

Sheffield Teaching Hospitals NHS Foundation Trust

Information and Technology Strategy 2020

Executive Summary



"The experience of industry after industry has demonstrated that just installing computers without altering the work does not allow the systems and its people to reach their potential; in fact, technology can sometimes get in the way. Getting it right requires a new approach; one that may appear paradoxical yet is ultimately obvious: digitising effectively is not simply about the technology, it is mostly about the people..."¹

¹ Wachter, R. (2016) "Making IT Work: Harnessing the Power of Health Information Technology to Improve Care in England" at
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Introduction

In 2013, the Trust Board approved our current Technology Strategy. This set out the direction for a five year programme of technology change that led to the Transformation Through Technology (T3) Programme.

As a result of the 2013 Technology Strategy, we have delivered significant changes to the Trust's use of technology and significantly improved our digital footprint. From a low base in 2012, our approach has positioned us well to become a digital hospital and we are well placed relative to our peers as the analysis of digital maturity for provider organisation across the NHS.

However, in the last three years the global, NHS and Trust contexts for information and technology have changed significantly. The opportunities we have to exploit information and technology to provide excellent patient care are now significantly more, but this is balanced with the challenges of more pervasive use of technology. Our patients expect us to use technology seamlessly in their interactions with us, and they want the Trust to provide secure technology that works for our clinicians. Our clinicians and non-clinicians want great service and agile, useable, joined-up information and technology at the point of care.

This new Information and Technology Strategy, jointly produced by our Informatics and Information Services teams, builds on the foundations laid in the last three years, responds to this complex new environment. It has been produced with support from across the Trust and our key suppliers.

Our vision is to attain the Five Year Forward View's Paperless at the Point of Care by 2020 initiative by achieving full digital maturity through the application of seamless and enabling technologies and therefore bringing STH to the forefront of health service technology, and cementing its reputation for patient care and research excellence. We want technology to support the Trust's vision of being recognised as the best provider of health, clinical research and education in the UK and a strong contributor to the aspiration of Sheffield to be a vibrant and healthy city region.

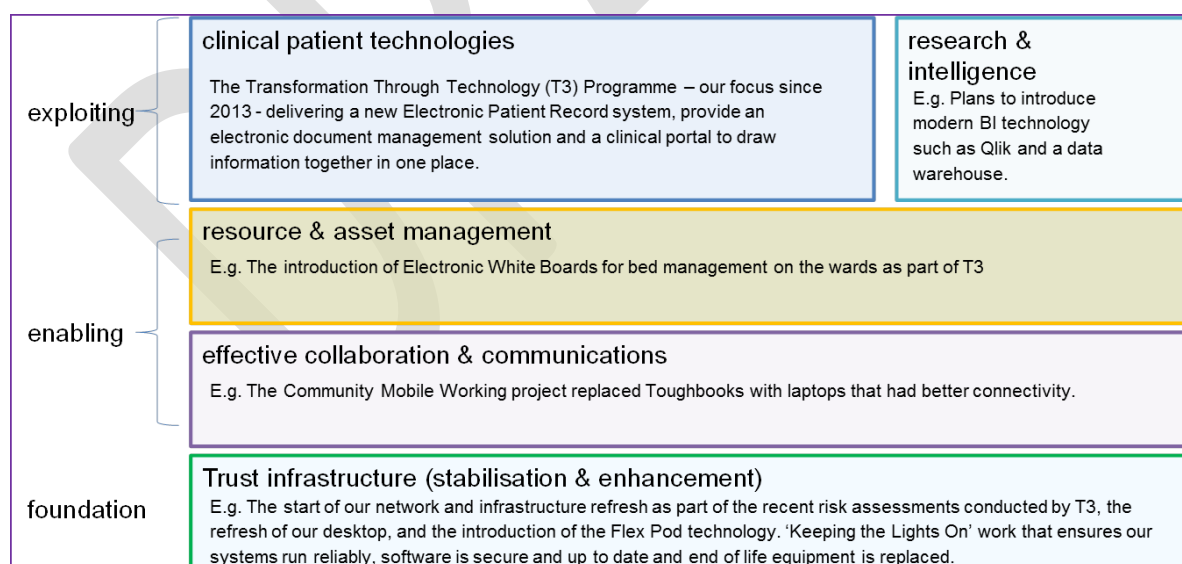
Our strategy is summarised in this Executive Summary, and detailed in the three volumes describing what we need from information and technology, what we will deliver over the next three years, and how we will deliver it. It shows how we will progressively deliver information and technology that enables us to provide outstanding patient care, balancing the advantages and risks associated. In delivering it we will be demanding and demonstrating value from all of our IT investments and asking our suppliers to do the same.

