Oxford University Hospitals NHS Trust

IM&T Strategy 2012 – 2017

Version 1.0

John Skinner
EPR Programme Director & OUH Director of IM&T
Executive Summary

This document outlines the Information Management and Technology (IM&T) Strategy 2012 – 2017 for the Oxford University Hospitals NHS Trust. It is aimed at providing a strategic framework for IM&T developments within the Trust and also an update for the Trust board on current state of the IM&T infrastructure as well as the national and local IM&T agendas. This strategy is compatible with the recently announced NHS information strategy - “The Power of Information: putting us in control of the health and care information we need”.

The strategy aims to link IM&T developments into the Trust’s overall objectives and detail the governance arrangements underpinning further investment in IM&T. The strategy argues that the implementation of electronic patient record systems is a critical factor in improving efficiency and patient safety and underpins the overall strategy of the Trust.

The Trust is a large, complex, multi-site hospital providing many tertiary services, teaching and research, is facing considerable changes in its business environment. Foundation Trust status and increasing competition from other providers mean that information and performance monitoring are critical for the future development of the Trust. The strategy details the developments required and the changes in governance needed to help deliver this.

The core clinical solution at the heart of the strategy is the Electronic Patient Record System that is being implemented during the course of 2012 building on the first phase introduced in December 2011. The introduction of the clinical solution delivering real-time information is fundamental to this strategy. The ability to develop and enhance to system over time will be at the heart of developments over the next five years. The objective will be to introduce Electronic Document Management and prescribing to enable the Trust to operate in a paper light way, with information available to clinical teams wherever they need it.

In this environment it is important that the Trust begins to maximise its use of EPR and over time replace its legacy systems as EPR gains additional functionality.
With the financial situation being difficult in the next few years it is vital that this strategy focuses on getting the basics right, i.e. the things that must be delivered by any IM&T strategy for an organisation to progress:

- robust scalable IT Infrastructure that delivers information where staff need it;
- sound governance arrangements;
- high quality information management;
- training and development of IT skills in staff;
- sound project management and procurement;
- working in collaboration with other NHS organisations.

Key priorities for the next two years are articulated within this strategy and these are summarised below.

a) Implementing the EPR clinically across the organisation in 2012/13
This will deliver real-time pervasive use of EPR across all of our services delivering major benefits to all clinical teams.

b) Making the case and delivering Digitised Notes (EDM)
The case for digitising notes is fundamental to safety given the multiple specialist notes that are routinely created for the same patient; the only way a unified record will happen is if the notes are all digitised starting with the specialist libraries.

c) A clear and robust information strategy with a data warehouse
As part of the preparation for EPR a new data warehouse has started to be built; a clear performance-reporting framework is critical to gaining Foundation Trust status; ensuring that patient level costing and other core reporting functions all use the same source of truth is vital to make this strategy work. The overarching need for the Trust to co-ordinate, standardise and maximise its use of operational data is articulated in the strategy. The data warehouse will deliver a single place for corporate data to be retrieved from, some standard structured reports defined to enable the organisation at all levels to monitor performance and to support operational service delivery. Over time, data sources from all activity systems, finance, commissioning and other sources will be linked to enable a consistent view of service delivery to be obtained, including service line costing and comprehensive modelling against planned activity. Where appropriate and in conjunction with the research community options for secondary anonymised use of operational information for research purposes will be explored.
d) Robust Infrastructure including single sign-on and mobile computing
The Trust has built up a technical infrastructure that supports digital imaging across the corporate network. This will need to be enhanced with additional infrastructure but is a firm foundation for the future. Over the next year the key developments will be the increased use of vWorkspace; improved mobile bedside access for staff; upgrading of the Trust’s storage and continued improvements to the network. The strategy for mobile devices will be explored based on experience of clinical use, combined with the technical assessment on security and cost.

e) Develop a strategy to for electronic prescribing
Work is being undertaken to develop a work plan for 2012/13 including options for implementing electronic prescribing either supported by the Southern Programme for IT if agreement on the case can be reached or working up a local business case for this critical development

f) Replacing some legacy systems including pathology and RIS/PACS
The business case for pathology replacement was made several years ago but the procurement was paused; a new case is being worked up; the need for replacing RIS and PACS is critical given the contract ends in June 2013.

g) Working up the options for the Trust at the end of the EPR Contract
The Trust will need to establish firm plans for the EPR programme at the end of the national contract in June 2015. There is no appetite locally for a procurement process to replace the current EPR with a different solution so the options are likely to be ones to consider who hosts and how this is undertaken. Any new contractual arrangement will need to support the strategic objectives of the trust including patient access, information sharing and research usage.

h) Information sharing and whole system working
The development of agreed ways for working to support information sharing across the health system and facilitate agreed models of working to support new models of care advocated through the commissioning channels.

These are an ambitious list of projects not all of which will necessarily be successful. Each of the projects will need to be carefully managed and risk assessed to ensure that they deliver on time and budget to meet the needs to the business objectives of the Trust. However agreeing to priorities these will enable the Trust to move forward coherently in support of its overall business objectives.
An outline plan has been developed which identifies key milestones over the next 5 years. Given the many uncertainties, especially in relation to CfH products and services, this should be seen as work in progress. A five year capital plan has been developed including IT capital and further work is expected on developing the CRS business case will be completed once the contract reset process has been finished.

