [right tools](#) and encouraging discussions locally, depending on where you are today in your RPA journey. We hope this guidance acts as a valuable resource as you start or continue to deliver outstanding, digitally enabled care to the NHS and Social care.

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[Jump to appendix](#) to see our vision for adoption of RPA in health and care

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01

Guide to understanding RPA



01

Guide to understanding RPA

Chapter contents

Definition

- Introducing automation
- Defining RPA, IA, and AI

Unpacking RPA

- RPA deep dive
- Benefits of RPA
- Strengths and limitations
- Identifying opportunities
- Prioritising opportunities
- Current use cases
- Mythbusters

Definition – Introducing automation

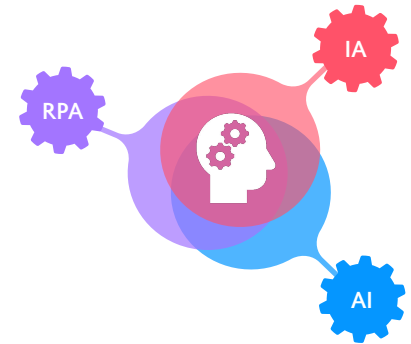
Automation is used to refer to a cluster of technologies including Robotic Process Automation.

About 'Automation'

The term 'Automation' describes a wide range of technologies that reduce human intervention in processes. Human intervention is reduced by predetermining decision criteria, subprocess relationships, and related actions, and embodying those predeterminations in software or machines.

Defining 'Automation' in the context of operational / business process improvement

In the context of business process improvement, automation capabilities have progressed along a continual spectrum as a variety of technologies have evolved and matured over recent decades. These technologies can be clustered into three distinct groups based on actions they enable, and the level of sophistication and degree of complexity of technical solutions used. These clusters are Robotic Process Automation (RPA), Intelligent Automation (IA) and Artificial Intelligence (AI).

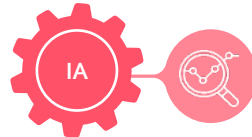


Definition of 'Automation' clusters:



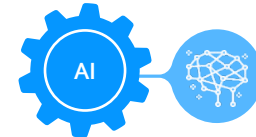
Robotic Process Automation

RPA is a technology that enables the build, deployment, and management of software (robots) that can be programmed to emulate human actions and interact with digital systems in order to automate basic manual and repetitive tasks.



Intelligent Automation

IA refers to the integration of robotic and intelligent systems from various emerging technologies, thereby increasing the scope of automation beyond simple rule-based tasks.



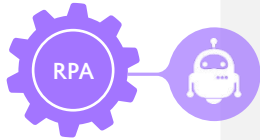
Artificial Intelligence

AI is the simulation of human intelligence or cognitive processes such as problem solving, visual perception, speech recognition and decision making by the computer systems.

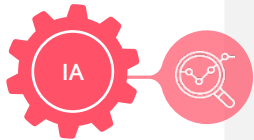
Definition – RPA, IA and AI

Automation can support and enable staff to digitise and/or enhance clinical and business processes across all levels of the organisation.

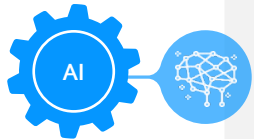
Increasing technology and process complexity



Robotic Process Automation imitates activities carried out by humans. It can automate high volume, rule-based, repeatable tasks, delivered just like its human counterparts. However, RPA can only handle structured and digitised data.



Intelligent Automation uses more sophisticated technologies than RPA for structured decision making. It can simulate rule-based decisions to automate more complicated tasks. It mainly handles structured data, but some IA technologies can digitise unstructured data to further enable RPA.



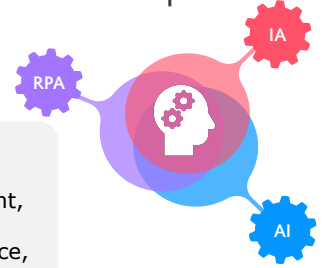
Artificial Intelligence refers to computer software with the ability to think. It allows examining of large, unstructured, varied data sets to uncover hidden patterns, trends, customer preferences and other useful data that can help inform better decisions.

Example use cases

- Front office: Patient administration, Appointment scheduling
- Middle office: Operational and service management, Report generation and distribution
- Back office: Corporate functions like HR and finance, Claims administration

- Front office: FAQs customer assistant, Medical Secretary, OP Call centre
- Middle office: Patient enrollment and eligibility, Theatre scheduling
- Back office: Physician credentialing

- Front office: Patient data analysis and triage to assist referrals – eConsult, eTriage
- Middle office: Fraud detection and risk management
- Back office: Medical imaging analysis support – Clinical administration of diagnostic support services



Example technologies

- Intelligent content recognition or extraction
- Natural language processing

- Natural language generation
- Machine learning

Unpacking RPA – Overview

RPA should always be considered as part of a wider, people-focused, transformation that will enable efficient work delivery in the NHS.

Today's technology impact

Emerging technologies used sporadically across the health and care system with ability to scale proving to be a significant challenge.

Continued struggle with volume of work vs continually increasing demand sometimes leading to poor outcomes and substandard experience.

COVID-19 driving existing backlogs, but also accelerating availability and use of technology across the sector.

The way work is delivered is beginning to change creates an opportunity for improving patient and staff experience.

Drivers for change

Changing expectations –
connected staff and
patients

Increased
connectivity –
added value



Availability of data –
better insights

Future technology impact

Digitally enabled staff using technology to improve care quality, efficiency and maximising time with patients – adding value to patient care, getting it right the first time, with the right clinician, at the right time.

Digitally engaged patients with greater autonomy over their health and wellness with personalised care and empowered patients managing their own care and care plans.

The boundaries of where work is delivered and care is provided are changing as models of care move outside of hospital and care settings with integrated care systems and end to end pathways with seamless handoffs and care with the right professional.

Seamless, real-time access to information in a single view at the point of need.

A people-centred vision



A world working with greater connectivity across care systems and with patients, with empowered staff, enabled by digital technology



[Jump to appendix](#) to find more detail on current case studies



[Jump to appendix](#) to look at NHS vision for acceleration of RPA

Unpacking RPA - Deep dive

Robotic Process Automation (RPA) is the simplest of technologies from the automation clusters

RPA is the automation of processes run today by humans. This automation is undertaken by 'robots' or software that mimics human actions. These are *not* physical robots, rather, they are simply programmes that do what they are told to do.

RPA is a digital worker

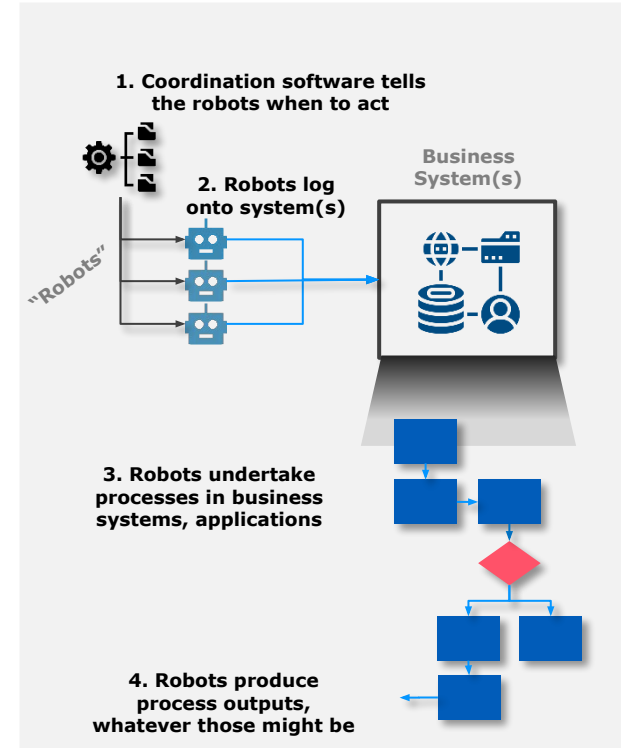
- It accesses systems and applications the same way a human does (with its own set of unique login credentials). The robots carry out processing in exactly the way they have been coded to do, defined by business rules and schedule established by process experts.
- This means that robots can create reports, enter or move data on systems, update dashboards, send emails, or indeed perform entire processes in the background (such as joiners / movers / leavers, invoicing, patient bookings). The primary purpose of robots is to support humans in the workplace by taking away mundane and repetitive tasks.

The scope of RPA application is expanding beyond back-office operations

The traditional scope of RPA was expected to be within mainly back-office functions like HR, finance and accounting, though this image is now shifting. RPA is increasingly being used in other creative ways alongside other technologies such as computer vision, machine learning, and even to augment existing system capabilities where integration between applications is not possible. For example, in clinical settings robots could flag only the tests that are out of range for the GPs and consultants so that they can avoid reviewing the entirety of tests reports.

RPA in the context of screen scraping (for example, smart card controlled systems with no Application Programming Interfaces (APIs))

Screen scraping is one of the capabilities RPA bots can deliver where there might not be any APIs available or are costly to implement. Traditional screen scraping tends to be fragile, needs constant changes and can sometimes require bypassing built into the security controls. NHS approved guidance is that screen scraping should be seen as a temporary solution which should be replaced by properly secured APIs once available. It must also be reviewed and approved to ensure it meets internal security standards.



Unpacking RPA – Benefits

The primary benefits of RPA are operational efficiencies, which help drive better quality of care with faster turnaround times and reduced cost.

RPA excels in taking away repetitive, manual work from employees, such as scheduling activities, copying and pasting data, and booking timesheets. In addition to operational and cost efficiencies, RPA unlocks the capability of organisations by augmenting their staff. Within the context of the NHS, this will mean freeing up valuable staff time – both clinical and non-clinical, so they can focus on value adding activities that improve patient care and outcomes.



Speed: RPA undertakes tasks 4–10x faster than a person, freeing up staff time to focus on patient care.



Reliability: RPA robots only do what they are told (no human errors) and will never mis-key, miscalculate or have a bad day; provided input data and business rules are correct, output data will be correct and consequently improve patient safety.



Productivity: Available 100% of the time 24/7 – the robots will never need to sleep, they will undertake their work whenever required, giving back time for clinical and non-clinical activities.



Flexibility: Robots are easy to schedule and assign to automations once they have been created. They can also be updated relatively quickly if the process requirements change, increasing responsiveness for patients.



Decoupling growth from labour: Robots increase the capacity of organisations allowing them to do more with less/same resources, which then allow teams to tackle care backlogs faster.



Cost reduction and return-on-investment (ROI): Robots are cheaper, faster, available 24/7 and can improve productivity and data quality, resulting in lower operational costs and hence better value for communities. Most organisations report 20-30% cost reduction and 30-50% ROI on RPA projects.



Auditability: Robots collect information on everything they undertake, allowing for full, retroactive inspection on every transaction they have undertaken.



Light touch: Robots work with existing applications and systems that an organisation has, which enable fast-tracking to digital transformation.



Employee satisfaction: By giving robots the mundane tasks, employees focus on the things that people do best (thinking, deciding, producing, and creating). This improves staff resilience – more time to do transformational work and adopt new ways of working.



Reduced attrition: Better staff satisfaction results in reduced attrition across organisations. Increasingly, companies are focusing on this as a main benefit they seek from RPA.

Unpacking RPA – Strengths and limitations

RPA is typically best suited for areas where process or business objectives could be outlined with simple rules.

Strengths and limitations

RPA is a relatively straightforward solution which is best at highly structured actions. RPA robots can work effectively alongside humans automating manual, rules-based tasks, freeing up time for their human counterparts to do more transformational and creative work.

Different types of RPA

RPA robots come in two formats, each with its own capabilities. Teams can decide on the best fit solution depending on the process/task requirements, frequency of the process, and level and frequency of human intervention required.



Unattended

- Unattended robots are triggered by a specific event or are scheduled to run at a given time – for example, automated appointment reminders for patients.
- They run in the background without impacting ongoing process performance – for example, reviewing appointment slot issues and waiting list management.
- They are used to eliminate human input for swathes of processes – for example, waiting list report or specialty reporting.

Attended

- Attended bots are triggered by a person when they want it to run – for example, linking appointments with pathology and diagnostics.
- Increases human productivity by finishing an individual's tasks – for example, long-term condition management of patients to track missing actions.
- Used specifically to improve customer-patient interactions – such as patient initiated follow ups, booking / polling range for booking appointments.

Unpacking RPA – Typical challenges

There are multiple practical challenges and limitations that may be faced when delivering your RPA programme.

Challenges and Limitations

1. **Set-up isn't quick:** typically it can be 3-5 months due to IT procedures and processes
2. **IT change processes:** delivering changes and updates to your RPA solution can be limited through internal change processes and timescales
3. **Process standardisation:** processes are typically more complex than at first glance and can cause delays to successful delivery
4. **Plan beyond POC:** RPA solutions are available on Cloud and on-premises – with significantly differing costs and capability
5. **Software updates:** can cause robots to fail and impact process operations, including business critical processes

Mitigations

1. Engage IT early with dedicated support from day 1
2. Clarify and understand your IT change processes to avoid delays
3. Be driven by data, not perception. Identify and engage process experts early and follow a lean-based methodology to reduce variation and exceptions in your existing processes
4. Plan early, with a clear future vision of your solution architecture, hosting and security
5. Define your business continuity processes for critical processes, including manual fall-back plans

Unpacking RPA - Identifying opportunities for RPA

RPA can be used in conjunction with or independent of other technologies, leveraging additional technologies allows organisations to automate more complicated processes.

What RPA software robots can do?



Log into any application



Connect to system APIs



Move files and folders



Extract content from documents, PDFs, emails and forms



Read and write to databases



Open emails and attachments



Scrape data from the web



Make calculations

What RPA software robots cannot do?



Read handwritten or scanned paper documents



Understand, interpret or make decisions without machine learning and AI



Process unstructured data such as emails, images, video, audio and text









Work on systems, applications or websites that continually change user interface

Unpacking RPA - Identifying opportunities for RPA

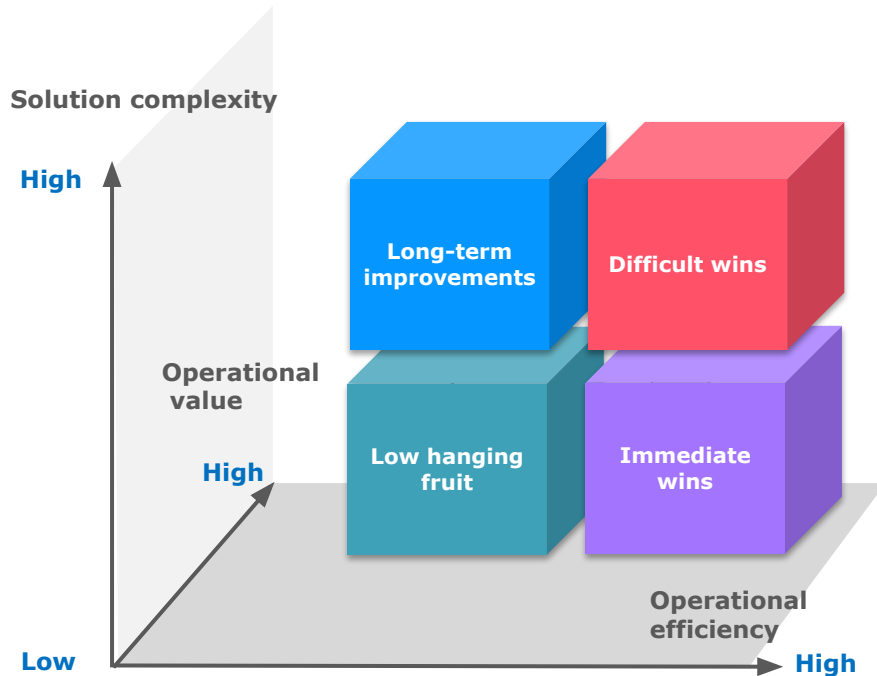
The most suitable use cases have very specific characteristics.

Processes that make good candidates for RPA have some or all the following attributes outlined in the table below. That is not to say that processes that do not possess some or all these attributes or features cannot be automated – but in those instances, project or delivery teams should proceed with caution.

| | Process characteristic | Description | Comments |
|---|---|--|--|
|  | Rule-based | Activities that can be performed by following well-defined rules are a good fit for RPA. | Consider adding case management or process workflow in the mix for more complex processes and decisions that require human judgement |
|  | High volume | The higher the volume and frequency, the higher the potential for saving staff time and reducing risk and human error. | In some cases, low volume tasks can also be a good fit if there are needs for reducing human error to improved compliance and to manage risks. |
|  | Low exceptions | Tasks with limited variation and fewer exceptions are a great fit. | Consider case management or enterprise workflow solutions for dynamic processes |
|  | Stable and well-defined process | Tasks that mature and stay relatively unchanged are a great fit. | Processes that change often require changing the RPA scripts. The resulting overhead may defeat the purpose of automation. |
|  | Low system change | Processes that require limited or no changes to existing systems are a good fit. | If the underlying system needs change, then it defeats the purpose of automation. |
|  | Structured data and readable electronic inputs | Tasks that require working with structured data and readable electronic inputs (Excel, Word, PDFs) are a good fit. | Consider adding optical character recognition (OCR) and other IA/AI technologies to the mix if the data is unstructured or in a format that is not readable, such as images. |

Unpacking RPA – Prioritising opportunities for RPA

Typically, teams will identify multiple RPA opportunities that will require prioritisation. An example framework is provided below to align opportunities with organisational priorities.



It's never about the technology, it's about patient care and safety

- Low complexity and repetitive admin tasks take staff away from patient care. Being able to give that time back in both clinical and non-clinical settings can have significant operational impact and can **improve patient care and outcomes**.
- Depending on what stage an RPA programme is in, setting-up costs might require significant investment. Hence, it is critical that there is a well-defined and validated **benefits case** which outlines clinical and non-clinical operational impact. To deliver that, identifying the **high volume, low complexity, high value opportunities** will be imperative in driving the success of the programme.
- Like any other transformation programmes, RPA initiatives also require the **right ownership and engagement** from **key stakeholders at the right levels**. Right type of opportunities that enable successful delivery of the benefits case are the key to **driving the success** of the programme and gaining stakeholder buy-in. If in doubt, go for volume.
- Project and programme teams will need to work hand in hand with clinical and non-clinical functions to **blend the functional expertise with technical knowledge** to identify the right opportunities.

Unpacking RPA - Current example use cases

Applications of RPA in the NHS today within front, middle and back office are summarised below:



Front Office



Appointments: Freeing up and matching capacity

- ✓ Rostering
- ✓ Did not attend (DNA) – reminders and rebooking
- ✓ Bed management

Supplementing clinical judgement*

- ✓ Imaging
- ✓ Case note change tracking
- ✓ Coding discharge letters
- ✓ Key controls (for example – end-of-life, drug seeking, child protection)

Transition between different care providers

- ✓ Out-of-hours
- ✓ Anticipatory care plans*
- ✓ Medication mapping or reconciliation
- ✓ Lab results and blood tests

Improving data quality

- ✓ Patient records – registrations updates and reconciliation
- ✓ Patient record analysis for proactive care*
- ✓ Immunisation records
- ✓ Clinical evaluation forms

*Based on scope and output of the use case, **medical device regulations** might be applicable.



Middle Office



Strategy and planning: Analysis of reports, legislation and contracts

Used alongside cognitive technologies to help with:

- ✓ Report intelligence
- ✓ Compliant clauses
- ✓ Contract leakage

Budgets and reporting

Used alongside AI and analytics to better manage:

- ✓ Gathering, cleaning, processing and interpreting data
- ✓ Predictive budgeting and forecasting
- ✓ Approval workflows

Risk management

Used alongside Intelligent Automation to improve:

- ✓ Risk factor monitoring
- ✓ Counter fraud processes
- ✓ Decision making

Programmes and projects

- ✓ Monitoring and responding to data to drive triggers
- ✓ Automated report generation and distribution
- ✓ Support to real time analytics



Back Office



Human resources

- ✓ Joiners and leavers (account creation/privileges)
- ✓ Temporary staff management
- ✓ Employee information maintenance

Finance and accounting (including payroll)

- ✓ Accounts payable and invoicing
- ✓ Reconciliation
- ✓ Operational cost management
- ✓ Reduced approval times

Procurement and supply chain

- ✓ Automated sign off and approval workflow
- ✓ Order confirmation
- ✓ Supply replenishment and inventory control
- ✓ Supplier performance (fulfilment)
- ✓ Inventory management

Informatics and reporting

- ✓ Monitoring and responding to data to drive triggers
- ✓ Automated report generation and distribution
- ✓ Support to real time analytics

Unpacking RPA – Mythbusters

Breaking down the most commonly held misconceptions about RPA.

MYTH #1

Robots are humanoid that will replace or overtake humans

Robotic Process Automation, or robots, or bots, refers to software code that can perform manual processes and create streamlined workflows. RPA only automates repetitive human activities freeing them from rote administrative work to focus on innovative and creative aspects of their work.

MYTH #7

RPA is fully automated and doesn't require human supervision

Humans are indeed required to programme the RPA bots, to feed them tasks for automation and to manage them. There's also the efficiency factor which comes into play – the RPA systems are fast, and almost completely avoid faults in the system or the process that are otherwise caused due to human error.



MYTH #6

To use the RPA software, one needs to have basic programming skills

For business and functional users, there are no programming skills required. They just need to understand characteristics of processes that fit automation. Although, now there is low code software than can allow these users to build their own automation without any requirement of programming skills.

MYTH #2

Robots are perfect

Bots can eliminate human errors and greatly reduce noise in statistics, however they are only as good as the information that is put into them. Bots are programmed to execute the formulas they are fed and as such, if there are errors in the logic of their code, they will continue to replicate those errors indefinitely.

MYTH #3

RPA is expensive

One of the biggest advantages of deploying RPA is instant results and quicker ROI compared to other transformation initiatives. The other important thing to remember is that RPA does not require replacing existing systems, instead it adds automation to existing systems to mimic human behaviour.

MYTH #4

Automation is owned and driven by IT

RPA programmes are a collaborative effort between business and IT. IT support is required to provide necessary resources and oversight for the platform, applications and RPA software to function smoothly.

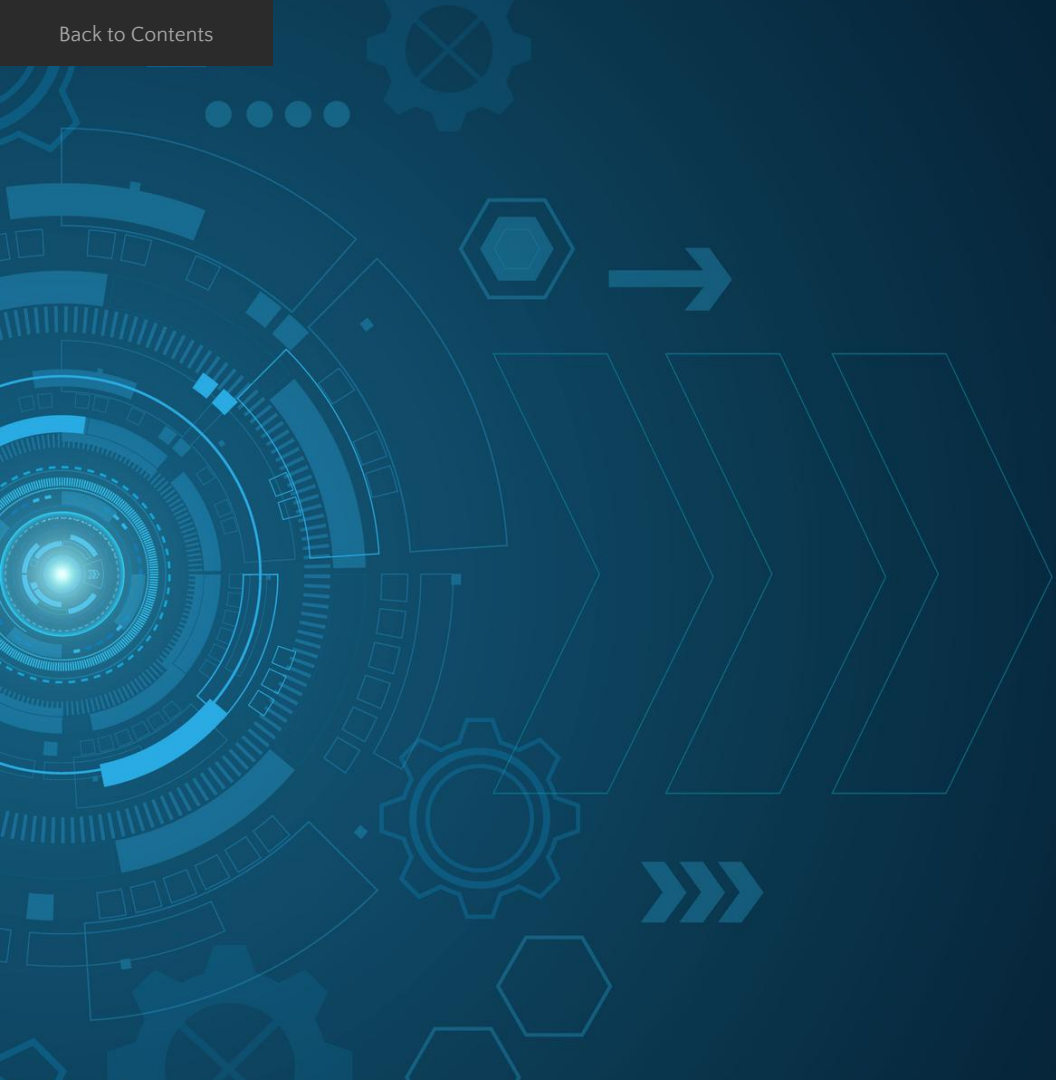
MYTH #5

RPA is an AI virtual assistant, specialised to do a narrow set of tasks

RPA is rule-based algorithms which can be used to capture, process and interpret streams of data, trigger appropriate responses and communicate with other processes. However, it cannot learn on its own – a key trait of an AI system.

02

Guide to getting starting with RPA



02



Guide to getting started with RPA



Chapter contents

Key considerations before getting started

- Identifying the right capabilities
- Readiness to deliver
- Licence types

Getting started with RPA

- Leverage NHS's co-existing architecture
- Pros and cons of different models

After starting with RPA

- What to consider for a benefits case
- How to build a benefits case
- Transitioning from programme to service

Procuring RPA (frameworks)

Key considerations before getting started – Identify the right capabilities

RPA programmes should align with organisational priorities which may differ between clinical and non-clinical teams. There are key questions that need to be considered to set up the right strategy and processes to deliver right outcomes.

