# University Hospital of North Staffordshire NHS Trust

# Responding to the Information Age – Information Communication Technology Strategy

# 2014 - 2019

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# 1 The Vision

Our vision for IT will be based on the needs of our patients, public and professionals working within the hospital and in community settings. The trust needs to transform its services over the next five years to meet ever rising patients' expectations and patient safety, experience and outcomes; to meet a minimum of 5-7% pa productivity improvement across all hospital services; support integrated care pathways across hospital and community and to deliver resilience sustainable IT infrastructure which supports the needs of all service users.

This will truly mean we must transform our current capacity and capability of staff, system and platforms in IT to enable us to secure these goals. This will mean we will need a more competent, effective and skilled workforce which will expand following the integration with Mid Staffordshire Foundation Trust (MSFT). It will also mean we will need to integrate systems between hospitals as we develop closer service partnerships with MSFT/Mid Cheshire Foundation Trust (MCFT)/and other acute and community providers. The trust must move towards an electronic hospital information system which will be secured by 2020 which eradicates the need for paper based systems, storage and referral of records and develops a software system which can develop decision support for our health professions to enable them to more productive, agile and flexible in their working arrangements and practices. This will result in a radical shift away from the use of administrative and clerical staff supporting data entry, quality resource and referral to a truly information driven organisation where all our staff contribute to our data entry as a by-product of all the activities they are involved in or support for patient care.

The future arrangements for patient care will require patients and their relatives to use our information systems much more fully and for us to develop new systems which engage them in their care. This will improve our responsiveness; reduce the need for out-patient attendances by 20% and enable us to provide greater support for them.

The move towards a greater academic development of the trust will result in new research informational systems to support clinical research which will be integrated with our service needs.

These changes will require substantial investment over by 2020. The trust will commit to around £20m investment in the development, maintenance and improvement of our IT systems by 2020 to ensure we can truly meet the needs of our patients, stakeholders and the public.

The goal of the Trust is to become one of the top university teaching hospitals in the UK by 2025 and to establish a 'world-class' reputation by 2030. Core to achieving that goal will be excellence in patient care across the North West Midlands, Cheshire, Derbyshire and Wales, and the building an innovative culture that enables us to exceed the expectations of patients and meet the needs of our commissioners and providers who work with us. At the same time, the Trust will become significantly more efficient and able to reinvest the savings it makes to accelerate its progress towards its goal.

Excellent information technology and an innovative and responsive information technology service will be critical to achieving our goal. It will enable the Trust to:

- **Effect significant changes in the way care is delivered**, supporting the move from outpatient clinics to the home with communications and mobile working technologies that facilitate better communications with patients and joined up working with community and other providers. Whilst improving our productivity, safety and reliability of services

- **Improve diagnosis, treatment and observation** by providing clinicians with state of the art decision support systems in our core specialities to reduce length of stay and continually improve the quality and efficacy of care in line with international best practice.

- **Rapidly create an integrated trust across our main campuses** as the Stafford and Stoke sites come together and use the best technology practice from these sites along with support for staff in tertiary centres, to bring up to new levels of technology performance.

- **Facilitate research and teaching excellence** and develop our relationship and reputation for excellence as a teaching hospital with the University of Keele using advanced analytics and technology support for clinical teaching and training.

- **Become significantly more agile, flexible and adaptive as a Trust** across our clinical and non-clinical disciplines so that we are able to respond and adapt to the fast changing health care environment of the NHS today.

The implementation of a technology strategy will benefit UHNS in the following ways:

- It will allow UHNS to have a clear direction for technology delivery and know that it will be aligned to the Trust's strategic direction and vision.
- It will deliver an improved, and more productive working environment for the clinicians day to day practice
- It will streamline working practices, improve efficiency and output for non-clinical staff
- It will afford safer and higher quality treatment for patients, whilst facilitating access to information on their condition, treatment and care pathway.
- It will give access for the public to appropriate information regarding friends and relatives, and insight to hospital facilities, services, healthy living advice and information.
- It will enable the organisation and its stakeholders to understand and drive the direction by appropriate choice of technologies and allow exploitation of any synergies
- It will allow the balancing of new requests for work against existing requirements and to prioritise and focus resources appropriately
- It provides the foundation for a new shape for the Informatics directorate that will be an enabler to take the Trust forward in its goal to be 'a world class centre of clinical and academic achievement, where staff work together to ensure patients receive the highest standards of care and the best people want to come to learn, work and research'

This Strategy is supported by a number of sub-strategies, currently under construction with a completion date of Quarter 1 2014/15. When complete they will be appended to this Strategy as appendices. Sub-strategies include:

- Infrastructure strategy
- Mobility strategy – incorporating device strategy and unified communications strategy
- Training strategy
- Device strategy – incorporating operating system and electronic office

# 2 *Strategic Drivers for the Trust's Information Technology*

The UHNS IT Strategy aspires to support the clinician in his/her day to day clinical activities aspiring to facilitate improved clinical productivity, reduction in risk, reduction in duplication of effort and delay, through the application of innovative and tested technology. It also aspires to support the clinician and clinical support services undertaking non clinical and administrative work.

The 2010 NHS White Paper: "Liberating the NHS [An information revolution]" sets out a vision for the NHS where patients have access to better information to stay healthy. This allows them to make more informed choices regarding their care. In addition, the NHS Planning document for 2013/14 "Everyone Counts" highlights once again the national priorities for IM&T being:

- Better data and informed commissioning
- More choice for patients
- More transparency for patients
- Higher Standards and safer care
- Improved outcomes

The Health Secretary has now set the challenge for the NHS to "go 'paperless' by 2018, to improve services and help meet the challenges of an ageing population". Objectives to achieve this ambition include:

- by March 2015 – everyone who wishes will be able to get online access to their own health records held by their GP
- hospitals should make information digitally and securely available
- clear plans in place to enable secure linking of electronic health and care records wherever they are held, so there is as complete a record as possible of the care someone receives
- clear plans in place for records to be able to follow individuals, with their consent, to any part of the NHS or social care system
- by April 2018 – digital information to be fully available across NHS and social care services, barring any individual opt outs

This strategy focuses on how we can use technology to support the development and progression of the organisation to reduce the reliance on paper, effectively introduce electronic / digital solutions, using the most efficient technology available. This will improve patient safety and reduce the probability of harm, by embracing computerised clinical decision support tools that standardise clinical decision making and lead different clinicians to the same set of diagnostic instructions for the sake of improved patient care, safety and outcomes.

In the face of severe spending constraints and an ageing population, the need for the NHS to find efficiencies has never been more important. This strategy will look to progress the Trust to increasingly efficient and effective clinical and non-clinical working practice through progressively integrated and functionally advanced clinical information and decision support systems. Patient experience will also be enhanced through integrated internal departmental systems in conjunction with joined up organisational care. This will include access to information from external health and social care providers - reducing patient administration delays and reduced duplication, whilst providing access to holistic, timely, accurate and up to date information at the point of patient care,

Research and development will be improved and aided by this strategy. Research relies upon high-quality information systems. A vast amount of data is collected, managed and used every day across the health care environment. This includes patient information, clinical activity, workforce information, as well as complaints data. The cross analysis of clinical and corporate information provides a vital research basis. Increasingly integrated data sources augmented with supporting data from external care providers will widen the boundaries for the research that is key to everyday service delivery, and to the development of the people that make up the health service. It lies at the heart of teaching, learning and the delivery of care.

Patient outcomes will be improved through a strategic direction towards integrated computerised algorithms and information. Protocols that incorporate more complex rules and reduce the clinical decision error rate. When computerised protocols are driven by patient data, output is patient specific, thus preserving individualised treatment while standardising clinical decisions. This will decrease variation in delivery of care and increase compliance with evidence-based recommendations.

# 3 The Trust's Current Information Technology Position

The recently introduced Clinical Digital Maturity Index (CDMI) is a 9 level model of a hospital's administrative and clinical system development that recognises that most NHS trusts will start with a patient administration system and then add increasingly sophisticated departmental systems, workflow and clinical functionality. The latest report released at the end of November 2013 describes the presence of systems and gives a picture of the digital journey each of the 160 acute NHS trusts are currently on. UHNS are currently in the second quartile of providers across the UK and ahead of a number of other large teaching hospitals. Mid Staffordshire is in the third quartile. In common with many providers this reflects a national picture where a PAS and core departmental systems are in place, but where there is a real opportunity around advanced exploiting technologies such as advanced e-prescribing, tracking and tracing technologies, and advanced decision support.

Against this national context, we have a strong overall platform on which to start that features:

- **Robust Departmental Systems –** Strong best of breed Departmental systems that to a large extent provide a platform for further technology innovation and the introduction of decision support technologies. Examples include; specialist clinical apps such as Mersey Burns, Map of Medicine, Utilisation Management and electronic-ICU solutions.

- **Mature Clinical Portal –** The Clinical Portal (CIS) developed in-house by clinicians for clinicians is a key asset and is already integrated with iPads. Unlike many Trust's this technology is already in place and facilitates the ability of clinicians to get a single view of a patient and can allow this view to adapt and change rapidly as new Departmental solutions are added.

- **Segmented Components –** A segmented technology architecture that consistent of core and clinic management systems, an extensive analytics and data warehousing capability, and our departmental systems as illustrated in appendix F. These are configured in a way that enables us to make changes in the major areas whilst immunising the other areas from the risk of that change.

- **Near Term Innovation –** The near term introduction of a number of newer technologies that are already well into their procurement. Examples include the new Electronic Prescribing and Medicines Administration System, clinical portal and the K2 Maternity solution.

- **Integration Opportunities –** The creation of a single Trust in the North West Midlands brings with it the opportunity to capitalise on the opportunity to modernise our core systems around the patient record, and accelerate our wider integration ambitions as a Trust through the use of technology.

- **Skills and Expertise –** We have an experienced IT team and the opportunity to inject additional expertise into a newly merged team.

There are some challenges too:

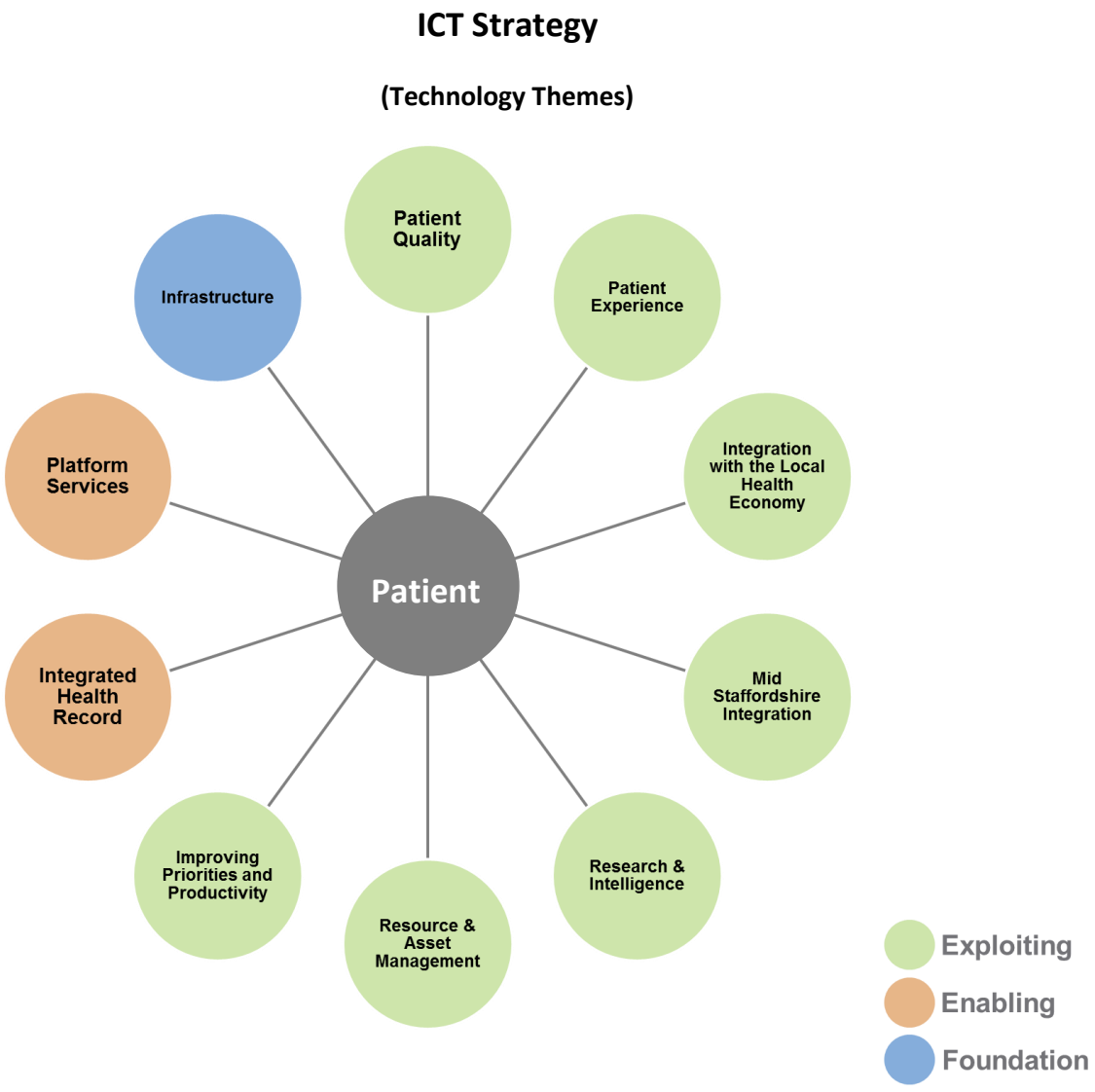
- **Ageing Infrastructure –** Foundation Technology, and specifically desktop and communications infrastructure is a partly invisible but essential asset if the Trust is to use Information technology to transform. For example, constraints placed on the Wi-Fi capacity by technology versions procured due to cost constraints under the PFI contract mean that the ability to provide modernised voice conferencing and mobile access has been problematic. Equally, much of our desktop estate is aged – up to 5 years old and out of warranty - and in need of refresh to support state of the art clinical support systems and use of technologies that tend to be demanding on processing power.

- **Capacity and Funding –** Capacity and funding constraints mean that we have been able to handle a limited amount of change in any one financial year successfully. At the moment, this has led to the on-going postponement of key clinical technology enabler's year on year.

# 4 The Information Technology Vision and Mission for UHNS

The goal in support of the Trust's Vision is to be recognised as one of the leading providers in the UK of information technology services to a University Hospital, seen as a leading innovator in the use of decision support technologies for our core disciplines and at the forefront of information technology and analytics innovation for research.

The Trust will seek to rapidly expand its information technology investment to deliver its 2025 Vision and beyond. This investment is translated as 10 distinct technology themes. This Strategy sets out how these 10 themes, shown below, will achieve this Vision.



We will achieve this by focusing on three key 'layers' of information technology:

- **Foundation Technology** – this will principally provide seamless joined up communications and hardware infrastructure across the Trust – the plumbing for our Information Technology. It should be reliable, robust and be a utility that is always available and performs as we require it. This technology will simplify our estate and make access easy and consistent for those inside and outside the Trust.

- **Enabling Technology** – this is technology concerned with managing our information that provides the information resource that will be the reliable source of all clinical and non-clinical information that underpins the Trust's day-to-day operations and strategy. Central to this will be our Integrated Health Record and Platform Services such as our core Electronic Patient Record (EPR) system and core non-clinical management systems. This technology will be the bedrock of our day to day operations and provide the information that we use to provide the best patient care possible and fuel our ambitions as a leading teaching hospital. Through the enabling layer we will standardise our approaches to the handling and dissemination of information, and our approach to core clinical and non-clinical processes so that we do the right things at the right time every time.

- **Exploiting Technology** – this will be the primary focus for the transformation of the Trust. It consists of a number of types of technology that will enable us to transform different aspects of our business including:
    - providing the highest standards of patient care and patient experience in line with our 2025 vision;
    - creating a truly integrated health economy across the North Midlands and beyond;
    - helping us to deliver the efficiencies and effectiveness we need from changed ways of working and the management of assets and resources that will enable us to re-invest in our core priorities
    - Supporting our research and intelligence ambitions as a leading University Hospital.