**Investment**

IM&T is increasing in importance for the Trust. Patient Care is increasingly dependent on having network and IT facilities which work. Given this it is essential that investment is gradually increased into IM&T services to ensure that the advantages of using IM&T are delivered using a modern infrastructure. Current capital and revenue investment by the OUH into IM&T is believed to be proportionally lower for the OUH than most other acute Trusts in South Central.

**Adherence to Standards, Governance and Processes**

A key component articulated through the Strategy has been to reinforce the need for appropriate governance for IM&T within the OUH. These are needed to ensure that the organisation moves in a common corporate direction and adheres to common interoperability standards, common technical standards and common data standards. Without these system cannot work together and information cannot be shared. The Trust is requested to re-affirm the importance of adhering to corporate standards and ensuring as systems are replaces the information and IM&T department are able to influence decision-making to ensure the systems are compatible with each other and can be incorporated into the IM&T and Information infrastructure. These will generally be managed through the Trust’s Health Informatics Committee and Information Governance Group reporting in through to the Trust Board.
Table of Contents

1. Introduction ............................................................................................................................8
2. Background and Context ........................................................................................................9
  2.1. Business Context .............................................................................................................9
  2.2. National IM&T Context ......................................................................................................11
  2.3. Local IM&T Context .........................................................................................................14
3. Objectives and Benefits .......................................................................................................16
  3.1. Realising the benefits of accurate clinical information collected in real-time ..........16
  3.2. Digital Health Record ......................................................................................................17
  3.3. Underpinning principles and technologies ......................................................................19
  3.4. Conclusion – so what does this mean? ...........................................................................19
  3.5. Community wide information sharing – connect all .......................................................20
  3.6. Becoming an information rich organisation ..................................................................22
  3.7. Shorter-term imperatives ................................................................................................22
  3.8. Benefits realisation ...........................................................................................................22
4. Current Situation ..................................................................................................................24
  4.1. IT Infrastructure ................................................................................................................24
  4.2. Information Systems Standards .........................................................................................28
  4.3. Information Systems .........................................................................................................30
  4.4. Strategic Approach for patient record systems ...............................................................31
  4.5. Information Management – Clinical Systems ................................................................32
  4.6. Business Systems ..............................................................................................................34
  4.7. Telecommunications ........................................................................................................35
5. Information Management ..................................................................................................35
  5.1. Overview ...........................................................................................................................35
  5.2. Data quality and standards ...............................................................................................36
  5.3. Systems and databases .....................................................................................................37
  5.4. Analysis tools and skills ...................................................................................................38
  5.5. Roles and responsibilities .................................................................................................38
  5.6. Outcome measurement and Clinical Informatics .............................................................38
6. IM&T Management and Governance .................................................................................39
  6.1. Overview ...........................................................................................................................39
  6.2. IT Procurement ..................................................................................................................39
  6.3. Project and Programme Management ...............................................................................40
  6.4. Benefits Management ......................................................................................................41
  6.5. Governance for the IM&T Programme .............................................................................41
6.6 IM&T Training and Development ............................................................41
6.7 Information Governance ........................................................................42
6.8 Health Informatics Services .................................................................43
6.9 Devolved IT staff ....................................................................................44
6.10 Information Management and support ..................................................44
6.11 System Development ............................................................................45
6.12 Web Development ..................................................................................45
7 Plans ...........................................................................................................45
7.1 Financial Planning Regime .................................................................45
7.2 Infrastructure .......................................................................................46
7.3 Deploying EPR across the Trust ..............................................................46
7.4 Corporate Application ............................................................................48
7.5 Other Applications ..................................................................................49
7.6 Local IT Systems ...................................................................................49
7.7 Telecoms ................................................................................................50
7.8 Outline Implementation Plans .................................................................50
8 Key Risks ..................................................................................................54
1. **Introduction**

The purpose of Information Management and Technology (IM&T) within the Trust is:

- To develop and document the implementation of the Trust’s vision to become a digital hospital with devices connected to an integrated Electronic Patient Record (EPR) which provides clinical and administrative staff with information about their patient wherever and whenever they need it.

- To provide a reliable, effective infrastructure to support a diverse range of technologies which improve communications both within the Trust and across the health care system, and deliver step change efficiencies in the process and delivery of care;

- To ensure that information and information technology is used to support staff in giving patients the best possible care within the Trust. The strategy should enable Trust professionals to have the information they need, where and when they need it. It also aims to ensure that patients, clinicians and management have access to appropriate information necessary to support them in making the right decisions at the right time;

- To support the strategic and business aims of the Trust in terms of its future status as a Foundation Trust, its service development strategy and its long-term research agenda;

- To support information sharing in support of patient pathways and safe care with all healthcare partners;

- To support the Biomedical Research Centre and facilitate clinical and academic research in line with the Trust’s strategic goals; the IM&T agenda needs to assist in providing appropriate anonymised data in line with Information Governance rules and the research ethics permissions.

