Sheffield Teaching Hospitals NHS
NHS Foundation Trust

Sheffield Teaching Hospitals NHS Foundation Trust

Technology Strategy and Roadmap

Part 1 - Strategic IT Requirements

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Foreword

The Technology Strategy and Roadmap for Sheffield Teaching Hospitals (STH) provides a five year roadmap for the development of Information Technology at STH that details the requirements of the Trust, the Information Technology capabilities that will be needed to enable strategic solutions and the governing principles for those solutions.

The Trust recognises that technology will enable more efficient, effective clinical decisions as well as improving the overall quality of patient safety and care. It will not be possible to deliver the highest quality of compassionate care without investment in IT systems to transform clinical services.

The strategy puts patients, their outcomes and safety, first. The delivery of this technology strategy will enable STH to devote more resources to patient care, to improve patient experience and to deliver more effective, reliable patient care. At the same time it will help staff work more efficiently and further improve safety. Patients will see significant benefits as staff will be able to spend more time with them and they will be much more involved in their own care.

Purpose of this document

This document is the first in a series of documents which, as a whole, form the complete Information Technology Strategy and Roadmap for STH. These are:

1. Information Technology Strategy and Roadmap - Part 1 Strategic IT Requirements
2. Information Technology Strategy and Roadmap - Part 2 The Strategy
3. Information Technology Strategy and Roadmap - Part 3 The Roadmap

Part 1 summarises 'why' the Trust has a need for a new strategy based on the requirements being expressed by both clinical and corporate services. Part 2 details 'what' the Trust's Information Technology Strategy is, the key decisions that need to be made and the major benefits of such an approach. Part 3 details 'how' the strategy will be achieved, laying out the proposed approach, the key assumptions made and the indicative timeline for the roadmap.

Please note that this document is a 'Technology' not an 'Information' strategy. However, once the IT strategy is up and running, we expect an organisationally owned 'information' strategy to be created. The requirements of the Trust for technology support will change over time and therefore this and the other documents will need to change to reflect this. These documents should be viewed as living papers that will be updated periodically under change control.

These documents service the needs of multiple audiences within the Trust:

- **Informatics Service Users** – both clinical and managerial users have provided the key inputs to the requirements in this document, and for them this document is designed to be an accessible requirements statement for validation and longer term reference. It allows stakeholders in different departments to see how both their own requirements are captured and interpreted, and how they fit into the wider landscape of the Trust's overall requirements

- **Informatics and Suppliers** – to provide the basis for identifying the core technology solutions that will provide the critical IT solutions of the future

- **Senior Management** – to understand the areas in which IT needs to focus and to align investment with the service priorities over the 1 to 5 year timeframe. The Information Technology Strategy and Roadmap for STH articulates the direction of travel over the next five years. It plots a course for the use of Information Technology at STH, taking into account the detailed requirements of the Trust, and the Information Technology capabilities that will be needed to deliver strategic solutions and the governing principles for those solutions.

Contents

1 The case for change

STH aims to be the best provider of health care, clinical research and health education, not just in South Yorkshire, but nationally, and in so doing, contribute more widely to the community of Sheffield. It plans to become a values based organisation on a continuous improvement journey that innovates in delivering services.

The balance between managing the finances and improving the quality of service delivery is a challenge for all services and on balance, the aim is to improve financial performance but not at the expense of quality, or the Trust's values and obligations to the community it serves. Again technology will hold the key in many cases to the elimination of waste and increase in quality.

The Trust realises that in order to be fit for this future it needs to change. These ambitions can only be realised by changing the way the hospitals are run, both operationally in terms of the way processes are operated and controlled, and clinically in terms of the speed and quality of providing patient care. The Trust Executive Group has therefore embarked on a programme of change that will design and deliver a series of projects that will drive process improvement, realise efficiencies, underpin clinical effectiveness and provide improved compliance.
Technology is a key enabler of this transformation plan and this technology strategy is aligned with the Trust's strategic objectives. The overall set of technology requirements is set against a backdrop of:

- National Information Strategy (The Power of Information)[1] which has set a ten-year framework starting from 2012 for transforming information for health and care nationwide. The strategy puts a greater focus on technology to move towards an integrated paperless information flow across organisations.
- The five year strategic aims and objectives from the Trust that have fuelled the appetite within the departments to change and achieve their operational efficiency targets. This drive is setting the expectations for an IT service to deliver excellent support and provide innovative solutions to improve working practices.
- The outcome and recommendations of the Francis Inquiry.
- The lack of a common and explicit understanding of the current services offered by informatics or how they are accessed compounded by ineffective demand management and portfolio investment appraisal.
- An existing Informatics Department that has gaps in key disciplines and capabilities.
- An aging application architecture that is not fit for the future and approaching technical obsolescence.
- An upgraded infrastructure that delivers an average service but is underutilised and not exploited to its full potential.

There is also a competing theme emanating from different areas of the Trust around balancing the need to understand the requirements for service and organisational change before targeting new systems and technologies to deliver it, versus the view that technology should drive change. In this case there needs to be strong leadership and direction in ensuring that delivery and benefit can be achieved without impacting other opportunities for service improvement.

[1] http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_134205.pdf

2 Strategic IT requirements

STH Informatics provides ICT services to 27 different clinical directorates in addition to corporate directorates. Users across the Trust have been consulted to gather their requirements and understand their future needs of technology and the Informatics service. Some of the requirements which have been captured are specific to their own Directorates and Groups; however, many are common across Directorates.

Requirements will continue to emerge and evolve as further gathering and analysis of the catalogue develops. Updating of these requirements will be linked to the Business Planning cycle. Currently, there are a core set of operational issues that technology, if exploited correctly, could help improve and maybe even resolve.

In addition it was recognised that two new themes were emerging:
Requirements for the the way the Informatics service needs to be delivered. This theme is recognised in this document but will be developed further in the delivery document.

Separately clinical directorates are beginning to express early ideas for business development opportunities and Informatics needs to be cognisant of any technology that may be required to underpin these. In many cases these are early thoughts and so are not yet specific requirements needing a technology solution. .

The key themes are grouped separately on Clinical and Corporate needs:

Clinical

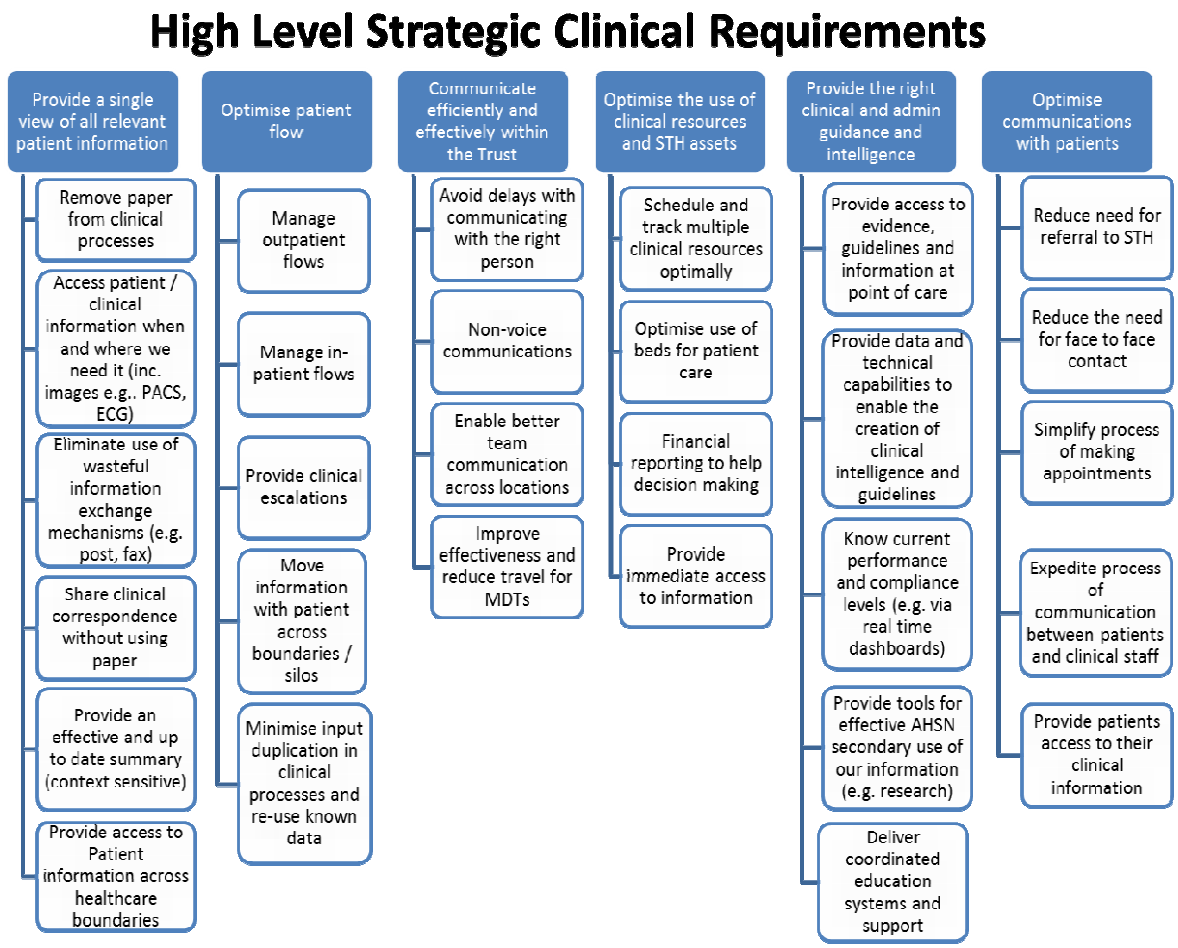
- Provide a single view of all relevant patient information
- Optimise patient flow
- Communicate efficiently and effectively within the Trust
- Optimise the use of clinical resources and STH assets
- Provide the right clinical and administration guidance and intelligence
- Optimise communications with patients outside the hospital

Corporate

- Provide effective non-paper based processes and information access
- Communicate efficiently and effectively within the hospital
- Optimise the use of corporate resources and assets
- Support assurance and governance across STH

The high level requirement groups that support these themes are summarised in Figures 1 and 2

To date not all services have been reviewed and consulted with, however, there is enough material to produce a full and comprehensive technology strategy, accepting that cataloguing and understanding all requirements from all services will be part of the core informatics business process from now on.



