



Low-Code in the NHS

Your Guide to Enabling Innovation,
Reducing Administration, and Creating
more time to provide care



Contents

p3 [The Challenge with the Current State](#)

p4 [What is Low-Code?](#)

p6 [Artificial Intelligence for Power Platform](#)

p7 [Bringing Low Code to Life: NHS Examples](#)

[Greater Manchester Mental Health \(GMMH\)](#)

[Your Healthcare CIC](#)

[London North West and TrakIt](#)

[Surrey & Borders](#)

[Hertfordshire Partnership University](#)

[NHS Foundation Trust](#)

[Berkshire NHS Foundation Trust](#)

[Royal Brompton](#)

[NHS Business Services Authority](#)

[Pennine Care NHS Trust](#)

p26 [Rounding it up: the main benefits](#)

p29 [Starting the Low-Code/No Code Journey:
Making the Case to the Organisation](#)

p31 [Building a Centre of Excellence](#)

p33 [Fusion Development: Connecting IT teams
and the frontline](#)

p34 [Call to Action](#)

p35 [FAQs](#)

The Challenge with the Current State

Ideas are rarely the bottleneck when it comes to digital innovation in the NHS. Talk to any IT team and they'll give you a long list of processes waiting to be effectively digitised: consenting, clinical observations, onboarding, triage processes, and so forth. Spend enough time with front-line staff and you'll get dozens more. There are always the odd few people who would like everything to go back to pen-and-paper, but in general, NHS staff are an innovative lot: by nature, they're good at finding ways to make things work, and creative about how things can be done better.

The key challenge facing digital innovation is staff, skill and time, as is always the case in a busy NHS environment. Especially now, at a time when many IT departments are focused on fundamental, all time-consuming projects like the implementation or migration of Electronic Health Records (EHRs), other small but important projects tend to be deprioritised. Given the increasing digital talent gap, it's rare to find a fully staffed IT team, which means external partners frequently need to be brought in to provide additional skills and time.

Building apps from scratch can be expensive and time consuming.

With discovery, prototyping, agile sprints of development and testing, and user acceptance testing, simple apps take several weeks, and complex apps can take months.

Buying an off-the-shelf product can absolutely be the right answer, but not always. Some digital transformations are too bespoke to a particular organisation's processes to be effectively integrated using an off-the shelf product. What do you do then?

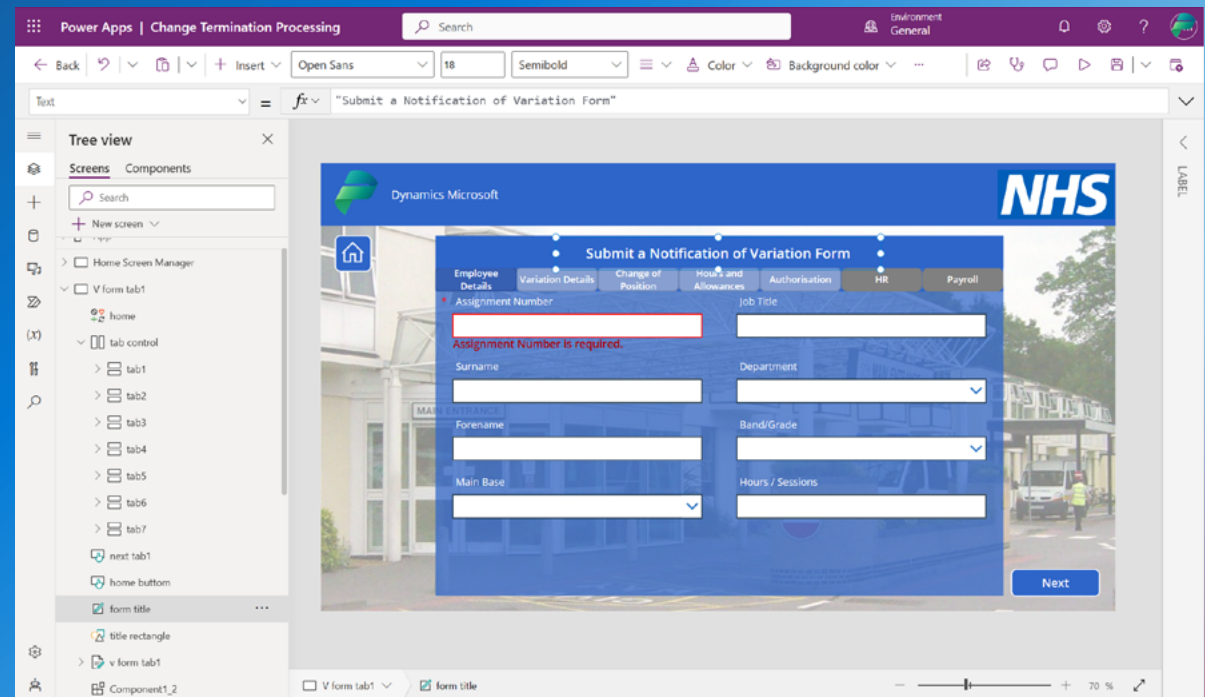


What is Low-Code?

Low-code platforms let you build software with minimal coding. Applications are built with common drag-and-drop elements. With low-code, these elements can be supplemented with coding to create features which aren't available, which means some knowledge of coding is required.

These capabilities are offered via a cloud-based platform by Microsoft, known as the Power Platform. The platform lets the user drag and drop component parts into an application, connect it into existing data flows, define workflows, and create user interfaces. All of this is then automatically converted into code without any further involvement from the user, for deployment across iOS, Android, Windows and web.

Collaboration with GitHub can simplify code reuse and knowledge sharing, enabling NHS Trusts to share their apps with one another, accelerating development. The first NHS low-code library was recently launched, and NHS England are aiming to grow the list of applications being shared over time [here](#).



The bottleneck with digital innovation is staff, skill and time



Power Apps
for web and mobile
application development



Power Automate
for process or workflow
automation



Power Virtual Agents
for chatbots and
conversational agents



Power Pages
for building secure, data-centric
business websites



Power BI
for data exploration,
analytics and reporting

The purpose of Power Apps is to reduce the time and effort associated with app development, while enabling simple integration into the rest of the Microsoft stack. Demand for apps – deeply integrated and customised to the workflows of each organisation – is growing quickly, and hiring skilled coders is a staffing challenge. Power Apps makes app development faster and cheaper, as seen in the case study from [Greater Manchester Mental Health](#).

Power Automate helps NHS Trusts with Robotic Process Automation, enabling everything from triage to HR processes happen quickly, particularly when it comes to moving data between systems, as developed by [Berkshire NHS FT](#). These automated flows can be triggered by users (a manual action), run on a particular schedule, or run based on an event – which can happen on the cloud or an on-premise server.

Power Virtual Agents and Power Pages help build chatbots and websites – an area where we're seeing a lot of interest from NHS organisations looking to improve customised communication with patients and carers.

There are benefits here for Pro Developers, too. The Platform integrates into Azure services such as API Management and IoT services, Visual Studio, as well as data services such as Synapse Analytics and CosmosDB, with over 350 out-of-the-box connectors. This means pro developers can meet demand faster, manage apps more easily with built-in security, governance and compliance capabilities. Build Tools specific for Power platform makes DevOps easier, enabling automation of common deployment tasks for applications. For Pro developers, this means the team can take a blended approach to low-code and code-first problems.

In the following sections, we will explore some real examples of low code in the NHS and overseas, including the benefits, challenges and recommendations for those looking to innovate.

Artificial Intelligence for Power Platform

The Power Platform suite of tools have now been integrated with AI capabilities, to make the platform even easier to use.

Users can now use natural language to describe their needs, making the build process even easier and faster.

Copilot for Power Apps

Makers can build a complete app just by describing what they need in natural language.

Build, reimagine, and deploy business applications all through intuitive natural language.