This paper defines the strategic direction for IM&T to support the Trust’s core strategy and vision. It aims to support and improve the Trust’s position as a service provider, a teaching and research centre and as a business. The thesis underpinning this, is that many of the service improvements, new developments and efficiency gains proposed by the Trust business plan rely on a modern and robust IT infrastructure and good quality and relevant information systems.
This draft builds on the previous 2007 IM&T strategy which was approved by the Board. This version will be circulated widely to stakeholders before being submitted for formal approval.

2. **Background and Context**

2.1. **Business Context**

The Oxford University Hospital (OUH) is a large and highly complex organisation which has arisen from the merger of the Oxford Radcliffe Hospitals NHS Trust with the Nuffield Orthopaedic Centre. It covers 4 main hospital sites, employs over 11,000 staff (c9000 wte). In 2010/11 there were:

- 697,012 outpatient consultations and treatments;
- 111,039 attendances at the emergency departments;
- 84,129 admissions for emergency assessment or treatment;
- 71,782 admissions for treatment as day cases (120,367 including renal dialysis);
- 25,485 admissions for planned inpatient treatment; and
- 9,219 babies delivered

In addition to providing core DGH services for Oxfordshire and neighbouring counties and the Trust is also a centre of specialist services on a regional and national basis. The Trust has a national and international reputation for research in many areas including musculo-skeletal services, neurosciences, cardiac services, cancer services and gastroenterology working in partnership with the University of Oxford and the Oxford Brookes University’s School of Healthcare.

The Trust’s long-term vision is:

- Oxford University Hospitals NHS Trust’s vision is to be a world leading, innovative academic health science system, working in partnership locally, nationally and internationally to deliver excellence in compassionate healthcare, education and research.

- This vision stems from the Trust’s establishment and founding partnership with the University of Oxford. It reflects OUH’s position as a provider of services for a local population and for those from further afield, its values in delivering compassionate excellence and its role as an active partner in healthcare innovation, education and research – with the aim of taking innovation “from bench to bedside”, forming an effective bridge from basic science to the delivery of evidence-based best practice in care.

The Trust developed a series of strategic objectives and the following table identifies how this strategy supports the overall strategic direction of the Trust.
<table>
<thead>
<tr>
<th>Strategic Goals</th>
<th>IM&amp;T Support for this Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>To provide high quality general acute healthcare services to the population of Oxfordshire.</td>
<td>Through the provision of world class IT systems which support clinical best practice, advanced record keeping and clinical decision support</td>
</tr>
<tr>
<td>Core Services</td>
<td></td>
</tr>
<tr>
<td>To provide high quality specialist services to the population of Oxfordshire and beyond</td>
<td>Through appropriate data sharing and facilitation to support rapid diagnosis utilising systems and networking, with clinical decision support that promotes best practice</td>
</tr>
<tr>
<td>To be a patient-centred organisation providing high quality and compassionate care – delivering compassionate excellence.</td>
<td>Through our patient-centred Electronic Patient Record with tasks and assessments supporting clinical best practice.</td>
</tr>
<tr>
<td>To be a partner in a strengthened academic health science system with local academic, Health and social care partners.</td>
<td>Through the use of data collected operationally and supported by joint working between Trust Information and IT teams with Academic colleagues to support the Academic and research agenda.</td>
</tr>
<tr>
<td>To meet the challenges of the current economic climate and changes in the NHS and become a resilient, flexible and successful Foundation Trust.</td>
<td>Robust information and support systems will support this</td>
</tr>
<tr>
<td>To achieve the integration of the Oxford Radcliffe Hospitals and the Nuffield Orthopaedic Centre during 2011/12, realising the benefits as set out in the business case.</td>
<td>Through integration of the clinical, business and information systems during 2011/12</td>
</tr>
</tbody>
</table>

Alongside the Trust’s strategic direction there is an overarching requirement for the IM&T service to deliver efficiency, flexibility and improvements in safe patient care through sensible use of technology.
2.2. National IM&T Context

At a national level IM&T strategy has been dominated over the past 7 years by the contractual framework established within NHS Connecting for Health (CfH) and delivered through the Southern Programme for IT (SPfIT). CfH procured Electronic Patient Record and PACS systems centrally with each health economy being responsible for implementation. However as the model has failed to deliver its expected results it has changed to provide more choice at a Trust level and less of a one size fits all approach. The central contracts themselves are due to run out by June 2013 for PACS and summer 2015 for EPR. The new central mandate and aspiration is now focussed on providers having to deliver an EPR which supports the “clinical 5” (referenced below, with additional focus in the future on Patients having more control over their own records. The detail of patient’s access has yet to be fully defined but this is likely in the first instance to be more focussed on access to the patient’s longitudinal record held within primary care, which means all correspondence about a patient is likely to be seen by the patient.

