
bjss
DIGITAL TRANSFORMATION IN HEALTHCARE: THE ART OF THE POSSIBLE

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FOREWORD

The NHS is at a turning point. Whilst there is no doubt as to the challenges ahead, there are also significant opportunities for the NHS to transform the way it treats and cares for people, including digital solutions designed by and with those who use them.

The establishment of Integrated Care Systems (ICS) is being hailed as the best chance in a generation to genuinely transform health and social care, with digital and data being core enablers in this process.

The COVID-19 pandemic has also created a unique opportunity to advance the large-scale process and behavioural change required for digital transformation to prove truly effective. Changes that would ordinarily have taken years were implemented in months or even weeks. The urgency of the situation created a new acceptance of digital-first ways of working from both patients and clinicians.

The past two years have shown what can be done when hearts and minds are focused on solving joint priorities. With staff fatigued and vacancies rising, it is vital that we continue on this trajectory by progressing effective initiatives that support and enable regional and local delivery while prioritising user-centred design.

For more than 10 years, BJSS has been a trusted partner to the NHS, designing and delivering major digital programmes across the country.

In this position paper, we share learnings and insights from some of our most important and impactful projects, and how we view the challenges and opportunities associated with driving digital transformation across health and social care. We analyse the policy landscape in health and social care and the rapidly evolving priorities for digital and data. We'll then explain why, whilst the ambitions and ideas may not be new, the outcomes have yet to be achieved at scale but are within reach.

We also set out where we feel the future challenges lie - because there's more to digital transformation than implementing new technology. The old adage "you can bring a horse to water, but you can't make it drink" rings true. You can ask your staff to download an app, but these must be part of a digital ecosystem, embedded in clinical pathways, that provides a holistic approach to health and social care, and places users at the heart of the solutions.

People use technology which makes their life easier; with pressures staff and citizens are under, the impact needs to be immediate and positive. For ICSs to be successful, there needs to be greater consideration around how they function, with well-defined working models and processes all underpinned by quality user experience.

At BJSS, we have the knowledge, expertise and capabilities required to truly understand the needs of the system and its constituent parts and to enable and guide transformation that delivers positive change across health and social care organisations.

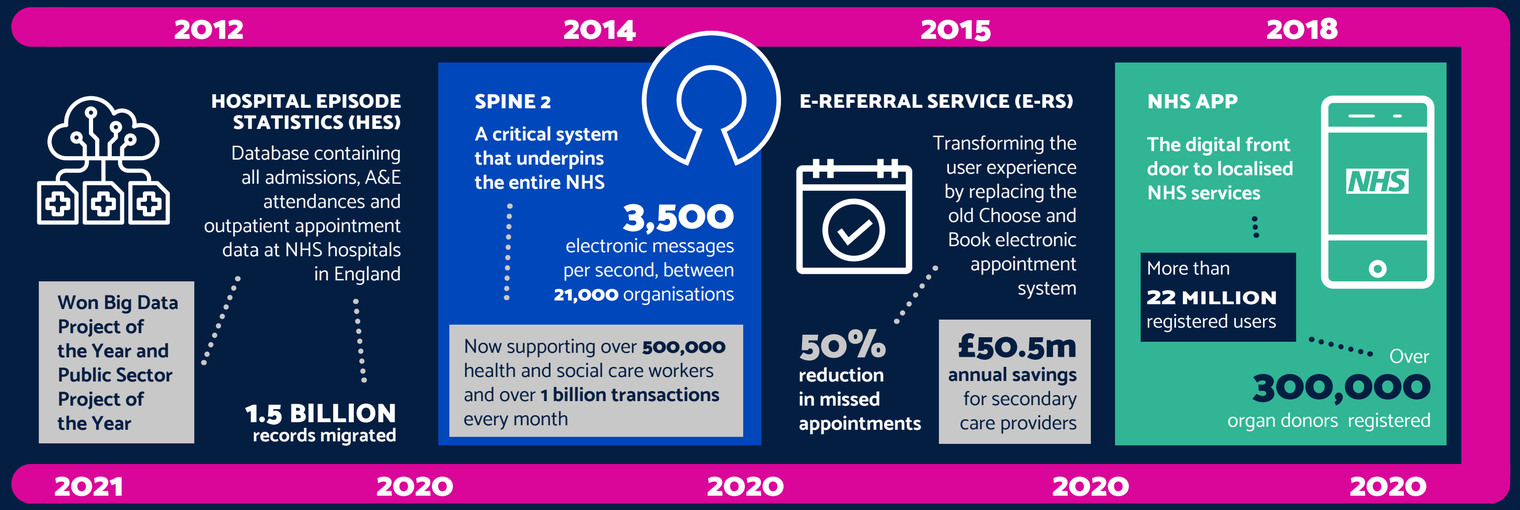
We hope that, in sharing our experiences and expertise, we can spark further conversations that lead to a step-change in our digital transformation efforts in health and social care.

> **For more than 10 years, BJSS has been a trusted partner to the NHS, designing and delivering major digital programmes across the country.**

Lauren Bevan
Head of Health & Social Care, BJSS

OUR HEALTHCARE EXPERIENCE HIGHLIGHTS

Since 2012, in collaboration with the NHS, BJSS has delivered a range of critical digital services that health and social care professionals, and the public, rely on each day.