Copilot for Power Automate

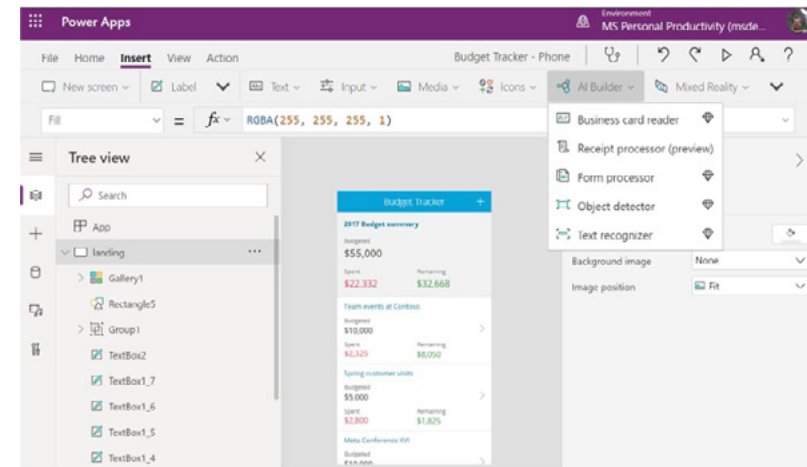
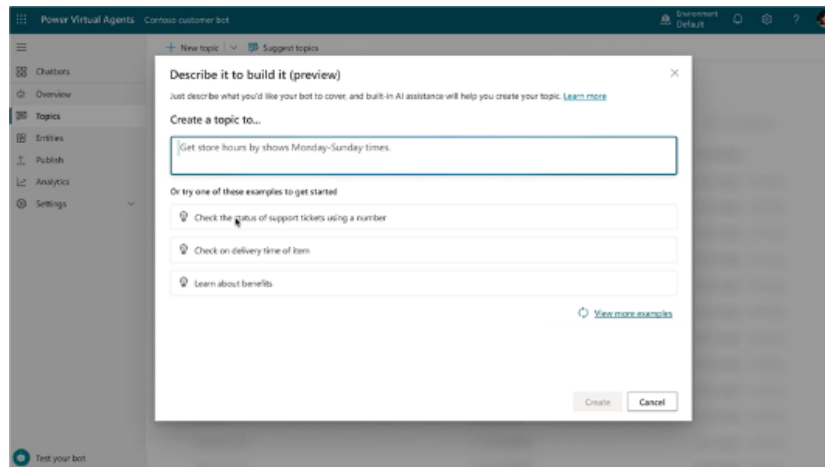
Use natural language to edit and extend flows with an AI-based copilot.

Easily build and iterate on flows as the copilot helps remove blockers or extend your flow.

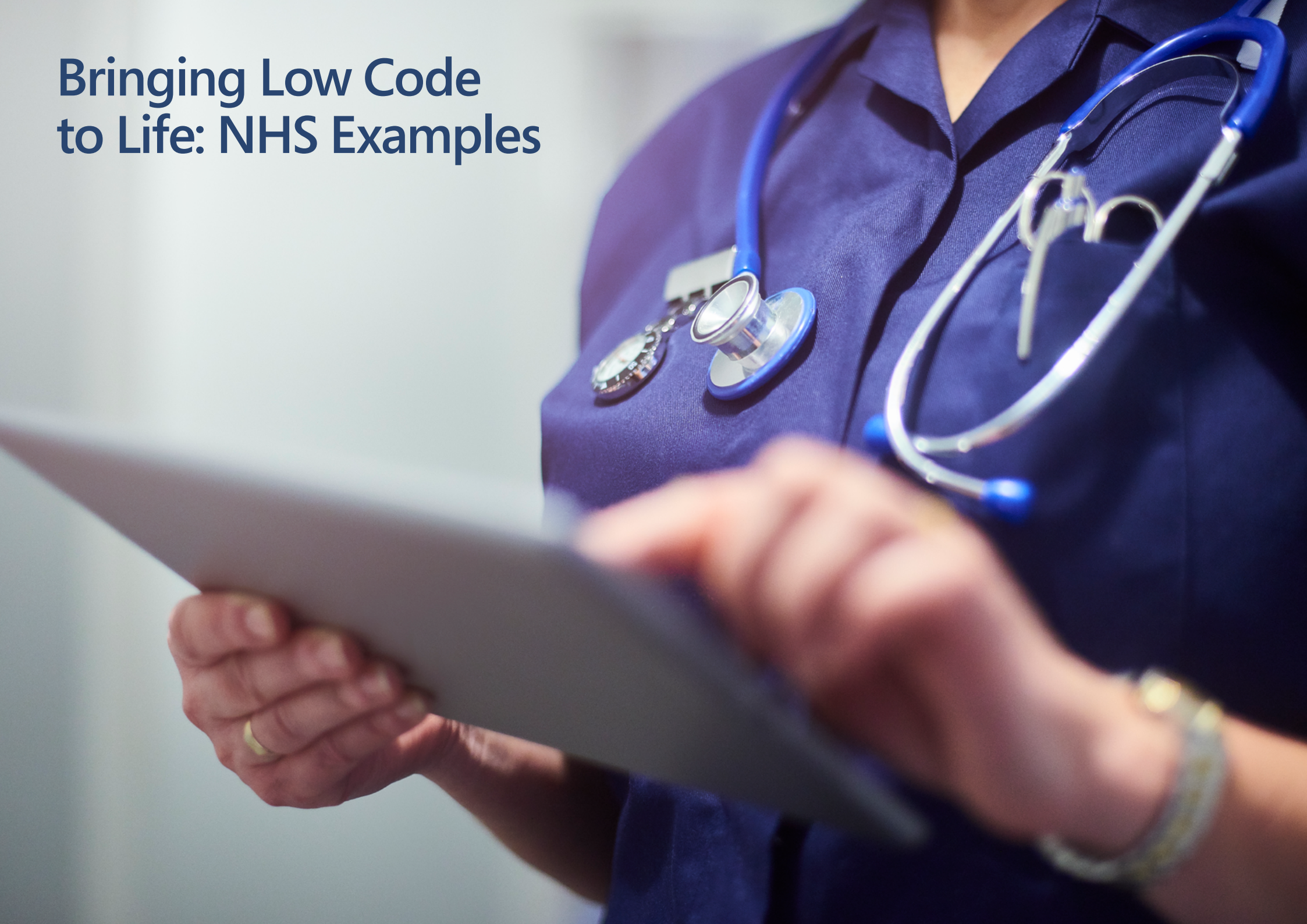
Copilot in Power Virtual Agents

Makers can quickly create and refine topics using natural language by **“describing it to build it.”**

Reduce bot-generation time down to hours or even minutes by leveraging Power Virtual Agents copilot.



Bringing Low Code to Life: NHS Examples



Case Study: Greater Manchester Mental Health (GMMH)

The Challenge

Steven McMonagle and Claire Wignal are mental health nurses who moved into digital transformation roles at GMMH. They have a real understanding of the opportunities and on-the-ground challenges faced by front-line staff, and it translates into a passion and excitement for making change.

The team started using Power Platform for simple, repetitive tasks – “like COVID reporting and managing staff lateral flow COVID testing” – but moved quickly onto a bigger challenge: e-observations.

Inpatient nurses must routinely take observations such as blood pressure and oxygen saturation on their wards. The results and overall score – NEWS2 – are written on a piece of paper at GMMH.

“It could be minutes or days before that information makes it into the patient record”, says Claire. “And it’s often not recorded in the right place – the paper is scanned and uploaded so isn’t entered as structured data. That can create a communication issue, because other clinicians can’t see the information where they’re expecting it in Paris [the Electronic Health Record].”

There are other problems as well. Paper records are time consuming to prepare and maintain. Sometimes a clinician walks away with the piece of paper before it’s scanned. On the whole, nobody likes the system.

“We looked at building a solution,” says Steven. “There’s a really high cost to entering into app development which integrates into the EHR, and a significant resource requirement to maintain the app. We never had the internal resources to do it ourselves. **Doing it externally came at a huge cost – we estimated it at about £300k-400k.**”



The Solution

Andre de Araujo, the head of ICT at GMMH, saw the benefits of Power Platform in helping resolve the challenge. **"The opportunities it provides you are enormous"**, he explains.

For this app, they decided to partner with ANS for some additional support. **"It was a question of confidence for the team,"** says Steven. **"It's the first app which integrates into our EHR, so it's important to be implemented in line with the Power Platform's best practices. We also did it to develop our Centre of Excellence."**

The Centre of Excellence (CoE) was used to turn Power Platform into an enterprise-grade solution for the Trust. GMMH needed multiple environments – for development, testing, and live – as well as clear governance policies and mechanisms to standardise approaches and develop their team, including training and toolkits. Best practices to developing a CoE are covered further in the [sections below](#).

The GMMH team and ANS worked together to build a PowerApp for the nurses and doctors to use, which instantaneously inputs the e-observations into the right location in the patient's EPR. This enables accuracy, accountability, and enforces requirements – such as respiratory recording.

The impact

The team defined in advance the KPIs they wanted to track in order to know whether the app was supporting the front-line in the way they anticipated. This included auditing the time it took for nurses to use the new application, versus the old process; time saved such as admin time scanning paper; staff satisfaction in using the app and finding the information.

Since implementing the app onto the wards, the average administration time for observations has dropped by 86%, saving an average of 130 minutes a week for involved staff.

Importantly, the cost of developing e-Observations via a Power App was far more viable than building it from scratch.

"We paid not 2/10 [20%] of what we would have paid if we had done it from scratch," says Steven. **"And that includes the cost of a partner to build the app, but also the setup of the Centre of Excellence"**.

The team plan to develop the app further. **"We want to be able to graph the results over time and facilitate comparisons,"** says Claire. **"We want to be able to visualise and then share it with patients."**

Tips for Success

"We've had the luxury of a really engaged ward and physical health lead," says Claire, describing what made this project successful. Communication has also been really important: digital literacy skills are extremely variable, and even the word 'app' was not clear to everyone. The team took pains to include the front-line, and speak a language which could be understood by everyone.