F igure 1: Strategic Clinical Requirement Groups

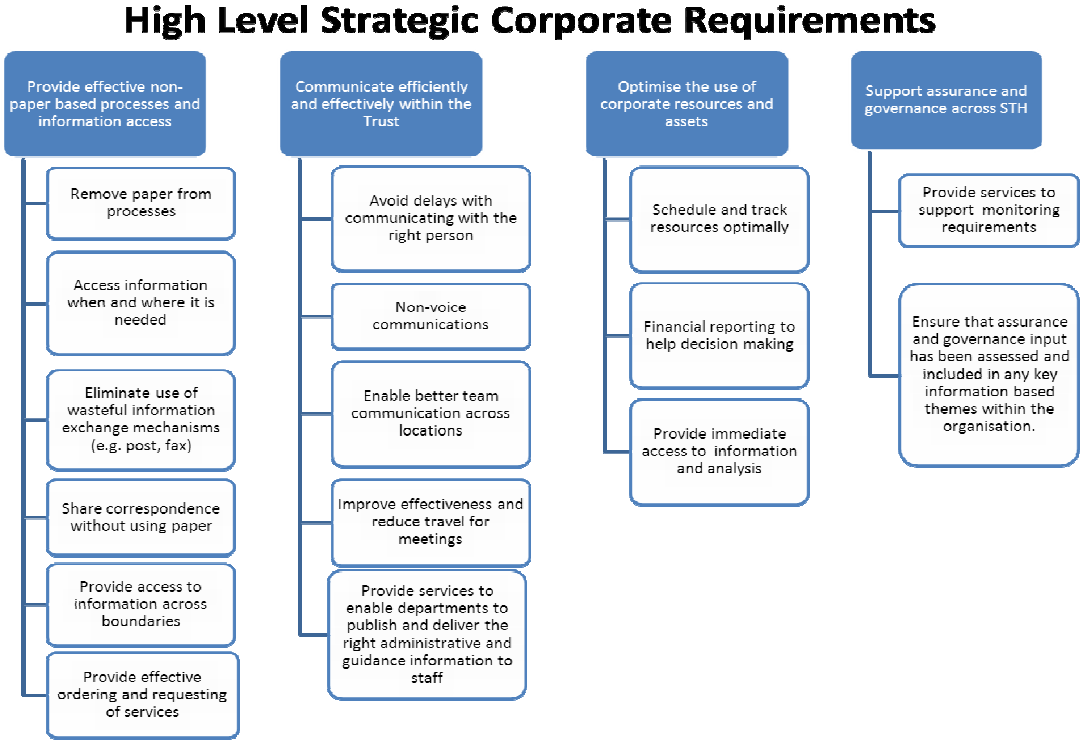


Figure 2: Strategic Corporate Requirement Groups

2.1 Sources of requirements

Requirements were gathered in a number of different ways. For example, interviews with the departments, reviews of the business and efficiency plans of all directorates, architecture brainstorming sessions, existing work requests from the Informatics department, feedback from the technology open day and meeting notes.

A list of around 700 requirements was captured from these sources. The requirements were then analysed and clustered into sets of related requirements.

The sources of information that were referenced to gather the raw list of requirements are listed below:

- Business requirements from clinical directorates
- Efficiency plans from clinical directorates
- Projects under Right First Time
- Architecture group brainstorming sessions
- Business Analyst - requirements documents
- Management meeting notes
- Existing Client Relationship Management (CRM) process
- Engagement with stakeholders from Primary Care Trust (PCT) / Commissioning Support Unit (CSU)
- Five year Strategic documents from each clinical directorates
- Stakeholder engagement Interviews
- Technology day feedback
- Informatics Portfolio Register

3 Requirements Catalogue

Analysing requirements enabled us to identify a set of key strategic groups against which we can develop the Technology strategy. Each interview and document provided a rich source of data (around 700 requirements) from which we were able to draw out high level requirements sets for each Directorate Group (Ref: Appendix 1).

Clinical and Corporate groups have been identified and documented separately, though it must be recognised that in a number of areas the clinical problems are either exactly the same as the corporate ones or similar, but without the clinical context, for example ‘access information when and where it is needed.’

Clinical Requirements

3.1 Provide single view of all relevant patient information

This theme is focused on providing a single view of a patient record, allowing Clinicians to care for patients with complete and simple access to patient information and their history so that decision making can be better informed and more timely.

3.1.1 Remove paper from clinical processes

Within clinical services and across Patient Pathways there is an abundance of paper form filling and maintaining paper diaries. Hand-off's between health care professionals and different specialties/services are predominantly done through paper form filling and faxing. This is time consuming and makes sharing information difficult (paper forms get lost, paper notes have to be physically transported from one location to another or need to be faxed, faxes are not always legible and pages go missing).

There is therefore a requirement to remove the paper from clinical processes.

The requirement was expressed as:

- Need for document management system to save money and reduce printing costs
- Need for electronic forms to remove waste through form filling and retrospective data input
- Use of technology for referrals – the referrals should not be on paper
- New paperless IT system which will mean the staff spend less time to record information and more time to see, treat and provide care
- Patient clinical information should be captured and maintained as digital records instead of paper records
- The clinicians have raised frustrations in dealing with forms and have asked to eliminate the need of endless form filling to drive patient events (i.e. requests for service, requests for assessment, transport & equipment requests etc.)
- Need to meet the data flow standards set by the NHS Commissioning Board and as a milestone towards making the NHS paperless by 2018[2]

3.1.2 Access patient / clinical information when and where we need it (including images e.g. PACS, ECG)

Many STH healthcare professionals work across multiple locations and often across multiple sites inside and outside of STH. Patient information, such as test results, diagnostic images, medication history and past medical history is held in a variety of paper and electronic systems. This means that often clinical staff do not have access to the patient information they need in the right place and at the right time. Access is also restricted internally due to the limited number of PCs available within many clinical locations.

Most disciplines cited a need for instant access and input of information, using mobile devices. However, there is no single view on what this device should be and may be role dependant, e.g. a smartphone, a tablet or a digital pen.

There is therefore a requirement to provide a flexible, consistent way of viewing all relevant patient information from any location.

The requirement was expressed as:

- Ability to access systems normally accessed at Sheffield Teaching Hospitals when undertaking clinics at different sites
- Enabling multiple systems to 'talk' to each other (e.g. replacing the need for ANP logs in to 4 systems just to see picture of patient status - PatientCentre, ICE, PACS, Takesheets)
- Need to ensure that the technology for remote access to images is suitable for mobile use

[2] http://www.dh.gov.uk/health/2013/01/paperless/

- Work with Primary and Community Services Care Group to deliver streamlined, integrated pathways for patients. An integrated IT solution will be required for a successfully integrated service model
- Other Reports into ICE (Cardiology, Endoscopy, Neurology)
- Enable information captured in one department to be available in another.

3.1.3 Eliminate use of wasteful information exchange mechanisms (e.g. post, fax etc.)

Many Directorates have expressed frustration at the inefficient exchange of information between departments and external teams and organisations. The most common one is the need to post, fax or physically transport information to other departments which takes time. It is then necessary to chase up with a phone call to confirm the department have received the information. There is therefore a requirement to create and share information electronically.

The requirement was expressed as:

- Need for shifting from faxing information/forms to communicating information with other acute services and services within other health and social care organisations, e.g. Updating and sharing Transfer of Care (ToC) documentation
- Information can be difficult to read when it has been handwritten and photocopied

3.1.4 Share clinical correspondence without using paper

Clinical correspondence created by one speciality contains information that is important to healthcare professionals working in other specialties. However, currently, clinical correspondence is being held in a multitude of systems and structures (mostly on paper) and is not easily visible or searchable by those who need it. There is therefore a requirement to share clinical correspondence electronically.

The requirement was expressed as:

- Ability to access all clinical correspondence for a patient, Services need to be able to access clinical correspondence created by other services
- Difficult to share information particularly clinical correspondence; for example, clinical correspondence for Endoscopy is created in Infoflex, whereas the rest of the service documentation is created in Word and stored on the S drive

3.1.5 Provide an effective and up to date patient summary (context sensitive)

Being able to access a summary of a patient's health record will provide clinical staff with relevant information to support their initial contact with a patient. This is particularly relevant in emergency situations where patients may not be able to provide this information themselves.
This concept has been implemented within the current patient medical record (on paper), the Inter-Professional Patient Record (IPPR). Making available an electronic equivalent to all healthcare professionals, regardless of location, system or device would have significant quality benefits allowing clinicians to progress care in a more informed manner.

This requirement was expressed as:

- Ability to see summary information without accessing multiple systems
- Access to Summary Care Record (SCR) or SystmOne to provide information about drugs, allergies and adverse reactions

3.1.6 Provide access to patient information across healthcare boundaries

As a major tertiary centre we provide care on behalf of both primary and other secondary care providers. A frequent issue raised was the ability for our healthcare partners to be able to view their patients' information that we hold to inform status and progress.

This requirement was expressed as:

- STH staff need to be able to access patient results electronically where the test has been undertaken by other NHS organisations, particularly other local District General Hospitals (DGH)

- Ability to electronically access patient information held by GP's in order to reduce emergency admissions
- Secure electronic communication channels between STH and other providers / primary care
- DGH clinicians need access to STH information and vice versa when at DGH sites to maintain care pathways

3.2 Optimise patient flow

Patient flow within STH is critical to the organisation and its efficient operation.

3.2.1 Manage outpatient flows

Following on from the success by Service Improvement work in some RHH outpatient clinics, many directorates have expressed a need for systems and processes to support their outpatient improvement work-streams. There are also requirements to support the changes in delivery of outpatient services in order to reduce the number of outpatient clinics and better integrate them with the community IT information systems to provide a seamless flow of patient information into and out of departments.

This requirement was expressed as:

- Outpatient tracking via kiosks and workflow tools i.e. patient check-in / kiosks being used to support physical flow from an outpatient clinic to diagnostic areas and back to clinic
- Continue the programme of outpatient improvement.
- Reform of Outpatient Pathway (Contact Centre Pilot)
- Evolve new, innovative and patient-centred outpatient administration processes

3.2.2 Manage in-patient flows

Maintaining patient flow through the hospital is critical to the organisation functioning efficiently and providing appropriate and timely care. Knowing immediately how the cycles of demand on different parts of the organisation are changing and the consequence it has from the front door through to safe discharge is critical to flow. As demand for inpatient services, especially unscheduled admissions, continues to rise, there is no simple way to see the status of care for patients across the organisation. There is a need to be able to view plans for patients and how they are progressing to minimise the clinical time spent on non-value added tasks (e.g. finding where a patient is, faxing forms to another department, or chasing the status of a request / result). A consequence of managing patient journeys more effectively would be to allow greater control over length of stay. Workflow analysis of the clinician's day to day activity has generated demand for use of technology to shift their efforts away from non-value-added activities toward value-added activities.