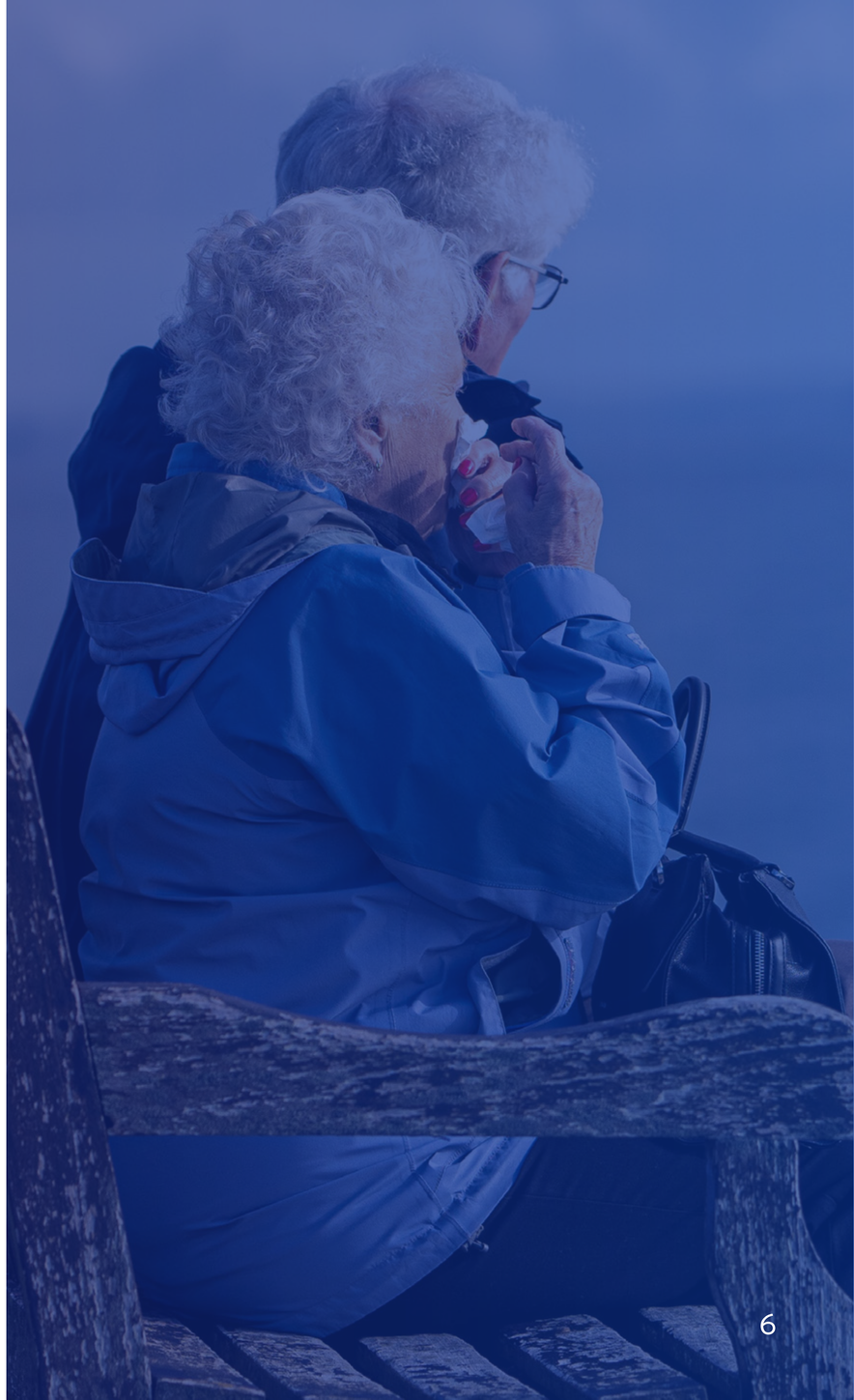
THE ENDLESS ROAD TO DIGITAL TRANSFORMATION

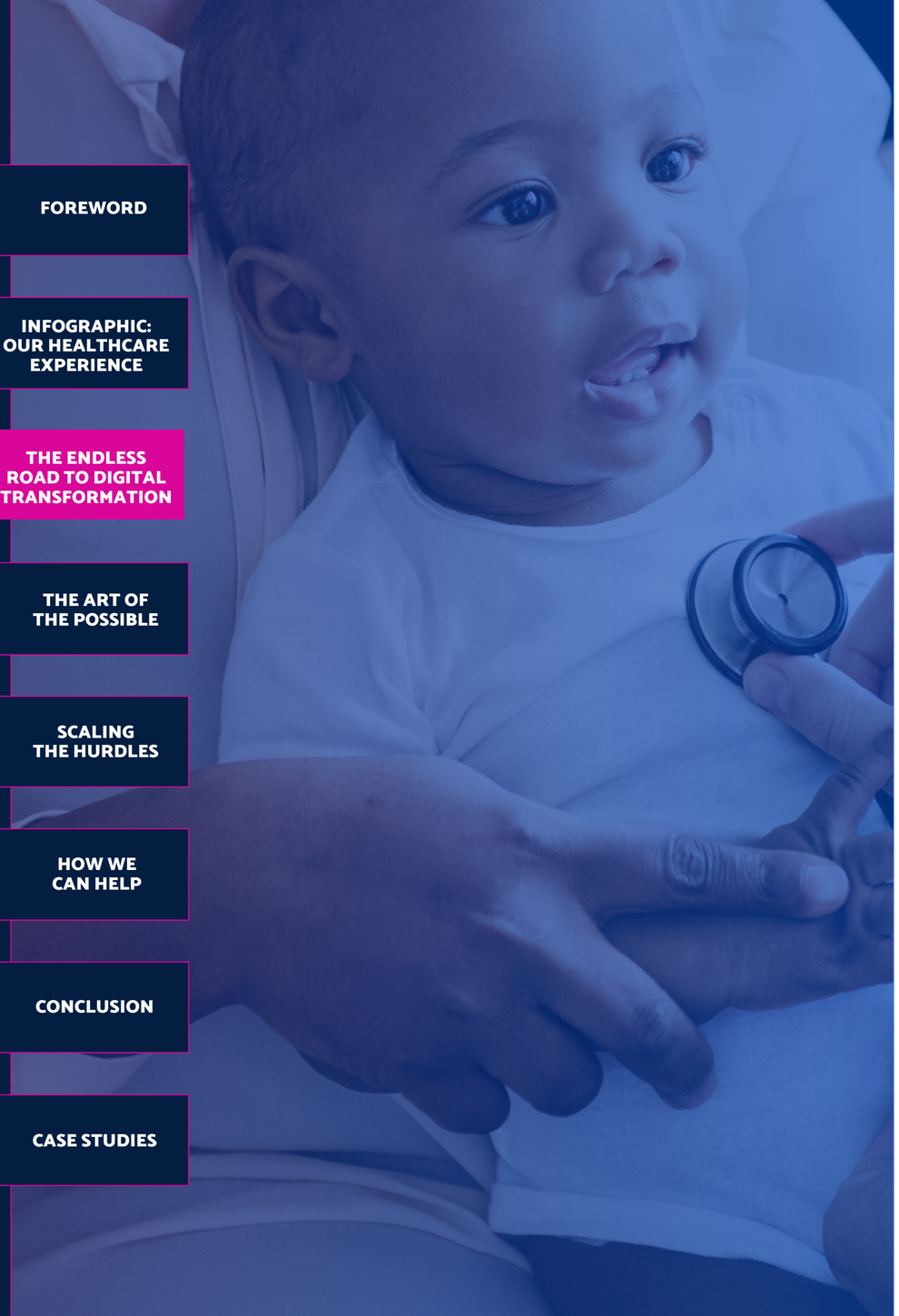
The concept of a digitised NHS is not new. As far back as the 1990s there were aspirations to make patient records electronically available at the point of care, linking GPs and pharmacists, and support the online booking of appointments.

The now infamous National Programme for Information Technology (NPfIT) had good intentions to deliver on these aspirations, but its shortcomings are well documented: insufficient consultation, little consideration for user experience, and a lack of the agility required for swift identification and rectification of strategic and technical errors.