"We also presented this as an innovation, rather than as a solution", she adds. It creates a sense of team, and co-development, rather than an answer which is pre-determined.

Case Study: Your Healthcare CIC

Ed Montgomery is the Managing Director of Your Healthcare CIC (Community Interest Company), a social enterprise which delivers health and community care services to the NHS. Services such as district nursing, rehabilitation, rapid response and physiotherapy are delivered by Your Healthcare.

The challenge

Your Healthcare's clinical system, delivered by a third party, went down on August 4th, 2022. The clinical teams, faced with no access to clinical notes, did what they could - they shared documents and excel sheets with one another. Not surprisingly, frustration built up with the clinical team quickly. "One person might update a document, but if records weren't accessible to the others, this would result in increasing clinical risks – and more clinical incidents," worried Ed.

When Ed and his IT leads (Phil Montgomery and Ed Tombs) realised it might be weeks or months before they regained access to the system, they knew they needed a new plan.

"We had a meeting with the lead nurses, and I committed us to build something in 2 days," says Ed Tombs wryly. "In the end it took us 12 days – with Power Platform - but we had something which enabled the nurses to log and use notes," he explains. "It started with a basic app which stored everything in Sharepoint lists, and believe it or not, the team was quite pleased. Of course, this then started a process of every team asking for additional functionality."

"We took this as a challenge," explains Phil. "We very quickly built out the core components we needed – appointments, referrals, notes, alerts. It's not perfect for every team, and it's undoubtedly still basic, but it's a lot safer than the alternative the nurses were using."

"Some of the clinical teams don't want to go back to the old clinical system, which is quite gratifying," says Ed Tombs. "It's been designed around the users, to their specific needs. Features and forms which have been requested and prioritised, and we've been able to get it up and running. Some of the advancements we've built are really good for workflow."

This has reduced a lot of stress for the executive team. "We've been running effectively since the 3rd week of August," explains Ed Montgomery. "We're tracking clinical incidents – the biggest risk was a couple of weeks after the clinical system went down. Now, our incidents are reduced from before our system went down."

This experience has differed significantly from others in their position. "We know a lot of other organisations who were also knocked out by the clinical system. As late as September, some were struggling to do anything. It hasn't been causing me sleepless nights at all."

Governance

"We had already done a lot of the work to review our governance to enable the use of Power Platform, and putting data into the Microsoft platform," says Ed Montgomery. They worked with an external consultancy to integrate the platform with Microsoft 365, knowing the data would include information from clinical systems. "Ultimately, it was about ensuring that what you're putting in place is safer – from a clinical and information governance perspective – than what you're leaving behind. We took an enormous step forward with the app," explains Ed.

Next Steps

"There are APIs going in and out of the old clinical system – so we'll likely use this, and data import tools, to get all our information back into the system when it's up and running," explains Ed Tombs. "Because the information is in a central place, we can do this easily."

"There's some information which we've recorded which can't be uploaded automatically, and I've been working on a Power Automate capability to put it back into the system," Phil adds.

The teams are understanding how they make use of the new workflows they've built into the app, and how that can support the original clinical system when it's up and running. "There's so much efficiency we can pull out," says Ed Montgomery. "Especially in back-office. We're looking at our longer term strategy. It's about how we enable our organisation to be more creative, with the right governance boundaries. There is so much capability with the individuals using the system to harness."

The team have already done a fair bit of automating, and see a lot of opportunity to do more. "Within IT, we use Power Automate quite a lot – for example, emails from network providers about specific issues automatically convert to tickets; the speech therapists have flows off the back of statuses changing in Sharepoint lists," says Phil.

"At the system level – with partners – there is so much we can do to enable appropriate flow. There are a lot of manual processes, like referrals, which we're aiming to eradicate," says Ed Montgomery. "We're looking at our process flows to support better service for our patients, while collecting data and using that data. We also want to put this functionality in front of our clinical teams – they're the ones who will make their services better," Ed enthuses. "The teams are looking for improvement consistently."

Case Study: London North West and TrakIt

James Biggin-Lamming is the Transformation Programme Director at London North West University NHS Trust (LNWH). Like many transformation directors in the NHS, he manages an enormous range of programmes designed to improve quality and efficiency in the NHS.

“There are hundreds of spreadsheets involved”, James explains.

“It makes governance very challenging from an administrative perspective. You have to gather information from a number of places and put it together, and it’s not evident where there are gaps. Then there’s all the wasted time copying and pasting between them and never being sure if you have the latest version”

A similar situation at nearby Imperial College Healthcare NHS Trust (ICHT), gave the organisations a chance to collaborate on a project which could benefit both Trusts. ICHT had begun experimenting with PowerApps to track cost improvement plans. Working together, the two organisations began to pull together a Power app called TrakIt. This pulled all their project plans together in one place, with project charters, finances, interdependencies, milestones, risk logs and attachments. ICHT and LNWH engaged CPS, a Microsoft Gold partner, to help build out the functionality for the platform.

“It’s essential now when we manage governance around our many projects,” he explains. “There’s a single source of the truth, and everything is tracked in the same manner, so there is real consistency which helps share and learn within and across our organisations.”

Ultimately, this will improve the success of NHS projects, and the overall productivity and care provided by the Trusts.

Since its launch, three more organisations in the patch have joined the TrakIt partnership. The app is designed to enable trusts to be flexible around their implementation of the application, while also enabling some cross-organisational sharing of information. Trusts across the country are showing an interest in adopting TrakIt.

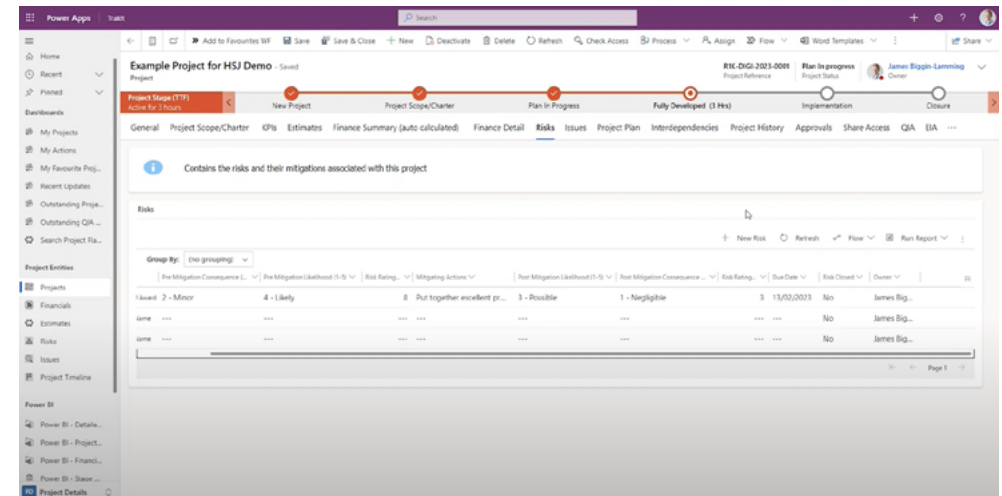


Figure 1: TrakIT application, Example Project

The impact of the solution is being felt by the project management teams across the Trusts. “The team isn’t having to replicate data or reanalyse everything. Getting ready for governance meetings doesn’t involve hours of work either,” says James.

“By saving an hour of time each week for each team member, an estimated 3,500 days a year is being saved.”

Case Study: Surrey & Borders

Helena Painting is Head of Software Development at Surrey & Borders Partnership Foundation NHS Trust (SABP) – the leading provider of health and social care services for people of all ages with mental ill-health and learning disabilities in Surrey and North-East Hampshire. The Trust operates across multiple locations – including inpatient hospitals and care homes as well as a range of community sites.

“A common theme has been transforming processes that were being managed with complex spreadsheets”, she says. **“Some of it seems dry until you realise how important it is – it’s about compliance. Ligature risks, compliance with NICE guidance, Policy management. It may not be very rock’n’roll, but it is important, if you get it wrong, it can be a major risk with regulatory or legislative implications”** she explains. **“Using Power Apps, we can streamline and transform processes and add value in the process, building in assurance, automating reporting and freeing up time for our colleagues. Where clinical staff are getting caught up in administrative processes, we can release time for them to provide care – that’s really important to me personally, and something the team are passionate about.”**

The screenshot displays the 'Paediatric Triage Line call' application. The main interface includes a header, a search bar for 'Hospital location', and a large redacted area with a warning icon and the text 'They are currently no c'. A modal form titled 'Please complete the form' is overlaid on the right, containing fields for Callers location, Call duration, A&E Arrival Time, Known to CYFS, PAS No, Primary Presenting need, Additional Presenting needs, A&E Status, Any follow up details, and Admin time taken.

Figure 2: Paediatric triage line. and app for capturing helpline activity. Call data redacted.

In addition to apps focussing on audit and compliance, Helena has a clear ambition to move the team towards developing apps that provide support in a clinical space and two current projects particularly illustrate this ambition. The first is a Day Planning App for use in Learning Disability services which replaces paper-based activity charts compiled for each resident. Having structure to our day is important for us all, and the challenge was to provide activity information in an accessible format for adults living in the Trust’s Learning Disability care home.