# 5 How Information Technology Will Help Deliver the 2025 Vision

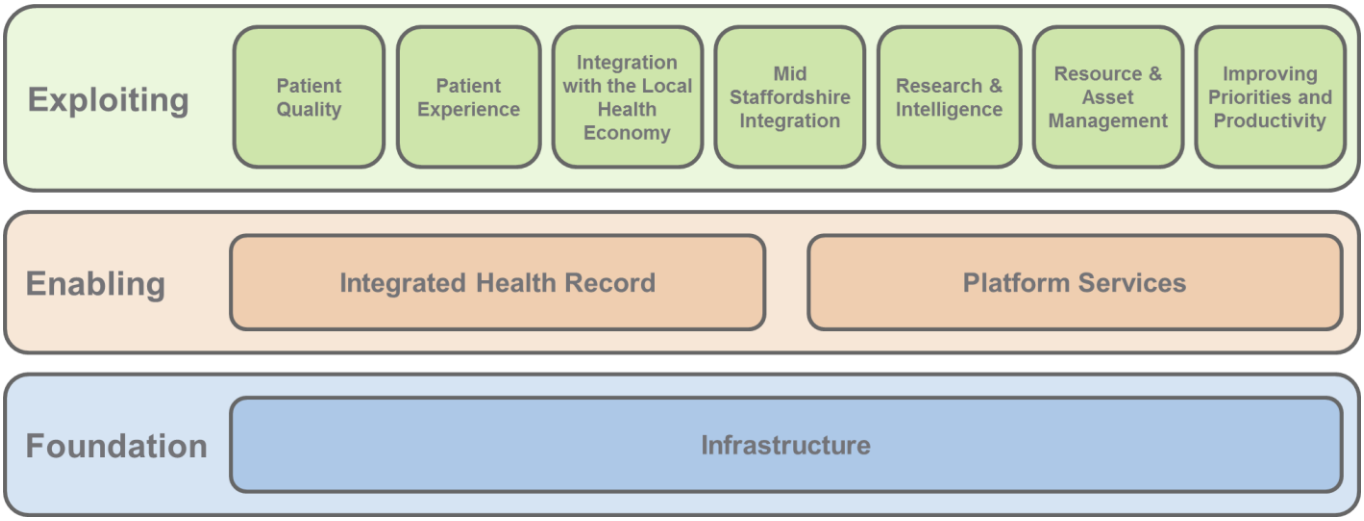
The Information Technology Strategy will use as its core - a robust technology framework structured around the Trusts mission and broken into the ten specific technology themes. This, in turn, helps enable the delivery of important items in parallel and helps us align more closely with potential 3rd party technology solutions / suppliers.

The technology themes can be considered as three layers:

- Creating a firm **foundation** for technology infrastructure
- **Enabling** excellent care through a robust and capable platform for electronic records and working
- **Exploiting** technology to support the achievement of our 2025 Vision

Together, the ten themes and three layers comprise the framework for delivering the Trust's IT Strategy; this is shown in the diagram below:

**The UHNS Technology Framework**



# 6 Clinical Decision Support At the Core of the UHNS IT Strategy

The Trust has an ambition to be a first class provider of clinical services, education, research and development. To continue to provide the world class hospital service our patients and community deserve, we must transform patient care whilst ensuring our financial viability by preventing any significant drops in activity income and continuing to work towards reducing the underlying recurrent deficit. The effective use of state of the art clinical and supporting technologies can help achieve these goals.

The Trust is already working in partnership with Mid Staffordshire NHS Foundation Trust (MSFT) and is in the process of integrating a number of services – approximately two thirds of MSFT's services. Furthermore, under proposals of the MSFT Trust Special Administrator, Stafford Hospital is proposed to become formally part the Trust. There are both a number of challenges and opportunities in integrating and selecting the most appropriate technologies that meet the needs of clinicians and patients across the sites and services that will become part of the wider Trust.

The current approach to clinical technology adopted within the Trust is the application of individual 'best of breed' systems in place within UNHS, in particular CSC i.PM (PAS) and i.CM (clinical management). i.CM and the clinical 'best of breed' systems are well liked by clinicians; however i.CM and i.PM only offer limited clinical decision support functionality as they are legacy solutions.

Integration with MSFT, who have recently introduced McKesson's Medway PAS, gives us the opportunity to roll out this more modern core clinical solution across UHNS, (taking advantage of a contractual break clause with CSC i.PM in April 2016) if this meets our needs.

A key technology opportunity is the deployment of solutions that help the Trust make good decisions, both by clinicians – to support the delivery of first class care to patients – and by the Trust as a whole, to ensure we make the most effective use of our resources and plan effectively with our partners in the local health economy to deliver the services our populations need both now and in the future.

Examples of such technologies include increasing the pace of rolling out technology 'at the bedside' to ensure clinicians have the up-to-date information they need to deliver excellent care, as well as improving productivity and reducing the potential for error by presenting and capturing data immediately and electronically.

Progressing the capability of shared electronic patient records (EPR) and self-service business intelligence (BI) are other key technologies that we are seeking to develop. A key decision the Trust will need to make in defining our strategic direction for clinical technology will be either to adopt a 'core EPR' solution which offers key clinical capabilities in a single, joined-up, product – or an 'enterprise EPR', which offers a much more holistic clinical solution (including departmental systems) at significant additional cost.

Historically there has been no clear path for a core or enterprise EPR. This IT strategy must therefore ensure we have a firm foundation to take best advantage of clinical decision support (CDS) technologies that will help our clinicians and the Trust as a whole to make good decisions and support excellent care.

## 6.1 How we will deliver innovative Clinical Decision Support (CDS) technologies within the Trust

As part of developing the IT strategy for UHNS, consideration has been given to which existing technology development underway within the Trust would have particularly high impact both in terms of return on investment (ROI) and ability to contribute to the vision of becoming leading innovator in the use of decision support technologies.

In undertaking the analysis to inform this Strategy, additional priority clinical decision support solutions have been identified, the set of options considered is outlined at Appendix B. Whilst these are subject to further analysis of the business case prior to targeted investment, these technologies are likely to be able to be delivered in the short to medium term and are likely to have high ROI – typically around 5:1 subject to the business case and realisation of benefits through associated change – and provide a combination of benefits to patient care and patient safety.

These technologies should align with the preferred approach, in the medium to long term, for implementing a new core EPR solution across the wider Trust described at 6.3.

**Additional priority clinical decision support solutions**

The insight and examples in the table below have been identified through research of available solutions. Other suppliers in addition to those discussed may have similar capabilities to those identified. Examples of actual products and case studies are available at the links in the footnotes.

| CDS technology | Description of capabilities and example products / solutions | ROI – contribution to themes & case studies |
|---|---|---|
| **Clinical alarms & messaging** | Technologies that notify intended message recipients via a wide array of mobile and fixed display devices including signboards, pagers, in-building VoWiFi or IP-DECT handsets, smartphones and tablets. Solutions deliver alarms, messages and data to staff via mobile devices e.g. tablets which enable a quicker response to clinical information. The clinician gets critical information as soon as it is required.<br><br>An example solution is Ascom Unite[1] which highlights the following capabilities:<br>• Communicate assignments and relay time-sensitive information to mobile staff<br>• Prioritise activities to improve efficiency / | Reduce wait times and costs through streamlining communications and improving workflows.<br><br>This technology would most contribute to improved:<br>• Patient Quality<br>• Patient Experience<br>• Priorities and Productivity |

[1] http://www.ascom.co.uk/uk-en/index-uk/products-solutions/technology-platforms/platform/ascom-unite/solutionloader.htm#overview

| CDS technology | Description of capabilities and example products / solutions | ROI – contribution to themes & case studies |
|---|---|---|
| | utilisation<br>• Reach mobile staff members quickly and require proof of message receipt | |
| **Utilisation management** | Provides visibility of patient status and any delays to their movement through the relevant care pathway. The technology[2] has the following capabilities:<br>• Identify those admitted to hospital who could have been treated in an alternative setting<br>• Helps commissioners and providers determine groups of patients who are to be assessed<br><br>Suppliers of utilisation solutions include Oak Group and Medworxx, who highlight the following case study at Royal Liverpool and Broadgreen University Hospitals Trust[3]:<br>• 45 → 18 over a one- year period, the average number of patients on the Ready for Discharge list dropped<br>• 500 → 100 over a one- year period, the average cumulative Ready for Discharge days also dropped<br>• 15% increase in respiratory patient throughput volume and LOS reduced from 10.5 days to 9.7<br>• 30% increase in the number of referrals into community beds, indicating better utilisation of existing intermediate capacity | Reduce inappropriate admissions and length of stay.<br><br>This technology would most contribute to improved:<br>• Patient Experience<br>• Resource & Asset Management<br>• Priorities and Productivity |
| **Task management / electronic observations, handover & assessments** | These solutions send alerts, tasks and escalations to the most appropriate member of staff in response to pre-set business rules<br><br>An example solution is Nerve Centre[4] which highlights the following capabilities:<br>• Electronic capture, calculations of EWS, and automated cascading escalations to ensure | This technology would most contribute to improved:<br>• Patient Quality<br>• Patient Experience<br>• Resource & Asset Management<br>• Priorities and Productivity<br><br>A report by ACCA[5] on use of Nerve Centre on a |

[2] http://www.institute.nhs.uk/quality_and_service_improvement_tools/quality_and_service_improvement_tools/demand_and_capacity_-_demand_management.html
[3] http://www.medworxx.com/content/medworxx-underpins-highly-successful-case-management-model-royal-liverpool
[4] http://nervecentresoftware.com/solutions/

| CDS technology | Description of capabilities and example products / solutions | ROI – contribution to themes & case studies |
|---|---|---|
| | recognition is followed by rescue<br>• Simple Observation Capture, preventing entry of invalid data<br>• Observation values that require immediate attention, such as very low sats, alert immediately<br>• Observation frequency is automatically set based upon EWS value<br>• Using locally configurable observation models, can support NEWS for adults and a range of age-based PEWS for paediatrics, with or local variants per speciality<br>• Nurses can escalate to doctors without leaving the patient bedside<br>• Integration with document management provides access to live charts via clinical portals or built-in PC and tablet support<br>• Standard assessments and ability to customize or build own assessments<br>• Task Management capabilities to ensure all assessments are completed within predefined business rules, or escalated<br>• Assessments can be automatically triggered upon admission or transfer based upon the patient's demographics, specialty, ward, age or consultant | 'small scale' in University Hospitals of Leicester indicates:<br>• Improved patient safety as tasks cannot be lost or forgotten<br>• Increased accountability from the system's built-in audit trail<br>• Potential to cut costs from reduced length of stay (LOS) and a lower incidence rate of SUIs<br>• Greater staff satisfaction owing to improved communication |
| **Point-of-care knowledge management** | Supports patient care by providing clinicians with comprehensive, evidence-based guidance and decision support 'at the bedside'<br><br>An example solution to identify optimal medication strategies is 'Map of Medicine'[6] which highlights the following capabilities:<br>• Map of Medicine is a collection of evidence-based, practice-informed care maps<br>• Maps connect all the knowledge and services around a clinical condition<br>• The care maps can be customised to reflect local needs and practices by commissioners | This technology would most contribute to improved:<br>• Patient Quality<br>• Patient Experience<br><br>Map of Medicine highlight a case study example from NHS Western Cheshire[7]:<br>• Using to communicate the Cellulitis Pathway to staff has reduced admissions from up to 40 to c. 20 per month<br>• Measured against a two day admission, minimum saving per patient of treatment in the community exceeds £2,000 |

[5] http://nervecentre.stage.philosophydesign.com/wp-content/uploads/2013/11/acca-tech-tp-ictaam.pdf
[6] http://www.mapofmedicine.com/solution/whatisthemap/
[7] http://www.mapofmedicine.com/mapinnhs/casestudies/reducinghospitaladmissions

| CDS technology | Description of capabilities and example products / solutions | ROI – contribution to themes & case studies |
|---|---|---|
| | looking to devise new care pathways<br>• Used by more than 50 healthcare communities, comprising over 150 organisations; they have published more than 1,400 local care maps<br>• NHS users in England should be able to access the Map of Medicine using either your Athens login or Smartcard, online | |
| **e-ICU** | Electronic Intensive Care Unit solutions take bedside readings from ICU into a centralised monitoring service; typically run over several hospitals with centralised monitoring staffed by nurses and an anaesthetist.<br><br>e-ICU[8] typically has the following capabilities:<br>• Ability to provide care to patients in multiple hospitals<br>• Optimize clinical expertise and facilitate 24-hour-a-day care by ICU clinicians<br>• Two-way cameras, video monitors, microphones and smart alarms provide clinicians with real-time patient data<br><br>An example solution is Philips / Visicu. | This technology would most contribute to improved:<br>• Patient Quality<br>• Resource & Asset Management<br>• Priorities and Productivity<br><br>A case study example from Avera hospitals[9] (USA) has suggested the impact of e-ICU has translated into about 400 lives saved. |
| **Clinical skills training** | Online skills training tool to improve consistency of clinical practice and manage professional training.<br><br>An example solution is Elsevier Clinical Skills[10] which highlights the following capabilities:<br>• Customisable electronic skills tool for improving the consistency of clinical practice as well as managing professional training<br>• Uses videos and animations to demonstrate a variety of skills<br>• Also includes Learning Management System (LMS) functionality and single-sign-on access (SSO) to facilitate easy integration | This technology would most contribute to improved:<br>• Patient Quality<br>• Priorities and Productivity |

[8] http://searchhealthit.techtarget.com/definition/Electronic-Intensive-Care-Unit-eICU
[9] http://online.wsj.com/news/articles/SB10001424052970204488304574428960127233136
[10] https://www.elsevierclinicalskills.co.uk/NursingPractice

| CDS technology | Description of capabilities and example products / solutions | ROI – contribution to themes & case studies |
|---|---|---|
| | • Is an online web based solution (for all major desktop and mobile browsers) and available as mobile and tablet apps (iOS and Android) | |
| **Specialist clinical apps e.g. Mersey Burns** | Specialist clinical apps are discreet applications typically delivered on a mobile device (i.e. a tablet) and have specific clinical functionalities. They may be low or no cost.<br><br>One prominent example is 'Mersey Burns'[11], which has the following functionality:<br>• Free clinical tool<br>• Calculates burn area percentages, prescribing fluids using Parkland, background fluids and recording patients' details<br>• Designed for physicians and runs on the iPad, iPhone, iPod touch, Android, BlackBerry PlayBook and HTML5 compatible browsers (http://app.merseyburns.com/)<br>• Regulated as a medical device in the UK by the MHRA – is the first regulated phone app in the UK<br>• Badged by the British Association of Plastic Reconstructive and Aesthetic Surgeons, BAPRAS | This technology would most contribute to improved:<br>• Patient Quality<br>• Priorities and Productivity |
| **Patient apps** | Apps to enable provision of feedback and response to relevant people involved in a patients care<br><br>An example solution is Digital Life Sciences 'Talk To'[12] – deployed in Birmingham Children's Hospital – which highlights the following capabilities:<br>• Giving feedback 'as easy as sending a text'<br>• Feedback goes directly to the person in charge, who can then send a message straight back to the patient or family member who left the comment<br>• Both comments and responses are | This technology would most contribute to improved:<br>• Patient Quality<br>• Patient Experience<br>• Research & Intelligence<br>• Priorities and Productivity |

[11] http://www.merseyburns.com/
[12] http://www.digitallifesciences.co.uk/

| CDS technology | Description of capabilities and example products / solutions | ROI – contribution to themes & case studies |
|---|---|---|
| | published directly on the hospital website | |
| **Risk stratification / patient segmentation** | Data analysis technology to allow clinicians to determine which patients will benefit most from early interventions such as in the community.<br><br>An example solution is United Healthcare / Optum or Health Analytics[13], who highlight the following capabilities:<br>• Risk stratification is the process of identifying the relative risk of patients in a population by analysing medical history<br>• Greater understanding of high-risk patient's medical needs and their history means a healthier patient, increased longevity, better treatment closer to home and more effective use of resources<br>• Software is capable of risk stratifying patients at practice, group and borough level providing clinicians with online access to multiple risk-stratification algorithms | This technology would most contribute to improved:<br>• Patient Quality<br>• Integration with the Local Health Economy<br>• Research & Intelligence<br>• Resource & Asset Management<br>• Priorities and Productivity<br><br>Health Analytics highlight a case study project to improve care of > 30,000 people living with COPD in London[14]<br>• Challenge was getting an accurate picture of health needs across 4 boroughs<br>• Led to reductions in admissions, saving an estimated £6.5m over two years |

## 6.2 Supporting the strategic needs of the Trust

Many (but not all), of the core decision support and healthcare delivery technologies that will be required to achieve the aims of the IT Strategy are provided 'bundled' into commercially available EPR solutions. Core EPR solutions offer the 'essentials' such as drug and allergy information, alerts, medicines administration; Enterprise EPR solutions offer additional capabilities to cover the technology needs of departments such as respiratory, gastrointestinal or cardiology – for example.

In addition to available EPR solutions, there are a wide range of stand-alone decision support technologies that can work alongside EPR solutions and can often – to a lesser or greater extent – integrate with them to extend their functionality. Whilst the capabilities of Core EPR are critical to any acute trust, these decision support technologies must be considered against key organisational drivers and the context within we seek to improve the services we provide.