EPR for the OUH

In 2003 the Trust chose Cerner as its preferred EPR supplier in an OJEU procurement undertaken before the National Programme for IT. Since the original deployment of Cerner in the South to the NOC the ORH has continued to want to implement Cerner under the National Programme. Delays occurred but the Trust has recently completed the implementation of the first phase of EPR covering ED & Maternity clinically, and PAS across the whole Trust. Within the contract additional flexibility has been negotiated to ensure that OUH can continue to develop Cerner to ensure it continues to meets our needs. The objective, agreed by the Trust Board, is to take what the National Programme delivers and utilise it as a starting point for further development. This will enable an in-house team to fully utilise the tools within the Cerner product to create new assessments with conditional logic and work-flow to improve both patient care and support clinical research as appropriate. Our aim is to become a digital hospital and be a flagship Cerner site maximising the benefits a comprehensive EPR can deliver. Alongside this the Business Case for scanning our paper notes is being developed with the aim of incorporating them into the digital record and viewing them within Cerner Millennium EPR.

Nationally the centre is promoting the “clinical 5” as the core functionality that all clinical services need to meet. Under the current National Programme contract we will be able to do all of these with the exception of Prescribing. The Trust is committed to being able to implement e-Prescribing and medicines management preferably through
an agreed extension to the National Programme or through the OUH procuring this functionality as an additional service. This is the next major development after the roll out of the clinical functionality is completed.

PACS/RIS
One of the other core components of the National Programme has been the delivery of PACS – (Picture Archiving and Communications System). This was implemented in 2005/6 and the contract is ending in June 2013. A project is under way to manage the exit from the current contract. One of the choices that need to be made is to determine what is incorporated into the “PACS” system. Currently this consists predominantly of Radiology imaging but not include other services (Cardiac Echos, Ultrasound or other images). In our strategic solution we will need to establish a scope which can encompass all the imaging requirements. Currently the recommended plan is to exit the contract with a two phased approach:

- Phase 1 will secure the current service and deal with the issues arising from the merger with the NOC in both RIS and PACS;
- Improving the ability to share images with healthcare partners is a major priority for the Trust and plans are being developed to do this through an upgrade to the current Radiology Information System to support easier use of the Imaging Exchange Portal used by many of our partner organisations; other image sharing will also be supported.
- Phase 2 will be a strategic upgrade based on emerging requirements and following further investigations of relevant systems.

ESR
Other national systems initiatives have been introduced. The Electronic Staff Record (ESR) has been introduced as a centralised system. However its implementation has been resourced to a minimum with the result that many of the desired benefits have not been achieved. The non-use of the recruitment module and the reduction in administrative staff supporting it mean that HR information is not as available or as structured as Budget holders might wish. It would be sensible to consider how improvements in HR information can be delivered and consider the option of devolving implementation of ESR to managers and staff. In addition reporting from ESR has been focussed on delivering the reports that ESR is capable of producing. **Strategically the Trust is considering linking the reporting of staff numbers and costs to the Finance and Activity reporting in a more integrated comprehensive data warehouse.**
Choose and Book, SUS and Spine Services
Choose and Book (CAB) has made a major impact in primary care and the Trust will need to move towards directly bookable services as soon as possible. The MARS Division already has a proportion of its services as directly bookable and the rest of OUH will need to implement more directly bookable services over the next year. The Secondary Uses Service (SUS) delivers activity information to Commissioners. The Trust delivers its performance information through this and generally achieves a good level of data quality on many key indicators.

Interoperability
The original vision of the National Programme was for an all encompassing set of linked systems that can deliver an integrated, patient centric solution. The reality is that many silos have been introduced with little linkage between systems. At a local level the Trust has been instrumental in publishing and making our data available in an open way when it is needed. This has been done through Case Notes. However strategically there is a need to embrace standards to deliver this and to work with partner organisations to share records for specific pathways. The IHE (Integrating the Healthcare Enterprise) supported XDS standards (Cross Enterprise document Sharing) provide a framework for this and in our PACS replacement we will be adopting these. Similarly Cerner has XDS extensions. It is critical as a tertiary centre that the OUH is easy to work with and that we assist and share information and records using common standards.

To support any exchange of information a Regional Index or “mini-spine” is needed as well as an XDS registry which enables consented access from a number of providers. In the current climate it is important to identify where this should reside & who would support the infrastructure. It may be something that the Trust wishes to invest in to support easy exchange of records with other hospitals. Making the Trust easy to work with will support the overall business objectives of the Trust and use of standards and openness to support and facilitate the exchange of information in a secure fashion will be critical to the long-term success of the Trust. Locally the Trust is supporting the development of a local Oxfordshire Care Summary integrated with Case Notes to support specific use case scenarios. This is an important development which needs to be managed along with other priorities in this strategy. In discussing and agreeing this strategy we will need to decide what resources we want to commit to facilitate the support of this work in support of its role as a tertiary centre.
2.3. **Local IM&T Context**

2.3.1. *Electronic Patient Record (EPR)*

For many years the local health community has taken a collaborative approach to delivering IM&T, including the Connecting for Health systems. However over the past two years there has been a strong move to encourage different providers to steer their own course. In Oxfordshire this will mean separate instances of RIO for Mental Health, Community Services (now merged to form Oxford Health NHS Foundation Trust) and Ridgeway. OUH is building on the implementation of a joint EPR and joint PACS system from the ORH and the NOC. This is supported by a joint Health Informatics Service hosted by OUH which is focussed on the OUH but also supports the remnants of the PCT and Ridgeway, as well as supporting the network for Oxford Heath.