Figure 3: example of an individual's day plan. Resident information redacted, test data used.

A second example of this drive to provide more direct support to clinician services is the Mental Capacity Assessment Act app. Currently under development, this app will support the Trust's clinicians in recording assessments made under the Mental Capacity Act in a consistent manner across the Trust, providing an intuitive and streamlined user experience and supporting activity reporting.

Data journey

The Trust have already made a commitment to migrate to Dataverse, using it as their primary data store for Power Apps. The next step is to better develop the team's range of common tables that can be utilised across apps. Helena would like to see closer integration with the Trust's data warehouse in the longer term. Additionally, the Application Development team are focusing on embedding localised Power BI reporting within apps.

What's next

"We're still expanding our service catalogue. Power Page is our next planned development, enabling us to offer a public-facing front-end to our apps – that's got to be our next goal", she explains. The team have their first production project using a Power Portal currently in development, providing a secure and validated referral form for clinicians to refer young people for peer group support.

Robotic Power Automation (RPA) using Power Automate Desktop is also high on the to-do list. To date the team have produced some proof-of-concept RPA processes together with a video to illustrate the concept to colleagues in the wider Trust with a full business case for adoption of RPA to follow. While there is clear potential for automation using RPA in the Trust Helena is keen that it should not be perceived as a cure-all, "using RPA needs to be considered carefully on a case-by-case basis to ensure it is the right approach", Helena explains.

Governance

"I love governance," Helena says, laughing. "Governance is an enabler, not a blocker. One of the process changes I've instigated is that governance begins right at the start of a project – at discovery. Sometimes I think there can be a temptation to write a DPIA (Data Protection Impact Assessment) at the end of a project. I'd strongly challenge that – for me, writing the governance documents invariably delivers additional insight and informs the design process," she explains. "It helps that we have an amazingly responsive and knowledgeable Information Governance team at the Trust."

Insights for using Power Platform

Digital departments across the NHS are often struggling with resourcing and Helena acknowledges it has taken time and effort to build the current team. Skilled Power Apps developers are scarce and in high demand. To build resilience Helena is looking to develop skills from within. "We're going to grow our own", Helena explains – App-in-a-day events, an evolving citizen developer strategy and informal secondments are in the plan - it's all about recognising and nurturing potential and interest where it is found.

Helena has some advice for other departments looking to do the same. "Maximise your use of Microsoft free training resources," she advises. Microsoft's Enterprise Skills Initiative, found [here](#), includes free training for all NHS staff, including a number of courses on Power Platform. It's also good to link up with other Trusts – you may find you have similar problems to solve and can pool resources or share apps.

She also recommends following a number of Powerapp YouTube gurus, including [Shane Young](#) and [Reza Dorrani](#).

Helena Painting can be reached [here](#) for those looking to learn more.



Case Study: Hertfordshire Partnership University NHS Foundation Trust

Avi Reddy is the Head of Information and Business Intelligence Systems at Hertfordshire Partnership University NHS FT. Hertfordshire is a Mental Health trust, and they were the first to deploy Powerapps onto the Central Tenant.

The Challenge

Avi's first area of focus was the improve staff journey across the trust. When a new starter joins the trust, the manger was asked to complete multiple forms to get their IT equipment, access to systems, badges etc. sorted. For each system, there are a load of forms which then have to be completed by a new starter and their manager. It's a similar system when any changes occur to staff member's working contract, and it's extremely inefficient – lots of Word documents.

"It was very a very time consuming, manual process for staff to complete. So I was getting constant feedback from the staff: why do we have so many forms to complete? How can we streamline this?"

The manual system also resulted in a lot of duplication. **"Since we had a lot of forms and systems which were not talking to the others, this resulted in quite a lot of discrepancies in the staff account across the systems"**, Avi explains.

The Solution

The Trust's digital strategy from 2019 had 4 main pillars, one of which was a digitally enabled workforce. A key workstream was simplified apps and automated workflows for onboarding new staff.

At each step of the staff journey, Power Apps is embedded. Power Automate helps with sending an induction pack to the new starter. An app helps capture all the new equipment requirements. Once the staff member is onboarded, there's an app for supervision and appraisals – which was once a word document. Now it no longer has to be emailed to HR to upload onto ESR.

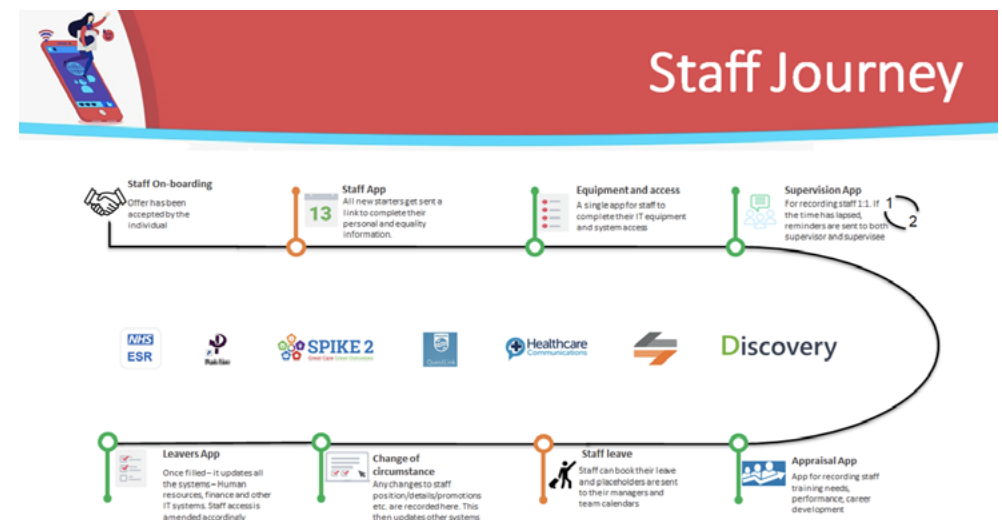


Figure 4: The Digital Hertfordshire staff journey

Staff leave is currently being managed by a load of Excel documents. The Trust is working on an app into place to manage staff leave, manager approvals, and automatic flags into calendars. The app will manage the number of days available to staff, track sick leave, and integrate into the Payroll and ESR systems.

Finally, at the end of the journey is the leavers app, for when a staff member is leaving the Trust. It helps ensure that all relevant accounts are shut down, equipment is returned, and so forth.

The system is being enabled by Power Apps and Power Automate, with corporate data sitting in Dataverse. **"We're not getting rid of any of the original systems"**, Avi explains, **"We're just making the end-to-end process slicker."**

The screenshot shows the 'ESR Staff Details' application interface. At the top, there's a header with a home icon, a user icon, the title 'ESR Staff Details', and the NHS logo with 'Hertfordshire Partnership University NHS Foundation Trust' and 'Logged on as:'. Below the header is a navigation bar with tabs: 'Staff Details' (selected), 'Work Details', 'Asset Details', and 'Login Details'. A red banner states: 'All items will automatically update on ESR. Note: changes may take up to 48hrs to update'. The form is divided into sections: 'Personal Information' (Full Name, Home Telephone, Personal Mobile, Personal Email), 'Equality Information' (Ethnic Origin, Sexual Orientation, Religious Beliefs, Disability), and 'Home Address' (Address Line 1, 2, 3, Town/City, County, Postcode). There's a table for 'Disability' with columns 'ID', 'Category', and 'Status'. The table has one row with ID '7501571', Category 'No', and Status 'Active'. A 'Save' button is at the bottom right.

Figure 5: Hertfordshire ESR Staff Details Application

The screenshot shows the 'Appraisal & Development App' interface. At the top, there's a header with a home icon, a user icon, the title 'Appraisal & Development App', and the NHS logo with 'Hertfordshire Partnership University NHS Foundation Trust' and 'Logged on as:'. Below the header is a navigation bar with tabs: 'Help' (selected), 'Pride', 'Values', 'Successes', 'Objectives', 'Aspirations', 'Development', 'Wellbeing /Support', and 'Record Date & Submit'. The main content area includes a 'Help' button, a 'Select New Appraiser' button, and a section for 'Appraiser: Hakan Akozek'. Below this is a paragraph explaining the app's purpose. There are two main sections: 'Our Vision' (Delivering Great Care, Achieving Great Outcomes - Together) and 'Our Mission' (We help people of all ages live their lives to their full potential by supporting them to keep mentally and physically well). There's also a section for 'Our Good to Great Strategy' with a diagram and a section for 'Our Values' with a list of values and their corresponding feelings.

Figure 6: Hertfordshire Appraisals & Development App

Other Areas of Focus

Avi has a long list of apps which he's already begun scoping, for everything from DPIAs to Health & Safety Audits.

Following the success of corporate apps across trust staff, the trust has invested and gone live with a number of clinical apps (including electronic observations, delayed discharges, and a placement app) that interact with the main electronic patient record (EPR) system (PARIS) on real-time basis via the trust integration engine and EPR APIs.