Why we need a new Information and Technology Strategy

In 2013, the Trust Board approved our current Technology Strategy. This set out the direction for a five year programme of technology change that led to the Transformation Through Technology (T3) Programme. The T3 Programme delivered many of the objectives set, and the Trust is now working to stabilise the products implemented by 2017. But the world has changed significantly, the NHS context and technology have changed fundamentally, and our original Strategy is no longer fit for purpose. Moreover, the value and volumes of information we hold as a leading teaching and research organisation have both increased. We play a central role in leading edge research and are now using high end “big data” techniques to progress our research agenda. Therefore Informatics and Information Services have collaborated to produce a unified strategy that sets a vision for the next three years.

We have improved our digital footprint since 2013

The T3 programme focussed on the implementation of core technology that would provide the foundations for a digital hospital as illustrated below. The components of T3 included the Lorenzo Patient Record system, an electronic document management system to allow us to transfer paper records to digital format, and a clinical portal to enable a single point of access to clinical information, the Xerox managed print service and deployed over 1500 laptops for mobile working. Moreover, a programme of risk mitigation for our core IT infrastructure and systems was started.

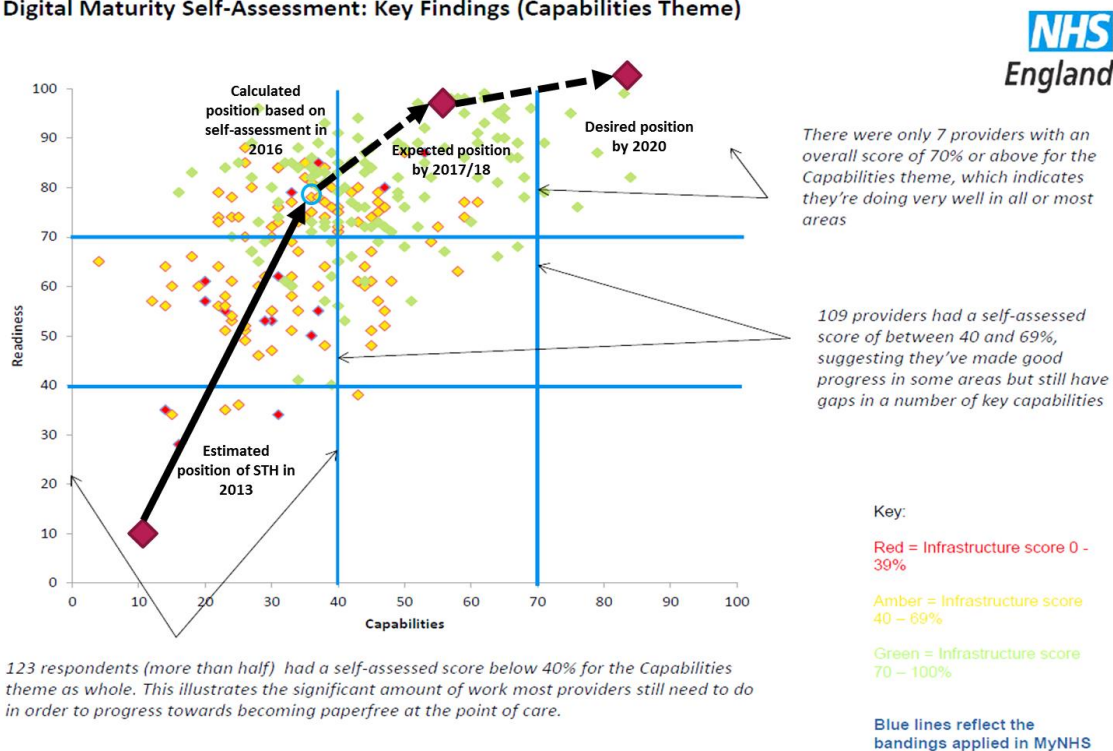


T3 has proven to be a significant undertaking. The organisation development challenge has proven to be even greater than anticipated as we continue to roll out the T3 products; however we expect our digital footprint to improve progressively over the next 12 months. Specifically, we will have digitised many of our paper records and also implemented a new electronic prescribing system across the Trust by the end of 2017. We will also have made significant progress in further stabilising

and securing our core infrastructure – something that we know, from the recent incidents at other large hospitals, to be absolutely essential².