The requirement was expressed as:

- Need for technology solutions to manage inpatient flows; know where patients are, what is happening to them, what they are waiting for. Know today whether STH have enough beds tomorrow to undertake all the elective work
- Need to know where the bottlenecks / pressures are within the system
- Focus on discharge planning and service improvement projects at ward level to improve patient flow
- Mobile working - worklists / workflow management
- Improve communication about where a patient is in the discharge pathway and what they require to enable that discharge. Length of stay is too long as the patients often cannot be sent home as facilities are not available for them
- Tracking plans (visibility of how care plans are progressing)

3.2.3 Provide clinical escalations

Patient observations and health monitoring is done manually by the hospital staff and recorded on paper. Local protocols should then be followed to ensure that change or deterioration in conditions is escalated, and the escalation leads to effective and timely review and intervention. Fully manual processes allow for the opportunity for steps to be missed and escalation / intervention to fail. As supported in the recommendations from the Mid-Staffordshire Public Inquiry[3], a real-time managed

[3] www.midstaffspublicinquiry.com

surveillance system with a robust tracking and alerting system can help caregivers identify 'at risk' patients and intervene early.

Other types of escalation and decision support should be built into Electronic Patient Records (EPR) components to check and escalate changes in patients conditions or attempted interventions by clinicians, giving an alert if prescribing inappropriate drugs, or a patient who appears to be losing weight at an inappropriate rate.

The requirement was voiced as:

- Alerting to a clinician when all results are ready (and also when not all have been received in a proper timeframe) and for it to be part of a failsafe workflow that the clinician reviews these results
- Find a more effective way of communication with clinicians "bleeps are paralysing clinicians – the current answer is to switch off bleep for 2-3 hours to get work done"
- Electronic vital signs monitoring is essential to reduce mortality rates, but needs to link to Hospital at Night services
- Provide an electronic solution for infection control surveillance and alerts

3.2.4 Move information with the patient across boundaries / silos

Patients and requests for services usually cross multiple service boundaries, but the processes for moving information means that STH staff are not always able to deliver the expected quality of service. The patient information collected on paper also poses a logistical challenge as these records need to be maintained and be made available as the patient moves along and between clinical pathways and departments. Episodes of care may be hidden with the multiple separate medical records files that exist across STH. Commonly, episodes of care also span partner organisations in both primary and secondary care where information movement is often not what the patient would expect or meeting clinical need.

The requirement was expressed as:

- Electronic case note tracking to ensure that all patient information is available at all patient contacts
- Online service request and mini workflow system
- Improve ways of managing Transfers of Care
- Method of alerting GPs when patients are admitted
- Therapy Services Referral System
- Allowing other hospitals clinicians to access tertiary records to ensure continuity of care
- Enabling provision of Emergency Department discharge summaries

3.2.5 Minimise input duplication in clinical processes and re-use known data

Paper based forms and letters lead to duplication of data and wasted effort. There is substantial evidence which shows a high degree of duplication of information captured across multiple paper forms and letters for a single patient. The duplication of effort has both quality and cost concerns. The quality is undermined by poor patient experience and the cost implications are due to manual efforts required to complete and maintain multiple documents.

Creation of clinical correspondence is a time consuming process which includes searching through paper documents, manually matching the reports against the patient record, preparing medical summaries and communication with other departments such as Laboratory Services.

The requirement was expressed as:

- Electronic Transfer of Care Document – remove duplication, increase access, prevent faxing and improve accuracy.
- Enable electronic information to be entered in real time by doctors, nurses and support workers rather than retrospectively by ward clerks
- Provide the ability for information entered in one system to populate other systems thus removing the need for Staff to re-enter clinical information from one system to another to ensure their preferred system is comprehensive
- Implement the use of configurable e-forms which would either force different practice using forms or at least monitor items that contribute to best practice

- Clinical efficiency programme: solution to allow letter following an outpatient appointment to be produced quickly through the selection of a template which is automatically populated with all the patient details and standard text. For every 5000-6000 appointments there is the potential to save 1 PA

3.3 Communicate efficiently and effectively within the Trust

This theme is focused on the 'instant communication' needs across STH and the wider partners in our network, looking at a combination of timelines, appropriateness and the travel consequences.

3.3.1 Avoid delays in communicating with the right person

The inability to connect and communicate with the right person about the right patient at the right time causes delays in providing patient care and time is wasted trying to contact the right person. Bleeping leaves the initiator not knowing if the recipient will respond, and the holder trying to juggle multiple requests for support concurrently, leading to missed responses. Live telephone communications are not always appropriate between staff as staff are mobile and unable to use their mobile phones due to the lack of mobile reception.

There is therefore a requirement to use technology to facilitate communication and promote collaborative working in a mobile way.

The requirement was expressed as:

- Lack of ability to speak rapidly to appropriate person – e.g. for immediate clinical guidance e.g. voice based communications, or instant messaging type functionality
- New intranet telephone directory.
- Collaborative working and sharing of information and learning points from other directorates
- People rarely answer the phone. Mobile phones are of limited use given the reception constraints
- Communication capability between GPs and consultants
- The ability for GPs (and others) to be able to identify specialists and speed access to results

3.3.2 Non-voice communications

This area covers communications to patients, as well as between clinician and other staff. Many clinical communications would benefit from being auditable to support governance and using asynchronous methods when speed of response is not as essential. Service managers within STH spend time communicating operational information on a frequent and on-going basis throughout the day. This is done through escalation meetings, face to face communication and numerous phone calls. These approaches, when compared to using technology, are time consuming and inefficient. There is therefore a requirement to use technology to support non-voice communications.

The requirement was expressed as:

- Reminder services to minimise DNA (did not attend) for outpatients
- Managed process for requests to review patients
- Information that needs to be communicated regularly - i.e. bed state, cancellation numbers etc. via something like twitter
- Promote using SharePoint to disseminate and share information to support staff engagement

3.3.3 Enable better team communications across locations

Enable remote, disparate teams to meet virtually without having to travel "back to base". The lack of ability for simple and quick instant messaging, video or other simple communications technologies means teams shy away from finding their own ways of effective working.

The requirement was expressed as:

- Mobile video/audio/web conferencing for teams at the end of the day and for meetings to avoid the "return to base", especially at weekends, and would also reduce travel ad save money
- Daily meetings between RHH and NGH with a need to share images – even though the trust operates within Sheffield, it takes 30 minutes to travel between sites and parking is a challenge. Video and document sharing are required

- Shortage of neurologists so the ability for a junior doctor on a ward round to 'video call' to a neurologist (in his office) for an opinion would be very good

3.3.4 Improve effectiveness and reduce travel for MDTs

Multi-Disciplinary Team meeting (MDTs) are mostly physical with little access to high quality videoconferencing. Travel is a major waste of time, even within Sheffield (with the time taken to park particularly). Staff are often unwilling to travel for a short slot within an MDT. STH support of services delivered in DGHs are often configured around MDT & OPD schedules rather than being flexible and patient centred due to the need to minimise clinician travel.

The requirement was expressed as:

- If consultants had access to multi-disciplinary information electronically, then there would be a reduced need for face to face meetings. For cross location MDTs, tele-conferencing is not sufficient – video and/or document sharing is essential
- MDT support into other hospitals. These MDTs will involve multiple people (on desktop or in a room) at STH and individuals from other Trusts who could join by PC, rather than travel. There would be more tertiary referrals if we could make this easier

3.4 Optimise the use of clinical resources and STH Assets

Many people raised the concern that they don't have knowledge of available resource and asset information to support basic management of services, or that infrastructure does not support their working practices.

3.4.1 Schedule & track multiple clinical resources optimally

Some clinical specialties require multiple resources in order to perform their services. Theatres need to schedule resources such as multi-disciplinary theatre teams, rooms, equipment, diagnostic services as well as scheduling patients for their whole pathway. Currently scheduling of disparate resources is undertaken using a combination of different electronic or paper systems.

Monitoring of real-time acuity in inpatient areas and referencing rostering systems could flag where staffing levels are a potential risk to quality of care.

The Trust operates a very successful medical equipment library, however several departments commented on the value of being able to track equipment, particularly where it moves between departments. Supplementary to this, tracking of assets enables prompt maintenance to be carried out as well as auditing capability.

There is therefore a requirement to be able to do enterprise wide scheduling and tracking, scheduling different resources across different services simultaneously.

The requirement was expressed as:

- Electronic booking across multiple services and resources - could we turn the doctor job plans into a schedule
- We want to be able to schedule multiple appointments and schedule resources at the same time as scheduling appointments
- Be able to track when equipment is not available due to maintenance or repair activities
- Be able to view pressures in the system; know where equipment is and what it is used for
- Supplement medical equipment library with a tracking system for medical equipment assets that move outside of the department
- Equipment challenges – needed right place, right time
- Patient case note tracking would be beneficial until the realisation of digitised records
- The ability to locate and contact essential support services such as facilities management and portering
- Auto-ordering of resources when they are used. e.g. from top-up trolleys

3.4.2 Optimise use of beds for patient care

Achieving an effective bed state and bed management is a time consuming and inefficient task utilising systems which are not core to providing clinical care. There is a need to ensure that maintaining a bed state is achieved derived from clinical care. There is separate identification of a need to coordinate beds with Hotel Services, bed maintenance and storage to ensure timely cleaning or replacement to bring beds back into use, linking this with patient based management this would support patient flow.

The requirement was expressed as:

- Real time bed management to review use of beds to ensure flexibility, particularly during seasonal fluctuations
- Develop an electronic bed simulation model to help in making informed choices for better use of beds for e.g. bay closures
- Manage the process for informing Hotel Services that beds need cleaning for the next admission and flagging when the bed is available again

3.4.3 Financial reporting to help decision making

During requirements gathering, clinicians often cited the need for greater transparency over performance, particularly in relation to cost data. Financial reporting on each service and their resources costs, will help the clinicians make right decision about the trade-offs between assets and services that use them. This will also inform the clinicians about the total cost of care provided.