RPA journey



Designing capability



Delivering capability

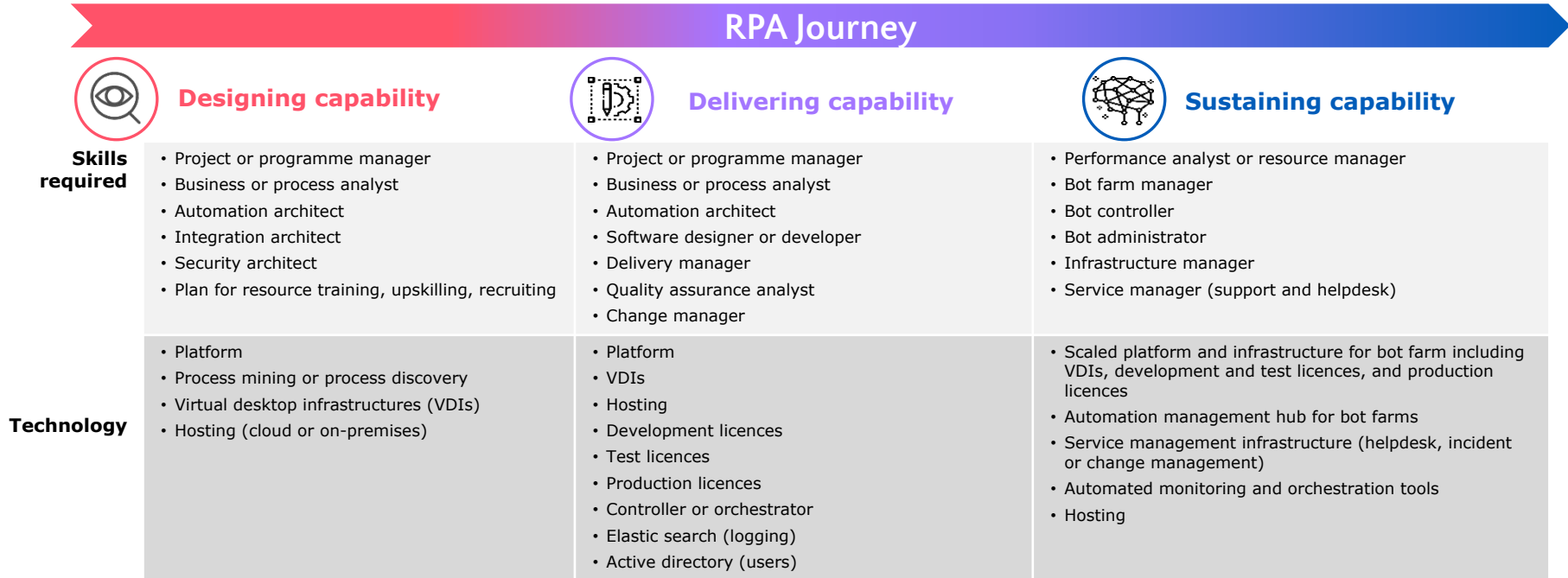


Sustaining capability

| Setting vision and strategy for RPA <i>What is the end goal for RPA?</i> | Mobilising proof of concept / proof of value (PoC/PoV) <i>Where and how do you start?</i> | Scaling using automation target operating model (ATOM) <i>How do you scale it?</i> | Digital work industrialised <i>How do you run and manage it?</i> |
|--|--|---|---|
| <ul style="list-style-type: none"> What are the key drivers for automation? What are the specific pain points we are trying to address? Where will we focus first – clinical or back-office functions? Do we have a mechanism in place to identify opportunities for proof of value (PoV)? What is our methodology to conduct process performance and volume data analysis on identified opportunities? Is there a wider benefits case for the target area? How can we secure sponsorship and funding to deliver that? | <ul style="list-style-type: none"> How will we identify the best opportunities for PoCs to prove value of RPA? What is the platform and infrastructure that we need to enable the PoCs? Have we engaged the relevant stakeholders from clinical and non-clinical teams? Do they have the bandwidth to support the programme? Do we have the right resources for delivery team and support from IT to provision RPA tooling? Do we have a plan for change management to enable adoption? Did the benefits realised align with benefits planned? What is the feedback from the staff and the patients? | <ul style="list-style-type: none"> Do we need an RPA hub or a capability center? What model of ATOM will serve our staff and needs best: centralised vs hybrid vs decentralised vs bespoke. What is the scope of services and capabilities they should have? for example, internal capability vs internal or external 3rd party service providers What is the target benefits case across the clinical and non – clinical functions? Do we have the right resourcing and infrastructure to deliver the same? Do we have established methodology and frameworks for ongoing discovery, triage and development to maximise utilisation levels of established RPA infrastructure and teams? | <ul style="list-style-type: none"> How will ongoing bot monitoring and performance optimisation work? What are the key performance indicators (KPIs) and service level agreement (SLAs)? Do our staff know what to do in case of any issues with the bot(s)? Do we have operational governance and patient safety controls in place? Do we have a process for incident management, platform maintenance and support? Have we set out alerts, KPIs, reports, stakeholder communication and operating rules? |

Key considerations before getting started – Readiness to deliver

It is also important to identify and understand the key roles, skills and technology required to determine investment scope, and set up and deliver.



These skills could be developed in-house. Alternatively, teams could engage external providers or suppliers, subject matter experts (SMEs) or a combination of the two in a hybrid delivery model.

Key considerations before getting started – Licence types

Licensing for RPA can be complex as the nomenclature and pricing model can vary widely. The typical licence types are described below.



Unattended licence

Unattended bots perform tasks without human intervention. Single unattended bot licence can accommodate one or multiple unattended bots based on volumes and frequency required by the use case.



Attended licence

Attended bots are typically individual bot assistants programmed on user machines and are specific to that user. Every attended bot will require a separate attended licence.



Non production licence

These licences are required for testing the workflows in non-production environments – for example, developing/test environments. They cannot be used for production bots. Every team will typically need to buy some of these for testing activities, so don't forget to account for the cost of these on top of your production licences. These should always be lower than your production requirement, as they would typically not handle the full processing volumes at once.



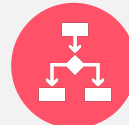
Production licence

These licences are required at the time of going live or productionising the bots. You would need to determine the number of production licences required by looking at the processing volumes and the uptime of the bot, just as you would calculate staff required to meet the demands of a process by considering total demand and working time the staff is available for.



Studio or developer licence

These are non-production licences used by developers to access development studios for the RPA software providers. Every developer typically requires a separate individual licence, but some vendors offer concurrent usage licences as well, however the price of the two may vary. Several vendors are now offering different types of studio licences varying from ones catering to traditional technical developers to low code studios targeted at citizen developers who do not have the technical coding skill set – for example, UiPath offers 3 types of studios, Studio, Studio X and Studio Pro.



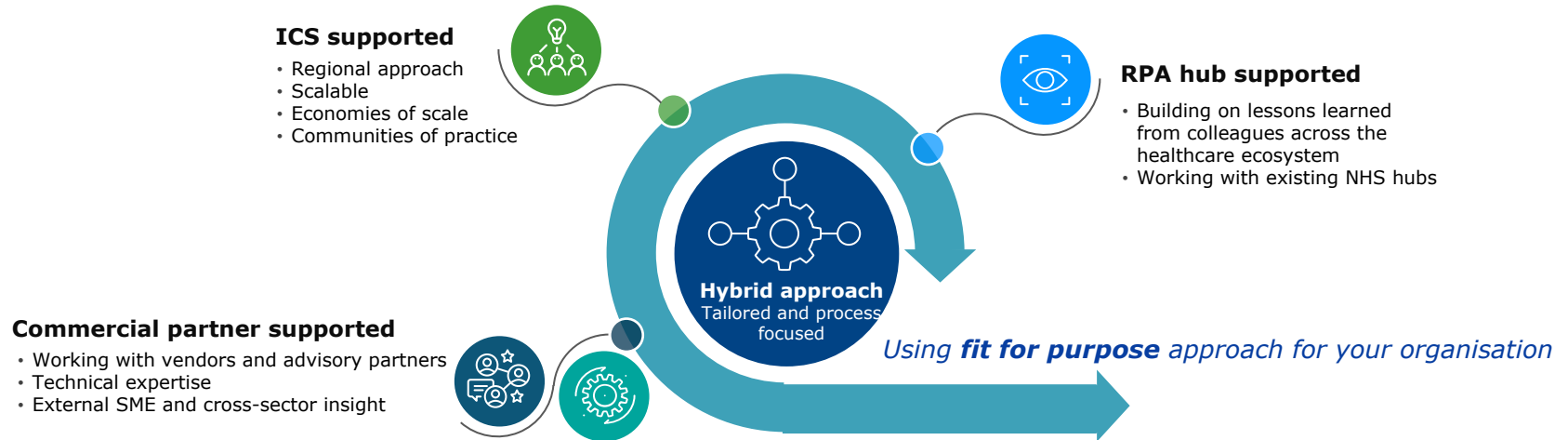
Orchestrator or bot controller or bot runners licences

These are controllers that provide remote monitoring and management of the bots or digital workers. All the bots can be connected to the controller(s) and controller(s) will manage the triggering and schedule of the bots. Controllers can manage multiple bots, but the number can vary by provider. You would also need to account for a non-production licence to ensure you can conduct testing effectively.

Getting started – Leverage co-existing architecture

Once the priorities have been established and tooling and resourcing identified, there are multiple entry points to starting your RPA journey.

The hybrid approach below encourages flexibility and provides the opportunity to adopt one, or multiple approaches, depending on your organisational needs and local priorities.







NOTE

- ICS: integrated care systems made up of multiple organisations providing care.
- RPA hub: referring to organisations that have mature RPA programmes and have been designated RPA hubs within the NHS network.

Getting started – Pros and cons of different models

Each option in the hybrid model has strengths and limitations to consider.

| Options for setting up your RPA programme | Overview | Pros | Cons |
|--|---|---|---|
|  Hub supported - Approach an existing NHS RPA hub | <p>There are multiple examples of hubs and good practice in place across the health ecosystem that can provide guidance and advice to organisations planning and mobilising their own programmes. When designing and mobilising RPA programmes advice, guidance and support can be sought from these hubs to ensure knowledge transfer across the system.</p> | <ul style="list-style-type: none"> ✓ Access to established processes, frameworks, governance and resource that have been tried and tested within the NHS ✓ Teams might be able to run test use cases on hub infrastructure and benefit from existing licence capacity as, typically, that is the largest capital investment that teams need to make upfront. ✓ Teams may be able to benefit from the combined scale of NHS requirements to get the best deal on RPA licences and services. | <ul style="list-style-type: none"> □ Depending on the size of hubs and current backlog of work, they might need to prioritise who they can support and when. |
|  Integrated care system (ICS) supported | <p>The NHS Long Term Plan confirmed that all parts of England would be served by an integrated care system from July 2022.</p> <p>ICSs offer an opportunity to design solutions and invest at scale across regions. Working with ICS colleagues to define your RPA programmes provide opportunities for efficiency gains and benefits leveraging the scope of activities across the organisations.</p> | <ul style="list-style-type: none"> ✓ This approach will allow addressing end-to-end patient journey to ensure seamless handoff of patients from one care provider to another and avoid disjointed experience across different verticals of care. ✓ Provides better economy of scale and allows effective knowledge sharing and integration within an ICS | <ul style="list-style-type: none"> □ Disparate IT systems across ICSs will increase build complexity and stakeholder management, as multiple approvals might be required from multiple IT teams to access applications. |
|  Commercial partner supported - advisory partner | <p>Several advisory support / consulting partners are a one-stop shop that can provide end-to-end services and expertise including infrastructure, design, development, run support and licences. They are also adept at helping programmes understand what exactly they may need depending on their strategy, programme maturity and individual requirements.</p> | <ul style="list-style-type: none"> ✓ Leverage build and run skillset, infrastructure and licence to test the solution ✓ Investigate the potential of RPA across the function/organisation and build a benefits case to justify further investment ✓ Test the solution to de-risk longer term investment and commitment ✓ Outline capabilities required to stand up the programme and plan for transition from external support led to internally owned | <ul style="list-style-type: none"> □ Teams still need to procure licence separately, however several advisory support partners have reseller agreements in place with a majority of top technology vendors. □ Additional cost to account for at the beginning of the programme. |
|  Commercial partner supported - product vendor | <p>Teams could also directly approach RPA vendor(s) to discuss a delivery strategy. This will allow them to jointly outline a plan that best fits the programme requirements, while addressing any specific programme constraints. The RPA vendors can support internal staff to build RPA capability or help engage one of the external advisory partners based on the size, scale and maturity of the programme, and specific programme requirements.</p> | <ul style="list-style-type: none"> ✓ Might be cheaper to access initial support compared to a consulting partner advisory | <ul style="list-style-type: none"> □ Any advisory support will be limited to more technical aspects of the programme. □ Potential to get locked into a product without having had a chance to complete market research and analysis. |

After starting – Building a benefits case

RPA will drive reduction in operational costs and costs of care delivery. But to develop a comprehensive benefits case, organisations should look at all clinical and non-clinical outcomes.

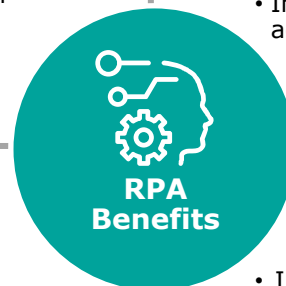


Operational benefits

- Increased operational capacity and speed
- Patient and treatment backlog reduction
- Reduced cost of care by reducing cost of delivery
- Faster turnaround

Patient safety outcomes and experience

- Improved patient journey and experience
- Better, faster and seamless delivery of care
- Increased time for care due to reduction in admin and manual activities



RPA
Benefits

Staff benefits

- Improved staff engagement
- Improved staff experience by enabling them to focus on value-added activities
- Reduced attrition and burnout
- Staff sickness or satisfaction



Process efficiency

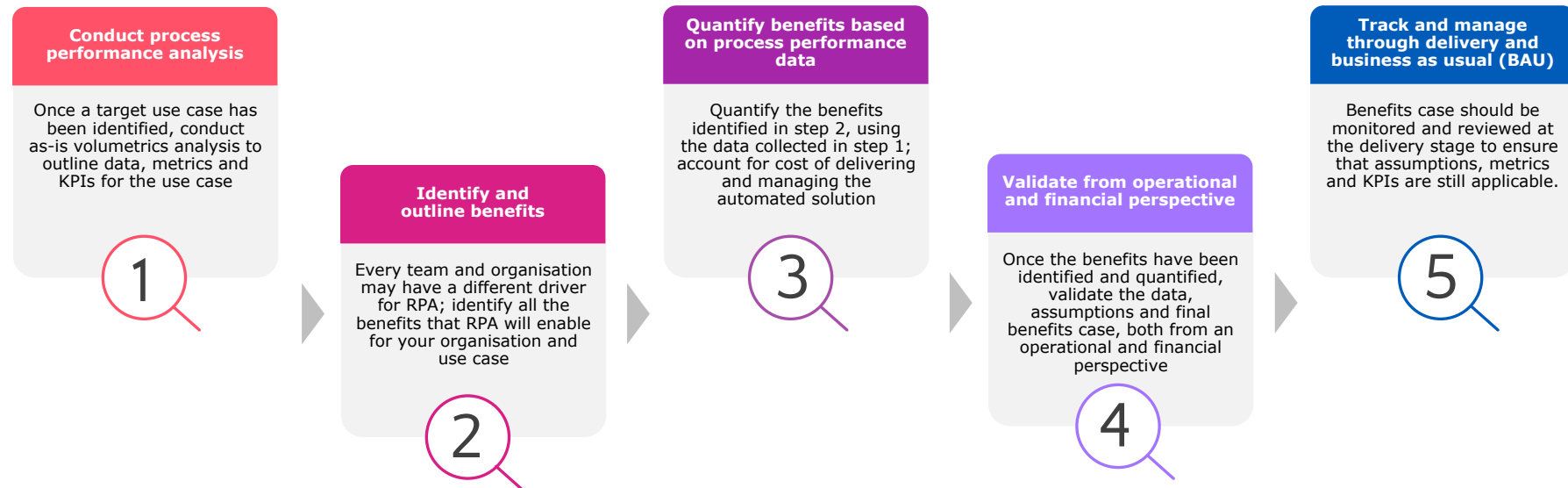
- Improve care quality and patient safety by reducing operational risk and variability
- Manual and transactional activities, and tasks get done quicker while also reducing human error
- Reduced process variability



Join the [NHS National Community of Practice for RPA](#) to access examples of benefit case, benefit framework and ROI

After starting – How to build a benefits case

For a comprehensive benefits case, a ‘total cost of ownership’ view should be taken to ensure all cost and benefit aspects of the solution have been identified and accounted for.



- The benefits case should ideally be analysed, managed, reviewed and audited at an opportunity as well as the programme level.
- RPA creates a dependency between two or more systems which can lead to systems becoming embedded, making change harder, more expensive, and riskier, which in turn can lead to legacy systems remaining in place for extended periods of time. RPA also reduces the benefits case for upgrading legacy apps. Organisations should review long-term IT roadmaps and create and risk assess short- and long-term benefits cases to ensure RPA is leveraged at the right time for the right use cases.



Join the [NHS National Community of Practice for RPA](#) to access *Benefit Case examples*

Transitioning from RPA programme delivery to RPA service

After the bots have gone live, they need to be managed like any other software solution. Hence, it is important to consider what an RPA service model will look like.

The service wrapper needs to carefully consider business as usual requirements and business criticality. Fall back options and service level agreements (SLAs) should be planned by engaging the right business, clinical, frontline and/or support staff to ensure they are in line with how the bots will be used.



| Overview | Pros | Cons |
|---|---|---|
| <p>Teams can look at expanding their internal capacity to account for roles and capabilities required to run and manage their RPA bots or digital workforce, and transition to a fully managed service like other IT applications or systems. The full range of service components that will need to be developed and delivered are outlined in section 4 under the 'Release and Embed' section, for reference.</p> <p>This service will be outside of the scope of project delivery team once the hypercare* period has been completed – hence the teams should plan for this at the onset of development.</p> | <ul style="list-style-type: none"> ✓ Business and project teams' proximity to service leadership ✓ Service teams will develop better understanding of internal processes and functions, helping them provide better run support ✓ No prioritisation required given the internal dedicated nature of the service | <ul style="list-style-type: none"> X Longer lead times to developing and establishing the capability fully X Increased investment in the programme X Initial utilisation of teams might be low as the programme scales X Limited ability to scale rapidly |
| <p>There are several pockets of RPA service capability across the NHS, both at an organisation and regional levels, such as ICS. Their capabilities ranges from project teams following the principle, "If you develop it, you run it" to organisations that have procured fully managed services provided by an external partner.</p> <p>Teams that are just starting their RPA journey could explore whether hubs or partners at a regional level can provide 3rd party services to manage their bots, or if they can benefit from scale of those that have commissioned external providers.</p> | <ul style="list-style-type: none"> ✓ Plug into existing service reducing lead times to establishing the capability ✓ Leverage the scale of consolidated regional volumes for better deals on software /resources / technical or advisory support, if required ✓ Ability to scale quickly ✓ Reduce the risk of duplication across the sector | <ul style="list-style-type: none"> X Limited by existing service model, service framework, prioritisation and SLAs X Might require integrating systems between the organisation seeking support and the one providing, increasing the resource and time requirements to setting up the service. Challenges with general data protection regulation |
| <p>There are a variety of external partners that provide services to run and maintain RPA services of varying size and scale. These include traditional consulting firms, business process outsourcers, information technology services firms, niche RPA consulting firms as well as specialised companies that just run and manage bot farms.</p> <p>Depending on the scale of their RPA programmes and vision for growth, teams can approach one or more partners to understand services provided and associated cost models.</p> | <ul style="list-style-type: none"> ✓ Plug into existing service, reducing lead times to establish the capability ✓ Benefit from deep expertise of providers that have significant experience of setting up, providing and running bot farms ✓ Ability to scale quickly | <ul style="list-style-type: none"> X External spend will require additional internal procurement approvals and processing X Will still require an internal service manager to manage the contract and service X External 3rd party will need to get access to orchestrator and potentially the bots, depending on the scope of services |

*Hypercare is user-centred support during a critical period in the project lifecycle.

Procuring RPA – Procurement category pillars

To procure RPA software and services, organisations will first need to determine the procurement category pillar the requirements will fall under. All six pillars have been described below:

| 1 Hardware – clinical | 2 Hardware – non-clinical | 3 Software / SaaS and apps – clinical | 4 Software / SaaS and apps – non-clinical | 5 Services - clinical | 6 Services / IaaS / PaaS– non-clinical |
|--|---|---|---|---|--|
| <p>Tangible hardware items, that may be governed by MHRA regulations and can only be used in a specific clinical setting, use case or environment.</p> <p>Such as, but not limited to, all-in-one medical computers or theatre consoles, radiology workstations and biometric medical items which are not included within a medical/clinical device category (covered by MHRA and NICE).</p> <p>Irrespective of whether procured as assets or subscribed device as a service (DaaS).</p> | <p>Tangible hardware items, which can be used in any setting, sector or use case and are not covered by MHRA regulations.</p> <p>Such as, but not limited to, end user computing and mobile or tablet devices and peripherals, printers or multi-function devices, physical servers and physical networking equipment, wireless access points and controllers, smart screens and white boards, reception consoles, and information screens.</p> <p>Irrespective of whether procured as assets or subscribed device as a service (DaaS).</p> | <p>Software solutions, applications or mobile apps used in patient care in any setting or sector, including any system of record which may contain elements or all of a patient’s record, consultation notes, treatment plan and prescriptions.</p> <p>Whether procured as remotely or Cloud hosted, on-premises, licensed or software as a service (SaaS).</p> | <p>Software solutions, whether procured as licences or software as a service (SaaS), that can be used across a range of non-clinical or back office settings, such as finance or procurement, HR, payroll, information governance and risk, legal services or IT services management systems, and business intelligence or analytical.</p> <p>Also includes RPA, digital dictation or transcription services, and other applications and mobile apps which may support the utilisation of the software solutions used in this pillar.</p> <p>Whether procured as remotely or Cloud hosted, on-premises, licensed or software as a service (SaaS).</p> | <p>Electronic assistive technologies (EAT) such as for environmental control systems and alternative means of access for complex disabilities, alarm technologies and services that support remote monitoring, enable supported living (for example, fall monitoring), continuous monitoring services to enable clinical diagnosis of patients at home; scheduled and on demand remote services to manage and control chronic illness (teleHealth, teleConsultation); medicine optimisation services.</p> | <p>6a. Network and hosting</p> <p>Intangible solutions such as, but not limited to, mobile data, networking, cloud hosting, infrastructure as a service (IaaS), platform as a service (PaaS), telephony lines.</p> <p>6b. Complimentary technology solutions</p> <p>Intangible solutions such as, but not limited to, cyber security or penetration testing services, data analysis or business intelligence services, technical support or data migration services.</p> <p>6c. Professional services and consultancy</p> <p>Professional services specifically regarding digital and technology (excluding project management or temporary staffing, which falls under workforce category) technical consultancy and advice.</p> |

RPA software will typically fall under **Pillar 4**, with any related technical or advisory services being covered under **Pillar 6**. After identifying the relevant procurement category pillar, organisations are advised to connect with [Crown Commercial Services](#) to understand the relevant framework that needs to be used.