The linkage and interoperability agenda is deemed a priority by the PCT as well as by OUH, but ownership and active participation is needed to make this work better. The Trust has been working closely with practices to encourage the delivery of results, discharge summaries and clinical correspondence directly into practice systems. This has progressed well and is delivering real benefits to practices. We are also working to ensure that referrals are imported into our EPR.

New developments will need to rely on local business cases for funding as there is no longer any central funding for IM&T schemes. If this strategy is approved it implies a need for long-term strategic investment in both the staff and IT and EPR infrastructure in order to deliver iterative improvements to the EPR leading to a paper-light way of working. The short term business case for the initial implementation of EPR has been through the Board. The longer term case for a team to continue to improve EPR over a number of years still needs to be made. This strategy argues the need for long-term investment in a development team to continuously improve the EPR developing new pathways, forms and assessments to make the service more effective.

Once the national contract is ended in 2015 it is inconceivable that the Trust will wish to change systems as Cerner Millennium will have only been live for a few years. It is therefore central to this strategy that the Trust plans for after the contract in a clear way. Options exist to extend the contract with the existing supplier; to consider an alternative external hosting service or to look at an internal hosting option. During 2012 an option appraisal of these options will be prepared as well as holding discussions with other Trusts to see if a collective approach would be beneficial. It should also be noted that if the Trust manages to negotiate a solution for EDM that contract is likely to be in place for a longer time frame than the current SPfIT contract. This will be considered as part of the post 2015 strategy for EPR.
2.3.2. Delivering the Trust’s business agenda

IM&T is an underpinning component of many aspects of service delivery for the Trust. Key priorities such as 18 weeks, achieving financial balance, managing hospital-acquired infection; supporting patient pathways all rely on ICT to manage the service. The dependence on IM&T for delivery of nearly all operational services, and information cannot be overemphasised. However, while there is recognition that IT services & infrastructure are central to the Trust the accompanying investment to support this is not always recognised. The continuous development and improvement has meant that desktop support services have been improved and made significantly more efficient over time with staffing levels having been reduced significantly with resource transferred to support the massive increase in numbers of servers supported rising from c50 8 years ago to over 250 now. Data stored and backed up has risen from under c500gb to over 200tb over this period. It is likely that increases in this will continue at this rate.

2.3.3. Interim projects

A number of interim developments have been promoted to meet the needs of both corporate requirements and individual departments both preparing for CRS and to meet different needs. These include:

- Implementing the ED whiteboard to improve access and change processes in advance of implementing Cerner
- Implementing interim Order Communications to change procedures in line with EPR and minimise the change at the time of implementing EPR; the interim Order Communications system is now ordering over 50% of hospital-based tests
- Implementing VTE assessments in Case Notes
- Implementing the electronic Discharge Summaries(eIDD) in Case Notes and delivering the outputs directly into practice systems
- Improving the discharge processes using the eIPIL and contact assessment forms
- Improving despatch of Radiology reports to GPs and part of GP order communications
- Upgrading the infrastructure and implementing wireless
- Single sign-on
- Implementing ORBIT as a reporting solution
These EPR preparatory projects are now being turned into a set of business continuity procedures in the event of EPR down time. They are being used to ease the implementation of the clinical functionality in EPR and enable staff to begin the process of managing patients assisted by an electronic record in advance of EPR.

2.3.4. **Infrastructure**

The OUH has undertaken a major exercise to improve its core infrastructure with the development of improved networking and wireless infrastructure and a community of interest network which is common across Oxfordshire. This enables any person connecting to the Oxfordshire network to access their services from wherever they are. However the OUH has an old PC infrastructure which will need to be addressed in the strategy. 45% of the stock of c5000 pcs is under three years old, with 28% 3-5 years old and 27% over 5 years old. The backend server infrastructure has also been substantially refreshed but is continuously expanding. The requirement for additional server rooms has been postponed through investment in server virtualisation; however this need cannot be postponed for longer. Investigations on making more use of the NOC server room are on-going and may have some potential to enable further postponement of this development.

3. **Objectives and Benefits**

3.1. **Realising the benefits of accurate clinical information collected in fuureal-time**

A clinically rich electronic record enables clinical staff to “data-mine” the record, thereby delivering many clinical, operational and research benefits that can then drive changes and improve clinical behaviour and outcomes.

Patient-level, clinician-level and organisation-level dashboards available through the Millennium system helps summarise and navigate clinical issues and performance against targets (both clinical and operational).

Bottlenecks can be identified in patient pathways and remedial work undertaken to remove them; length of stay or admission prevention strategies can be developed and embedded in the electronic pathway support, directly influencing clinical workflow where appropriate.

The Trust can use these and other innovative technologies to allow for more flexible and novel ways of working, thereby allowing increased activity without having to increase human resources – and so deliver the NHS Quality, Innovation, Productivity and Prevention (QIPP) agenda.
Working with the BRC there are real opportunities to utilise the EPR to understand and demonstrate the effect of changing practice on outcomes and length of stay. Partnering with the research community to utilise and realise the opportunities of real-time recording are an essential component of our strategy.

