LONDON NORTH WEST HEALTHCARE NHS TRUST

IM&T STRATEGY

FINAL

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TABLE OF CONTENTS

1. INTRODUCTION

1.1 INTRODUCTION

1.1.1 This document sets out the Trust's IM&T Strategy for the period 2015 to 2020 and has been developed:

- in response to a number of key national and local drivers and pressures;
- to enable the organisation to meet strategic goals for clinical, operational and corporate integration;
- to support Divisional priorities and objectives, as established through business planning and transformation programme;
- to facilitate future IM&T developments to support improvements in patient care and patient experience;
- to enable remodelling of IM&T services following 2014 merger.

1.1.2 Importantly, the Strategy will also enable the delivery of improved services to patients, staff and commissioners, and reflects the views of stakeholders regarding their considered priorities and aspirations.

1.1.3 The Strategy also builds upon a number of significant investment decisions approved by Trust Board over the past year, including business cases for Clinical Portal, Electronic Patient Record (EPR) and Electronic Document Management solutions, each being essential components of the planned strategic 'solution architecture'.

1.1.4 The Strategy will be delivered through formalised programme and project management methodologies, and where appropriate projects will be subject to approved business cases and defined procurement activities.

1.2 VISION

1.2.1 Over the term of this Strategy, i.e. by 2020:

> *"Every staff member will be able to capture and view all of the clinical and performance information they need, when and where they need to, so delivering enhanced patient outcomes, significant efficiency improvement and a better user experience for all.*
>
> *Through systems interoperability and collaborative working with partners across the local health economy, we will also enable our patients with access to their digital care records, extending patient involvement and informing their choices".*

1.2.2 The supporting Strategic Objectives are set out in Section 4 (page 24), having previously been signed-off by the Trust Board in March 2015 when approving the Strategic Outline Case for EPR referred to above.

2. CURRENT IM&T SERVICE PROFILE

2.1 INTRODUCTION

2.1.1 This section describes the IM&T service and infrastructure as it stands currently, including those initiatives which the Trust Board has already approved to move forward with.

2.1.2 These are described across three respective functional headings: Care Records; Business Intelligence; ICT Infrastructure.

2.1.3 IM&T strategy development, investment approvals and project oversight are currently managed through an IM&T Strategy Board, reporting up to the Trust Board through the Finance Investment & Estates Committee.

2.1.4 IM&T service delivery and audit assurance are currently managed through an Information Assurance Board, reporting up to Trust Board through the Audit Governance & Risk Committee.

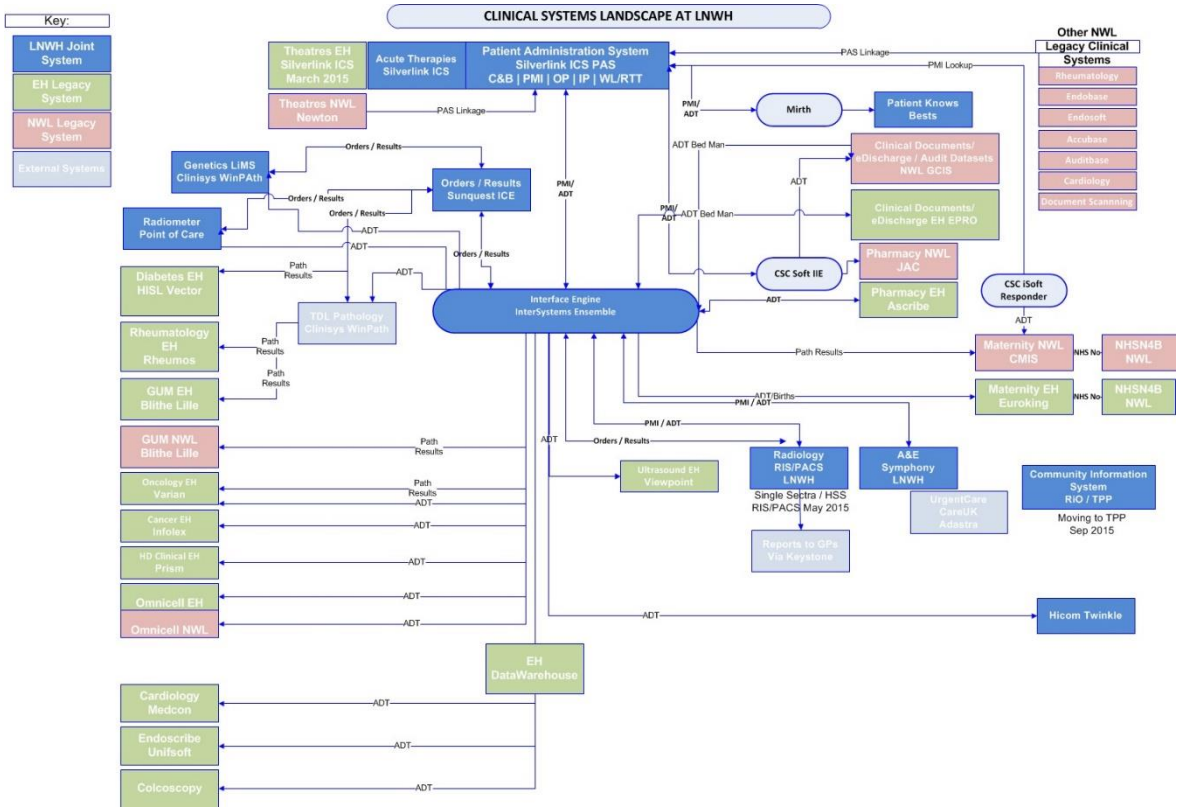
2.2 CARE RECORDS

2.2.1 There are a number of existing separate clinical systems (ePRO, GCIS and numerous individual departmental systems) that had been implemented across the two legacy organisations which result in patient data across the merged Trust being further fragmented. Patients can be asked for the same information multiple times and there may be multiple instances/versions of the same data, leading to potential clinical risk.

2.2.2 A number of current departmental clinical systems are provided by small companies or are reliant on temporary and contractor staff to be kept up to date and maintained, thus exposing the Trust to risk of the supplier going out of business, leaving the market or failing to suitably invest in ongoing product development.

Existing Arrangements and Service Gaps

2.2.3 The existing systems topology is illustrated below. This gives a high level view of those clinical information systems have been merged for the new Trust and the extent of legacy Trust specific systems (most of which are thereby duplicated, e.g. two separate Maternity systems).



2.2.4 Whilst perhaps not immediately obvious from the above systems map, there are a number of further anomalies and variable practices across the Trust sites, including:

- Variation of mixed economy between paper and electronic information;
- No single view of the patient record across the new Trust;
- Manual processes currently not supported by any systems;
- Inability of a number of current systems to support innovation, mobile technology and point of care access.
- Issues with the paper case notes including availability, misfiling and legibility.
- Differential data standards and systems configuration constrains the provision and quality of management information.

2.2.5 Training functions are also quite fragmented and there is variable provision across the key clinical systems. Whilst there is some dedicated resource for PAS and the RiO community systems, other departments chiefly rely on the availability of local super users to train new staff on their respective clinical systems.

Stronger Together – Merger Programme

2.2.6 The two legacy Trusts documented a joint IM&T Strategy in 2012/13 to support the merger Full Business Case submission. The Trust Board has since approved a number of subsequent major IM&T business cases and investment decisions to unify clinical information systems consistent with this strategy, including:

Completed:

- Patient Administration System (iCS PAS)
- Integration Engine (Ensemble)
- A&E Clinical System (Symphony)
- Order Communications and Results Reporting System (Sunquest ICE)
- Radiology Information System & Picture Archiving Communication System (Sectra)

In Progress:

- Real-Time Bed Management (PAS and bi-directional interfaces to EPRO, GCIS)
- Data Warehouse & Business Intelligence Solution (Internal)
- Community Information System (TPP SystmOne)
- Clinical Portal (finalising Preferred Bidder decision at time of writing)
- Electronic Patient Record (Strategic Outline Case approved March 2015)
- Electronic Document Management (Strategic Outline Case approved March 2015)

2.2.7 The first 4 of the 'completed' projects can be seen as 'tactical' decisions, covering a period of circa 5 years, with replacement or upgrade solutions being considered within the term of this Strategy.

2.2.8 The RIS/PACS, Community, Clinical Portal, EPR and EDM schemes are considered as 'strategic decisions', each expected to be for a period in excess of 5 years, i.e. extending beyond the term of this Strategy.

"Day in the Life"

2.2.9 Prior to the merger the joint IM&T management team undertook a 'Day in the Life' project in 2014, aimed to understand user experience and document the current practices across the merging sites. This was progressed as a clinical engagement activity with internal and external stakeholders, shadowing and walking through existing work processes, gathering feedback from interviewees and replaying key points with them before presenting specific findings to the Trusts' Joint IM&T Clinical Advisory Group and IM&T Strategy Board.

2.2.10 A separate detailed review was also carried out and formally reviewed by the Trust's IM&T Strategy Board, comparing current GCIS and ePRO functionality against contemporary EPR solution specifications. This review concluded that the current legacy Trust clinical systems provided for not more than 50% of a full EPR specification, reinforcing the necessity for progressing the business case for a long term EPR solution across all sites.

2.2.11 Building further on this work, and as part of the development of this Strategy, a series of three subsequent stakeholder workshops were held in Q1 2015 which included Trust Board members (executive and non-executive directors), clinical staff, divisional managers and departmental personnel, as well as external representation from local GPs and CCGs.

2.2.12 A summary of the main issues with the current systems environment raised by users through the above engagement process and subsequent IM&T strategy workshops are illustrated below.

2.2.13 Notably, the business case for accelerating the deployment of a Trust-wide Clinical Portal, ahead of EPR procurement and implementation, was progressed as an agreed strategic response to the consensus findings from the stakeholder engagement activity.

2.3 ICT INFRASTRUCTURE

2.3.1 The following is a summary of the current infrastructure across the Trust detailing key issues and highlighting recent developments.

- **PC, Network and Server Security:** Common – separate but centrally managed - anti-virus, device encryption, port security and internet monitoring systems now in place across all sites to reduce risk of service disruption or data loss.

- **Network Capacity:** To ensure high availability of IT systems as well as good performance, triangulated, high bandwidth, resilient, wide area network in place between the three core hospital sites, with network hardware and general configuration standardised across all sites. To avoid tying staff to a desk or cable, a new network management/monitoring system and extended Wi-Fi provision to cover all acute sites will be implemented by the end Q3 2015, for connected Trust devices.

- **Network Login:** Multiple Windows Active Directory domains in place, inherited from legacy organisations. Accounts will be migrated to form a new single Active Directory domain over the next 12 months. Until this is achieved the process of sharing information or accessing systems can be complex for staff who regularly rotate to work across sites.

- **Data Centre:** Three resilient designed for purpose main data centres are distributed across the acute sites, enabling data replication and greater options in relation to disaster recovery and business continuity planning.

- **Wide Area Network (WAN) – Acute Sites:** The acute sites are triangularly interconnected using 1GB links providing a resilient primary backbone ring. Each of the acute sites are also part of a 200Mbps EtherVPN network and have N3 connections for internet and spine applications access, providing further layers of resilience, high levels of availability and good performance.

