Aintree University Hospital NHS
NHS Foundation Trust

Informatics Strategy 2014 - 2018

'Getting IT Right'

Version	Date	Amendment
V0.1 – v0.9	11/03/2014	Drafts
V1.0	18/03/2014	Issued for approval
V1.3	23/04/2014	Final for Board Approval

Approvals:

Name	Lead	Issue Date	Review Date	Version
Trust Board of Directors	Mr Phil Downey Divisional Chief Operating Officer, Division of Diagnostics & Support Services	May 2014	May 2018	2

Contents

1. Executive Summary

This Informatics Strategy, *'Getting IT Right'*, was developed through extensive stakeholder engagement. It identifies the key contributions that Informatics can make to enabling the Trust to respond to local and national strategic drivers; to meet its corporate and clinical objectives; and to address the needs of its users and stakeholders.

The UK Council for Health Informatics Professions defines Health informatics as

> *"the knowledge, skills and tools which enable information to be collected, managed, used and shared to support the delivery of healthcare and promote health.'*

In many NHS Trusts, the Informatics function also covers the production and analysis of information. However, in this Trust, there is a separate Business Intelligence (BI) department which performs that function. Although, the requirement for improved clinical information and reporting was repeatedly raised in stakeholder interviews, this falls outside the scope of this Informatics strategy and will be addressed separately by the BI team.

The strategic vision for Informatics for the Trust is:

> *To create a fully-digital hospital environment in which patient-centred electronic records can be accessed in a single, integrated way by patients themselves and those caring for them within the hospital and across the community subject to stringent security and confidentiality controls. This will be supported by a modern IT infrastructure which supports access at the point of care, unified communications and flexible mobile working arrangements and by access to clinical and corporate information to support clinical and business decision-making, research and audit.*

The mission for the Informatics service is:

> *To become a valued partner to the Trust, listening and responding to our customers' requirements, demonstrating the art of the possible and providing a robust, safe and secure Informatics environment.*

The Informatics vision and mission are supported by five strategic objectives. These are to:

1. Create a single integrated **Electronic Patient Record** (EPR) system, through the specification and procurement of a commercially-available, proven solution.
2. Review and enhance the current **Electronic Document Management** (EDM) solution to enable the solution to be used in an efficient way.
3. Develop and integrate **other Trust systems** outside of the core EPR development.
4. Develop, maintain and manage a modern and reliable IT **infrastructure and improve IT service** provision through bringing services in-house, including integration management and IT support services.
5. Achieve better **integration across the wider health community** through participating in record-sharing initiatives, staying abreast of innovative technologies and championing the use of technologies that can improve working practices and patient involvement.

Five strategic themes are explored and an action plan to achieve the vision is included in the strategy.

This is includes an exploration of the options for achieving full electronic patient records and the investigation of opportunities for collaboration across all relevant healthcare partners.

It is recommended that the Trust invest in Informatics to create a partnership that will enable the business to meet and exceed both local and national standards. Through investment in the recommended actions in section seven of this document the Trust will improve its clinical care, patient safety and reporting standards.

2 Introduction

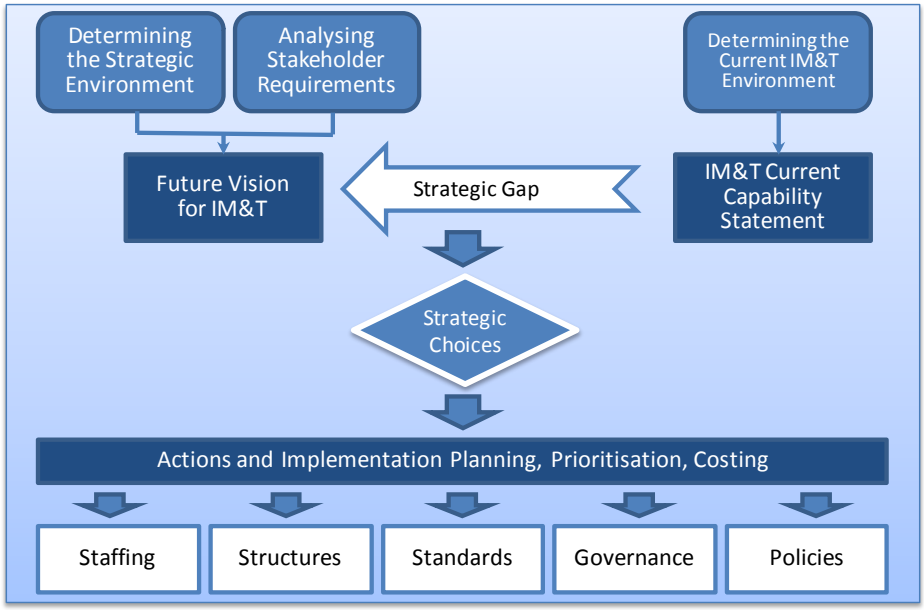
The Trust operates in a complex and challenging environment, as acknowledged in its Strategic Plan 2013-14. This is a time of significant NHS reform and associated uncertainty, as pressures of economic austerity, and an ageing society, with increasing poor health, weigh on the system. The focus for service delivery is on the quality of care, patient experience and responsiveness to patient needs whilst at the same time, the Trust has financial constraints. Increasingly, the Trust must engage and work with the wider health system to help shape the new models of delivery, through collaboration, partnership, and change.

Purpose of this Document

The Trust is committed to the effective use of Informatics to support the delivery of excellent patient care, facilitate the work of our clinicians and deliver efficiency gains. This strategy sets out the roadmap to achieving these aims. It examines the Trust's business and strategic drivers and derives relevant strategic objectives to guide the activities of the Informatics service and prioritise investment in Informatics. It identifies the key gaps in Informatics capability that will need to be addressed in order to achieve the vision for Informatics. Finally, the strategy presents a pragmatic and achievable programme of work to achieve the vision.

Process Used for the Development of this Strategy

The process used for the development of this strategy is summarised in the diagram below:



Approvals

This document will be reviewed and approved by the Informatics Strategy Group, the Trust Executive Team and the Trust Board.

3 Strategic Context

This section describes the context in which the Trust operates and identifies the key strategic drivers at a national and local level.

3.1 Social Context

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:

Future of health and social care 2013-2033

- **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.

3.2 National Context

In January 2011, the Government set out its plans to modernise the National Health Service in the Health and Social Care Bill. It describes a health system in which patients and the public have a stronger voice and more control – "no decision about me without me".

Putting patients first: the NHS England business plan for 2013/14–2015/16

In June 2013, NHS England published its business plan addressing the need for a fundamental cultural change within the NHS that puts patients at the heart of all processes and outcomes. The plan describes an 11 point scorecard which measures performance of key priorities, focused on receiving direct feedback from patients, their families and NHS staff.

Securing Sustainability – Planning Guidance for NHS Trust Boards 2014/15 – 2018/19

The Trust Development Authority (TDA) recommends that Trusts should build and maintain strong relationships with all partners. The stark financial outlook must be a catalyst for providers and commissioners to move away from incremental annual plans and instead develop longer term plans in partnership that respond to the key challenges.