From a low base in 2012, our approach has positioned us well to become a digital hospital and we are well placed relative to our peers as the analysis of digital maturity for provider organisation across the NHS below illustrates.

Digital Maturity Self-Assessment: Key Findings (Capabilities Theme)



The global, NHS and Trust contexts for information and technology have changed significantly

The world in 2016 is however very different to that in 2012/13. There has been a significant change of emphasis in the focus of the NHS on system wide change, activity levels are suffering and financial pressures across the system have never been more acute. Some of the factors to which the Trust and, by extension, its technology must respond include:

- **The NHS Five Year Forward View** “Paperless at Point of Care” by 2020.
- **Digital and Data Quality Maturity Indexes** have been designed to help identify areas where trusts need to improve.
- **Our Sustainability and Transformation Plan, the CCG Local Digital Roadmap and the Test Bed Digital Vision** (with Sheffield running its own Test Bed – the Perfect Patient Pathway), and our local Vanguard through the **Working Together Programme**.

² Stevens, L. (7th December 2016) “Another IT Crash in the North” at http://www.digitalhealth.net/clinical_software/48339/another-it-crash-in-the-north

- **Changed clinical and research needs** of technology and information in the wake of T3.
- **A multitude of contract renewals / external demands** such as the need to modernise our e-mail system to NHS Digital standards and the need to re-tender long running contracts such as that for our digital dictation software.
- **Wider technology innovation and big shifts** in the way the technology providers see future healthcare technology.
- **Security threats** including the rise of cyber-attacks on healthcare organisation are becoming increasingly common and in addition to protecting the confidentiality of our data, its integrity and availability are at a heightened level of risk as recent events at other Foundation Trusts have illustrated³.
- **Demography**, including 171% increase in people over 90 by 2037 at one end and a significant shift in “digital natives” at the other affecting both patients and our workforce.

Most recently, Professor Robert Wachter’s review of NHS IT has led to recognition of the inherent difficulties of delivering technology change in secondary care, and a more sophisticated approach to that set out in the Five Year Forward View that places an emphasis on:

- **A more carefully paced transition** to becoming Digital At The Point of Care, matched by central funding, and running until 2023 (with the majority of Trusts expected to meet the original timescales of 2020), and;
- **A step change in clinical leadership** of IT in NHS hospitals including the active education of medical staff in technology, and in their specification, design and implementation.

Since 2013, we have also begun to create a significant capability in information and business intelligence under our Chief Operating Officer. Linking this capability with the technology and data has never been more critical to the Trust.

What we need information and technology to do

Our information and technology needs from 2016 onwards have been clarified in many conversations with patients, clinicians and non-clinicians, and researchers alike. At the very highest level the Trust needs to build on the assets we have built through the T3 programme, and to make them significantly more useable and joined up for our clinical teams. We also need to provide a much more agile and flexible approach to communicating and collaborating both internally within the organisation, and with patients. Finally, all of this needs to be supported by an excellent and responsive IT service.

³ Stevens, L. (5th December 2016) “Aggressive ransomware blamed for NHS cyber-attack” at <http://www.digitalhealth.net/cybersecurity/48336/aggressive-ransomware-blamed-for-nhs-cyber-attack>
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Our patients want the Trust to provide secure technology that works for our clinicians.

We have worked with our Patient Governors and Citizens Reference Group to understand the experiences of inpatients, outpatients and visitors to the hospitals within the Trust and how technology could make that experience better. Making sure we can assure patients that the data we hold about them is kept confidential, has high integrity and is only shared where appropriate and when consent is given is a high priority. Accessing amenities, such as Wi-Fi when an inpatient, will improve the patient experience. Patient requirements that this strategy must take account of include:

Access to Wi-Fi

Patients want to have access to the internet and social media from the wards. If a patient feels well enough to work from their hospital beds IT needs to be able to support this.

Easy to use systems

As the hospital/patient relationship becomes more electronic, systems that patients interact with need to be user friendly. Patients also want to be confident that their clinicians can use the systems correctly.

Navigating the hospital sites

Patients would value help via a phone app to navigate the hospital sites as they are large and it's difficult to find where you need to go.

Medical Record Access

Accessing our own medical records and taking ownership of them is important. However, reassurance needs to be provided that the Trust is taking steps to make sure personal information is kept safe and only shared when permission has been given by the patient. In addition we need to bolster the Trust's IT security to protect it from cybercrime, which is becoming an increasing threat.