Despite its significant issues, NPfIT's legacy can be seen in the creation of several system-wide critical systems and services such as the NHS Spine, N3 Network, Choose and Book, and picture archiving. These systems, or their successors, remain as the foundations from which system-wide digital transformation will continue to be driven, as has been set out in recent policy documents such as the Long-Term Plan, What Good Looks Like framework and the National Data Strategy.

The current direction of travel is for national bodies to consolidate services that are best managed centrally and can enable different parts of the NHS to work together. Meanwhile, regional hubs and local service providers can procure systems that meet the needs of their patient population - provided they meet nationally specified interoperability and data standards – and empower people to take control of their own care through services such as the NHS App and NHS.UK, remote monitoring, and digital health apps.





Future-proofing the foundations

For more than 10 years, BJSS has been a key partner to the NHS, ensuring these digital foundations are future-proofed and delivering benefits to service providers and patients.

For example, in 2012 **we helped NHS Digital with the development and build of the next generation of the NHS Spine** using open-source products and agile ways of working. Through this work in re-architecting, re-engineering and rebuilding the system, we helped to save £20 million per year in staffing and storage costs alone. Spine 2 is the backbone of the NHS, enabling tens of thousands of organisations to share data safely, securely and seamlessly.

We also delivered and continue to operate the **e-Referral Service (e-RS)**, which enables over 75,000 GP to outpatient referrals each day. The service ensures better joined-up care and provides flexibility to patients to book appointments at a time and place that is convenient to them.

Similarly, we helped NHS Digital bring the **Hospital Episode Statistics (HES)** database in-house, reducing the manual processing required, and ultimately making the system more user-friendly and useful when accessing vital clinical data, all while saving time and money.

These projects have several factors in common that led to their success. Firstly, although they were centrally led, they were **collaborative projects co-created with service providers.** And secondly, they **embraced architecture-first, user-centred design and agile principles** that ensured the end result was fit for purpose and accepted by the teams that would use them.

Scaling digital maturity

In recent years, there has also been some success in scaling digital maturity regionally through the government-funded Digital Aspirant, Global Digital Exemplars and Fast Follower programmes. And whilst a silver lining from COVID-19 has been the rapid deployment of certain technologies, the pandemic did halt aspirations for system-wide digital transformation while the NHS tackled the most significant crisis in its history.

Tackling COVID-19

When the pandemic hit, it was imperative that the NHS acted and deployed new technologies at speed – something it has historically struggled to do. **Our vast experience and expertise in designing and delivering national NHS systems and our strong relationships across the NHS enabled us to play a key role in the national COVID-19 response**. This included reducing pressure on primary care by helping to deliver virtual consultations via the NHS App and implementing the App's Fit Note solution to reduce the need for people to attend a GP practice, saving clinician time and reducing transmission risk.

We worked with NHS Digital to create the Emergency Department Digital Integration (EDDI) system to minimise the risk of transmitting COVID-19 in overcrowded emergency departments. **We also worked alongside the Department of Health and Social Care, Oxford University, and NHS Digital to develop the COVID-19 Risk Stratification tools**. Both of these technological solutions are outlined in more detail later in this report.

The challenge ahead

However, while there were some positives to come out of the pandemic, such as increased use of online booking, virtual appointments, and a change in perception around digital-first approaches, **there are now significant backlogs across acute, mental health, community, primary care, and social care services**. These service pressures sit alongside existing challenges of **staffing shortages, patient health inequalities, and disparities of digital maturity** across England.

The newly established NHS England Transformation Directorate has set out its vision in response to these challenges, with digital and data playing an integral part in better informing clinical decision making and the delivery of system planning. It pledges to **"work together with clinicians and the frontline to redesign services, find creative solutions to address elective surgery, use technology to reduce friction for patients and clinicians, tackle the backlog and put us on a new trajectory for access and capacity"**.

To that end, there are several welcomed programmes of work aimed at levelling up digital capabilities, introducing core levels of EPRs across the NHS, and instilling a greater focus on population health and personalised prevention. There's also an acknowledgement of the need to expand the functions and uptake of the NHS App, and for the NHS to become "a thriving innovation ecosystem" to transform the health of the nation.

One thing is clear: no single government department will be able to accomplish this alone. Achieving these goals, many of which have been long-held aspirations, will require the collective efforts of the NHS, in partnership with ICSs and local providers, and through collaboration with an ecosystem of suppliers.

> **At BJSS, our vast experience and expertise in designing and delivering national NHS systems and our strong relationships across the NHS enabled us to play a key role in the national COVID-19 response.**

THE ART OF THE POSSIBLE

Our Head of Private Health & Life Sciences, Tom Mellor, considers how human-centred design and a pragmatic, agile approach to delivery are critical to digital transformation in the NHS. When these components align with strong leadership and sufficient funding, anything is possible.

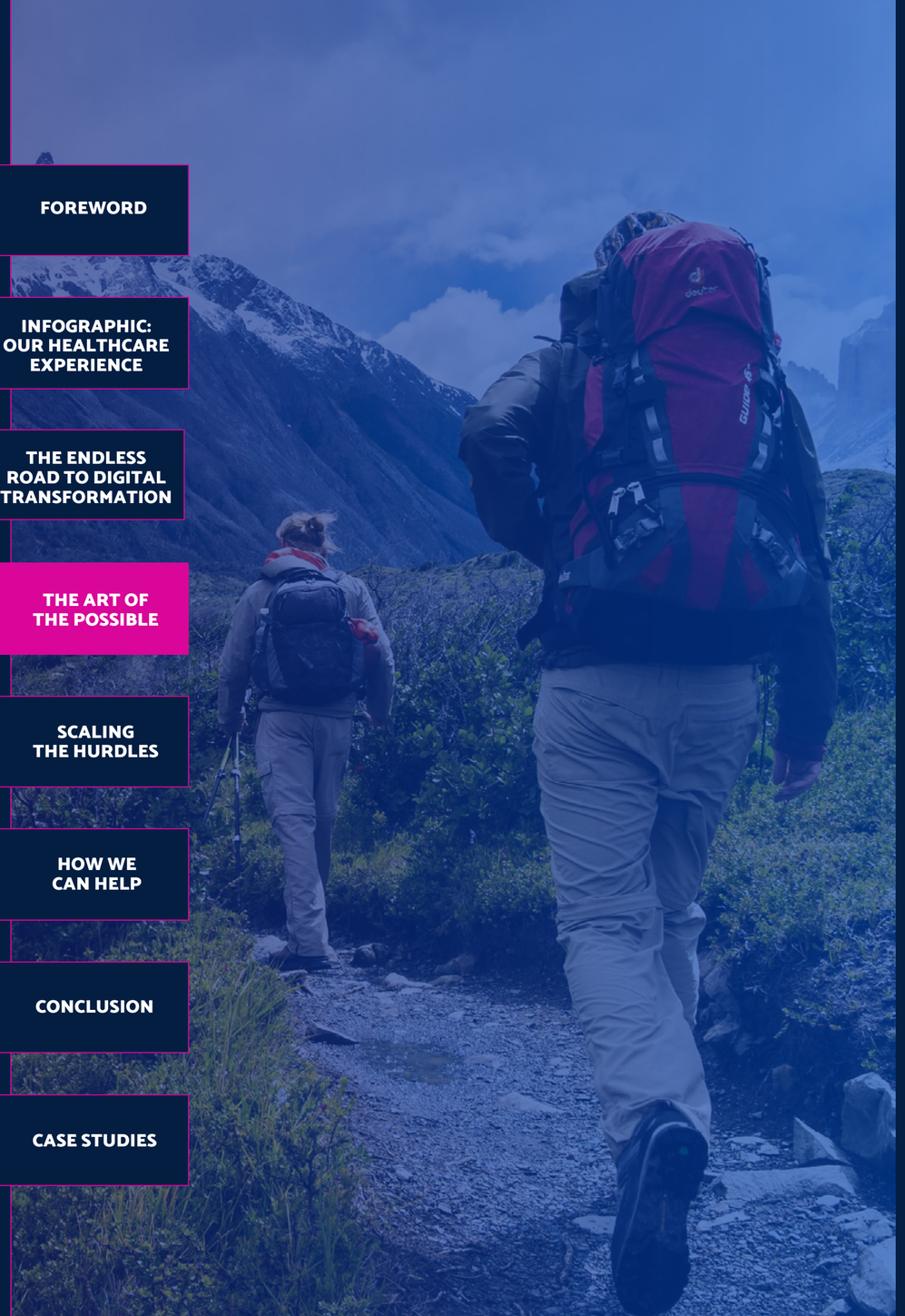
'Digital' has rightly been called out as a high priority across the NHS and for ICSs in particular. A well-thought-out digital ecosystem will be a key enabler for ICSs to understand their populations' needs, do things differently and unlock key benefits that form the business case for integrated care at scale in the first place.