Patient Info	Observation Details	Check due (mins)	Location	Summary
☐ PARIS ID: 65685 DOB: 01/01/1999 First Name: ANITA Last Name: TEST Obs Reason: MONITORING NEW ADMISSION New Obs	Type: CONTINUOUS: ARM'S LENGTH (4-1) Start Date & Time: No checks performed Last Checked On: Mon 15-05-2023, 11:30 Last Checked By: No checks performed	0	 Risk Plan Updated: ☐ No	Select record to enter risk summary
☐ PARIS ID: 65685 DOB: 01/01/1999 First Name: ANITA Last Name: TEST Obs Reason: MEDICATION MANAGEMENT New Obs	Type: CONTINUOUS: ARM'S LENGTH (1-1) Start Date & Time: Tue 16-05-2023, 10:23 Last Checked On: Tue 16-05-2023, 09:20 Last Checked By: moislam1@nhs.net	60	 Risk Plan Updated: ☐ No	Select record to enter risk summary
☐ PARIS ID: 65685 DOB: 01/01/1999	Type: CONTINUOUS: EYE (1-1)	60	 Risk Plan Updated: ☐ No	Select record to enter risk summary

Total returned results: 3 [Save](#)

Figure 7: Hertfordshire Observations app, screenshot courtesy of Digpacks, Patient information redacted

In the past, staff used to record clinical observations on paper and upload them onto PARIS. But now with the e-observations app, their inpatient staff can access a user-friendly version of the e-observations section that is our clinical system on smart devices (tablets/ipads) via the PowerApp. This allows staff to record real time observations whilst moving around the ward ensure our service users are safe and secure. **"In the first 2 months of its launch, we had 45,000 observations recorded via the app across 5 of our inpatient wards – keeping our service users and wards safe."**

In terms of a team, Avi has a small team which helps maintain the apps, but they work with a build partner and ensure they do a robust knowledge transfer after the app is complete. Hertfordshire's Partner, Digpacks, helped build some of their solutions but also trained internal staff up on PowerBI.

"There is coding involved," Avi explains. **"You can't just give it to a clinician and say – here, build me an app. So there is coding involved, but the rate at which you can develop apps or applications to capture data is 10 times faster.** And the beauty of Powerapps is that it's in the Microsoft environment, so your apps can work with Teams and with NHS mail, and with the security wrapped around it."

Case Study: Berkshire NHS Foundation Trust

The Challenge

Jon Burton is the head of RPA at Berkshire Healthcare NHS FT. Berkshire, like most organisations across the NHS, are struggling to recruit enough staff to keep up with demand.

"If not for a focus on RPA, we'd see increasing numbers of patients struggling to get referrals, and increasing administrative burdens being placed on clinicians. We wanted our administrative staff helping our clinicians deliver care, not focused on paperwork," says Jon.

One of the first areas for RPA at Berkshire was in managing referrals for physiotherapy. Multiple record systems made the process for referral management lengthy: each referral took roughly 20 minutes to input into systems. The team, 33 strong, were processing approximately 6,000 referrals a year, with complex business rules, resulting in a significant amount of time taken away from patients.

The process is also subject to a 2 hour SLA (Service Level Agreement) – which, when combined with this administrative burden, created a challenge for the team.



The Solution

The team paired up with DigPacks, a Microsoft Power Platform partner to implement improvements. The new process mimics a number of previously manual tasks, including identifying the right council, integrating into the Rio/Servelec environment to create a new referral associated with the patient following these rules.

The robot has been programmed to perform the steps of the process automatically, pulling over the relevant details, including them into the right systems, and creating the appropriate referral.

The total time for the robotic process is 2:19, a saving of approximately 17 minutes per patient. With over 6,000 referrals yearly, that's an estimated 226 hours of FTE time saved annually.

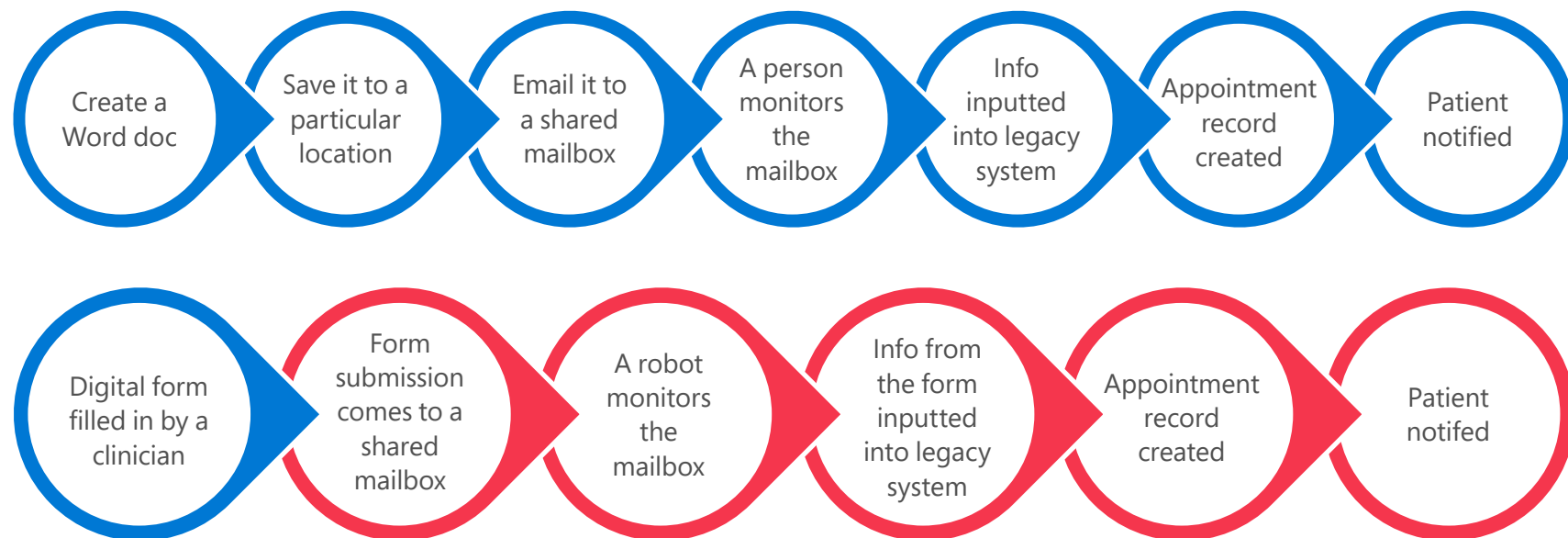


Figure 8: Berkshire's before-and-after processes for physio referrals (above = original process; below = RPA process)



Other Areas of Focus

Berkshire Healthcare FT has made some inroads across a number of areas of their trust with RPA. An expenses Bot has reduced the administrative workload of an individual reviewing and summarising expense receipts, filing and following up on discrepancies, **taking a 3-day process to a 62-second process.**

An HR process to enable joiners and leavers, which involved an excel spreadsheet with multiple individuals uploading information simultaneously, was turned into a Powerapp, integrated into the recruitment system with automated communications, reminders, and dashboards. **The trust estimates that the process saves 17.5 hours of time each week.**

Case Study: Royal Brompton

For Adam Igra, the Innovation Programme Director at Guy's and St. Thomas' Hospital (GSTT), the focus with Power Platform was on patient engagement.

Adam's journey with Power Platform began when he was driving innovation at the Brompton, a specialist respiratory and cardiology trust. "With our new model of outpatient care, particularly for managing patients with long-term conditions, we needed ways to engage efficiently with patients remotely," says Adam.

Before the pandemic, the Trust was looking at eforms through their Electronic Health Record. "It was an excruciating, lengthy process, just to digitise very simple forms, and hugely costly. So it never got taken forward," Adam says.

Enter Microsoft. "We had a lot of paper-based PROMs, or patient-reported outcome measures," he explains. "There were so many tools we already had access to within the Microsoft365 suite which enabled us to pivot to digitalise these processes. We enabled patients to fill in these forms remotely, and used Power Automate to move the data into different formats and uploaded the information into our Electronic Patient Record," he says.

This enabled clinicians to create automated alerts and significantly reduced administration. "A paper form – which was a 45-minute process to manage – became instantaneous," Adam explains. The resulting documentation could be easily shared, such that the PROMs were in front of the clinician at the start of the patient's next outpatient appointment. "And importantly, we could turn around a new digitised form within a matter of hours from a developer perspective".

The team avoided processes which required CE-marking, mainly automating and digitising existing paper-based processes.

"This was about using a lot of our existing licensing and capabilities," Adam says. "We ran it on a shoestring initially". The organisation did need some premium licenses to enable connectors to create word documents and PDFs, and also to move data into EHRs. "But there was a lot we accomplished without a huge outlay", he explains.

Of course, good governance and Standardised Operating Procedures (SOPs) were still critical. "Data needs to be stored and shared safely", he says. "You need clarity around how long data is being held, and when it's being deleted". But ultimately, there were a lot of simple processes which were quickly converted to digital and saved time. "It's not always sexy, but it saved thousands of hours," Adam says.