Our traditional focus on confidentiality remains, but the most significant risks relate to the availability and integrity of the information we use day to day to service patients safely. Our focus therefore needs to be significantly increased on the availability of our systems (in response to denial of service, ransom ware and other types of attack from viruses and malware), and on the integrity of information we hold (for example from external ransom based attacks on core clinical data such as prescription information).

Our clinicians and non-clinicians want great service and agile, useable, joined-up information and technology at the point of care

Building on patients' needs, our clinicians and non-clinicians alike want technology that supports:

Technology Fundamentals

Providing a good service is fundamental to the smooth running of the hospitals and community sites, therefore getting the

basics right is really important.

Electronic Communications & Collaboration

Ensuring clinicians can always access the systems they need both inside and outside the Trust and have the right tools to work together. A focus on communications and collaboration technology, and better integration at health economy level, could yield significant clinical benefits.

Easy to Use Systems

Making sure the information we have is reliable and easy to use is fundamental to how we work. Being able to capture and edit this easily is crucial to helping have the best picture of a patient clinical record possible.

Clinical Information & Decision Support

Making sure that we get the clinical information we need is available in one place in order to provide the best care and make the right clinical decisions is paramount.

Core Clinical Platforms

There has been a necessary focus on T3, but we need not to lose sight of the critical platforms that clinicians use today and how they will evolve too as they coalesce, interoperate and, ultimately, are retired or replaced.

Managing Assets & Resources

Developing and introducing systems that enable more effective management of our workforce, improved clinical safety and enhance our management of devices is becoming increasingly important.

Business Intelligence

Ensuring that we understand our data collection processes and that these are fit for purpose. Developing data standards that allow data to be integrated and analysed. Developing technical analysis that can support prescriptive analytics to drive improved patient health care outcomes. Driving both outstanding care and research excellence through our management and use of our information and intelligence assets.

What we want to achieve

Our vision is to attain the Five Year Forward View's Paperless at the Point of Care by 2020 initiative by achieving full digital maturity through the application of seamless and enabling technologies and therefore bringing STH to the forefront of health service technology, and cementing its reputation for patient care and research excellence.

We want technology to support the Trust's vision of being recognised as the best provider of health, clinical research and education in the UK and a strong contributor to the aspiration of Sheffield to be a vibrant and healthy city region.

Our vision is supported by some concrete aims

Over the next three years we will support our information and technology vision by delivering against a number of aims as set out below:

Clinical Patient Technologies

Deliver a fully integrated EPR, which includes patient administration, Emergency Department and prescribing functions and will be integrated with Maternity, Theatres and Orders and Results systems.

Replace, refresh, enhance or integrate our other systems as appropriate to help us move towards a more integrated environment.

Rationalise or re-platform remaining systems with a goal of reducing the estate by 30%.

Enhancement and development of the Integrated Clinical Portal. Phase 2 will consist of upgrades and further integration of our significant applications. Phase 3 will explore the potential of a community services and patient portal view.

Employ new systems that assist in **Clinical Decision Support**.

Develop a Document strategy and implement a solution that moves anything that generates paper to an electronic format.

Research & Intelligence

- Ensure that our **data is stored securely**.
- Ensure that data sources are extracted and transformed to **maximise data quality and data integrity**.
- **Use automation** wherever possible to create resilient data processes.
- **Use the best platforms share data** to a wide range of end users.
- Ensure that information is presented in a **meaningful and accessible** way to end users.
- **Develop education and training** to create intelligent users.
- Ensure our **use of information drives the strategic objectives** of the organisation and **decision making processes**.
- **Use business intelligence to challenge and innovate** the way we deliver health care.
- **Encourage a culture of curiosity** around data and business intelligence.