The requirement was indirectly expressed in the form of solutions for cost savings, some of which are:

- Improve care group analysis infrastructure to benchmark costs.
- Achieve data feed between theatre cabinets and SLR database allowing individual costing of surgical procedures and benchmarking between surgeons
- Shadow monitor new HIV tariff changes to better understand implications for future funding

3.4.4 Provide immediate access to information

As a resource, staff waste considerable clinical time walking to and from PCs whilst on the ward to access information. Access to, and input of, information at the point of care should be immediate.

The requirement was expressed as:

- On ward rounds, clinicians are constantly back and forward between patients and PCs (to access X-rays, etc.). Access to this information at the bedside is essential. Devices are slow and take too long to log on. If a clinician finds a PC that hasn't already been turned on and is ready to use, he/she will just give up and find another one. In a patient consultation, technology should be invisible, instead, the clinician spends a lot of time logging in and looking at the PC and not at the patient
- Considerable time is wasted travelling between PCs and patients, and junior doctors writing notes on paper to inform rounds. This all causes delay and inefficiency

3.5 Provide the right clinical and administration guidance and intelligence

This theme covers a range of needs from effectively re-using raw clinical data, to ensuring that non-patient specific information and knowledge is available, to enable informed decisions to be made, and ensuring that staff can access training and learning when and where they need it.

3.5.1 Provide access to evidence, guidelines and information at point of care

The technological advances in healthcare over the last few decades have transformed levels of healthcare knowledge and models of delivery. Managers and clinicians have expressed the need to be armed with the latest knowledge bases and Trust standardised information at the point of care to support their decision making.

The requirement was directly expressed as*:*

- Access to Trust clinical guidelines, policies, protocols and handbooks
- Access to online validated knowledge sources e.g. Up-to-date[4] – online clinical decision support tool
- Policies & Procedures website is not easy to navigate, and when you do find resources they are often past review dates

3.5.2 Provide data and technical capabilities to enable the creation of clinical intelligence and guidelines from information sources

Capabilities need to be developed and the tools provided to generate business intelligence from raw clinical data. The tools should be able to provide a broad range of standard aggregation and reporting options to ensure all pertinent statistical information is available in near real time for service review.

The requirement was indirectly expressed as:

- We want to get the analysed data as information to ensure compliance and take proactive measures
- Access to Datix and Dr Foster systems
- To engage in benchmarking with other Directorates and providers with respect to new methods of care delivery. With the requirement to collect data, methods of collection and recording will need to be considered

3.5.3 Know current performance and compliance levels (e.g. via real time dashboards)

Most Trust KPI and compliance based monitoring is retrospective, often created from medical records after discharge. From managing beds and patient flow, to ensuring that clinical standards on Dementia or VTE assessment are being met, there are requirements to have the capability for real time monitoring for data so that the information available can be used for real-time decision making. This needs to be both for externally driven targets as well as known evidence based standards and good practice.

The requirement was expressed as:

- Ensure robust systems are in place to monitor performance against CQUIN targets and feedback results to relevant teams
- Electronic Patient Record with business rules forcing people to complete CQUIN documentation requirements i.e. VTE and dementia assessments
- Making paper and PC based quality compliance such as electronic Clinical Assurance Toolkit (eCAT) accessible on mobile devices
- Combined Performance Management Reporting systems
- Develop robust and realistic activity plans and measurement against them

3.5.4 Provide tools for effective Academic Health and Science Network (AHSN) secondary use of our information (e.g. research)

The focus of the AHSN is to bring together education and hospitals, in order to translate research into improved patient care. Informatics can help the research work by providing analysed data to provide relevant information to the AHSN.

The requirement was expressed as:

- Relevant aggregated patient data (in anonymous form to safeguard patient interests in line with Data Protection Act) for research purposes
- Enablement of research databases across directorates
- Need to be able to interrogate data for research purposes

[4] http://www.uptodate.com/home/

3.5.5 Deliver coordinated education systems and support

There were many references to educational systems and training for clinicians and support staff, and the difficulties in using existing resources where available. Some examples of this specifically identified a consequential impact on achievement of Trust KPIs.

The requirement was expressed as:

- STH Staff requiring research supporting software i.e. statistical packages/ reference packages
- Need a comprehensive and accessible training package – mandatory and some service specific
- Need for licensed reference manager software for non-honorary clinicians
- Simplified processes for booking and managing learning and mandatory training
- Availability of Trust e-learning from mobile devices and from home

3.6 Optimise communications with patients outside the hospital

3.6.1 Reduce the need for referral to STH

Primary and secondary care providers are looking for methods to locally manage more of their patients. STH clinicians want to support these processes whilst still allowing specialist input and avoid unnecessary referral. Sharing primary care records with hospital specialists asynchronously at times convenient to each has enabled more informed clinical decision making and reduced outpatient referrals. For GPs the service provides timely and helpful advice and supports management of Chronic Kidney Disease in the community.

The requirement was expressed as:

- eConsultation (a potential IT solution for connecting the patients with clinicians)
- Provide online services and screening test requesting for patients
- Provide direct advice and guidance to GPs

3.6.2 Reduce need for face to face contact

Directorates are looking for ways to reduce the numbers of outpatient contacts, both for the convenience of patients as well as to support efficiency savings. Currently face to face contacts across the NHS account for 90% of healthcare interactions. Every 1% reduction in face to face contact saves 200m across the NHS[5].

This requirement was expressed as:

- Tele-health and remote monitoring solutions to enable greater options of alternative types of patient & clinician contact, and to ensure it is managed in an appropriate manner to reduce outpatient appointments
- Web cam communication
- Tele-medicine to reduce the number of outpatient appointments
- Video consultations would help with reducing and managing outpatient workflow for prisons, where it is difficult to arrange appointments in advance (also true for others)

3.6.3 Simplify process of making appointments

Across Sheffield Teaching Hospital, GP's refer direct to specialities most commonly by sending a referral letter in the post. The referral is then graded by a consultant before an appointment is made by the speciality admin team. Uptake of Choose & Book across STH is as low as 20% and do-not-attend (DNA) rates are high; some specialities have DNA rates as high as 20%.

There is therefore a requirement to use technology to improve the process of managing outpatient appointments including allowing patients to make their own appointments.

[5] http://digital.innovation.nhs.uk/pg/dashboard

The requirement was expressed as:

- Uptake of Choose & Book (C&B) is low; lots of services manage their own bookings rather than adopt centralised referral model
- Patient based web / kiosk booking system
- Making I-refer (a potential IT solution for referring the patients) available internally and externally to the Trust

3.6.4 Expedite process of communication between patients and clinical staff

A major frustration cited during interviews was the delays in connecting patients with the clinical staff. The improvement of communication process between patients and clinical staff will go a long way in improving the patient experience. This will include simplification of forms and providing options to the patients for choosing the mode of communication.

The requirement was expressed as:

- Embed patient choice at centre of integrated sexual health service using menu driven booking systems – web based and manned telephone systems
- Patient clinical support via the Internet

3.6.5 Provide patients with access to their clinical information

The Information Strategy, The Power of Information[6] mandates that patients should be able to access their own records and contribute to them.

There is therefore a requirement to use technology to enable this.

The requirement was expressed as:

- Provide patients with copies of clinical exchanges in a form they want to receive.
- Improve the access of patients to their own case-notes. This is currently hindered by the number of systems used

[6] http://informationstrategy.dh.gov.uk

Corporate Requirements

Many of the corporate requirement themes have a direct relation with clinical themes, as they often share common processes and they may have common or shared solutions.

As most corporate functions also provide key services to clinical teams, simplifying and improving the efficiency of access and visibility to services will have a benefit throughout the organisation. This is both in releasing clinical time from finding and chasing paper to enabling service functions to reduce cost and improve efficiency. This challenge to reduce NHS bureaucracy is being taken up by the NHS Confederation[7] who have recently announced they will be setting a goal for all hospitals to reduce their bureaucracy by one third.

3.7 Provide effective non-paper based processes and information access

This theme is focused on simplifying the background paper based processes currently used to run the organisation and on providing improved and consistent information workflows for users and recipient teams.

3.7.1 Remove paper from processes

Within corporate services and across the organisation there is an abundance of paper form filling to request services, log issues and record statuses. This is time consuming and makes sharing information difficult (paper forms are often incomplete, get lost, they often need to be faxed, faxes are not always legible and pages go missing) and when it is received, it needs re-entering into other systems.

There is therefore a requirement to remove the paper from common processes.

The requirement was expressed as:

- Need for document management system to save money and reduce printing costs
- Need for electronic forms to remove waste and speed up process time
- Improve the use of electronic systems for stock control
- Electronic Asset Tracking system
- Effective Corporate Document management, rather than splitting information across a number of document management systems and the S drive
- Electronic patient record function including document management and manager self-service. HR are mostly paper based today, although they have a vision to be technology enabled in the future
- Avoid printing of very large quantities of paper through use of mobile technology

3.7.2 Access information where and when it is needed

Many staff work across multiple locations and often across multiple sites inside and outside of STH. Corporate information, such as access to forms and services is often only possible via form, fax or telephone. This means that staff do not have access to the information they need in the right place and at the right time. Access is also restricted internally due to the limited number of PCs available across the organisation.

Most corporate teams cited a need for instant access to, and input of information, on mobile devices both on and off site to facilitate meetings and effective working. However, there is no single view on what this device should be and may be role dependant, e.g. laptop, smartphone or tablet depending on need.

The requirement was expressed as:

[7] http://www.nhsconfed.org/priorities/latestnews/Pages/NHS-Confed-to-lead-review-of-bureaucracy-in-NHS-announces-health-secretary.aspx

- Need to work seamlessly across sites without carrying excessive paper
- A learning management system that supports access from outside of the trust
- Income generation – providing services to external organisations supported by IT systems

3.7.3 Eliminate use of wasteful information exchange mechanisms (e.g. post, fax etc.)

All directorates have expressed frustration at the inefficient exchange of information between departments and external teams and organisations. The most common one is the need to post, fax or physically transport information to other departments which takes time. It is then necessary to chase up with a phone call to confirm the department have received the information.
There is therefore a requirement to create and share information electronically.

The requirement was expressed as:

- End the need for shifting from faxing information / forms to communicate information

3.7.4 Share correspondence without using paper

Correspondence created by corporate directorates is commonly now shared via email wherever possible, but email does not readily facilitate managed workflows effectively. It also does not allow others to view the current status of requests or manage the processes for queries and updates, which often require further phone calls and faxes.