[13] http://health-analytics.co.uk/products/risk-stratification/
[14] http://health-analytics.co.uk/casestudies/copd/

As an example, 'utilisation management' software is available that can enable and promote effective flows of patients through their care pathways; these can integrate with core EPR solutions to provide useful contextual information on the source of delays, for example, and the managerial or clinical reasons behind them.

A critical consideration in implementing these additional decision making technologies is the difficulty of integrating with the EPR solution. This will require the Trust to take on the 'systems integrator' role to ensure these technologies work together as anticipated.

## 6.3 High level options for an integrated EPR solution

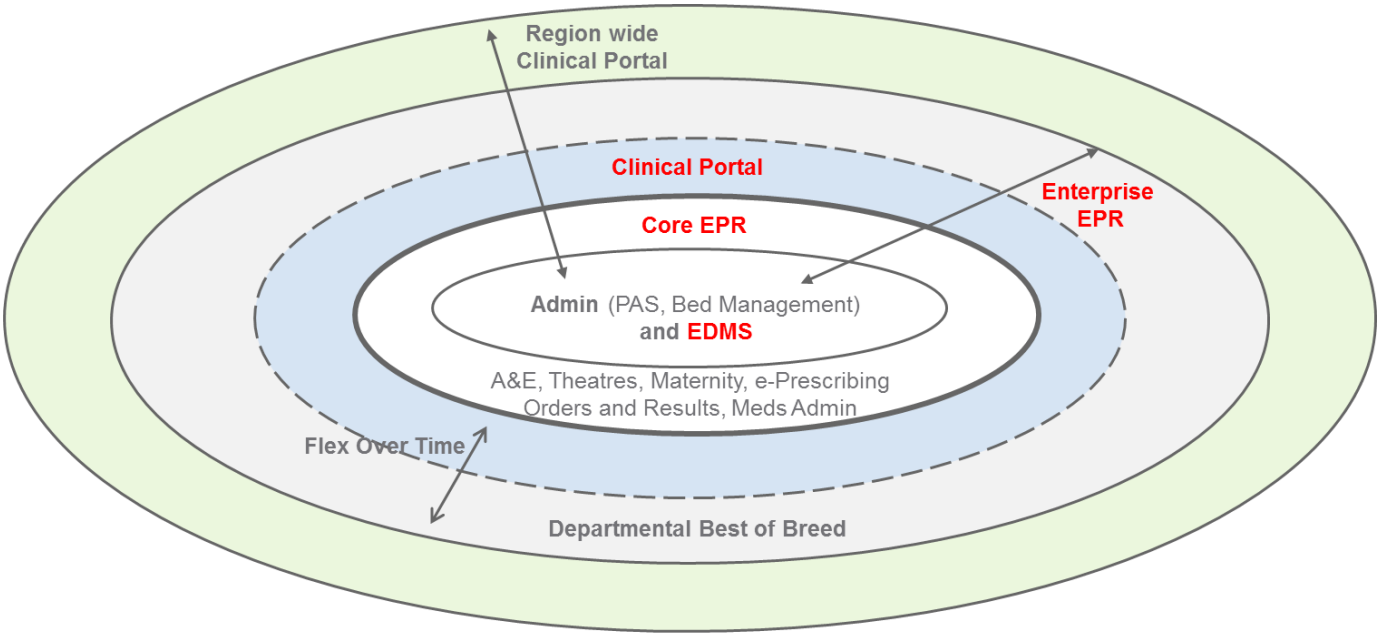
There are three main options for the future strategic direction of EPR within the merged Trust:

1. **Integrate & develop the various clinical solutions across the Trusts to achieve a 'best of breed' technology architecture**
   - The current solutions are well liked by clinicians but are based on legacy products that do not natively support integration with each other, or with potential additional decision making technologies.
   - This approach provides maximum flexibility of clinical application choice but requires the Trust to maintain sophisticated service integrator capability in order to implement and support a fully integrated solution.

2. **Adopt a single 'Core EPR' solution with deployment of specific decision support and 'best of breed' departmental systems, integrated through a clinical portal**
   - Core EPRs offer native integration and a single patient record across the major systems.
   - The clinical portal provides users (e.g. clinicians) with an integrated single clinical view and may also integrate effectively with additional technologies that provide improved information to aid decision making.
   - This approach still provides some flexibility for 'best of breed' solutions for specific departments / specialisms to be adopted (e.g. renal, oncology) but greatly reduces the effort required to integrate these systems with the EPR.

3. **Adopt a full-scale 'Enterprise EPR' solution across both UNHS and MSFT hospitals**
   - Enterprise EPR solutions offer a single, organisation wide single patient record across all systems; the integration effort required to achieve this is relatively minimal as these modules are all designed to communicate and work with each other from the outset.
   - Enterprise EPR solutions offer deep and fully integrated decision support functionality through the maintenance of a single integrated clinical record
   - There is a very high cost (£30/40m+) for initial ownership and, due to its wide scope across departments and specialisms, implementation can be very complex and protracted.
   - The implementation track record in the UK NHS has not been satisfactorily proven.

The following diagram depicts the differing scopes of the solutions under consideration:




## 6.4 Preferred option for an integrated EPR

An enterprise EPR is not currently an affordable solution. It is unlikely that a wide range of 'best of breed' solutions will integrate to an extent that clinicians are sufficiently confident to rely on them, the preferred approach is therefore option 2: adopt a single 'Core EPR' solution with deployment of specific decision support and 'best of breed' departmental systems, integrated through a clinical portal.

A roadmap to achieving this vision for decision support technology within the Trust therefore needs to:

- **Define the approach to delivering an EPR** for the Trust as an anchor point to extend decision support against the Trust's ten technology themes
- **Identify decision support solutions** (such as those described in section 6.1 (page 14) that are likely to have a positive return on investment, a sufficiently beneficial impact on clinical outcomes and will integrate effectively with the core systems.

This conclusion, after consideration of the benefits, dis-benefits and risks of the three main options for the future strategic direction of EPR, aligns with the strategies of other NHS trusts following the closure of the National Programme for IT. The evidence shows that the keys to successful (or unsuccessful) delivery are strong clinical leadership and significant investment in and commitment to change.

# 7 Technology Themes – The Foundation Layer (Our Infrastructure)

**An overview of the benefits that this theme will deliver**

Infrastructure is the foundation of our IT Strategy. The Trust has a significant number of user devices across the breadth of the organisation. Recently and off the back of the introduction of Wi-Fi, 3/4G and tablet based devices, the requirements of the user of IT at the Trust has become more dynamic, with increasing requirement for mobility, flexibility and ease of use .

Currently the predominant user device across the estate remains the PC, however there are increasing numbers of laptop, tablets and other form factor devices in use. The current IT device estate is 7,667 managed devices.

**User Device estate as at December 2013**

| Device | Asset Count |
|---|---|
| Laptop | 903 |
| Desktop | 4561 |
| Laser Printer | 375 |
| PACS Screens | 155 |
| Theatres Screens | 98 |
| iPads/iPods | 713 |
| Battery Powered Cart | 247 |
| Order Comms Printers | 615 |

To administer an IT device estate of this size presents a significant overhead and considerable investment. Plans will be developed in 2014 to move the Trust where possible to a common PC operating systems and a standard Office support platform. In 2014 a pilot study will be undertaken to review the provision of the desktop and application's environment. Technologies such as Virtual Desktop and Virtual applications will be explored. Application presentation on tablet and small form factor devices will be explored to identify the range of tablet and device operating systems (e.g. Android, is), to support the Trusts approach to mobility.

In terms of other devices, we will continue to reduce the number of printers across the organisation and introduce MFDs, in parallel with assessing electronic solutions to prevent the need for printing.

The increasing level of internal software development such as the CIS and the WIS is resulting in clinical and business reliance upon these systems. With the aim of removing paper records and progressing towards and electronic health record, it is essential that the correct infrastructure and resource is in place to support this. This will require additional investment to ensure that the hardware is capable of providing a resilient electronic solution and to ensure that resource is available to resolve system issues at all times. In turn, all systems are dependent upon fully functioning network, servers, PCs and mobile devices.

**Some of the technologies we will consider to support this theme**

The technologies that we may develop and implement to support this theme include:

- Bring Your Own Device (BYOD)
- Disaster tolerant systems
- IP telephony
- Radio Frequency ID (RFID) e.g. for lab tracking
- Smart Cards & Single Sign-On (SSO) e.g. Caradigm Identity & Access Management
- Unified Communications
- Virtualisation (VDI)
- Barcode scanning
- Positive patient identification

Additional detail on the technologies forming part of this theme is included within the following sub-sections.

## 7.1 Fixed network

The Trusts Network is currently provisioned and managed by a third party company as an integral part of the Trusts thirty year PFI contract. The contract covers provision of fixed Wi-Fi and Voice over IP telecommunications network infrastructure.

The IT Directorate will work in a tripartite partnership with Corporate Services and the PFI provider to ensure that through the appropriate contract management process, suitable provision of network services to the Trust. These will facilitate:

- Bedside Care
- Mobility across the Trust
- Effective use of mobile communications technology

The IT Directorate will collaborate with the PFI provider to ensure:

- Appropriate governance exists to facilitate resilient provision of network services, ensuring that any changes to the configuration of the network services are done within a risk controlled environment.
- Developments to the fixed network meet requirements in terms of resilience and capacity to deliver modern IT facilitated patient care.

## 7.2 Wireless Local Area Network (Wi-Fi)

Future developments of the Trusts Wi-Fi infrastructure will need to ensure that access to information via a Wi-Fi device is on an equivalent level to the provision of access on the ‘hard wired’ Local area network. Future Wi-Fi design should include the latest available Wi-Fi connectivity standard. There must be adequate provision of network access points to incorporate RFID and configurable to allow non-contentious and secure provision of Patient/ Guest Wi-Fi access.

Due to the reinforced concrete construction of a large proportion of the Trust building estates, connectivity from mobile phones to the cellular network is extremely poor. Without major re-construction of the hospital site this situation will not be overcome. A re-provision of the Wi-Fi network on the Trusts site will require enough Access Point coverage for Wi-Fi enabled mobile phones to be able to maintain a stable connection to the internal Wi-Fi infrastructure and for the Wi-Fi infrastructure to act as a gateway to the external cellular network infrastructure.

## 7.3 Smart cards and Single Sign On

The use of personal smart cards in the NHS environment can bring benefits in terms of cost, security and productivity. Access to information can now be associated with a host of clinical and corporate systems that may be related to the acute patient care, or be more diversely relating to patient information stored within primary or community care settings. It is currently difficult and time consuming for staff to remember passwords for a number of clinical systems, and this issue will magnify as we look to work in a more integrated way with external agencies.

Single sign-on technology integrated with smart card technology will be able to store the identity of the staff member and facilitate access to systems without the requirement to remember a list of usernames and passwords. This technology can also be integrated into building management systems and other physical security systems. Benefits are in terms of improved security through role based systems access control. Clinicians will have the correct part of the clinical record displayed to them, related to their level of access.

## 7.4 Interfaces

The Trust currently uses the iSoft interface engine (iSoft iIE) to interface PAS, Theatres, Clinical Coding, Order Communications and Maternity and the Trust Business Intelligence Warehouse with Trust generic systems interfaces Neon and Rhapsody. Neon and Rhapsody provide interface engine capability for EDMS, Pathology, Radiology, Pharmacy and other Trust specialist and reporting systems and external messaging systems.

The interface standard adopted by the Trust will continue to be HL7 v3, as long as this is the recognised NHS standard for interfacing. Where possible the Trust will take advantage of and comply with the NHS Interoperability toolkit. Integral to the future PAS system review a review will be a requirement to replace the iSoft iIE interface. Specifications for any new or replacement Departmental systems will need to incorporate interface requirements.

## 7.5 Email

The Trust has had a recent upgrade to its email system which currently sits upon a resiliently configured Microsoft Exchange 2010 Outlook Platform. Currently the MS outlook platform is used for internal and external email communications and internal diary management. The system meets the current messaging needs of the organisation. However, NHS England is initiating a project to review the provision of NHSMail 2 services. This will offer a free to the point of use, an encrypted email and calendar system which incorporates a national user directory. The Trust will monitor the development of NHSMail 2 and be involved where possible in influencing its design. As the existing Trust system approaches end of life, a functional review will determine the optimum development path for the Trust.

## 7.6 Unified communication

Irrespective of the choice between local and national platforms, by 2016 the Trust will move towards unified communications service incorporating integration of voice, SMS, email, video and instant messaging. This will facilitate a more mobile and peripatetic workforce capability.

The essence of communication is breaking down barriers. In its simplest form, the telephone breaks distance and time barriers so that people can communicate in real time or near real time when they are not together.

There are now many other barriers to be overcome. People can use many different devices to communicate (Wi-Fi phones, iPhones, personal digital assistants [PDAs], personal computers [PC], multi-functional communications devices etc.), and there are now new forms of communication as well, such as instant messaging. The goal of unified communications involves breaking down these barriers so that people using different modes of communication, different media, and different devices can still communicate to anyone, anywhere, at any time.

The Trust will progress a converged messaging approach. Development of the Trusts converged messaging environment will be an integral responsibility of the Mobile Technology Group.

## 7.7 Virtualisation

The true benefit of cloud computing may only be realised where the virtualisation of servers and where possible applications has been progressed. Virtualisation moves IT provision away from applications being dependant on individual servers and components allowing much more inbuilt fault tolerance, machine independence and much more efficient utilisation of the Trusts server estate, and is a step towards cloud based computing. Ahead of considering a move to a cloud environment the Trust will continue to work where possible towards a virtualised IT estate.

## 7.8 Bring Your Own Device (BYOD)

The majority of NHS staff already own a range of personal devices such as a smart phone, tablet or a PC yet also use equivalent or similar devices in the workplace. By enabling a Bring Your Own Device (BYOD) environment, staff will have opportunities to use their own devices in the workplace, this will have a number benefits for both staff and for the Trust.

Applying the appropriate security technology so that the Trust's staff are able to use their personal devices safely and securely for work purposes will allow flexibility and freedoms for staff using the devices of their choice rather than encumbering them with work tools that duplicate their personal devices. This approach also provides significant cost avoidance to the Trust. The Trust will work in partnership with an IT partner to create a BYOD approach to the organisation that will comply with the ICT Security policy and associated policy pertaining to use of personal equipment for Trust business.

## 7.9 Radio Frequency Identification (RFID)

The trust will consider the timely introduction of RFID technology following a cost and benefits analysis to be undertaken subsequent to the release of this strategy. Overcoming the logistical difficulties in terms of physical resource and equipment scheduling and tracking, including the tracking of patients and Trust resources, has an evidence base for reducing delays, reducing cancelled procedures and improvement in logistics and physical resource management.

## 7.10 Disaster tolerant systems

The Trust has reached the point where the provision of healthcare to patients is dependent on the continuity of IT infrastructure and associated systems. In advance in provision of critical Clinical Information systems resilience will be incorporated to the point where systems are configured across the Trusts three data centres, Data will be replicated across the estate so that no server related single point of component failure or server

room disaster will cause disruption to the provision of service. Progress to full resilience for all Trust systems will need to be over a period of time that finances allow. However where existing vulnerabilities currently exist, Disaster Recovery provision will be considered as an interim measure.

## 7.11 Data centre strategy

The Trust currently hosts its own ICT infrastructure on site. However, there is a growing trend in the ICT market place toward Cloud computing. Cloud Computing allows users to access applications and data via a web browser with little or no software needing to be installed on local machines. As a result, authorised users can access and share information remotely and securely from any location which is key to underpinning more efficient and resilient ways of working and delivering the integrated care services that are at the heart of NHS reforms

Cloud Computing offers the potential to transform working practice, delivering numerous benefits including:

- Reduced clinical risk due to higher systems availability
- More secure data and stronger Information Governance
- Reduced operating and ownership costs
- Robust service built on enterprise-class infrastructure
- Guaranteed service levels - 99.99% uptime
- A 'Pay for what you use' utility style service
- 'Capacity on demand' Infrastructure with the ability to scale up or down, enabling a rapid response to changing business requirements
- No 'technology refresh costs' enabling organisations to join at their own pace

There are many benefits to the cloud computing environment, but for the move to cloud to be cost effective for the Trust there needs to be a fully costed spend to save plan, the ability to virtualise at least 85% of the Trusts existing ICT architecture and a return identified from the reduction in resource usage (predominantly electricity), and release and reuse of existing data centre real-estate.

A move to cloud computing requires significant initial investment. The IT Directorate will collaborate with colleagues in Finance and 3rd party cloud environment provider, to determine an appropriate time line for the Trust to move to a cloud based infrastructure environment.