The initial and continued organisational transformation, as more functionality is rolled out, will enable the Trust to make year on year service improvements that will underpin future annual efficiency plans.

3.2. Digital Health Record

The Cerner Millennium product will provide the comprehensive EPR that will lead to paperless digital health care. Both the financial and qualitative benefits are clearly evidenced in research and literature across the world. It delivers all of the functions (and more) described by the NHS as core requirements (now referred to as the Clinical 5 in the NHS Operating Framework) and included in the TRUE description below:

3.2.1. Transparent access to all clinical information and documents (Clinical 5-3)

- Enables real-time communication to and between clinicians and teams, supporting medical, nursing and other clinicians’ handovers, “hospital at night”, rapid response teams and others.
- Clinical decisions better informed, more timely, and “remote” from the bedside if necessary i.e. the “virtual ward”, as paper dependence/constraints removed.
- Integration of results of patients’ vital signs (either wired or wireless) can deliver a patient status index, which can forewarn critical events and alert relevant clinicians in real-time.
- Clinical pathways (e.g. discharge planning, surgical assessment planning, risk reduction measures etc) are supported with variance tracking – delivering fewer delays and reduced inpatient length of stays.
- Allows greater flexibility of service delivery from the workforce.
- Removal of the paper record (by legacy and day forward scanning) eliminates large volumes of administrative work, and prevents wasted clinic visits as a result of missing notes.
- Delivers greater accuracy in recording of diagnoses, co-morbidities, and complications, thereby positively impacting Trust revenues.
- Telehealth support - Secure web-facing interfaces can allow patients access to key areas of their record and to enter self-monitoring results for more efficient chronic
disease management. Similarly this allows connection of remote (out of hospital) monitoring for early warning.

- Linked to above is the ability for patients to have direct electronic access to their carers.

3.2.2. **Real-time patient management (Clinical 5-1 & 4)**

- **Patient administrative information, admission discharge & transfer functions (ADT); reporting for NHS contractual purposes (Clinical 5-1).**
- Enterprise wide scheduling of clinics, theatres, tests and beds (Clinical 5-4).
- Patient, staff and asset tracking (requires wireless network infrastructure) - reduces time spent “looking for things” and should facilitate more timely decisions.

3.2.3. **Universal requesting of all diagnostic tests and services and result reporting (Clinical 5-2)**

- Requests can be for clinician and allied health professional (AHP) tasks, and can be posted to individual/group task list.
- Patient-level task lists show status of care pathway.
- Results now “find” the requestor in real-time wherever they are, allowing safer and timelier management decision to be made.
- Ability to track status of investigations
- Fewer unnecessary duplicate investigations are made.
- All results (including vital signs and assessments) available immediately in Millennium results flow sheet – different flowsheets assemble relevant results for different specialties, with result provenance and lab reference values etc.
- Escalation of results if endorsement does not happen in appropriate timeframe reduces risks associated with missed critical diagnostic results.

3.2.4. **ePrescribing and medicines administration (Clinical 5-5)**

- Delivers significant reduction in drug errors and cost savings, as well as ensuring accurate communication about patients’ medication across the various health sectors.
- Reduces risk of giving the wrong drug to the wrong patient, and risk of litigation.
- Allows response to treatments to be recorded in relation to the treatment.
- Can ensure best practice.
- Also allows remote management as stated above and linked to in-theatre prescribing and fluid balance.
3.3 **Underpinning principles and technologies**

**Key principles** need to be embraced by the organisation:

- Universal clinical adoption of the functions described under the TRUE headings discussed above.
- Effective clinical engagement of both clinical and non-clinical staff.
- A willingness by all staff to see this clinical transformation achieved.

**Underpinning technologies:**

- Sufficient appropriate form-factor devices for clinicians, where they are needed serving as many different uses as is possible (an example would be to use the “blood transfusion handhelds” or iPADs for positive patient identification in medicines administration, and to collect vital signs).
- Interfaces: the Oxford laboratories currently send results to GPs directly into their clinical systems. This will be supplemented in the next year to enable the same for radiology reports and discharge summaries.
- Ease of use with single sign-on and context sharing to enable clinicians to have access to what they need swiftly and reliably, and the intent is to extend this across health sectors.
- Common reference data universally used, conforming to standards (e.g. test catalogues and SNOMED CT terminology).
- Integrated paper scanning service.
- Positive patient ID using bar codes or RfID.
- Universal wireless access.
- Self-registration kiosks for outpatient check-in.
- Push technology delivering real-time clinical information and messages to clinicians (e.g. modern paging technology, SMS, smart phone applications).

3.4 **Conclusion – so what does this mean?**

In the US there are a number of health systems using this technology now. They are able to run virtual wards and virtual ICUs monitoring patients remotely, thus supporting local care teams that are sometimes under-resourced from neighbouring larger hospitals. Small rural hospitals can have augmented virtual support in a similar way. A similar approach would enhance the ability of the OUH to maintain high quality care at the Horton Hospital.