Each NHS Trust is part of a broader local health and social care economy and has a key responsibility to play a full and active role in the development of local strategies which impact on health.

An engagement strategy with patients, stakeholders and staff is recommended within the report.

Through this patient engagement, Trusts should also be clear on communicating the standards of service that are being provided. Being clear on what patients can expect from their NHS provider is critical, both in terms of services that are delivered today as well as what local communities can expect in the future.

Securing Sustainability states that Trusts should focus on ensuring that their services are Safe, Effective, Caring and Responsive.

Commissioning for Quality and Innovation (CQUIN) framework

The CQUIN framework for 2013/14 aims to secure improvements in quality of services and better outcomes for patients, whilst also maintaining strong financial management.

'Innovation Health and Wealth, Accelerating Adoption and Diffusion in the NHS' stated that, from April 2013, compliance with high impact innovations would become a prequalification requirement for CQUIN. Relevant criteria include:

1. *3 Million Lives:* Set a trajectory for 2013/14 for increasing planned use of telehealth/telecare technologies.
2. *Digital First:* Establish a 2012/13 baseline and a trajectory for improvement to reduce inappropriate face-to-face contact.

The ten digital initiatives are:

- minor ailments online assessment;
- appointment booking online;
- primary care pre-assessment;
- appointment reminders;
- mobile working in community nursing;
- pre-operative screening online;
- post-surgical remote follow up;
- remote follow up in secondary care;

- remote delivery of test results;
- secondary care clinic letter.

3.3 Information Strategy for the NHS

Safer Hospitals, Safer Wards: Achieving an Integrated Digital Care Record (IDCR)

In January 2013, the Health Secretary, Jeremy Hunt, stated that he intends the NHS to be paperless by 2018. NHS England's 'Safer Hospitals, Safer Wards' published in July 2013 sets out this vision for a fully integrated digital care record (IDCR) across all care settings by 2018:

'An information rich care system built on innovative and integrated solutions'

The guidance underlines the importance of effective *information governance*, and digital systems with a *user interface* which is intuitive and accessible. It also emphasises the importance of having clinicians at the heart of decision making and encourages appointments of Chief Clinical Information Officers (CCIOs).

The guidance introduces the concept of the Digital Maturity Index (DMI), which is a benchmarking tool that enables NHS hospitals to better understand how investing in information technology and using it effectively can improve patient safety and outcomes, reduce bureaucracy, and deliver efficiencies. The Clinical DMI for the Trust is included in Section 4 of this document.

3.4 Issues Arising from National Strategic Context

In summary, Informatics needs to support the Trust in responding to *national* strategic initiatives through:

- ensuring information is complete, accurate and available to enable the public to become involved in decisions about how services are provided;
- enabling patients to take control of their information, make informed choices about their care and treatment options, and about how and whether to participate in trials and research;
- promoting and enabling the sharing of information and services to enable the Trust and healthcare professionals to provide more integrated care and to forge closer links with social services and other agencies through the development of an integration strategy;
- applying Informatics in innovative and effective ways to support the Trust in making quality and productivity gains in line with the national QIPP agenda, including specifically addressing the telehealth agenda in *3 Million Lives* and the ten initiatives in *Digital First*.

3.5 Local Context

3.5.1 Trust strategy

Aintree University Hospital NHS Foundation Trust (AUHFT) provides general acute health care to a population of 330,000 people in North Merseyside and surrounding areas, and also works with a range of partners to provide services in the community. The Trust is a major teaching hospital of the University of Liverpool and its tertiary centres provide specialist services to a wider population of around 1.5 million in Merseyside, Cheshire, South Lancashire and North Wales.

The Trust is a large hospital providing Accident & Emergency services and a wide range of acute and non-acute specialties, in addition to outpatient and day surgery services. The Trust's patient demographic includes exceptionally high rates of heart disease and cancer, with a culture among the local population of low empowerment over their health. A long history of underfunding in primary care and over-provision of secondary care services has also been associated with a reliance on the availability of hospital-based care.

The Trust's vision is:

'To provide world class services for all of our patients'.

Underpinning the overarching vision statement is the Trust's day-to-day purpose which is *'getting it right for every patient, every time'*. This statement expresses the desire of the entire Trust workforce to provide high quality care for all patients.

The vision is supported by the Trust's four corporate priorities to:

- *deliver High Quality Safe Patient Care;*
- *develop Staff's Potential;*
- *deliver our Targets and Obligations;*
- *develop Effective External Partnerships.*

The Trust ended the 2012/13 financial year with a £1.3m operational surplus which greatly exceeded the Trust's target of £0.3m. As well as the strong financial position achieved by the year's end, the Trust's operational targets across a wide range of directorates were in most cases met, and in some cases exceeded.

3.5.2 Trust Transformational Clinical Strategy

The transformational clinical strategy sets out a three year strategy for Aintree University Hospital NHS Foundation Trust. It outlines the 'whole hospital change programme' that will need to be delivered if the Trust is to be successful in achieving its vision.

The transformational clinical strategy presents the key priorities that the local Clinical Commissioning Groups and Local Authorities are aiming to address, which include:

- improving Quality, Innovation, Productivity and Prevention, through the reduction of admissions and length of stay;
- focussing on health promotion and ill health prevention including smoking, cardiovascular disease and stroke, alcohol misuse, obesity and mental ill-health;
- joint working of planned care services with a redesign of care pathways to improve access and quality of interventions;
- successful joint working between primary and secondary non-elective and emergency care services with the introduction of community-based support initiatives.

The strategy sets out clear guidance for the continuation of collaborative working and the need to extend the Trust's current service portfolio through competitive tenders and continuous improvements within the service portfolio.

3.5.3 Trust Communications Strategy

The Trusts communication strategy makes it clear that effective communication and engagement lies at the heart of an effective organisation and will is key to 'getting it right for every patient every time'. It acknowledges that technology will play a core role in the success of the Trusts communications strategy, and a digital review is planned to fully understand the capability of digital technology.

As technology will be core to the delivery of the communications strategy it is important that the IM&T and communications teams work closely together to understand the organisations needs and how technology, especially digital and social, can support the achievement of the Trusts overall business objectives.

3.5.4 Liverpool Health Partners

Aintree's Cost Improvement Programmes have delivered £24 million efficiency savings and further savings are becoming increasingly difficult to achieve. It is clear that, if the Trust is to continue to deliver high-quality, safe patient care; meet the significant financial challenges facing all NHS organisations; and continue to focus on internal efficiency, working in partnership will be required to achieve service reconfiguration and further efficiency savings.

The vision for Liverpool Health Partners (LHP) is to become:

"A strategic partnership for creating health gain pursuing excellence in healthcare delivery, research and clinical education"

The LHP consists of 9 founding partners:

- Aintree University Hospital NHS FT
- Alder Hey Children's NHS FT
- The Clatterbridge Cancer Centre NHS FT
- Liverpool School of Tropical Medicine
- Liverpool Women's NHS FT
- Royal Liverpool & Broadgreen University Hospitals NHS Trust
- University of Liverpool
- Liverpool Heart & Chest NHS FT

In addition to the nine founding partners, LHP intends to develop a network of members to include other NHS, Higher Education and industry organisations from across Merseyside, Lancashire, Cheshire and North Wales.