- **WAN Connectivity – Community Sites:** All Brent, Ealing and Harrow community sites are also connected to the Trust's primary network via 10/100 Mbps EtherVPN links to form a private secure cloud. As with the acute sites, N3 connections provide further resilience to ensure availability and access to systems and information.

- **WiFi – Trust Users:** Northwick Park and Central Middlesex Hospitals currently have >95% Wi-Fi coverage across each site, and Ealing Hospital will achieve same levels of coverage by the end of 2015.

- **WiFi – Guest Users:** A monitored Academic and Student Wi-Fi internet access will be available by Q3 2015, across all 3 acute sites. A managed Patient and Guest Wi-Fi service will be also offered by the Trust during the current financial year.

- **Remote access:** There are currently two legacy remote access solutions in use within the Trust offering approximately 600 connections. It is proposed to move to a single resilient solution, as with the marked increase in community-based and home working it is envisaged that the need for this facility will double in the next two years.

- **Mobile devices:** Over the past 18 months almost 1,000 additional mobile devices have been deployed, primarily tablet devices for use by clinical staff on acute wards and in community settings, including midwives, 'STARRS' assessment and rehabilitation service and tri-borough district nursing teams. Through summer 2015 the roll-out will extend further as we complete deployment of the community EPR solution (SystmOne).

- **Acute Telephony:** There is a mixture of traditional analogue/digital and IP telephony at the acute sites, each with different systems**.** The Ealing Hospital and Northwick Park phone systems are connected to the Central Middlesex phone system to enable inter-site dialling. There are currently two 24x7x365 switchboards in operation, based at Ealing and Northwick Park Hospitals respectively. The analogue systems, at Ealing in particular, are nearing end-of-life, and will need replacing or upgrading in the near future.

- **Community Telephony:** There are numerous telephony systems and solutions across the community sites, few of which fall under the current remit of the Trust. It is anticipated that over time the Trust will to take on telephony provision to our staff and provide service option to other occupants of the community buildings, through Trust-wide IP telephony.

- **Video conferencing:** There are 20 high quality free standing VC Units and 50 desktop VC licences in place, installed across the 3 acute sites. There are also two additional VC units through an N3 Managed Video Conferencing Service for inter NHS site meetings. Multi-Disciplinary Team (MDT) facilities are also in place across all 3 acute sites, although it should be highlighted that there is very keen demand across the clinical body to upgrade these as soon as possible.

2.3.2 With regards to non-technical elements:

- **Support services:** A unified ICT organisation structure has been formally introduced in June 2015 and this marks an important milestone to enable the move to a 'best of both' model, so achieving a more consistent user experience and building additional resilience into the staffing teams also.

- **Governance:** All key ICT policies were unified on merger day one, including Information Security Policy, Information Risk Policy, Change Management Policy, Disaster Recovery Policy and Business Continuity Plan.

2.4 BUSINESS INTELLIGENCE

2.4.1 The Trust's current information services, performance reporting and business intelligence capabilities each require significant extension and improvement in order to support delivery of Trust corporate objectives.

2.4.2 Whilst the core information management function is now working within a single unified structure, each of the constituent teams are fragmented across four sites due to space constraints and there remain recruitment and retention challenges, particularly for the more senior roles.

2.4.3 Data quality risks are prominent on the Trust's Corporate Risk Register, for both Acute and Community services respectively, and have been subject of extensive formal audit focus over the past two years.

Data Warehouse and Reporting Tools

2.4.4 The provision of a robust and comprehensive business intelligence and data warehouse solution has long been recognised as a key priority in enabling the Trust to meet mandatory reporting requirements and to achieve the required performance improvements, service reconfiguration and financial stability.

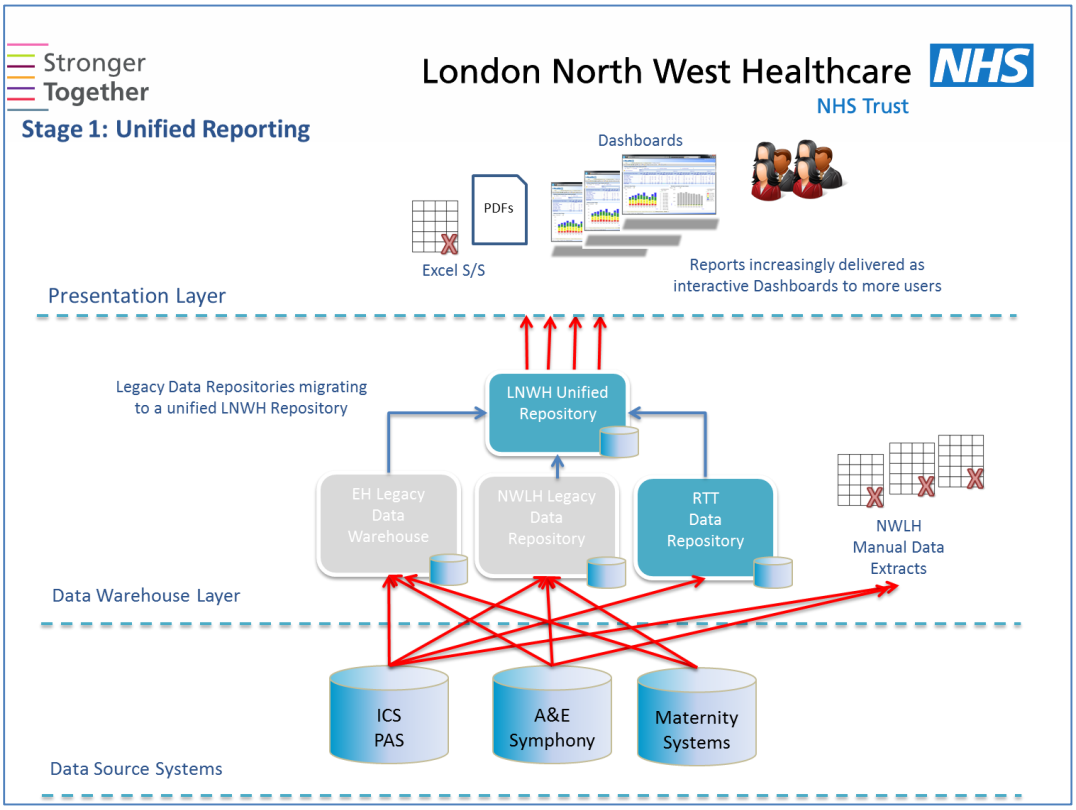
2.4.5 The existing data warehouse and reporting arrangements inherited from the legacy organisations have a number of significant limitations in terms of scope, quality, ease of use and the hosting capability to meet the increasing demand for accurate and timely information from clinicians and managers. Prior to the merger, the legacy reporting infrastructures were unable to keep pace with the escalating demands from clinicians and managers for access to increasingly sophisticated information. RTT performance being one prominent example common to both legacy Trusts.

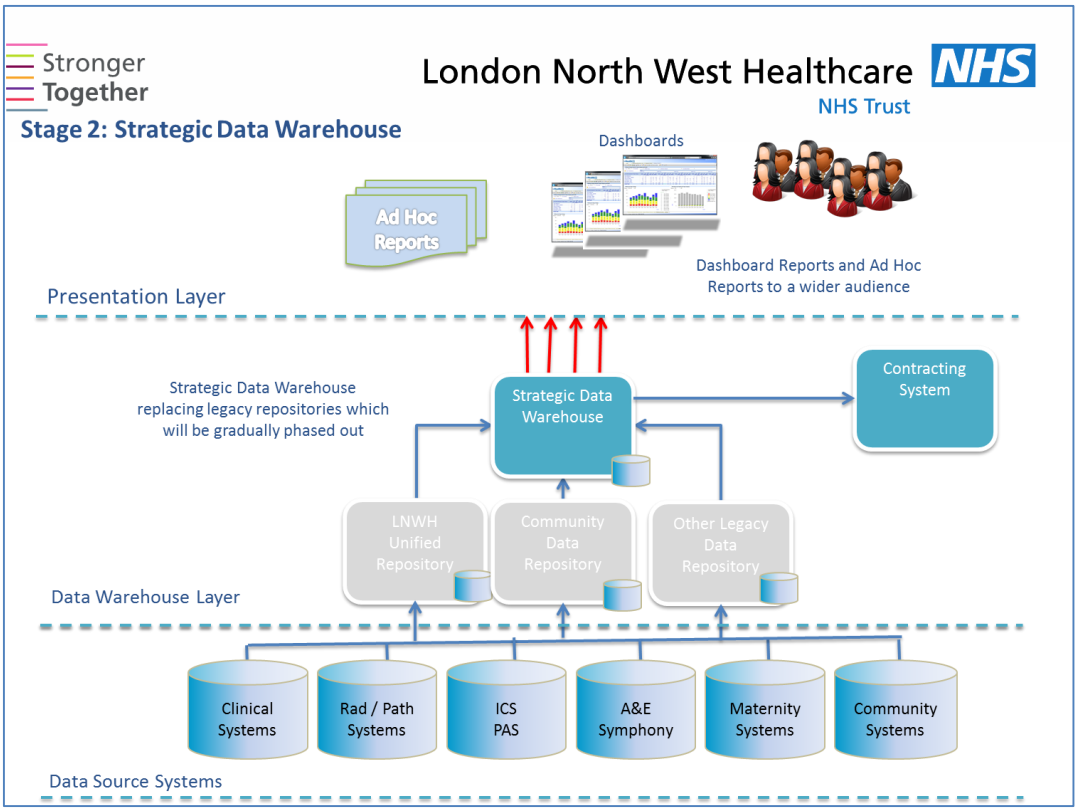
2.4.6 The Trust recognised the need to consolidate what were (at the point of merger) five separate data warehousing environments into a single solution to enable integrated reporting at all levels across the new organisation. This is a complex challenge, complicated variations in local identifiers, data definitions and usage across the various source systems, even where the two legacy Trusts had adopted the same clinical applications.

2.4.7 LNWHT has developed a Business Intelligence programme to address a) the urgent requirement for unified reporting and information access for the newly merged Trust, as well as b) to implement the longer term improvements in business intelligence and data warehouse infrastructure which will deliver improvements in information maturity. This must be based on a sound data quality framework and robust data collection and processing providing a "single version of the truth".

2.4.8 This Business Intelligence programme identifies a staged approach which commenced with capital investment in 2014/15 to address urgent 'unified reporting' requirements for the merged Trust. This is planned to be followed by further strategic investment, subject to business case approval, to deliver the full functionality and extensive scope of a strategic Business Intelligence & Data Warehouse solution.

2.4.9 The staged development and deployment approach is illustrated in the slides copied below.





Information Assurance

2.4.10 In March 2014 the two legacy Trusts formally accepted an independent information maturity audit report which highlighted the importance of "reliable and insightful information based on a robust approach to data quality". The report identified 23 key assessment criteria grouped by four key areas; Governance, People, Processes and Systems & Data.

2.4.11 Five key actions were identified to ensure a step change in data quality across LNWHT:

- Get data quality firmly on the radar of the Trust Board
  Dashboards for reporting the status of data quality to facilitate greater scrutiny and monitoring of compliance with key data standards.

- Get the right people focused on data quality
  Ensure that senior management can exercise their responsibility for data quality with timely access and visibility of key data quality indicators through the dashboard reports and that there is clear accountability for data quality improvement plans.

- Create environment where data quality is at the heart of the Trusts business agenda
  Improving the visibility of data quality issues and driving improvements in data collection.