Funding is being made available to accelerate digitisation at NHS trusts as part of a national mission to level up digital provision across health and social care.

Calls for executive digital representation on Integrated Care Boards to be mandatory should also ensure that appropriately skilled and experienced people are driving discussions, leading investment decisions, and setting the tone for how digital is done.

> **"The digital ambition is well-intended. However, the focus on EPRs represents the biggest centrally-led drive to equip all trusts with EPRs since the NPfIT 20 years ago.**

We all know how that ended. This time around, to avoid another missed opportunity, we must recognise the risk of being too fixated on the solution and be more conscious of users and the wider digital ecosystem.



Turning the challenge into an opportunity

Focusing predominantly on EPRs risks putting ICSs on the back foot before they've had the chance to get going. There are numerous sources of complexity that need to be understood. Clear strategies and roadmaps must be developed, rather than jumping straight to a solution.

For example:

- **ICSs and their populations vary significantly across the country, as do the populations within an ICS**; we must remember the commitment to be place-based in our planning and understanding of user needs.
- **EPRs need to fit into an existing technology landscape that is incredibly complex**. A new system would need to integrate with national systems such as Spine and the e-Referral Service, as well as work with a huge variety of local systems in use across the ICS, including existing EPRs.
- **There are numerous stakeholders that need to be engaged and consulted** to ensure the best technical approach is being used (e.g., consideration of data, applications, etc) to meet requirements and ensure the best return on investment.

Done properly, EPRs promise significant benefits from a national perspective through to neighbourhood level. However, unless they are delivered as part of a comprehensive programme of planning and design activities covering people, process and technology, these benefits will remain largely unrealised.

- **People** - User-centric design needs to be embedded in the approach from the outset. Understand the current pain points. How will a change make users' lives better and/or easier? This is vital to ensure investment is made in the right solution for the needs of the ICS.
- **Process** - Being agile, collaborative and pragmatic is the best approach for ensuring change and enabling delivery.
- **Technology** - Don't come to the table with a solution before considering how it will benefit users, and work within, and leverage, the existing, highly-complex technology landscape.

None of this is revolutionary. Yet, there are many examples of health and social care digital programmes that have not taken this approach and failed to realise the intended benefits. All too often there is the perception that it will be too timely or too costly or there will be too few people with the skills to work in this way – yet this is not the case.

Tom Mellor
Head of Private Health & Life Sciences, BJSS

Collaboration is key

Few NHS organisations have the in-house capability and/or capacity to approach large-scale digital transformation in this way. Collaborating with partners who have a strong track record in addressing these challenges will be vital to realising the potential for technology to support integrated care. The value of the experience of delivering system-wide digital programmes in the NHS cannot be underestimated and will be key to overcoming the inevitable hurdles.

> **The expertise to develop strategies and roadmaps, to design and deliver, and optimise and operate, can only really be found in organisations with end-to-end capability and deep health and social care experience.**

Digital transformation in the NHS is inherently complex. We shouldn't be put off by past failures, but we must learn from our mistakes. The establishment of ICSs has been born from the learning that we must have greater collaboration between health and social care, commissioners and providers, and communities and organisations. It is crucial that digital leaders also learn from the dangers of being too solution focused. They must identify partners with a strong understanding of designing to users' needs and, above all else, a track record of delivering for the NHS.

SCALING THE HURDLES

So, with that in mind, what are the next steps, both nationally and locally, to realising the core objectives of a digitally enabled NHS?

With a challenge as big as digital transformation, the answer is to consider where central teams add value and can support meaningful, system-wide transformation. Only then will it have a positive impact at a local level on patient experience and outcomes. **There is no big bang solution - that has been tried and failed. The answer is to take a strategic, evidence-based look at the challenges and focus on where the most gains are.**

As discussed in the previous section, **'The endless road to digital transformation'**, many of the challenges within the NHS are well versed – for example, the overwhelming siloing and fragmentation of the system, the complexities associated with implementing system-wide solutions, the need to increase efficiencies to tackle patient backlogs and meet ongoing pressures. And yet, while there is no single fix, there are plenty of solutions that pave the way for significant gains.

> **We worked with NHS Digital to build e-RS – a single, central booking system that facilitates all GP to outpatient referrals. This is a system-wide solution that slashed referral processing times by 75% and halved missed appointments for secondary care providers.**

System-wide solutions that work

Take the problems associated with the many NHS siloes; the lack of interoperability between systems, and the inability for data to flow freely and securely across organisations and boundaries. By their very nature, nationally-implemented systems can overcome this if the complexities of local delivery can be surmounted - and they can.

Spine 2 provides interoperability between 21,000 organisations and 23,000 healthcare IT systems. It is one of the largest healthcare IT platforms in the world and has enabled unparalleled digital transformation across the NHS. BJSS supported NHS Digital to design, build, and continually transform the system. Key to the successful implementation was the combination of user-centred design coupled with an 'Architecture-first' ethos to tackle the vast integration complexity.