The LHP aims to act as a framework to enable collaboration opportunities among its members. AUHFT have used the LHP framework to collaborate with the Royal Liverpool & Broadgreen NHS Hospitals Trust (RLBUH) and Southport & Ormskirk NHS Trust to deliver a joint vascular service in North Mersey to improve the health outcomes for patients.

The Trust became the Major Trauma Centre for Cheshire & Merseyside, in collaboration with the Walton Centre and RLBUH, which ensures that major trauma cases get fast access to the specialist treatment they require. The Trust also participates in a shared service with RLBUH to deliver pathology services across both Trusts and Liverpool Labs are currently procuring a shared Infection Control solution for use across the partnership.

3.5.5 Informatics Merseyside Local Health Economy Informatics Strategy 2012-2015

The Informatics Merseyside Local Health Economy Informatics Strategy focuses on the economy-wide, cross-organisational informatics actions needed to help improve healthcare value and to help achieve economy-wide, joined-up care. Its strategic aim is:

To embrace health informatics to assist in:

- enabling more joined-up, efficient patient care across the health economy;
- empowering patients to be more directly involved in their healthcare;
- improving health care value – the ratio of quality (clinical outcome plus patient experience) relative to the cost of healthcare.

The strategy identifies six strategic themes. These include the following which are particularly relevant for the Trust:

1. Joined-up care

Support for cross-boundary working, social care interaction and integration of clinical teams requires efficient 'interoperability' and 'connecting' of systems so that information is recorded and made available to support pathways of care. Interoperability studies are being progressed to identify what needs to be done.

2. Supporting the shift from hospital to care closer to home

To support the ageing population, especially those with long-term conditions, the Local Health Economy (LHE) will further explore innovative solutions such as telehealth and telecare to provide care closer to, or preferably within, patients' homes.

3. Patient empowerment

To keep patients informed and directly involved in their healthcare, patients will be provided with access to their records and advisory material, and the LHE will develop and offer convenient two-way liaison through electronic messaging.

Work is in progress to shape these initiatives and, as the principles emerge, the Trust will reflect them in its Informatics development.

3.6 Issues Arising from Local Strategic Context

Informatics needs to support the Trust in responding to *local* strategic initiatives through:

- Demonstrating the 'art of the possible' in assisting the Trust in continuing to meet and exceed its operational financial targets;
- Creating a robust Informatics service that enables the Trust to continue to develop its strategic partnerships and collaborations across the local health care economy;
- Providing high quality information and reporting, and clinical system solutions to assist the Trust in achieving its Transformation Clinical Strategy;
- Participating in local information-sharing initiatives across the local health community.

3.7 Stakeholder Analysis

During this exercise, a range of stakeholders were consulted through interviews and workshops. The full list of those involved is included in Appendix A. The stakeholder analysis showed the majority of stakeholders felt that the Trust's IT systems hold data and information in 'silos' and there is little integration between the Trust's three major IT systems: the Electronic Document Management (EDM) system; the Electronic Prescribing and Medicine Administration system (EPMA); and the Sigma Patient Administration System (PAS). For example, although EDMS may be accessed via a link to view a patient's scanned notes, the information held within them is not integrated within the core clinical record and able to be used for clinical decision support, alerting, etc.

As a result of this lack of integration, patient information is not available at the point of care, and clinicians report that often information is not available when a patient has transferred from one clinical area to another, for example upon leaving theatre and being readmitted to a ward. There is also a mixture of digital and paper-based information which creates significant patient safety risks and an increasingly difficult working environment for clinicians and other health care workers.

There are a number of issues resulting from overdue upgrades to the systems and PC estate, as well as the lack of a unified approach to the distribution and use of IT solutions across the Trust. Differing versions of software and methods of recording information compromise data quality and the disparate nature of the systems also inhibits the use of real-time data.

There is currently no central governance process for the procurement of IT systems. As a result, IT contracts for existing systems cannot be managed effectively in working towards a complete electronic patient record. The current method of procuring and implementing IT solutions has also led to systems being 'shoe-horned' into the existing Sigma PAS structure, a practice which is unsustainable in terms of both management, and interfacing and infrastructure capability.

The Trust currently has a contract with System C for the creation of interfaces to the Sigma PAS, however this service has become financially unviable with heavy costs being associated with each interface request.

There is a huge unmet demand for system enhancements and clinical information to support process changes and improvements in efficiency and patient safety. The Informatics team is not sufficiently resourced to meet these. Although system enhancements are prioritised through a Prioritisation Group, this was not known or understood by many of the stakeholders interviewed.

The Informatics department is aware of the necessity for clinical engagement within IT and the recent appointment divisional Clinical IT leads is designed to address this.

3.8 Issues Arising from the Stakeholder Analysis

Further actions arising from the stakeholder analysis include:

- Improve integration of information system to reduce 'information silos';
- Upgrade hardware and software across the Trust to provide a standardised user platform;
- Establish central governance for the procurement of IT solutions;
- Improve clinical engagement with Informatics through the implementation of divisional IT lead roles within the directorates.

4 Vision and Strategic Objectives

This section aims to describe the vision for Informatics and identify the key strategic objectives for its achievement.

4.1 Vision

The strategic vision for Informatics for the Trust is:

> *To create a fully-digital hospital environment in which patient-centred electronic records can be accessed in a single, integrated way by patients themselves and those caring for them within the hospital and across the community subject to stringent security and confidentiality controls. This will be supported by a modern IT infrastructure which supports access at the point of care, unified communications and flexible mobile working arrangements and by access to clinical and corporate information to support clinical and business decision-making, research and audit.*

The mission for the Informatics service is:

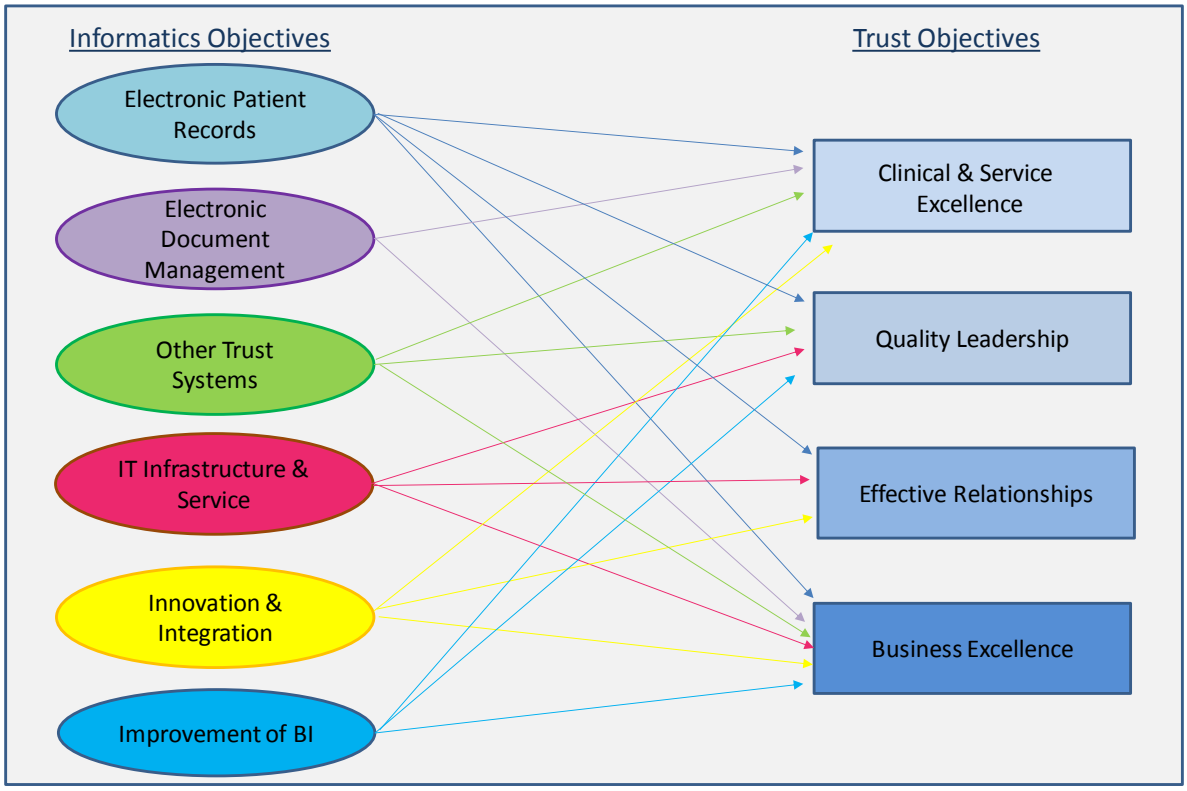
> *To become a valued partner to the Trust, listening and responding to our customers' requirements, demonstrating the art of the possible and providing a robust, safe and secure Informatics environment.*

4.2 Informatics Strategic Objectives

The following list identifies the principal objectives for Informatics to respond to the strategic drivers and achieve the vision for Informatics. These are to:

1. Create a single integrated **Electronic Patient Record** (EPR) system, through the specification and procurement of a commercially-available, proven solution;
2. Review and enhance the current **Electronic Document Management** (EDM) solution, including reviewing current usage of the solution and associated business change management and training, introducing a more comprehensive indexing system and considering integrating more tightly into the chosen EPR system to enable the solution to be used in a more efficient way;
3. Develop and integrate **other Trust systems** outside of the core EPR development;
4. Develop, maintain and manage a modern and reliable **IT infrastructure** and **improve IT service** provision through bringing services in-house, including integration management and IT support services;
5. Achieve better **integration** across the wider health community through participating in record-sharing initiatives, staying abreast of innovative technologies and championing the use of technologies that can improve working practices and patient involvement;
6. Improve **business intelligence** and reporting systems including trending and business analytics covering clinical information and performance management.

Mapping of Informatics Strategic Objectives to the Trust's Corporate Priorities



5. Current Status of Informatics

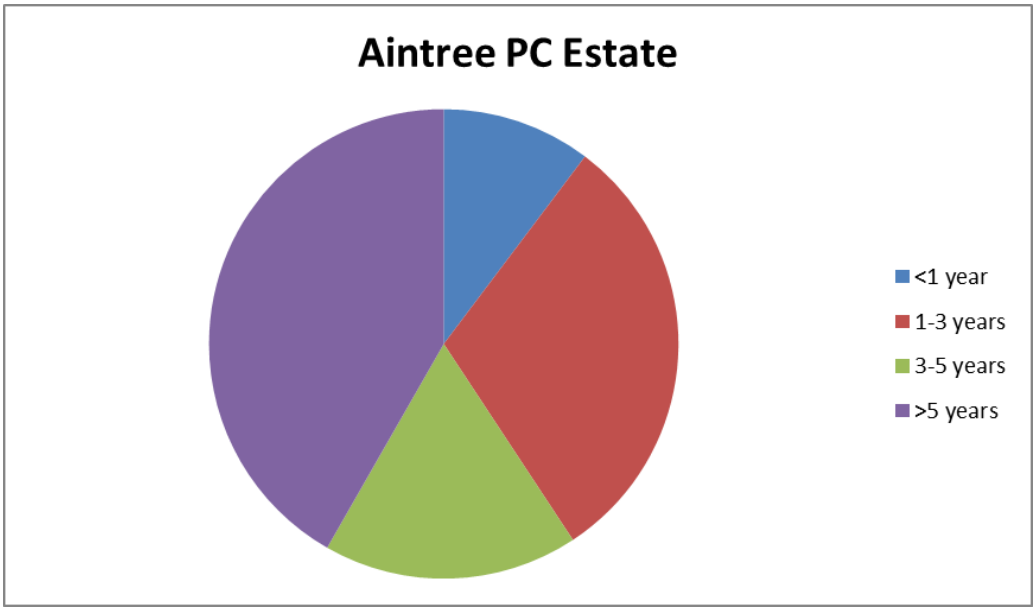
This section describes the current status of Informatics capabilities.

5.1 Trust Informatics Infrastructure and Services Provision

In June 2013, Clinical Informatics transferred into the Division of Diagnostics & Support Services. The Head of IT and the Clinical Business Manager are jointly responsible for the Business Unit and work in an effective and highly successful partnership.

However, IT infrastructure is currently purchased in an ad-hoc way, leaving the whole IT estate in a vulnerable position. This needs to be addressed urgently.

The Trust's desktop PCs are rapidly becoming out of date and at present there is no Trust-wide replacement programme. With almost 50% of the PC estate over 5 years old, an ad hoc replacement approach is no longer viable. The ageing PCs are having a detrimental effect on the treatment and care of patients with PCs taking in excess of 20 minutes to reboot.



In 2013, the Trust purchased 500 VDI or Cloud computers through capital funds and these have been rolled out to clinical areas to replace desktop PCs. This i-Cloud roll out has proven successful with a dramatic reduction in log in times.

A number of Information Security risks have been identified. There are over 1,000 Access Databases on the Trust I-drive and it is unclear whether these contain patient identifiable information. This is being reviewed by the Trust Information Security Manager.

5.2 Informatics Merseyside

Several elements of the Information Technology services are provided by Informatics Merseyside (IM), formerly North Mersey Health Informatics Service. There are currently issues identified with capital allocation, the Informatics Merseyside contract, and information security.

Informatics Merseyside provide:

- Desktop support - PC and hardware installation, fault finding, resolution and hardware repairs;
- Technical services - third-line support;
- Voice and data - maintenance and support of the Local and Wide Area data networks;
- Programme and Project Management team - this team was reduced significantly last year and now has only one staff member;
- IT Training - the training service delivers Informatics systems and application training;
- System Support and Development;
- Web/Software Development.