The requirement was expressed as:

- Completing online forms to drive a workflow e.g. completing sick leave forms

3.7.5 Provide access to information across boundaries

There are multiple boundaries within the organisation where information flows are problematic.

The requirement was expressed as:

- There is a disconnect between clinical/corporate and financial systems
- Business intelligence is needed on the transactional side of e-commerce and workflow
- New system procurements need to include ability for Information Services to confirm who commissioner of activity is
- There is an increasing need to support analysis, intelligence and more complex commissioning data requirements that will require an underlying data warehouse for joined clinical and corporate information.
- Access to information sources is often seen as ‘owned’ in silos within the organisation stopping effective use of the information we hold

3.7.6 Provide effective ordering and requesting services

Ordering and requesting of services needs to support open and visible workflows so that requestors and recipients can view status and manage the process of service delivery without creating additional contacts and effort where it is not required.

The requirement was expressed as:

- Self-service processes
- e-Expenses
- Supplies ordering
- Staff forms
- IT account requesting / system access requests

3.8 Communicate efficiently and effectively within the hospital

Staff are starting to use multiple channels to communicate effectively, often preferring personal devices over corporate supplied ones. There is a need to provide an effective infrastructure to support different methods.

3.8.1 Avoid delays in communicating with the right person

The inability to connect and communicate with the right person or team at the right time causes delays in providing patient care and other services whilst time is wasted trying to contact the right person. Bleeping leaves the initiator not knowing if the recipient will respond and the holder trying to juggle multiple requests for support concurrently leading to missed responses. Ringing busy telephone lines for common services like IT Service Desk can lead to delays in services working effectively.

The requirement was expressed as:

- Phone line tends to be engaged for Porter Services. There is a second phone number that no one uses, even so limited ways of accessing the service
- Create a 'Contact Centre' for IT Service Desk

3.8.2 Non-voice communications

This area covers the same issues as documented in the clinical requirements, recognising the corporate teams face many of the same issues as clinical ones, and that often the communication issues are between clinical and corporate teams.

3.8.3 Enable better team communications across locations

This area covers the same issues as documented in the clinical requirements, recognising the corporate teams face many of the same issues as clinical ones, and that often the communication issues are between clinical and corporate teams.

3.8.4 Improve effectiveness and reduce travel for formal meetings

Large formal meetings in STH are all held physically with no option to access high quality videoconferencing. Travel is a major waste of time, even within Sheffield (with the time taken to park particularly). Staff are often unwilling to travel for a short slot within a meeting. More access to desk based or higher quality conferencing resources is needed.

Requirements expressed as:

- If staff had access to all resources and information electronically, then there would be a reduced need for face to face meetings. For cross location meetings, tele-conferencing is often not sufficient – video and/or document sharing is essential

3.8.5 Provide services to enable departments to publish and deliver the right administrative and guidance information to staff

Most departments currently use the Intranet to publish and deliver information, but it is not always in the most accessible, searchable and current state. It is also only available via existing Trust PCs. More tools and access is needed to allow ease of transfer between guidance and initiating forms, workflow or discussion. This needs to be maintained within an appropriate governance framework to ensure consistency and appropriateness.

3.9 Optimise the use of corporate resources and assets

STH is a vast organisation with resources and assets dispersed across multiple sites throughout the city. The level of logistical support and the scale of effort required to locate, deliver and manage them is considerable. Many people raised the concern that they do not have knowledge of available resource and asset information to support the basic management of their services, or that corporate infrastructure does not support their working practices. Technology could be employed to enhance the utilisation of these resources.

3.9.1 Schedule & track resources optimally

A number of corporate services have resources to help perform their services. Ownership and scheduling of even simple resources such as meeting rooms can often rely on good will, prior knowledge and multiple methods of contact / booking.

There is therefore a requirement to be able to do enterprise wide scheduling and tracking, scheduling different resources across different services simultaneously.

The requirement was expressed as:

- The ability to locate and contact essential support services such as facilities management and portering
- Room booking for meetings
- eRostering including live management data

3.9.2 Financial reporting to help decision making

Effective financial reporting relies on all relevant information being available in a timely manner for analysis. Improved tools and views of aggregated information to support recipients of the analysis will also help improve uptake and understanding of the information and enable more changes to be made.

The requirement was expressed as:

- There is a disconnect between clinical/corporate and financial systems – lack of integration with others, for example, estates
- Extra functionality required in finance systems such as Auto-Upload
- Understanding the costs of services

3.9.3 Provide immediate access to information and analysis

As a resource staff waste considerable time trying to summarise and understand existing data / information. There is a clear need to allow role based access to simple toolsets and pre-configured summary views / dashboards of core information that allows analysis and drill down through data to understand the detail behind it.

The requirement was expressed as:

- Analysis of workforce information - possibility that something like QlikView would support data analysis
- Understanding patient reported performance data
- Lack of an organisational Information Strategy
- Lack of a core data warehouse
- Overall concern that full business intelligence is not being flagged as a requirement by many services

3.10 Support assurance and governance across STH

Corporate assurance and governance functions across STH require access to diverse information sets that need to be collated in reportable and verifiable ways. It is critical that awareness of these needs is taken into account at all stages of this strategy and implementation.

3.10.1 Provide services to support monitoring requirements

All corporate departments have internal and external needs to monitor report and support within their areas, and more widely across the organisation. They need to access timely information in a simple way.

The requirement was expressed as:

- Patient feedback and 'friends and family' testing
- Patient experience based performance data
- Audit of effectiveness of corporate processes
- Corporate compliance with mandated / contracted targets, e.g. appraisal
- Coordinating systems to support monitoring compliance needs from NHSLA, IG and inspection visits
- Performance ratings at a button press
- Return on investment for training (analysis) enabling managers to evaluate value of training

3.10.2 Ensure that assurance and governance input has been assessed and included in key technology themes within the organisation.

Coordinated governance and assurance involvement in changes to ways of working and new projects will be critical in ensuring that reporting and validation processes are incorporated in the future. This should facilitate a reduction in additional or duplicate processes that are created to support these needs and increase the effectiveness of these processes.

The requirement was expressed as:

- All services that we provide have a governance and assurance impact. Effectively monitoring and recording these is key
- Technology is a change enabler, and it is the change that needs appropriate governance and assurance

Emerging Requirements Themes

Some key themes have emerged from the initial requirement gathering exercise that do not fit as requirements for Technology, but they were significant enough to be logged for future consideration.

3.11 Develop Business Capability

An emerging theme within discussions with clinical directorates has been the need for directorates to develop their business capabilities to support their desire to pursue additional sources of income. Currently this is in its infancy and the requirements for ICT to support it are not yet clear beyond the needs identified elsewhere, but it is apparent that these needs will emerge with more clarity during the life of this strategy.

It is clearly recognised STH have an opportunity in many disciplines to expand services locally, nationally and even internationally – as well as a requirement to respond to growing competitive threats. To be successful will require the adoption of new cultures, processes and technology to develop, scale and market services to provide a high level of customer service.

Initial themes developed are:

- Business agility
- Commercial acumen
- Commercial customer service and support
- Scalable location independent services
- Supporting corporate directorates in procurements and supplier management

3.12 Provide usable and well supported technology

During face to face meetings with Directorates a number of key requirements were raised that relate more to the Informatics service rather than the clinical and corporate information and technology problems and requirements.

It is recognised that in order to address the organisational requirements stated above, a more sophisticated ICT function is required, one that is capable of shaping and influencing the strategic initiatives, rather than simply reacting to tactical demands. Informatics will therefore need to provide ICT services and shared capabilities that can support a broad set of stakeholders both from a functional and capacity perspective. The requirement interviews clearly indicated that, whilst there was disquiet about the performance of some Informatics services, there was also positive feedback about the people on the ground.

The reasons are many and complex, but common themes are that Informatics does not provide the technology to support improving the situation and the organisation does not provide the drivers to encourage the cultural change other than in those areas that already keep embracing it.

The requirement was expressed as:

- Make systems and support available when and where it is needed (24/7)
- Make training effective
- Make systems easy to use
- Deliver systems that perform
- Simplify access to systems
- Provide a one stop shop for ICT
- Provide choice of platform (BYOD)
- Provide resilience, failover, reliability and security

The feedback can be categorised into a driving set of principles for taking ICT forwards at STH that will be developed in the '**Technology Strategy and Roadmap – Part 2 the Strategy'** document that supports this series.

- Service Principles: As important as having in place the IT solutions themselves, is ensuring that there is parallel service delivery which ensures their effectiveness. A set of 'service

principles' have been defined for the new Informatics service, all of which reflect staff feedback.

- Architectural Principals: It was clear that it is not enough to buy the best IT solution for a specific need. It is very important that solutions can be integrated to be easy to use, effective and efficient.

4 How these strategic requirements support the Trust's 5 year aims and objectives

The solutions identified to these requirements will deliver a range of improvement opportunities that will help the Trust to realise its five year strategic aims and objectives.

4.1 Mapping to Trust's aims and objectives

Below is a mapping of the Technology requirements to the Trust's aims and objectives.