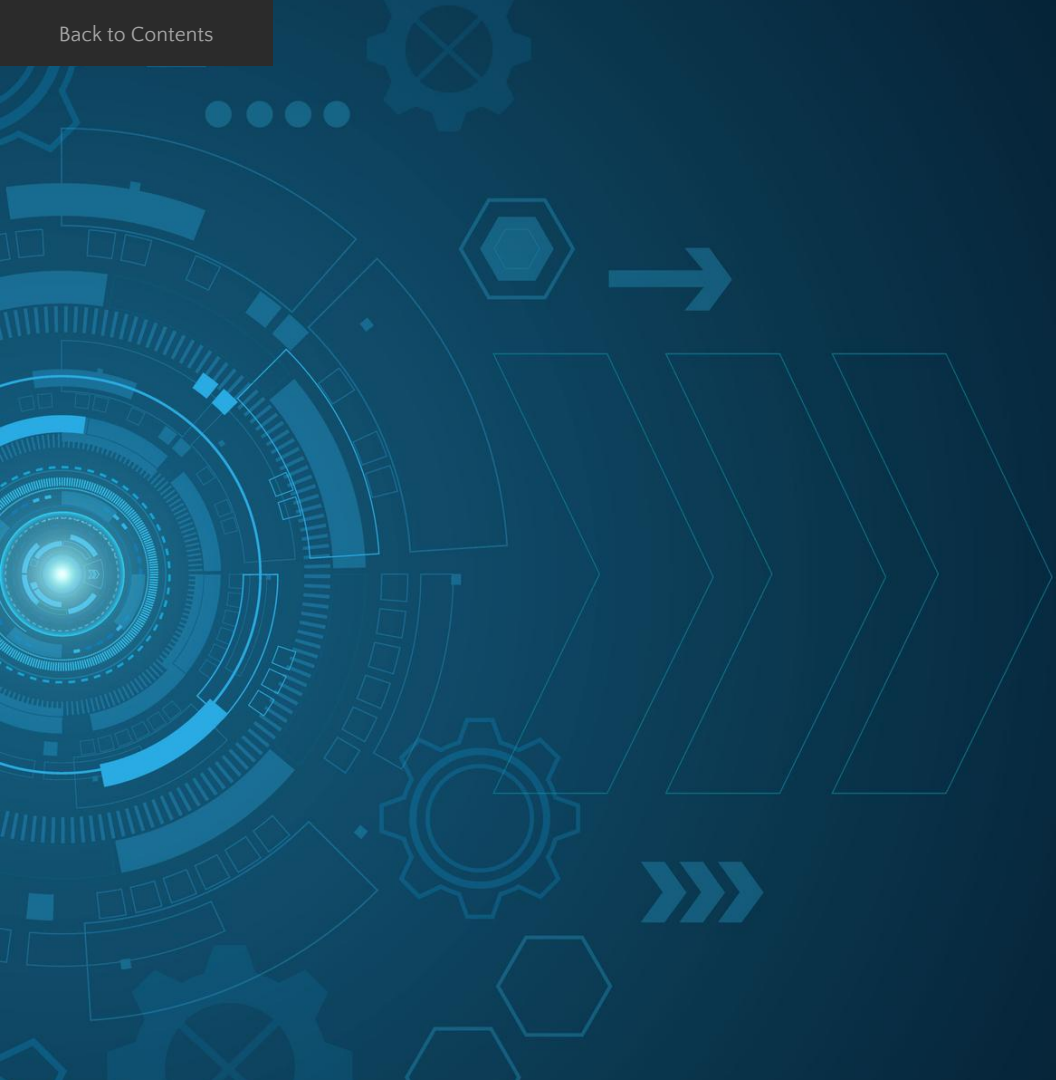
Procuring RPA – Key technical standards to consider

Any product within these pillars must meet the minimum standards defined below.

| 1 Hardware – clinical | 2 Hardware – non-clinical | 3 Software / SaaS and apps – clinical | 4 Software / SaaS and apps – non-clinical | 5 Services - clinical | 6 Services /IaaS / PaaS – non-clinical |
|--|--|---|--|--|--|
| <ul style="list-style-type: none"> MHRA compliant Ethical or sustainable standard compliant Current OS “N” minus one compliant Cyber essentials accredited or ISO 27001 accredited | <ul style="list-style-type: none"> Ethical or sustainable standard compliant Current OS “N” minus one compliant Cyber essentials accredited OR ISO 27001 accredited | <ul style="list-style-type: none"> NHS number as core data record Web based user interface GDPR compliant Cyber essentials accredited or ISO 27001 accredited Cloud native with UK based hosting location(s) Open APIs HL7 Compliant FHIR standard compliant DCB0129 compliant SNOMED CT or ICD10 compliant | <ul style="list-style-type: none"> GDPR Compliant Cyber Essentials Accredited OR ISO 27001 Accredited Cloud Native with UK based hosting location(s) Open APIs HL7 Compliant NHS National RA Policy | <ul style="list-style-type: none"> Ethical / Sustainable Standard Compliant Cyber Essentials Accredited OR ISO 27001 Accredited | <div data-bbox="1586 329 1881 380" data-label="Section-Header"> <h3>6a. Network and hosting</h3> </div> <ul style="list-style-type: none"> Ethical or sustainable standard compliant Cyber essentials accredited or ISO 27001 accredited <div data-bbox="1586 528 1881 622" data-label="Section-Header"> <h3>6b. Complimentary technology solutions</h3> </div> <ul style="list-style-type: none"> Ethical or sustainable standard compliant Cyber essentials accredited or ISO 27001 accredited <div data-bbox="1586 781 1881 832" data-label="Section-Header"> <h3>6c. Professional services and consultancy</h3> </div> <ul style="list-style-type: none"> Ethical or sustainable standard compliant |

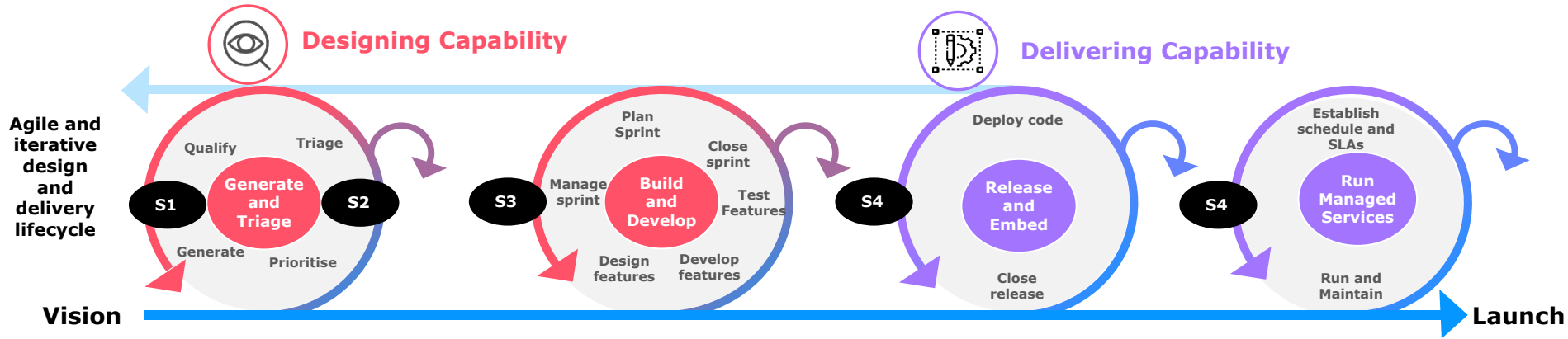
03

Guide to delivering and sustaining RPA

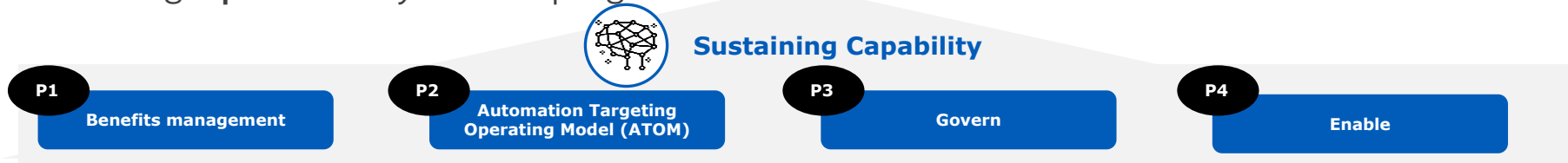


Delivery life cycle and sustaining pillars - Chapter overview

RPA is a transformation programme. It is important to consider the end-to-end lifecycle from project to BAU service to enable sustainable and lasting change. **Designing** and **delivering** RPA solutions are divided into **4 stages**, which will be covered in the [first section](#) of this chapter.



The [second section](#) will highlight how to successfully and safely sustain RPA adoption by embedding **4 pillars** into your RPA programme.



03

Delivering RPA

Chapter contents

Automation designing and delivering lifecycle

- Demand generation (Stage 1)
- Demand triage (Stage 2)
- Build and develop (Stage 3)
- Release and embed and run managed services (Stage 4)
- Examples of existing processes

Automation sustaining pillars

- Benefits management (Pillar 1)
- Automation target operating model (ATOM) (Pillar 2)
- Govern (Pillar 3)
 - Governance
 - Business change
- Enable (Pillar 4)
 - Training and upskilling
 - Accelerators and assets
 - Innovation and continuous improvement

Stage 1 Demand generation – Identifying opportunities for RPA

Identifying opportunities for RPA is key to understanding the potential benefits and hence the infrastructure required that supports benefit realisation while minimising delivery costs.

Approach overview

To ensure that the **maximum benefit is realised** by an RPA programme, a backlog of RPA opportunities must be created to support the continuous and ongoing throughput of solution development.

RPA teams or programmes can build upon an existing backlog which might already be in place to develop the initial pipeline. Validation and collaborative working with the process SMEs across clinical and non-clinical teams will help **ensure accuracy**.

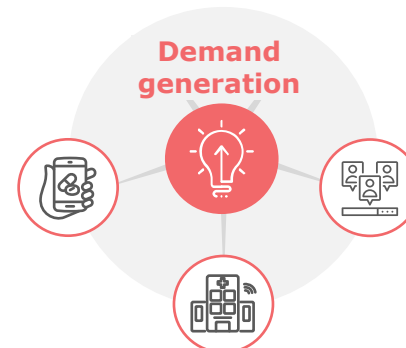
This also requires understanding how operations are set up, as they might be very specific to teams, trusts or particular GP surgeries depending on local models and requirements. Hence from the outset, it is important to engage with and empower staff to become advocates of the programme to help gain buy-in, support and provide a multi channel forum for them to **identify future automation opportunities**.

Multipronged approach to identifying RPA opportunities

Comprehensive analysis

This can help in identifying high-value opportunities for teams in the early stages of their RPA journey. It has two approaches:

- **Top down** - Focus on improving efficiencies through FTE (Full-time equivalent) effort and allocation. In this approach, processes are evaluated based on how much time staff are spending on manual activities and how often.
- **Bottom up** – Detailed review of individual target process areas to identify opportunities for improving staff and patient experience, driving operational efficiency and reducing duplication.



Design thinking workshops

This brings together a diverse set of stakeholders, from IT, clinical teams, operational staff and wider organisation units, to gain their support and consensus for RPA initiatives. It enables them to gain a holistic view of operations and identify potential target areas for automation while collaborating with each other.

Staff engagement

This helps identify and generate demand through engagement with staff, in the form of a marketing and comms campaign to raise awareness, demonstrations and drop-in sessions to highlight the art of the possible, and proactive engagement with key process owners or teams. In order to build a sustainable pipeline, it is critical that this is planned effectively and delivered throughout the life of the RPA programme.



Join the [NHS National Community of Practice for RPA](#) to access our [GitHub RPA open source](#)

Stage 2 Demand triage – Shortlisting RPA opportunities

An effective triage framework ensures limited resources and investment can be focused on best value opportunities driving the best ROI for communities, NHS services users and staff.

Approach overview

Once there are use cases identified to create an initial automation pipeline, the RPA teams will need to prioritise the order for development.

Teams will need to outline a **Benefits management** process, which will provide a consolidated view of opportunities mapped against organisational, financial, and safety measures (these should be endorsed by the executive team or programme sponsors).

An example of **ABC criteria** to assess requirements versus existing and planned RPA activity is provided in this page.

Teams can use any combination of the example metrics that align best with your requirements.

Initial pipeline (example)



HR staff information, payroll, recruitment, finance



Referral receipt to upload into an electronic system, and automation of text responses



Patient registration in system's patient communications links



Waiting lists, booking processes, validation, administration



SMS to allow patients to confirm, cancel or rebook appointments

Benefit and value to the business:

Processes should be ranked based on the benefits delivered, the benefits are defined according to organisational priorities, and RPA teams should work closely with individual department leads to ensure the prioritised backlog is constantly aligned with changing organisational priorities

Triaged backlog:

Prioritised and sequenced for the optimum delivery of benefit which can be delivered by the RPA teams as they ramp up capacity and capability

Appropriate for automation service:

To assess the suitability of the business process to be automated we recommend considering process size, complexity, exceptions, type of data input (structured or unstructured) and the technologies required

Cost (Automation effort):

Processes are ranked according to the level of complexity and effort to automate them, thereby driving cost. Large or complex processes are tackled in small chunks and later effort remain in the backlog

Source - Atos Intelligent Automation Methodology



[Jump to appendix](#) to see example process detailing management of ideas from triage through to pipeline



Join the [NHS National Community of Practice for RPA](#) to access our ROI and benefit case examples

Stage 3 Build and develop – a lean approach to process development

A lean based development approach to RPA solutions will ensure processes are optimised before being built and automated.

Approach overview

Due to COVID-19, the backlog of routine work has suffered significant delays. With the ever-increasing need for our NHS to work harder and faster, any capacity created in the system is extremely valuable, not just from an operational perspective but from staff wellbeing perspective as well.

For the development of RPA and intelligent automation solutions, in addition to engaging the right stakeholders, teams also need to engage CIO or CCIOs who understand how the operational efficiencies can be made in a clinically safe way. This should be combined with a lean based approach – for example, the **PRE-ACT model**.

This approach examines the current state of operations to reduce exceptions, minimise variants and remove wasteful activities so that only value-adding activities are automated, if required.

The future mode of operation should be as stable, lean and efficient as possible, thus reducing development and support effort and time, and improving the benefits from automation for the organisation.

P Purpose of process is clear with a focus on operational efficiency and business value

R Reduce exceptions, variants, workarounds, by assuring prerequisites of upstream processes by using lean thinking

E Eliminate wasteful or unnecessary activity by applying lean principles

A Automate using RPA or task application

C Combine (manual and automated) tasks (group into larger chunks of continuous process, develop skills and changing responsibilities, if necessary) and reduce over-specialism

T Transfer to the right people (team with capacity, skills and lowest cost)



Source - Atos intelligent automation methodology



[Jump to appendix](#) to see a detailed development lifecycle plan outlining typical activities and deliverables

Stage 4 Release and embed and run RPA managed services

It is important to plan for the effort and cost of managing and running the digital workforce in a business-as-usual (BAU) setting so that quality of care and safety standards are maintained.

Operations: Just as the human workforce requires facilities, training and line management support, the digital workforce needs platform and oversight in the form of bot managers or controllers.

The strategy for managing and supporting the automated solution should be agreed during process design and implemented in parallel to development. It should also include documenting how the to-be process works in BAU; what are the potential risks, business criticality and hence business continuity planning (BCP) options to ensure everyday operations are not impacted. This ensures adequate planning time to determine the optimum approach for the support model. Elevated support arrangements should be considered and put in place for any critical processes, especially those that directly impact clinical services.

Once the support model has been established and there are digital workers in production, teams can also consider building 'Auto robots' that can not only automate the monitoring but can also take remedial actions autonomously in case of process failures. The process which the Auto monitoring robot is not able to correct successfully can be escalated to the support team. Support teams will escalate to the IT support function for issues related to the underlying IT infrastructure comprising of network, servers and devices.

Key service components for managing digital workforce:

Platform management

- Automation platform maintenance
- Routine patching, impact assessment and upgrades of Automation tools, testing of workflows after patching or upgrades
- Access management for robots and users
- Licence Keys management

Service management

- Standardised support using ITIL v3
- Incident management
- Service request management
- User access management
- Wide support coverage
- SLAs, KPIs– defined as per business criticality of the processes

Monitoring

- Check process run as per schedule
- Trigger bots manually in case of failure
- Monitor platform availability and utilisation parameters
- 24x7 bot monitoring, exception handling
- MIM Process

Change management

- Impact analysis and estimation
- Break fix development
- Deploy to production
- Business process change

Reporting and dashboards

- Business KPI, Benefits KPIs
- Robot productivity, utilisation
- Success rate, exception rate
- AHT, SLAs

Continuous improvement

- Reactive problem management
- Proactive problem management
- Small enhancements



Jump to appendix to read further on optimisation, vendor and infrastructure Management

Examples of existing processes

The tables below provide a list of processes which have been automated as identified by respondents to the NHS National RPA Survey 2020.

Administrative processes

Ambulance to ER admin

Call reminder send daily report

Demographics batch service (DBS) and System C Medway PAS

Endoscopy waiting list

GP e-RS accept referrals

GP referrals from ERS to Kainos Evolve

Invalid contact details

NHS object library, e-RS

Patient appointments

Patient call reminder

Process referrals

System synchronisation

Clinical processes

Antibody testing

Cardio-respiratory diagnostic tests

COVID-19 oxygen flow

Data synchronisation

Finds and downloads results

GP referrals - check e-RS Referral for correct service and schedule appointment

GP referrals - e-RS to EPR (CED)

Maternity self-referrals into Cerner

Monitor O2 levels

Outpatients clinics

Patient letter analysis

Register patient and admit to ED

Uploading referral into EPR

Waiting list pathway analysis

Source - [National Robotics Process Automation \(RPA\) Survey 2020](#)

Examples of existing processes

Finance processes

| | | | | |
|---------------------------------|--|-------------------------------------|-------------------------|------------------------------|
| Agency invoice processing | Completing supply chain budgets | Emailing PO receipting reminders | Invoicing processing | Realtime financial reporting |
| Allocation of agency payment | Completing uniform budgets | Formatting billing data for uploads | Raising a quote | Realtime workforce reporting |
| Completing budgets | On-boarding: COVID starters into ESR payroll | Genetics Referrals (e-RS) to EPIC | Raising invoices | Running a debtor list |
| Completing Henry Schein budgets | Email PO order budget holders | Invoices to web centre | Reporting and invoicing | |
| | Emailing debt reminder letters | | | |

Human resources processes

| | | | | |
|--|-------------------------------|---|--|--|
| Accounts payable invoicing registrations | Authorisation rights changes | Maternity and FT reminders to managers | Payroll processing | Running HR reports |
| Advertising jobs | ESR staff movements | Maternity letters process | Process agency invoices | Running monthly childcare report and associated emails |
| Auto-enrolment letters | Longlisting vacancies on TRAC | NHS Electronic Staff Record (ESR) - update password expiry launched | Processing factual reference requests | Running weekly topdesk reporting figures |
| Birthday bot | HR on-boarding: numerous | NHS object library - NHS Jobs | Professional reg report and visa reports | Workforce conditional offers |
| Callbot | HR staff account creation | NHS object library - TRAC | Recruitment, sending conditional offers | |
| Conversational bot | Long to short listing HR | Pay progression reminders | Running cycle to work report | |

Source - [National Robotics Process Automation \(RPA\) Survey 2020](#)

Examples of existing processes

IT processes

| | | |
|---------------------------|--|--|
| Add user to NHS.net | Staff directory snap | Extract referral data |
| Appointment booking | COVID daily status, group daily report (data gathering only) | Health records processing |
| Choose and book reporting | ED sitrep submission | Moving records from manual or paper to EPR |
| Synchronising database | eReferral admin | HR establishment control form |
| Analyse staff directory | eReferral processing | Merging patient records |
| KPI analysis | Exchange account deprovisioning | Off-boarding and on-boarding |

IT processes

| | | |
|--|--------------------------------|--------------------------------------|
| Adding users to shared folder | NHS object library - ESR | Read NHS Emails |
| Adding user to distribution list in exchange | NHS.net account deprovisioning | Social care NHS mail access requests |
| Active directory report | Patient referrals | Daily status report |
| Video conferencing | System synchronisation | System access |

Source - [National Robotics Process Automation \(RPA\) Survey 2020](#)

Examples of existing processes

Operations processes

52 week breaches in Datix

Allocate UK Healthroster

Communication service form

Debtor process, clinic

Moving to new patient record system

Processing of low value requisitions

Reminders and invoicing

Running a care group report

Running a referral report

Running a sedation report

System synchronisation

03



Sustaining RPA



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Pillar 1 Benefits management

Benefits identification, quantification and ongoing management is imperative for RPA programmes to demonstrate value and create momentum within the organisation.

Approach overview

The primary aim of RPA is to release capacity for clinicians and other front, support or back-office staff so they can be more efficient in dispensing valuable, skilled activities.

To that effect, benefits management starts at the onset of delivery with the creation of an outline business case. In addition to process metrics, this should account for digital maturity, for example, legacy systems, levels of interoperability, system or application standardisation, and data source.

By building this initial, quantified view, the benefits can be validated and monitored throughout the delivery lifecycle to ensure that opportunities are progressed, paused or stopped altogether based on robust evidence.

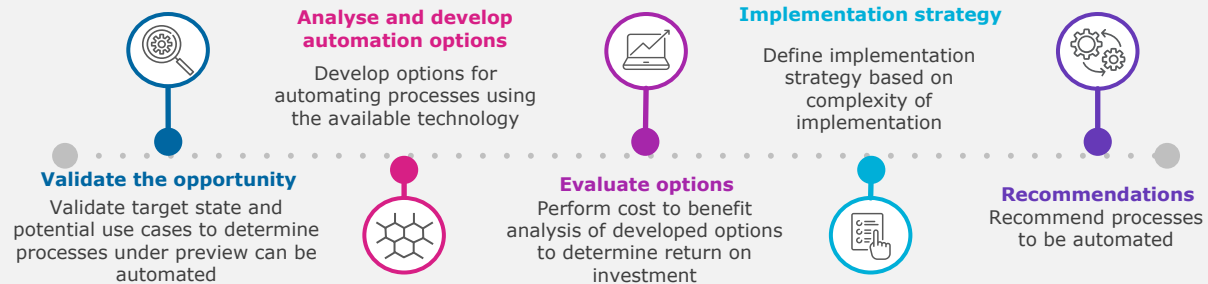
Business case and return-on-investment (ROI) model

The intent of the outline business case is to help process owners understand the level of benefit they are likely to achieve through automation. This allows opportunities with the greatest return to be prioritised and implemented at pace.

Here we have used demand generation and triage processes to help the RPA teams to progress the right opportunities through cost-benefit analysis and establishing the right baseline to measure against.

These are the core components for developing the outline business case and ROI model. The business case and ROI will evolve as the solution is developed and delivered. It typically follows the steps as shown in the diagram below.

It should be used as a constant touch-point between the RPA teams and stakeholders or process owners to ensure that the solution delivered meets expectations and that the defined benefits will be realised. Throughout the programme, RPA teams should put in place the necessary touch points so that the benefits can be managed through the governance framework.



[Jump to appendix](#) to read how benefits management can be directly linked to the delivery lifecycle
Join the [NHS National Community of Practice for RPA](#) to access benefit framework and ROI examples

Pillar 2 Automation Target Operating Model (ATOM) – Impact overview

Defining and implementing an operating model that includes people, processes and technology infrastructure that supports RPA sustainability will help achieve and establish maximum value.

These are some key factors:



Understand the impact and benefits

- ATOM helps outline how the different functions (business, clinical, IT) must work collaboratively to deliver the RPA strategy.
- ATOM allows focus on the value being delivered, the use cases and those activities that will drive the realisation of intended benefits.



Collaborate and iterate through design

- Collective design, governance and delivery processes ensures faster decision making.
- Iterative design and embedded change management process enables delivery at greater speed.



Drive consensus and buy-in

- Coordination and consensus across all impacted stakeholders is a key success factor.
- Stakeholders conducting design decisions in coordination builds a cohesive environment with less chance of disruption or diversion.
- This provides a sustainable setting to build on the momentum and support for the programme more widely in the organisation.



Enable value creation

- RPA is still a relatively new technology.
- The iterative design and implementation process enables the organisation to manage risk, test value propositions, and if successful, scale delivery quickly.



Embed continuous improvement thinking

- ATOM design process does not end and should continue as part of the organisation's continual ways of working as the scale and scope of the programme evolves.
- This makes the organisation more prepared, malleable, and responsive to changing business requirements and new opportunities in the future.

Pillar 2 Automation Target Operating Model (ATOM) – Key factors

When identifying the appropriate ATOM, there are key factors to consider which are summarised below.

Approach overview

RPA can play an important role in driving end-to-end operational outcomes, such as creating more capacity for staff to focus on providing the best care they can.

As initial RPA deployments prove to be effective, teams should explore strategies for expanding across the organisation.

Multiple options are available to scale; here we consider one, the creation of a **central competence centre (CCC)*** or **RPA hub**.

Establishing a CCC drives value, benefit and improved outcomes for RPA delivery.

CCCs bring together the management, best practices, research and training related to delivering and sustaining RPA across the organisation.



Scaling beyond Proof of Concepts (PoCs)

- Automated solutions are generally used for a wide variety of processes across different parts of the organisation and often initially delivered at small scale through PoCs.
- A key question, therefore, is how to scale and deliver **enterprise-wide value**, including combining with existing systems – for example, through using application programming interfaces (APIs) and in the future to incorporate new technologies, such as artificial intelligence (AI), whilst aligning with compliance and risk management requirements.
- The setting up of a CCC is a good way of coordinating and monitoring these efforts.



Start with the simple questions...

While a CCC can provide guidance on building, sustaining, scaling and embedding automation across the organisation, **there are “simple” questions that often create roadblocks and need to be addressed upfront:**

- Where and with whom does ownership of RPA sit within the organisation?
- What is involved?
- How many people are needed, and what expertise is required?
- How long will this take?
- What is an estimated budget?
- Is there an option to leverage or integrate partially with an existing competence center in the wider NHS to benefit from their experience and de-risk initial setup and delivery while reducing delivery turnaround times?



...But do not underestimate the detail

- It is crucial to address these questions, creating a charter is one tool for providing the framework for evaluating proposed processes, and fostering the skills, methods, tools, and technologies to most effectively implement the automation.
- Clear roles and responsibilities must be addressed up front, and clearly defined across all key stakeholders within the organisation.** For example, different groups within IT may need to be involved, as they are responsible for different applications and provision of the platform itself, as CCC stakeholders, they will offer remarkably different insights from within and across IT functions.



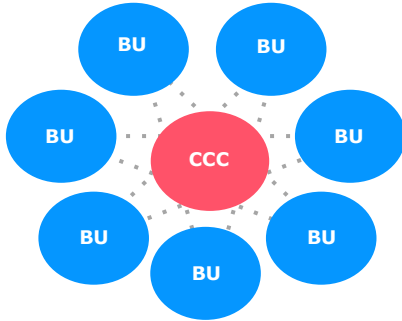
** If you are starting your automation journey, then you don't need to become a CCC or RPA hub. To find out more about RPA hub in your region [reach out to us](#).*

Pillar 2 Automation Target Operating Model (ATOM) – Key options

There are 3 key options that form the basis of designing and standing up any Central Competence centre (CCC) or hub.