The Trust has decided to bring the majority of the service in-house to generate efficiencies and to create a smaller, focused team that would better support Trust users. Support staff would be familiar with the smaller number of Trust systems rather than having to provide support across a large number of systems used by all the Trusts that IM currently support. An in-house team would provide closer alignment to the Trust's priorities.

5.3 Clinical Systems and the Clinical Digital Maturity Index

The Trust's clinical digital maturity index is shown below. The model is broken down into nine levels and analysed by use of clinical systems. The systems and maturity levels are categorised under a RAG (red, amber, green) status. The Trust is benchmarked within its quartile, using a range of data sources to give a wider picture of take-up and the possible reasons for take-up variances. AUHFT is placed in the second quartile of Trusts and scored 72 points overall with the top Trust in this quartile scoring 75 points.

The Trust has completed the first three levels of the CDMI with the fifth and eighth levels also shown as completed. The Trust still requires investment and development in specialist departments, clinical noting and document management, enterprise scheduling and ePrescribing to complete all nine levels of the CDMI.

The Trust was also assessed on:

- analytics and interoperability where the Trust scored full compliance;
- portals and patient access, where patient access was not deemed completed;
- integration with primary care, where once again the Trust scored full compliance; and
- coding. The Trust complies with the NHS number policies, however only this standard out of three was met, Snomed CT and DM+D were not deemed as met.

The assessment of the Trust's systems is shown below:

9	Advanced e-prescribing	Inpatient e-prescribing ward	Oncology e-prescribing	CDS in use on e-prescribing	
		JAC (EPMA)	None	First Data Bank (Multilex)	
8	Simple e-prescribing	Outpatient (TTO) e-prescribing			
		JAC (EPMA)			
7	Enterprise scheduling	Scheduling	Clinical workflow engine / integrated care pathways	Blood tracking	
		McKesson (Medway Sigma)	None	None	
6	Clinical noting and document management	Document management	Clinical noting	Observations - vital signs	
		CCube Solutions (CCube)	McKesson (Medway Sigma)	None	
5	Order comms and diagnostic reporting	Order comms	Diagnostic reporting	Bed management	
		McKesson (Medway Sigma)	McKesson (Medway Sigma)	In House ()	
4	Specialist departmentals	Cardiology	Oncology	Critical Care	
		Philips (Unknown)	None	None	
3	Departmentals	A&E	Theatres	Maternity	
		McKesson (Medway Sigma)	CSC (ORMIS)	N/A	
2	Core ancillary	Pharmacy	Pathology	RIS	PACS
		JAC (Pharmacy Stock Control)	CliniSys (WinPath)	HSS (CRIS)	Carestream Health (Carestream VUE PACS)
1	Foundation	PAS	Discharge letters	Community PAS	Simple BI
		McKesson (Medway Sigma)	McKesson (Medway Sigma)	N/A	McKesson (Medway Sigma)

The Trust's main digital systems comprise:

- SIGMA Patient Administration system (PAS) – SIGMA was designed to be the unifying tool that doctors, nurses and other healthcare professionals use irrespective of whether they are in clinic ordering tests, on the ward reviewing a sick patient or in MAU or AED. However, the system has little true clinical functionality and, has only limited integration to some of the Trust's clinical systems. Where there is a link, the integration is usually limited to receiving output of data from PAS and few bi-directional data feeds are in place. This requires staff to discharge patients on at least two separate systems, creating data quality problems and, potentially, patient safety issues.
- Electronic Document Management system (EDM) – The Trust's EDM system was procured and implemented as part of the Trust's wider EPR strategy. It was implemented on the assumption that, once scanning had been completed, the Trust would be operating a paper light/free environment based on the Sigma EPR solution. Therefore, the scanned records would not be routinely accessed in a clinical environment. This meant that the documents were scanned as archive documentation rather than with the more comprehensive indexing which may have been considered more appropriate for routine clinical access on an ongoing basis. The Trust's EPR strategy was not accomplished due to the lack of functionality and clinical development provided by the EPR supplier, this has meant that the scanned records held in the EDM are still needed for clinics. The lack of indexing means that a significant amount of time is still spent looking for information within the records and is creating patient safety issues when information cannot be located.
- Electronic Prescribing and Medicine Administration system (EPMA) – The Trust's EPMA system is not fully integrated with the Trust's other electronic systems. The EPMA system therefore acts as a standalone system which inhibits clinical decision support as the rules set by the EPMA cannot be applied throughout the patient's record. For example, blood results cannot be used to drive rules within the prescribing system and it is not possible to order a single set of investigations and medications from a single screen within one system
- Community Systems – there is no single system in use across community services, with some staff using Sigma and others using EMIS. This creates challenges for the BI team in capturing activity across all staff groups based in the community.

In summary, Informatics needs to support the Trust in responding to issues with the current status of Informatics through:

- Assimilation of the Informatics Merseyside IT support resources into the in-house Informatics team;
- Review of services, including interfacing currently supplied by McKesson;
- Completion of the Information Security review of databases;
- Continuing to work towards the targets set by the clinical digital maturity index through the implementation of the electronic systems specified in levels four, six, seven and nine;
- Implementing clinical and patient portal technologies;
- Implementation of Snomed CT and DM+D coding practices;
- Integration of the Trust's Sigma PAS with clinical systems as specified in the EPR approach in section 6;
- More granular retrospective indexing for those scanned patient records already in the EDM system, with a redefined ongoing scanning and indexing approach;
- Additional development of the EDMS to ensure that the functionality is maximised and additional training and support to ensure that users make the best use of the system.
- Implementation of comprehensive clinical decision support through the integration of the EPMA system with the other main clinical and administrative system throughout the Trust;
- Implementing a rolling replacement of the PC estate;
- Increasing investment in Informatics for the update and replacement of the items listed in the infrastructure investment programme.

6 Strategic Themes

In this section, major strategic themes are considered as to how the end vision for Informatics can best be reached.

6.1 EPR Options

Modern electronic patient record (EPR) solutions offer the potential to embed computerised decision support into day-to-day care delivery and record-keeping to provide full patient information, promote best practice, minimise errors and hence improve safety, quality, efficiency and effectiveness.

The Trust's previous Informatics Strategy, published in November 2011, set out an ambitious plan to deliver fully-electronic patient records by July 2014. The delivery of that strategy depended on the full implementation of the Sigma solution being developed and supported by System C Healthcare (later acquired by McKesson).

The promised advanced clinical functionality, such as electronic prescribing, advanced decision support and clinical documentation including noting, care plans and assessments, has not yet been developed fully by the supplier and delivery dates have been repeatedly rescheduled. Clinicians and users express scepticism that the current system will deliver the required functionality to the quality and timescales they need.