- Automation of data processing and the underlying resilience of systems.
  Deliver a fully automated strategic data warehouse environment including enhanced validation, data definitions and rules which will replace all existing manual processes including spreadsheet modifications.

- Step up the compliance regime.
  Establish compliance regimes to monitor the effectiveness of the data quality framework.

2.4.12 Whilst certainly not a panacea, investment in Business Intelligence infrastructure is an essential component of these data quality initiatives. A fundamental element is the automated provision of data, routinely refreshed and with appropriate data quality controls incorporated into the transmission of data from clinical / administrative source systems to the central data warehouse. The end to end data flows extract appropriate data sets from each system and, as part of the "extraction, transform and load" process, applies business rules and checks for data integrity and quality.

Improving Access to Key Performance Data

2.4.13 In addition to addressing the challenges of information maturity the Business Intelligence programme also delivers a significant step change in the way in which information management and reporting is delivered to key stakeholders and customers, through a fully automated solution utilising easy to use self-service reporting tools for managers and clinicians.

2.4.14 There is an urgent and critical business requirement to enable executives and senior managers to become self-sufficient in access and proficient in use of management information. The Trust executive, operational managers and clinical leadership all require timely access to key performance information, and be confident that this can be analysed by Division, Specialty, Ward and Clinician without requiring specialist technical skills to do so.

2.4.15 The Business Intelligence programme must deliver a significant step change in the way in which performance information management is delivered to key stakeholders and colleagues, through automation of relevant, trusted and standardised reporting.

3. STRATEGIC DRIVERS

3.1 STRATEGIC DRIVERS

3.1.1 The following paragraphs provide an overview of strategic drivers that have been influential in the development of the Trust's IM&T strategic objectives. This includes social context as well as national and local healthcare drivers.

3.1.2 IM&T Implications are then assessed and highlighted to demonstrate what IM&T will be required to provide in order to underpin the delivery of these goals and priorities.

3.2 SOCIAL CONTEXT

Future of health and social care 2013-2033

3.2.1 The King's Fund published their view of the key social trends that will affect how health and social care is delivered in the next 20 years. The key messages from an information technology perspective are as follows:

- Our use of the internet continues to grow
  Four out of five people in the UK can currently access the internet at home, and three out of ten use a smart phone to do so. It is expected that by 2032 everyone will have access to the internet.

- Computing power and data is increasing exponentially
  The increase in computing power, new devices, sensors, and screens combined with improving access to ever-expanding quantities of data will support the shift to what is known as 'ubiquitous computing'. In health and social care there will be new opportunities to capture, relay and interpret vital signs and other health information, both in the home and in other care settings.

- Social media will grow rapidly in importance
  The impact of social media on health and social care can be expected to grow, particularly alongside increased public availability of information. Patients and doctors are already using social media such as Twitter and Facebook to post medical problems and seek help finding diagnoses.

- The rise of the app
  Apps have a wide array of uses in health and social care, including providing information about conditions and supporting self-diagnosis.

- Changing the relationships between professionals and service users
  Information technology is changing the way in which professionals manage and make use of their knowledge. This is likely to drive changes in the relationship between professionals, and between professionals and service users.

3.3 National Context

National Information Strategy - Safer Hospitals, Safer Wards

3.3.1 'Safer Hospitals, Safer Wards' was published in July 2013 and sets out vision for a fully integrated digital care record (ICDR) across all care settings by 2018: - 'An information rich care system built on innovative and integrated solutions'.

3.3.2 'Safer Hospitals, Safer Wards' reinforces the importance for Trusts to have an Electronic Patient Record (EPR) solution and sets specific aims and targets, including:

- "Our vision is for a fully integrated digital patient record across all care settings by 2018".
- "Information must flow both within health organisations and across boundaries into social care, allowing vital data to follow patients through their care pathways".
- "Patients and citizens must also be able to access and use this data – their data – whenever they wish".
- "Local NHS providers will be free to make investment decisions about the solutions which work best for their organisations, but they must meet national standards in vital areas such as data security and interoperability with other systems. The most important standard is that all providers adopt the NHS Number as primary identifier on all patient data".

Five Year Forward View, October 2014

3.3.3 In June 2014 Simon Stephen's "NHS Five Year Forward View" identified specific improvements in health provision needed over the next five years as being;

- In mental health and learning disability services
- In faster diagnosis and more uniform treatment for cancer
- In readily accessible GP services
- In prevention and integrated health and social care.

3.3.4 In addition, it stated that the NHS must take decisive steps to break down the barriers in how care is provided between family doctors and hospitals, between physical and mental health, between health and social care, identifying major opportunities in using data to drive transparency, quality improvement and the move to more proactive and anticipatory care. It identified the criticality of proper data linkage between GP systems and hospitals and other health care providers to create secure, confidential longitudinal information that would allow the NHS to target prevention and quality improvement, as well as help discover new treatments and cures.

3.3.5 The report acknowledges that whilst the NHS is one of the world leaders in primary care computing and national infrastructure, progress on hospital systems has been slow. It defines a new approach where there will be a national focus on the key systems that provide the 'electronic glue' which enable different parts of the health service to work together and other systems will be for the local NHS to decide upon and procure, provided they meet nationally specified interoperability and data standards.

3.3.6 The Forward View identified that the National Information Board will be expected to publish 'road maps' laying out who will do what to transform digital care. Key elements will include:

- Comprehensive transparency of performance data – including the results of treatment and what patients and carers say – to help health professionals see how they are performing compared to others and improve; to help patients make informed choices; and to help CCGs and NHS England commission the best quality care.
- An expanding set of NHS accredited health apps that patients will be able to use to organise and manage their own health and care; and the development of partnerships with the voluntary sector and industry to support digital inclusion.
- Fully interoperable electronic health records so that patients' records are largely paperless. Patients will have full access to these records, and be able to write into them. They will retain the right to opt out of their record being shared electronically. The NHS number, for safety and efficiency reasons, will be used in all settings, including social care.
- Family doctor appointments and electronic and repeat prescribing available routinely on-line everywhere.
- Bringing together hospital, GP, administrative and audit data to support the quality improvement, research, and the identification of patients who most need health and social care support. Individuals will be able to opt out of their data being used in this way.
- Technology – including smartphones - can be a great leveller and, contrary to some perceptions, many older people use the internet. However, we will take steps to ensure that we build the capacity of all citizens to access information, and train our staff so that they are able to support those who are unable or unwilling to use new technologies.

Personalised Health and Care 2020: Framework for Action

3.3.7 This policy paper from the Department of Health National Information Board was published in November 2014 and sets out a framework and a number of key milestones for delivery of the direction established within the Five Year Forward View.

3.3.8 Whilst individual milestones will be reviewed annually the National Information Board framework is clear on the expectation that:

- From April 2016 the Care Quality Commission will take performance against data quality standards into account as part of its regulatory regime;
- By March 2018 all individuals will be able to record their own comments and preferences on their care record;
- By 2020 all care records will be digital, real-time and interoperable.

Digital Maturity

3.3.9 Both the 'Safer Hospitals, Safer Wards' publication and the above mentioned National Information Board framework also formalised the concept of a '*Clinical Digital Maturity Index*' to help local economies and organisations benchmark their capability to deliver 'meaningful use' of integrated digital care records.

3.3.10 The initial version of this Clinical Digital Maturity Index tool was launched in November 2013 and NHS England has since set up a Digital Maturity Programme to create, provide and administer an enhanced audit framework/toolkit. This is intended to evidence achievement of digital transformation across health and social care in England and specifically the delivery of paperless services.

3.3.11 The framework/toolkit will display how far organisations have progressed across a number of dimensions such as system readiness, digital capabilities, information sharing, cyber security and local digital infrastructure. The framework will also provide organisations with metrics/measures that will allow progress on digital capability to be tracked and monitored over time. It is expected that this will be published by October 2015.

3.4 Local Health Economy Context

Shaping a Healthier Future

3.4.1 'Shaping a Healthier Future' (SaHF) sets out a vision for the future of healthcare in North West London which is being taken forward by the eight constituent Clinical Commissioning Groups (CCGs).

3.4.2 Three overarching principles form NHS North West London's vision for care. They are that health services need to be:

- Localised where possible
- Centralised where necessary
- In all settings, care should be integrated across health, social care and local authority providers to improve the provision of seamless patient care.

3.4.3 The eight North West London CCGs have agreed on the need to transform out-of-hospital care, which must centre on the patient and ensure people receive the right care, in the right place, at the right time. In order to deliver this, the CCGs have agreed a set of standards covering four areas:

- Individual empowerment and self-care
- Access, convenience and responsiveness
- Care planning and multi-disciplinary care delivery
- Information and communications.

Whole Systems Integrated Care

3.4.4 In developing this refresh of the Trust's IM&T Strategy we have also reviewed the strategic IM&T programmes of other Trusts within North West London to ensure that our priorities and roadmap are complementary and to ensure that health economy patient flows are suitably supported.

3.4.5 Supporting the collaborative Whole Systems Integrated Care agenda, all health and social care organisations within North West London are represented in a monthly senior informatics forum ('Design Authority'), which includes patient representation also. There is certainly now a greater degree of alignment between individual organisations' IM&T priorities, and a number of specific collaboration projects that are supported by all partners.

3.4.6 This joint working is grounded on three key themes, namely:

- *Better care for service users* through systems and information that empower them to access services, inform their care and choices.

- *Better informed and supported professionals* having accurate and timely information available to make better decisions, and technology to support ways of working that deliver higher quality care more efficiently.

- *Better outcomes* through optimising use of systems and technology; providing access to information to allow commissioners to make more effective procurement and commissioning decisions.

3.4.7 The most significant of these collaboration projects is the commitment to develop and implement a North West London 'Healthcare Information Exchange'. This will effectively deliver a Patient Portal solution, enabling patient access to a shared longitudinal record fed through interfaces from individual Trust and GP systems.

3.4.8 The detailed project plan is currently being developed and needs to confirm a number of key design decisions including numbering strategies, authentication and interfacing requirements. A more detailed data sharing plan will be developed and agreed for each participating organisation.

Commissioning for Quality and Innovation (CQUIN)

3.4.9 The CQUIN framework aims to support operational improvements in the quality of services, whilst creating new, improved patterns of care and maintaining strong financial management.

3.4.10 Whilst contractual CQUIN schedules are negotiated on a year by year basis, there is clear intent from Commissioners (CCGs and NHS England alike) to use the CQUIN framework to facilitate a rapid and continuing increase in the interoperability of systems across care settings, along with ensuring a step change in adoption of clinical decision support functionality and improvement in the quality of clinical communication with GPs.

3.5 TRUST CONTEXT

Vision and Objectives

3.5.1 The Trust's stated Vision, as set out in the merger Full Business Case is "***To provide excellent clinical care in the right setting by being compassionate, responsive and innovative***".

3.5.2 The Trust has five over-arching Corporate Objectives to achieve this Vision:

Corporate Objectives
1. Improving our focus on quality and safety
2. Improving patient experience, satisfaction and engagement
3. Creating a sustainable workforce that is engaged in developing and improving services
4. Ensuring financial stability
5. Planning for our future

3.5.3 Sustained achievement against these objectives clearly requires highly effective performance management and governance arrangements, ensuring evidence based decision making and swift response when standards are not being met.