Also, consider the success of **e-RS**. We worked with partner organisations and NHS Digital to build a single, central booking system that facilitates all GP to outpatient referrals. This is a system-wide solution that slashed referral processing times by 75% and halved missed appointments for secondary care providers.

The positive outcome achieved through e-RS can be partly attributed to the user-centred development approach, which ensured the end product met the needs of its users. This, in combination with strong NHS leadership, agile working, and genuine blended teams meant that the solution achieved widespread uptake. The result is the successful shift from lengthy paper-based referral processes to an electronic system, speeding up the process which results in a better patient and clinician experience, more efficient referrals, and more time available for patient care.

Strategic support for the next stage of NHS digital transformation

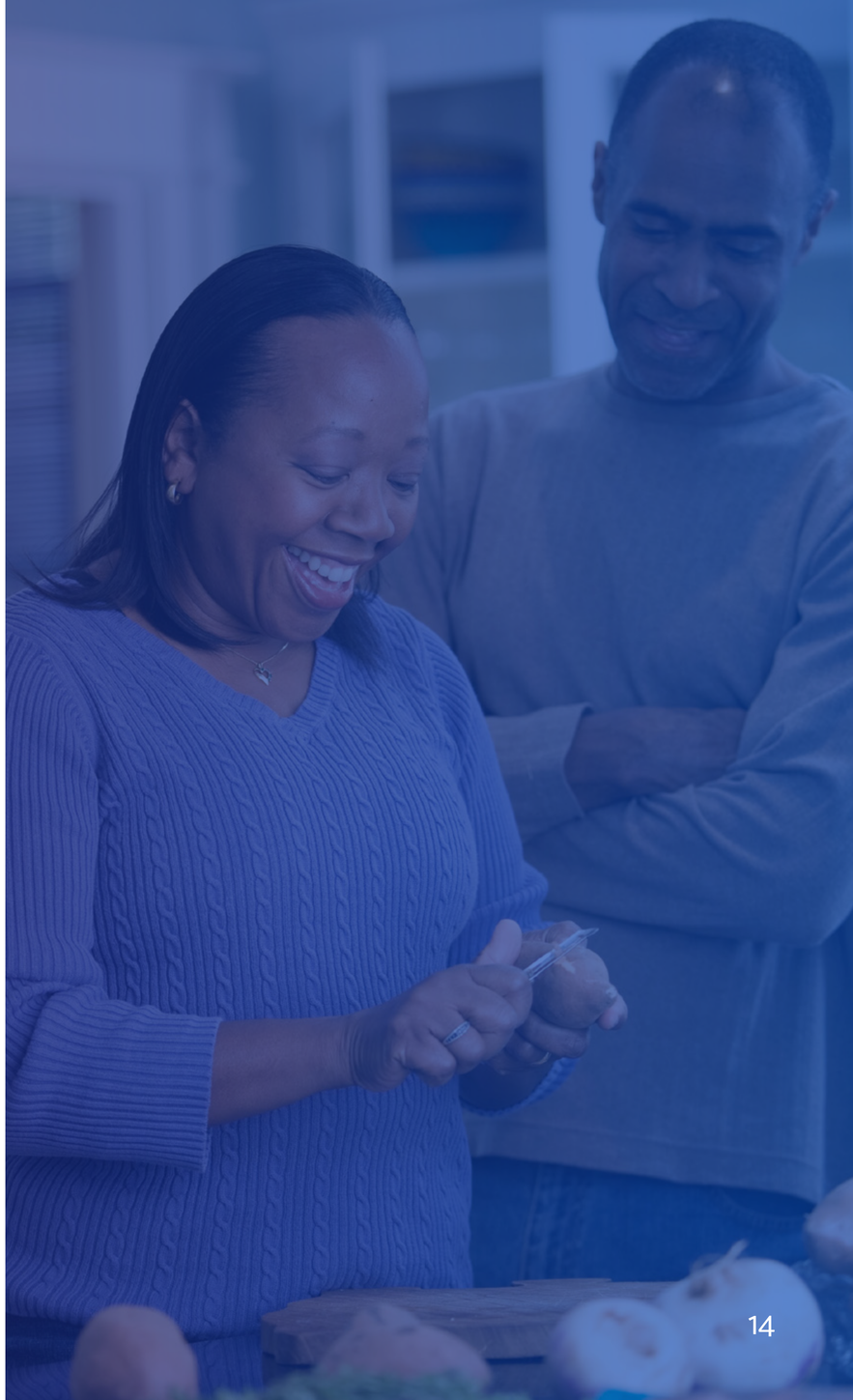
The NHS needs partners that understand how to design and deliver these critical systems. Of equal importance, however, are partners with the ability to solve strategic problems – for example, how to drive system efficiencies, how to reduce the elective care backlog, or how to improve patient experience?

BJSS is practically unrivalled in our involvement across a wide range of NHS mega-programmes. From strategy, to design, delivery, and operation we offer a unique blend of skills and experience.

Our work across **e-RS**, **e-BRAM** and **Wayfinder** illustrates how our teams combine deep technical knowledge of NHS technologies (in this case, booking and referrals) with a creative, human-centred strategic approach to problem solving.

e-RS has provided the foundations for the NHS to achieve its aspiration for anywhere to anywhere (any-to-any) bookings and referrals. Following on from its success, we were asked to provide advisory support to national leadership looking at the development of a seamless and fully operational any-to-any booking, referral and appointment management ecosystem for health and social care.

This programme of work, known as e-BRAM (electronic booking, referrals, and appointment management) aimed to provide electronic connection of services via booking, referral, and triage, from any point of referral to any service, agnostic of care setting – currently comprising over 120 million appointments in England each year.



e-BRAM wasn't about providing a solution to a single problem. We took a long-term, strategic view of the capabilities required across the NHS landscape for booking and appointment management over the next five to ten years. The focus was to identify the capabilities that would deliver the greatest impact, including supporting the NHS to tackle the immediate issues of the post-COVID-19 backlog of elective care.

Following on from e-BRAM, we are working with NHS England to design and deliver transformative new functionality within the NHS App. The Wayfinder programme aims to enable patients to take more control over their care whilst also providing better joined up referral and booking processes that will reduce waiting times and the elective care backlog.

> **Our ability to support this strategic work is, in part, a result of our ability to cross-cut many of the silos associated with data and digital transformation in the NHS.**

We are multifaceted in terms of our capabilities: a technology and software consultancy with experts in AI and skilled project managers who champion agile and human-centred approaches. As a result, we have developed a reputation for getting things done - successfully orchestrating projects involving multiple partners, many of whom are competitors. In having this cross-cutting outlook, we have the holistic oversight that enables us to see where the challenges lie and offer solutions - many of which are often thought too complex to succeed.

Translating national solutions to meet local need

ICSs are tasked with improving the lives of their local populations. To support this goal, there must be a detailed understanding of how national technology solutions can be implemented at a local level and how local needs and pain points vary.