Extensive engagement was undertaken with users in order to identify the main problems with the current systems environment and their key requirements for any future solution. As a result of the requirements identified, five options for an EPR strategy are being considered:

- **Option 1:** Do nothing, wait for the development of Sigma. This option relies on the delivery of the proposed road map for the development of Sigma's clinical functionality by the supplier, McKesson.
- **Option 2:** Procure a single integrated EPR system covering all areas of the Trust. This approach would require the replacement of the Sigma PAS and other major clinical systems such as e-Prescribing and Medicines Administration (EPMA).
- **Option 3:** Select "best-of-breed" systems for each department, specialty or function, and develop an integration architecture within which these component systems will inter-operate.
- **Option 4:** Procure a clinically focused EPR solution to 'wrap around' the Sigma PAS. This option would retain the Sigma PAS as the core administration system and add a suite of proven clinical modules that would integrate to the PAS to provide full clinical functionality.
- **Option 5:** Undertake a collaborative procurement with the Royal Liverpool and Broad Green Hospital Trust.

These options will be evaluated against factors including usability, achievability, affordability and strategic fit to the Trust's objectives.

The Trust has concerns about the affordability of the options and has therefore decided to take some time to fully develop an outline business case and to review some of the solutions available in the EPR market. The Royal Liverpool and Broad Green Hospital Trust are also currently considering commencing a procurement for EPR, so the opportunity will be taken to explore options for collaboration and economies of scale.

The next steps are to develop an outline business case, in which the costs, risks and benefits of the options are fully examined and the implementation and investment profiles are presented.

The outline timetable for procurement and implementation would be as follows:

Market Analysis and Business Case Development	April – June 2014
Requirements Analysis and OBS development	June - September 2014
Procurement (if required) commences (9 – 12 months)	September 2014
FBC approval and contract signature	September 2015
Phase 1 implementation complete (PAS & OCS) (9 – 12 months)	September 16
Phase 2 advanced clinical functionality commences	October 16

The advanced clinical functionality would be rolled out over a 24 – 36 month period and enhancements added on an ongoing basis thereafter.

6.2 Electronic Document Management

When the Trust's Electronic Document Management (EDM) system was implemented, the assumption which drove the implementation planning was that it would be a tactical, interim measure taken as a step towards implementing the full EPR strategy. The project was focussed on efficiency and cost savings, i.e. removal of the existing legacy paper records and the costs associated with managing and storing them and to improve the availability of clinical records.

It was believed that SIGMA would be operating as a full electronic record, containing the majority of the patient notes. Users report that access and retrieval of key pieces of information is difficult and time-consuming and feel that more granular indexing and closer integration into the relevant parts of the electronic record held on Sigma would ease this situation. However, this view is not shared by Informatics Managers responsible for the EDMS who feel that the users could use the current solution more effectively.

As the Trust embarks on its new EPR strategy, the scanning and processing of paper patient records and the usage of the system must be reviewed to ensure quick and efficient access to the information that is contained within the EDM. Further analysis to determine the root of the perceived usability problems will be completed and this may result in further training and awareness programmes, process redesign and business change support, system design changes or changes to the indexing regime.

It is understood that achieving a full electronic record will take time, and therefore the effective inclusion of scanned images of remaining paper note-keeping must be addressed.

The EDM solution itself is considered to be fit for purpose and this strategy is not proposing its replacement. However, a review of its implementation, additional training and business process change management is essential to make this useful tool workable in the clinical environment.

6.3 Other Trust systems

There are a number of other systems across the Trust which fall outside of the strategic EPR programme.

These include:

- business systems, such as the HR systems which require updating and enhancing;
- digital, paper-free management of corporate processes including a structured document storage and management environment and workflow management;
- specialist clinical systems which are unlikely to be adequately covered by the main EPR solution (e.g. ITU systems);
- tactical solutions, where there is an immediate need which cannot wait for the full EPR to be procured and implemented.

There is a backlog of demand for enhancements and additional developments to existing commercially-provided and in-house systems. These include requests for additional reports from ABI, ad hoc database and portal-type developments; configuration changes to SIGMA (e.g. proformas), etc.

A transparent prioritisation and governance process will be established to assess these requests for systems purchase, development or configuration. A business case must be approved for each request (proportionate to the scale of requested investment).

These cases should set out the resources required, whether from existing Informatics staff or bought in resources, and the benefits anticipated from progressing the development.

Each case will assess the extent to which the development progresses the Trust towards its long term strategy, or distracts or diverges from it. In the case of a divergence, a migration path back to the strategy should be included.

The likely approach for each of the key systems is shown in the table below:

Function/Type	Supplier/System Name	Likely Outcome
Patient Administration System	McKesson Sigma	Replace with EPR
A&E	McKesson Sigma	Replace with EPR
Community	Sigma and EMIS	Review options for community systems including replacing with EPR, extending the use of EMIS or selecting a specialist community system.
Theatres	CSC ORMIS	Replace with EPR
Order Communications	McKesson Sigma	Replace with EPR
Electronic Prescribing	JAC EPMA	Replace with EPR
Pharmacy Stock Control	JAC	Retain and interface to EPR
Pathology (LIMS)	Clinisys WinPath	Retain and interface to EPR
Radiology (RIS)	HISS Cris	Assess EPR module but probably retain and interface to EPR
PACS	Clearstream VUE	Retain and interface to EPR
Cardiology	Philips	Replace with EPR
ITU	None	Assess EPR module but probably select best of breed and interface to EPR
Specialty-specific databases	Various current and planned, including Bluespier (Orthopaedics)	Assess EPR and use where possible. Consider 'tactical diversion' from strategy and implement best of breed and

		interface where VFM or patient safety benefits can be demonstrated in the short term
EDM	CCube	Retain and interface to EPR
HR	ESR	Review options including assessing national replacement for ESR
Staff Rostering		Retain and interface
Finance		Retain
Corporate Document Management & Workflow	None	Assess potential of Microsoft products such as Sharepoint, extending the clinical EDM solution or selecting and implementing a new tool to support this.
Business Intelligence	In house ABI	Assess options for replacement/ development

6.4 IT Infrastructure and Service Improvements.

6.4.1 Infrastructure Investment

The Trust must invest in its technical infrastructure to support the developments set out in this strategy. As IT equipment ages, it is more likely to fail. The impact of such failures in clinical areas could be catastrophic, affecting patient care and potentially causing operations or outpatient clinics to be cancelled. Areas for investment and the approach to be taken for each are set out below:

End User Devices (PCs, etc.)

As far as possible, traditional desktop computers will continue to be replaced on a phased basis with 'cloud computers' in a 'desktop virtualisation' strategy. All the data and application software is stored and run from the central data centre, meaning that faulty devices can simply be replaced, with the user able to continue working from an alternative location. These devices are well-liked by the user community and provide savings on power and management costs.

For the remaining desktop PCs, a rolling 3 year replacement programme will be established.

Local Area Network

A phased programme for the replacement of all network switches over the next 5 years will be developed. Devices will be prioritised based on those that will operate within the wireless network. These switches can provide power to run the new VOIP telephones. Clinical areas will be prioritised to improve speed and resilience.