Resource & Asset Management

Introduce new cross-cutting systems that help us to manage:

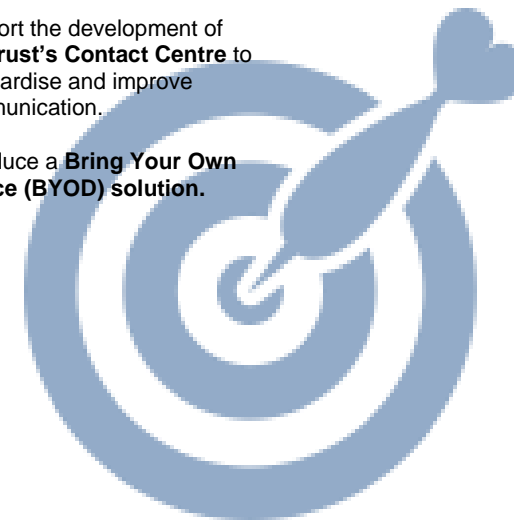
- Our **medical staff** through a single rostering system.
- Our **clinical and non-clinical rooms** to improve utilisation.
- Our **medical devices** by tagging and tracking to make sure all equipment can be located when required.
- Our **bed management system and use of eWhiteboards** through the T3 optimisation work.
- MDTs by **enhancing existing facilities and introducing new technologies**.

Effective Communication and Collaboration

- Develop a **Mobile Device Management solution**.
- Introduce **more mobile technologies to clinics and wards**.
- **Develop our inter-Trust communications** with our Working Together Programme partners with video conferencing.
- **Implement a Digital Dictation solution** that improves functionality and allows for compatibility with other Trusts.
- Support the development of the **Trust's Contact Centre** to standardise and improve communication.
- Introduce a **Bring Your Own Device (BYOD) solution**.

Trust Infrastructure

- **Modernise our network infrastructure** (Local and wide area networks and our existing Wireless network).
- **Expand our application hosting capability**.
- **Implement a new email solution** to ensure we remain compliant with national standards.
- **Implement a refreshed desktop solution** that updates our Microsoft Office provision.



Our strategy will deliver information and technology that achieves these aims progressively.

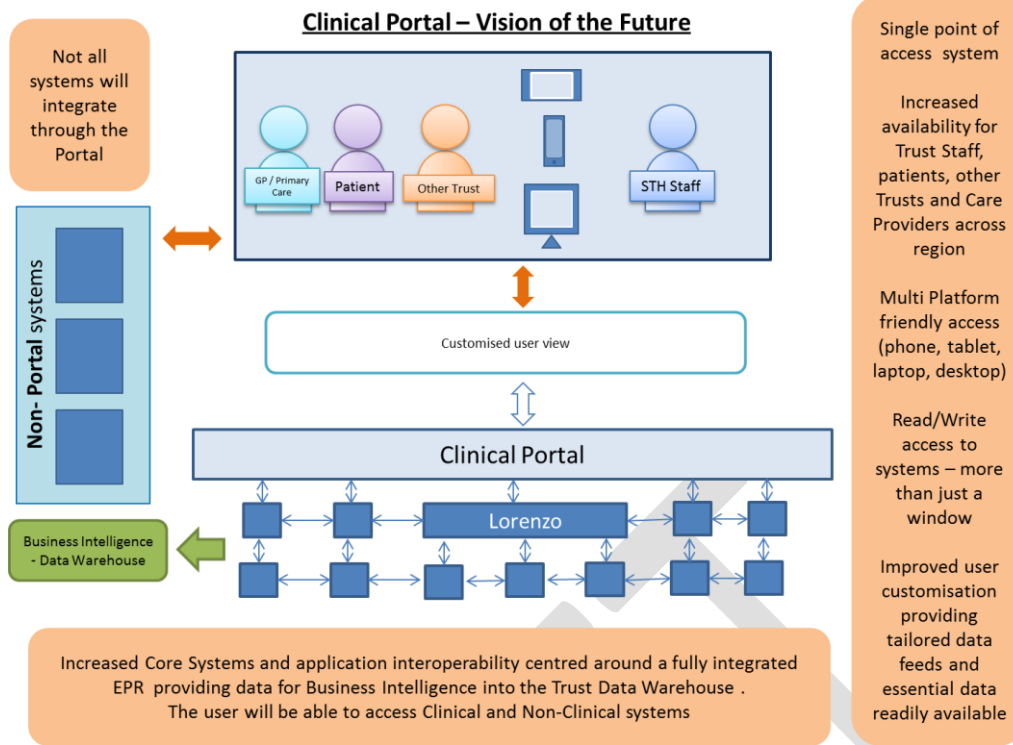
Our approach to delivering the aims within the capacity and funding constraints of the Trust needs to be coherent and maximise the value we get from the technology we have already delivered through our investment in the T3 programme.

Delivering on our aims and achieving the vision of a Trust that is paperless at the point of care by 2020 is achievable, but requires focus. We need to do relatively few things to the highest possible standards, rather than react to too many, possibly conflicting, real time priorities. In particular, we need to integrate our IT and find a mechanism to mobilise our workforce once, rather than through multiple different local interventions.