3.5.4 In this context, performance management information must enable qualitative and quantitative analysis, and must cover an integrated and balanced view across clinical activity, workforce and financial indicators. We must also ensure we are reporting "single version of the truth" with assurance regarding the veracity of the information being reported.

3.5.5 It is also essential that these corporate objectives are met and sustained across all of our Trust sites and so this necessitates accelerated integration across our clinical and corporate services. This includes unified clinical and managerial leadership and governance structures, along with streamlined pathways and procedures to make optimal use of capacity and capability across all sites.

3.5.6 IM&T is hence a crucial enabler and has a direct impact on the level of efficiency, clinical effectiveness and the quality of outcomes for patients.

3.6 Aligning the IM&T Strategic Requirements

3.6.1 It is clear that we must deliver an information infrastructure that will allow the Trust to tailor, deliver and manage in a more integrated fashion and across diverse care locations and patient populations.

3.6.2 Without the deployment of common technology solutions that underpin seamless information exchange across sites, services and care settings, it will not be possible to effectively address the demands of Trust's patients, staff, commissioners and the NHS as a whole.

3.6.3 Through delivery of this strategy it is essential that all of our IM&T functions and products are recognised as a strategic asset, providing high quality services and enabling continuous process improvement throughout the organisation.

3.6.4 There is very evident alignment between the findings across our internal 'Day in a Life' interviews and the wider stakeholder strategy workshops as summarised in section 2. Furthermore these are also wholly consistent with the IM&T standards and capabilities necessary for the Trust to deliver against the external strategic drivers set out earlier in this section above.

3.6.5 These points of alignment in respect of IM&T requirements include:

- Single sign-on – removing the need for repeatedly typing in user names and passwords to streamline clinical workflows and enable staff to quickly and securely access clinical and administrative applications.
- Data entered once – integrated solutions that mean that data is only entered once and then made available to all.
- Interoperability – extended data sharing and common integration standards between acute, community and multi-disciplinary teams, as well as with primary, community and social care partners.
- Single view across all patient information - integrated care solutions that support multi-disciplinary working across all care organisations (primary, secondary, tertiary and social care) and the delivery of seamless care by providing users with the data and tools that they require from all care delivery locations.
- Decision support - improved decision making through real-time, rules based decision support by 'automating executable knowledge based rules'. This is essential in helping to ensure that appropriate care is delivered to all of the Trust's patients and result in reduced errors and the avoidance of adverse events, e.g. through electronic prescribing.
- Patient involvement and self-management – provide patients with access to their personal care records healthcare and empower them to make informed decisions about their treatment and about how and whether to participate in trials and research.

- Infrastructure – robust, high performance and 'always on' infrastructure capable of intelligent alerts, monitoring and self-diagnosis, supported by 24x7x365 ICT services.
- Processes not constrained by physical locations – enabling virtual service provision by implementing technologies and solutions to decouple service provision from fixed facilities, including Telemedicine.
- Security and Information Governance - embedding information governance awareness throughout the organisation and ensuring highest standards of IT security management including protection against cyber-threats.
- Mobile and point of care technology – mobile applications, along with point of care diagnostic and monitoring devices, enabling clinical professionals to enter patient data as near to the point of collection as is practical.
- Integrated care - solutions that support multi-disciplinary care planning and delivery, underpinning seamless care pathways.
- Intuitive user interface – enhanced user experience and promoting 100% user adoption.

4. IM&T VISION AND OBJECTIVES

4.1 APPROACH

4.1.1 This section articulates the Trust's IM&T Vision and Objectives, aligned to meet the stated strategic drivers and also to reflect the agreed the outputs from stakeholder involvement exercises, i.e. 'Day in a Life' and subsequent series of strategy workshops as described in Section 2.

4.1.2 This section also then highlights critical success factors and key challenges that we will expect to face in delivering the strategy.

4.2 VISION

4.2.1 Over the term of this IM&T Strategy, i.e. 2015 - 2020:

"Every staff member will be able to capture and view all of the clinical and performance information they need, when and where they need to, so delivering enhanced patient outcomes, significant efficiency improvement and a better user experience for all.

Through systems interoperability and collaborative working with partners across the local health economy, we will also enable our patients with access to their digital care records, extending patient involvement and informing their choices".

4.3 STRATEGIC OBJECTIVES

4.3.1 This Vision is reinforced through the IM&T Strategic Objectives which were developed and refined through the stakeholder strategy workshops held in Q1 2015 and now set the formal parameters for appraisal of all planned IM&T investments - and other necessary resource prioritisation - over the term of this Strategy.

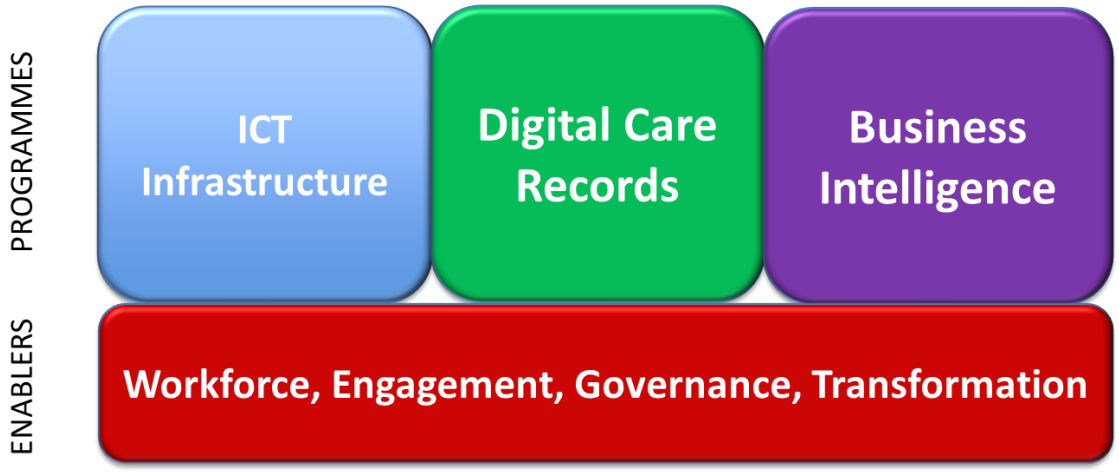
4.3.2 Indeed these objectives were set out and formalised within the Strategic Outline Cases approved by Trust Board in March 2015, for Electronic Patient Record and Electronic Document Management solutions respectively. There are a number of Critical Success Factors required to successfully realise this Vision and set of Strategic Objectives.

Strategic Objectives for IM&T
1. Meet national objectives for 'clinical digital maturity' and paperless working
2. Support acceleration of the Trust's clinical integration strategy, including process standardisation across sites and services
3. Standardise on interoperable systems that enhance clinical practice and seamless working across the patient pathway, irrespective of location
4. Empower patients to take control of their own information and increase self-management through improved patient and provider interaction and communication
5. Embed real-time scheduling and decision support into clinical workflow, including alerts and notifications
6. Become an information rich organisation, built on 'single version of the truth' and 'self-service' performance reporting
7. Extend collaboration and engagement with clinical teams, ensuring clinical leadership is embedded into IM&T solution design and governance
8. Build the capacity of IM&T functions including competencies across the Trust's workforce
9. Deliver all defined QIPP plans, through measurable productivity improvement and streamlined systems
10. Provide fully resilient and secure IM&T services, available and supported 24x7x365

5. DELIVERING THE STRATEGY

5.1 DELIVERING THE IM&T VISION

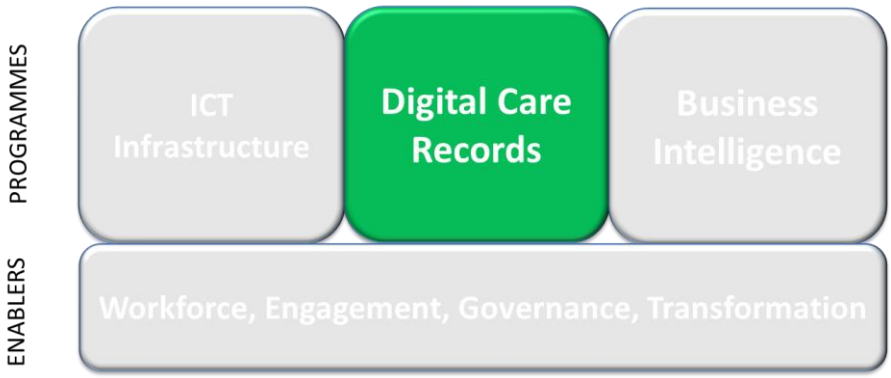
5.1.1 In order to deliver the Vision and Objectives, resulting projects are grouped into three main programmes, along with four enabler themes which cover across each of the three programmes:



5.1.2 'Programmes' are expanded upon in this section, including identification of the main constituent projects and workstreams.

5.1.3 'Enablers' are then described, including identification of main challenges and planned developments.

5.2 DIGITAL CARE RECORDS PROGRAMME



5.2.1 Over the past 3 years the combined Trust's clinical IM&T priorities have been tackling two parallel objectives:

- Integration/merging of existing departmental clinical systems, to support earliest integration of the associated clinical services across the merged organisation, e.g. PAS and A&E.
- Extended footprint and enhanced clinical functionality, increasingly adopting paperless workflow processes (by doctors, nurses and support staff), e.g. whiteboards, community mobile working.

5.2.2 In this IM&T Strategy there is clearly the imperative to reduce the number of clinical systems and integration points over time. The Trust's ultimate goal is to capture all clinical data into a single integrated record. This will be supported by common clinical functionality, workflows, decision support tools, a single security model and data audit capability.

5.2.3 This is entirely consistent with the wider health economy strategy for a more patient centred, holistic service, characterised by 'interoperability' with other health and social care providers, greatly enhanced communication with the patient and their family or carers, and provision of patient access to their own personal health records.

'Strategic' vs 'Tactical'

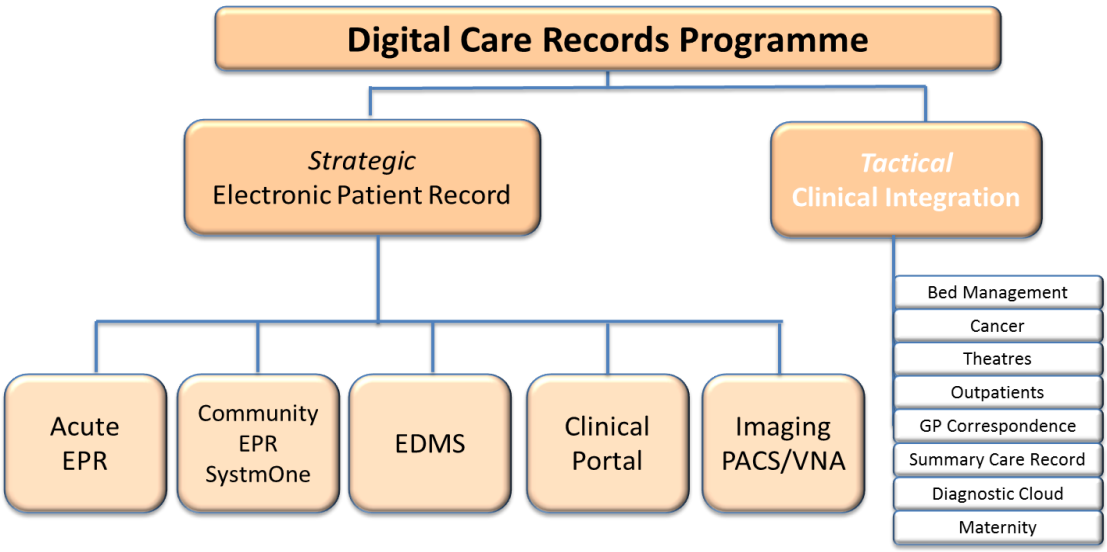
5.2.4 Strategically, there is clearly the imperative to reduce the number of clinical systems and integration points over time. The Trust's ultimate goal is to capture all clinical data into a single shared view. This will be supported by common clinical functionality, workflows, decision support tools, a single security model and data audit capability.