Case Study: NHS Business Services Authority

Neil Coupland and Neil Dodds at the NHS Business Services Authority (NHSBSA) initially started looking at Microsoft Power Platform to solve a practical issue: car parking spaces at their Stella House head office in Newcastle. There were more people in the office than they had parking spaces for. Their first app was launched just before the pandemic, when suddenly the problem was flipped and the car parking app became a valuable proof of concept for something much more important.

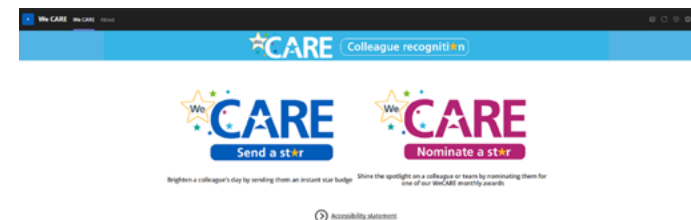


“Due to Covid, we suddenly found that there was almost nobody in the office and car parking was no longer an issue, but when colleagues needed to come in, it was vital that we could ensure social distancing. We needed to find a way to book desks on a daily basis for colleagues to use safely.” says Neil Dodds. The duo used the proof of concept based on the car parking app and extended it to provide what they needed, so it supported checking in and out, reporting, and so forth. That application was then shared with other organisations, like the NHS Counter Fraud Authority, to help manage the issue. “One thing we’ve learned is to shape our apps so they’re sharable from the start,” explains Neil Coupland.

“Our next app was built to boost staff morale during this difficult time when colleagues were mostly working from home and were missing the day-to-day contact they had enjoyed in the office.” Says Neil Dodds. The NHSBSA have a set of values which fall under the acronym ‘CARE’ (to be Collaborative, Adventurous, Reliable and Energetic), so the team built around these values, creating the ‘We Care’ app. This was a simple idea, giving any member of staff the ability to nominate colleagues for a “Star” in line with the NHSBSA values, and to send thank you messages or wish people a happy birthday.

Neil Dodds says “Adoption depended on the use of existing technology within the Microsoft Teams environment that our colleagues were already familiar with. We knew we had to create something that was quick, easy and fun to use that would replace the connectivity we had enjoyed before the pandemic.” The ‘We Care’ app was built in six weeks, and with the knowledge and capability they’ve gained since, the team believe they could now do it in a week or two.

The app has proved to be much more widely used than previous rewards initiatives and by colleagues from all levels and across all directorates in the organisation. The organisation has been nominated for national awards for their work on the application.



Accessibility

As an Arm's Length Body of the DHSC, with services used by the general public, the NHSBSA is required to meet GDS accessibility standards. This is something the team takes very seriously, always striving to improve. "We're working with Microsoft on this," says Neil Coupland. "It's sometimes the small things – for example you can't have green and red as the main colours on a screen." Through using these applications over time the team has now developed an instinctive understanding of good user design.

Looking ahead

The team started small: "We repurposed a number of people who had previously spent most of their time working with Access Databases that supported business processes: they had no prior knowledge of Power Apps. They did some 'app in a day' sessions, and started prototyping," says Neil Dodds.

"Now that we've undertaken several projects as proof of concept we can see how we might be able to apply this to our public-facing systems," says Neil Coupland, "We recently launched a new Freedom of Information portal which uses the Power Platform applications. The customer journey has been improved and we've moved to a modern technology platform that's easier to support."

"It's very much been a journey – and it's a journey that's by no means complete," finishes Neil Dodds.



Case Study: Pennine Care NHS Trust

The Challenge

"Someone came to me with a problem, and Power Platform was the **easiest way to solve it**," says Mike Culshaw, Chief Technology Officer at Pennine Care NHS Foundation Trust.

The problem was one of inspections – in particular, audits of nurse call bells. These were inspected regularly, and put into spreadsheets. Others extracted this information to make reports.

It didn't take long to create a Power App which resolved this problem. **"One of the users told me, 'this has saved about an hour a day, roughly' – and that's just on the ward which tested this,"** Mike says. **"Now it's, wow, what can we do next?"**

Mike is keen on building on the success of others. **"I saw what was done with clinical observations at another NHS Trusts, and I just want to lift and shift this into my organisation,"** he says. "Feeding it through Power Apps into the clinical record – this would free up ridiculous amounts of [clinical] time."

Data strategy

"If we get Dataverse right, then everything else can be built on it faster and easier, as it's the same set of data we're often using," explains Mike. **"I've got a static number of wards, with the same buildings, the same layout. If someone's creating an inspection app, versus an estate app, we're changing a couple of fields."**

Mike has invested in setting up Dataverse with common data tables which he sees as usable across a number of apps. **"We can transform Estates processes completely,"** he says. **"There are so many physical people checking things."**

Governance

There are benefits with come with implementation on the NHS Central Tenant, says Mike. **"When NHS Digital [now NHS England] first launched Power Platform, it wasn't there – but now it's locked down. I'm not worried about people doing anything they want. I can control who is making apps.** If someone comes up with a good idea, and they're capable of implementing it, that's a different conversation," he says. **"But if the one person who developed it leaves, who looks after it? This is what I'm managing,"** he explains.

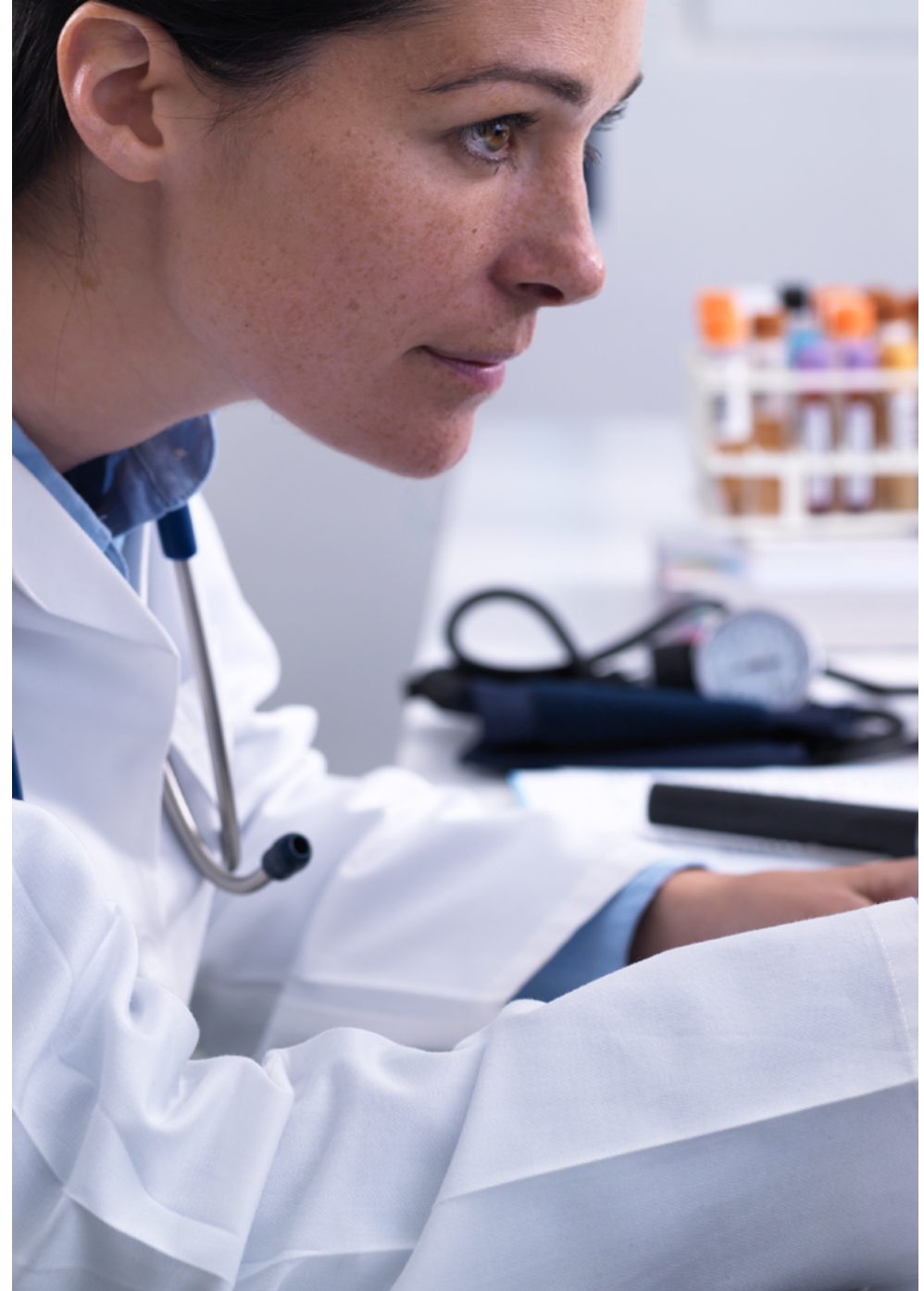


Rounding it up: the main benefits

At Microsoft we're seeing a growing number of organisations adopt low-code as a core part of their digital strategy. As seen from the case studies above, the benefits include:

- **Faster Development** – Applications can be built more quickly, which means better use of IT staff time. This leaves them able to do more, resulting in greater benefits of digitisation. It's also easier to iterate changes, so if developing in an agile manner with end users, the app is likely to have greater impact.
- **Lower cost, including development and maintenance** – Reducing the time needed from staff means lower cost, particularly if a comparison is made to bringing in external resources. Gartner has estimated that the **average cost to develop an app is 74% less with Power Platform than with traditional coding methods.**¹ Developers can also use out-of-the-box solutions like chatbots, geo-sensitive interactive maps and mixed reality capabilities.