Our deep understanding of a wide range of national systems that integrate at a local level puts us in a unique position to tackle this national-into-local opportunity. This has been developed through the detailed user-centred research undertaken on multiple projects and through the delivery of projects such as the Emergency Department Digital Integration (EDDI) system.

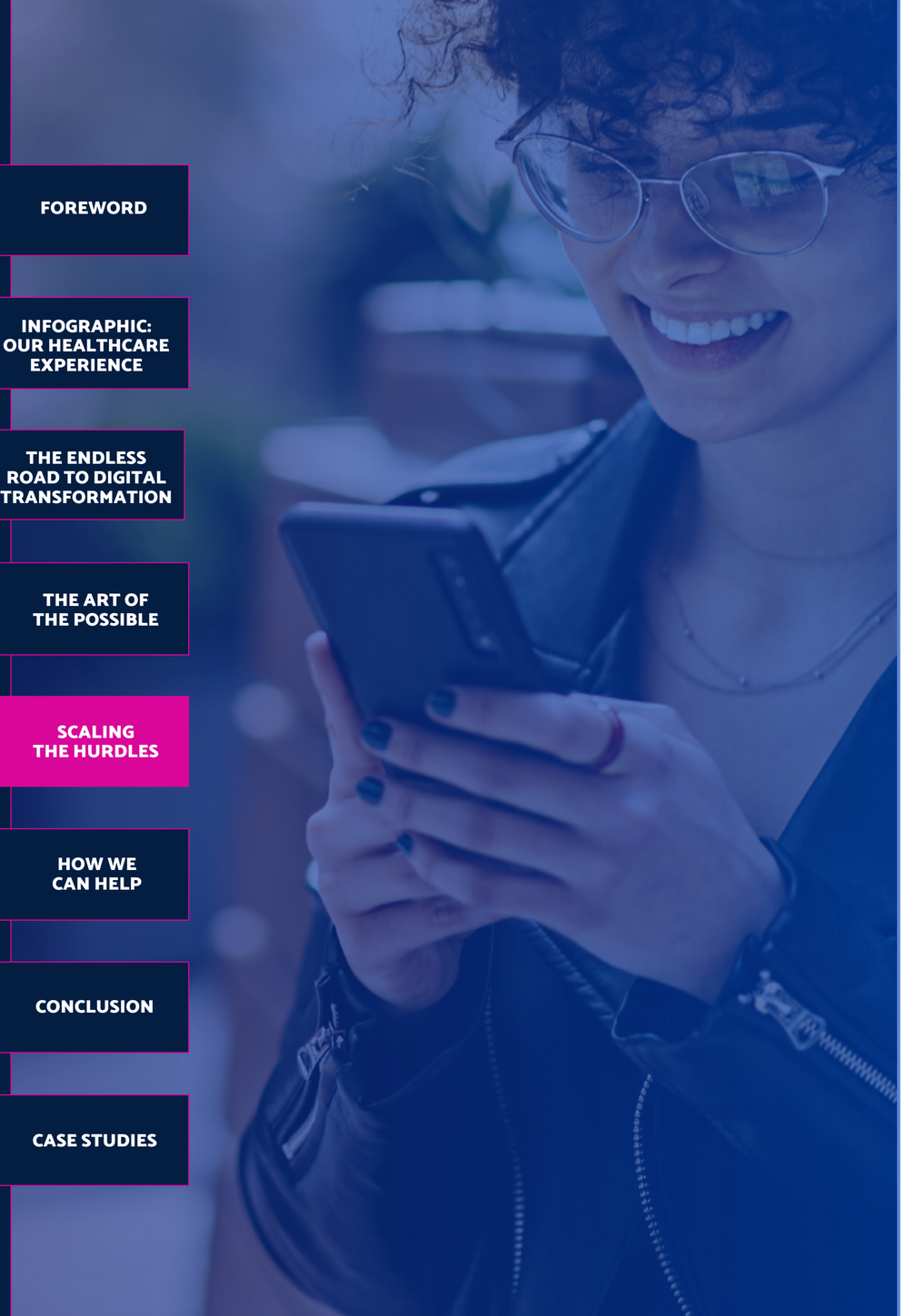
EDDI provided NHS 111 staff and users with a way to book specific arrival times in emergency departments across England. In partnership with NHS Digital and NHSX, BJSS developed and deployed the system in under four months in response to the urgent need to reduce overcrowding within emergency departments to reduce the risk of transmission of COVID-19, as well as manage patient flow into already stretched and understaffed departments.

We worked with local emergency department staff to understand the requirements and how a booking system could effectively reduce pressure. For example, we identified how, by allowing NHS 111 operators to capture and share clinical data with EDs, the data could be used to ensure patients would be seen by staff members who are best placed to provide treatment, thus reducing waiting in the department and the need for on-site triage.

> **EDDI is just one example of how the NHS is already delivering local benefits through centrally-delivered technology – and the opportunities for this national-to-local technology transfer with other projects is huge.**

In partnership with NHS Digital, we developed an **award-winning risk stratification tool** to process England's entire population through QCovid®, an algorithm developed by the University of Oxford. QCovid® uses a range of factors such as age, sex, ethnicity, and existing medical conditions to predict an individual's risk of death or hospitalisation from COVID-19. This was paired with an online population risk assessment viewer that allowed GPs to view their patients' QCovid® risk assessment outcomes securely.

The technology that underpins this solution has wide-reaching potential and has already been identified to support national cohorting for the winter flu and future winter COVID-19 vaccination programmes. There is also the potential to use it to identify the risk of other diseases beyond COVID-19, such as a person's risk of developing diabetes or cardiovascular disease. At a local or regional level, it could also be used to identify those at risk of high levels of care, thus enabling early targeted intervention to be put in place as a preventative measure.



Capitalising on shared services

When implementing these solutions, either at an ICS, place, or organisational level, care must be taken to understand the local picture and how local variations may cause challenges. Through our work with NHS England, NHS Improvement North East and the Yorkshire Digital Transformation Team, we have undertaken detailed Discovery work to understand specifically what the opportunities are for national support and where commonalities may exist across ICSs regionally.

The Digital Transformation Team is one of seven regional teams that support the delivery and commissioning of high-quality services, and directly commission primary care, public health and specialised services at a local level across England.

We undertook a six-week strategic Discovery, including engaging with digital leaders, teams and bodies across the North East and Yorkshire region. This involved reviewing the digital strategies and frameworks of each of the four ICSs in the region and distilling key themes, commonalities, differences, and opportunities for alignment across the region. We sought to understand the ambitions and challenges of each ICS in terms of implementing their digital strategies and consider what regional initiatives could support them. This work included reflection on the existing role of the North East & Yorkshire Digital Transformation Team, its relationships with the four ICSs and the potential remit for the future. This has led to greater clarity around the role of regional NHS England in digital transformation going forward.