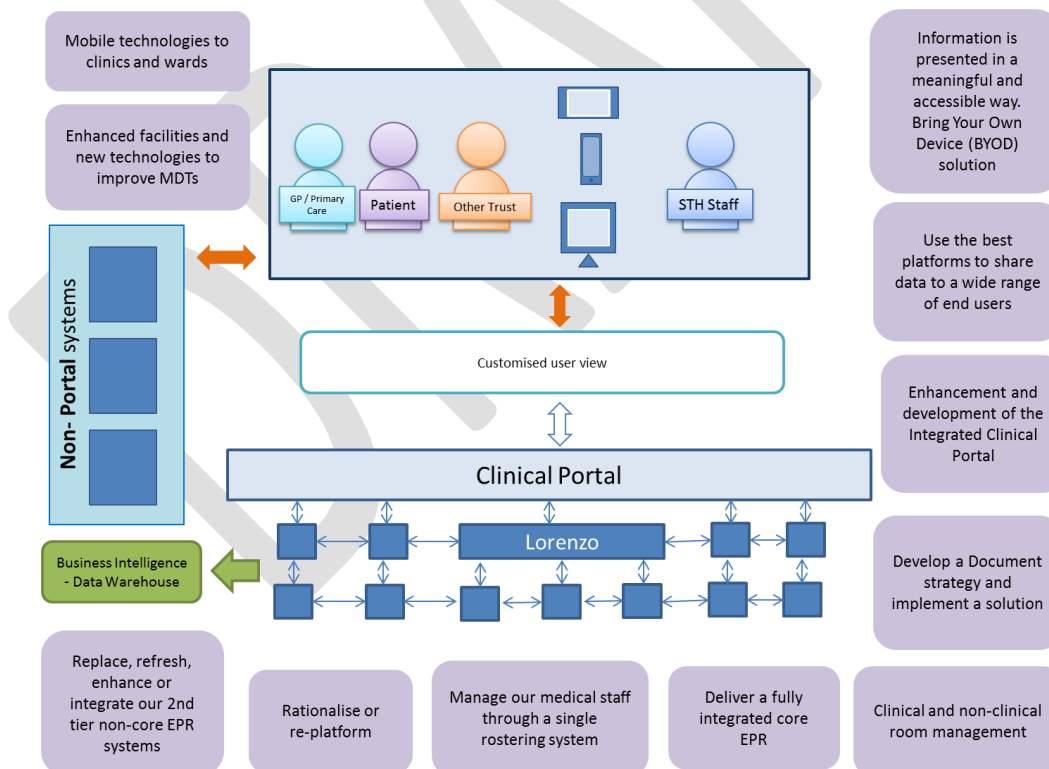
It is important to recognise that an EPR, within the STH context, cannot be defined as a single system. The internationally accepted definition, as set by the Healthcare and Information Management Systems Society (HIMSS) European Electronic Medical Record (EMR) Adoption Model, states that an EPR is a collection of capabilities rather than an individual application. To achieve a sophisticated and comprehensive EPR we plan to expand our Clinical Portal and integrate more systems. This will allow for a single view of the patient record.

By 2020 the Clinical Portal will provide Trust staff with a powerful tool to support how we interact with a vast array of systems, clinical and non-clinical. Centred on the patient, it will present the user with a customised view of up-to-date and relevant information to a device that is suited to them. It will enable the user to input data and request services from a single point of access, enhancing current ways of working and driving efficiency.







In addition to patient access, Clinical Portal information will be accessible from neighbouring Trusts and care providers. Increased Core Systems and application interoperability centred around a fully integrated EPR providing data for Business Intelligence into the Trust Data Warehouse is also the goal. This information and technology vision is illustrated on the next page.