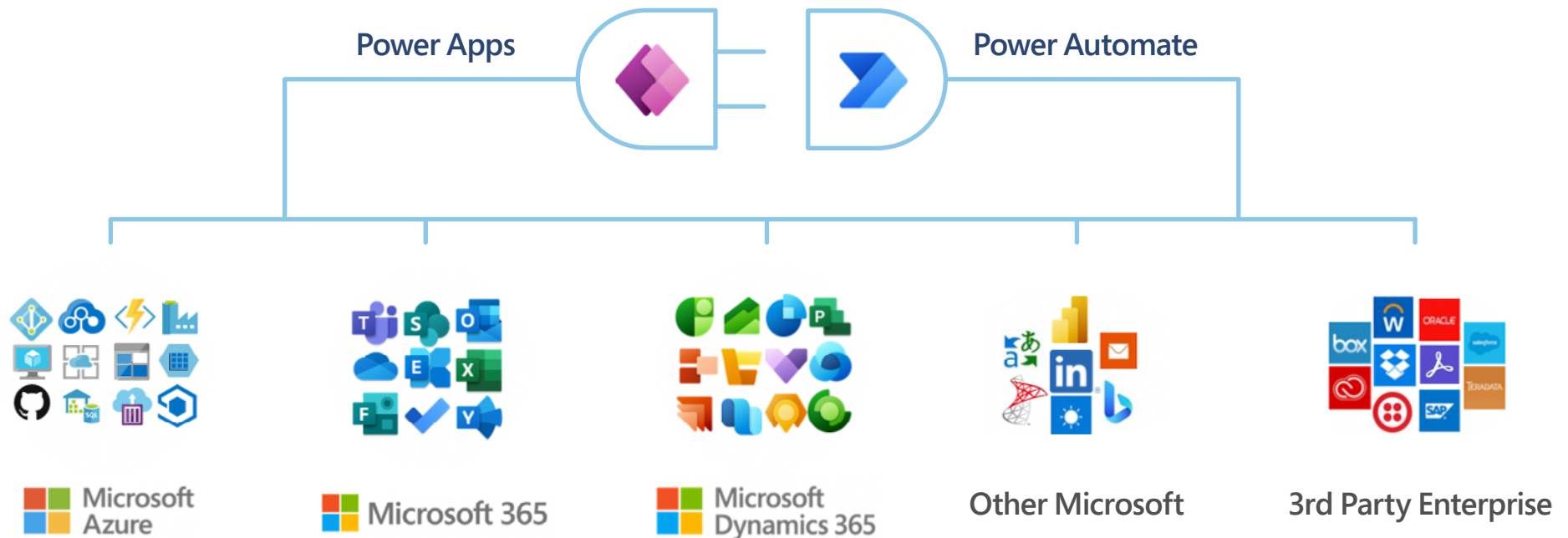
¹Forrester: The Total Economic Impact™ of Power Apps. March, 2020.





- **Engaging the Frontline** – Power Platform allows for the possibility of front-line innovators – people who aren’t developers who want to build products. This increases staff motivation and can scale the breath of innovation which happens in a trust. NHS Trusts are effectively bringing together clinical and IT teams, to the benefit of both, and delivering innovation at speed. They’re also doing this with effective governance, while managing expectations – as discussed in our Centre of Excellence section. A few front-line staff have found new career progression opportunities in this way – as seen in some of our case studies, and [here](#).
- **Reusability and simplicity** - Core components, once built in low-code, can be easily and quickly reused – including data integrations (which reinforces the source data’s integrity) and reflection of the trust’s physical and organisational structure (for instance, wards and beds). More importantly, Trusts are already sharing their apps with one another, further accelerating development.
- **Integration into Azure and NHS tech stack** – Power Platform integrates into Office 365 – including SharePoint, Teams and Excel – as well as Dynamics. It’s built on Microsoft’s Common Data Service which makes it easy to connect to data stored in Microsoft Dataverse, on various on-premise or cloud data sources (including SharePoint, Microsoft 365, and SQL Server). This can help reduce the number of logins, and help consolidate information into a single place (e.g. sitreps or communications from an external platform into a Teams channel)

- **Security and Compliance** – Power Platform is built to make security and governance simpler. Data warehousing, security, compliance and deployment capabilities save developers time and money, linking apps to Azure Active Directory, Key Vault and Intune.
- **Ownership and Customisability** – Power Platform enables Trusts to digitise processes to reflect their unique situation, and subsequently own the fruits of that labour.



Power Platform supports a rich ecosystem of connectors across Microsoft and non-Microsoft cloud and on-prem services

Starting the Low-Code/No Code Journey: Making the Case to the Organisation

Low-code platforms depart from the traditional 'buy' versus 'build' dichotomy. Strategically, IT teams develop a blended portfolio of custom-built products (which may be developed in-house or externally), and off-the-shelf products where available and applicable to their context.

The Power platform introduces a new option, one we term 'assemble'. Instead of building from scratch, or buying a managed product, the platform offers the lego pieces which enable IT teams to assemble their own apps quickly and securely.



Build

Internal senior development resource to build out applications from scratch.

Advantages

- Deeply customized, purpose-built to the needs of the organization
- can integrate seamlessly into existing infrastructure

Disadvantages

- Can be expensive, or limited functionality relative to procured
- Likely time-consuming - may distract senior developers' time from key projects (e.g. EPR).



Buy

Go to market for individual/specific requirements.

Advantages

- Fast, agile, often modular
- Functionality likely more sophisticated - e.g. can be UK-CA marked medical devices
- Comes with product roadmap, service wrap

Disadvantages

- Result may be multiple point solutions, sometimes creating duplication of IT spend
- Reliance on external providers may lead to lack of data ownership



Assemble

Introduce low-code development. Junior & 'citizen' developers quickly assemble templates to create apps.

Advantages

- Fast, agile, using in-house development capabilities
- Frees up senior developers for key projects (e.g. EHR)
- Enables purpose-built apps
- Engages junior and front-line staff

Disadvantages

- Training needed to get junior developers comfortable with platform
- New governance and cultural changes needed to make best use of platform

An 'Assemble' option with Power Apps can accelerate the speed with which apps can be built out, making better use of the IT team's skillset and time. Senior developers can continue to focus on major projects and complex developments, while more junior resources are able to more quickly and cost-effectively create bespoke applications for their organisation.

When making the business case for Power Platform, it needs to be done in the context of the specific apps the team intends to build on the platform.

It's rare that, by building just one app, the team can yield sufficient savings on which to rest a business case for Power Platform. More likely, the benefits need to come from a programme of a number of RPA processes, apps, and/or chatbots.

The benefits derived from Power Platform usually accrue to time savings for the IT staff, and the costs relative to building an application from scratch (especially if this involves an external consultancy). But there are other benefits: for example, NHS Trusts tell us they have reduced spend on duplicative applications, with the governance and security of Power Platform enabling better visibility of an app ecosystem. A significant side benefit of Power Platform can be better adoption by front-line staff, and improved speed of innovation.