Centralised

One CCC serving all business units (BU)



Pros

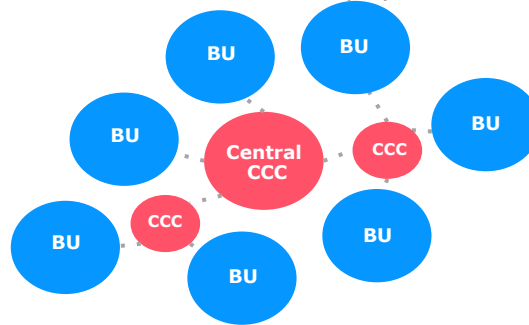
- One platform to provide centralised support for all lines of business
- Easier to disseminate skills, methodologies, lessons learned and best practices
- Standardised RPA design, development and support process

Cons

- Automation prioritisation challenge: some lines of business might struggle to meet central 'one size fits all criteria' to make the cut
- Slower RPA deployments

Hub and spoke or federated

One central CCC, linked to federated CCC dedicated to business units (BU)



Pros

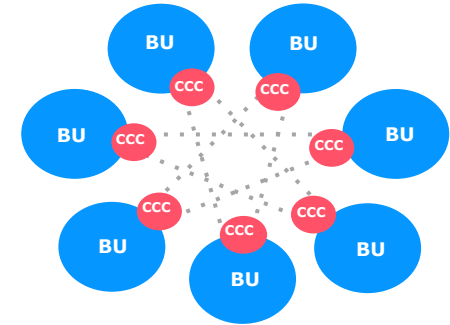
- The central CCC handles most complex projects while federated CCC cover the rest
- Reduction in prioritisation challenge, with federated CCC dedicated to lines of business or functions
- Higher functional process knowledge can be built within federated CCC, given their proximity to businesses

Cons

- Lack of collaboration can lead to discrepancy in expertise, governance, methodologies between central and federated CCC

Decentralised

Independent CCC for each business unit (BU)



Pros

- Each business unit drives their individual automation programmes and their prioritisation
- All RPA CCCs are close to individual business units

Cons

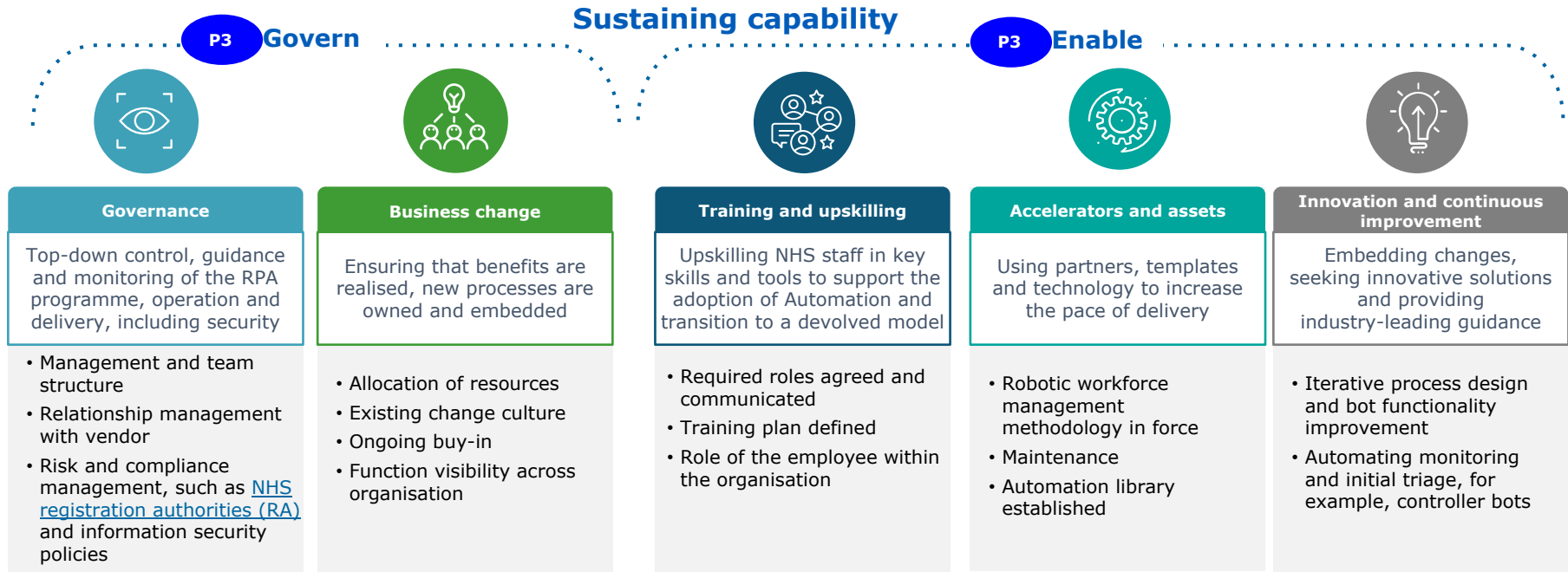
- Regular exchange of best practices across separate CCCs must be enforced
- High risk of incoherence in standards, governance, methodologies and support levels
- Certain CCC roles will be duplicated



Jump to appendix to look at an example set of design principles that can be identify ATOM option that will be a best fit

Pillars 3 and 4 Govern and enable – Overview of governance and enablement

Organisations will require a holistic framework for managing and scaling the ATOM and RPA programme capabilities in an effective manner by embedding appropriate governance and enablement policies. In the next couple of pages, we will deep dive into pillars 3 and 4.



Pillar 3 Govern – Governance

An effective governance framework will help outline design principles and decisions across people, process and technology design elements.

Approach overview

RPA projects require multi-functional coordination across several teams. Therefore, the framework provides leadership, coordination, and best practices for the most efficient delivery of the project.

This is even more critical in the context of delivery of health services, as any new digital pathways should account for impact on patient care and safety. As part of overall governance for RPA programmes, they should build in a detailed risk management plan and ongoing engagement with clinical safety officers and clinical governance committee and leads to ensure clinical risk is minimised.

The framework allows for combining multiple technology, process and data solutions to empower and assist staff.

The framework enables benefits realisation and ensures ROI.

People and skills



- Roles and responsibilities
- Training and upskilling; team mix, internal vs external vs hybrid
- Providing assurance to staff on value added
- Mitigating risks for neurodiverse and disabled staff

Governance and standards



- Assessment and prioritisation standards
- Development governance
- Operations governance
- Regulations, requirements and compliance

Process and delivery



- Enforce secure coding
- Scoring or ROI
- Reusability of assets
- Establish development best practices to avoid waste

Technology



- Track tool usefulness
- Security standards
- Manage scalability
- Bot infrastructure and licenses
- Platform and bot management and maintenance

For more details and example of governance framework and a detailed security plan, click on the link below:

1. [Governance forums, TORs and RACI](#)
2. [Information security plan](#)
3. [Examples of job descriptions and role profiles](#)



[Jump to appendix to look at a high-level illustrative interaction model](#)



[Jump to appendix to find more detail on role distribution across the forums](#)

Pillar 3 Govern – Business change

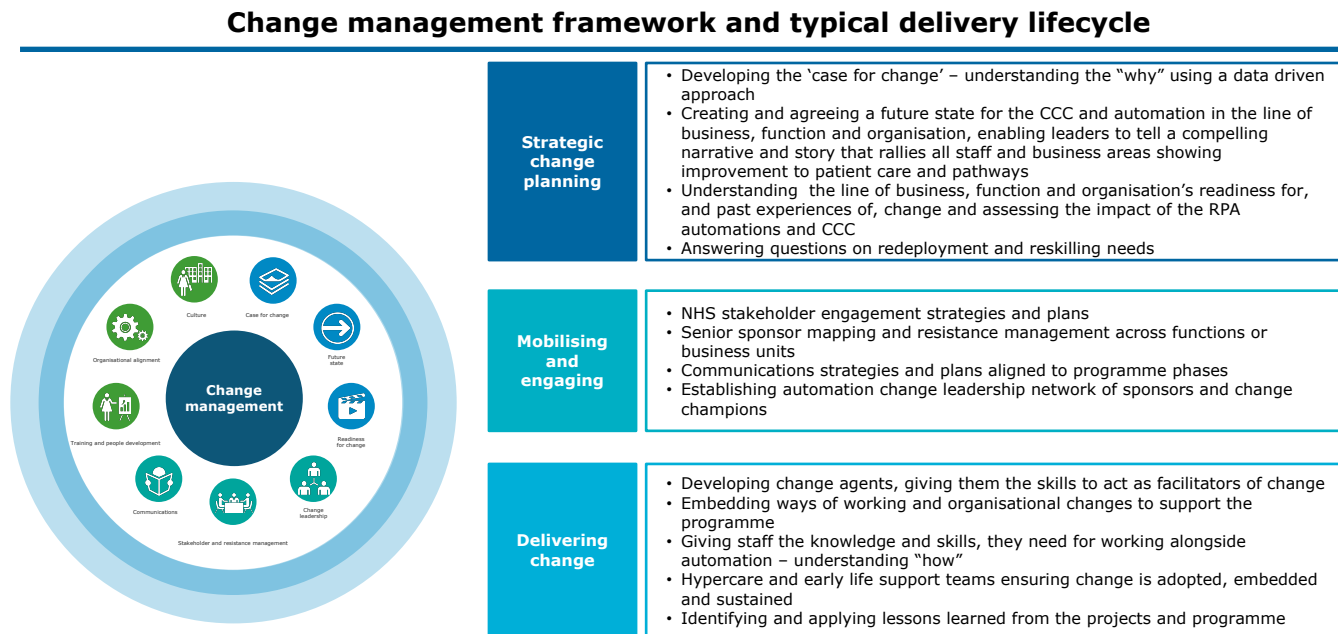
Change management and the focus on embedding new ways of working as part of culture needs to be part of delivery to influence a mindset shift.

Approach overview

To define and deliver the interventions required to make the organisational shift that is required to embed automation solutions within the NHS, we recommend using a change management framework – an example has been shown here for reference.

Ideally, these activities should be included as part of the delivery roadmap across every phase of the programme. This will ensure impacted NHS and its staff are **ready, willing, able** to deploy and **sustain** automation solutions. It will also support key activities to build the foundations for change, deliver change throughout, and make it stick through inflight and early life support actions.

The change framework should provide a robust approach to support the communication strategy and other change management interventions to ensure that stakeholder management is embedded in all phases.



Source - Atos intelligent automation methodology

Pillar 4 Enable – Training and upskilling

Organisations will need to invest in upskilling staff and teams in key skills and tools to support the delivery and adoption of automation.

Approach overview

The RPA CCC team should provide knowledge and capability building for automation in wider organisation across lines of business. This capability can be curated, built and developed within the CCC and leveraged across the business. This capability should:

- Create and deploy a role-based NHS automation capability framework
- Provide automation capability maturity assessment tools and services to determine training needs
- Curate, develop and deploy a range of learning resources
- Taking steps to engage and consult with neurodiverse and disabled staff
- Provide ongoing coaching and capability development

The initial focus should be on CCC staff, however as the programme matures, the learning resources should be made available to all staff to support adoption across the business, with a specific focus on a group of key team leaders who will be coached in operational excellence.

The learning approach, formed by insights from other automation programmes, should leverage a multi pronged strategy:

Be ready now

The CCC should be a high performing multi-disciplinary team. All CCC staff should be trained and coached to have the skills, capacity and motivation to thrive in this demanding environment.

Help teams adopt

Automation projects rarely fail due to technical capability. They struggle because the organisation is not ready or capable to drive and adopt the benefits of automation. Hence, the teams should work with your key business team leaders to provide them with operational leadership coaching and equipped team leaders to be inclusive to freeing up capacity and improve the value of automation.

Prepare to own

NHS needs to be certain that their own staff have the skills and capacity to be self-sufficient for the transfer of all or most CCC roles "in-house". While the programmes might start with the support of external advisors, there should be plans in place to develop this capability and transition internally.

Illustrative plan for design, delivery and continual management of training and skill requirements from initial RPA programme set-up through to business as usual.

Ongoing management of training

| Confirm CCC roles | Create capability maturity framework | CCC team assessments and TNA | Facilitate and deliver CCC upskilling | Ongoing coaching and mentoring | Regular CCC capability reviews |
|---|---|--|---|---|---|
| The activity or role RACI matrix informs CCC capability needs | Adapt capability framework for all CCC roles. Use to help development and recruitment | Individual assessments and training needs analyses will create learning need | Deliver learning interventions according to agreed need | On the job individual and team coaching of CCC team | Re-assess individuals as their experience and skills grow |
| | Create CCC learning pathways | Create CCC learning portal and materials | | | |
| | Create pathways for each CCC role and capability level | Creating and curating automation content | | | |

The ongoing process for managing training needs starts with confirming the **CCC roles RACI** and using this to create the **CCC capability maturity framework**. This will describe the automation capabilities required across a range of maturities (developing, performing and excelling) and will be used to complete individual and team assessments, and personalised **training needs assessment (TNA)**. Along with the CCC role RACI, this can also be used to **guide and inform recruitment** into the CCC as part of your transition state approach and to create role-based **learning paths**.

Pillar 4 Enable – Accelerators and assets

Using standardised templates and tools can help significantly increase the pace of delivery and hence shorten the timelines to benefits realisation.

Recommended list of templates or frameworks for RPA delivery programmes (illustrative and not exhaustive)

Approach overview

Tried and tested techniques, templates and tools can significantly accelerate the pace of RPA delivery programmes. They can be utilised from the outset and incorporated quickly into the RPA delivery capability teams and avoid the need to establish them from the ground up.

The teams should also encourage development of reusable assets at every stage of delivery to continue to add to the set of accelerators that other teams can draw upon as they set up their programmes. Innovation exchanges or automation marketplaces can be effective ways of collating, managing and sharing this collateral across programmes.

| Stage | Template or framework | Description |
|-------------------|---|---|
| Designing | Intelligent automation playbook | Central to the operation of an automation capability, containing the operating procedures, governance, templates and processes to run the programme effectively |
| Designing | Capability maturity framework and roles RACI | Can be used as a framework to create learning pathways for specific technical roles |
| Designing | Use case characteristics checklist | A simple checklist to allow business users to identify use cases fit for RPA |
| Designing | High level prioritisation matrix | A 2x2 or 3x3 matrix based on strategic, operational and business imperatives to prioritise the use cases generated by the business |
| Designing | Benefits case design | Framework to develop the business case for RPA, either quantitative or qualitative, based on the operational effectiveness criteria business wants to meet |
| Designing | Detailed use case assessment framework (for example, ABC framework) | Framework to assess business and capability requirements, select the right technology for the job and right use case for the technology selected, for example, ABC framework outlined under the demand triage section |
| Delivering | Delivery methodology and associated gated approach | Typically agile based delivery approach incorporating a toll gate methodology to control and manage the delivery quality |
| Delivering | Process design document | Detailed design document outlining RPA design at the click level, validated by process or use case owner prior to development |
| Delivering | Release management approach, including solution design document | Release management approach checklist and framework to go live with RPA solutions in line with IT change management approach |
| Delivering | Change management framework | Approach defining and delivering the interventions required to make the organisational shift required to embed Automation |
| Enabling | Operations support plan and SLAs | People, process and technology plan to run and maintain automations solutions; typically outline L1-4 support options and service SLAs |
| Enabling | Training and skills development framework | Framework providing capability build for Automation in the wider organisation. This competency can be built, developed and delivered centrally via the CoE |
| Enabling | Continuous improvement approach | Multi-pronged approach to build upon automation solutions to keep up to date with industry and technology trends, as well as broaden the remit to continually drive business process improvement |
| Other | Benefits management framework | Benefits management framework to enable rapid identification, tracking and realisation of benefits throughout the automation lifecycle |

Pillar 4 Enable – Innovation and continuous improvement (CI)

To drive continued growth, improvement and value from RPA programmes, it is important to consider approaches to embedding innovation and a CI culture.

Approach overview

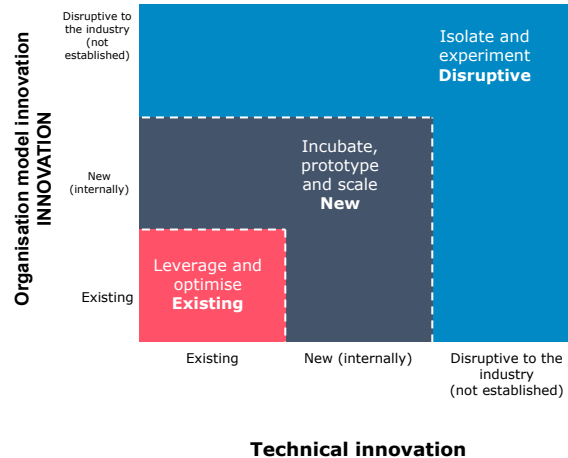
Innovation and continuous improvement (CI) is an essential mechanism to keep the NHS's automation and business process improvement services as valuable as possible.

These programmes can make an important pillar of cross organisation partnership to solve existing and emerging business and operational challenges and opportunities.

An innovation and CI approach can be built into the automation delivery roadmap from three perspectives:

1. Leverage existing capabilities (reviewed on every process design)
2. Bring in new capabilities (strategy, typically reviewed once a quarter)
3. Explore disruptive concepts (on demand, internally or in partnership)

Innovation and continuous improvement approach



Disruptive

Explore and experiment with ideas not yet adopted in the industry, in an isolated environment that does not impact on the business. **This is a value-added service.**

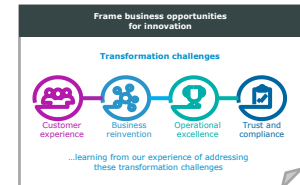
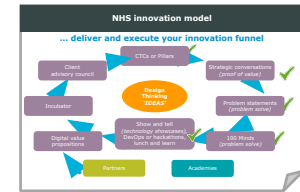
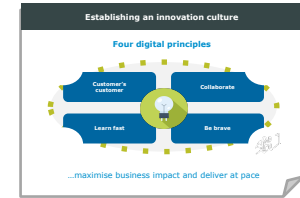
New

Research and prototype capabilities in use elsewhere in the industry to test application to existing business challenges. **This is reviewed every quarter.**

Existing

Leverage and optimise the existing capabilities of NHS in a different and creative way to bring business value. **This is reviewed in every process design.**

Examples of realising the art of the possible



04

Technology for RPA



04

Technology for RPA

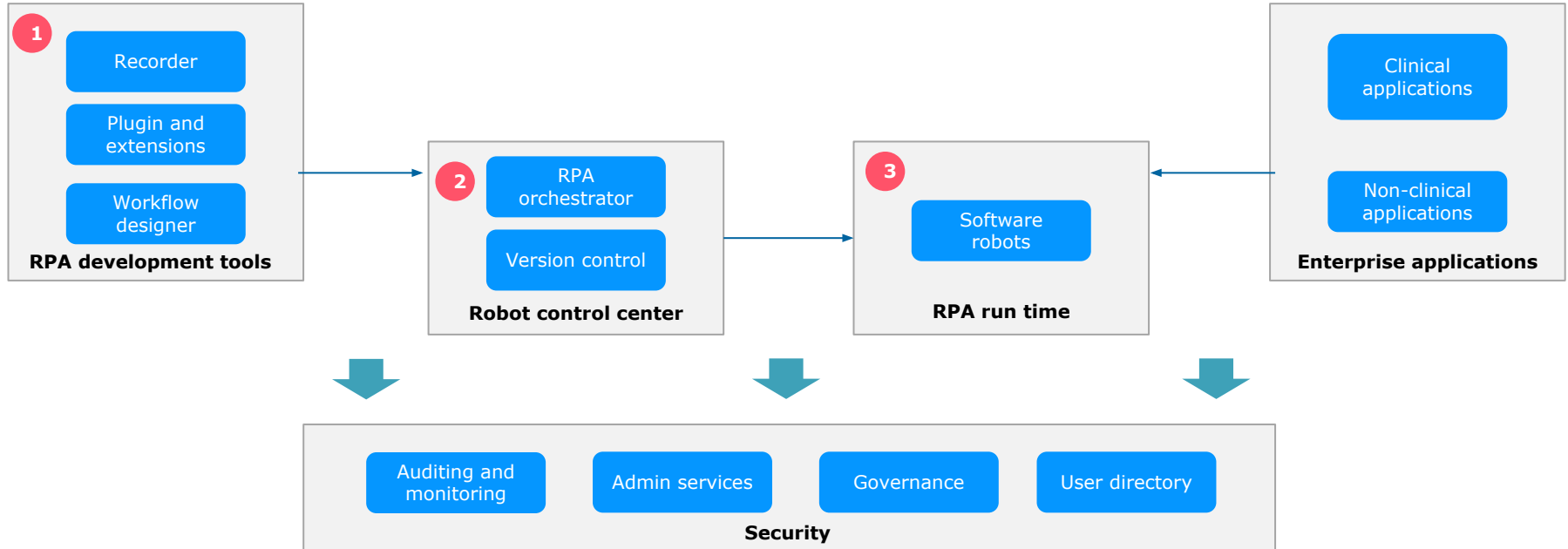
Chapter contents

Technology

- Reference architecture
- Technical requirements
- Compliance requirements

Reference architecture – RPA high level architecture

Each RPA vendor has their own nuances and varied nomenclature, but all products comprise of three fundamental elements: **development tools**, **robot control centre** and **run time**.



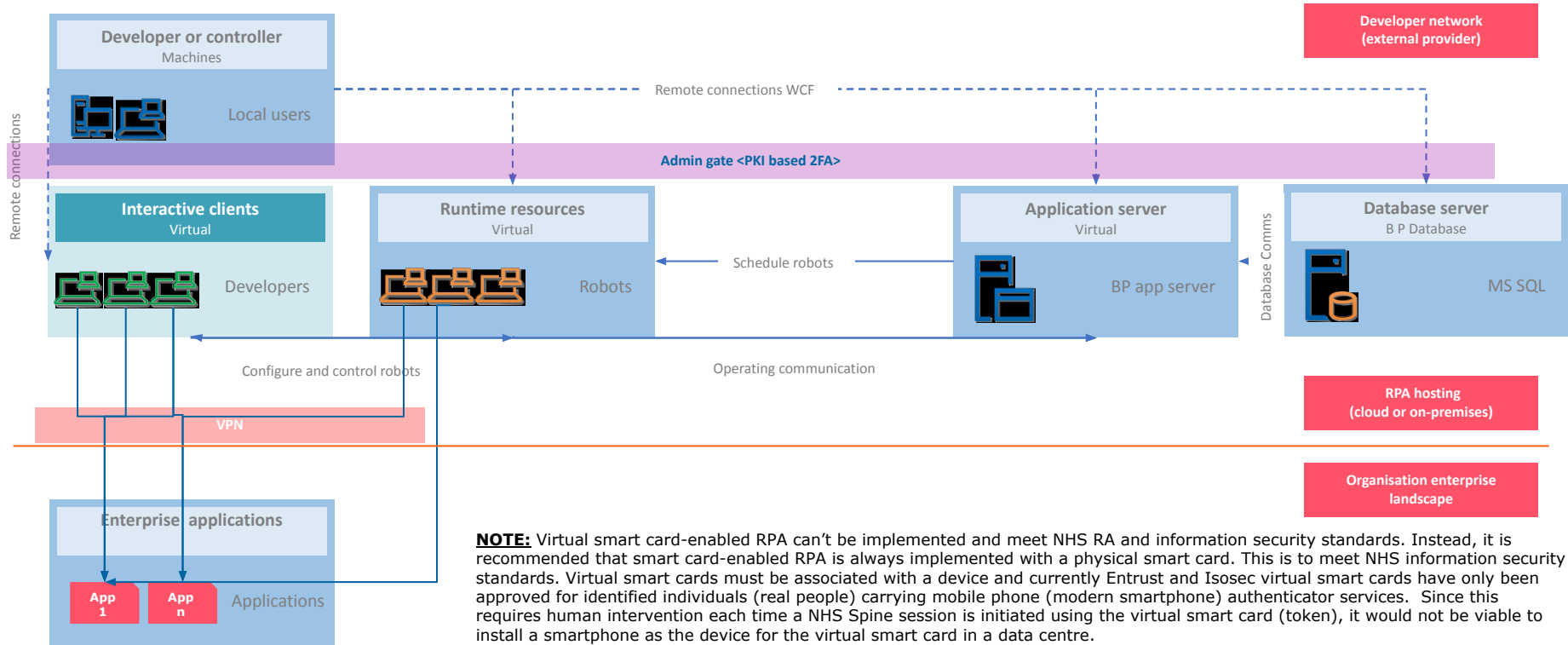
Reference architecture – Components description

The components shown on the previous slide are described here in more detail.

| Component | Description |
|--------------------------------|---|
| RPA development tools | <p><i>Recorder:</i> The recorder is the part of the development studio that developers use to configure the robots. It is like the macro recorder in Excel, the bot recorder in any platform, records steps. It records mouse and keyboard movements on the UI and this recording can be replayed to do the same steps again and again. This enables rapid automation.</p> <p><i>Extension and plugins:</i> Most platforms offer many plugins and extensions to ease the development and running of bots. In many applications, such as EPR or Oracle Finance , it is not easy to individually identify controls of the UI through traditional techniques. RPA vendors have developed plugins and extensions to help with these issues.</p> <p><i>Workflow designer:</i> The workflow designer is used by developers to create robot configuration or train the robots. Using the development studio, a set of instructions and decision-making logic is coded for robots to execute. Some platforms provide flow-charting capabilities such as Visio, so it becomes very easy to plot steps in a process, whereas some other platforms require coding. In most studios, in order to do commercial development, developers need to have a fair amount of knowledge of programming, for example, loops and variable assignment amongst others.</p> |
| Robot control centre | Robot control centre provides robot management capabilities. It monitors and controls a robot's operation in a network. It can be used to start or stop robots, make schedules for them, maintain and publish code, redeploy robots to different tasks, and manage licences and credentials. |
| RPA run time | Once issued their instructions, the software robots (also referred to as “clients” or “agents”) carry them out, interacting directly with enterprise applications to process transactions. The list of actions that a robot is capable of performing can be provided out of the box or actions can often be custom created using code. |
| Security | A set of tools to support compliance or any regulatory requirements and provide audit of actions taken and decisions made. |
| Enterprise applications | The applications, such as EPR or finance or procurement or other clinical and non-clinical systems, that belong to the organisations which are integrated with RPA for workflow orchestration. |

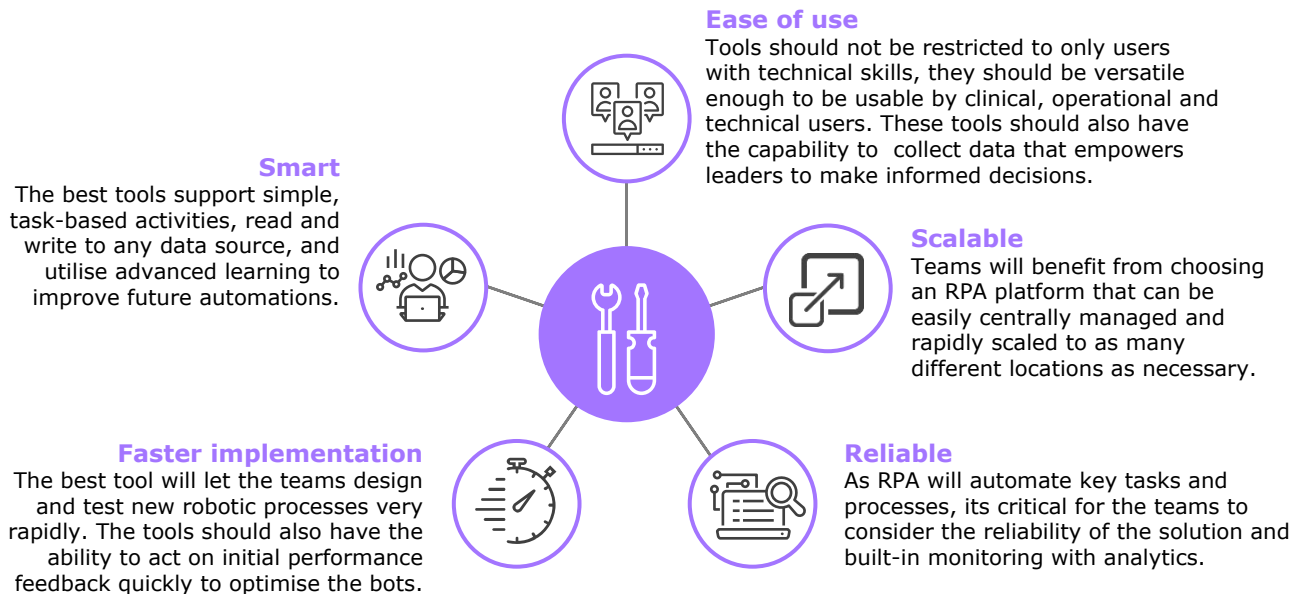
Reference architecture – RPA architecture implementation

The architecture below shows a prototype implementation hosted on a cloud platform.