Understanding local challenges through a user-centred approach

Similarly, our knowledge of national systems, technological and research experience also proves valuable when working with local organisations. For example, we took a user-centred design approach to understanding the users' experience and data flow of **York & Scarborough Teaching Hospitals NHS Foundation Trust's** in-house developed legacy Electronic Patient Record (EPR) in their ED. This involved our Service Design Team, including user research and product design, immersing themselves in the patient and clinician experience, observing and interviewing the emergency department teams, and seeing the EPR used in real time.

We then provided the Trust with a detailed understanding of the end-to-end patient journey and how the EPR performed from a patient and clinician perspective. This enabled us to then outline the strengths and weaknesses of the current system and where there were opportunities for improvements, both in terms of 'quick wins' and longer-term requirements.

HOW WE CAN HELP

The examples we have highlighted throughout this eBook are just some of the many projects where we are supporting digital transformation within the NHS, from a national level through to our work with individual trusts. Our expertise spans the whole landscape, taking in the system-wide challenges at a national level and how they impact on a regional and local level.

We recognise that few NHS organisations have the capability and/or capacity to tackle large-scale digital transformation alone. Collaborating impartially and objectively with partners who have a strong track record in addressing these challenges will be vital to realise the potential for technology and data to support and enable integrated care. The value of the experience of successfully delivering and operating system-wide digital programmes in the NHS cannot be underestimated and will be key to overcoming the inevitable hurdles.

The expertise to develop strategies and roadmaps, to design and deliver, and optimise and operate, can only really be found in organisations with end-to-end capability and deep health and social care experience.

> **Our capabilities range from human-centred design, consulting, data and AI, to large-scale delivery and managed service. Combined with our extensive experience of NHS-wide systems and services, we are in a unique position to respond to this challenge.**

To summarise, our approach puts **people** at the heart of our solutions. We follow a tried, tested and trusted **process** that enables us to deliver **technology** that meets requirements now and in the future.

- **People** - We design and build best-in-class, human-centric digital services (NHS App, COVID-19 Risk Stratification tool).
- **Process** - Our Queen's Award-winning **Enterprise Agile®** approach and design thinking underpin everything we do. We also balance precision with pragmatism. Our track record of delivering some of the most difficult and complex technology programmes within the NHS demonstrates we know what it takes to get the job done.
- **Technology** - We have extensive experience of developing national NHS systems, setting out how to integrate with them, and defining a strategy that sets the direction of travel for future systems (NHS Spine, e-Referral Service, e-RS API strategy, electronic Bookings, Referrals Appointments Management (eBRAM) programme).

Most importantly, we work with our NHS partners to develop their skills and grow their capabilities and capacity to deliver sustainable digital transformation going forward.

CONCLUSION

Our teams continue to work side-by-side with the NHS and other health and social care providers to design and deliver innovative technology solutions. By combining our deep understanding of health and social care technology with an approach underpinned by user-centricity, agility and pragmatism, we can provide the support that organisations need in these complex times.

Visit our website to find out more about our expertise, and contact us to see how we can help you tackle some of your biggest digital heath challenges.

Visit: bjss.com/health/

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CASE STUDY:

NHS Spine 2: Rebuilding one of the world's largest public healthcare platforms

NHS Spine is one of the world's largest public healthcare platforms and forms part of the UK's critical national infrastructure. It supports major NHS business applications, providing interoperability across 21,000 organisations and 28,000 IT systems.

The legacy system was unwieldy and costly to maintain. It comprised a very large bespoke codebase, many servers, and other hardware that relied on a large number of complex underlying software components, all of which were proprietary. The requirements were clear: build and deploy a replacement system to reduce development, support and license costs, and increase reliability, performance, and resilience.

As the strategic delivery partner for NHS Digital, BJSS was engaged to completely re-architect, re-engineer and rebuild Spine using open-source products and agile ways of working.

With virtually no disruption or downtime, BJSS and NHS Digital delivered a major programme to rebuild Spine, securely transferring the entire NHS to this improved system and delivering increased reliability, performance and resilience, and dramatically reduced costs. Resourcing and operational costs have been reduced by over £21m per year thanks to commodity hardware and open-source software.

Spine now supports over 500,000 health and social care workers in England and processes over one billion transactions every month – more than four times the average load on the UK's entire debit and credit card transaction system. At peak, the system processes 3,500 messages a second.

Spine makes it easier for NHS staff and third parties to securely share information between services such as the Electronic Prescription Service, Summary Care Records (SCRs) and the e-referral Service (e-RS). BJSS has been closely involved in the integration of these services and the development of new innovative services which can be rapidly built thanks to a fully supported set of APIs.

For example, BJSS supported the London Ambulance Service to develop a new digital service to enable paramedics to securely access SCRs via iPads when in the field. This is just one example of how NHS Spine supports innovation and is creating a more connected NHS and better patient experience.

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CASE STUDY:

NHS e-Referral Service: Modernising GP to outpatient referrals to increase efficiencies and improve patient experience

In 2015, we were asked by NHS Digital to deliver the e-Referral Service (e-RS), the replacement solution for the legacy Choose and Book system for GP to outpatient referrals. The existing system was widely considered as providing a poor user experience, using costly proprietary software and an inflexible platform, so it needed to change.

The initial development project involved removing dependencies on the existing electronic health care record product by delivering new business logic and data access layers. The user interface was re-developed in collaboration with users while maintaining the look and feel to maintain system familiarity. An extensive data migration approach was also designed and implemented to transfer over 25 million patient records to e-RS.

We applied our **Enterprise Agile®** methodology to the project, which aligns agile software delivery processes with the typical challenges faced by larger organisations. This, combined with our expertise in open source and DevOps, enabled us to deliver an affordable, maintainable and expandable solution.

This flagship NHS system now supports 40,000 referrals per working day and has over 300,000 registered NHS users. It has slashed referral processing times by 75% and has halved missed appointments at secondary care providers. The National Audit Office estimates that these collective benefits save secondary care providers around £50.5m every year.[1]

With our support, NHS Digital has created a system that makes the health service more efficient and better connected than ever before.

1. https://www.nao.org.uk/wp-content/uploads/2011/05/1012888.pdf

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CASE STUDY:

EDDI: Reducing overcrowding and managing patient flow in emergency departments

At the start of the first UK COVID-19 lockdown, there was a 27% decrease in the number of emergency department (ED) attendances compared to the previous month. Concerns surrounding the coronavirus were causing members of the public to stay away from hospitals, despite needing urgent medical care.

To minimise the virus transmission risk and reduce overcrowding in EDs, BJSS worked with NHS Digital and NHSX to rapidly develop the Emergency Department Digital Integration (EDDI) system. From inception to live, the team launched this revolutionary new system in just four months.