The vision will enable us to deliver our information and technology aims in an holistic manner building on our investments to date through T3 as shown below:



In doing this we will focus on building the systems that our patients and staff need in line with a set of end user focused design principles:

- ✓ **Easy**  I find systems at the point of care **as easy to use as those I use in my personal life** and do many of the same things such as drawing, handwriting and click and select options that maximise speed.
- ✓ **Flexible**  I am able to use **any appropriate device, including my own**, confidently and securely, and when I use Trust systems they will be available, accessible, reliable, and fit for the job I am doing within the Trust.
- ✓ **Connected**  I am able to **easily contact my colleagues, talk to them as if we were face to face, and exchange information with them** at the point of care wherever that is, and wherever I am.
- ✓ **Supportive**  I am able to find **all of the information I need to have about a patient in a clear and easy way in one click at the point of care** and have confidence that it is up to date and complete.
- ✓ **Reliable**  I am confident that if something goes wrong with any technology I need to do my job, it will have been **fixed before I am aware that there is a problem.**
- ✓ **Coordinating**  Our systems **help us to coordinate teams and resources effectively, efficiently and safely so that we can deliver the best possible care to our patients.**

How we will achieve our Information and Technology Vision

Our Information and Technology vision and aims are underpinned by a realistically achievable technology and information roadmap. Delivery will require us to focus on a number of things, some of which are essential and our approach will need to be flexible and pragmatic.

Putting patients first in our IT thinking

We aim to support the Trust at every step in the delivery of excellent patient care. By maintaining a clinically led strategy and consulting with patient groups, we will be able to meet the priority needs of the Trust and the patients we serve.

Focussing on standardisation

Through the investment we have already made through the T3 programme we will increase the focus on standardisation across the Trust through the use of technology and process redesign.

Building an Information culture – encouraging “curiosity”

We will engage with organisational development momentum around the Trust to encourage an information intelligence culture that will maximise the IT and healthcare opportunities.

Demonstrating local and regional leadership – through the STP and wider

Sheffield Teaching Hospitals are already taking a leading role at the regional and local levels. We bring clinical and technical expertise to these groups; this influences the direction of travel across the region.

Making sure that we build for the future not for expedience

We will focus on making sure that the essential long term building blocks are put into place, so that we have the flexibility to meet changing requirements in the future.

This means in practical terms that we will:

- Make sure that we focus on a robust and secure networks and storage infrastructure that is sustainable and resilient to cybercrime, availability and integrity threats.
- Carefully consider where core information is held in our design thinking so that it is open and accessible across and outside the Trust to NHS standards for future needs and not siloed in response to short term needs.
- Make sure that we put the essential components in place for managing a more mobile estate before mobilising in an uncontrolled way – in particular our Enterprise Mobile Management approach and infrastructure will be a key stepping stone towards a controlled and secure mobile estate.
- Make sure that the user interface is designed for the long term and starts to isolate clinical users from change at the back end systems. This will enable us to facilitate changes to core systems more easily and minimise operational impacts. The centrality of a modernised clinical portal layer is critical to this.
- Make sure that anything we build is sustainable and supportable for the long term including the resilience and commitment of our supply chain.

Demanding and demonstrating value from all of our IT investments and asking our suppliers to do the same.

Deriving and maximising the value from our investments in IT lies at the core of our approach taken to developing our strategy to 2020. Whilst our vision to be paperless at the point of care derives from a wider NHS aspiration, it must not become an end in itself. The excellence of the care we provide must remain our priority and technology only an enabler to achieving that.

This strategy builds on:

- The investment that was made in technology platforms for the T3 programme and places a premium on enhancing those investments to derive significant business benefits rather than investing heavily in new IT.
- The approach adopted in T3 to include optimisation and benefits realisation as a core part of our Informatics work.
- Other investments in technology platforms across the Trust, recognising that change for change's sake in IT is the wrong thing to do if we do not use it to move our clinical performance forward. This means that we will integrate platforms over time rather than embark on costly replacement programmes.
- The start we have made in protecting our investments in technology and information through the use of more robust infrastructure such as the Flex Pod, and securing our estate against the increased threat of cyber-attack.
- The start we have made with clinical engagement in IT through T3, but which now needs to accelerate through the follow up to the recent Wachter Report.

Over the past three years we have significantly strengthened our governance around IT planning and the integration of that with the business planning cycle. We will build

on that and the approaches used on T3. In addition to that we will need to operate the following principles in our investment approaches as we develop business cases and present investment decisions:

- **Necessity** – is this the only way to solve the problem?
- **Demonstrable value add** – can we evidence it will make a difference?
- **Proof of Concept** – have we actually proven it works for STH?
- **Ready in 6 months** – can it be done quickly?
- **Standardisation** – does it help us standardise operationally and clinically?

Our approach embodies these principles by:

- Focussing on doing a few things that will progressively lead to the benefits we are seeking.
- Aligning with the needs of the organisation and strengthen the clinical and operational links we have.
- Aiming to prove that a solution will actually work clinically and operationally before taking it on trust from our suppliers.
- Retaining a flexible approach to our future investments.
- Building on our existing investments and doing it safely to ensure the Trust is protected against threats posed through wider integration.
- Saying no to solutions that take us backwards or potentially off course.
- Holding our suppliers to account through effective management and contract negotiation.