5.2.5 Within the Digital Care Records programme, this Strategy paper distinguishes between two main headings:

- ***'Strategic'*** projects are those that are fundamental to the Trust's Vision and Objectives for full digital maturity, and make up the essential components of the Trust's end-state digital care records architecture, and shall be deployed during the term of this Strategy, i.e. by 2020.

- ***'Tactical* Clinical Integration'** projects are those that will be delivered ahead of the strategic EPR components referred to above, where necessary to accelerate clinical integration of services across sites. These tactical projects are typically those where there are urgent drivers that cannot wait until we achieve full EPR implementation. It would be expected that these tactical projects are effectively 'interim' investments, in that we would expect them to be superseded by the end state EPR components by 2020.

5.2.6 This is illustrated as a programme structure below.



5.2.7 Both the 'Strategic' and 'Tactical' projects have been identified and established via the stakeholder engagement initiatives (pre- and post-merger) and then further reinforced through the Trust-wide business planning process. They are also reflected in the Trust's Transformation Programme priorities.

5.2.8 It is planned that remaining legacy systems will be replaced by the end-state EPR solution during the term of this Strategy. This will be the position unless such replacement is proven not viable, i.e. as potentially the case when looking at very specialist niche legacy systems supporting a single specific clinical service. Even in this eventuality, we would intend to incorporate these retained legacy systems into the 'strategic EPR' via the Clinical Portal solution.

Electronic Patient Record Solution

5.2.9 Trust Board approved the Strategic Outline Case for the centrepiece acute EPR solution in March 2015, and work is currently progressing to complete the Outline Business Case (OBC) for Trust Board consideration by September 2015.

5.2.10 The proposed timetable aims to complete the subsequent procurement and contract award by end 2016, followed by a phased deployment with full roll-out targeted by end 2018.

5.2.11 Under each of these options being appraised in the OBC the replacement of existing clinical systems will be phased on a prioritised sequence which sets out to optimise patient safety and productivity enhancement. Electronic Prescribing will be deployed as early as feasible.

5.2.12 The full EPR solution set will deliver a single digital patient record, including all relevant event and outcome data and enhancing clinical data capture at the point of care. The solution set will also embed real-time scheduling and decision support into clinical workflow, including alerts and notifications.

5.2.13 The EPR procurement scope is summarised below:

- Patient Administration System
- Electronic Prescribing and Medicines Management
- Order Requesting and Results Reporting
- Clinical Documentation
- Integrated Care Planning & Workflows
- Alerting and Clinical Decision Support
- Clinical Audit
- Shared Patient Record
- Enterprise Wide Scheduling
- Bed Management
- Accident & Emergency
- Theatre Management
- Pharmacy
- Maternity

Community EPR

5.2.14 The Trust is currently implementing our strategic Community EPR solution (TPP's SystmOne) to replace the three separate RiO systems in use across Brent, Ealing and Harrow. The final contract was awarded in October 2014 and the tri-borough system is due to go-live through September 2015.

5.2.15 The project delivers a significant step change for community informatics. Through implementation of SystmOne the community teams will move a long way towards their paperless objective with patient information being recorded close to real time – the project scope includes comprehensive roll-out of hand held mobile devices.

5.2.16 This will, by extension, deliver much richer data quality, which in turn means significant improvement in the availability and quality of performance information for service management and planning. This is essential in order to progress patient level costing and service line reporting, and ahead of any future move to cost per case based contracts and tariffs.

5.2.17 Providing clinical staff with a fully functional mobile working solution will also enable a greater ratio of patient facing time and tangible clinical productivity improvement. For example, the project's benefits realisation plan requires at least one extra visit (patient contact) per fortnight from all peripatetic staff. Standardising on a unified system across the 3 boroughs will also enable much greater integration of management and administrative functions across the boroughs, adding to the resilience of clinical services and expansion of support services for patients and carers.

5.2.18 Very significantly, deployment of SystmOne will deliver the strategic commitment for full interoperability with GP systems. For those GP Practices also using SystmOne this will deliver a fully Shared Patient Record (this is the case in Ealing). For Practices using EMIS this will be achieved through reciprocal interfacing commitments that both suppliers (TPP and EMIS) are signed up to nationally, having made formal announcement in March 2015.

Electronic Document Management

5.2.19 Trust Board also approved the Strategic Outline Case for parallel investment in an Electronic Document Management solution (EDMS) in March 2015, with work progressing to complete the Outline Business Case (OBC) for Trust Board consideration by September 2015.

5.2.20 The EDMS will provide the capability and capacity to digitise existing paper based patient records, and to scan and attach any subsequent paper records created once the EDMS goes live. This is entirely complementary to the EPR project and together the two projects will deliver enable multiple, simultaneous and controlled access to patient notes, 24x7x365.

5.2.21 As with EPR the proposed timetable for EDMS aims to complete procurement evaluation process and contract award by end 2016.

5.2.22 In addition to supporting the strategy objectives for digital records, there are also a number of urgent local drivers that require this project to be delivered at the swiftest possible pace.

5.2.23 For a number of years the failure to weed and destroy casenotes beyond minimum retention has resulted in a year on year accumulation, leading to a significant overcrowding of the main libraries. This has then resulted in overflow areas and numerous other archives located in less than favourable locations, often some distance from the main libraries.

5.2.24 Casenotes are also increasingly moving between all three acute sites and being transported to bedded community sites also in support of clinical service integration and management of RTT pathways. Numerous hospital departments also hold their own physical health records outside the main library facilities, including: Maternity, Genito-Urinary Medicine, Paediatrics, Therapies, Orthotics, Orthodontics, Genetics, ITU and Audiology.

5.2.25 The reality is that paper based records simply cannot keep pace with the complexity of the patient journey and emerging delivery models based upon multidisciplinary working, integrated care pathways, outreach clinics, drop-in centres etc.

5.2.26 The EDMS will provide the following primary requirements:

- Integration with the Trust's EPR system(s) for viewing and management of documents.
- Ability to filter document types for efficient searching.
- Automated paper to digital conversion of documents.
- Version Control with workflow management.
- Structured approach to indexing of images against patient records.
- EPR system will automatically generate copies of edited letters to populate the EDMS so that all letters are viewable and stored in one place.
- Full audit facilities and version control capabilities to stop deletion of documents and providing a full audit trail for legal evidence.

Clinical Portal

5.2.27 Our Full Business Case is also being finalised for purchase and implementation of a Clinical Portal solution to provide staff with a single view of the existing digital clinical records across all sites. The procurement also includes e-Forms functionality and an integrated suite of mobile applications, primarily for capturing real time nursing observations data and making this immediately available with the patient's digital record.

5.2.28 The procurement is currently at Preferred Bidder stage and the proposed timetable aims to complete to award contract by September 2015, then achieve Phase I (Single Sign-on and acute integration) go-live by March 2016.

5.2.29 The Trust currently has two key legacy systems which provide some of the functionality identified in the requirements for the Clinical Portal, each circa 50% of the stated specification. Both legacy solutions will be retained in the interim as feeder systems to the new Clinical Portal pending the procurement of a full EPR solution.

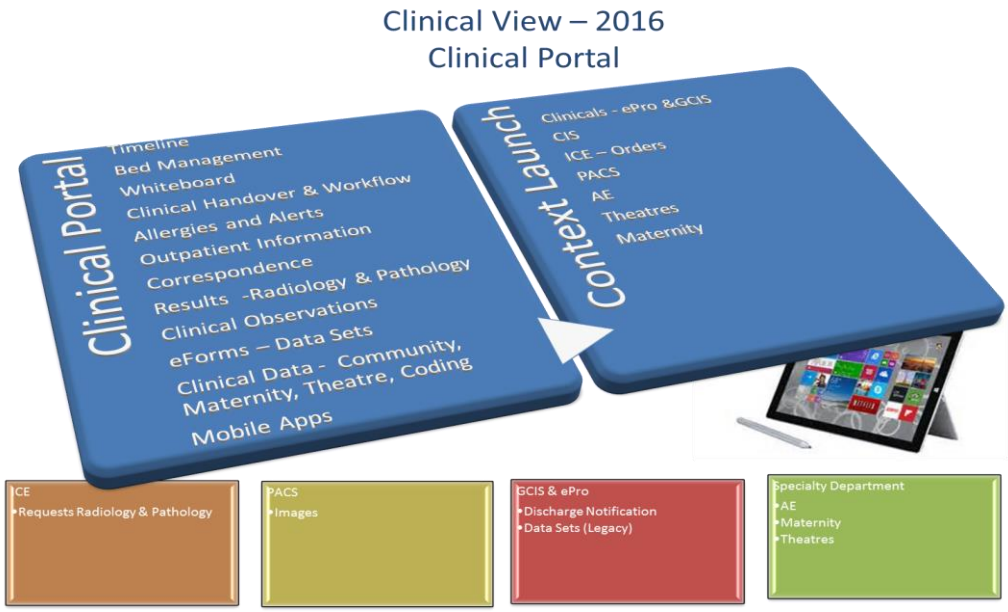
5.2.30 Key priorities for the Trust through this Clinical Portal investment include:

- providing users with a single integrated patient record view with a common up-to-date look and feel;
- significant reduction in the number of logons users need for the different departmental systems they currently have to access to view all the data available for a patient;
- support for new models of care delivery including integration of acute and community services;
- improvements in patent safety with a reduction in the risks associated with the current high numbers of systems in use (multiple versions of allergies, alerts, etc.)
- extending the capture of clinical data at the point of care with the use of mobile technology and innovations including the use of apps and handheld devices; and
- ultimately enable patients, their caregivers and families with access to patient records to enable them to take a more active role in care.

5.2.31 The project scope includes interfaces to key Trust systems - iCS PAS, Sunquest ICE Results and Orders, HSS RIS, ePRO and GCIS, CMiS and Euroking Maternity System, Ascribe A&E and TPP Community Information Systems.

5.2.32 The Clinical Portal also dovetails with the proposed North West London 'Health Information Exchange' collaboration project (hosted by colleagues at Imperial), which is intended to deliver a Patient Portal solution, enabling patient access to a shared longitudinal record fed through interfaces from individual Trust and GP systems.

5.2.33 Key features of the Clinical Portal are illustrated below:



Medical Imaging Management

5.2.34 Whilst the Trust has now implemented a new, unified, Radiology PACS (go-live completed in May 2015) there are currently numerous additional medical image solutions deployed across our sites, each with its own departmental system and image stores. In addition, there is an increasing demand for the ability to store images for other 'ologies', including dermatology, ophthalmology and pathology, which will grow over the 5 year term of this Strategy.