## 7.12 Shared services

Until recently there were two ICT Shared Service providers in the Staffordshire Health Economy – North Staffs HIS and South Staffs HIS. The two services have been recently merged to form a single service provider who is now hosted by the Staffordshire & Stoke-on-Trent partnership. Once the newly formed service has reached a condition of steady state operations, a review will be undertaken in relation to the Trusts involvement in the service and what the benefits and impact of such a move would be. This review would be primarily driven with a view to understanding the quality, value and staff resilience implications to the Trust

## 7.13 IT literate workforce

The move away from paper based systems and a record to an environment that is totally digitized presents many opportunities for reduced risk, improved patient care and patient safety. It also however brings a level of complexity and requirement to be able to use IT equipment as part of the daily work pattern, to a degree that now affects all members of healthcare staff. It's important that the facility exists to train staff to safely use and

get the best from the clinical information systems within the Trust, but also to ensure that basic IT skills training is available. IT literacy is now an integral requirement for healthcare practitioners and we must ensure that the facilities exist to provide:

- Basic computer literacy
- Typing skills
- Back Office suite skills – email, word processing, internet/intranet usage
- Clinical Information Systems competences

The UHNS IT Training team will ensure that the appropriate training courses are offered to all staff and that appropriate IT clinical and non-clinical systems training is an integral part of all IT projects across the Trust. The IT Directorate will continue to work with the skills academy to offer training facilities and non-clinical IT training courses.

# 8 Technology Themes – The Enabling Layer

## 8.1 Integrated health record

**An overview of the benefits that this theme will deliver**

Integrated health records, supported by a robust platform for core and departmental systems, including an Electronic Document Management System (EDMS) – are not simply about patient administration and scanning and storing documents electronically. There is a strong clinical case, in addition to efficiency savings in terms of administration and estates:

- Better patient care – clinicians have a fuller picture of patient medical history (e.g. allergies, alerts) through the provision of access to information across multiple systems. Improved multi-disciplinary access to information helps improve patient care and reduce risks.
- Reduction in administration – a significant reduction for filing, tracking and paper records retrieval.
- Cost savings from legacy system and less paper - existing medical records tracking computer system would be decommissioned, avoiding software usage, maintenance and support costs. Lower usage of paper and associated costs through direct data entry using e-Forms.
- Access anytime/anywhere – the provision of simultaneous 24/7 access to clinicians, to patient health records irrespective of location across Trust premises or devices.
- Reduction in storage space and estate costs – an estimated 70% reduction in health records storage space. Re-profiling of existing Medical records departments and associated savings in terms of estates costs.

**Some of the technologies we will consider to support this theme**

The technologies that we may develop and implement to support this theme include:

- Electronic Document Management System (EDMS) e.g. CCube
- Clinical Portal e.g. Graphnet
- Patient Access to Records
- Summary Care Record (SCR)
- Telehealth – technology to help individuals live more independently and for longer at home, and reduce admission to hospital; includes personal alarms, medicine management and other monitoring devices e.g. Hygieia who are working with the Ulster hospital and have an innovative device for home management of insulin dosage

Additional detail on the technologies forming part of this theme is included within the following sub-sections.

### *8.1.1 Patient Administration System (PAS)*

The PAS system will remain at the heart of the Trusts Electronic Patient Records System, and be the primary repository for the Master Patient Index and patient administration functionality.

The level of Electronic Patient Record that the Trust currently holds is achieved by adopting a best of breed approach to Departmental systems and required clinical functionality. As well as patient administration the functionality to provide orders for tests and results reporting and real time admissions discharges and transfers.

The system has bi-directional interfaces with 'best of breed' departmental system's creating an environment of a virtual Electronic Patient Records System.

The Existing Trust PAS system is built on technology that was implemented almost a decade ago. The system is not popular with its users and the clinicians across the Trust who find it not to be intuitive to use, to require too many interactions to get to the information that they require and often slow to process transactions. The contract for the current system was extended in 2012 until 2018. The contract does however incorporate a break clause that may be taken at the end of financial year 2015/16,

Planning for a new PAS replacement will begin in 2014/15. Any new system must meet the requirements of the modern healthcare environment. It will need to be user friendly and intuitive to use with information no more than 2 mouse clicks away where possible. It will need to be dynamic in its presentation, so that it may be used on a number of form factor devices, which fit the clinician's requirements and incorporate the latest interface functions such as touch screen functionality. A full requirements analysis will be undertaken as the first stage in the replacement planning process. The options for PAS are analysed as part of the EPR options analysis in section 6.3.

In 2011 the Department of Health identified a requirement for all NHS Acute Provider organisations to implement Key elements of clinical functionality. These components include:

- a patient administration system with integration with other systems and sophisticated reporting
- order communications and diagnostics reporting (including all pathology and radiology tests and tests ordered in primary care)
- letters with coding (discharge summaries, clinic and Accident and Emergency letters)
- Scheduling (for beds, tests, theatres, etc.)
- e-prescribing (including 'To Take Out' medicines)

These requirements supplement the levels of Electronic Patient record achievement that all Acute NHS Trusts aspire to achieve. There are 6 recognised levels of Electronic Patient Record. UHNS has made significant progress on all levels of EPR and is currently at level 3 EPR with significant progress against levels 4, 5 and 6. The following table demonstrates current progress and timescales for future developments.

**Trust EPR Status**

| EPR level | Features / modules | Complete / target |
|---|---|---|
| 1 | Master Patient Index | |
| | Patient administration | |
| | Accident & Emergency | |
| | Clinic Booking | |
| | Case Note Tracking | |
| | Standalone Departmental Systems | |
| | Pathology | |
| | Theatres | |
| | Radiology | |
| | Pharmacy | |

| EPR level | Features / modules | Complete / target |
|---|---|---|
| 2 | Common patient identifier - all systems | |
| | All systems use NHS Number | |
| | Major Systems integrated | |
| | Access to all systems from any terminal | |
| | Basic Specialty Modules: Renal, Maternity, Infection Control, Oncology, Summerset Cancer Registry | |
| 3 | Results Reporting | |
| | Order entry | |
| | Electronic Prescribing with rules | 2016 |
| | Care pathways/plans | 2016 |
| | Basic Data Repository | |
| | Automatic discharge letters | |
| 4 | Alerts and warnings | |
| | Expert systems support | 2016 |
| | Embedded Guidelines | 2014 |
| | Access to Knowledge Databases | 2016 |
| 5 | Workflow and Document imaging (EDMS) | 2017 |
| | Specialty modules: Gastro, Critical Care | 2018 |
| | Advanced data repository | 2017 |
| | Full integration of clinical information System | |
| | Majority of Clinic info stored in EPR | |
| 6 | Advanced data input devices | 2016 |
| | PACS | |
| | Digital images – WABA- Digital imaging | |
| | Full case note on-line | |
| | High Speed Networks | |
| | High Resolution Monitors | |
| | Full electronic records (no paper) | |

### *8.1.2 NHS number*

The patient NHS number has been nationally recognised as the single unique patient identifier for healthcare. Using the NHS Number helps to share patient information across national healthcare settings safely, efficiently and accurately, improving patient safety. Advantages include:

- make referrals using Choose and Book
- is the only National Unique Patient Identifier
- helps create a complete record, linking every episode of care across organisations.
- it helps create a complete record for each patient
- it enables information to be safely transferred across organisational boundaries
- babies are given their own NHS Number to link their healthcare records for life

There is a national mandate for the uptake and usage of NHS number across all healthcare systems. The use of NHS number as unique patient identifier will be integral to any systems procurement that the Trust undertakes.

### 8.1.3 Summary Care Record

The Summary Care Record is an electronic record which contains information about medicines, allergies and other generic care information specific to a patient. Having this information stored in one place allows it to be accessible by care providers anywhere. The Summary Care Record will encompass information that relates to a patient and his or her care that is received at any location across the country and is available to any health or social care provider again on a national basis. The Summary Care record is not an information rich as the local Trust or Health Economy wide record will be, but will form the recognised an accessible national repository relating to an individual's care record.

We will continue to procure specialist solutions where appropriate and integrate these with current external systems and the CIS to form an integrated electronic health record.

When procuring external systems, we will continue to work with system suppliers to ensure that:

- All systems to 'talk to each other' and must adhere to a standard specification, particularly regarding integration capabilities, in line with the ITK Interoperability Toolkit.
- All new system suppliers are willing and able to integrate not only with current systems (where applicable), but also with internal systems including the CIS, to support the development of an electronic health record.
- As technology continues to evolve and services and demands continue to change, it is important that system suppliers are able and willing to adapt systems to meet requirements. Where possible, this should be established at the time of contract negotiations to minimise additional costs.

### 8.1.4 Patient Access to Records

The Power of Information the 2012 Government Informatics Strategy for Healthcare identified a requirement for all patients to be able to see appropriate components of their own health record. The only way to achieve this effectively is to present (without the patient having to understand how to log into a myriad of different systems), a single instance of the holistic care record for each patient (with the appropriate governance and access levels in place). It is the current plan that an instance of the Local Health Economy Integrated record with the appropriate controls applied will be made available for patient access in a controlled environment.

This is part of the government promise that there should be no decisions made about the patient without the patient's involvement. It also means that the patient can build up a knowledge and understanding around their respective condition and to provide information to help them make short or long term lifestyle decisions' in support of their health, treatment and care.

#### 8.1.4.1 ePrescribing

There is a planned roadmap for the rollout of electronic prescribing and medicines administration (ePMA) across UHNS that will replace the paper prescription charts in most instances ensuring paper light practices culminating in a paperless system for electronic prescribing and medicines administration by September 2015

The programme begins with a pilot on two Medical wards in March 2014; these wards have expressed a particular interest in being involved in the project, are sufficiently clinically challenging to the system and also demonstrate a consistently stable patient group which reduces the clinical risk associated with transfer from one system to another.

Following this initial pilot and evaluation period the implementation process will continue across the hospital inpatient and outpatient areas as follows: May 2014 to April 2015 completion of the Medical wards and associated outpatient areas, followed by Renal wards, dialysis ward and outpatients, Surgical wards, theatres and outpatient areas, Maternity centre, Paediatric areas and Maternity areas in succession.

From May 2015 the system will be sufficiently mature and embedded across wards and departments in the Trust. This will facilitate and enable continued progress to the more clinically challenging areas of Emergency Department, Cancer Centre and Critical Care Department.

## 8.2 Platform Services

**An overview of the benefits that this theme will deliver**

Through the development of the Clinical Information System (CIS), we are in the process of creating a platform to share information across the health economy. GP Practices are being provided with access to inpatient and outpatient activity, results, letters and viewing clinical notes. We are working with the Christies Trust in Manchester to progress the development of linking portals together, which will also provide the ability to link any willing NHS organisation together and share data at an agreed level. We wish to continue to develop this model and to enhance the level of clinical information that can be agreed and shared between organisations locally and over a wider geographical area. This is only constrained by the willingness of organisations to share data and the level of information governance in place to provide assurance to all organisations.

We will continue to develop platform services, including the CIS, into the Trust's electronic health record. We will provide functionality to:

- Electronically notify clinicians of results and clinical information
- Capture outpatient and inpatient clinical notes electronically through electronic data capture forms
- Capture drawings electronically using specialise drawing software
- Provide mobile devices to facilitate access to the electronic health record across the organisation
- Capture and store clinically important information from external systems outside our organisation to support the delivery of patient care

**Some of the technologies we will consider to support this theme**

The technologies that we may develop and implement to support this theme include:

- Clinical Information System
- Clinical Portal e.g. Graphnet
- EPR
- NHS Number / Patient Administration System

Additional detail on the technologies forming part of this theme is included within the following sub-sections.

### *8.2.1 Clinical Information System (CIS)*

The continuing development of a clinical portal for the Trust has been underway for some time. The CIS is a web based IT system which acts as a clinical portal allowing clinicians, clinical staff, members of multidisciplinary teams and supporting departments to view information that is recorded and stored in other IT systems. This prevents the need to log into multiple systems to find patient information significantly speeding up the process of accessing patients' clinical information at the point of care.

The CIS provides access to or replicates information recorded in the following systems:

- iPM detailing all the patient attendances
- PACS
- EDMS

- results reporting and orders from iCM
- flow-sheets completed in ICM
- e-discharge letters from e-discharge and clinic letters from Medisec Trust
- Somerset Cancer system
- access to Christies portal for cancer patients treated at Christies
- A&E attendance letters generated in MSS
- Evolution maternity system
- ORMIS theatre system
- alerts generated in IPM and ICM

Development will include clinical noting, supporting the clinical staff in recording clinical data at the patient bedside which can then be accessed and shared with other clinicians without having to wait for patients notes, again significantly speeding up access to patient information at the point of care.

The development of the Clinical Information System commenced in 2009 to provide a portal for clinicians to view information from a number of systems avoiding multiple logins and viewing across a number of screens. The system has evolved into a portal, which not only provides access to multiple systems, but also is a tool to facilitate electronic data capture.

In order to reduce the generation of paper records and improve information availability, it is necessary to provide an alternative solution to the use of paper based health records. The CIS is now at a stage of development where data can be captured electronically through electronic clinical notes. This paper assesses the current functionality, roadmap and readiness of the CIS in supporting the delivery of an electronic health record. The functionality that is directly beneficial for the development of an electronic health record can be grouped in the following categories:

**System accessibility**

- IPM – inpatient, outpatient, A&E activity
- A&E System
- Order Coms & Results reporting
- Theatre System
- Maternity System
- PACS
- Medisec letter viewer
- Electronic Document Management System (EDMS)
- Somerset Cancer Registry

**Results, Alerts & Observations**

- Infection Control alerts (from ICM and Somerset Cancer Registry)
- Pathology and Radiology results through a direct link to ICM from the CIS
- Chart trends
- Echocardiograms
- View co-morbidities and allergies (fed from E Discharge)
- BMI calculator
- Clinical letters against activity

**Electronic noting**

- Pre-AMS Triage Form
- Plaster Room Care Plan
- Emergency Treatment Plan
- Diabetic DSN Summary Note
- Ad hoc notes
- Surgical op notes
- Formatting to include bullet points, bold, italic and paragraph formatting
- Dictation of clinical notes using the voice recorder on the iPad

#### *8.2.1.1 CIS electronic noting*

There are a number of tools available to support the creation of electronic notes through the CIS. A PC and keyboard can be used to type electronic notes and the following options are available through the iPad:

- Stylus
- Bluetooth keyboards
- Voice recognition

There are a number of developments in progress to support the removal of paper notes. These are predominantly forms and templates that are being recreated as electronic structured clinical notes. Any structured paper form can be turned into an electronic structured note; logic can be built in to this process in order that this becomes iterative. The addition of electronic structured notes does not require an upgrade of the CIS.

#### *8.2.1.2 CIS future functionality*

Future developments of the CIS will involve the integration of additional systems and inclusion of additional functionality. Specific developments to support the progression towards an electronic health record include:

- Drawing software
- Improved link to indicate presence of scanned health record
- Specific notes:
    - Cardiac Arrest Audit form
    - Heart Failure Cardiology proforma
    - Heart Failure flow chart
    - Fracture clinic care plan
    - 18 week data capture form and further integration with Savience
    - Diabetic notes
    - Enteral feeding notes
    - Orthotics
    - Orthodontics
    - Critical Care Summary
    - Anaesthetic charts
    - Anaesthetic obstetric noting
    - Vascular enhanced recovery pathway for open abdominal aortic aneurysms noting
    - Alcohol liaison risk assessment
- Specialty system photographs

- Patient lists – can be configured for specialties, consultants

Additional developments to support usage and improve functionality:

- Raise Pathology and Radiology orders from CIS
- Additional dynamic system links:
  - CRIS
- Additional system links:
  - Varian (Cancer System)
  - Medical Oncology

### *8.2.2 Electronic Document Management System*

This is a major change programme in the way that clinicians and other associated staff groups will access medical records. It has been accepted clinically that this change needs to take place and has the full support of the Exec Team. IT infrastructure was put in place with the move into the new Hospital to support the move to going paperless in Outpatients Clinics as a first step.

The project will facilitate the transition from a paper based health record to an integrated electronic health record across the organisation and into community clinics supported by the Trust.

The Trust has already implemented an electronic document management system but a clear strategy for the transition from a paper based health record to a fully integrated electronic health record has not yet been realised.'

Other key strategic drivers include:

- Financial savings
- An imbalance between capacity and demand
- Electronic Patient Record Project (EPR)
- Fit for the Future PFI Project (FFtF)
- Controls Assurance
- Health and Safety requirements
- Clinical Governance
- Clinical Risk Management
- The approval of a 'Strategy for the Management of Patient Records for 2003 – 2010' by the Trust board
- A prerequisite to the furtherment of mobile working

These contextual drivers combine to ensure that the Trust delivers clinically safe and administratively effective services.