Technical requirements – Choosing the right tool

There are various RPA tools in the market, at a high level, preferred tools should have the following characteristics:



The following pages highlight the technical requirements that need to be considered for an RPA solution.

Technical requirements – Key attributes

Key attributes that organisations need to look for in RPA software are summarised below.



The following three pages provide a description of each requirement in more detail.

Technical requirements (1 of 3) – RPA

Key attributes that organisations need to look for in RPA software are as follows:

Overarching requirements

- ✓ The tool should be designed to provide organisations with a business owned and IT-supported virtual workforce
- ✓ The tool must offer a software platform which is robust, highly scalable, powerful and flexible
- ✓ The tool must provide central management of robots and analytics dashboard for insights and utilisation
- ✓ The tool must include out-of-box software robots and ability to custom build software robots to automate end-to-end processes, supported with cognitive capabilities such as continuous learning and improvement using data and analytics

Compatibility with existing estate

- ✓ The new RPA software need to be compatible with existing clinical and non-clinical systems – for example, finance and HR systems, trust integration engines, EPR, pathology and radiology information systems
- ✓ The vendor must provide a list of potential compatible healthcare systems and must need no or minimal configuration work for those systems
- ✓ The tool should be capable of extracting and integrating data from different data sources and systems
- ✓ The software should be able to read and write different document types
- ✓ The software must provide the ability to be hosted on a desktop or on a on-premises server or public or private or hybrid cloud

Automation process

- ✓ The software must provide an intuitive Visual interface to allow technical and non-technical users to build workflows using drag and drop style activities with minimal training
- ✓ The software must provide the ability record process steps for functions so that the bots can follow these steps and execute tasks
- ✓ The software must include a workflow manager which can create the workflow for multiple bots and link them through a task chain
- ✓ The Bots must understand the data and objects on the screen, so that it is easy to handle any changes in the application
- ✓ The software must provide the ability to record multiple activities at once
- ✓ The vendors must provide pre-built connectors for the software that can easily integrate with key applications in the enterprise
- ✓ Robots can be scheduled , placed in queues , triggered set a predetermined times, initiated by humans, or actively monitor databases to activate

Security*

- ✓ The software must provide the ability for multiple bots to share architecture with central control
- ✓ The vendors need to ensure the software is aligned with NHS data privacy regulations and data is kept within country boundaries in line with GDPR regulations
- ✓ The solution using the software is architected for enterprise-level security, compliance, support and audibility
- ✓ The software must provide security features to ensure only authorised personnel of the enterprise can access or manipulate data
- ✓ The solutions built using the software must provide high level of flexibility for encrypting the data at rest (data storage) as well data in motion (APIs and messages)

*Detailed assessment will be required against NHS specific standards, for example, NHS RA and information security standards.

Technical requirements (2 of 3) – RPA

Scalability

- The software must have the ability to execute unlimited business processes with a single bot for greater scalability
- The software supporting the bot must have built-in objects and libraries that organisations can reuse in order to support scaling up of processes and automation can be scaled up or down according to business needs
- The software must provide flexibility to adjust the number of resources assigned based on business demands
- The Software need to offer 4 levels of integration – User Interface, API, operating system level and database level to support scaling up automation based on the enterprise needs

Exception handling

- The solution built using the software needs to provide multiple error handling options to users when changes occur in automated processes
- The software needs to provide the ability to easily track errors, provide alerts and recommend changes to processes
- The software needs to include controls for exceptions which can be configured easily and trigger notifications as needed
- The software need to provide the option to flag and notify the administrator any change in the processes and allow to continue or terminate depending on preset rules or administrator action

Implementation

- The vendor needs to support the ability for their software to be hosted either on-premises by the organisation, by a managed service provider in partnership with the RPA provider, or on a public cloud such as Azure or AWS
- The software must be able to automate software maintenance and need to provide backward compatibility with software versions
- The vendors licence model should be flexible and include SaaS-based platform as well
- The software must be able to handle changes to automation scenarios in the bots due to application version updates. It also needs to support changes to the processes and quickly save the changes to the server to make them available for bots and making change management easier

Centralised control and analytics

- The control room in the software must provide visibility and control from a single dashboard to schedule, track, verify, log, organise and report on all automation activity, allowing enterprise user to maximise the benefits of automation
- The software bots must be able to capture all content-level information so that every action on all the bots would yield real-time process statistics and operational analytics for the digital workforce
- The software bots must help optimise processes and provide RPA reporting
- The software must support enterprise users to track KPIs and cost savings through automation and monitor individual worker and entire workforce performance

Technical requirements (3 of 3) – RPA

Audit trail

- ✓ The software must provide the ability to monitor and audit trail the users and bot activities through control centre
- ✓ The software must display both scheduled and failed tasks
- ✓ The software must document any failure for future audit needs
- ✓ The software must provide a detailed log sheet which provides a time-stamped history of every action and decision that is taken

Cognitive capabilities

- ✓ The software must be able to use visual or image recognition technology to see screen elements just as humans do
- ✓ The software must provide the ability to use machine learning for semi-structured processes that typically need expert decision making
- ✓ The software must provide the ability to use natural language processing for analysing natural written language text and documents
- ✓ The solution developed using the software must ask for human assistance when it encounters something it cannot understand and will learn from those escalations to continuously improve its ability to automate similar tasks in the future

Training and support

- ✓ The RPA vendor should offer in-house, on-premises and online (interactive and on demand) training sessions and tutorials
- ✓ The technology provided by the user should be user-friendly so that minimum support is required to create bot process flows

Pricing

- ✓ The buyer should discuss with vendor annual licensing model with the ability to buy additional bot licences varies depending on the requirement
- ✓ The buyer should also consider per-transaction and usage-based licensing model
- ✓ The software vendor should not add any additional charges for the server component or any centralised functionality
- ✓ The software vendor should make sure any maintenance and support costs are included in the pricing and clearly stated, if charge additionally
- ✓ The software vendors should be aware that the NHS owns IP for automation developed by them for the buyer using the bot software

Compliance requirements

NHS specific compliance requirements that need to be considered for any RPA implementations are as follows:

Medical device regulation

The 2002 UK Medical Device Regulations apply to all products qualifying as a medical device or in vitro diagnostic medical device (henceforth we mean both by 'medical device'). All digital technologies classed as medical devices must meet the relevant requirements of the regulation and have a UK Conformity Assessed (UKCA) mark in place before they can be placed on the UK market, please note that an up-to-date CE mark will continue to be recognised until 30 June 2023. The Medicines and Healthcare Products Regulatory Agency's (MHRA) [medical devices flowchart](#) helps developers of digital health technologies understand if their technology is considered a medical device under the 2002 UK Medical Device Regulation.

It is the responsibility of the legal manufacturer to determine if the implementation of automation falls within scope of the above regulations. Assessment of whether an automation qualifies as a medical device or not can be complex and must take into account the wider context of the automated process. Additionally, this assessment is made more complicated, as automation that utilises a known medical device may then themselves be an accessory to a medical device. It is advised that trusts contact their compliance or medical physics or clinical engineering department for clarification. In case of uncertainty, please contact the MHRA.

Clinical risk management

NHS Digital information standards on clinical risk management in digital systems is designed to help health and care organisations assure the clinical safety of their health IT software. These standards provide a set of requirements to promote and ensure the effective application of clinical risk management by:

- health organisations that are responsible for the deployment, use, maintenance and decommissioning of health IT systems ([DCB0160](#)); and
- manufacturers that are responsible for development and maintenance of health IT systems for use within the health and care environment ([DCB0129](#))

NHS digital technology assessment criteria

[NHS digital technology assessment criteria](#) for health and social care (DTAC) gives staff, patients and citizens confidence that the digital health tools they use meet *clinical safety, data protection, technical security, interoperability and usability and accessibility standards*.

NHS identity and access management

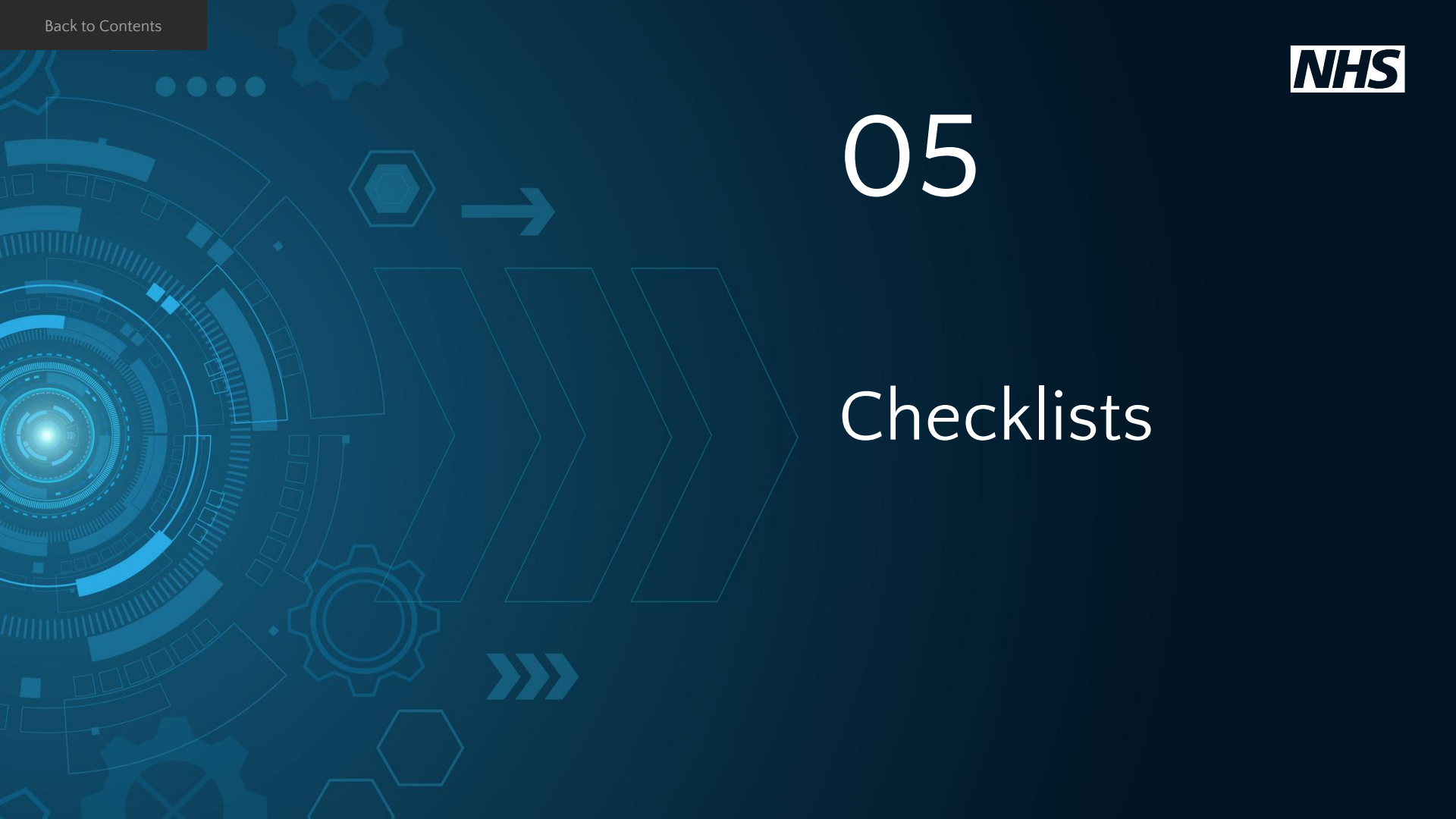
Any RPA deployment involving NHS Spine must use APIs or the NHS's PKI based identity management capability (approximately 900,000 Smart Card users) which handles identities for real people based on international PKI standards. [NHS Digital RA](#) and cyber security have developed an assessment framework to enable each RPA deployment solution request to be assessed on a case-by-case basis for RA and information security controls. If the controls and risk and mitigation assessments are considered satisfactory, a time limited deployment will be agreed as an exception to NHS RA policy.

Information governance

Information governance requirements are specific to each trust or local authority, which may include completing data protection impact assessments (DPIAs) for each technology being commissioned.

05

Checklists



Standards and guidelines (1/2)

Before going live with RPA solutions, there are a series of standards that must be complied with, these are described below:

| Ref | Category | Requirement | Link to standard or guidance | Relevance for RPA |
|-----|---------------------------|---|---|---|
| SG1 | Clinical safety standards | Perform clinical risk management assessment | Clinical Risk Management Standards <ul style="list-style-type: none"> • DCB0129: Clinical Risk Management • DCB0160: Clinical Risk Management | The clinical safety standards define the requirements and criteria which must be adhered to in order to assure the clinical safety of all IT software, as well as the implementation guidance for achieving the requirements. |
| SG2 | Cyber security | Consider principles | National Cyber Security Centre (NCSC) Cloud Security Guidance | This document highlights details of cloud security principles and provides guidance on how to configure, implement and use cloud services securely. |
| SG3 | Data security | Consider good practice | National Cyber Security Centre (NCSC) Bulk Data Principles | Provides good practice and guidance for understanding how to manage and protect bulk data which is held digitally. |
| SG4 | Data security | Complete DPIA assessment | Data Protection Impact Assessment (DPIA) | DPIA provides a step-by-step guide to help identify risk associated with data and mitigate against them. |
| SG5 | Data security | Completed self-assessment | Data Security and Protection Toolkit (DSPT) | This online self-assessment tool is to be used by all organisations that have access to NHS patient data and systems to assess their performance against the National Data Guardian's data security standards and provide assurance that they are compliant with data security standards. |

Standards and guidelines (2/2)

Before going live with RPA solutions, there are a series of standards that must be complied with, these are described below:

| Ref | Category | Requirement | Link to standard or guidance | Relevance for RPA |
|-----|--|---------------------------------------|---|--|
| SG6 | Interoperability , usability and accessibility | Check and complete (where applicable) | Digital Technology Assessment Criteria (DTAC) | DTAC provides an assurance that all digital health tools used meet the defined clinical safety and technical standards. |
| SG7 | RPA as medical device | Check and complete (where applicable) | Regulating medical devices in the UK | The Medical Device standards and regulations define a series of recommended processes for the development, deployment and certification of medical devices and related services. |
| SG8 | Screen scraping | NHS national RA policy | Registration authorities and smartcards | Provides guidance on streamlining authentication for clinicians and remote smart card registration and emergency guidance for registration authorities. |



This document has been produced in partnership between the NHS Transformation Directorate and Atos. For more information please contact:

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Join the NHS National Community of Practice for RPA
<https://future.nhs.uk/connect.ti/RPA/grouphome>

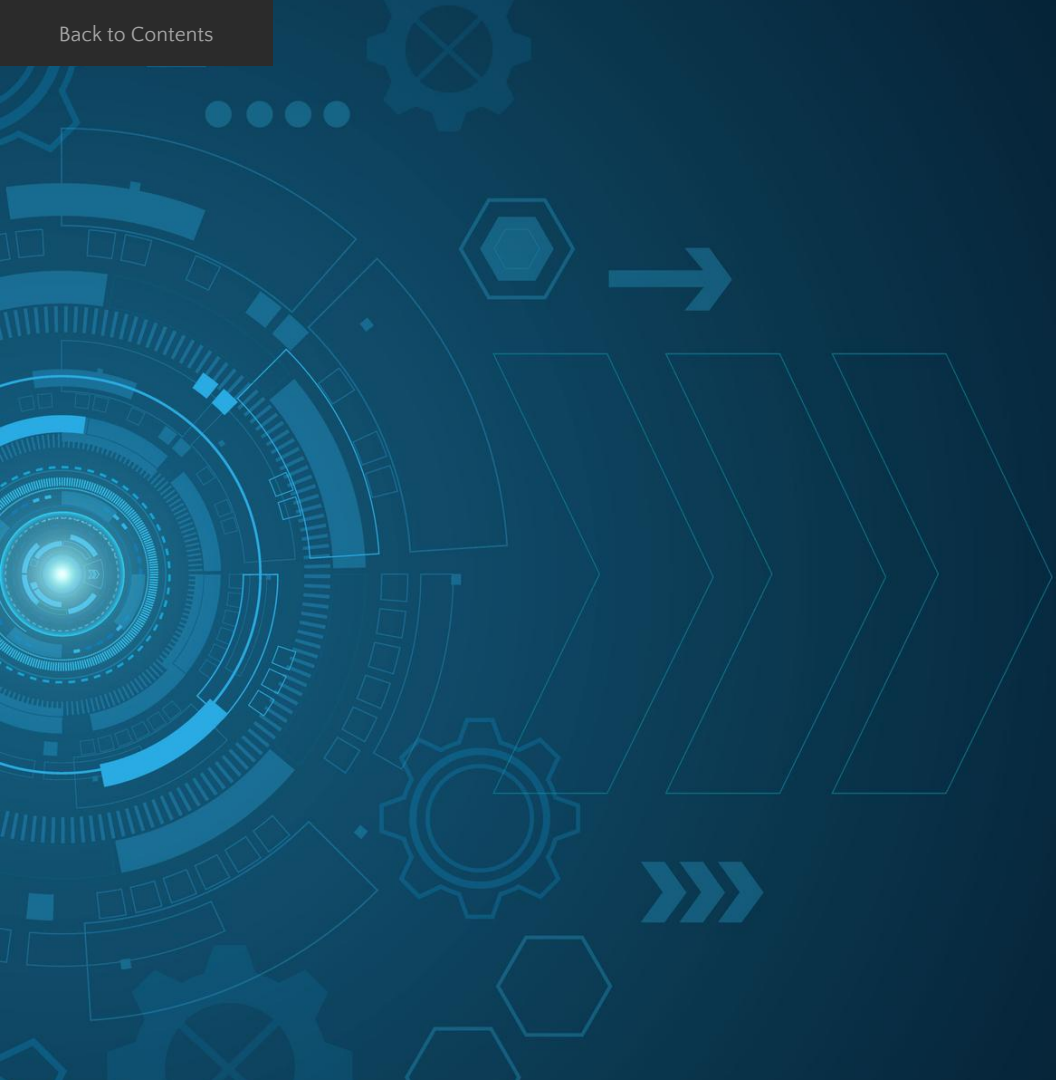
06

Appendix



A01

Guidance methodology



Methodology

This guidance has been developed collaboratively with input from organisations across the health and care system.

Gathered best practices



[2020 National RPA Survey review and analysis](#)



Research into national and International Exemplar Organisations and case studies



Horizon scanning of emerging trends in healthcare and other industries

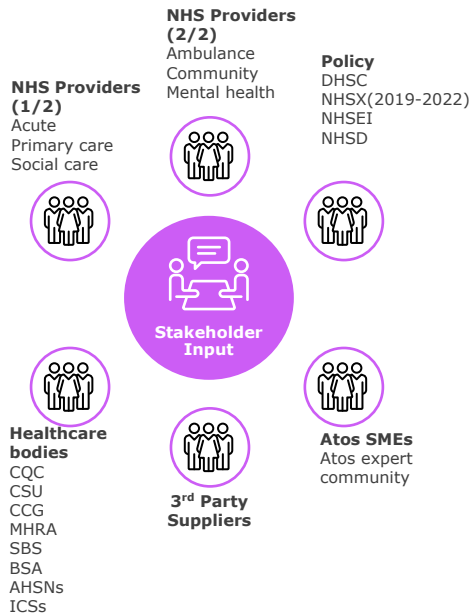


Gather collateral from recent RPA deployments

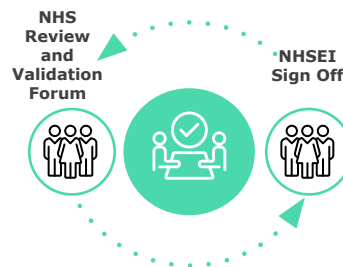


Gather Subject Matter Expert (SME) input into RPA best practices.

Engaged with stakeholders



Iterative review with key parties



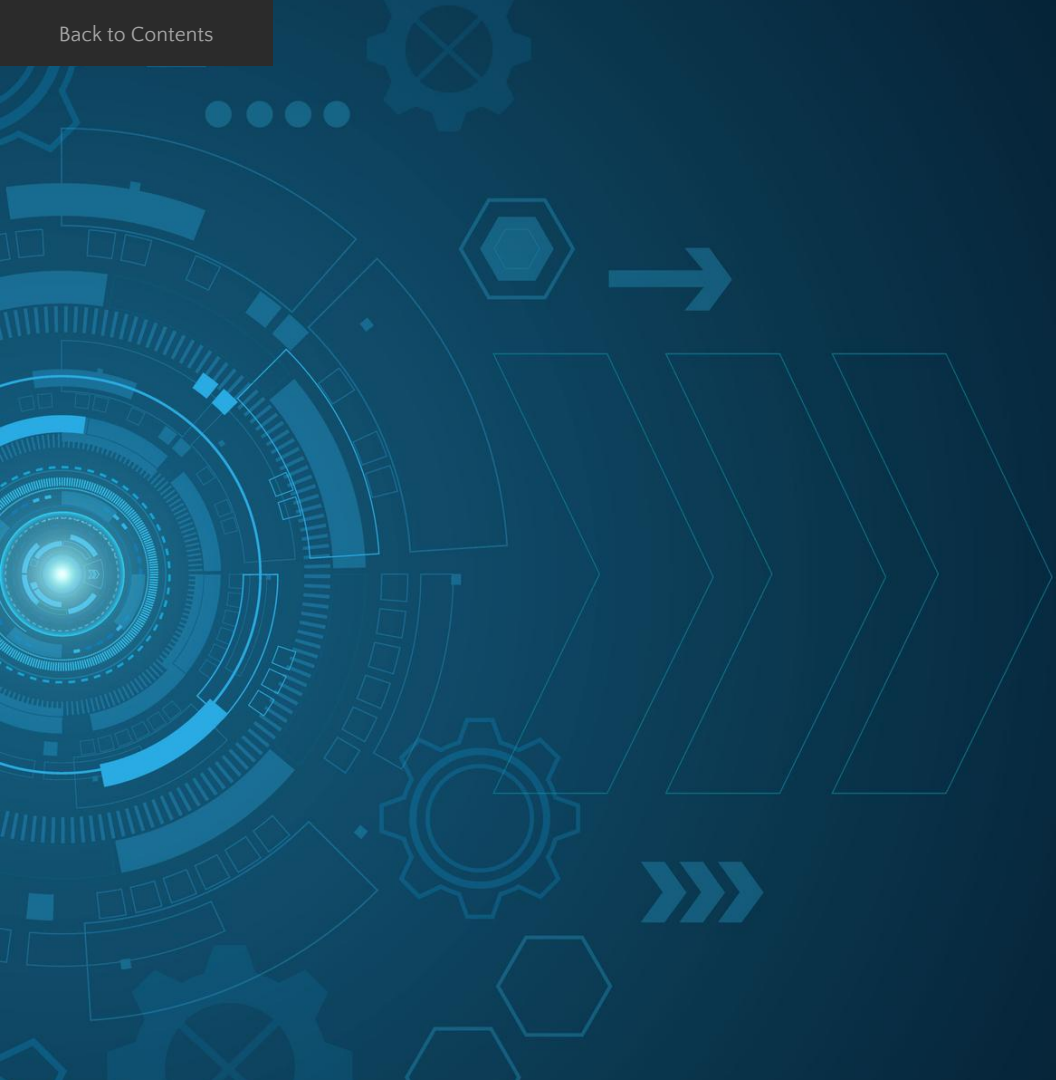
Publish



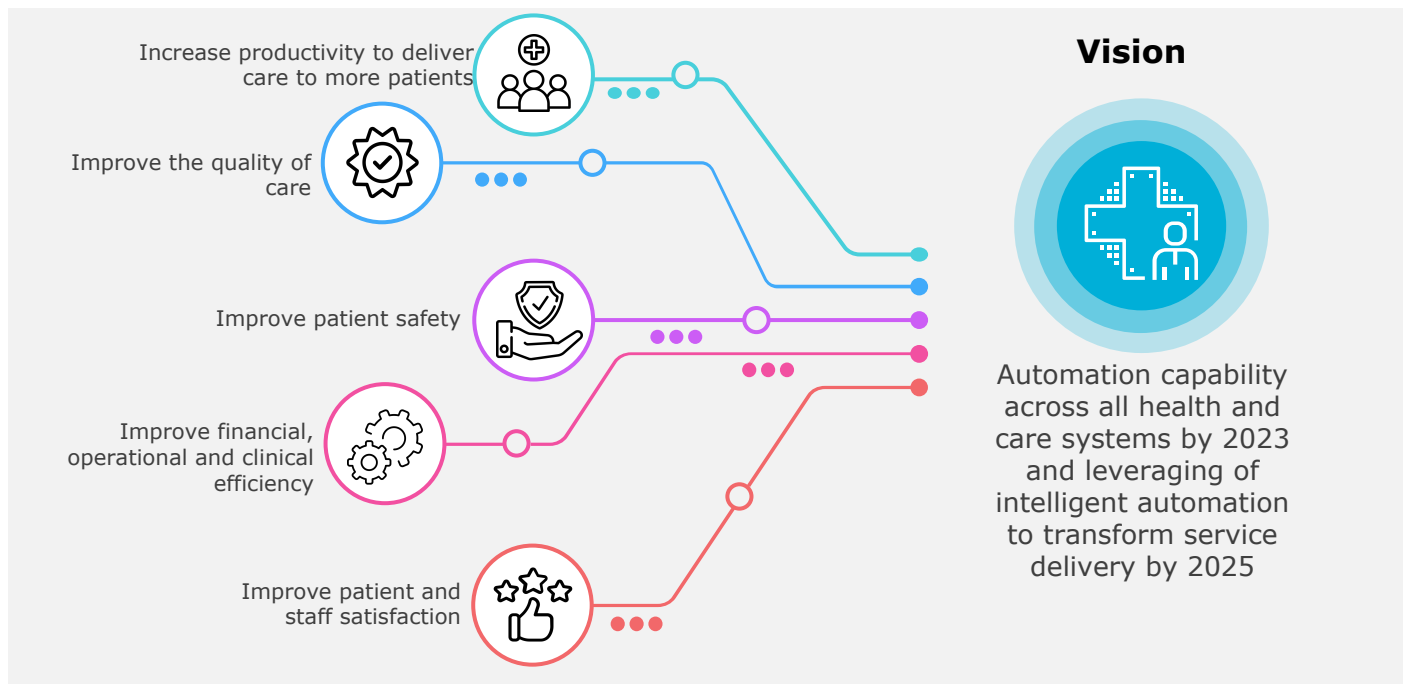
Join the [National Community of Practice for RPA](#) to access additional information.