5.2.35 A strategic Medical Imaging Management solution will enable the Trust to:

- locally integrate archives across different content creators (including Radiology PACS and the planned EDMS)
- create a high performing local storage cache of new, 'live' content
- deploy lower cost storage for the older, more static content
- create an independent archive for all medical images and integrate it with the Trusts' EPR
- ensure advanced storage management, independent of any single vendor or technology
- provide the ability to ingest data that is standards-based (DICOM, HL7, XDS etc.)
- facilitate disaster recovery of medical image data using multiple access methods (DICOM, XDS, SQL, custom APIs etc.)
- lay the foundations for better – and more secure – data sharing
- offer full audit trail and security
- integrate into a standard HL7 infrastructure
- be open as regards the data stored in it.

'Tactical' Clinical Integration Projects

5.2.36 Real time bed management, maintained via touch screen electronic ward whiteboards, will be standardised across all acute sites over summer 2015. This includes enhanced integration between PAS and the legacy GCIS and EPRO clinical systems.

5.2.37 Go-live on a unified Cancer Management System is scheduled for end November 2015, when the team on the Northwick Park and Central Middlesex sites migrate onto the Infoflex system used at Ealing Hospital. This will deliver the ability to standardise tracking and MDT processes across all sites, enable joint working/cross over, provide integrated KPI reporting and ensure compliance with all nationally mandated returns for cancer waiting times.

5.2.38 A business case will be completed through summer 2015 to support extending the NPH/CMH Theatres Management System onto the Ealing Hospital site, whilst re-focusing on the effectiveness of the system as used at NPH and CMH. This is a priority identified in the 2015/16 Transformation Programme, with KPI targets for improved theatres efficiency and utilisation.

5.2.39 As with Theatres, there is an established sense of urgency for accelerating plans to unify Outpatient organisation across both sites, including review of all main process stages. This includes greater coverage of electronic referrals, appointment text reminders and self check-in kiosks, as well as Trust-wide adoption of digital dictation to meet GP (and national contract) expectations regarding timeliness, completeness and structure of clinic letters and associated correspondence.

5.2.40 Maternity, including Early Pregnancy Unit imaging, is also identified as an area for thorough 'tactical' review, notably in the context of imminent service reduction at Ealing Hospital. An options appraisal is currently being finalised.

5.2.41 In addition to these decisions for further unification of systems in place at the legacy Trusts pre-merger, there are also ongoing developments being progressed which relate to systems already unified, typically with the objective of extending levels of 'interoperability' with primary care. Such projects include integration of the national Summary Care Record and the Symphony A&E system (so that key elements of the patient's GP record are available to clinicians in the Trust's Emergency Department), and completing the roll-out of Order Communications for Pathology & Radiology. The latter project includes promotion of the new Diagnostic Cloud service whereby Trust clinicians can view the results of all previously ordered diagnostic tests, including those ordered by GPs or other neighbouring provider Trusts in the North West London health economy.

Interoperability

5.2.42 Interoperability commitment runs through all of the above strategic investments, and many of the tactical projects also, i.e. to extending real time electronic data sharing both between our acute and community services, and with partners in the local health and social care economy, subject to patient consent models and appropriate information governance agreements.

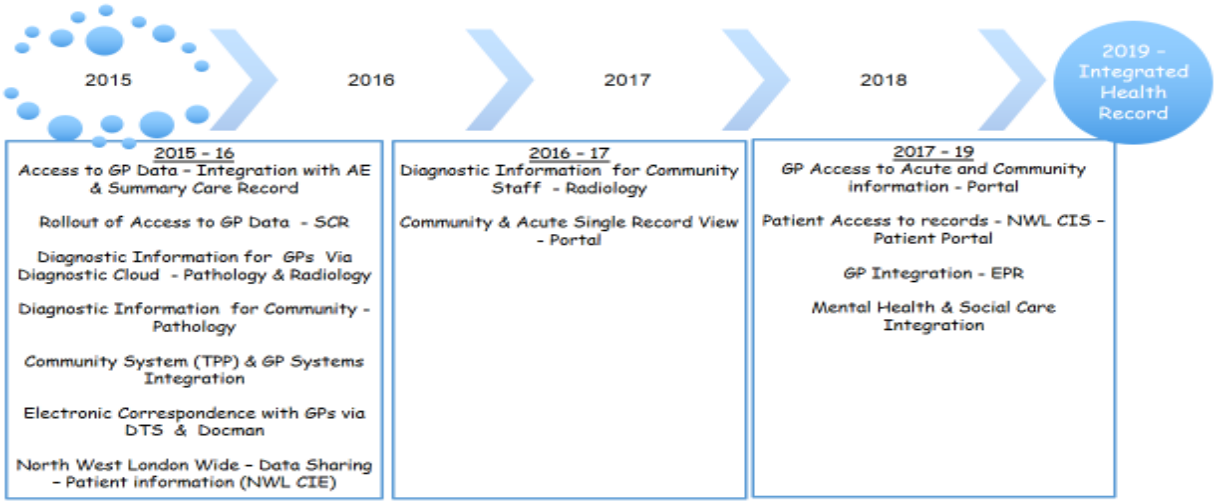
5.2.43 The technical focus for interoperability is through the use of open "Application Programme Interfaces" (APIs) to enable messaging between different systems based on agreed technical and data standards. Hence, within our Strategy, we must ensure that all new system procurements mandate appropriate standards for open API's to facilitate appropriate levels of data sharing, both with internal clinical systems and healthcare partner systems.

5.2.44 NHS England's vision for interoperability is based on the principle that the GP record remains the primary health and care record, which can be accessed from organisation based 'Integrated Digital Care Records' through open interfaces. Effectively, this assumes (and mandates) advanced EPR adoption across provider organisations.

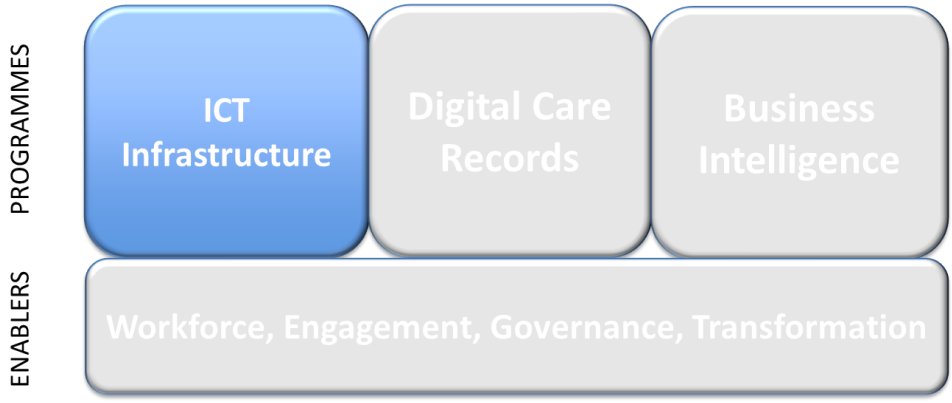
5.2.45 NHS England strategy also promotes the use of the Summary Care Record (SCR) which will provide enhanced functionality with the ability to view key universal flags e.g. discharge medications and other clinical safety

information. The NHSE strategy expects that Trust clinicians are able to access the SCR through our local clinical systems.

5.2.46 The Trust's local plan for extending interoperability is illustrated in the diagram below, reflecting existing CQUIN commitments with local Clinical Commissioning Groups and NHS England.



5.3 ICT Infrastructure Programme



The Challenge

5.3.1 As set out at section 2 there have been a number of developments over the past 2-3 years within the ICT functions under joint management. These have prioritised integration of the separate legacy organisations' network infrastructures to fully enable cross-site communications and common systems access. This has included hosting for unified clinical applications, expansion of video conferencing, enhanced disaster recovery and resilience, unified policy framework and full ICT restructuring to enable the move to a truly unified service model.

5.3.2 However, whilst this has demonstrated quite significant progress, there remains the need to unify the infrastructure components, rather than just join them together, in order to deliver an optimised and fully efficient service, and to ensure consistent ('best of both') user experience across all sites. Importantly, this must include community sites as well as acute hospitals.

5.3.3 As we progress the roadmap to single digital records, it is also paramount that we make the significant step change in process maturity and service guarantees, where hosted applications are always available without unacceptable risk of unplanned downtime and the ICT service ensures 24x7x365 support to all users. There is also of course the additional challenge for ICT (and opportunities for the wider workforce) to fully embrace and utilise mobility solutions, in order to achieve the IM&T Vision, whereby access to information is available for every authorised member of staff, where and when they need it.

5.3.4 Lastly it is recognised that our investments and efforts over the past few years have been predominantly focused on services for staff; we must add the focus on patient facing services also, as described in Section 3 when we looked at strategic drivers and IM&T implications.

5.3.5 Building on the outputs from the stakeholder workshops earlier in the year, the joint ICT teams have held a series of further planning sessions in order to establish design principles, shape a programme structure and define the resulting set of project plans.

5.3.6 Through this activity the teams defined the following set of commitments for the ICT Programme:

- Never restrict authorised staff by their location or the need for a cable
- Always be there and available 24/7, ensuring that the ICT teams (including suppliers) can resolve significant incidents that impact on operational services in a reasonable timescale
- Maximise our efficiency and productivity
- Move to paperless processes and culture, reducing costs and bureaucracy whilst not relaxing on necessary audit controls
- Deliver a connected health and social care environment, enabling interoperability and controlled data sharing
- Secure information and services against threats, whilst supporting BYOD and multi-platform initiatives
- Be reliable, resilient and robust in planning to mitigate against disaster recovery scenarios
- Build our competency and capacity to support changes in future technology and business needs
- Improve patient experience, empowering patients to take control of their own information and increase self-management
- Lead technology innovation in patient care.

5.3.7 These shall be managed through workstreams for effective programme monitoring and to best manage the inevitable technical interdependencies. The programme structure is described below.

ICT Programme and Workstreams

5.3.8 These ICT objectives shall be managed through the following workstreams defined to ensure effective programme monitoring and reporting - and to best manage the inevitable technical interdependencies:.

Patient Services

5.3.9 This workstream consists of projects all aimed at directly improving patient experience and/or helping in the delivery of patient care. These include WiFi initiatives to ensuring that patients can keep in touch with their friends, family and social network when in hospital, and technology to make outpatient check-in easier by the use of self-service kiosks which most patients will be used to from their GP surgery.

5.3.10 The use of video conferencing tools and introduction of telemedicine will all allow clinicians to communicate with patients when they are not both at the same location. This can help reduce travel and wait times for patients and lead to a faster, more appropriate identification of care needed.

5.3.11 Telemedicine can be split into three main categories: store-and-forward, remote monitoring, and interactive telemedicine. ‘Store-and-forward’ involves transmitting medical data from a patient to a doctor for assessment at a later time; ‘remote monitoring’ or ‘telecare’ uses devices to monitor patients in a non-medical setting; and ‘interactive telemedicine’ or ‘teleconsultation’ uses technology such as videoconferencing and telephones for real-time remote communication.

5.3.12 Telehealth technology is now also widely available and has been successfully implemented in numerous care settings. Connecting patients in their home to clinicians via video technology has been proven to reduce hospital admissions. During the lifetime of this strategy, the Trust intends to provide technology to facilitate telehealth, including linked facilities to allow patients to access their patient record summary and book online appointments.