Wireless Area Network (WAN)

The current wireless access points and wireless access controllers to provide management for the wireless network will be replaced over the next 3 years. The upgrade of the WAN will provide a

faster connection speed and will enable the network to be utilised by more services than it is currently able to support. Again, clinical areas will be prioritised.

Telephone system

A four-year telephone replacement programme will replace the current telephone handsets with VOIP handsets. These systems will utilise technology to provide additional benefits to the Trust, allowing it to communicate better internally and externally using message services such as 'messageme' and 'presence'. The new communications system will also enable the use of video conferencing and enable use of an automated switchboard for callers to the hospital.

Servers

A rolling replacement programme will be established for all servers to ensure that performance and availability remains high. As far as possible, a server virtualisation approach will be adopted to minimise costs and maximise effective server space.

SAN Storage Area Network

Additional disk space will be needed each year to manage Trust data growth. A storage review will be conducted to assess SAN vs Cloud based technologies at the end of the current three year contract.

Handheld/Trolleys

The current unwieldy 'computers on wheels' or 'trolleys' will be replaced over the next 18 months with more handheld devices or smaller trolleys to provide bedside recording of data.

Mobile Working

There is increasing demand throughout the Trust for improved support for mobile working. This ranges from remote working in the community, mobility within the hospital, a managed approach to the proliferation of tablet devices, users' own devices (BYOD) and the unification of voice and data communications.

A strategy will be developed for supporting mobile working which includes tackling the organisational change required to operate this technology safely and cost-effectively and to maximise the benefits gained.

6.4.2 IT Service Provision Options

Stakeholder interviews identified significant dissatisfaction with the current IT support arrangements. Users felt that the service had lost the close connection it had with the Trust business and that consequently IT support staff failed to recognise the priorities for resolving faults within the Trust. They stated that there appears to be a high turnover of service desk staff with a consequent lack of expertise retained on Trust systems.

The IT Support service is currently provided by Informatics Merseyside (IM), an IT shared service hosted by Mersey Care NHS Trust. IM went live in October 2006 and has 320 staff providing Informatics services and support to approximately 30,000 users, 20,000 IT devices and 750,000 patients in and around Liverpool.

The services provided by Informatics Merseyside are:

- Desktop support;
- Technical services;
- Voice and data;
- Programme and Project Management team;
- IT Training;

- System Support and Development;
- Web/Software Development.

The Trust feels that it no longer receives best value for money from Informatics Merseyside and has made the decision to repatriate a number of services back in-house. This allows for a full audit and review of the skills, resources and infrastructure provision, improving the knowledge on which to base any subsequent decision.

6.5 Integration across the Wider Health Community

6.5.1 Information Sharing

Options for integration with the wider health community including GPs, community services, social care, third sector, private providers and neighbouring acute services will be explored during the lifetime of this strategy in conjunction with defining an agreed way forward for EPR and in collaboration with local health economy partners.

Two-way continuous communication with patients and their carer community will also become increasingly important. Increased access and interaction with both clinical and non-clinical information will be required to empower patients and make supporting processes more efficient.

Portals can be used as a connection between service providers (e.g. between acute services, GPs and community services) and also between Trusts and their patients and carers. Patient portals can be used for booking appointments, sharing information regarding treatment or self-diagnosis, and can also be used for results reporting, appointment reminders and as an enabler of information collation from telehealth solutions.

The implementation plan for this strategy includes the exploration of clinical portals or other relevant solutions in liaison with our partners in the local health community. This will cover both clinical and non-clinical business requirements to provide a wider social interface

The selection of a solution for community services, whether this is using the hospital EPR system or a specialist community system with integration, or using GP systems such as EMIS will also be explored within the first year of this strategy.

6.5.2 Telehealth

Telemedicine is the use of communication and information technologies to deliver clinical care where the individuals involved are not at the same location. They may be two or more healthcare professionals or a healthcare professional and a patient, foe example. Telehealth includes this definition, and extends it to include telecommunication used to deliver non-clinical services such as research and health education promotion.

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

Telehealth technology is now also widely available and has been successfully implemented in numerous care setting supporting staff to provide more timely and accurate care and for patients to feel more in control of their own wellbeing.

Connecting patients in their home to clinicians via video technology has already been proven to reduce hospital admissions but the future potential for telehealth is even more exciting with increasing developments in areas such as smart phone apps, motion sensing technology within games consoles and smart TVs.

During the lifetime of this strategy, the Trust intends to provide technology to facilitate telehealth, including self-care management, virtual clinics and remote monitoring, consistently across the health economy.

The action plan for implementing this strategy includes the exploration and trialling of appropriate telehealth technologies. In the first instance a business case will be developed to support the Trust in delivering a number of business objectives, including the requirements of the Contract Service Development and Improvement Plan.

It is essential that robust Information Governance arrangements are put in place to cover all use of identifiable data, and in particular that these are updated to cover the use of emerging technologies such as telehealth applications.

The following specialties have indicated a desire to be involved in the first wave of projects:

Teleconsultation

ENDOCRINOLOGY	Development of nurse telephone clinics for thyroid follow-up. This will improve capacity in thyroid service and reduce demand on Endocrinology clinics.
PRISON HEALTH SERVICES	Delivery of video consultations to reduce DNAs, improve patient experience and to reduce potential security threats within the hospital.
SPECIALIST WEIGHT MANAGEMENT SERVICES	Use of teleconsultations to support the delivery of specialist weight management services in Cumbria and Lancashire.
VENTILATION SERVICES	Use of teleconsultations to support the delivery of Ventilation outpatient services across the North West.

Telecare

HEART FAILURE SERVICES	Using telehealth to reduce Heart Failure nurse input into the care of selected patients.

Telemedicine Education

KNOWSLEY COMMUNITY DIABETES SERVICE	Use of internet-based education programmes to provide community-based diabetes education programmes.
CARDIAC REHABILITATION	Use of internet-based cardiac rehabilitation programmes. During preparation of Knowsley CVD bid the team explored the use of telehealth to reduce the nurse input into the care of selected heart failure patients as well as the use of internet-based cardiac rehab programmes. Whilst further appraisal would be required in order to evaluate cost effectiveness this would build on the excellent work undertaken by the team in develop proposals for the Knowsley cardiovascular service.

6.5.3 Patient Engagement

The patient is central to whole-community working as they are currently the only people with the overall view of their care journey. As a result, they are experts in the process and the care they receive and their views and insight will be vital to improving quality and efficiency.

Technology increasingly supports the patient engagement agenda and will continue to do so. Digital technologies already enable patients to have more of a voice with websites such as Patient Opinion and social media tools such as twitter, which enable patients to share their views without having to wait to be asked.

As part of this strategy, and in line with the Trust Communications strategy, the impact of digital technology on patient engagement will be assessed. At the core will be understanding the power of social media and the options that best suit the Trust's patient engagement needs.

7 Actions and Implementation Plan

1. Create a single integrated **Electronic Patient Record** (EPR) system, through the specification and procurement of a commercially-available, proven solution.