A02

NHS vision for
RPA and
automation in
healthcare

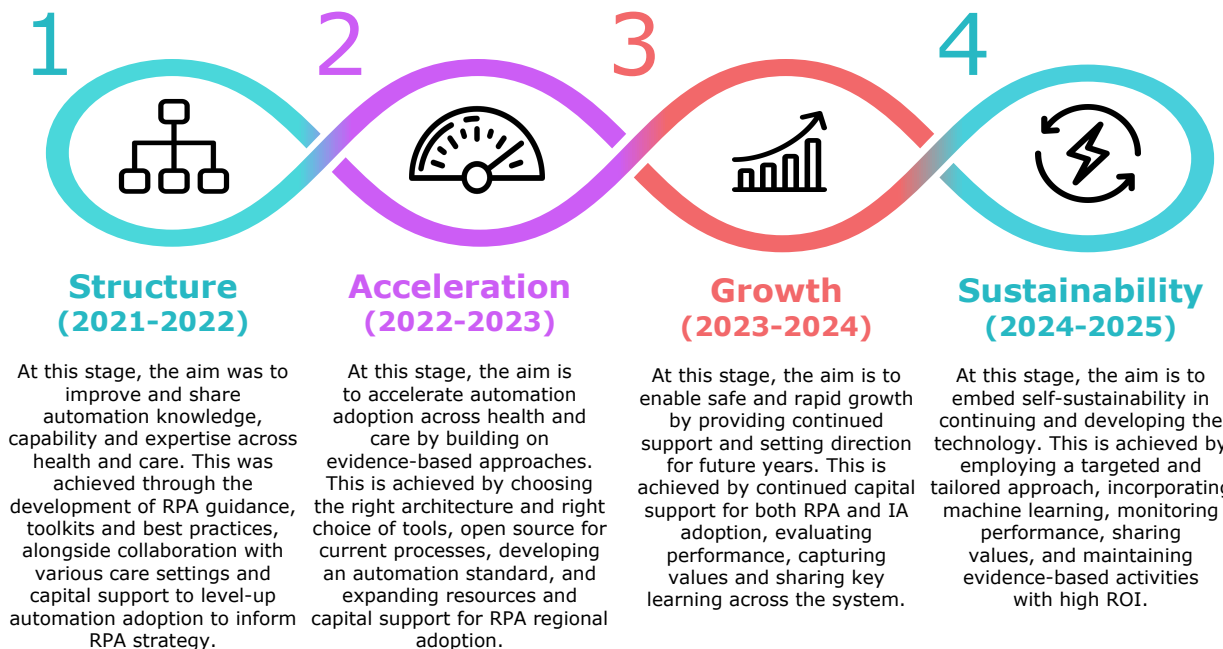


This guidance supports the health and care system in achieving the Automation vision set by the NHS Transformation Directorate in its 2021 RPA in Health and Care Plan. This will support Elective Recovery Plan and Secretary of State's mission to increase capacity by automating tasks such as patient registration and data uploads to enable staff to spend more time with patients.



Source - NHS Automation Plan for Health and Social Care (July 2021)

Over the next 5 years, enabled through RPA, the aim is to deliver a more connected health experience that is fit-for-purpose.



Join the [NHS National Community of Practice for RPA](#) to access our [GitHub RPA open source](#)

Source - NHS Automation Plan for Health and Social Care (July 2021)

To support the realisation of the vision, a collaborative approach based on shared learning and insight is required.

Across the NHS, there are multiple RPA projects and programmes that have started to establish maturity across their organisations.

The health ecosystem can use the current expertise within the system to not only build upon their initial pipeline but to help them identify and understand any relevant pitfalls early in the process.

Additionally, organisations should showcase, promote and publicise their own use cases, solution design and RPA journey to benefit the wider RPA community across the NHS.

Therefore, organisations can leverage current RPA expertise in the health and care system by following 3 steps.

Leveraging experience from wider RPA community in NHS

1. Discover

Has someone done this before within the wider NHS that can be leveraged? What business areas / functions / use cases have proven potential?



2. Adapt and adopt

Can existing solutions / codes / assets be repurposed or adapted to fit our requirement, making our implementation faster and cheaper?

3. Promote and share

What channels can we leverage to promote, share and publicise our programme and solutions so other projects can find them when needed?



Accessible and practical guidance, best practices and lessons learnt



Shared infrastructure for faster set up and lower total cost of ownership (TCO) across NHS; NHS is pushing for a SaaS-first approach



Shared license capacity and ability to leverage national scale for best deals on technology



Process / bot/ reusable assets catalogues enabling faster set up, delivery and quicker time to value nationally



Easily accessible centralised guidance on regulations, clinical safety assurance and data governance

A03

RPA in healthcare
today and good
practice

A03

RPA in healthcare today and good practice

Chapter contents

Global trends in RPA today

- Cross-industry trends
- Global healthcare trends

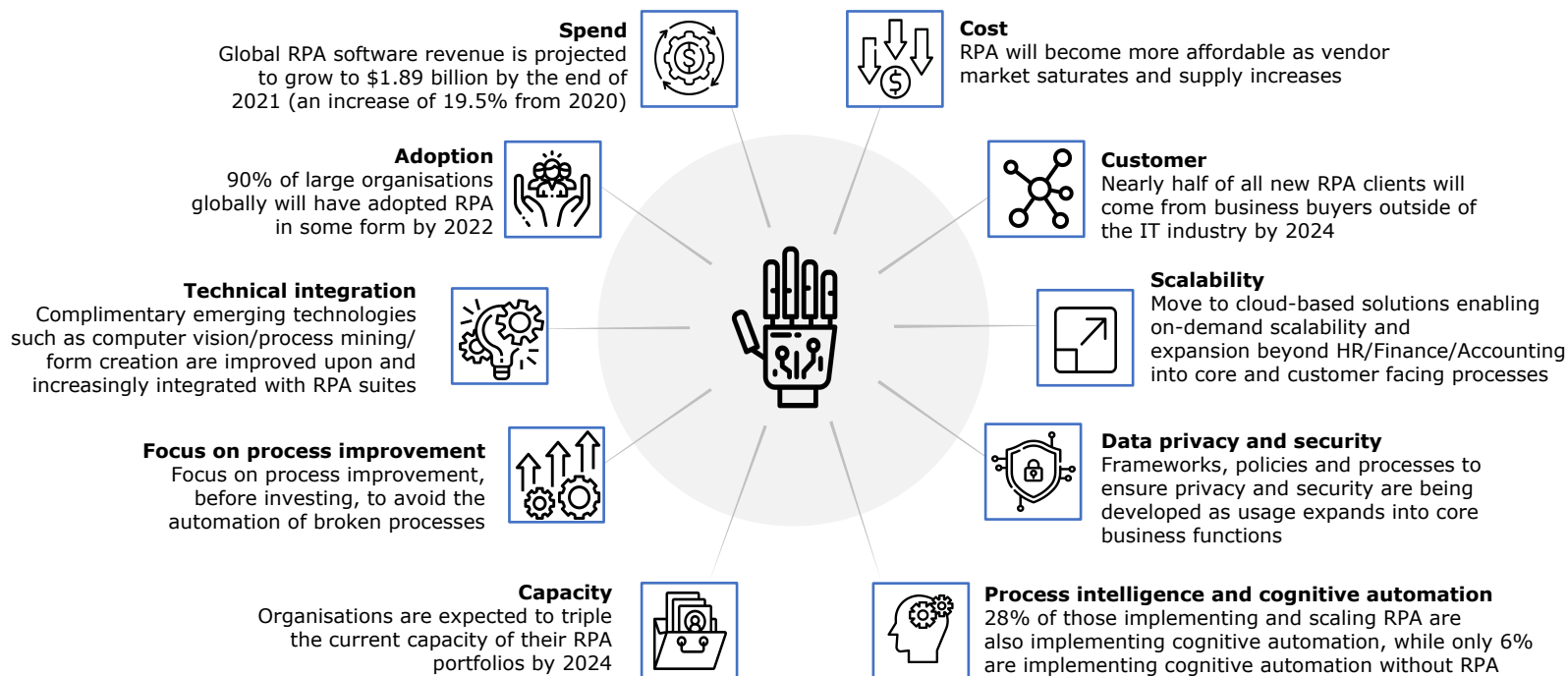
RPA in the NHS today

- 2020 national RPA survey analysis- insights
- Delivery maturity in the NHS
- Challenges and opportunities
- Example use cases
- 2020 national RPA survey- results breakdown

Good practice

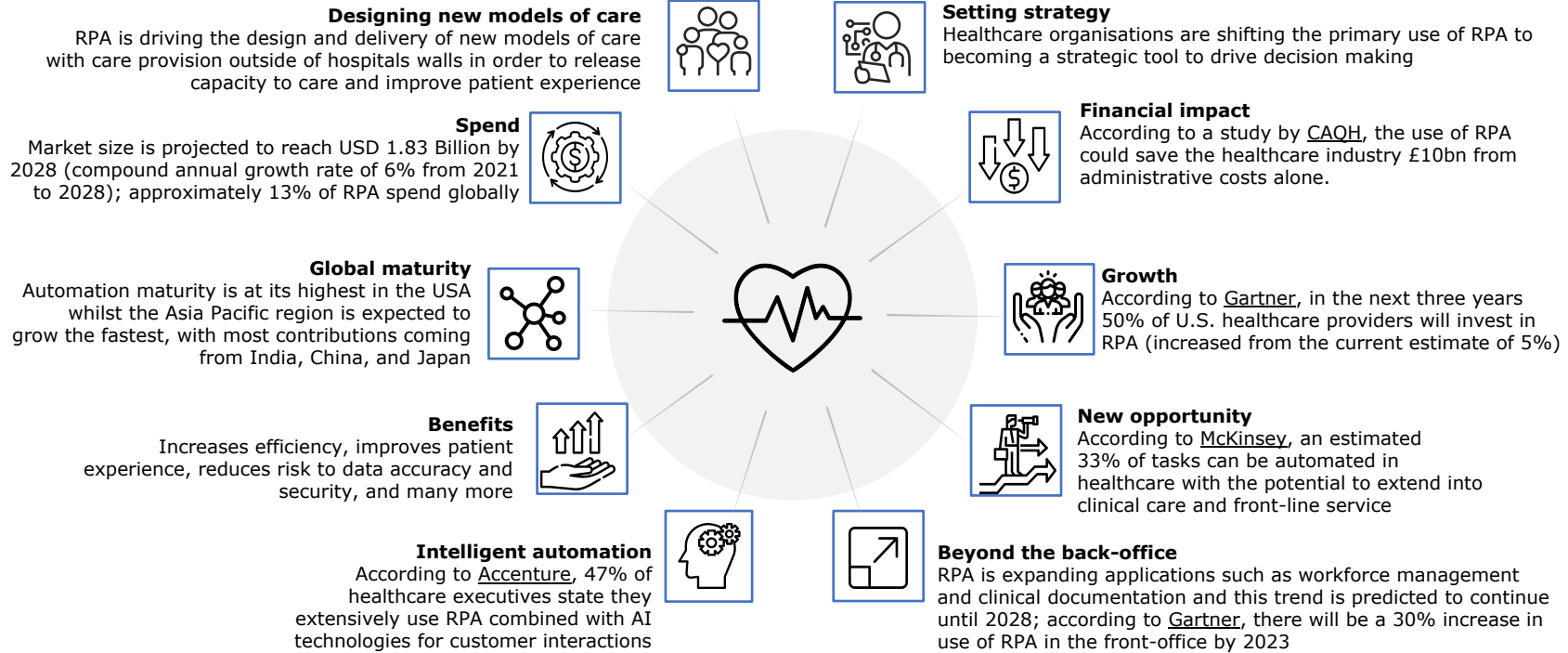
- National exemplars
- International exemplars

Global trends show increasing investment, adoption and broadening use of RPA across all sectors and a shift away from its perception as an IT-led solution.



Source - [Gartner](#)

Within healthcare globally, there is a clear opportunity for driving value from RPA, which is reflected in increasing investment, application and benefits realisation.



Source - [Verified Market Research](#)

A03

RPA in healthcare today and good practice

Chapter contents

Global Trends in RPA Today

- Cross-industry trends
- Global healthcare trends

RPA in the NHS Today

- 2020 national RPA survey analysis - insights
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- Example use cases
- 2020 national RPA survey - results breakdown

Good Practice

- National exemplars
- International exemplars

2020 survey insights

A pattern of increased use of RPA is emerging, but delivery is often siloed leading to missed opportunities for efficiencies at scale.



Designing capability



Usage

- 50% + of respondents indicate RPA is being used in their organisations.
- 42% of other respondents indicate they are considering using RPA.
- Implementations range from immature (0 – 3 automations) to mature (25+ automations).
- Implementations have been undertaken largely in isolation of one another.

Insights

RPA is becoming more prevalent, leading to increased capability and experience.

This experience though is largely siloed.

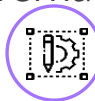
There is a need to raise awareness of how to apply the technology and to look at efficiencies and benefits of a more joined up approach across the system.



You can read the full report [here](#)

Survey insights

A **capability gap** exists to enable delivery at scale while technical complexity and varied governance arrangements create delivery challenges.



Delivering capability



Capability

- Only 2% of respondents consider themselves subject matter experts in the RPA field.
- 28% indicated they are highly skilled and 33% with a basic skill level.
- ~ 2% of organisations are delivering RPA in-house.
- Common areas of capability deficiency identified include lack of business analysts and developers.
- Commonly found that developer skilling up takes more-than-anticipated commitment.



Technology

- There is a mix of cloud and on-premise implementation of RPA.
- Test environments for multiple systems (ESR included) do not fully replicate production, therefore causing issues when promoting to live.
- Numerous RPA implementations facing access management or Smart Card issues.
- Some environments (test and prod) face CPU or memory issues when too many accounts access them at the same time (robotic accounts included).



Governance

- Governing structure for RPA within the NHS varies
- 15% of organisations have a dedicated Centre of Excellence (CoE).
- 22% have provided governance through an already existing framework.
- There is no overarching institution exist to share best practice.

Insights

There is a need to raise awareness of the basics, in relation to RPA and its application across the system.

Capability gaps mean that options for accessing skills need to be considered by joint working within the sector and with partners.

Experience from established CoEs should be shared freely across the healthcare ecosystem to benefit those organisations facing challenges relating to technology and governance models.

Source - NHS National Robotics Process Automation (RPA) Survey 2020

Survey insights

Process efficiency and accuracy are the primary benefits being realised whilst support is needed in navigating the vendor market.



Evolving capability



Benefits

- Over 20% of respondents highlighted improved process efficiency, increased accuracy and productivity as key benefits from adopting RPA.
- ~ 19% indicated that there would be cost and time savings as a by-product of increased productivity.
- Lack of clarity on if RPA is the most appropriate solution for certain situations rather than other tools such as PEGA or system integration.
- What 'good looks like' has been defined on a per-implementation-basis.



Market

- 45% of respondents listed Blue Prism as an already existing or potential vendor, 20% of respondents listed UiPath, 14% indicated NDL.
- Some other providers listed include Automation Anywhere, Medxnote and NICE.
- Most or all licensing and service agreements have been agreed at an individual trust, practice or organisation level.
- Lack of clarity on what licences or packages are required by organisations.

Insights

Benefits are being realised across the sector however support is still needed in identifying the appropriate technical solution.

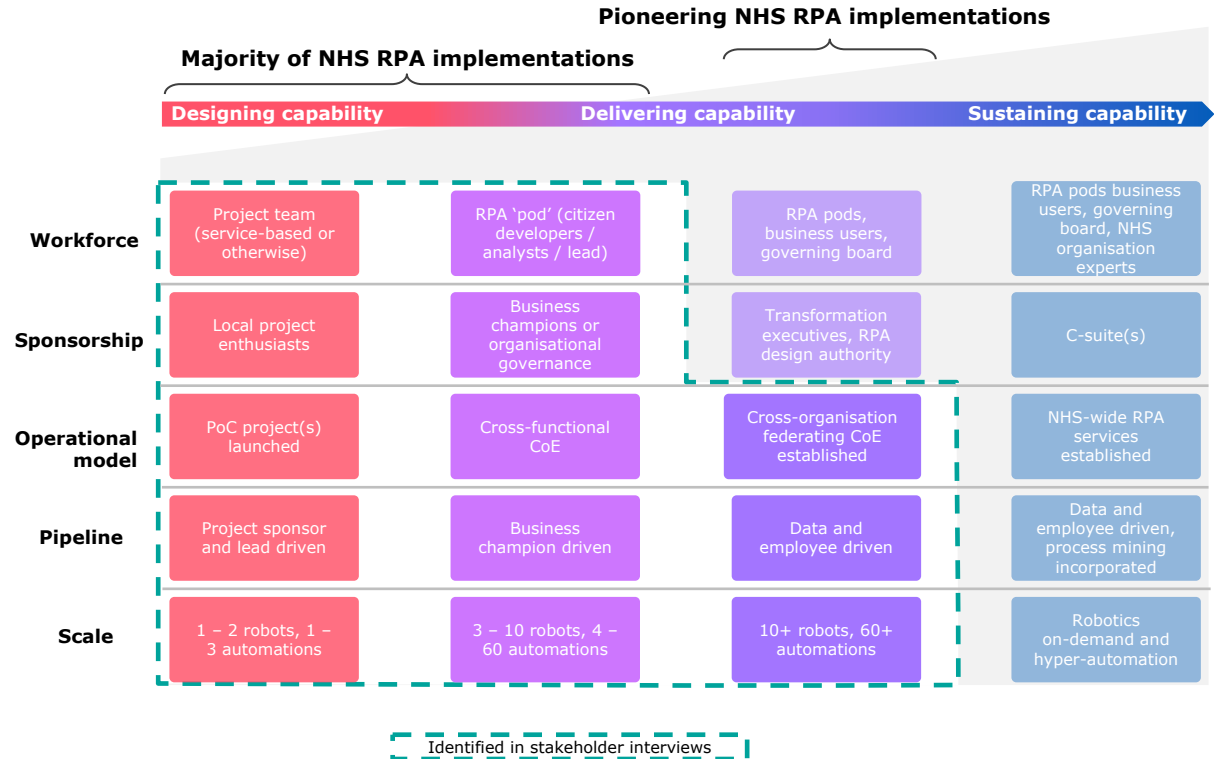
The market is competitive with multiple vendors providing services to the NHS however investment has been localised potentially missing opportunities for added value at scale.

Source - NHS National Robotics Process Automation (RPA) Survey 2020

Delivery maturity in the NHS today

Observations

- RPA is **widely experimented with** across the NHS
- Most organisations already on the automation journey are **between designing and delivering** on the maturity model.
- Predominant **usage is in 'traditional RPA' targets of HR, finance, accounting** – clinical usage is immature.
- Usage in acute care and supporting organisations is most advanced** compared to other care settings.
- There is a **limited usage** within other care settings such as **primary care, social care, community and mental health.**



Challenges

Key challenges exist in the ability to fund, deliver and scale RPA across multiple care settings.

Designing capability



Defining and understanding RPA

Varying definitions of RPA lead to misconceptions of what RPA is, what it isn't, its benefits and how it should be implemented and sustained creating uncertainty amongst stakeholders.



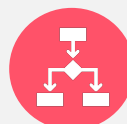
Investing in RPA

High upfront costs for procurement, mobilisation and implementation lead to the true total cost being underestimated; multiple and complex frameworks through which organisations go-to-market and engage with suppliers delay investment.



Buy-in and consensus

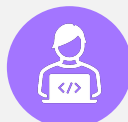
Due to competing priorities and differing strategic objectives gaining buy-in and building consensus from leadership and across departments is complex.



Vendor engagement

Complex organisational structures within the NHS and a lack of well defined policies and processes create challenges for vendors to access and support organisations.

Delivering capability



Capacity and capability

Defining the required skills, technical expertise, level of resourcing, capacity and effort required for the implementation of RPA and ongoing support



Technical complexity

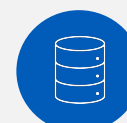
Complexity regarding interoperability, solution architecture, solution hosting, bot development, licensing arrangements and traffic requirements require deep SME.

Sustaining capability



Decentralised automation operating model

Limited central coordination has resulted in siloed working, a lack of shared expertise and experiences between organisations and reduced the effectiveness of change management activities.



Data quality, security and privacy

Securely managing and processing high volumes of data, including patient data, generate significant security and privacy concerns.

Source - NHS National Robotics Process Automation (RPA) Survey 2020

Opportunities

Opportunities exist to address some of key challenges in order to realise benefits for providers, NHS workforce and patients.

Designing capability



Enhanced governance

To improve consistency through the introduction of a set of frameworks, policies and processes for implementing RPA across NHS



Learning from experience

To drive wider options with a coordinated and structured approach to lessons learned and sharing good practice from those organisations at varying stages of their RPA journeys



Use the technology to its full capability

To get the best benefit impact by leveraging full scale of technology capability. RPA is a proven technology. Use the projects as an opportunity to push the envelope on the solution design to maximise process efficiency.

Delivering capability



Knowledge transfer

Working closely with more digitally matured organisations and partners across the sector to build capability within teams



Delivery models

Working with NHS organisations, and partners to deliver in a joined up approach that reduces duplication and minuses investment

Sustaining capability



Teamwork and collaboration

To eliminate silos and improve collaboration, communication and teamwork across organisations



Innovation

Sustaining improvement and exploring new opportunities for delivering value through partnerships with international healthcare exemplars, cross industry working and with the start-up community



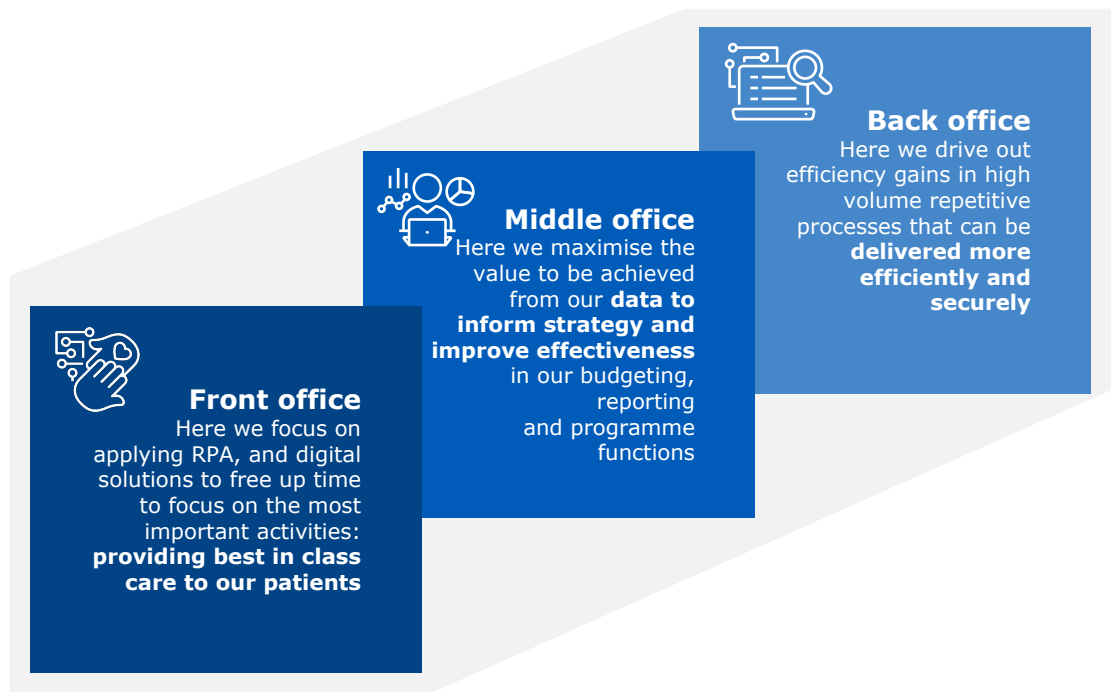
Build momentum and scale

To drive business benefits more widely at NHS. RPA is a local technology with ERP reach. It's secure, can be applied quickly and has already been proven at NHS.

Source - NHS National Robotics Process Automation (RPA) Survey 2020

Example use cases

The practical application of RPA within the health and care sector can be understood through the concepts of 'front', 'middle' and 'back' office.



Survey analysis: NHS national RPA survey (2020)

The National RPA survey was carried out in August 2020 to provide a better understanding of the level of adoption, maturity and governance within the NHS structure. The survey received 172 responses across NHS and social care and industry partners.

Following the analysis of the survey, NHS identified key issues and barriers to adoption. To address the barriers this guidance is developed to support the system in adopting, managing and scaling RPA safely, securely and efficiently, and to ensure benefits are maximised across NHS.

Adoption

Over 50% of respondents indicated that RPA is currently being used within their organisations at different levels.

42% of respondents indicated that while they are not using RPA within their organisations, they are considering it.

Maturity

While a total of 51% of respondents say that RPA has been piloted or implemented within their organisations, and 63% have indicated that they only have basic or no skill at all, or are still exploring RPA.