Corporate Objectives	High Level Requirements	Comments
Deliver the best clinical outcomes	Manage patient flows	Achieving best clinical outcomes can only be delivered with a combination of many disparate requirements being brought together. The principle to supporting this should be ensuring that clinicians have access to the right information, when and where they need it.
	Provide clinical escalations	
	Move information with patient across boundaries / silos	
	Access patient / clinical information when and where we need	
	Provide access to evidence, guidelines and information at point of care	
	Optimise use of beds for patient care	
Provide patient centred services	Simplify process of making appointments	Supporting with technology the delivery of services that enable patients to interact with STH in a way they want, and eliminate wasteful processes that take clinical staff away from providing care. Using technology to truly improve a patient's experience.
	Expedite process of communication between patients and clinical staff	
	Provide patients access to their clinical information	
	Reduce need for face to face contact	
	Reduce the need for referral to STH	
	Move information with patient across boundaries / silos	
Employ caring and cared for staff	Enable better team communication across locations	A key way for informatics to support this is by ensuring we remain fully engaged with the organisation and provide the service and access to technologies that meet their needs.
	Non-voice communications	
	Make training effective	
	Make systems easy to use	
	Make systems accessible	
	Make systems that perform	
	Make access to systems quick and easy	
	Provide choice of platform (BYOD)	
	Intranet	
	Make systems and support available when and where we need (24/7)	
Spend public	Minimise Input duplication in clinical processes	Delivering the technology to support improved efficiency and use of our resources will be a shared

Corporate Objectives	High Level Requirements	Comments
money wisely	Eliminate use of wasteful information exchange mechanisms (e.g. fax)	challenge across the organisation with distributed support and ownership of benefits from investment.
	Use existing information to create clinical correspondence without rekeying known information	
	Remove paper from clinical processes	
	Know current performance and compliance levels	
	Optimise use of beds for patient care	
	Financial reporting to help decision making	
	improve effectiveness and reduce travel for MDTs	
	Reduce need for referral to STH	
	Schedule and track multiple clinical resources optimally	
Deliver excellent research education and innovation	Deliver coordinated education systems and support	Provision of an adaptive environment to support research and innovation within the technology estate is core to STH and its future.
	Provide tools for effective AHSN and research secondary uses of our information	
	Provide data and technical capabilities to enable the creation of clinical intelligence and guidelines	

5 Prioritisation Framework

The demand for technology solutions far outstrips the resources available and it is envisaged that this situation will remain for the foreseeable future. Therefore a prioritisation process is required as part of the on-going governance process. The key steps in the prioritisation process are:

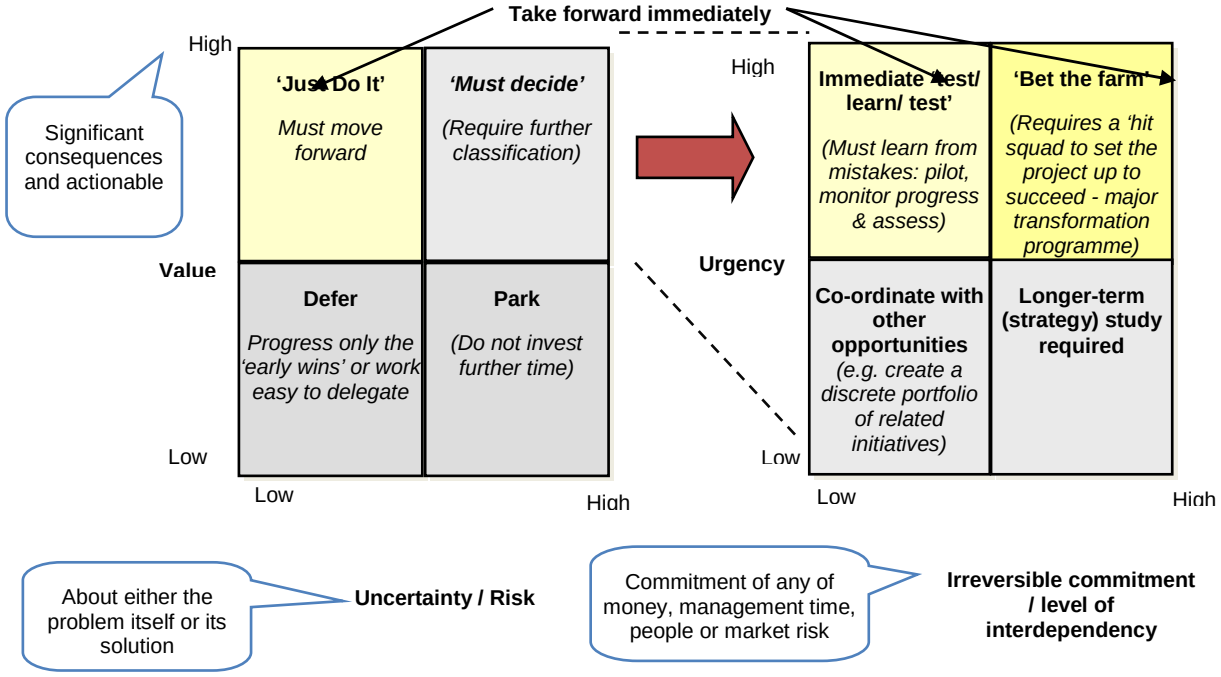
- Determine the 'must do' key foundation and enabling projects. Scope the resource and financial impact of completing these within the required timescales
- For all other candidate projects, map the project benefits and timeframes. Methods for completing this task range from highly complex modelling to brown paper and post-it notes
- Identify critical high level dependencies
- Match the candidate projects against the objectives and approved selection criteria, including risks and constraints (e.g. resource or financial constraints) using a prioritisation framework to create a priority matrix
- Select projects comprising the overall programme of work

Steps in this process are iterative – as awareness of existing initiatives increases and the understanding of their impact on the programme (which is also being refined) is increased.

5.1 Creating a priority matrix

The scoring framework is based on two main parameters:

- Value
- Risk



To support the decision making process, additional scoring methods can be used to ensure consistency of results. An example framework is presented overleaf.

5.2 Scoring framework to support prioritisation

5.2.1 Value measurements:

Parameter	Description	Scoring Guidelines			
		Low -1	Med – 2	Med – 3	High – 4
Strategic alignment to Trust's objectives	Strategic alignment to Trust's core aims and objectives	Does not directly or indirectly enable any Trust's core objectives	Indirectly enable a few of the Trust's core objectives	Directly enable a few or indirectly enable all Trust's core objectives	Directly enable all of the Trust's core objectives
Business perception	Number of times the requirement was mentioned as critical by the business in various interview opportunity	1 time	2 times	3 times	More than 4 times
Tangible benefits	How much operational savings are sought with this change	Less than £100k / year	£100k-£500k / year	£500k-£1m / year	Over £1m / year

5.2.2 Uncertainty measurements:

Parameter	Description	Scoring Guidelines			
		Low -1	Med – 2	Med – 3	High – 4
Urgency	Is the requirement mandated to be delivered by a fixed date due to regulatory laws, market forces, or internal cost saving objectives? Will the problem exacerbate with time?	Benefits not mandated by a fixed date	Benefits is a must in five year time frame	Benefits is a must in two-three year time frame	Benefits is a must in an year time frame
Total cost / effort	How much cost and effort will be required for the project implementation?	Over £2m	£1m-£2m	£500k-£1m	Less than £500k
Time to benefit	How soon will the benefits be realised after the project implementation	Over a year	6months to an year	Less than 6 months	Immediately

6 Next Steps - Maintaining the requirements catalogue

This document is a living document that tracks high level requirements and changing priorities on an on-going basis to provide the Trust with the pragmatic roadmap and some degrees of freedom to adapt to the changes in the environment. Ownership of the requirements will be retained by a new clinically lead governance body for Informatics, the Technology Board (see appendix B). Maintenance and updates will be conducted by the new Informatics Strategy and Planning function. Updates at least annually will be presented to the Technology Board and organisation.

Appendix A: Key Requirements from Care Groups and Corporate Services

This chapter documents the key requirements for each group that were gathered and analysed to determine the strategic requirements. Some corporate directorates are still to have requirements gathered.

A.1 Emergency Care

Key Requirements	Strategic Themes
Technology to provide wireless data capture to remove the need for proformas and retrospective data entry	Optimise patient flow
The ability to schedule and manage patient flow along a pathway where a single hospital visit requires multiple diagnostics scheduling	Optimise the use of clinical resources and STH assets
A system to automatically reschedule / cancel all appointments in a patient's journey, e.g. respiratory clinic and physiology appointment	Optimise the use of clinical resources and STH assets
Comprehensive blood monitoring systems for specific drugs / diseases	Optimise patient flow
Electronic document management	Provide single view of all relevant patient information
GP patient record (SystmOne) access for outpatients	Provide single view of all relevant patient information
Speech recognition based dictation	Optimise patient flow
Mobile Devices on the ward	Provide single view of all relevant patient information
Data sources electronically combined to enhance coding	Optimise the use of clinical resources and STH assets
Electronic document management	Provide single view of all relevant patient information
Replacement of patient tracking system	Optimise patient flow
EPR / Integrated records	Provide single view of all relevant patient information
Effective Data Transfer procedures as patient move between services	Optimise patient flow
Secure email to promote GP communication	Optimise patient flow
Difficult to share information particularly clinical correspondence	Provide single view of all relevant patient information
Image capture, storage and retrieval for image viewing for endoscopy images and capsule endoscopy service.	Provide single view of all relevant patient information
Multiple Referral forms and processes	Optimise patient flow
Develop an electronic solution for the new Transfer of Care Document to remove waste through paper based data capture and faxing and increase data accuracy	Optimise patient flow
Respiratory physiology results in ICE	Provide single view of all relevant patient information
Research database that reduces duplicate entry	Provide the right clinical and admin guidance and intelligence

Key Requirements	Strategic Themes
Technology to reduce cross city travelling	Communicate effectively and efficiently within the Trust

A.2 Obstetrics, Gynaecology, Neonatology

Key Requirements	Strategic Themes
Replace Evolution Maternity System by combined JMIS / DigiPen solution.	Optimise patient flow
Remove unnecessary duplication of data and double data entry.	Optimise patient flow
Ability to provide triage, decision support and call recording for incoming telephone calls from patients.	Optimise patient flow
Facility for patients to be able to use an on-line referral system to midwives and to make on-line appointments.	Optimise communications with patients outside the hospital
Provision of hand-held devices for use in a clinical environment.	Provide useable and well supported technology
Secure communication (such as automated electronic document transfer) with other health care organisations.	Optimise patient flow
Support for the use of in-house or bespoke developments to provide "quick fix" solutions (e.g. in order to meet NHS mandatory requirements).	Provide useable and well supported technology
Clinical bed state management - i.e. beyond what is available in the existing PatientCentre PAS.	Optimise patient flow
Provision of secure data storage on hand held devices.	Provide useable and well supported technology
Support for multiple clinical pathways associated with admission to the labour ward - including the ability to link to external systems such as transport.	Optimise patient flow

A.3 Surgical Services

Key Requirements	Strategic Themes
Electronic booking across multiple services and resources - could we turn the doctor job plans into a schedule.	Optimise the use of clinical resources and STH assets
Existing systems are cumbersome and require a lot of effort - information we need available electronically and not more than 2 clicks away.	Provide a single view of all patient information
Patient tracking / patient flow solution - priority to manage inpatient flows; know where patients are, what's happening to them, what they are waiting for. Know today whether we will have enough beds tomorrow to undertake all our elective work.	Optimise patient flow
Electronic lists for in and out patients	Optimise patient flow
Need to improve two way communication between services - driven by paper form filling.	Optimise patient flow
There are not enough PCs on the wards.	Provide useable and well supported technology
Information that needs to be communicated regularly - i.e. bed state, cancellation numbers etc. via something like twitter.	Communicate effectively and efficiently within the Trust