# 9 Technology Themes – The Exploiting Layer

## 9.1 Patient quality

**Some of the technologies we will consider to support this theme**

The technologies that we may develop and implement to support this theme include:

- Assisted Living & Telehealth
- ePrescribing / Medication Alerts for dose checking
- Clinical Information System (CIS) eform interfaces
- Electronic forms to capture and reuse data
- Portable tablet patient interaction e.g. VitalPAC and Graphnet – system for recording bedside observations on a handheld device; have various algorithms build in to calculate clinical scores
- Clinical alarms & messaging e.g. Ascom Unite – delivers alarms, messages and data to staff via mobile devices e.g. tablets
- Clinical skills training solution e.g. Elsevier Clinical Skills – online skills training tool to improve consistency of clinical practice and manage professional training
- Entity identity management (patient matching)
- Hospital at Night
- Specialist clinical apps

Additional detail on some of the technologies forming part of this theme is included within the following sub-sections.

### *9.1.1 Assisted Living & Telehealth*

The NHS Operating Framework 2012-13 stated “Telehealth and Telecare offer opportunities for delivering care differently but also more efficiently. Use of both of these technologies in a transformed service can lead to significant reductions in hospital admissions and lead to better outcomes for patients.

Central Government view on Assisted Living: “The Assisted Living Innovation Platform (ALIP) run by the Technology Strategy Board enables independent living and better quality of life for people with long term conditions and the increasing numbers of older adults by breaking down the barrier between technology and living contexts to encourage real implementation. The ALIP was premised on the fact that people are living longer. However, the number who will have long term conditions, and as they grow old become frail, is set to increase”.

As an organisation providing care to patients with long term conditions (LTCs) the Trust has an interest in its patient’s welfare, to exploit available technologies that keep its LTC patients well longer. Also where possible to keep them out of hospital by being proactive in spotting signs of exasperation, and by providing information and support that the patient may use to adjust their lifestyle towards healthier living.

Aspects of Telehealth implementation will depend on the pathway that the patient is on, but may include.

- Remote monitoring of patients condition (e.g. vital signs)
- Video conferencing between consultant and patient
- Provision and direction to Health and supporting guidance information
- Bespoke consultant to patient support advice and guidance.

The Trust will undertake an initial proof of concept with Heart Failure, with a view to developing a bespoke Trust Heart Failure Telehealth facility. Other areas of the Trust will then be reviewed on an individual basis.

There will also be involvement in the Local Health Economy wide Digitisation Programme that incorporates Telehealth and Telecare and is a consortium of local government, health and social care provider organisations from across Staffordshire and Shropshire. Part of the remit of this group will be to attract centralised government funding.

### *9.1.2 Telemedicine video conferencing*

Telemedicine is a rapidly developing application of clinical medicine where medical information is transferred across distance, for the purpose of consulting, and sometimes remote medical procedures or examinations usually for the purpose of specialist second opinion. The use may be as simple as two health professionals discussing a case over the telephone, or as complex as using satellite technology and video-conferencing equipment to conduct a real-time consultation between medical specialists in two different countries. Video conferencing may be an integral part of Telemedicine as it can be to Telehealth.

Video Conferencing facilities may also be utilised for not clinical conferences and meetings that can be effective in saving traveling time and expense. The Trust has already invested in video conferencing facilities as part of the Trusts inclusion in the national cancer network, and as part of the Trusts City General Hospital PFI build. Developments and the appropriate application of Telemedicine will be regularly reviewed in line with clinical requirements, and as an integral part of the Health Economy wide Digitisation Programme.

### *9.1.3 Location Independent Care*

There are increasing requirements for the staff of the Trust to access information at locations that are away from the main hospital site. There are also a number of initiatives (such as Hospital at Home), that require the creation of a virtual environment. So that the clinician may administer treatment with the same level of information support as in the acute setting, there is a requirement to introduce remote mobile working.

Mobile working doesn't always necessitate the presentation of the full system that may be accessed in the acute hospital or ward. What is important is the presentation of the information that is required to undertake safe and supported healthcare, whilst being able to collect the required information at the point of patient care, in areas where poor connectivity to wireless systems does not cause hindrance. It's also important to ensure that the user device is easy and quick to activate, It's not intrusive or a blocker to the delivery of care, it incorporates disconnected working (for areas with poor cellular connectivity), it's able to be presented on a number of devices including laptop, tablet and smart phone, relevant information may be presented and input as required at the point of patient care.

Remote fixed working will also be reviewed in terms of staff productivity and flexibility through the ability to access Trust systems from home. IT will work with Directorates whose staff are increasingly required to work outside of the Trusts boundaries on the best fit of technology to meet their needs.

## 9.2 Patient experience

**Some of the technologies we will consider to support this theme**

The technologies that we may develop and implement to support this theme include:

- Patient/Guest Wi-Fi & Cellular Network Access
- Telemedicine
- Video Conferencing
- Clinical kiosk
- Potential additional clinical decision support technologies considered within the IT Strategy:
- Patient Care Websites e.g. Digital Life Sciences – patient-focused web resource to provide information structured around the patient journey
- Real-time patient feedback apps e

Additional detail on some of the technologies forming part of this theme is included within the following sub-sections.

### *9.2.1 Patient / guest Wi-Fi & cellular network access provision*

Future network configuration should include the ability to segregate and provide on premise Wi-Fi access to the general public whilst on site. There are many patients and visitors (e.g. Renal patients), who need (due to the care that they receive), to regularly spend significant amounts of time at the Trust. Access to public Wi-Fi would allow them to make use of that time and in some cases undertake remote working. The Trust will work in partnership with the PFI provider on the design of a solution that allows a service to be offered to the public that doesn't compromise the security or impact on the capacity of the Trust Wi-Fi and that compensates the Trust to ensure that the service provision is cost neutral to the Trust.

## 9.3 Improving priorities & productivity

**Some of the technologies we will consider to support this theme**

The technologies that we may develop and implement to support this theme include:

- Bed / Ward Management solution
- Digital Dictation
- Digital Pens
- Electronic Data Capture
- Access to Knowledge Bases
- Paperless clinical noting
- Voice Recognition
- Ward Observations System
- Map of Medicine
- Task management / escalations
- Utilisation / patient flow management
- Electronic -ICU

Additional detail on some of the technologies forming part of this theme is included within the following sub-sections.

### *9.3.1 Ward Information System (WIS)*

The Trust Ward Information System (WIS) will continue to be rolled out across the Trust. The system gives a real time electronic white board view to warn staff on the status of each patient including Bed states, patient transport, TTO status Infection and other alerts. The WIS has proven extremely useful for ward staff in terms of avoiding unnecessary discharge delay and ensuring that patients' needs do not go unattended.

To support the CIS, we will continue to develop the ward information system (WIS) providing a real time view of bed status and patient flow across the organisation. Reflecting information captured and displayed in the CIS, the WIS displays a subset of information, restricting patient confidential / sensitive data whilst displaying alerts, triggers, indicators and a discharge checklist to support patient flow.

With clinically driven software development, the WIS provides clinical staff and managerial teams with the information to effectively manage patient flow, being able to better manage patient care with better availability of data providing more responsive care.

Our aim is to extend the availability of data held within the WIS to support the provision of a local health economy demand and capacity model.

### *9.3.2 Electronic data capture*

Reducing the generation of paper is key to supporting the Trusts Health Records scanning strategy. A number of approaches to capturing information will be progressed.

Working with clinicians the internal software development team will continue to develop electronic templates and data capture forms to remove the need for paper data capture. A number of forms have already been developed with clinical input.

Additional enhancements will be made to the electronic data capture using robotic integration and electronic templates to reduce manual data entry and improved data quality accuracy.

The solution will facilitate better availability of data for clinicians and patients, reducing the likelihood of missing or out of date information.

### *9.3.3 Digital dictation and Voice Recognition*

Is a method of recording and managing natural speech to enable easier handling of transcription into text by using speech recognition software. Digital Dictation may be used for creating letters and creating clinical notes. This can significantly improve turn-around times for correspondence and improve on and possibly illuminate transcription times.

The benefits to the patient Trust and staff will be through:

- reduced clinic typing turnaround time,
- reduced backlog of typing,
- improved working environments,
- reduce pay and non-pay costs,
- reduced agency and overtime costs, associated to the production of clinical correspondence.

### *9.3.4 Knowledge Base integration*

A future replacement PAS system will need to incorporate links to electronically available drug and clinical knowledge bases to provide on-line and active clinical decision support. Many large drug companies, clinical research institutions and academic centres have put considerable resources into developing BMA approved intelligent knowledge and research support systems that can provide support to the health care professional on a day to day basis.

### *9.3.5 Digital pens*

As above electronic forms will be utilised to avoid paper generation and facilitate improved data capture. However, the use of digital pens will be reviewed for environments that require a more flexible and intuitive approach to data capture and where input of data via the PC is not always possible. Digital pens are used to capture the handwriting of a user and convert it into digital data. The digital data can be interpreted by handwriting software (Optical Character Recognition) to provide a text rather than image based data.

### *9.3.6 Mobility within the Trust*

As the dependency on access to digitised information increases, there is an increasing need for that information to move closer to the bedside and for the presentation of information to follow the clinician on his/her ward round. This needs to be enabled via software interfaces that are touch screen enabled and the use of a form factor device that may accompany the clinician without being heavy or cumbersome or intrusive to the delivery of care. It is the intention to present the Trusts clinical systems through an operating system agnostic

presentation platform that will allow access to care records on clinical tablets, iPads, iPhones and other form factor devices that are easy to use and are ergonomically compatible to the delivery of bedside care.

So far the use of iPads and iPods across UHNS has proven to be beneficial to clinicians in the accessibility and availability of data and we continue to be committed to the on-going development and use of this technology.

The Trust will continue to ensure that internal and external systems are compatible with mobile devices and where this is not currently available; we will work towards the implementation of mobile compatible solutions or seek alternative solutions where necessary.

We will aim to secure funding to facilitate the:

- provision of additional mobile devices to clinicians to support the delivery of patient care to the bedside if that's on the ward or if that's at home
- development of applications to maximise the use of mobile technology
- training of staff to ensure that the devices and applications are adequately supported and developed in line with appropriate standards and requirements

We will continue to monitor and manage the performance and effectiveness of mobile devices to ensure that the most appropriate technology is being used and provide assistance and support to users where required through the recently established ICT Mobility Team.

### *9.3.7 eLearning*

The Trust will continue to explore better ways of training its staff that are more flexible, cost effective not time constrained, and allow the member of staff to learn at a pace suited to themselves and their work patterns. The use of eLearning software packages and approaches will be explored by the IT Training Department, with a view to understanding where different approaches to delivering IT training courses across the Trust.

## 9.4 Supporting the Integration of Services across UHNS & MSFT

There is a significant enabling requirement for ICT to undertake in helping progress the North & Mid Staffordshire organisational transformation agenda, whilst facilitating improved clinical productivity. This may be progressed by giving clinicians the technical facilities to achieve more with the same, or with fewer resources on a more diverse geographical footprint.

**Consolidation Opportunities**

With the proposal of the integration of acute services across Staffordshire, comes great opportunity to embrace ICT in the support of clinical and administrative services. ICT that can:

- Enable more joined up, efficient patient care across Staffordshire by integration of systems forming a single acute patient record.
- improve healthcare value - enabling quality improvements and giving commissioners, clinicians and other providers of care the joined up Acute information and intelligence they need to deliver efficient healthcare across Staffordshire.
- Improve collaboration between geographically disparate care teams
- Improve communications across acute services
- The potential to reduce the need for face to face patient consultation and patient travel through the use of innovative technologies such as Telehealth and Telemedicine, for patients with long term conditions, or potentially those who have to travel for care.
- Reduced costs - collaborative savings, less duplication of information and information capture.
- Provide community wide gain - removing barriers, bridging gaps to enable cross organisational access to information that improves processes and care.
- Provide improvements in clinician time and effort - improved access and availability of information
- Patient safety - reduced risk, improved outcomes from better availability of information and innovative solutions
- IT Enabled Business Transformation; using IT to streamline business / back office operations, taking out costs and improving services.

**Benefits to Staff, Services and Patients**

- **All services would work in an integrated way – one service delivered over 2 sites**
  Integrated ICT systems would mean that a single electronic patient record and associated activity could be viewed and updated irrespective of the point of care delivery, supported by innovative technologies such as video conferencing and telemedicine.

- **We want to create world class clinical services for Staffordshire and keep services in the County. Where the best people come to learn, work and research.**

The consolidated implementation of ICT systems and processes can support the delivery of key quality, innovation and productivity informatics themes. These may include shared electronic patient records, clinical systems with the ability to record consultations electronically, improved electronic communications between clinicians, Telehealth, Telemedicine Map of Medicine and systems that support modernisation of pathology and other diagnostics services. Thus enabling an environment that is attractive to the best clinicians and the delivery of high quality care.

- **Provides basis to re-orientate services in Staffordshire to use facilities and staff more flexibly to meet patient demand.**
  Consolidated Finance, HR, Email, Facilities and other administrative and clinical support systems mean that non clinical staff can work in a site independent way. Dedicated IT links between Trust sites will allow clinical images, orders, results and correspondence to be shared quickly and safely across sites.

- **Supports UHNS Financial Recovery**
  Consolidation of ICT licences, contracts, hardware infrastructure and associated support resources will effectively reduce cost overheads

- **Maintain a local hospital in Stafford, going beyond the range of services recommended.**
  Access to specialist services, systems and research facilities that are afforded from University Hospitals status at UHNS, may be seamlessly and securely provisioned to the Stafford site through a joint ICT infrastructure.

- **Provide services locally where possible, only centralising special elements of services in Stoke where there is a strong clinical argument**
  The use of consolidated administrative and clinical information systems and data, supported by modern communication and conferencing technology provides the ability to form virtual teams irrespective of geography.

- **Invest in modernising facilities in Stafford to support high quality, efficient and effective patient care.**
  A larger organisational configuration may provide the opportunity to attract funding to support its strategic ICT direction to have real time up to date and accurate clinical information at the point of patient care irrespective of location.

- **Work closely with other organisations to provide integrated primary, community and acute services.**
  The ability to move to implement consolidated technology and systems, which facilitate seamless clinical pathways and supports 'the patient journey' in partnership with local health and social care providers.

- **Attracting the best people to come into Trust to learn, work and research.**
  ICT in collaboration with Academic Health Science Network, the University partnership and local healthcare organisations, can help support an attractive work environment of clinical excellence, academia and research.

- **Enhanced support for patients with long-term conditions. Reduced need for admission to hospital through development of care in alternative settings, including patients' homes. Delivering services within agreed access targets, e.g. cancer standards, 18 week targets.**
  Telehealth, Telemedicine and Video conferencing and collaboration tools offer health and social care providers a whole host of opportunities to provide their services in a more efficient and productive manner. By allowing real-time, two-way interaction, this technology effectively simulates the experience traditionally obtained face-to-face in examination and operating rooms. Opportunities to utilise these technologies are vast, from providing fast and efficient consultations to patients away from the acute sites.

- **Full integration of Stafford Hospital into the structures of UHNS and Keele Medical School, with enhanced infrastructure to support research, innovation, education and teaching on the Stafford site.**
  This can only be undertaken via the robust provision of IT infrastructure, internet access and where a secure IT environment is provided and monitored by ICT. The consolidated approach to the Academic Health Science network and its digital Agenda will also support clinical development and strengthen the Trusts ability to support research and development in both the Stoke and Stafford sites.

Mid Staffordshire NHS Foundation Trust (MSFT), has recently undertaken a procurement exercise for the provision of a new EPR system. Up to quarter one 2014/15 the deployment of this system has extended to the implementation of Patient Administration System elements only. UHNS have a best of breed EPR environment, based upon an ageing Patient Administration System that clinicians find 'clunky' to use, slow and not intuitive. The existing plan is to consider replacing the UHNS system in quarter one 2016/17, with an option to replace in 2018/19.

This situation affords an opportunity for the future converged organisation. It is the current working assumption that upon the dissolution of MSFT and absorption of services that there will primarily be an extension of UHNS systems across both organisations. However this will only be the case where it is clinically, financially and strategically prudent to do so.

It is anticipated that MSFTs systems and their associated contracts will be novated to the consolidated UHNST organisation post acquisition of MSFT. This will present the opportunity to engage with the supplier with a view to extending the PAS system function across the UHNS enterprise. This will address the usability issues that have been identified, provide enhanced functionality that are characteristic of a modern PAS system such as touch screen enabled and dynamic presentation on various form factor devices.

However, a full assessment of the way forward on integrating services will be undertaken as an integral part of an ICT transition programme. The merits of each system will be evaluated against agreed criterion and the systems that present best quality and value. It is envisaged that the full transition of services will take two and a half years anticipating a start in May 2014, and completion in November 2016. During this period a transition team will be required for the integration and roll out of joint systems.