Governance

Governing structure for RPA within the NHS varies. While some organisations (15%) have a dedicated Centre of Excellence (CoE), others have provided governance through an already existing framework.

Approximately 40% of organisations are in the process of setting up a dedicated governance framework

Industry partners and suppliers

In addition to challenges faced with complex organisational structures, a total of 36% of suppliers indicated that they have experienced challenges relating to user's lack of knowledge of what processes to be automated.

Source - NHS National Robotics Process Automation (RPA) Survey 2020



Join the [NHS National Community of Practice for RPA](#) to access the full report or read our [blog](#)

A03

RPA in healthcare today and good practice

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Good practice

- National exemplars
- International exemplars

Good practice national exemplars – Centre of Excellence GDE Blueprint Exemplars

Northampton
Hospital Trust
(Northampton, UK)


 Northampton General Hospital
 NHS Trust


 Employees
4,400


 Clinicians
2,520


 Facilities
1


 Bed capacity
700+

A district general hospital in Northampton managed by the Northampton General Hospital NHS Trust providing a wide range of health care and mental health services.

Challenge

By the middle of 2020, Northampton Hospital was experiencing an increase in the number of COVID-19 patients requiring ventilation.

As oxygen was required in regular supply, it was necessary to capture data from the large oxygen tanks, to enable oxygen levels available on site to be monitored regularly without the need of a staff manually logging onto the system every hour and everyday, and physically checking oxygen levels on tanks.

Solution

By working in conjunction with a technology supplier, a bot was created in record time, which enabled the team to capture oxygen levels data, monitor the oxygen levels 24 hours a day without human intervention, as well as provide required information to the oxygen supplier.

Results

- ✓ Real time oxygen level data was available which enabled regular supply of oxygen.
- ✓ Improved efficiency in oxygen management and supply process.
- ✓ Staff time was freed up, enabling staff to provide support to other areas where help was desperately needed.



Join the [NHS National Community of Practice for RPA](#) to access more case studies and learn more about RPA Centres of Excellence

Source - [Northampton Hospital](#)

Good practice national exemplars – GDE Blueprint Exemplars

Northern Care
Alliance NHS
Group

Northern Care Alliance
NHS Group



NHS Group

The Northern Care Alliance NHS Foundation Trust contains four care organisations. Each one is managed by a medical director, director of nursing, director of operations, HR director and finance director.

Together they oversee and are responsible for the day-to-day running of four hospitals and extensive community services within Salford, Oldham, Bury and Rochdale.

Challenge

The decision was taken to invest in RPA across the NCA to drive improved efficiency and outcomes.

The primary focus was on 6 areas:

- Partial booking (Urology)
- Evolve to PAS
- Endoscopy referral
- Open episodes on PAS
- Outpatient consultation to consultant referral
- e-RS: Retrieval of referral documentation

Solution

A digital factory operated within Salford Royal Foundation Trust that enabled the organisation to identify and resolve service and operational issues before investing in new technology.

The digital factory established an end-to-end solution to facilitate the design and development of RPA solutions aligned with agreed processes.

The RPA environment was hosted within the Pennine Data Centre.

Results

Records, assessments and plans

- ✓ Reduced administrative time processing inpatient day case registrations in general surgery will release time for booking centre staff to answer the phones. This will reduce the number of abandoned inbound calls.

Transfers of care

- ✓ Reducing time spent processing consultant-to-consultant referrals to free up time. Automating the process of manually registering consultant to consultant outpatient referrals on PAS will save time for booking teams.



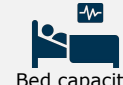
Join the [NHS National Community of Practice for RPA](#) to access more case studies and learn more about current RPA uses

Source - [GDE Blueprint](#)

Good practice national exemplars

NHS England and NHS Improvement (NHSEI)

A function within this national organisation which was supporting the country to receive essential consumables during the COVID-19 pandemic.



Across health and social care in England

Challenge

In mid-March 2020, the demand for essential consumables to protect staff, patients and the general public began to rise and coordination of the supply of these products was required at a national level.

A central team was set up to manage the demand, prioritisation and distribution of these essential consumables. Demand rose exponentially in a short time from ten to c1.5k requests per day. The system and staffing levels were insufficient to deal with this volume of demand.

Solution

We already had RPA installed on the central architecture and were able to work with a small development team to develop automation to select, read, transfer and log requests from email into the demand management system.

The bots started by processing the backlog and human caseworkers continued to manage the urgent requests. The bots then were integrated into BAU, processing all requests into the demand management system.

Results

- ✓ The backlog was cleared, allowing the caseworkers to again see and handle today's work today.
- ✓ All organisations received the essential consumables they needed (>9 million items).
- ✓ The bots processed each case in c.4sec compared to c.4min for a caseworker.
- ✓ The use of the bots avoided temporary staff costs of c.£3m and cost c.£56k to develop, launch and maintain for the year.



Join the [NHS National Community of Practice for RPA](#) to access more case studies and learn more about current RPA uses

Source - [Northampton Hospital](#)

Good practice national exemplars

Central and North West London NHS Foundation Trust

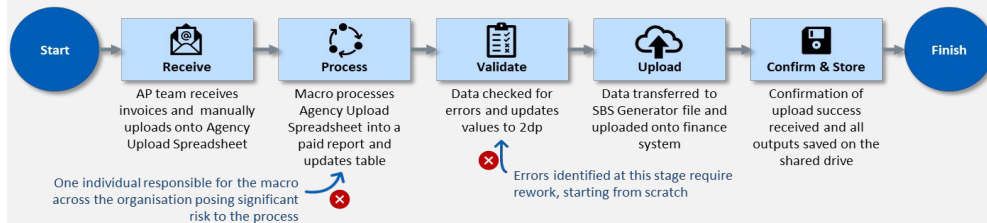
Central and North West London have partnered with NHS England and NHS Improvement's [Corporate Services Transformation Programme team](#) (NHSEI) to use their centrally architected RPA platform to automate some of their processes. They chose this platform because it gave them a way to try automation without committing to buy their own infrastructure and they received project and development support from NHSEI.

One of the bots was developed to ensure agency invoices were uploaded, checked for validity and accuracy, and paid. That process was usually undertaken manually and took upwards of three hours of back-office staff time and also time from frontline clinical team managers who were checking validity of the invoices.

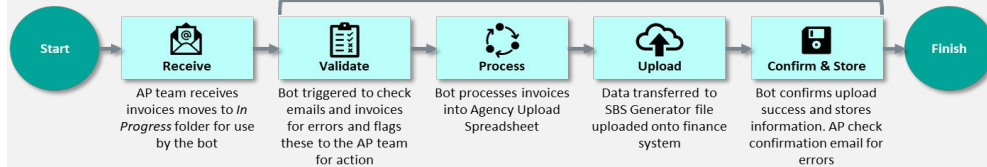


What has been automated?

MANUAL PROCESS: 2-3 hours



RPA PROCESS: 10-30 minutes



What are the benefits?

- Staff working across this process were spending upwards of a full working day each week on non-value adding tasks, the introduction of automation reduced this to c30min.
- Staff are confident that the bots are picking up errors and reducing the amount of rework that they previously had to do in addition to the processing time, meaning they can focus on more value adding tasks.
- Cost reduction benefits of c.£250k have been realised from the introduction of automation in this process through:
 - the reduction in duplicate and fraudulent claims
 - correction of charged rates to those agreed via frameworks
 - errors flagged at the start of the process rather than at the end, meaning time is not wasted and rework is reduced



Join the [NHS National Community of Practice for RPA](#) to access more case studies and learn more about current RPA uses

Good practice national exemplars

Central and North West London NHS Foundation Trust and West London NHS Trust

Central and North West London and West London have partnered with NHS England and NHS Improvement's [Corporate Services Transformation Programme team](#) (NHSEI) to use their centrally architected RPA platform to automate some of their processes. They chose this platform because it gave them a way to try automation without committing to buy their own infrastructure and they received project and development support from NHSEI.

RPA was initially deployed across Central North West London (CNWL) to reconcile timesheets and booking reports, reduce potential for fraud by controlling the route that agencies can invoice through and significantly reducing time consuming, administration heavy workflow, freeing staff time for more fulfilling and value adding tasks.



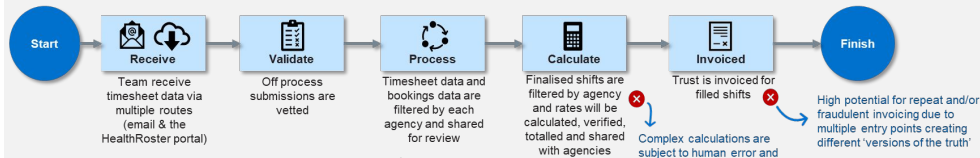
Central and North West London
NHS Foundation Trust



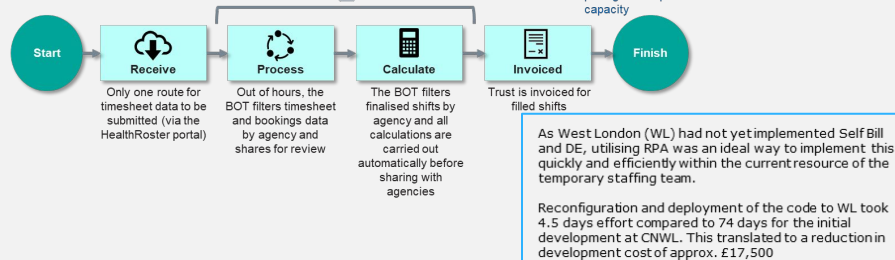
West London
NHS Trust

What has been automated?

MANUAL PROCESS: 45 hours over a week



RPA PROCESS: 3-4 hours over a week



What are the benefits?

- Equivalent of 1.2 WTE in time saving achieved at CNWL through the automation of report generation, the removal of the need to vet off process invoices, the minimising of query management through eliminating calculation errors.
- Controlled processing of payments, only accepting invoices for finalised timesheets on the rostering platform enables full compliance with No PO no pay and significantly reduces potential for fraudulent invoicing. At their second site, West London (WL), 1.4% of transactions (£598,000 value), equating to 5.5% of agency spend, was submitted via a Non-PO route in the 12 months prior.
- Implementation of self bill at West London is estimated to reduce AP invoice volumes by approximately c.40% per year.



Join the [NHS National Community of Practice for RPA](#) to access more case studies and learn more about current RPA uses

Although currently in limited use, there are examples of RPA being deployed successfully in other care settings such as mental health.

Black Country Healthcare

Black Country Healthcare NHS Foundation Trust provides specialist mental health, learning disability, and community healthcare services for the population of the Black Country.

The trust used Oasis as their Patient Administration System (PAS), which involved collecting paper notes in the field, delivering it to headquarters and inputting the data into the system. In total, this process took around 10-15 minutes every time. This was very time-consuming, prone to errors, and ineffective for remote working.

This highlighted the need for an easy-to-use and secure RPA tool, to migrate data from their three smaller systems into the trust's main PAS. Black Country Healthcare managed to migrate approximately 60,000 patient index records and 80,000 referrals in under three weeks. The tool is full comprehensive (works across several devices and operating systems) and scalable (can be used as a one-off or more frequently). As a result, the processing time was brought down to 3 minutes (a 70-80% reduction). Having processed around 15,000 transactions in under 6 months, this saved the trust a considerable amount of time. Having considered the benefits of RPA, the trust is rolling out RPA across two other teams.



Black Country Healthcare
NHS Foundation Trust



Join the [NHS National Community of Practice for RPA](#) to access more case studies and learn more about current RPA uses

Source - [NDL Black Country Healthcare](#)

International exemplars: Max Healthcare, India

Max
Healthcare
(Delhi, India)



One of the largest hospital networks in North India providing a wide range of healthcare, homecare (wellness) and pathology services across India.



Employees
15,000+



Clinicians
4,800+



Facilities
17



Bed capacity
3,400+

Challenge

Max Healthcare was faced with the challenge of manually processing large volumes of patient records and transactions daily, data entry, inconsistencies in data format, unstructured data, while ensuring the accuracy and security of documents.

Their main priority and objective was to improve the efficiency of existing processes to ensure greater accuracy and reduction in turnaround time.

Solution

They adopted an Enterprise RPA Platform, to create a new data entry solution and streamline high volume processes like claims processing, data entry, and reconciliation for government healthcare schemes.

Results

- ✓ Reduced turnaround time for claims processing, by at least 50% and CGHS and ECHS time savings of about 65%-75%.
- ✓ Low investment, savings of ~ £99,000 over a period of 12 months.
- ✓ Improved security and compliance.
- ✓ Improved employee experience.



Join the [NHS National Community of Practice for RPA](#) to access more case studies and learn more about current RPA uses

Source - [UiPath](#); [Max Healthcare](#)

CGHS; Central Government Health Scheme
ECHS; Ex-Servicemen Contributory Health Scheme
*£100,000 approx.

International exemplars: Cleveland Clinic, USA

Cleveland
Clinic
(Ohio, USA)



Cleveland Clinic

A non-profit multispecialty academic medical centre that integrates clinical and hospital care with research and education.



Employees
35,000+



Clinicians
18,800+



Facilities
17



Bed capacity
5,000+

Challenge

Driven by its vision to be the best place for care and the best place to work in healthcare, Cleveland Clinic was seeking innovative ways to improve its patient and employee experiences.

Their aim was to increase operational efficiency to enable them provide better service to patients, as well as reduce cost.

Solution

Cleveland Clinic worked with a provider to:

- Prioritise processes for automation
- Rapidly implement automation solutions
- Build a structure to drive sustainable, ongoing automation efforts

Results

- ✓ Achieved \$700K (~£525,000) ROI over three years from initial proof of concept to implementation.
- ✓ Identified use cases to automate claim edits and eligibility verification edits, driving 80% faster processing time.
- ✓ Established centre of excellence for automation.



Join the [NHS National Community of Practice for RPA](#) to access more case studies

A04

Delivering and sustaining RPA

(supplementary information)

A04

Delivering RPA (supplementary Information)

Chapter contents

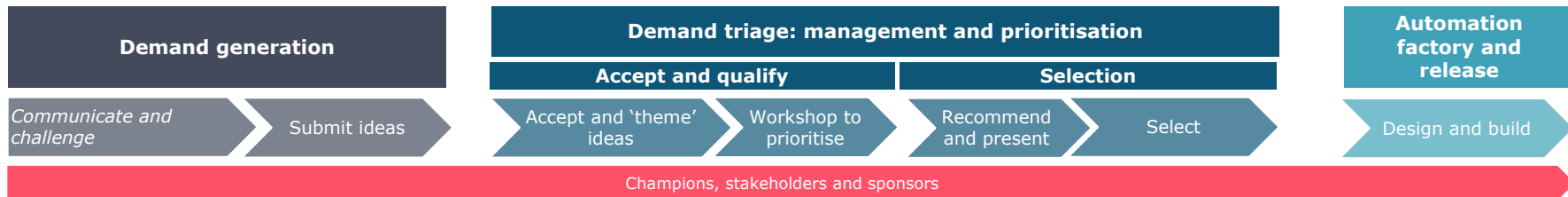
Automation designing and delivering lifecycle (additional material)

- Demand triage
- Build and develop
- Release and embed

Automation sustaining pillars (additional material)

- Benefits management (Pillar 1)
- Automation Target Operating Model (ATOM) design principles (Pillar 2)
- Govern (Pillar 3)
 - Governance (example job descriptions and profiles)
 - Business change

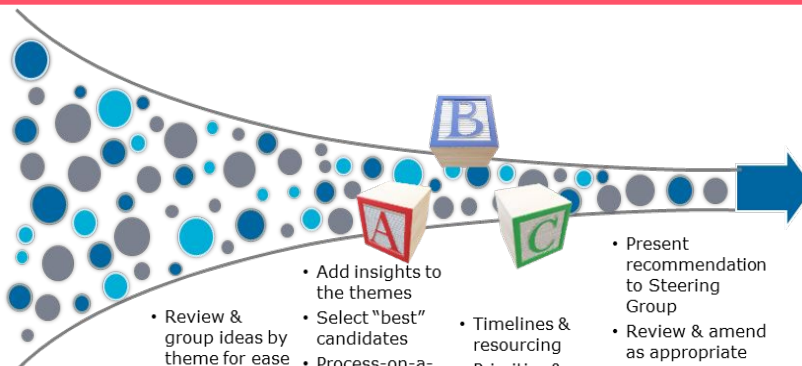
Stage 2 Demand triage - Overview of managing ideas through pipeline to launch



1

Demand generation

Structured idea capture and tracking



3

Build and develop

"Hopper" of leads

"Pipeline" of prospects

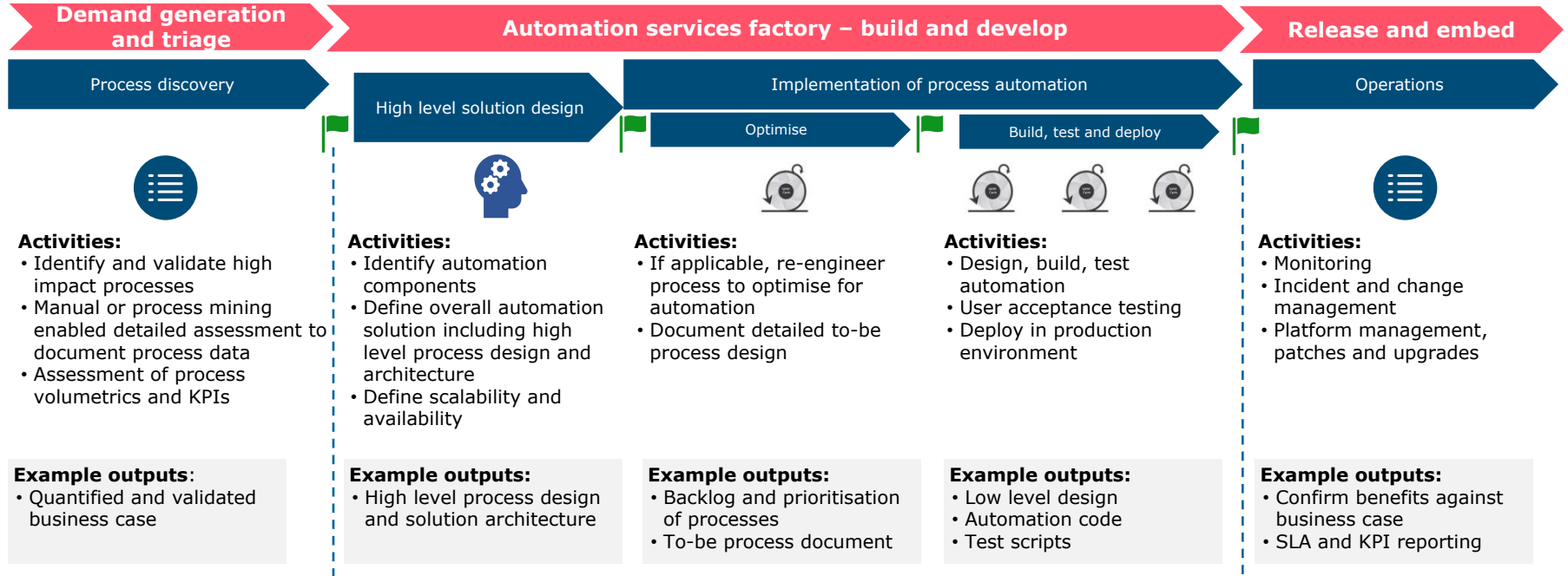
"Backlog" of secured work

Source - Atos Intelligent Automation Methodology

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Stage 3 Build and develop – Automation services factory

Example RPA development lifecycle and example outputs



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Stage 4 Release and embed – Optimisation, vendor and infrastructure management



Optimisation

RPA run and manage support teams can optimise the overall cost of running the infrastructure and services in the following ways:

- Robot utilisation and optimisation

The bot scheduling should be done to optimise the robot utilisation while maintaining the process SLAs. This will ensure that:

- Bot schedules are planned to maximise the infra and licence utilisation
- New licences are purchased when they are needed and not in bulk

- Capacity optimisation

Here the staffing levels, the compute power, storage and costs can be adjusted at periodic intervals, based on advance visibility into needs, and historical trend of utilisation, backlog and available capacity



Ecosystem and vendor management

The RPA delivery teams should anticipate that as the RPA programme matures, there might be a requirement to partner with multiple third party providers, advisory support or even other technologies such as content extraction to continue to automate.

The service should be designed to have the capabilities to seamlessly manage diverse technologies and bring all the vendors, IT services or third party service providers under a single overarching governance framework designed to optimally support your automation programme.



Automation infrastructure management

As part of the run and support services, RPA support teams will need to manage and optimise the automation infrastructure. This could be hosted on premise locally or on cloud for NHS, depending on the provider and hosting mechanism selected for the programme.

This will include the servers as well as the software required for automation. The service delivery process should integrate the infrastructure management and platform management so that the issues get addressed seamlessly.

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A04

Sustaining RPA (supplementary Information)

Chapter contents

Automation designing and delivering lifecycle (additional material)

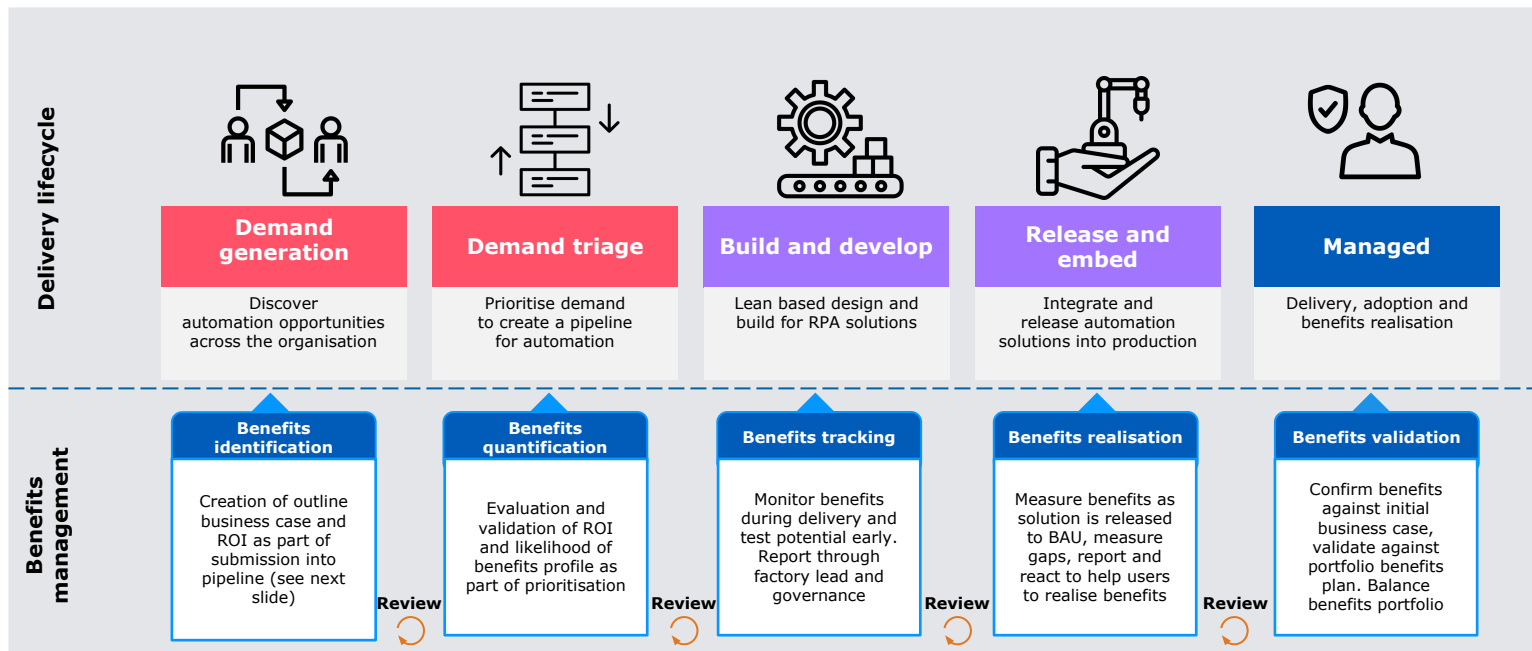
- Demand generation
- Demand triage
- Build and develop
- Release and embed

Automation sustaining pillars (additional material)

- Benefits management (Pillar 1)
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- Govern (Pillar 3)
 - Governance (example job descriptions and profiles)
 - Business change

Pillar 1 Benefits management - Delivery, adoption and benefits realisation

To ensure optimal benefits return, the benefits management process should be directly linked to the delivery lifecycle as shown below (with governance controls in place). This will help ensure that benefits are tracked from definition to realisation.



Join the [NHS National Community of Practice for RPA](#) to access examples of benefit framework and benefit reporting

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Source - Atos Intelligent Automation Methodology

Pillar 2 ATOM – Design principles

Design principles will enable effective alignment with organisation-wide strategic priorities and provide direction on high-level operating model choices

Design principles (illustrative)

Each programme should develop a set that aligns best with strategy, vision and requirements of their organisation or lines of business

The operational effectiveness goals will underpin initial automation programme focus, capabilities and operating model.

The initial focus will prioritise capacity creation and efficiency capture, aligned to targeted outcomes across lines of businesses or specific focus area.

The development and deployment of our automation capabilities and services will follow a standardised approach by leveraging standardised methods, tools and development standards.

The model will consider compliance with GDPR, cybersecurity and data confidentiality requirements and their application.

The automation portfolio will prioritise clinical safety.

We will look to leverage the capabilities from innovation center to convert high-impact opportunities.

As we develop the scale of our programme, we will leverage scale in relationships with suppliers.

Operating model choices

| | Centralised | Hub and spoke or federated | Decentralised |
|---|-------------|----------------------------|---------------|
| → | ● | ● | ○ |
| → | ● | ● | ○ |
| → | ◐ | ● | ○ |
| → | ● | ◐ | ○ |
| → | ◐ | ○ | ○ |
| → | ● | ● | ○ |
| → | ◐ | ● | ○ |



Key:

Greater alignment to design principle (choices are illustrative)

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Pillar 3 Governance

Once the ATOM structuring choices have been made, the interaction model can be defined to ensure roles and responsibilities are clear.