Providing an exemplary service is fundamental to the smooth running of the hospitals and community sites, therefore getting the basics right is really important. A strong, robust and professional approach to support for our IT estate on a day to day basis is essential to the rest of our Strategy; becoming paperless at the point of care necessitates reliable, available and performing technology solutions in the hands of our staff underpinned by top class support. There is also room for improvement in the service we provide and so as part of Strategy we intend to strengthen the Informatics operating model and core processes to provide a service of which we can be proud.

During the latter part of 2016/17, the Trust's informatics team will deliver a series of improvements to the management of our day to day IT service. As part of this we will appoint an overall Project Manager for the delivery of a programme of service improvement.

Things we need to get absolutely right

In the delivery of this strategy there are key elements that must be successfully implemented.

- Although the T3 Programme has been formally closed as completed, there is still much optimisation work to be done, with particular regard to EDMS.
- There are a series of game changing cross cutting programmes scheduled for 2017/18 that require complete delivery. These include the replacement of our Digital Dictation system, replacement of our email system to NHSMail2 to ensure we are compliant with national standards, the implementation of Lorenzo's electronic prescribing function for inpatients, significant enhancements to the Integrated Clinical Portal, the introduction of Wi-Fi for patients and staff and a refreshed Telephony platform.
- We must ensure that the design of our solutions is led by the users, whether clinical or non-clinical.
- We must deliver exemplary day to day service.
- We must ensure our core infrastructure is resilient and safe.

Things that might limit our progress

This strategy is ambitious. We believe that in order to transform and keep pace with the changing environment it is important to be bold in our vision. There are, however, risks to the delivery of this strategy that cannot be overlooked.

- There may be a failure to get all of the basics right and engage effectively with the Trust.
- The imbalance between demand and capacity, combined with the added complication of funding pressures may inhibit the number of elements we achieve.
- The condition of our infrastructure may become a limiting factor in the pace of change we are able to achieve.
- Cyber-attacks are an increasing concern and an inability to be agile in defending ourselves could harm the Trust.
- Allowing silos of information and technology to grow will undermine the strategy's attempts to support standardisation.
- Diverting attention and capacity away from our agreed business plan will mean our vision will not be achieved.

Next Steps

Planning We will actively refresh our forward plan annually as part of the business planning process. We will prioritise projects that deliver the best benefits for the Trust and help us move towards a CQC rating of Outstanding.

Areas of focus Our primary focus will be on delivering solutions that are of genuine value to the Trust through cross-cutting systems that improve activity.

Governance We will harness the Trust's governance structures to focus on STH Information and Technology Strategy 2020 – Executive Summary

maximising value from informatics capital spend and help Informatics to prioritise projects.

Benefits Assessment Each April, there will be an assessment of the benefits from the previous years' investments to understand what lessons we can learn and where we can improve.

Sub-strategies In delivering this overall Information and Technology strategy we will develop technical and (where needed) directorate sub-strategies that specifically identify the future needs of information and technology. It is a reality that in an organisation as complex as STH we have to work through the issues logically.

The technical strategies will look explicitly at:

- **Desktop** – How we build a robust case and plans for the migration to the right desktop solution for STH in 2018/19 consistent with our wider Technology Strategy and mitigating the commercial risks the Trust faces due to the current Microsoft agreement with Crown Commercial Service expiring in 3 years.
- **Network** - Re-baselining our network risks in a changed context and putting in place a robust case and plans for our networks and storage to 2018/19.
- **Mobility** – Developing a robust case and concrete plans for delivering our mobility ambition to 2018/19.
- **Cyber Security** - Mitigating short term cyber security exposures and the development of a robust plan of action and approach to managing the longer term cyber security risk faced by the Trust.

Test Bed Innovation We will make sure to utilise the successful outcomes from Test Bed initiatives to guide how we as a Trust can integrate better with Primary care.

Maintaining Engagement We will make sure to maintain our engagement with patients and Trust staff to build strong relationships.

In conclusion, this refreshed strategy is ambitious but structured around researched and validated needs that can yield real benefits to improve patient care. There are many constraints on our path to achieving this, however our awareness of them will allow us to plan effectively, seek additional funding routes and streamline our services where possible.