5.3.13 A single point of access Contact Centre service is also envisaged, supported by Interactive Voice Recognition (IVR) technology, to provide an appropriate first line response to both internal and external callers, enabling a greatly extended service scope and consistently improved service levels and quality of response.

Mobility Solutions

5.3.14 This consists of a series of projects to support our increasingly mobile, agile workforce ensuring that staff have access to information and the ability to communicate no matter where they are. An improved remote access services and the proliferation of WiFI will ensure that staff can stay connected whereas the introduction of a virtual desktop infrastructure will ensure that staff can move from one location to another without having to disconnect from the applications that they are using.

5.3.15 Moving communication from old-fashioned analogue channels to the digital network will expand our capability to support video conferencing, allow the location of people and equipment to be determined and remove the need for staff to check multiple voice mail and email systems to catch up with messages.

Security and Performance

5.3.16 With the increasing dependency on the ICT infrastructure comes the need to ensure that the infrastructure is robust, resilient, always available and high performing. Projects within the workstream will ensure that the infrastructure can cope with varying demands, withstand failures of individual (or even multiple) components, perform operations quickly and be safe and secure from interference (malicious or otherwise).

5.3.17 The technology available to us, and the skills of our ICT staff, must become such that problems are foreseen and prevented rather than reacted to and fixed.

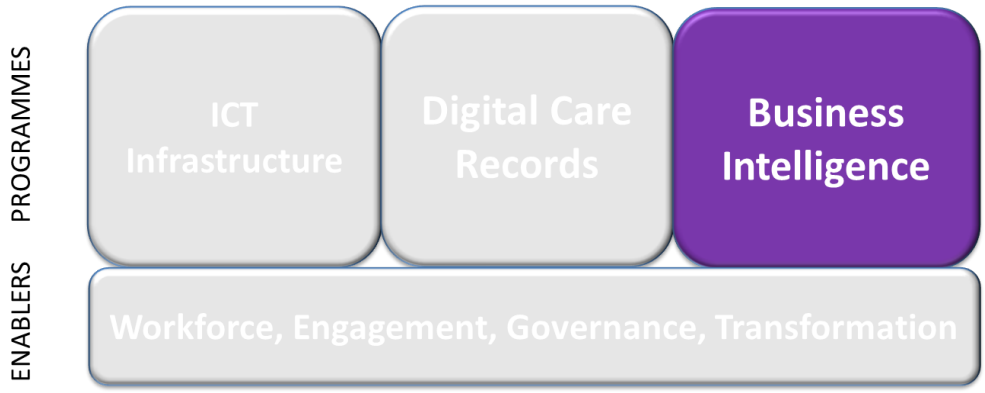
Service Management

5.3.18 These set of projects are concerned with ensuring that the ICT Service is delivered professionally and openly. We shall measure and publish how well we do this and ensure that we meet our customer needs. Where possible we shall remove the reliance on individual ICT staff so that problems can be resolved consistently quickly. We will also extend the availability on self-help and on-line video tutorials to enable staff to resolve most problems themselves (with support available if they can't).

Paperless Functions

5.3.19 Removing paper not only saves money and is better for the environment; it also supports efficiency improvement and removes process variation. Some Trust process may currently take several days to follow involving paper forms being signed and mailed between departments. This is particularly constraining now that we are moving to unified support functions located at individual sites. Introduction of 'eForms' and Workflow can reduce this to minutes and also provides a full auditable record of the process at the same time, which is something we are all well used to outside of work, with the ubiquity of on-line banking and shopping etc… Document scanning can also free up significant physical space as well as making information more easily available and safeguarding patient confidentiality.

5.4 Business Intelligence Programme



The Challenge

5.4.1 As set out at section 2.4 a number of current challenges are acknowledged in relation to the delivery of an effective and comprehensive Business Intelligence capability. Following on from the merger, work continues to fully unify the information management function including full integration of teams and standardisation of internal processes and outputs. There is also a significant challenge to improve the culture and consistency of data collection, so that information becomes an assured management tool for informed and proactive decision making.

5.4.2 As with the ICT infrastructure requirements, the Business Intelligence programme will seek to address these challenges through a series of themed workstreams, as illustrated overleaf.

5.4.3 As we progress through the Strategy roadmap to single digital records there will be further challenges in responding to the significant growth in digital information with deeper and richer clinical datasets. Year on year, more and more data will need to be integrated, analysed and presented. Data sources will extend beyond our core internal clinical systems, e.g. incorporating external benchmarking.

5.4.4 It is also high priority to accelerate the extent to which we integrate financial and workforce information to achieve a broader and more balanced insight. It is flagged that this may require consideration of future changes within our business systems, i.e. if necessary in order to provide the richness of information required by the organisation. In particular this could have implications for systems used for capturing and managing Finance, Human Resources and Clinical Governance data.

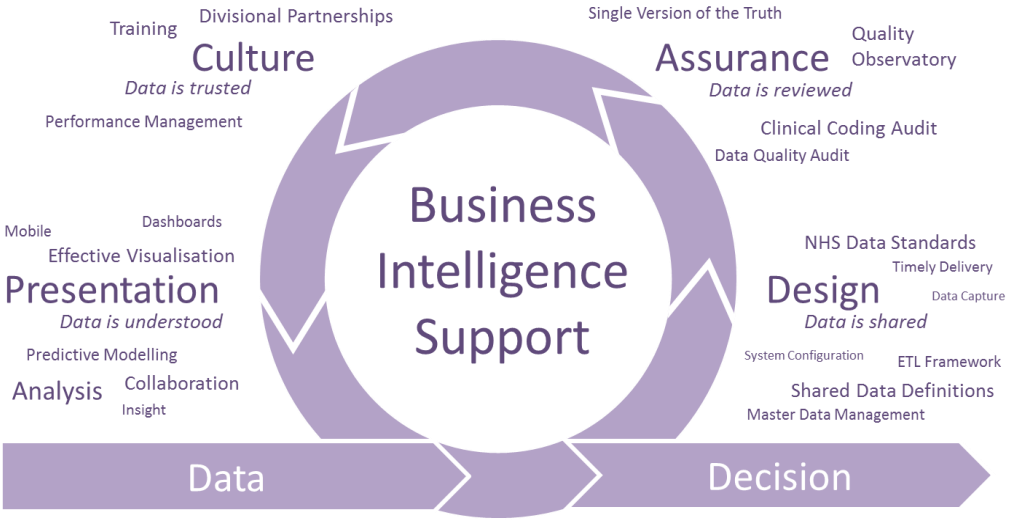
5.4.5 There is hence significant scope for a more sophisticated approach to Business Intelligence and performance reporting, with a much greater focus on data driven insight enabling evidence based decision making, predictive modelling and proactive performance management.

5.4.6 The Business Intelligence Programme will be managed through defined packages of work, all supporting a continually improving cyclical process to deliver increasing levels of maturity and extended scope of the insight provided.

5.4.7 Commitments to be delivered through this programme cycle include:

- Robust standards for data capture and coding.
- Data warehouse solution architecture based on recognised industry best practice methodologies for schema design and storage, which will enable automated data processing and deliver timely access to information.
- Defined business logic layer with data definitions and standards to ensure consistently accurate and **"single version of the truth"** reporting.
- Integration and triangulation of key data sets across activity, finance, workforce and quality domains.
- Self-service reporting for all managers and clinicians to access key information through sophisticated, yet intuitive, reporting tools and dashboards.
- Analysis solutions to enable predictive planning as well as retrospective performance reporting.
- An information culture which promotes data driven decision making with a skilled and enabled workforce.

5.4.8 The cyclical process at the core of the Business Intelligence Programme is illustrated below:



5.4.9 Delivery of this will be managed through defined workstreams as described below. As with the ICT programme this approach will support effective programme monitoring and sequencing the inevitable interdependencies.

5.4.10 This programme will deliver increasing levels of business intelligence maturity over the term of the strategy, with the flexibility to incorporate changes in source clinical and corporate feeder systems as they are deployed.

Data Capture and Coding

5.4.11 It is imperative that data is complete, accurate, reliable, understood and trusted.

5.4.12 This Strategy commits to enabling continual data collection improvements through system design, user training and clear standard operating procedures to ensure data is captured accurately at source.

5.4.13 Data quality timeliness, completeness and accuracy will be monitored through regular data quality reports and clinical coding audit with regular feedback to those responsible for capturing data at source.

5.4.14 'Data quality kitemark' assessments will also be published for all KPIs reported to Trust Board.

Data Warehouse Solution Architecture

5.4.15 It is further essential that all key data necessary for reporting is stored in a suitable data warehouse environment which meets industry standards for data processing and management.

5.4.16 This ensures that robustness and absolute consistency of data processing techniques for the Extract, Transformation and Load (ETL) of datasets from source systems, schema design and master data management. The Business Logic Layer within the data warehouse solution then enriches the source system data and transforms it into information.

5.4.17 Over the term of the Strategy, we will continue to expand the scope and functionality of the Trust's data warehouse solution, i.e. to incorporate additional source feeds, extend the business logic and further automate data processing. This will include accommodating the series of planned changes to our clinical and corporate systems portfolio, commencing with the SystmOne go-live planned for September 2015.

Report Presentation and Analysis Tools

5.4.18 The IM&T Vision requires that all appropriate staff are provided with access to the required performance information "when and where they need it".

5.4.19 This Business Intelligence Programme commits to a number of key components for this, including self-service reporting, advanced analysis tools and automated delivery of an agreed schedule of data extracts, reports and scorecards.

5.4.20 Dashboard development will provide self-service access to key performance and management indicators, including facilities for more detailed analysis and navigation across all relevant 'domains' and 'dimensions'.

5.4.21 Advanced analysis and data discovery tools will provide statistical and predictive modelling as well as the application of data mining techniques to uncover underlying patterns and trends in the data.

5.4.22 Automated production and distribution of information will accelerate the reporting timetable, and ensures consistency both internally and externally.

Analytical Insight

5.4.23 Taken together, all of the above data capture, data processing and reporting components will go a long way in enhancing the Trust's information assurance maturity, and will greatly improve stakeholder's confidence in making data supported decisions.

5.4.24 Going beyond this, it is also recognised that we must embed an effective information culture throughout the Trust, with information supporting decision making and assuring quality of effectiveness of our services.

5.4.25 To achieve this goal, this will also require training and support so that staff are confident and proficient in the use of the tools made available to them. This includes staff within the information management functions as well as information recipients at all levels through the organisation.

5.4.26 Additionally, we must develop the skills and capacity required for establishment of a highly effective Business Intelligence Unit function, to provide balance and objectivity, and to look outwards for intelligence similarly derived from external information sources, e.g. Dr Foster benchmarking metrics.

5.4.27 Resulting from this we need to ensure that the structure of individual corporate functions is not a constraint to us providing Trust Board and Clinical Divisions with integrated performance information across activity, finance, workforce and quality domains.

5.5 Critical Success Factors

5.5.1 There are a number of important Critical Success Factors required to successfully realise the Vision, Strategic Objectives and Programme deliverables.