Technology to reduce cross city travelling.	Communicate effectively and efficiently within the hospital
If we could just stop faxing that would be great - it takes ages to fax, pages go missing and then we have to follow up the fax with a phone call.	Provide a single view of all patient information
Could we provide patient information via the internet?	Optimise communication with patients outside the hospital

A.4 Head and Neck Services

Key Requirements	Strategic Themes
Complete the migration of paper based processes to use the departmental Medisoft System. (Note that no commercial EPR systems provide the specialty specific requirements incorporated into the Medisoft System.)	Provide a single view of all relevant patient information
Include Neuroscience test results such as EEG/EMG on the ICE Reporting System.	Provide a single view of all relevant patient information
Complete the implementation of the Dental EPR system and supporting technologies to become paper-light	Provide a single view of all relevant patient information
Complete the integration between the Medisoft departmental EPR and the OIS ophthalmic imaging system.	Provide a single view of all relevant patient information
Provide effective remote access - e.g. via portable iPad tablets that can be used to view patient records and PACS images by on-call clinicians. (This is essential to support the Major Trauma Centre.)	Provide useable and well supported technology
Develop a strategy and the necessary support for remote clinics - e.g. by use of mobile van. (This strategy would include the existing Diabetic Eye Screening Service.)	Provide a single view of all relevant patient information
Provide integration between Medisoft System and Trust processes for e.g. transfer of letters and prescriptions.	Provide a single view of all relevant patient information
Provide support for the development of commercial services.	Develop Business Capability
Provide improved support for collaborative on-call arrangements covering "North Trent" and collaborative communication between GPs and Trust consultants.	Optimise patient flow
Provide access to Trust systems from other hospitals and to other Trusts' systems from STH in order to support the Neurology clinical network.	Provide a single view of all relevant patient information
Support the migration and inclusion of Oral Pathology database into STH infrastructure	Provide a single view of all relevant patient information
Provide support for e-learning - in connection with training of staff on rotation as part of the Neurology clinical network.	Provide the right clinical and admin guidance and intelligence
Provide "single sign-on" facilities to overcome having to log on to multiple different systems.	Provide useable and well supported technology
Provide support for efficient review of test results - e.g. by sending alerts when results are ready and by providing access to effective clinical summaries while reviewing	Optimise patient flow

results.	
Enhance and extend the existing Stroke Telemedicine System.	Optimise patient flow

A.5 Diagnostic and Therapeutic Services

Key Requirements	Strategic Themes
Complete delivery of order communications project	Optimise patient flow
Order communications for general practice	Optimise patient flow
Paperless reporting	Optimise patient flow
Ensure patients receive care in a timely way	Optimise patient flow
Trust-wide document management and forms collection	Provide a single view of all relevant patient information
Process management (through workflow)	Optimise patient flow
Portal based access to electronic records/systems	Provide a single view of all relevant patient information
Ability to produce outcome monitoring data from available clinical systems	Provide the right clinical and admin guidance and intelligence
Need to support big data requirements now and in the future – Gene sequencing computations	Provide the right clinical and admin guidance and intelligence
Enhance network wide system communications	Optimise the use of clinical resources and STH assets
Improve ability for pathologists and GPs to communicate directly	Communicate efficiently and effectively within the hospital
Enable a Customer Relationship Management function to help support commercialised activities	Develop Business Capability
System to manage, track and report on activity / referrals and support centralised referrals	Optimise patient flows
Provide lab to lab communication - i.e. direct data transfers.	Optimise patient flows

A.6 Specialised Cancer, Medicine and Rehabilitation

Key Requirements	Strategic Themes
Provide an integrated patient information system across acute and community services. (I.e. link department Assays system and community / primary care SystmOne.)	Provide a single view of all relevant patient information
Provide a Trust-wide EPR (e.g. to include clinical correspondence and clinical images)	Provide a single view of all relevant patient information
Enable access to systems at other Trusts and access from other Trusts to STH systems e.g. to look up test results.	Provide a single view of all relevant patient information
Provide support for telehealth such as remote monitoring via a web based patient portal or teledermatology by use of web transfer of images.	Provide useable and well supported technology
Provide improved communication facilities between GPs and STH consultants.	Optimise patient flow

Key Requirements	Strategic Themes
Provide support for the use of mobile devices in a clinic environment.	Provide useable and well supported technology
Provide support for patient check-in and patient tracking in a clinic environment.	Optimise patient flow
Provide access to Summary Care Record.	Provide a single view of all relevant patient information
Provide support for spinal commissioning dataset collection and submission	Provide a single view of all relevant patient information
Provide support for sharing care with clinical network Trusts - via e.g. network based clinical portal.	Provide a single view of all relevant patient information
Provide a secure EPR environment for GUM patients while also linking to the Trust EPR for support of e.g. HIV patients.	Provide a single view of all relevant patient information
Provide support for e-consultations.	Optimise communication with patients outside the hospital
Provide web based and kiosk based patient booking systems.	Optimise communication with patients outside the hospital
Provide support for web portal based business developments such as on-line procurement of sexual health related products.	Develop business capability
Enable EPR systems including GUM Excel care to support research requirements and statutory data requirements.	Provide the right clinical and admin guidance and intelligence

A.7 South Yorkshire Regional Services

Key Requirements	Strategic Themes
Access to laboratory Results performed within DGHs	Provide a single view of all relevant patient information
Service would like to become a paperless department	Optimise patient flow
No formal logging of jobs / tasks and status updates to know where patients are at in journey. Example given of managing requests on ward round leads to extended LOS	Optimise patient flow
Provide direct Advice & Guidance to GPs	Optimise patient flow
Ability to contact right person first time during emergencies	Communicate efficiently and effectively within the hospital
Virtualise Local MDTs	Communicate efficiently and effectively within the hospital
STH need to be more aggressive in marketing services to ensure patients on fringe of borders are not referred elsewhere. Offering innovative technology based services will support this	Develop business capability
VitalPac is essential to reduce mortality rates, but needs to link to Hospital at Night services	Optimise patient flow
Patient Information Leaflets, would like to deliver them to patients via alternative means	Provide a single view of all relevant patient information

Key Requirements	Strategic Themes
Need to be able to search information – i.e. know which patients have had a specific drug or used a specific device	Provide the right clinical and admin guidance and intelligence
Can't get echo and other investigation reports into ICE	Provide a single view of all relevant patient information
Access to patient information held by other acute services i.e. notes and clinical correspondence.	Provide a single view of all relevant patient information
Access to patient information near to the patient	Provide useable and well supported technology
No access to STH Information when in off-site clinics	Provide useable and well supported technology
Lots of duplication and re-entry of data between paper and electronic systems	Optimise patient flow

A.8 Operating Services, Critical Care and Anaesthesia

Key Requirements	Strategic Themes
Provide facilities to enable care of Critical Care patients to be shared across the "North Trent" clinical network. (This would include both viewing of clinical data and improved information exchange to support patient transfers.)	Optimise patient flow
Provide support for scheduling of multiple resources in the operating theatre environment.	Optimise the use of clinical resources and STH assets
Provide joined-up information from multiple systems e.g. to enable attribution of costs to patient episodes.	Optimise the use of clinical resources and STH assets
Provision of mobile devices across OSCCA together with web based access from mobile devices to key applications such as ORMIS.	Provide useable and well supported technology
Provide electronic anaesthetic record (potentially linked to monitors) accessible from mobile devices.	Provide useable and well supported technology
Provide effective document management system for clinical guidelines.	Provide the right clinical and admin guidance and intelligence
Provide support for equipment tracking.	Optimise the use of clinical resources and STH assets
Improve information transfer processes from STH to GPs - e.g. episode summary for critical care stay.	Optimise patient flow
Provide support for initiatives such as private pain clinics.	Provide a single view of all relevant patient information

A.9 Community Services

Key Requirements	Strategic Themes
Poor connectivity on existing mobile device estate.	Provide usable and well supported technology
Not enough PCs	Provide usable and well supported technology
GPs do not provide access to Shared data through SystmOne	Provide single view of all relevant patient information
Need to record information in patients' homes and leave a	Provide usable and well supported

Key Requirements	Strategic Themes
copy	technology
Access to other trust systems such as PACS/ICE/PAS etc.	Provide single view of all relevant patient information
Wish to make use of emerging technology such as tablet devices, smartphones, digital pens etc.	Provide usable and well supported technology
Would like to see integration between systems (such as SystmOne and Patientcentre	Provide single view of all relevant patient information
Need linkage with A&E Systems	Provide single view of all relevant patient information
Would like eRostering/scheduling system – perception that Community Services needs are not considered when corporate level purchases are made.	Provide single view of all relevant patient information
Assistive Technology – need remote monitoring and alarms. Must consider standardisation and integration with Existing/emerging systems	Provide usable and well supported technology
Video conferencing for meetings	Communicate efficiently and effectively within the Trust
Video conferencing to support work out of care homes	Optimise communications with patients outside the hospital (TRUST)

A.10 Finance

Key Requirements	Strategic Themes
Improve the use of electronic systems for stock control. Around 40% of stock control and routine replenishment is currently supported by PDA and Barcode	Remove Paper from Processes
Extra functionality required in finance systems such as Auto-Upload? Authorised signatory database Other requirements: e-Expenses, electronic asset tagging, Cashiers?	Remove Paper from Processes
Document Management – Storing documents on both DocuShare and S drive cumbersome	Remove Paper from Processes
A quick win would be online banking	Remove Paper from Processes
There is a disconnect between clinical/corporate and financial systems – lack of integration with for example Estates	Provide access to information across boundaries/Systems integration
Requirement for Business Intelligence on the Transactional side of e-commerce and workflow – currently done via Excel and Access DB	Provide access to information across boundaries/Systems integration
Wireless connectivity for laptops a quick win – Tracey to progress	Provide usable and well supported technology
PC infrastructure slow and unreliable (frequent crashing)	Provide usable and well supported technology