Objective service improvements have been delivered in many hospitals using this systematic approach with new ways of working improving quality and safety as well as making efficiency savings.
Telemetry and early warning systems are being used to reduce the readmission rate to ICUs and radically reduce the cardiac arrest rate. Extending telemetry out into the community would bring new opportunities. Patient access to their own records for entry of key chronic disease management information and communications with their carers would lead to significant reductions in follow-up visits and admission or re-admission rates.

All of the above is possible with current technology that is being used in various settings mainly outside of the UK. Bringing them together under a programme of innovation and change will undoubtedly improve outcomes at the same time as reducing costs. However, delivering this digital future requires concrete investment plans in order to realise these clear and measurable benefits.

*Adopting this digital vision will underpin the sustainability and success of the Trust.*

### 3.5 Community wide information sharing – connect all

While achieving major benefits from implementing our digital strategy is an absolute must, a key operational priority must be to improve the systems and ability to share information with partners in healthcare especially primary and social care.

**Messaging**

Major improvements are being made through working with GP colleagues in the transfer of Information Task Force, leading to routine messaging of Radiology reports and also sharing of eDD’s and ED summaries with practices. This needs to be built on with the implementation of EPR. The strategy will be to continue to route the messages through Case Notes in order to ensure that there is an alternative repository for Business Continuity. Some sharing of discharge information has commenced with Social Care. This also needs to be built on. Establishing a workflow for inbound referrals will be the next step in this process some of which is dependent on other systems like Choose and Book.

**Community Systems**

The transfer of staff from CHO to OBMH and the new combined service (Oxford Health NHS Foundation Trust) means that community hospitals are utilising RIO as their prime system. This is already posing some problems with different identifiers being used and causing some problems for OUH diagnostic services operating out of Oxford Health facilities. It is therefore important both for the patient and for our medical staff to establish as much linkage to Rio from Cerner and vice versa as is possible. Under the current contract it is clear that the ability to inter-operate with RIO is constrained by the arrangements put in place through the National Programme. As a basis for interoperating the need for common reference data needs to be stressed. There is also a
need to develop with health partners a community wide Patient Master Index to ensure that all of the identifiers a patient is known by are appropriately linked. This need is also linked to the earlier discussion on having a regional index. Oxfordshire PCT is keen to work with the Trust to establish an Oxfordshire Care Summary utilising Heath Information Exchange technology to enable carers in the Trust to see current medication and to enable partners in the community to see documentation produced in participating systems. An open source partner (Mirth Corporation) will be assisting the trust in delivering this utilising open XDS standards that are promoted centrally.

**Long-term conditions**

Establishing improved shared management of patients with chronic conditions, such as chronic heart disease or diabetes, currently tends to be disjointed, with little sharing of information about separate episodes of care occurring in primary and secondary care, and interventions by others such as social care. The goal is to provide, in the future, more patient-centric services supported by cross-organisational integrated information. A systematic common approach to this has proved elsewhere to be an effective method for improving patient care. The technology to deliver this is not yet in place through the National Programme but it is a clear business priority and operational plans for delivery need to be considered jointly with partner organisations.

At a fundamental level the technology support for this required use of common identifiers, protocols to easily enable access from social care to access NHS networks when they are entitles and vice versa. Delivery of technical frameworks will enable integrations of services and provide a strategic framework to keep key customers of the OUH linked in with our services. Work is in progress in conjunction with the Biomedical Research Centre (BRC) to establish some exemplar projects supporting Diabetes, COPD and Psychiatric long-term patients. This will be used to establish standards and potentially could be expanded to cover other long-term disease cohorts. The current intent is to establish a joint programme between the BRC, the local health community and the Trust to enable a common set of services to be used to support effective management of a number of long term diseases. This will be integrated with the Oxfordshire Care Summary and provides opportunities for innovative developments across the Health Community.
3.6 Becoming an information rich organisation

The Trust has many disparate sources of clinical and performance information. As part of the move to foundation Trust and with the clinical audit and research agenda the Trust need to move towards maximising its use of information for both operational and clinical management. This requires a focus to improve consistency and data quality, to utilise common data models to ensure that consistent reliable information is delivered seamlessly to those who need it. As a point of principle we need to guarantee clinical staff that all data that has been entered electronically into the EPR must be available for reporting back to clinical staff to support clinical process engineering and research.

3.7 Shorter-term imperatives

As well as moving incrementally towards the above strategic goals, there are several objectives which IM&T must support over the next 12 months or so. These include:

- Information to support Service Line costing, the new divisional structures and management of the financial challenges each division has;
- Support for critical targets such as management of 18 week wait;
- Collection of critical CQUINN data e.g. VTE assessments & management of readmission including the management of 18-week RTT waits;
- Introduction of direct booking for Choose and Book appointments with the EPR;
- Improvements in timeliness and quality of activity data;
- Supporting the Information Governance agenda
- Information, policies and plans to support Foundation Trust application;
- Support for new requirements arising from the Operating Framework and the new requirements from new Commissioners.