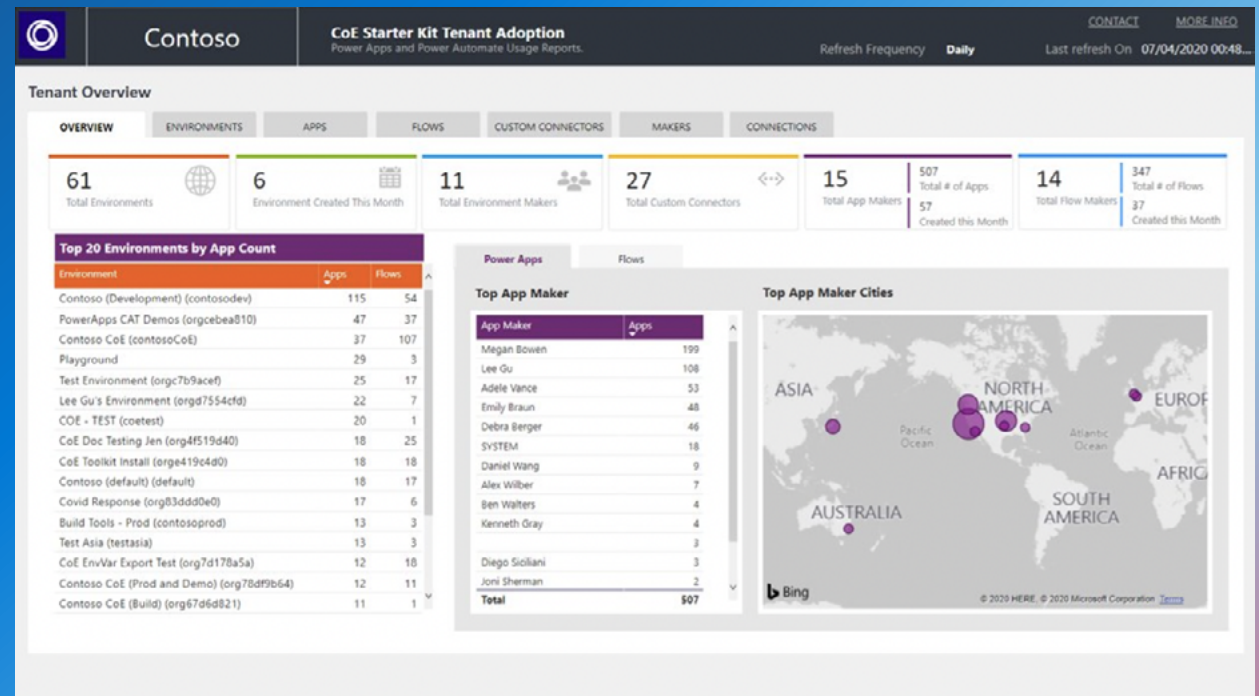
There are significant economies of scope in the use of Power Platform, which means that a longer-term, multi-app business case can be a lot more powerful than one for a single app.

- **Increasingly, trusts are sharing low-code apps across the NHS,** with NHS England creating a 'library' to share this material freely
- **Apps built for a trust often contain reusable components.** For example, multiple apps may depend on information about the layout of the Trust (wards and beds), links to the EHR, or to staff records. Connectors built once can be reused repeatedly. As these apps are easily reusable within Power Platform, the time-costs of building apps can decrease over time;
- At the beginning of the journey, Trusts **support low-code learning and development for staff**, along with new processes (such as Information Governance and setting up a Centre of Excellence). These are one-off costs which make the initial business case more challenging, but represent investments with long-term benefits.
- **Reusability of apps and capabilities** across the NHS is a key factor which we hope will increase the value of Power Platform over time, as the app library increases in size and scope. For NHS Trusts on the Central Tenant, one benefit is that they can rely on the NHS Centre of Excellence, rather than creating their own. While governance is still managed at the local level, the Application Lifecycle Management can be centrally-led.

Building a Centre of Excellence

The biggest concern we hear about Power Platform is this: “will we suddenly have a proliferation of unmanaged apps creating chaos at our Trust?”

- Can anyone in our Trust build out a Power App and set it live?
- What if someone connects the app to sensitive data?
- Can we see what apps are being built?
- Each individual, team and department in our trust has different/competing priorities – with low-code, what if they get excited and start building out lots of applications that don’t align with the overall priorities of the healthcare organisation?



IT Teams naturally have processes for rolling out and managing applications in clinical environments which ensure they are secure, resilient, and most importantly don't place clinical processes at risk.

This is where a Centre of Excellence comes in. Our [toolkit](#) provides guardrails and policies to support teams enforce standards and governance associated with use of the Power platform.



Build a governance community with a CoE

The Center of Excellence (CoE) toolkit provides out of the box built-in guardrails to enforce and audit policies seamlessly, promoting standards, consistency, and governance across teams and applications



Establish and automate your edit process

Create workflows using management connectors to permit or restrict behaviour and trigger policy compliance alerts.



Comprehensive logging across Microsoft services

All activity logging is integrated with Office Security and Compliance Center. Use this data to create cross-tenant usage dashboards,



Build a governance community with a CoE

Centrally manage production, sandbox, and trial environments. Secure and control apps, flows, and control apps, flows, and other resources in each environments.

Fusion Development: Connecting IT teams and the frontline

NHS front-line staff can sometimes feel there is a 'glass wall' between end users and developers, and they sometimes feel that digital processes and policies are created in isolation from them, or without their insight.

['Fusion development'](#) – building apps with end-users – is a core part of user-centric design. The challenge is to bridge the language gap between the users: both front-line NHS workers and IT teams have a vast dictionary of acronyms and words of their own.

Power Apps enables end-users to get more involved with innovation and experimentation. In combination with pro developers, they can take on different responsibilities when it comes to deploying an app – one focused on the end-use prototype, and pro developers focusing on enabling connectors, managing security, and transitioning a prototype into a production-ready application.

Over time, we envisage mixed teams, comprising pro developers as well as front-line users with experience and training, becoming part of a joined team. Frontline 'citizen' developers – such as GMMH's mental health nurses who are now in their digital team - can contribute their knowledge of NHS processes and enable successful testing, deployment and improvement of apps, while also helping with elements of low-code development. Pro developers can focus on complex apps, connectors, and code-only projects.





Call to Action

- **Get in touch.** We're available [here](#) to answer your questions and help you with your Power Platform Journey.
- **Learn more.** [Join our Community Call](#), where NHS leaders share examples of the great work they're doing with Power Platform Technology. Work with your NHS Account Executive to create a free 'App in a Day' session for your trust, to engage and inform staff (both front-line and pro developers) on low-code. There are also ongoing sessions which you can sign up for which run regularly, [here](#). Finally, our Enterprise Skills Initiative (ESI) programme includes Power Platform courses and accreditations, many of which are free or heavily discounted for NHS staff, [here](#).
- **Share what you're doing.** Trusts are already sharing their apps with one another. NHS England has created a new library (the NHS Mail Solution Store) to share code. Reach out [here](#) to access and contribute.
- **Tell us what's needed.** We are open to feedback. Tell us where our central resources need more work – for examples, connectors which are needed, Centre of Excellence capabilities which are required, and other capabilities which will benefit all NHS organisations. We're here to listen and help.

FAQs

We're on the NHS Central Tenant. What does this mean for us?

As an organisation operating on the central tenant, your organisation can access most Power Platform functionality via the tenant, including Power Apps, Power Automate, and Power BI.

The Central Tenant does not yet include Power Pages, Power Virtual Agent and Unattended RPA, but the product roadmap is regularly reviewed and updated so it's important to look out for NHS Digital communications which discuss upcoming changes on the tenant.

Each NHS organisation that wishes to access Power Platform on the central tenant is required to setup a secure environment where Power Platform licenses can be assigned. For guidance on how to setup required environments, please review the relevant information provided by the NHSMail team: [Power Apps – NHSMail Support](#)

I'm worried about governance. How do I prevent staff from building unsafe applications and managing control?

Our Centre of Excellence (CoE) toolkit helps address exactly this issue, and has been successfully implemented in a number of organisations: See the above section, here.

What is Dataverse?

Microsoft Dataverse is the data platform for Microsoft Power Platform. It enables scalable solutions to data and leverages Microsoft security, so IT teams can fully control and automate their data strategy. Dataverse is the platform on which Dynamics 365 apps are built, and Dataverse provides support for Sharepoint, OneDrive and OneNote integration.





Do I need a license to use Power Platform?

As an individual user, you can sign up for a free trial* to access the premium features of Power Platform (such as accessing connectors and model-driven applications) or access the version of Power Platform [which is embedded in M365](#).

When considering the broader use of Power Platform as part of your organisation, you will need to purchase licenses for users to access premium capabilities. Microsoft offers various licensing options depending on the specific needs of your organisation. For example, you can purchase different licenses to access Power Apps, Power Automate, Power BI and Power Virtual Agent.

It is best to consult with a Microsoft licensing expert to determine the specific licenses required based on your organisation's requirements.

To access Power Apps, there are two main license types:

Power Apps Per App Plan: This provides a named user with the ability to build/access X1 Premium Power App (a 'premium' Power App is an application that is a model-driven application or utilises premium connectors).

Power Apps Per User: This provides a named user with the ability to build/access unlimited premium Power Apps (see above definition).

* Please note: NHS Trusts that use the central, NHSMail tenant may not be able to sign up for a free trial. For more information on accessing Power Platform licenses on the central tenant, please review the following support pages: [Power Apps – NHSMail Support](#)

Do I need an enterprise license, or can we get licenses for a subset of our staff?

An enterprise-wide license can be accessed to provide trust wide access to Power Apps. It is also possible to access licenses for a subset of your workforce. Please reach out to a Microsoft licensing expert or your LSP for support on how to access these licenses.

What are connectors, and how do I find a list of Power Platform connectors?

[Connectors](#) enable a multitude of services to 'talk' to Microsoft Power Platform solutions. Connectors exist for a range of services such as Twitter and SAP. There are [nearly a thousand connectors](#) pre-built within Power Platform and growing. There are tutorials to enable you to create [custom connectors](#) for on premise data or other services.