A.11 Hotel Services

Key Requirements	Strategic Themes
Number of PCs and BlackBerrys slowly increasing however there is still a small shortage in PCs. PCs are also out of date	Provide useable and well supported technology

and refresh is required.	
Help with Procurement from IT would be useful it would be beneficial to get help with procuring systems and ensuring requirements are fulfilled through supplier.	Provide useable and well supported technology
Automation of some processes and cutting some stages out to make it more efficient (this is not all necessarily IT).	Provide effective non-paper based process and information access
Complaints procedure - there is no profiling on data. Information collected should be integrated and produce valuable insights.	Optimise the use of corporate resources and assets
No Integration or communication of other departments systems. It would be useful for other departments to share their data which can be used by Hotel Services and this would remove unnecessary duplication of work.	Provide effective non-paper based process and information access
Phone line tends to be engaged for Porter Services. There is a second phone number that no one uses, even so limited ways of accessing the service	Communicate efficiently and effectively within the Trust
Significant admin within team. Working towards being paperless may be an option but would require training on systems that replace paper admin.	Provide effective non-paper based process and information access
Domestic Services do a lot of auditing and they use a few handheld devices amongst department, however there are not enough. Need for a quicker easier away of auditing around hospitals.	Provide effective non-paper based process and information access
Enabling patient choice - e.g. patients being able to choose what they want for lunch/dinner off a menu.	Communicate efficiently and effectively within the Trust
Access to video conferencing - for example dealing with solicitors, global contacts etc. Cross trust communications could be improved.	Communicate efficiently and effectively within the Trust

A.12 Patient Partnerships

Key Requirements	Strategic Themes
Provide patients with technology and the opportunity to feedback on our services	Provide usable and well supported technology
Support delivery of customer services platforms	Provide effective non-paper based process and information access
Enable effective analysis of feedback and performance	Optimise the use of corporate resources and assets

A.13 Information Services

Key Requirements	Strategic Themes
Involvement in procurement of new systems to ensure corporate information needs are conformed to in contract	Provide the right clinical and admin guidance and intelligence
Improved tools to deliver Business Intelligence to organisation in a usable manner	Provide the right clinical and admin guidance and intelligence

Key Requirements	Strategic Themes
Creation of a central data warehouse	Provide the right clinical and admin guidance and intelligence
Central agreements with all Information Asset Owners that data in departmental systems can be aggregated with appropriate measures in a central warehouse	Provide the right clinical and admin guidance and intelligence
Automated updates from NHS Spine to PAS to maintain correct GP and commissioner details	Provide the right clinical and admin guidance and intelligence

A.14 Human Resources

Key Requirements	Strategic Themes
Electronic patient record function including document management and manager self-service. HR are mostly paper based – needs to change	Provide effective non-paper based process and information access
Payroll data is 2 months out of date – needs to be more timely	Provide effective non-paper based process and information access
Performance ratings at a button press	Optimise the use of corporate resources and assets
Move to paperless	Provide effective non-paper based process and information access
eRostering including live management data	Provide effective non-paper based process and information access
Currently not compliant with CQC on appraisal recording	Support assurance and governance within STH
A Learning Management systems that supports access from outside of the trust	Communicate efficiently and effectively within the Trust
Mobile Technology – online, off site, access to e-portfolio from home	Provide effective non-paper based process and information access
Learning for patient's e.g. how to manage diabetes – link with clinical requirements	Optimise communication with patients outside the hospital
Need to make extended use of ESR – already have "basics" but want to leverage usage	Provide effective non-paper based process and information access
Access to data at the right time (mobile working)	Provide effective non-paper based process and information access
Voice recognition for example in tribunals	Provide effective non-paper based process and information access
Workflow systems e.g. for pre-employment screening and document transfer	Provide effective non-paper based process and information access
Junior Doctors and the use of lots of external systems – lack of compatibility and no integration	Provide effective non-paper based process and information access
Re-validation – lack of systems integration (providing data out of the trust)	Provide effective non-paper based process and information access

Appendix B: Proposal to establish a Technology Board

Boardroom

Following on from the technology presentation at the TEG meeting on the 23rd January 2013, one of the recommendations was to establish a Technology Board to oversee the development and implementation of the Trust's technology strategy.

These papers set out the proposed goals and remit of this Board and asks TEG to approve this and to consider who the members should be.

Why does the Trust Need a Technology Board?

Effective governance of an organisation's technology agenda is always a challenge and in the current economic climate and technology driven culture, it's harder and yet more important than ever. The challenges that health care organisations (including STH) face with their technology agenda include:

- Managing the tension between strategic projects and operational issues because technology is both a critical enabler to organisational strategy and also required for the day-to- day operations of the business.
- Decisions regarding big technology projects that could consume large amounts of resources (time and money) such as an Electronic Patient record.
- The greater appetite for new technology and information with organisations wanting to use enterprise Business Intelligence, advanced analytics, big data, systems to improve patient engagement and innovative technologies.

Additionally, within STH, there is a growing clinical and managerial demand for improved technology which is being driven by the need to make efficiency savings, the need to improve productivity, the desire by staff to adopt and use new technologies and the recognition that technology can be a strategic enabler for the organisation.

In response to this, the Trust is in the process of developing a new technology strategy and good governance will be essential to its success. Without effective governance the Informatics Director will be forced to focus on tactics rather than strategy and the opportunity to exploit technology as an enabler to organisational strategy will be missed.

What does good technology governance look like?

Good technology governance is much more than just deciding project priorities, it ensures that the organisation's strategy is achieved by:

- Evaluating stakeholder needs, conditions and options
- Setting direction through guiding principles, prioritisation and decision making
- Owning the Technology strategy
- Monitoring performance, compliance and progress against agreed direction and objectives
- Relating to other executive committees and functions (having cross over members)
- Providing transparency through communications and compliance

Without good technology governance the following issues can exist (most of which can be found in STH today):

The mechanisms to make IT-related decisions are unclear, slow and sometimes contradictory	IT projects have difficulty aligning with other governance bodies such as CIT, BPT,TEG
Senior management feels there is low value from IT related investments	The organisation initiatives are mistakenly viewed as 'IT Projects'
Senior management cannot explain IT governance	Difficulty engaging non-IT execs
IT is a barrier to implementing new strategies	Inappropriate placement of decision making
Led and dominated by IT	Lack of transparency
Over reliance on informal mechanisms to get things done	Seemingly infinite number of 'little projects' of equal (urgent) priority
IT management focussing on tactical issues rather than strategic problems	Demand for IT typically far exceeds supply
Lack of clear direction	A belief that standards inhibit creativity

The Proposal

The Trust will create a clinically led Technology Board that will oversee all aspects of the technology agenda; governance; strategy; finances and communications. This Board will own the Technology strategy and a high level set of technology principles against which all technology development requests can be evaluated. This will enable a federated model of governance for the Trust where there is a centralised oversight, a core budget and an overarching technology strategy whilst still allowing directorates some freedom to operate providing their proposals meet the technology principles and can be funded.

The Board will maintain a high level oversight over all aspects of technology development and will also lead the organisation by becoming technology proficient. It will avoid having endless meetings focussing on the detail which can be managed in the supporting groups set up to support it.

The reason for proposing a clinically led Technology Board is in order to create a clinical technology vision. Industry research tells us that very few healthcare providers spend sufficient time and effort on creating a detailed long term clinical IT vision, and as a result, have difficulty selecting and implementing clinical systems, not to mention getting value from these systems.

A clinical IT vision statement is essential and it needs to be clear, well-defined and detailed. It needs to be communicated throughout the organisation so that everyone understands it and recognises why the goals encompassed in the vision were selected.

Clinical systems can be transformational or barriers to clinical quality, depending on how they are selected implemented and used.

A well-articulated long term clinical IT vision leads to better implementations by ensuring that the system meets current and future needs, and can assist leadership in dealing with special interest groups by pointing out how their requests either further or hinder the goals of the organisation.

The goals of the Technology Board will be to:

- Oversee the creation of the Clinical IT vision
- Meet the needs of the organisation
- Cover the organisation end to end
- Alignment with Trust strategy, structure and culture
- Apply a single integrated framework
- Enable a holistic approach
- Separate governance from management

The responsibilities of the Technology Board will be to:

- Oversee the development and implementation of the technology strategy
- Ownership of the core IT budget (providing an annual plan for CIT and BBT)
- Prioritise and approve major IT-enabled initiatives
- Ensure alignment with all other major programmes in the organisation
- Monitor benefits from major technology-enabled initiatives
- Monitor IT performance metrics
- Address exceptions to the technology principles
- Develop the communication structures to ensure transparency, visibility and to bolster compliance
- Ensure incorporation of 'lessons learned' from major technology initiatives

The Board will be supported by a number of operational groups:

The IT PMO (which in turn will be supported by a number of project boards for key projects)
The IT Senior Management group who will be monitoring: Finance, performance, KPIs, risks and quality standards

A Technical Design Authority who will be responsible for horizon scanning, recommendations for changes to the existing technology strategy and development of a new technology strategy

Membership of the Technology Board

Senior leaders throughout the organisation are required to be members of the Board in order to give representation and to back the end result and ensure it is acted upon.
The Medical Director has agreed to chair the Board, the Informatics Director will act in the role of 'supplier of a technology service' and the Technology Board will be the customer of this service.
Other nominations for membership are:

- Director of Strategy and Planning
- Director of Finance
- Deputy Chief Operating Officer
- Two Clinical Directors
- Two Nurse Directors
- Two General Managers
- Director of Service Improvement

The proposal is for this Board to meet monthly for the first year as there are a number of key decisions to be made regarding technology as well as the development of the technology strategy. Also, international technology studies have shown that IT governance committees that meet monthly are perceived as highly effective.

Appendix C: Acronyms and abbreviations

Acronym / Abbreviation	Description	Notes
A&E	Accident & Emergency	
AHSN	Academic, Health & Science Network	
BYOD	Bring Your Own Device	
ECG	Electrocardiogram	
EMR	Electronic Management Record	
EPR	Electronic Patient Records	This term is mostly used in the UK to be synonymous with EMR
EDM	Electronic Document Management	
EDMS	Electronic Document Management System	
HAB	The Health Advisory Board	An well-known Health 'think tank'
ICT	Information and Communications Technology	
IPPR	Inter-Professional Patient Record	
MDTs	Multi-disciplinary Team	
OPD	Outpatient Department	
PACS	Picture Archive Communication System	
PAS	Patient Administration System	
SCR	Summary care record	
SSO	Single Sign-on	
STH	Sheffield Teaching Hospitals	
TEG	Trust Executive Group	The new Trust technology board is a subcommittee of TEG

End of document