Action	Year 1	Year 2	Year 3	Year 4	Year 5
1.1 Procure and implement an EPR in accordance with the approach explained in section 6.1					
1.2 Review and rationalise the current Trust paper documentation and processes in preparation for EPR implementation.					
1.3 Integrate remaining clinical systems with the new EPR					
1.4 Integration of information systems through the implementation of an EPR to rid the Trust of information silos.					
1.5 Creation of a central governance approach for the procurement of IT solutions.					
1.6 Further develop effective clinical engagement across Informatics through the divisional IT lead roles.					
1.7 Continue to work towards the targets set by the clinical digital maturity index through the implementation of the electronic systems specified in levels four, six, seven and nine.					
1.8 Implementation of comprehensive clinical decision support through the integration of the EPMA system with the other main clinical and administrative system throughout the Trust.					

2. Review and enhance the current Electronic Document Management (EDM) solution.

Action	Year 1	Year 2	Year 3	Year 4	Year 5
2.1 Review of usage and usability.					

2.2 Implement review findings.	

3. Develop and integrate other Trust systems outside of the core EPR development

Action	Year 1	Year 2	Year 3	Year 4	Year 5
3.1 Establish a governance and prioritisation process for all system investments					
3.2 Review business systems support, particularly HR, and assess impact of the ESR contract renewal					
3.3 Review Technology Fund bids in the light of this strategy and decide which ones to progress for the next round of funding					
3.4 Evaluate options for Community Systems and implement selected solutions					
3.5 Assess options for support Corporate Document Management (e.g. Sharepoint or extending the clinical EDM solution).					
3.6 Assess how social tools such as Sharepoint, Yammer, Twitter, Google+ could be used to support communications, learning and engagement both internally and externally and the resource implications.					

4. Develop, maintain and manage a modern and reliable IT infrastructure and improve IT service provision through bringing services in-house, including integration management and IT support services.

Action	Year 1	Year 2	Year 3	Year 4	Year 5
4.1 Create a robust Informatics service that enables the Trust to continue in developing its strategic partnerships and collaborations across the local health care economy.					

4.2 Upgrade of hardware and software across the Trust to provide a standardised platform.	
4.3 Conduct a rolling replacement of the PC estate.	
4.4 Investment and implementation of the recommendations within the infrastructure replacement programme.	
4.5 Planning for and moving IT services back in house.	
4.6 Consider creating integration capability in-house and bringing support back in from McKesson.	

5. Achieve better integration across the wider health community through participating in record-sharing initiatives, staying abreast of innovative technologies and championing the use of technologies that can improve working practices and patient involvement.

Action	Year 1	Year 2	Year 3	Year 4	Year 5
5.1 Informatics to demonstrate the art of the possible in assisting the Trust in continuing to meet and exceed its operational financial targets.					
5.2 Research, procure and implement clinical and patient portal technologies.					
5.3 Support the Trust's Telehealth initiatives.					
5.4 Contribute to the local health community plans for integration and participate in emerging initiatives.					

8 Governance

This section sets out the governance arrangements for the implementation of this strategy.

8.1 Informatics Strategy Group

The Informatics Strategy Group's functions include the following:

- To ensure that Information and Information Technology support the aims and priorities of the Trust, and in particular support the Improving Care by Working Differently agenda.
- To ensure that a vision and strategy for Information and Information Technology are developed and communicated throughout the Trust with a clear set of benefits identified.
- To provide Executive leadership and promotion of Information and Information Technology throughout the Trust.
- To ensure that appropriate resources are allocated to Information and Information Technology programmes, that programmes are properly managed; and that identified benefits from Informatics investment are delivered to plan.
- To ensure that Information Governance is integrated into the strategy and contributes appropriately to the performance of the Trust.
- The Strategy group will report directly to the Hospital Management Board and will meet quarterly to discuss:
    - monthly summary reports on Information and Information Technology programmes;
    - Information Governance and reviews of IT project status;
    - New IT Business Case Projects;
    - Audit Reviews;
    - Policy Reviews;
    - Report on review of Business Continuity plans;
    - Project Closures;
    - Project Lessons Learnt.

8.2 Prioritisation of Internal Software Development Requests

The governance arrangements for software development requests are as follows:

- A Request for Software Development is generated via the ePMO system. This includes a specification of the work required;
- Requests are reviewed by a clinical team consisting of the IT Clinical Leads, Divisional representation, and key members of the IT senior team;
- Requests are prioritised in line with the Trust corporate objectives and clinical need/priority;
- The prioritisation list is reported to the Informatics Strategy Group for approval and onward monitoring of progress.

9 Methodologies and Best Practice

A recent portfolio programme and project management audit has been undertaken by the Trust. The opinion of Internal Audit was:

> *"While there is a basically sound system of internal control, there are weaknesses, which put some of the client's objectives at risk. There is evidence that the level of non-compliance with some of the control processes may put some of the client's objectives at risk."*

In response to the audit's findings the following industry standard approaches will be implemented across all Informatics programmes and projects.

Programme Management

Managing Successful Programmes (MSP) is a structured, flexible framework that allows the management and control of all activities involved in managing a programme. MSP is the de facto standard used for managing programmes in the NHS.

Project Management

PRINCE 2 has been adopted as the in-house standard for project management and key staff have received training and mentoring in project management techniques. All projects have a Project Group with a sponsor and clinical engagement. A recent audit confirmed that this implementation is robust.

Service Management

ITIL is the most widely accepted approach to IT service management in the world. ITIL provides a cohesive set of best practice, drawn from the public and private sectors internationally.

Security Management

The Trust intends to gain certification to the ISO/IEC 27001 standard in order to achieve:

- better management of information security risks, now and in the future;
- increased access to new customers and business partners;
- demonstration of legal and regulatory compliance;
- potential for reduced public liability insurance costs;
- enhanced status and competitive advantage;
- overall cost savings (reduced errors and re-work).

Information Governance

Information Governance describes how organisations process and handle information. It covers personal information, ie that relating to patients/service users and employees, and corporate information, eg financial and accounting records.

Information Governance describes how to deal consistently with the many different rules about how information is handled, including those set out in:

- The Data Protection Act 1998.
- The common law duty of confidentiality.
- The Confidentiality NHS Code of Practice.
- The NHS Care Record Guarantee for England.
- The Social Care Record Guarantee for England.

- The international information security standard: ISO/IEC 27002: 2005.
- The Information Security NHS Code of Practice.
- The Records Management NHS Code of Practice.
- The Freedom of Information Act 2000.
- The Human Rights Act article 8.
- The Code of Practice for the Management of Confidential Information (to be published in 2013)

10 Conclusion

It is recommended that the Trust invest in Informatics to create a partnership that will enable the business to meet and exceed both local and national standards. Through investment in the recommended actions in section seven of this document the Trust will improve its clinical care, patient safety and reporting standards.

Each investment action will be supported by an Outline Business Case (OBC) that will assess options for solutions including analysis of strategic fit and value for money and return on investment, and will be presented to the Trust Board for investment approval.