EDDI is a cloud-based application which is fully integrated with NHS 111 online and NHS 111 telephony. It communicates with NHS 111 through a secure set of APIs telephony. The system communicates with NHS 111 through a secure set of APIs that meet the NHS' CareConnect and FHIR standards and Interoperability guidelines.

For the first time, NHS 111 had the ability to book specific ED arrival times for patients based on their clinical need. This transformed the patient experience - reducing the risk of overcrowding and giving patients confidence of being seen safely.

By providing specific urgent care ED arrival times, hospitals across England were able to allocate an accurate level of resource to cope with demand. EDDI allows NHS 111 operators to share clinical data with EDs, who can use this data to ensure the most appropriate staff members see patients.

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CASE STUDY:

COVID-19 Risk Stratification: Risk stratification to target specific population health needs

Large-scale risk stratification was identified as a crucial tool for dealing with the coronavirus pandemic, using the insight of the University of Oxford's QCovid® – an evidence-based model that uses a range of factors such as age, sex, ethnicity and existing medical conditions to predict a person's risk of death or hospitalisation from COVID-19.

The Department of Health and Social Care challenged NHS Digital to explore the ways QCovid® could be utilised to support the national response to the pandemic. BJSS, in partnership with NHS Digital and the University of Oxford, quickly identified two potential options:

- A risk stratification tool to process England's entire population through QCovid®
- An online population risk assessment viewer to allow GPs to view their patients' QCovid® risk assessment outcomes securely.

In developing the risk stratification tool, 46m lines of patient data were processed in order to put England's entire adult population (aged 19-100) through QCovid® and identify patients that would be required to shield.

Approximately 15.5m people were identified, culminating in an additional 1.7m previously unidentified individuals being added to the shielding list. These individuals were yet to be selected for vaccination and were subsequently urgently prioritised by their GPs.

It took just seven months for the team to deliver and launch the risk stratification tool and the online population risk assessment viewer, both of which played a significant role in the NHS' fight against COVID-19. The tools have since been recognised nationally, winning the Florence Nightingale Award for Excellence in Healthcare Data Analytics from the Royal Statistical Society, and being highly commended in 2021's HSJ Patient Safety Awards.

CASE STUDY:

eBRAM: Future-proofing electronic bookings, referrals and appointment management

The eBRAM (electronic booking, referrals, and appointment management) covers all routine activities across the NHS; over 120m appointments are made in England each year. The existing mix of tools, standards, architectures and functions in place across the NHS and social care creates significant issues for those delivering and receiving services.

We were commissioned by NHSX and NHS Digital to provide research, design and technical advice to a multidisciplinary team of experts who were tasked with understanding the current digital ecosystem around appointment booking, referrals and management and mapping out future needs.

Taking a Government Digital Service (GDS) user-centred design approach, our Discovery Team looked at:

- Identifying common patterns and themes found in multiple different care pathways and settings, where common national digital solutions - services, standards or guidance - could be applicable
- Understanding the user needs and digital capabilities necessary to support the transformation of outpatient, primary and community care that is anticipated by the NHS Long-Term Plan, and meaningfully empowering patients throughout the process.

To do this, our Project Team researched the user needs of patients, clinicians, and administrative staff whilst engaging with stakeholders from across the system to understand the systemic challenges, complexities and opportunities to apply digital solutions at a national level.

We consolidated hundreds of challenges and pain points across multiple journeys into 10 root problems. This then enabled us to develop a strategic model for referrals and appointment bookings aligned to the vision of the NHS Long-Term Plan.

In addition, we identified the capabilities needed to support the model and build towards a radical new model of appointments and referrals.

CASE STUDY:

Wayfinder: Helping patients to find their way – an end-to-end timeline of care

In 2019, following the successful work on the eBRAM project, we were challenged by NHS Digital to discover what was going wrong with appointments and referrals across the NHS. The problems were easy to find: long waiting lists, cancellations, complex language, missing appointments and confusing instructions are everywhere in healthcare. But the solution is complex.

The resulting programme - Wayfinder - aims to deliver not just reduced waiting times and appointments, but real changes to how care is delivered. New technologies will support both patients and clinicians in making complex health decisions, reduce the amount of complex planning they need to do, and return the focus to caring for people.

The solution is ambitious and radically innovative; it encompasses a new vision to achieve fast-paced change that will reduce time and money. It achieves this through a new decision-making approach to the referral pathway.

For the first time patients will have an end-to-end timeline of care in their NHS App or on NHS.UK; they will be able to see their appointments, referrals and, in time, their test results and waiting times - a single source of truth. Patients will be able to plan their care, know where to go and when, how long they'll wait, and who to contact if they need support. They'll be able to view, reschedule and cancel appointments nationwide.

In turn, this will relieve key pressures on NHS staff - multiple phone calls looking for information will be reduced to a single point of contact. And worried patients will have direct access to support resources 24-hours a day.

Wayfinder will also support the reduction of the elective care backlog, by turning 'waiting time' into 'preparation time' for patients, so that the right people are ready for the right care at the right time.

Wayfinder is the first step on a long road in terms of system-wide change that benefits patients brought about as a result of this ambitious and innovative new vision. But it's a step only made possible by a combination of creativity, human-centred design, collaboration and delivery expertise.

CASE STUDY:

Taking a user-centred approach to EPR design at the York & Scarborough Emergency Department

York & Scarborough Teaching Hospitals NHS Foundation Trust's electronic patient record (EPR) was originally co-created with clinicians and other users, however it has been repeatedly modified over the last 20+ years in reaction to emerging requirements rather than as part of an overarching strategy. The Trust recognises that this has resulted in a system that is no longer optimally designed for their current user needs and reporting requirements.

BJSS was commissioned by the Trust to conduct a user-centred design review of the EPR system within the Trust's Emergency Departments (ED), with a dual focus on user experience and data capture.

Central to BJSS' approach was landing a small but experienced team to experience life on the frontline of ED - researching, observing and interviewing clinicians and other users in their workplace. This user-centred approach allowed the team to experience real-life scenarios, track full patient journeys, map dependencies with other systems and departments, highlight drop-offs from the EPR to paper to other systems, and understand the cause of these behaviours.

Ultimately, we wanted to find ways to reduce time spent away from patient care which would lead to better clinician and patient experience and improved health outcomes.

The team developed an 'as is' position of the ED including a service blueprint, journey map, ecosystem, and in-depth personas. Collectively, these artefacts illustrated the strengths and weaknesses of the current EPR system, focussing on users' needs, behaviours and system pain points alongside the user journey.

Storyboards, scenarios and first-hand user testimonials were used to visualise findings for stakeholders through show-and-tells and a final report. This included a series of quick wins and longer-term recommendations supported by high-level concept designs representing the 'art of the possible,' and how the Trust could implement a user-centred approach to transform the patient and clinician experience of ED.

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