**Some of the technologies we will consider to support this theme**

The technologies that we may develop and implement to support this theme include:

- Data Centre Strategy
- Shared Services
- EPR strategy
- As per other elements listed across the other themes
- Data migration

## 9.5 Integration with the Local Health Economy

**An overview of the benefits that a focus on this theme will give us**

UHNS is the singular teaching hospital between Manchester and Birmingham. Running several specialist services. The Trust aspires to have partnerships and run integrated services with a number of other organisations. The Trust is already providing services as part of the Stronger Together Programme with Mid Cheshire NHS Trust, running joint services with Mid Staffordshire NHS FT, providing services at Heywood Hospital, providing Trauma services for North Wales, and collaborating with other Trusts and specialist organisations such as the Christie in Manchester and Macclesfield NHS FT and Burton Hospitals NHS FT.

A proposal has been put forward that will deliver a shared care record system working across the Staffordshire and Shropshire health economy, integrating data from the acute trusts, primary care, community care and social care. The overall aims will be to develop:

- A single trans-agency portal for care teams in Staffordshire and Shropshire
- A detailed multi-agency record which contains key data in the pathways of care from acute to community
- A cross-community alerting system to provide safer and better care for vulnerable patients.

These developments will impact on a population of 1.47M with 9 Trusts and 250 general practices.

A full benefits programme is being developed as part of this project and benefits will be identified, agreed and then measured as the system rolls out. High level benefits include:

- a shared system encourages and facilitates shared and integrated working to improve care
- better clinical decision making based on richer and more timely information shared between clinicians
- improved healthcare outcomes for patients, including a better patient experience
- substantial improvements in efficiency across the board, e.g. fewer repeat tests, less time spent completing forms, chasing results, massive reduction in paper

**Some of the technologies we will consider to support this theme**

The technologies that we may develop and implement to support this theme include:

- Clinical Portal e.g. Graphnet – simple and single online view for clinicians of priority information about individual patients, rather than accessing from a number of separate systems
- eDischarge
- Potential additional clinical decision support technologies considered within the IT Strategy:
- Risk Stratification / Patient segmentation

Additional detail on some of the technologies forming part of this theme is included within the following sub-sections.

### *9.5.1 Supporting wider partnership working*

Access to an accurate and up-to-date health record, that is relevant to the patient, irrespective of where that information is stored, is critical to high quality patient care. There are already a number of clinical teams working across North Staffordshire, Mid Staffordshire and Mid Cheshire Trusts including ENT, Urology, Vascular,

Colorectal, Upper GI, and plastic surgery. In all there are over 50 consultants working out of more than one site and this number is expected to grow as the pace of the Mid Staffordshire integration increases.

Some of the patients are on pathways where they are referred, appointed and treated within a single Trust but many of the pathways cross Trust boundaries so a patient may be seen as an outpatient in one Trust and then operated on in another.

At present the three Trusts (UHNS, MCFT, MSFT), use different computer systems, so the patient data is held in different places. This means it is very difficult for clinicians to review patient details because they would need to know which system the data was held on and then be able to access that system from the site they are working at in order to treat the patient effectively. This is true both when a patient pathway encompasses more than one Trust and when a clinician is working at one Trust and gets an enquiry about a patient being seen or treated at another.

Seeing and treating patients without access to the complete record is inefficient and will inevitably lead to increased clinical risk.

The proposed way forward is to take core data from the PAS and clinical systems from each of the three Trusts and to present that data in a single shared record. The data collated will include demographics, encounters with outcomes (face to face contacts), referrals, ADTs, results, X-ray reports and clinical correspondence such as discharge summaries. The data will be presented in date order within type so that for example a clinician will be able to look at all appointments or results from all three Trusts in a single list sorted in date order. This shared record will be available to the relevant clinicians working at all three hospitals.

This would involve building on a shared record already in use within the health community. The current record holds GP data from across Staffordshire. This viewer is already installed in the UHNS A&E Department, and has been integrated with the Trusts CIS. This means that clinicians will be able to view the shared record using their existing EPR login and the solution works within patient context. Other Trusts will be able to embed the viewer within their local systems as a next phase.

### *9.5.2 Local health economy interoperability*

The approach to local health economy interoperability will build on an existing deployment of the Care Centric shared record, a solution which supports integration of data between primary and secondary care. This approach extends the work by adding records from other Trusts (e.g. community and social care), targeting the inclusion of data relevant to type of care, and rolling it out to the larger geographical area. The detailed shared record will include:

- socio-demographic data
- clinical data (biometrics, diagnoses, procedures, investigation results, medications)
- cross-agency working (referrals, alerts, and correspondence)
- shared plans to support transitions in care (e.g. A&E summaries, discharge summaries and care assessments).

Alerting systems will be developed initially for End-of-Life and Dementia to enable care teams to respond in a co-ordinated and pro-active way (e.g. A&E admission acting as a multi-agency alert for patients with these specific problems).

In 2015/16, it's planned that an integrated and fuller shared care record will help clinicians and carers working in primary, community, social and secondary care across the two counties accessing and updating a common detailed record under stringent confidentiality and consent rules.

## 9.6 Resource & asset management

**An overview of the benefits that this theme will deliver**

Since 2008 the Trust has been developing and has implemented a technically advanced business intelligence solution, this has completely changed the reporting capabilities within the Trust. Continued clinical and business engagement is vital to ensure that this technology is exploited to the full and made available widely to staff, providing a better understanding of data.

**Some of the technologies we will consider to support this theme**

The technologies that we may develop and implement to support this theme include:

- Radio Frequency ID (RFID) e.g. for patient and resource tracking – wireless use of electromagnetic fields to transfer data to automatically identify and track tags attached to objects e.g. beds or to easily locate of samples and automate data entry in pathology labs
- Potential additional clinical decision support technologies considered within the IT Strategy:
- Utilisation / patient flow management

Additional detail on some of the technologies forming part of this theme is included within the following sub-sections.

### *9.6.1 Business Intelligence system & data warehouse*

The Business Intelligence team work closely with the corporate Information Team in the generation of decision support information and productivity dashboard. This capability presents the Trust with an advanced and bespoke reporting facility that is able to mine and provide relational reporting on information from a number of disparate data repositories.

Most users will use the Data Warehouse through simply running reports or looking at dashboards via the Report Centre (SharePoint Portal).

### *9.6.2 Dashboards*

There are a number of capabilities within the Trust for BI Development depending on requirement and governance.

- Performance Point – interactive dashboards that present data in simplistic form with very easy drill through down to patient level intelligence.
- Decomposition Tree – Part of SharePoint 2010. Works alongside Performance point allowing users to drill through data and developing their own queries that have the capabilities for graphical outputs.
- Dundas Dashboards – This is for the development of enterprise wide dashboards, produced by the IT BI Development Team.

Some staff use Excel Services for self-analytics. We make report tools available to users who have access to the Dashboards for them to use if they wish. The dashboards also enable users to do degrees of self-analytics.

## 9.7 Research & intelligence

**Some of the technologies we will consider to support this theme**

The technologies that we may develop and implement to support this theme include:

- Business Intelligence System e.g. Business Objects
- Clinical Dashboards e.g. QlikView
- Potential additional clinical decision support technologies considered within the IT Strategy:
- Risk Stratification / Patient segmentation – United Healthcare / Optum

Additional detail on some of the technologies forming part of this theme is included within the following sub-sections.

### *9.7.1 Access to Primary Care Data*

As a fore runner to a Local Health Economy (LHE), wide record access to the patient's primary care record will be integrated into the Trusts Accident and Emergency system.

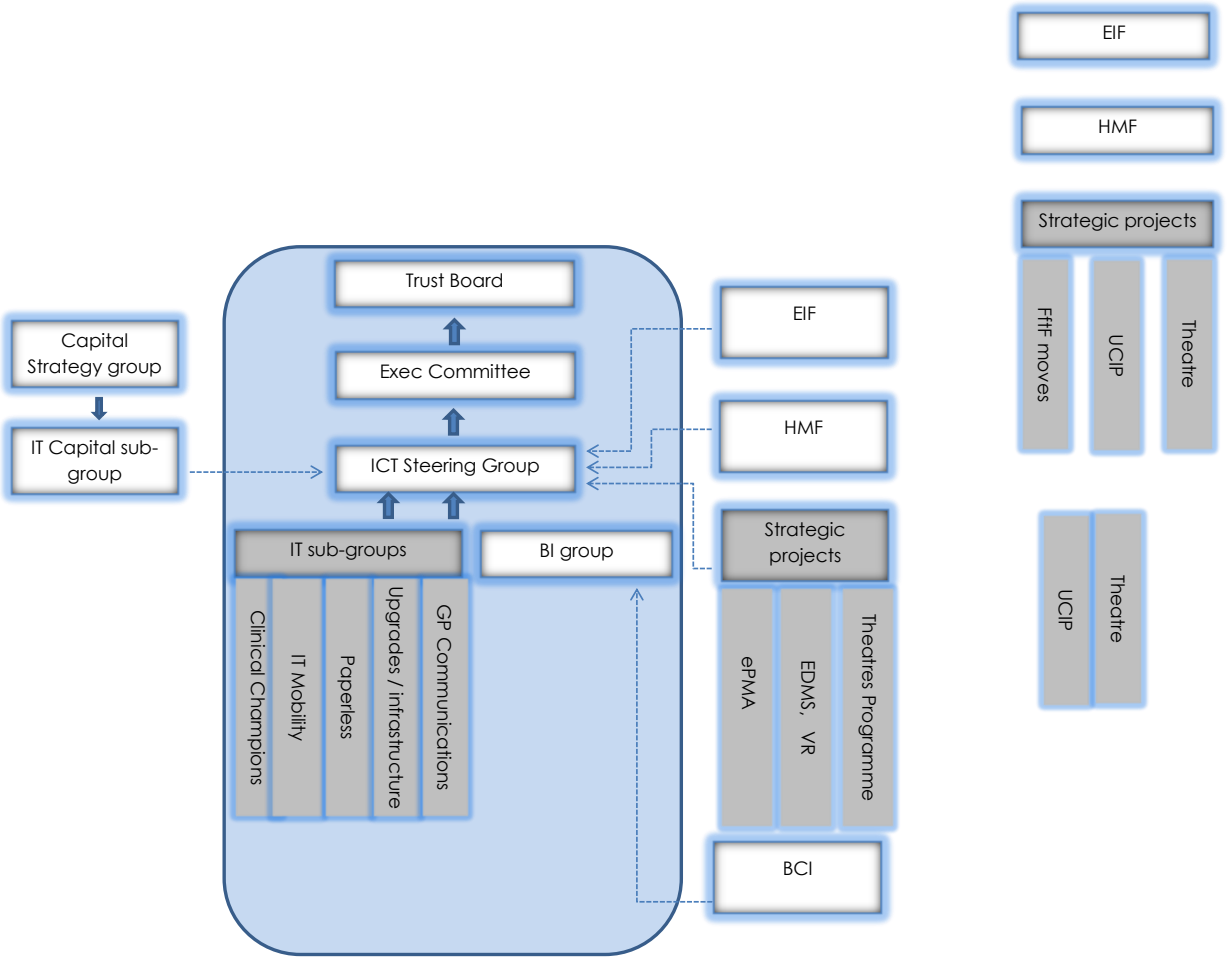
The introduction of Primary Care data to A&E, MAU and other critical areas across the Trust will make significant progress towards improving patient care and safety; contribute towards alleviating winter pressures and reducing unnecessary repeat assessments across different professionals. This initial phase project will be completed in December 2013. To facilitate this data sharing agreements will be put in place between participating GP practices, the Stoke-on-Trent Clinical Commissioning Group, North Staffordshire Clinical Commissioning Group and the Trust.

### *9.7.2 Access to Trust Information from Primary Care*

The patient and the care that they receive will benefit from access to the Trust Clinical Information System from within the GP practice. The ability to order tests directly from the Trusts systems and discuss the acute care episode, outcomes and results in the GP Practice will cut down time delays and frustrations for GPs and patients. Information sharing agreements have already been developed through the initiative to share primary care data in A&E. A plan to roll out an instance of the Trusts Clinical Information System is in the Appendix of this strategy.

# 10 Strategy governance and delivery approach

In order to drive forward change to achieve efficiencies and exploit the benefits of technology, it is critical that we maintain a high level of clinical engagement. An effective governance framework for the management of IT enabled projects and to ensure continued clinical engagement can be shown as:



## 10.1 IT principles underpinning the Strategy

The following set of IT principles underpins the vision and mission; these have been applied in forming options and taking decisions around IT and will help define how the Strategy is taken forward:

**Principle 1: Strategic Alignment**
We will be mindful of all Trust values, strategic aims and clinical responsibilities when making our IT decisions and always aim for "right care, right time, right place"

**Principle 2: Integration**
We will make decisions in support of 'joined-up' IT services across the local health community to reduce fragmentation so that we can maximise our effectiveness in providing 'joined-up' patient care

**Principle 3: Sustainability**
We will avoid short termism and the risk to clinical outcomes this can bring and, where it makes sense, we will bring forward the strategic rather than make do with the tactical

**Principle 4: Listening**
When making IT decisions that affect them, we will we listen to Trust staff and assist them in growing their knowledge on new technologies with appropriate training and support

**Principle 5: Business Ownership**
We will identify business owners for each project who are responsible for working with IT to maximise the benefits for the patient, the Trust and any other key stakeholders

**Principle 6: Innovation**
We will encourage a culture of progress and creative use of new IT and ensure we have the underlying IT infrastructure, funding and on-going resources to support it

**Principle 7:Value**
Clinical care, efficiency, patient safety and information exploitation will sit at the heart of all our decision making as we strive to deliver maximum benefits for optimum cost from our IT strategies and solutions, which we will work closely with our partners and suppliers to achieve

**Principle 8: Creative re-use whilst modernising the estate**
In addition to buying new, we will also look at upgrade, better use of existing capability, as well as decommissioning in order to support moving the Trust's IT forwards

**Principle 9:Usability**
We will consider usability as non-negotiable for all our IT systems

**Principle 10: Governance**
We will consider all relevant aspects of governance and ethical responsibility when making our IT decisions

## 10.2 Business change management

IT is an enabler for the successful delivery of transformational change across the organisation, supporting the drive for efficiencies through the introduction of electronic systems and facilitating timely, accessible clinical information across the local health economy and wider. In line with the strategic objectives of the organisation, IT enabled transformational change will deliver a reduction in administrative staff, the removal of paper based health records and facilitate the treatment of patients with an integrated care record, improve clinical productivity and reduce clinical risk.

In order to successfully develop or procure and implement IT solutions to support widespread process and workforce change, it is critical that the clinical and business processes and requirements are clearly understood and managed. Business change provides this assurance and understanding through an assessment of current and future practice, identifying potential obstacles or barriers to change, agreeing an IT solution that will facilitate change and supporting clinical teams in the implementation and successful delivery of IT enabled change.

The requirement for improved availability of clinical information across geographical areas and timely clinical information to support patient flow within the organisation has driven key internal IT developments. The development of the Clinical Information System (CIS) as a clinical portal from which patient activity, results and

clinical correspondence can be viewed from multiple systems has supported improved availability of real time patient related information across and outside of the Trust. The development of the Ward Information System (WIS) and high level control view has provided each inpatient ward with an electronic bed status, highlighting the status of results, clinical correspondence, transport, TTOs and discharge related information. Business Change has been integral to the development of, and implementation of these systems, transforming the organisation from a position of paper based, manual, disparate systems with out of date information across wards to an electronic patient flow information system and electronic clinical portal.

Business Change will support the next stage of transitional transformation change, removing paper from Outpatient clinics, supporting electronic nursing noting across wards, introducing electronic prescribing and an integrated care record across the community. The IT systems cannot be implemented and adopted without business change support, to ensure that change is implemented successfully and smoothly to realise benefits and maintain the platform for on-going transformation.

To deliver robust ICT services to the Trust and to continue towards a paperless clinical environment that is becoming increasingly dependent on IT, it is vitally important to have the right skills and resources in place.

## 10.3 IT Infrastructure Library (ITIL)

The Trust's IT technical services will operate under best practice Governance and methodology. First line IT support will be represented by the IT Service Desk undertaking Incident management and proactive problem management. Second and third line support will be delivered by desktop support services and IT Operations incorporating configuration and asset management.

The Trusts server estate will be governed by ITIL best practice incorporating Availability, release, change and Disaster Recovery components. Change control procedures will be undertaken via documented change control board and procedure, where appropriate in partnership with the trusts PFI partners.

## 10.4 Programme & project management

Managing Successful Programmes (MSP) – MSP methodology will be utilised for Programme Management. MSP comprises a set of principles and processes for use when managing a programme. It is founded on best practice. It is very flexible and designed to be adapted to meet the needs of IT Programmes in complex environments, with a focus on ensuring that benefits are identified and released as appropriate.