Interaction model (illustrative)



Steering board

Steering, challenge and update, point of escalation, change approvals



Programme management

CoE or RPA lifecycle execution design, setup and operate, including operational performance, efficiency and effectiveness, metrics, benefits, change management



Automation delivery or project management

Rapid adaptive design, develop and delivery of process automations



Platform and infrastructure management

Management of underlying RPA platform and technical architecture

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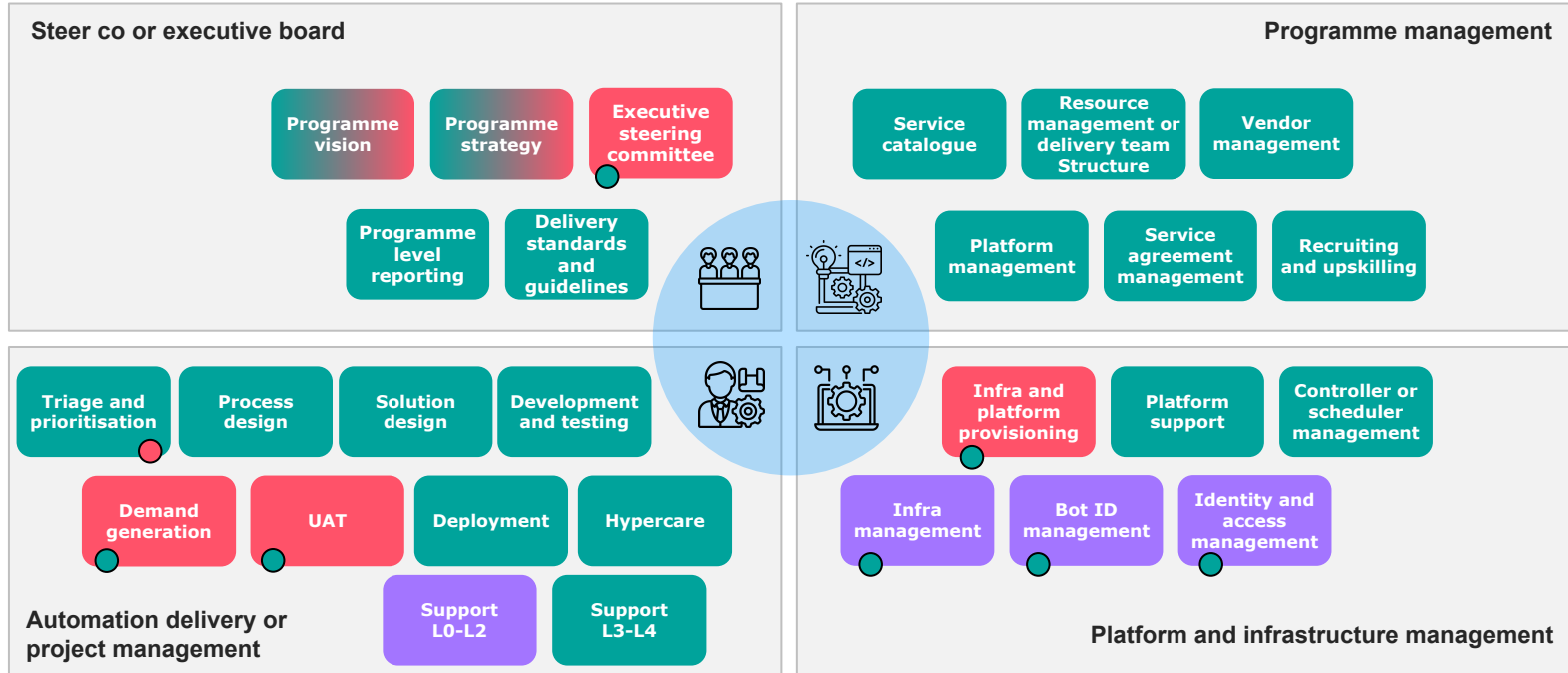
Pillar 3 Governance - Illustration of governance model

Responsibilities

Primary owner

Enable or support

BU CCC IT



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CCC - Central Competence Centre. BU - Business Unit. UAT - User Acceptance Testing.

Pillar 3 Governance – Forums, terms of reference (ToF) and RACI

How do we provide adequate governance and manage decision making?

Approach overview

The governance structure should provide a strong centralised structure to enable operational performance, efficiency and optimum return on investment. This include:

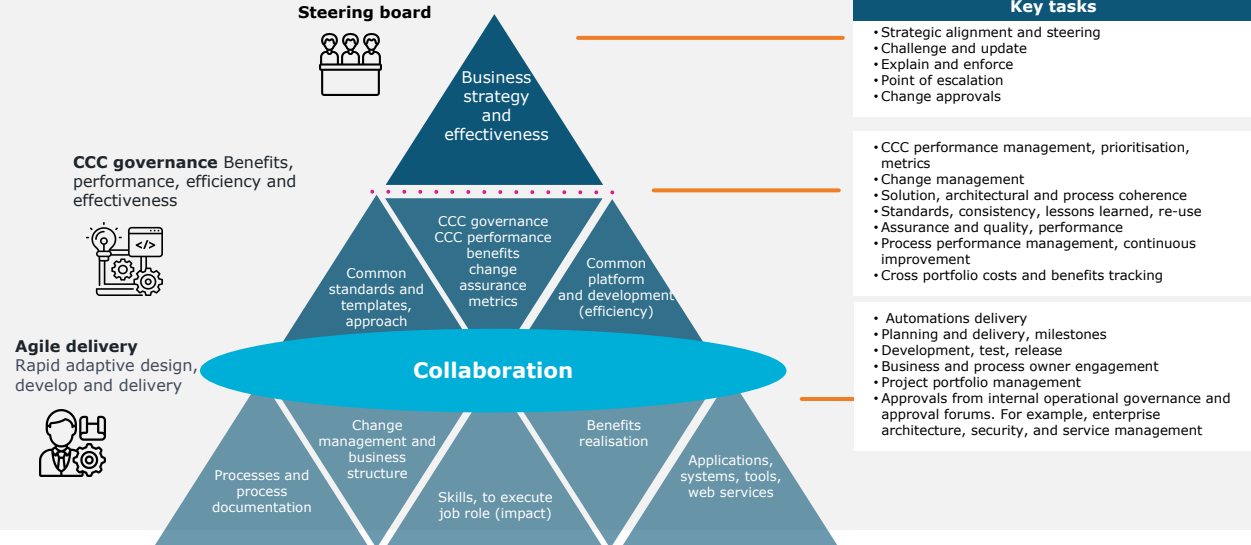
- ongoing strategic, organisational and stakeholder alignment
- efficient and scalable delivery capability
- assured and high-quality deliverables
- robust measurement, monitoring and realisation of benefits by working with responsible owners

RPA delivery is best suited to an agile approach, combined with iterative development lifecycle (initiate and define, build, test and integrate, closure – if one exists) ensuring full alignment with internal processes and governance.

The model should be designed to be flexible over time as the programme matures and scope evolves.

Governance will typically operate at three levels:

- **Steering board:** Steer, challenge and update, point of escalation, change approvals
- **CCC or RPA lifecycle execution:** CCC or RPA lifecycle execution design, setup and operate, including operational performance, efficiency and effectiveness, metrics, benefits, change management
- **Process automations delivery:** Rapid adaptive design, develop and delivery of process automations



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RACI - Responsible, Accountable, Consulted, Informed. **CCC** - Central Competence Centre.

Pillar 3 Governance – Information security

For each automation service, continual review of appropriate security controls and compliance procedures should be conducted.

Approach overview

- RPA delivery teams should liaise with right IT stakeholders to familiarise themselves with local NHS security policies, which will be used to inform the security management plan for delivery.
- It is imperative to identify the risks and implement mitigating controls applicable to each phase of the automation roadmap, from setup to implementation.
- A standard set of controls for managing confidentiality, integrity and availability risk in the RPA delivery will need to be defined at the required security classification.
- Additional specific controls addressing automation risks might need to be implemented if the RPA teams must handle information assets or working practices at a higher level of assurance.
- Delivery teams will also need to ensure ongoing security compliance, reporting and governance.

Example security management plan

Information security management

- Asset classification and security assessment at defined stages following NHS's policies and procedures
- Defined security metrics and reporting aligned to our ISMS with overall Governance and continuous improvement
- Security incident management processes

Access controls

- Defined access provisioning or deprovisioning process complying with NHS policies
- Multi-factor authentication as a standard approach
- Automation credential assets are typically encrypted using AES 256-bit

Communication security and cryptography

- Configuring a trusted channel according to policies: VPN connections, secure FTP sessions, HTTPS websites
- Data encryption at tool level follow SSL or TLS encryption for data in both transit and rest
- Environment isolation and user role segregation as per business process requirements
- Tools to prevent leakage of sensitive HR, IP or financial data

Operational security

- Comprehensive vulnerability management programme
- Frequent security patch or AV updates and cybersecurity readiness
- Full auditability using logs
- Version control in accordance with governance and policies at NHS

Audit and monitoring

- SIEM and reporting
- Security and infosec built into support and maintenance processes
- Automation tools provide complete tracking all actions performer by all user in all product components
- Comprehensive audit trail process logs to be shared for infosec and audit purposes as per NHS policies

Human, physical and environment security

- All RPA teams and CoE staff to have pre-employment checks, including locally-applicable criminal record checks, and regular security training
- If there are external advisors supporting programmes, their client devices used to access the applications should be company managed and patched up to date. And any external support staff (including, where approved, from offshore) will access the systems over a secure VPN

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Examples of job descriptions and role profiles

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Roles and responsibilities



Programme lead

Summary

Responsible for managing the RPA hub operation and performance in line with strategic vision; manage partners and steering board



Responsibilities

- Lead and drive overall success of the RPA hub
- Manage RPA hub programme activities, governance processes, metrics and measurement to ensure best in class approach to solutions delivery. As the leader of the RPA hub, they also lead the RPA strategy roadmap as well as help shape the program priorities
- Manage steering board expectations and communicate hub performance; take direction from steering board to set priorities for the hub
- Work closely with local leads to engage and help educate wider organisation
- Manage software, platform, advisory, delivery factory partner relationships
- Drive successful operations in maintaining and enhancing deployed automation solutions.
- Forecast staffing and resource (infrastructure, licence) needs as the program grows
- Allocation and coordination of RPA hub resources, formulating best-practices, user training, proactively monitoring issues and risks and driving timely solutions. People manager for hub resources



Skills

- Understanding of RPA landscape: trends and emerging technologies in the process automation domain and how they can support Rothschild
- Strong demonstrated leadership, mentorship, and team management capabilities
- Good knowledge of project management; Experience with agile project delivery methods, tools and concepts
- Ability to manage and work with vendor partners
- Strong business skills and experience in working with cross-functional teams
- Very good planning and organisation skills and time management
- Excellent communication skills and ability to explain the technical aspects to business people and relevant stakeholders; Good presentation skills, both written and verbal
- Strong interpersonal skills, cross-cultural understanding, charismatic leadership capabilities to lead colleagues, sometimes without direct line management responsibility



Experience

- At least two years of experience in RPA technology with exposure to different stages of the RPA development lifecycle; UiPath knowledge is a distinct advantage
- A minimum of six months experience in project delivery using Agile methodologies, expert level in Agile software development life cycle – SCRUM
- Previous process improvement experience or qualifications such as Lean Six Sigma is advantageous
- Profound understanding of different RPA operating models
- Strong demonstrated leadership, mentorship, and team management capabilities

Roles and responsibilities



Business or process analyst

Summary

To analyse and understand business and user needs, communicate technical elements to business users throughout development.



Skills

- Agile methodologies (SCRUM, SaFe)
- Aptitude to contribute to evolving methodologies to continually improve them
- Analytical skills in order to see different perspectives, identify best solution, accounting for technical limitations, conflicting requirements and time or resource pressures
- Understanding workflow-based logic and ability to understand business process from workflow diagram and conceptualise it as an automated solution
- Highly-developed stakeholder management and communication skills
- Ability to translate complex business requirements into clear technical instructions
- Proactivity and flexibility to deal with unexpected long wait times in technical infrastructure development and potential lack of capacity from key stakeholders and process owners



Experience

- A minimum of 12 months experience as a technical or intelligent automation business analyst, designing solutions and managing related workstreams
- A minimum of six months experience in project delivery using Agile methodologies
- Experience with workflows and ability to understand business process from a workflow diagram to conceptualise an automated solution
- Certification in Business Analysis from an Intelligent Automation Provider (for example – Blue Prism, UiPath) is advantageous
- Previous process improvement experience or qualifications such as Lean Six Sigma is advantageous



Responsibilities

- Manage the delivery of multiple RPA deployments
- Manage stakeholder expectations and communicating with them efficiently
- Identify and triage candidate processes for automation, including the creation of business cases
- Lead the automation analysis for candidate processes
- Gathering business requirements from key stakeholders and translating these requirements into a clear and robust automation solution
- Analyse success on implementation and creating documentation for effective change management



Roles and Responsibilities



Performance analyst or resource manager

Summary

To evaluate automation process, platform performance and outcomes of implementation.



Skills

- Analytical skills to identify metrics, gather data and analyse to produce useful information
- Data visualisation
- Process excellence skills (for example, Lean Six Sigma)



Experience

- A minimum of 12 months experience as a business analyst or performance analyst
- Experience forming KPIs and assessing business benefits
- Experience using data visualisation tools to translate complex data into compelling and relevant business stories and actions



Responsibilities

- Produce standardised reports and charts of solution or implementation performance
- Develop performance measurement frameworks such as key performance indicators (KPIs), goals and benefits
- Creatively visualise analysed data to tell compelling and actionable stories
- Use expertise to lead or contribute to the development of short- and long-term strategic plans



Roles and responsibilities



Technical or automation architect

Summary

To provide technical leadership and architectural design



Responsibilities

- Solution design and architecture for intelligent automation solutions
- Create innovative solution offerings based various product releases
- Develop best practice documentation for solution design and development
- Create innovative tools, frameworks and methodologies for automation delivery



Skills

- Good experience in hands on solution architecture experience in intelligent automation tools, for example – UiPath, Automation Anywhere
- Extensive design and development experience on platforms like .Net (ASP or VB), Java, JavaScript, C#, C++
- Extensive experience of intelligent automation solution architecture using document processing, intelligent bots using ML/AI components, cloud



Experience

- Extensive experience of intelligent automation solution architecture using document processing, intelligent bots using ML/AI components, cloud
- Knowledge of MS Windows, Server OS, AD, networks, security principles and IT general controls
- Knowledge of OCR, digital certificates and encryption
- Knowledge of AI/ML and their application in automation
- Experience in RFP response, proposals and solution presentation

Roles and Responsibilities



Software developer

Summary

To design and run and improve automation process solutions on Intelligent Automation software to meet business needs.



Skills

- Accredited intelligent automation developer, for example – UiPath, BluePrism, Automation Anywhere
- Agile methodologies (SCRUM, SaFe)
- The aptitude to contribute to the evolution of methodologies to continually improve
- Highly-developed communication skills for delivering key messages to a range of stakeholders both internal and external (including outside the NHS) to the organisation, some at very senior level



Experience

- A minimum of 18 months experience developing and implementing Robotic Process Automated solutions as an accredited developer
- A minimum of six months experience in project delivery using Agile methodologies
- Experience with workflows and ability to understand business process from a workflow diagram to conceptualise an automated solution



Responsibilities

- Configuring and implementing RPA processes using efficient, well-structured, and easy-to-understand workflow structures
- Creating and updating solution documentation including user troubleshooting guides, and communication of risks and issues
- Providing timely solutions to day-to-day issues that arise in running of the RPA process including software related issues
- Creating and documenting test procedures and scenarios for pre UAT phases
- Qualifications and Experience Required



Roles and responsibilities



Quality assurance analyst

Summary

To build quality into process design and development; design and execute automation test plans (as part of a risk-based approach); and to drive continual improvement throughout the automation life cycle.



Skills

- Software or process quality assurance skills, using risk-based tools such as FMEA
- Functional and non-functional testing including ability to analyse changes to development of products and identify most effective techniques and tools to use
- Development of test mappings from business process definitions
- Process Performance, test, and data analysis



Experience

- Experience developing and running tests on intelligent automation development and operations
- Software quality assurance across software development life cycle
- Good experience using a range of contemporary technologies including cloud platforms, open source



Responsibilities

- Using risk-based approach (for example, FMEA) to identify potential failure modes and effects, and with the developers, design process mitigation controls. Confirm during testing and develop ongoing controls in production
- Work with developer and business analyst to design testing plans for the process automation solution
- Run and manage tests to ensure all business requirements are fully met
- Conduct analysis on performance and test data and interpret to advise on required actions to drive continual improvement throughout the automaton life cycle
- Qualifications and experience required

- The aptitude to contribute to the evolution of methodologies to continually improve them
- Ability to be analytical and see different perspectives to identify best solution, accounting for technical limitations, conflicting requirements, and time/resource pressures
- Understanding workflow-based logic and ability to understand business process from workflow diagram and conceptualise it as an automated solution
- Highly-developed stakeholder management skills. Listening, understanding, and asking the right questions during process reviews with SMEs. Liaising with range from junior to executive stakeholders both internal and external (including outside the NHS)
- Excellent communication skills with ability to translate complex business requirements into clear technical test requirements

Roles and responsibilities



Infrastructure engineer

Summary

Design, build, manage and support the infrastructure services that underpin all process automations.



Responsibilities

- Organise and create infrastructure set up for hosting RPA solution on the cloud or server
- Provide infrastructure support for server installations and troubleshooting
- Resolve escalation requests regarding infrastructure and security
- Lead installation, troubleshooting and training
- Develop strategic and tactical engineering roadmaps for intelligent automation technologies ensuring they are future-proof and the organisation derives maximum value from their investment in technologies



Skills

- The aptitude to contribute to the evolution of methodologies to continually improve them
- Ability to be analytical and see different perspectives in order to identify best solution, accounting for technical limitations, conflicting requirements and time/resource pressures
- Understanding workflow-based logic and ability to understand business process from workflow diagram, and conceptualise it as an automated solution
- Highly-developed stakeholder management skills, listening, understanding and asking the right questions during process reviews with SMEs. Liaising with a range of stakeholders, from junior to executive, both internal and external (including outside the NHS)
- Excellent communication skills with the ability to translate complex business requirements into clear technical instructions, and explain technical ongoings in simple business terms
- Proactivity and flexibility to deal with unexpected long wait times in technical infrastructure development and potential lack of capacity from key stakeholders and process owners

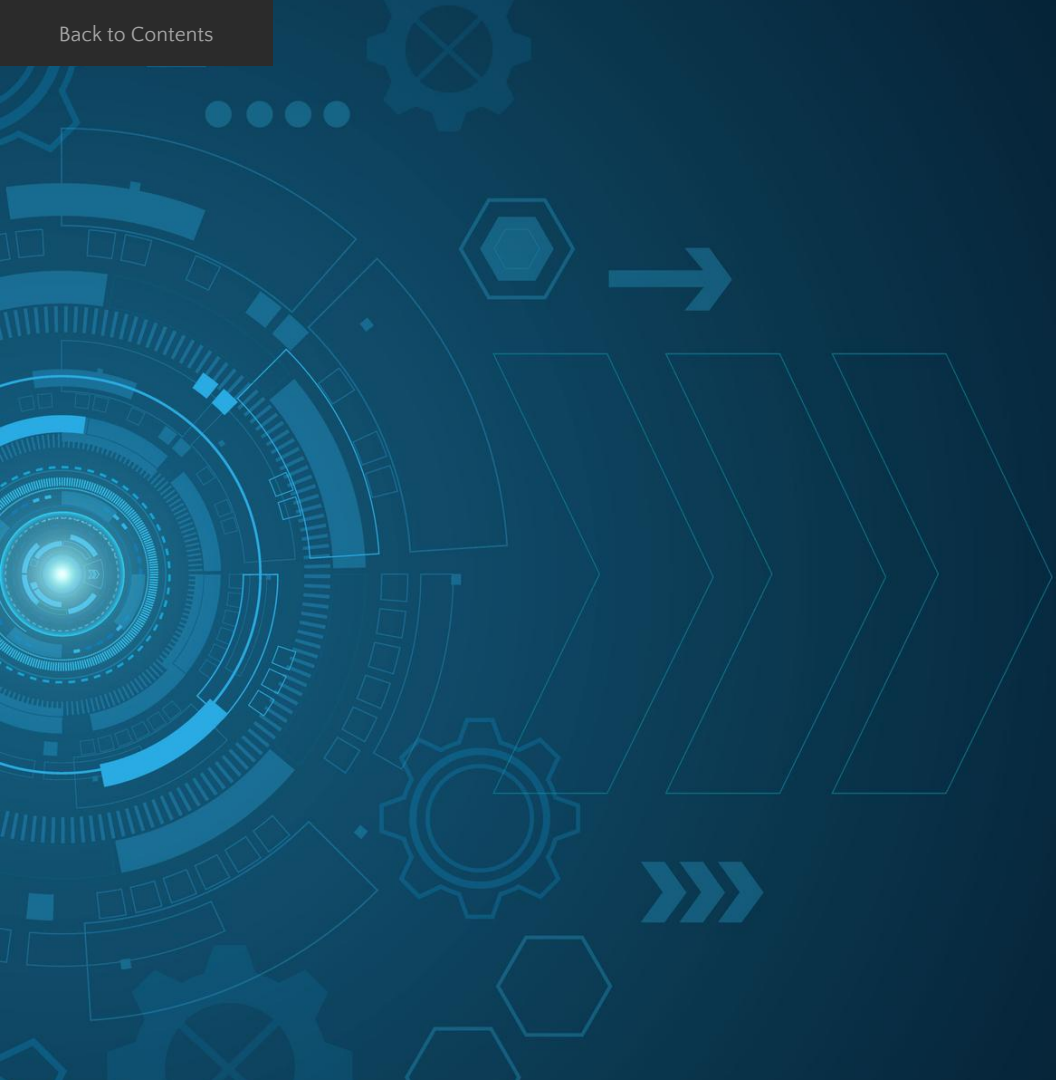


Experience

- Moderate experience in network security, protocols and network administration knowledge
- Good knowledge of security regarding cloud-based infrastructure
- Knowledge of Microsoft Active Directory and SQL Server
- Ability to work in a cloud-based or hosting environment (Microsoft Azure Cloud is a plus)
- Experience using automated monitoring tools (for example – SCOM, SCCM, Nagios)
- Previous experience with setting up UiPath orchestrator platform on Azure cloud is a plus
- Knowledge of ITIL, Agile methodologies (SCRUM, SaFe) and industry best practices
- Strong virtualisation experience using Hyper-V, VMWare
- Experience with workstation management systems and desktop imaging
- Experience with Web Server technologies, especially IIS
- Experience in writing PowerShell scripts

A05

Glossary of terms and acronyms



Terms and acronyms

| Acronym | Term |
|---------|-----------------------------------|
| .NET | Network Enabled Technologies |
| 2FA | Two-factor Authentication |
| AD | Active Directory |
| AHT | Average Handle Time |
| AI | Artificial Intelligence |
| API | Application Programming Interface |
| ASP | Active Server Pages |
| ATOM | Automation Target Operating Model |
| BAU | Business as Usual |
| BU | Business Unit |
| CNA | Could not attend |
| CAPEX | Capital Expenditure |
| CCC | Central Competence Centre |
| CGHS | Central Government Health Scheme |
| CI | Continuous Improvement |
| CoE | Centre of Excellence |

| Acronym | Term |
|----------|--|
| CPU | Central Processing Unit |
| DCB | Data Coordination Board |
| DNA | Did not attend |
| DTAC | Digital Technology Assessment Criteria |
| E2E | End-to-End |
| ECHS | Ex-Servicemen Contributory Health Scheme |
| e-RS/ERS | e-Referral Service |
| FMEA | Failure Modes and Effects Analysis |
| GDPR | General Data Protection Regulation |
| GP | General Practitioner |
| HTTPS | Hypertext Transfer Protocol Secure |
| IA | Intelligent Automation |
| IaaS | Infrastructure as a Service |
| ICE | Integrated Clinical Environment |
| IIS | Internet Information Services |

Terms and acronyms

| Acronym | Term |
|---------|--|
| IP | Intellectual Property |
| KPI | Key Performance Indicator |
| ML | Machine Learning |
| MMC | Microsoft Management Console |
| MS SQL | Microsoft Structured Query Language |
| OCR | Optical Character Recognition |
| OS | Operating System |
| PaaS | Platform as a Service |
| PALS | Patient Advice and Liaison Service |
| PAS | Patient Administration System |
| PKI | Public Key Infrastructure |
| PoC | Proof of Concept |
| RACI | Responsible, Accountable, Consulted and Informed |
| RFP | Request for Proposal |
| ROI | Return on Investment |

| Acronym | Term |
|---------|---|
| SaaS | Software as a Service |
| SCCM | System Center Configuration Manager |
| SCOM | System Center Operations Manager |
| SIEM | Security Information and Event Management |
| SLA | Service-Level Agreement |
| SME | Subject-Matter Expert |
| SSL | Secure Sockets Layer |
| TLS | Transport Layer Security |
| TNA | Training Needs Assessment |
| TOM | Target Operating Model |
| TOR | Terms of Reference |
| UAT | User Acceptance Testing |
| UKCA | UK Conformity Assessed |
| VB | Visual Basic |
| VDI | Virtual desktop infrastructure |

Terms and acronyms – Organisations

| Acronym | Term |
|---------|--------------------------------------|
| AHSN | Academic Health Science Network |
| BSA | Business Services Authority |
| CCG | Clinical Commissioning Groups |
| CQC | Care Quality Commission |
| CSU | Commissioning Support Unit |
| DBS | Demographics Batch Service |
| DHSC | Department of Health and Social Care |

| Acronym | Term |
|---------|---|
| ESNEFT | Suffolk and North Essex NHS Foundation Trust |
| ICS | Integrated care systems |
| MHRA | Medicines and Healthcare products Regulatory Agency |
| NHSD | NHS Digital |
| NHSEI | NHS England and NHS Improvement |
| SBS | Shared Business Services |
| UHB | University Hospital Birmingham |

Frameworks and standards

| Acronym | Term |
|-----------|--|
| AES | Advanced Encryption Standard |
| CCS | Crown Commercial Service |
| ISO 27001 | International Organisation for Standardisation - Standard for Information Security |
| ITIL | Information Technology Infrastructure Library |