Critical Success Factors for IM&T
Be master of our own destiny wherever practical, making decisions from the perspective of the Trust's patients and staff, in close cooperation with other partner organisations where appropriate.
Firmly establish this strategic direction for IM&T and stay the course, whilst allowing due flexibility for industry and technology changes.
Filter and manage all investment requests through an appropriate governance framework charged with achieving the strategic plan and applying these principles to decision-making.
Overcome inertia of existing processes and ties to legacy systems, in order to move forward with truly transformational change.
Implement common applications across the Trust, unify data standards, remove unnecessary and unwelcome variation, minimise support overheads.
Focus on integrated suites of applications from a smaller number of suppliers/contracts: minimise the integration burden and manage out business continuity risks as systems are replaced.
Allocate sufficient capital and operating funds over the period to support the strategic initiatives, subject to robust investment appraisal.
Organise IM&T and other programme/project leadership for effective, efficient planning and execution, avoiding fragmentation of direction to individual department level

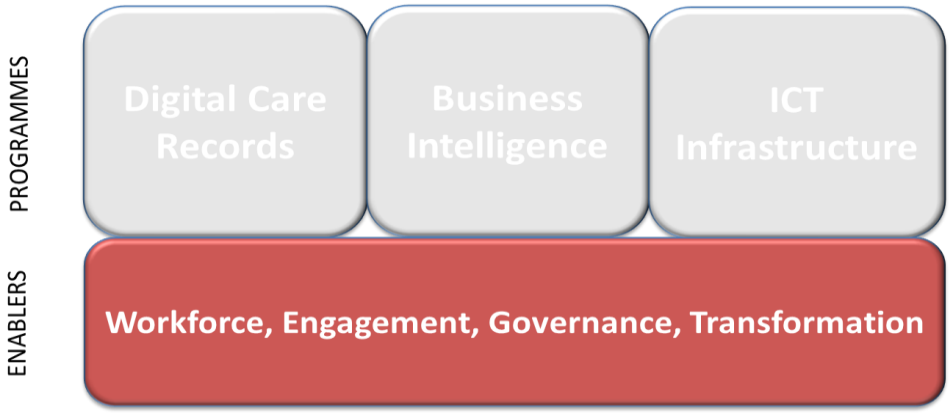
5.6 Funding Assumptions

5.6.1 All strategic investments will need to be subject to appropriate business cases, with internal approvals formally managed in accordance with delegated limits.

5.6.2 Where funding requirements can not be accommodated within available allocations from the Trust's Capital Resource Limit, then strategic capital funding will need to be sourced via the NHS Trust Development Authority. This has been the case with a number of current investments including approved Full Business Cases for RIS/PACS and Unified Reporting, along with Outline Business Case approval for Clinical Portal (with Full Business Case scheduled for 2015/16).

5.6.3 It is acknowledged that such cases must be (at least) revenue neutral, including taking account of capital charges and depreciation. Managed service options will also be explored within all applicable value for money and affordability appraisals.

5.7 ENABLERS



5.7.1 The above listed 'enablers' were each identified through the stakeholder workshops as needing specific attention and senior oversight through the term of the Strategy, as each are essential for successful project delivery and subsequent benefits realisation.

5.7.2 These also correlate with the 'Key Risks, Constraints and Dependencies' set out in the approved Strategic Outline Cases for EPR and EDMS proposals.

Workforce

5.7.3 It is imperative that delivery of this Strategy will require prominent clinical leadership, as well as active involvement from networks of well informed and representative multi-disciplinary clinical subject matter experts (SMEs), suitably immersed in each of the strategic projects. Crucially, this needs dedicated time for project workload, albeit balanced against clinical commitments.

5.7.4 For all 'strategic' projects it must be considered a pre-requisite to ensure that clinical implementation and SME lead roles are sufficiently resourced, as well as having confirmed backfill arrangements in the event that time commitments are beyond that which can be managed with SPAs or other supernumerary elements of the job plan.

5.7.5 Whilst this is equally true for IM&T functions, the greater challenge within IM&T is to increasingly shift to resourcing these projects via staff from within our substantive teams, so retaining knowledge and skills within the teams and reducing current reliance on costly contractors. This is especially true for programme and project management, business analysis, HL7 integration, training, change management and Business Intelligence developer roles. Moving forward we must also be mindful of the need to introduce in-house mobile applications development.

5.7.6 It is the firm intent of the IM&T senior management team to introduce local Graduate and Apprenticeship schemes, supported by HR and developed in partnership with local education organisations. This 'grow our own' principle is seen as a vital enabler for a sustainable IM&T workforce plan, and has been seen to work extremely well in the past in areas such as ICT Support and Clinical Coding.

5.7.7 It is also important that all IM&T functions are sufficiently developed such that they are recognised as 'business partners' to the clinical and corporate service teams. This objective is reflected in all post-merger IM&T restructuring and will be monitored through regular user surveys and other feedback mechanisms, as well as via regularised publication of key performance indicator metrics for each individual function.

5.7.8 With regards to developing the level of ICT and Informatics skills for wider groups of staff, there are two main areas of focus:

- ICT technical skills (all staff groups). This will be supported through periodic 'IT support clinics' held in individual departments and community sites, as well as via self-help tutorials and other knowledge base material available via the Trust intranet.

- Information Analysis skills for staff within operational teams including managers and clinicians. Local training content will need to be developed in conjunction with Trust Performance and Planning leads, to develop the analytics and information manipulation skills of managers at all levels.

Engagement, Transformation & Governance

5.7.9 Recruitment to the key role of Chief Clinical Information Officer (CCIO) is a further essential activity. The CCIO will be expected to provide senior clinical leadership and direction in representing clinical staff to ensure the safe and efficient design, deployment and use of IM&T to deliver improvements in the quality and outcomes of care.

5.7.10 Working with the senior IM&T team and through the IM&T governance structure, the CCIO will champion the development of a clinically appropriate information culture across the organisation. The CCIO will also be expected to chair the IM&T Clinical Advisory Group, along with developing a network of informatics champions and subject matter experts within the clinical and nursing professional groups.

5.7.11 It is equally important that the Clinical Advisory Group is acknowledged to be truly representative of the Clinical Divisions and staff groups within the multi-disciplinary clinical workforce. Whilst currently this is reflected in the Terms of Reference, levels of attendance are inconsistent.

5.7.12 An effective engagement strategy also requires commitment to maintaining a high quality communications plan.

5.7.13 Initial communications activities will accompany the launch of the Strategy and will thereafter be maintained through the Clinical Advisory Group and relevant Programme and Project Boards. This must also factor in awareness of relevant external developments, in particular those occurring within the local health economy.

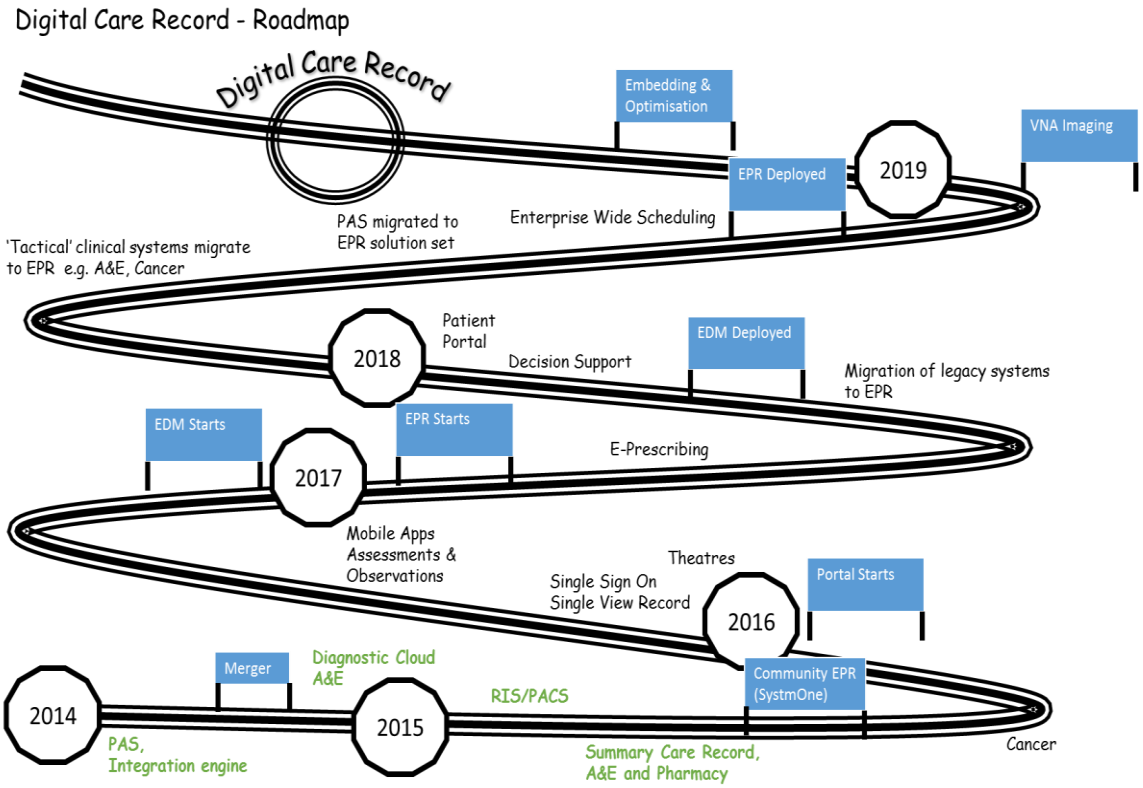
5.7.14 All constituent programmes and projects will be managed in accordance with formal methodology and programme/project managers will be required to monitor delivery of benefits realisation targets (outcomes) as well as defined project deliverables.

5.7.15 Deployment of all new clinical systems must be subject to risk assessments by accredited Clinical Safety Officer. Privacy Impact Assessment must also be completed by an Information Governance manager.

6. STRATEGIC ROADMAP AND PLAN

6.1 HIGH LEVEL ROADMAP – DIGITAL CARE RECORDS

6.1.1 The target Roadmap is illustrated below. It is recognised that this is subject to investment approvals and timely deployment .



6.2 PROGRAMME PLAN – DIGITAL CARE RECORDS

Digital Care Record Programme - High Level Plan											
	Q1 15-16	Q2 15-16	Q3 15-16	Q4 15-16	Q1 16-17	Q2 16-17	Q3 16-17	Q4 16-17	Q1 17-18	Q2 17-18	Q3 17-18
Community EPR	SystmOne Deployment			Interoperability: EMIS, CHIS							
Clinical Portal	FBC		Deployment: Single Sign-on			Mobile Apps & eForms					
EDMS		OBC, Procurement, FBC					Deployment				
Acute EPR		OBC, Procurement, FBC					Deployment to end 2018				
Medical Imaging	PACS Live		Strategic Outline Case		OBC, Procurement, FBC				Deployment to end 18/19		

6.3 PROGRAMME PLAN – ICT INFRASTRUCTURE

ICT Infrastructure Programme - High Level Plan										
	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16	Q3 16	Q4 16	Q1 17	Q2 17	Q3 17
Patient Services	WiFi	Kiosks & Apps		Apps and Telemedicine				Contact Centre		
Mobility Solutions	WiFi	Remote Access & VDI			BYOD, Unified Comms and RFID					
Security & Performance	Single Points of Failure		Monitoring			WAN & LAN Optimisation		Data Centre & Cloud		
Service Management	Self-Help & SLAs		Change Management			24/7 & SSO				
Paperless Functions	Scanning		eForms & Workflow & Digital Signatures							