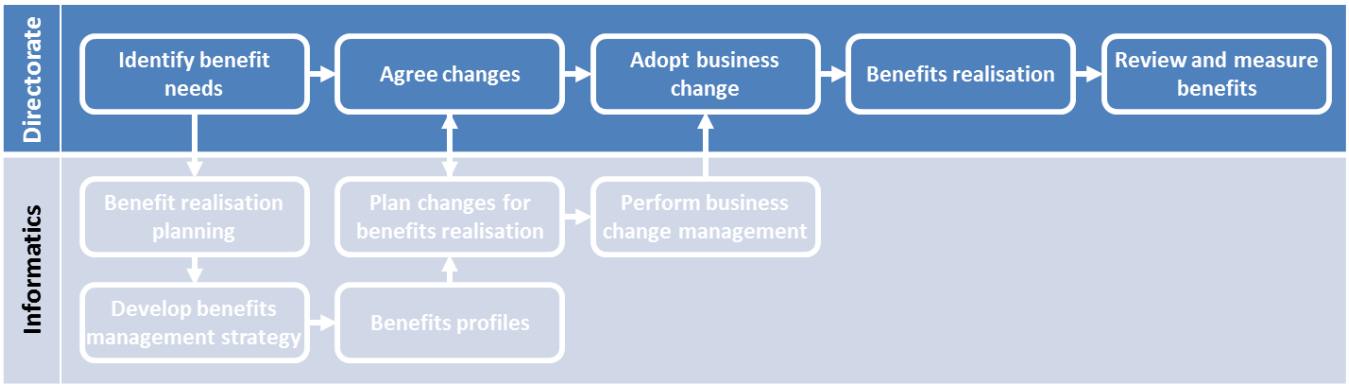
PRINCE2 methodology will be employed for all IT projects, PRINCE2 is a de facto standard developed and used extensively by the UK government and is widely recognised and used in the private sector, both in the UK and internationally. It embodies established and proven best practice in structured and controlled project management.

PRINCE2 Project Resource Planning- In order to effectively deliver fit for purpose IT Project to the Trust, it is essential that the necessary resources are available. The question must be posed – "Do we have the Human, Financial & Infrastructure resources in place or committed to providing the necessary resources to fulfil and sustain the Trusts IT requirements?"

The allocation of resources to the plan for both project implementation and post project steady state is part of the overall process of planning, estimating and resourcing of a project. This needs to be included at Business Case stage, and each time the plan is reviewed and revised, the resourcing implications will also need to be reviewed.

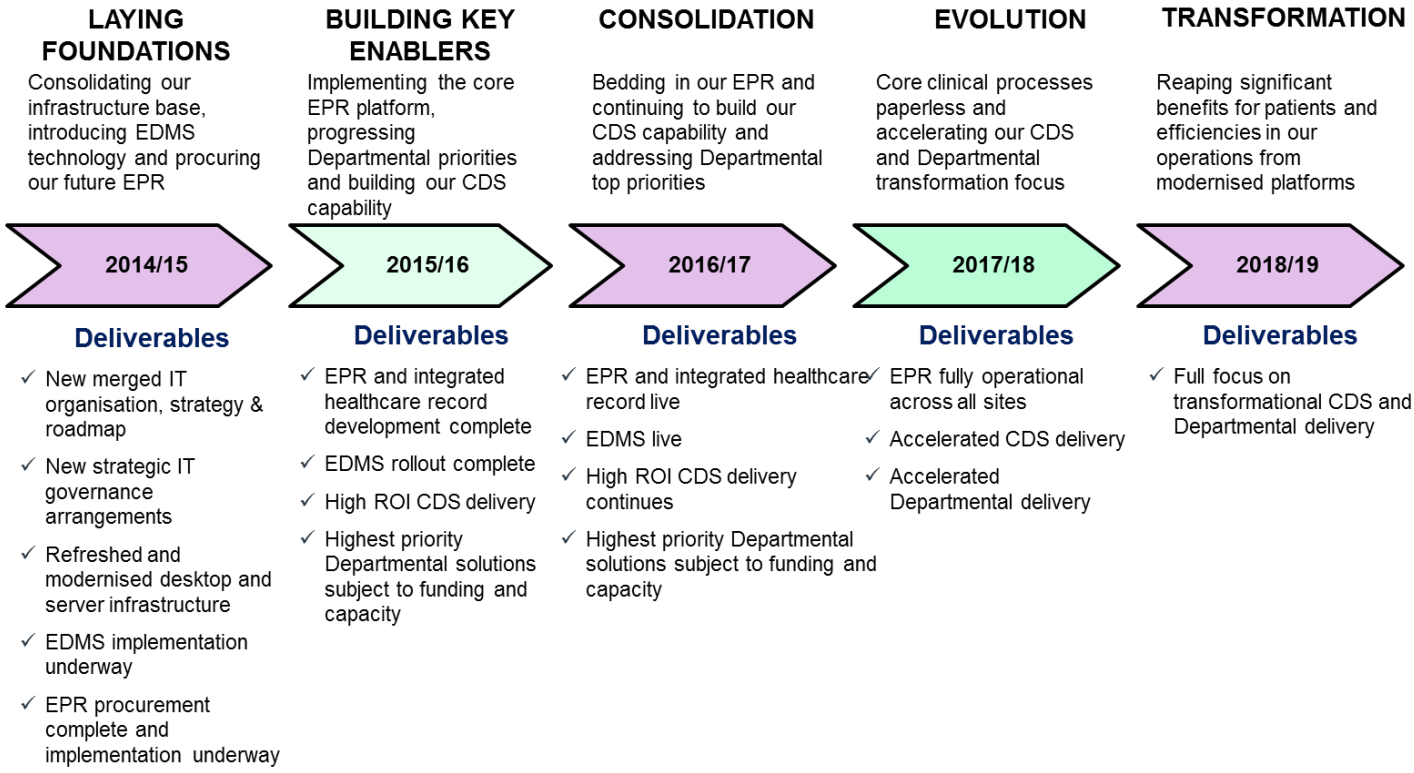
## 10.5 Benefits realisation approach

The benefits needed, as identified by the various directorates, will be turned into programmes of work designed to deliver both the business and the IT change that is required to ensure these can be realised. It will be the responsibility of the directorates to adopt the proposed change and also their responsibility to harvest, review and measure benefits and to ultimately say whether the business case has been met. In this context Informatics is the 'enabler' for business change and benefits realisation, not the 'owner'.



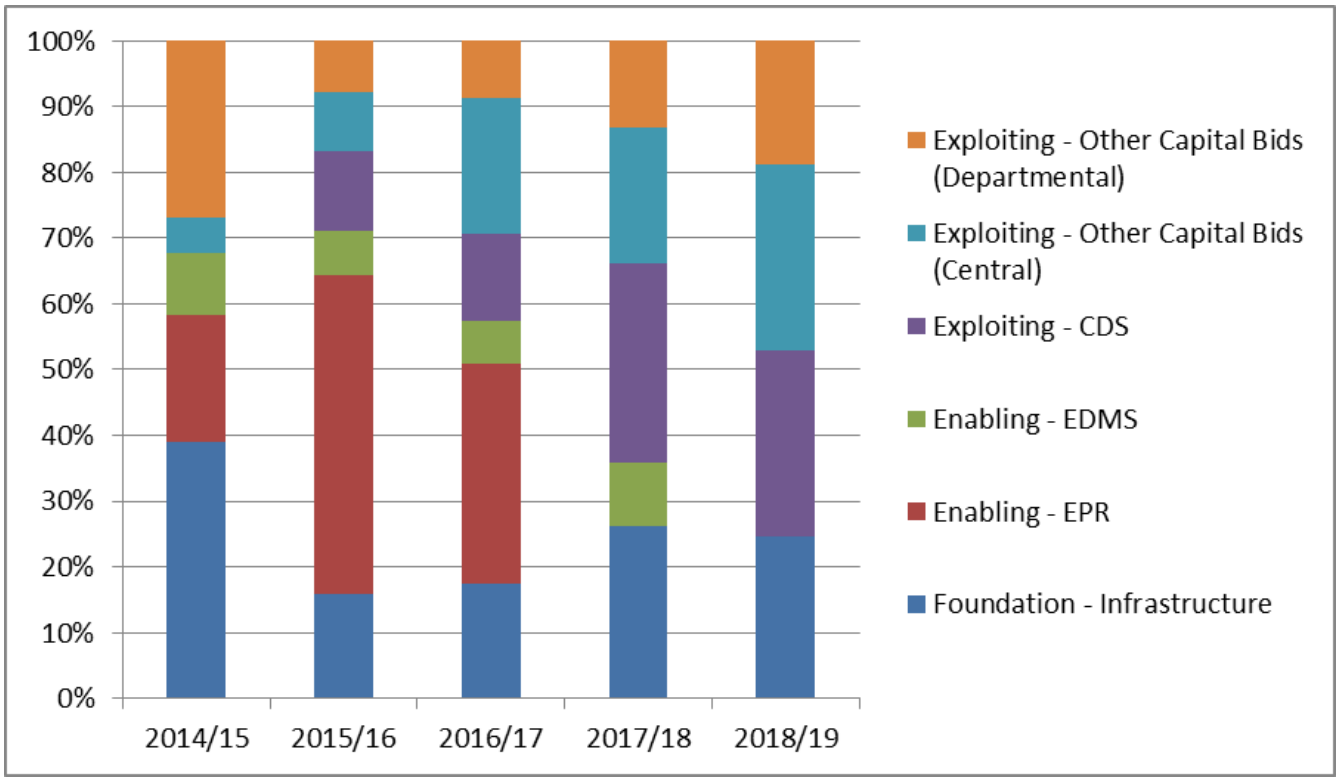
# *A. UHNS Technology Roadmap 2014-19*

The Technology Roadmap for UHNS from 2014 – 19 is illustrated below:




To achieve the objectives set out in this strategy our priorities in the next 2-3 years need to be to successfully integrate UHNS and MSFT on a single integrated care platform and to ensure that there is a resilient infrastructure platform able to support our ambitions for 2025 in terms of state of the art clinical decision support systems.

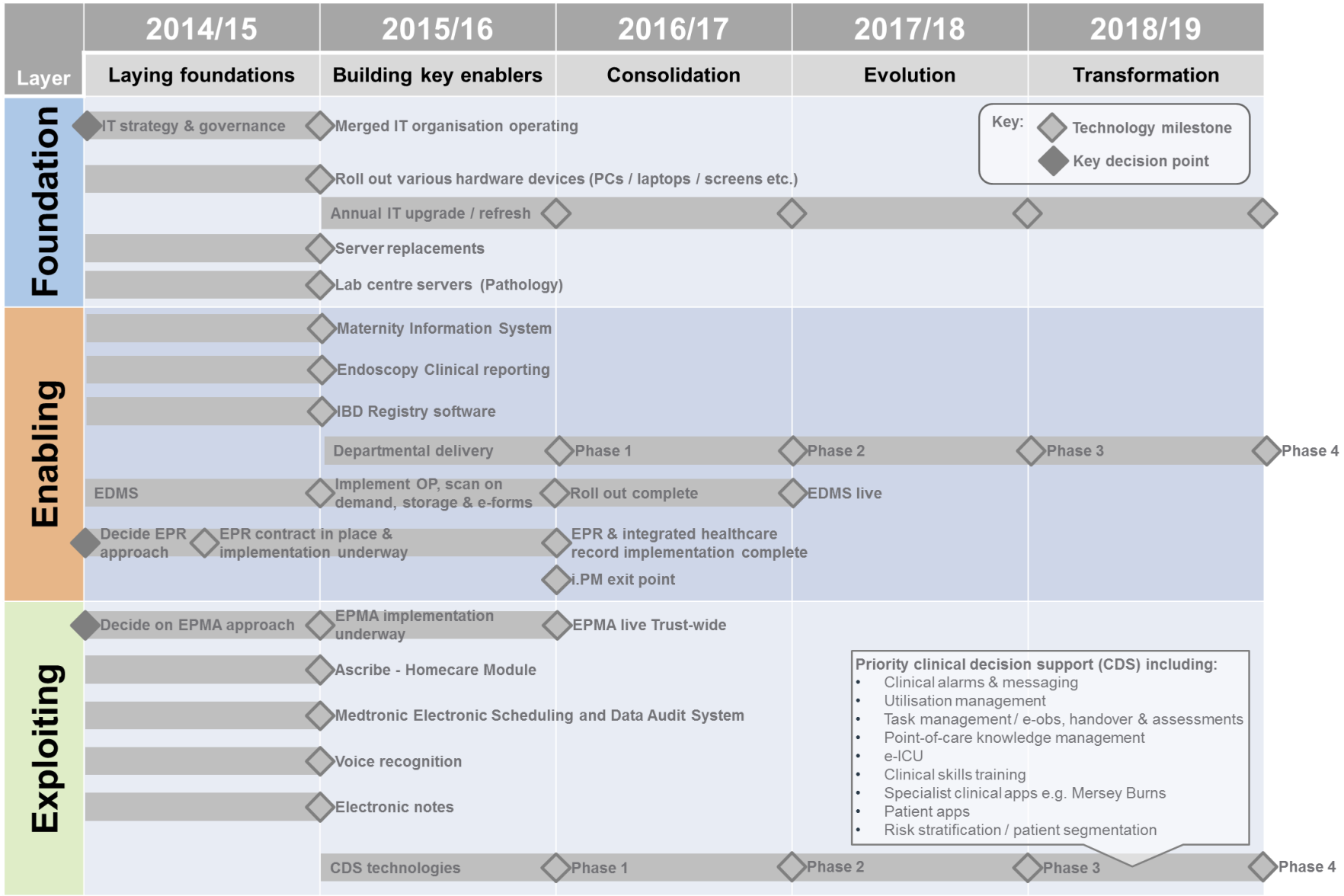
Within the funding and capacity available within the IT team to support unprecedented levels of change we will have to make clear choices within the Governance framework set out in the strategy as to where we focus our efforts over and above our strategic intent. The figure below illustrates the proportion of available spend we will be able to deploy against our priorities over the 5 years of this strategy.




The following page provides the detailed roadmap.

University Hospital of North Staffordshire NHS Trust

## UHNS Technology Roadmap 2014-19



# *B. Examples of Clinical Decision Support (CDS) technologies*

The findings of the research and analysis on CDS technologies that was undertaken to inform this Strategy is included below. Other suppliers in addition to those indicated and/or linked to may have similar capabilities to those identified:

| Theme | Examples of technologies that will support decision making |
|---|---|
| **Patient Quality** | **Technologies already under consideration:**<br>• Assisted Living & Telehealth<br>• ePrescribing / Medication Alerts for dose checking, alternative orders e.g. UHB who have reported some interesting results with their prescribing system, which has reduced the delay between prescribing and administration, and improved accuracy link<br>• Clinical Information System (CIS) eform interfaces e.g. CCube link – electronic forms to capture and reuse data, creates a 'read only' view and also drives automated data entry<br>• Portable tablet patient interaction e.g. VitalPAC link and Graphnet link – system for recording bedside observations on a handheld device; have various algorithms build in to calculate e.g. Sepsis-6 score<br>**Additional technologies identified and included within the roadmap / Strategy:**<br>• Clinical alarms & messaging e.g. Ascom Unite link – delivers alarms, messages and data to staff via mobile devices e.g. tablets<br>• Clinical skills training solution e.g. Elsevier Clinical Skills link – online skills training tool to improve consistency of clinical practice and manage professional training<br>• Entity identity management (patient matching) e.g. NextGate link – examines patient records from systems, links related records together under a single key, creating a 'single and best' entry<br>• Hospital at Night e.g. Nervecentre link – mobile task management for acute out of hours care, replaces 'bleep' system with one that communicates live patient-related information wirelessly to the clinician<br>• Specialist apps e.g. for burns such as 'Mersey Burns' for calculating burn area percentages etc. link |
| **Integration with the Local Health Economy** | **Technologies already under consideration:**<br>• Clinical Portal e.g. Graphnet – simple and single online view for clinicians of priority information about individual patients, rather than accessing from a number of systems<br>• eDischarge e.g. Kainos Evolve eDischarge link – clinical information to GPs at discharge<br>**Additional technologies identified and included within the roadmap / Strategy:**<br>• Risk Stratification / Patient segmentation – United Healthcare / Optum link – data analysis technology to allow clinicians to determine which patients will benefit most from early interventions such as in the community<br>**Technologies considered but not included within the roadmap / Strategy:**<br>• Medical Interoperability Gateway (MIG) – managed service that enables patient data exchange between GPs and clinicians – including viewing detailed records (including medication, long-term conditions) and exchanging clinical docs |

| Theme | Examples of technologies that will support decision making |
|---|---|
| **Improving Priorities and Productivity** | **Technologies already under consideration:**<br>• Bed / Ward Management ('whiteboard') solution e.g. Aura Flow link<br>• Digital Dictation<br>• Digital Pens<br>• Electronic Data Capture<br>• Knowledge Base<br>• Paperless clinical noting e.g. Aura Note link<br>• Voice Recognition<br>• Ward Observations System e.g. Nervecentre link<br>**Additional technologies identified and included within the roadmap / Strategy:**<br>• Map of Medicine link<br>• Task management / escalations e.g. Nervecentre link – sends alerts, tasks and escalations to the most appropriate member of staff in response to pre-set business rules<br>• Utilisation / patient flow management e.g. Oak Group link, Medworxx link – provides visibility of patient status and any delays to their movement through the relevant care pathway<br>• E-ICU e.g. Philips Visicu link – takes bedside readings from ICU into a centralised monitoring service; typically run over several hospitals with centralised monitoring staffed by nurses and an anaesthetist<br>**Technologies considered but not included within the roadmap / Strategy:**<br>• Bespoke mobile app platform e.g. NDL awiMX link – software toolkit and server platform to quickly design and manage multiple bespoke apps for smartphones, tablets etc. to allow easy mobile working<br>• Clinical workflow e.g. Kainos Evolve Patient Manager link – automatically prompts appropriate clinical activity for each patient at the right time; enables creation of customised processes, forms and reports<br>• Process builder tool (i.e. for protocols & guidelines) e.g. Expert 24 link – allows creation of processes / workflows in a visual manner by, for example, drawing a flowchart<br>• Order set management e.g. Elsevier InOrder link – enables the creation, management and use of order sets; allows the import of existing order sets and creation of new order sets based upon hospital terminology and order items |
| **Research & Intelligence** | **Technologies already under consideration:**<br>• Business Intelligence System e.g. Business Objects link<br>• Clinical Dashboards e.g. QlikView link<br>**Additional technologies identified and included within the roadmap / Strategy:**<br>• Risk Stratification / Patient segmentation – United Healthcare / Optum link<br>**Technologies considered but not included within the roadmap / Strategy:**<br>• Business intelligence platform e.g. Google cloud / Big query, Caradigm link – online 'on demand' services that are easy to use and scalable to allow interactive analysis of massive datasets<br>• Clinical Insight Engine / online clinical content e.g. Clinical Key link – online 'knowledge base' for clinicians that provides answers from published medical resources with a focus on ease of search and presentation of information in a structured way that aligns with doctors' workflows,<br>• Data Warehouse e.g. InView link – a database used for current, trending and historical reporting and data analysis which is created by integrating data from one or more disparate sources creates a |

| Theme | Examples of technologies that will support decision making |
|---|---|
| | central repository 'warehouse' of data<br>• Health Maintenance / Population Health Management e.g. Caradigm link – uses insight from 'big data' sources to identify opportunities for healthcare surveillance within a population, also disease management, care management and patient engagement e.g. Aridhia link are doing work with big data for chronic disease management |
| **Patient Experience** | **Technologies already under consideration:**<br>• Patient/Guest Wi-Fi & Cellular Network Access<br>• Telemedicine<br>• Video Conferencing<br>• Clinical kiosk<br>**Additional technologies identified and included within the roadmap / Strategy:**<br>• Patient Care Websites e.g. Digital Life Sciences link – patient-focused web resource to provide information structured around the patient journey<br>• Real-time patient feedback apps e.g. Digital Life Sciences 'Talk To' link – app to enable provision of feedback and response to relevant people involved in a patients care<br>**Technologies considered but not included within the roadmap / Strategy:**<br>• Social Customer Relationship Management (CRM) e.g. Microsoft Dynamics Online link – cloud customer management tool to identify, track and manage individuals and their interactions; also supports social marketing |
| **Platform Services** | **Technologies already under consideration:**<br>• Clinical Information System<br>• Clinical Portal e.g. Graphnet<br>• EPR<br>• NHS Number / Patient Administration System<br>**Technologies considered but not included within the roadmap / Strategy:**<br>• Business intelligence platform e.g. Google cloud / Big query, Caradigm link |
| **Integrated Health Record** | **Technologies already under consideration:**<br>• Electronic Document Management System (EDMS) e.g. CCube<br>• Clinical Portal e.g. Graphnet<br>• Patient Access to Records<br>• Summary Care Record (SCR)<br>• Telehealth – technology to help individuals live more independently and for longer at home, and reduce admission to hospital; includes personal alarms, medicine management and other monitoring devices e.g. Hygieia link who are working with the Ulster hospital and have an innovative device for home management of insulin dosage |

| Theme | Examples of technologies that will support decision making |
|---|---|
| **Resource & Asset Management** | **Technologies already under consideration:**<br>• Radio Frequency ID (RFID) e.g. for patient and resource tracking link – wireless use of electromagnetic fields to transfer data to automatically identify and track tags attached to objects e.g. beds or to easily locate of samples and automate data entry in pathology labs<br>**Additional technologies identified and included within the roadmap / Strategy:**<br>• Utilisation / patient flow management e.g. Oak Group link, Medworxx link<br>**Technologies considered but not included within the roadmap / Strategy:**<br>• Patient level information and costing system (PLICS) e.g. Synergy Costing link<br>• Resource & Capacity Planning e.g. SAP link |
| **Mid-Staffs Integration** | **Technologies already under consideration:**<br>• Data Centre Strategy<br>• Shared Services<br>• EPR strategy<br>**Additional technologies identified and included within the roadmap / Strategy:**<br>• As per other elements listed across the other domains |
| **Infrastructure** | **Technologies already under consideration:**<br>• Bring Your Own Device (BYOD)<br>• Disaster Tolerant Systems<br>• IP telephony<br>• Radio Frequency ID (RFID) e.g. for lab tracking link<br>• Smart Cards & Single Sign-On (SSO) e.g. Caradigm Identity & Access Management link<br>• Unified Communications<br>• Virtualisation<br>**Technologies considered but not included within the roadmap / Strategy:**<br>• Barcode scanning e.g. Gryphon link<br>• Positive patient identification e.g. Dakota link – Various methods are available for positive patient identification, including handwritten or printed wristbands, barcoded wristbands and the use of photographic identity cards.<br>• Scanning e.g. Kainos Evolve Managed Scanning link |

## C. Information Technology Commitments 2013/15

These include:

- To complete the move of the Server Room at the Royal Infirmary to new Maternity and Oncology Server Room by March 2014
- To complete the technical refresh of the EPR applications by December 2013, including:
- Move of IPM and Evolution servers (currently on most recent versions)
- ORMIS, ICM upgrades to the latest version
- To install a single sign on solution following completion of the EPR technical refresh
- To procure and build the new PACS server room
- To reduce the number of printers across the organisation and introduce MFDs where not already present
- To standardize PCs across the organisation to reduce variances in hardware
- To replace the number of devices held by individual staff members, replacing a PAC with a laptop for managerial staff
- To provide clinicians with iPads to support the availability of data in the delivery of patient care
- To review the ICM electronic requesting and resulting system to identify areas for improvement for discussion with the supplier
- To review the level of mandatory fields within IPM and produce an impact assessment of changes to improve data quality issues
- To deliver full rollout, implementation and adoption of the WIS, becoming the central point of bed status and patient flow information across the Trust
- To deliver full rollout of the CIS including a communication exercise to raise awareness of the functionality and information available to staff
- To provide ORMIS Theatre training to Maternity staff
- To incorporate WIS and CIS training into the mandatory system training for all new starters
- To develop interfaces from the WIS to disparate systems to highlight the status of: Transport, TTOs, Orders, Results, outstanding discharge items, Theatre pathway
- To produce an electronic solution to scan GP referral letters into the CIS
- To identify the staged widespread introduction of electronic form data capture to replace paper data capture in an outpatient setting (including electronic drawing software)
- To produce a modular strategy for the production and adoption of electronic forms to replace paper forms
- To provide monthly classroom training lessons for all key applications
- To assess the feasibility of developing a vital signs application to be used on iPods across wards
- To implement E Discharge via the iPad across all wards
- To switch off all paper discharge letters and clinic letters for North Staffordshire, Stoke, Cheshire and South Staffordshire patients
- To provide an integrated digital dictation solution via the CIS to reduce multiple system access
- To educate the use of the Business Intelligence tools
- To produce Dashboards to highlight performance of clinical areas
- To interface the CIS to Christie's external portal, using the link to facilitate interfacing to Leighton Hospital
- To achieve full rollout and implementation of an E Prescribing system
- To achieve full rollout and implementation of a new Maternity system

- To achieve paperless clinics in an outpatient setting and full adoption of electronic noting for all inpatient activity
- To secure funding for iPads and other appropriate mobile devices to facilitate access to the CIS and other applications across the Trust
- To receive all GP referrals letters electronically
- To achieve integrated clinical portals across the local health economy and across wider regional areas as an extension of integration with the Christie's portal
- To enhance the use of Business Intelligence tools
- To obtain Business Intelligence feeds from all EPR and critical system applications

# *D. Current Plans*

**Existing projects implementation plans**

Appendix 2 ICT Roll out plan.xlsx

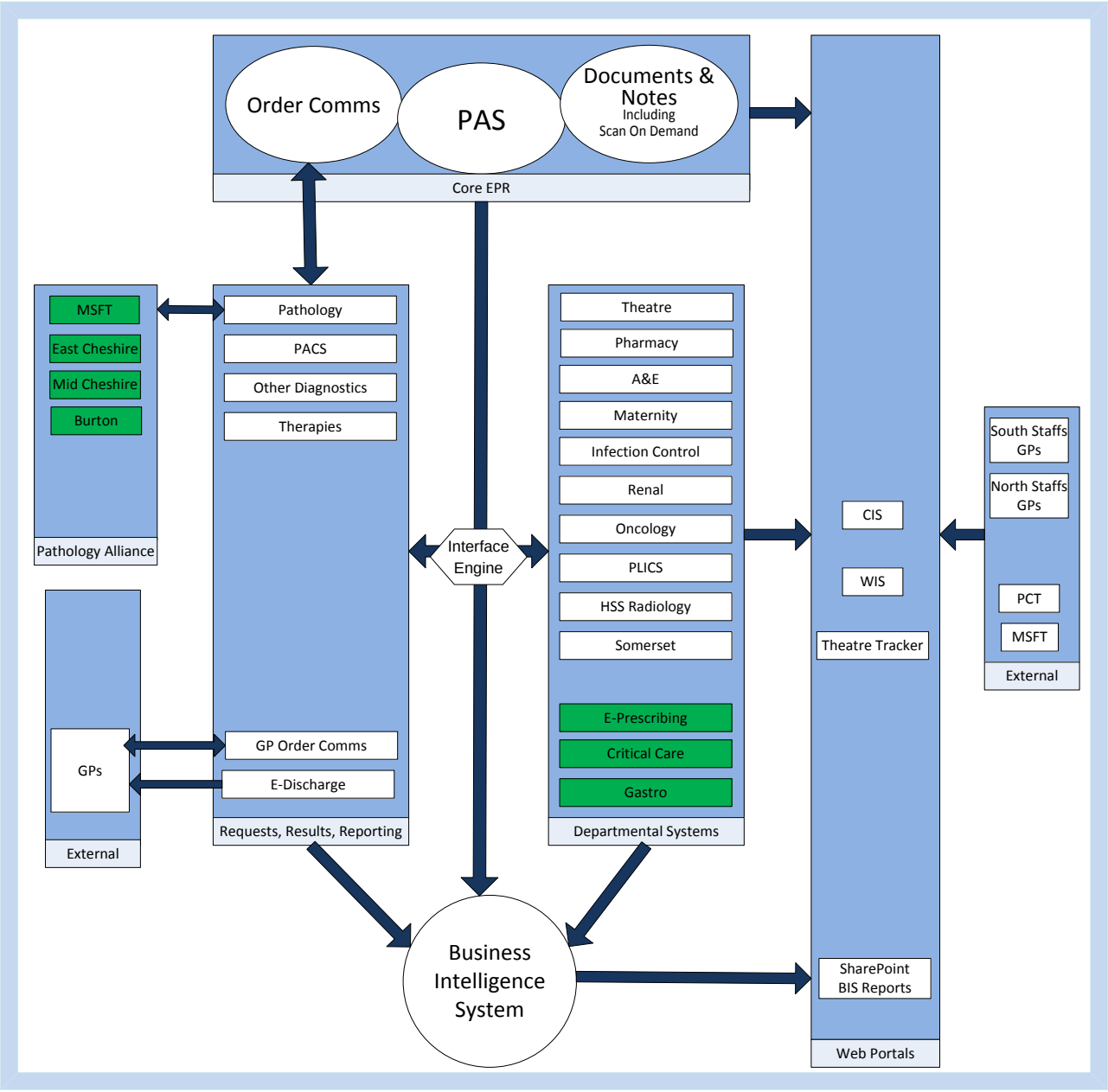
**5 year capital investment plan**

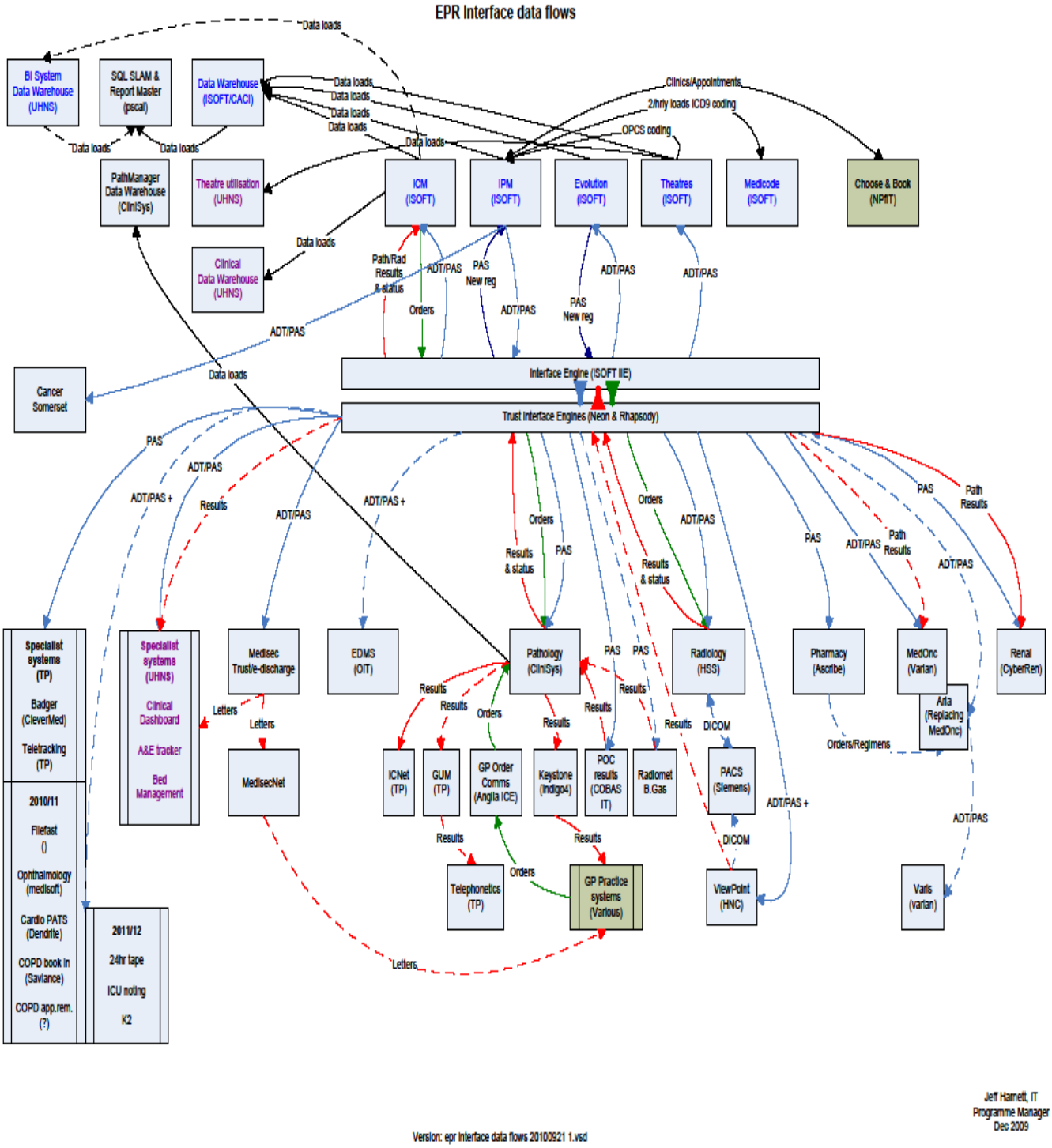
**Prioritised ICT capital bids (2014/15)**

**PAS replacement resource requirements plan**

**Ward Information / Clinical Information System implementation plan**

## *E. UHNS systems configuration*






Jeff Harnett, IT Programme Manager
Dec 2009

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