3.8 Benefits realisation

Full realisation of these objectives and benefits will take a timescale beyond the life of this strategy to achieve, but the steps taken in this strategy will move the Trust significantly nearer this state. Each of the component parts of the overall programme will have robust benefits realisation plans at the core of the project and as an explicit part of the business case, with base-line assessments and post-implementation reviews to demonstrate benefits realisation as a core part of the programme. In essence the Trust will be on a fast track to move from the prime record being the paper case notes to a digital future. The core delivery of this will be measurable and obvious to all.
This strategy commits to supporting the Trust, its staff, patients and the wider health and social care community by:

- placing greater emphasis on information systems improving patient care and supporting clinical processes including improving clinical communications;
- facilitating the introduction of a comprehensive electronic patient record;
- providing clinicians with on-line access to patient records, online booking, ordering, clinical decision support, library information and administrative services;
- establishing a programme to work smarter exploiting the ICT infrastructure to improve processes and establish new ways of working exploiting work-group and shared facilities;
- mobile solutions which support care at the bedside utilising devices that are approved by the clinical staff who are to use them subject to the appropriate information governance arrangements;
- simplifying and reducing the numbers of different systems through integration with the EPR;
- Investing in staff training and in infrastructure to ensure staff in post are able to use new technology to the full, and gain the best possible value from IM&T investment.

This will be achieved by:

- providing a modern, robust and scalable local IT infrastructure;
- developing enhancements to EPR to replace local systems and to ensure the number of systems in use decreases;
- ensuring the Trust obtains best value from its current and future investment in new technology;
- placing proper emphasis on staff development and end user support as a key success factor in the use and benefits of information technology;
- establish a robust communications strategy to consult and implement the strategy and improve IM&T services across the organisaiton;
- Working in partnership with NHS colleagues in CFH, SHA and local Trusts and PCTs.

This will support the overall business objectives of the Trust through:

- The provision of improved clinical outcome information supporting both improved care and safety and the research agenda;
- Supporting redesign of hospital services, improved efficiency to enable sustainable long-term growth.
4 Current Situation

4.1 IT Infrastructure

4.1.1 Corporate Data Network

The Trust’s corporate data network is at the centre of a countywide network service the health community as a whole. This represents a major asset to the health community and has enabled considerable investment in the infrastructure to support all health organisation across the county. The core switches running the network have provided 99.99% availability over the past year (this includes all planned maintenance). Business continuity has been proved by turning off one of the core switches on each site and having no support calls for network outages arising from this action. All clinical areas have diverse routing to both core switches on each site. Wireless is pervasively available with some exception on the older building on the Churchill site where the future of the building is uncertain. All inter-site links are now resilient with additional capacity between the JR and the Churchill coming on stream in the near future. IP telephones are in use in all new sites backed up by analogue phones in every ward area. The wireless network has been engineered to enable University colleagues to connect to OWL (Oxford University Wireless network) & EDUROAM (the International federated academic network), patients and the public to connect to BT Openzone and social care to connect back to the Oxford County Council network. This infrastructure is routinely used by over 700 staff daily to utilise University resources and on occasion over 900 members of the public. In addition a number of clinical devices are using the wireless and data network to send data back to “mother ships”. This infrastructure is now assumed to work and represents a major benefit to the Trust. Over 90% of clinical areas have diverse routing which means that the switch goes back to two different core switches. This means that when we last needed to upgrade the core switches at the Horton, JR and Churchill sites there was minimal impact on clinical services. In terms of usage the wireless network access routinely has over 900 users, the educational access runs at over 600 and the corporate data network supports over 6500 PCs and 2000 printers. Continuing investment is needed to ensure that this network remains up to date and is under appropriate level of support and maintenance.
4.1.2 Wireless Tracking

Wireless tracking is now available for use. Major parts of the Trust have been mapped and if a device is connected to the wireless network it is possible to see where it is and where it has been. If an RFID tag is put on an object this can also be tracked. This is now being used for tracking keys, for tracking medical devices in the equipment library; discussion have commenced with Maternity about using this to track babies and maintain security; phones logged into the wireless network can also be tracked enabling fast access to staff. It is expected that this will be used in many other areas in the future.

4.1.3 Computer Rooms

A major investment in virtualisation has meant that investment in a new computer room has now been able to be postponed. The use of virtual servers has enabled over 200 servers to be run on 24 physical servers saving over 7 complete cabinets as well as substantial electricity, cooling and network equipment cost. However the continued rise in the numbers of servers required to run different services means that additional capacity will be required. Currently, there are investigations into the options for using the NOC server room for additional capacity (but this is in a PFI space which may need further power and air conditioning). Currently 5 racks in OCDEM are being utilised and paid for by Oxford Health. These are profitable and are contracted for a further two years, however our real need is to establish a separate back up to OCDEM. This year the JR computer room has been stabilised with new air-conditioning, however the room itself is not ideal and there is no ability to increase power to enable it to run more services. An option appraisal is being undertaken to establish the viability of using third party capacity, or to establish a new data centre on the Churchill site where there is power in situ and to see whether any other facility in the Trust can be converted. This latter option will not deliver a long-term solution. Currently there is space for 21 additional physical servers, however if notes digitisation and RIS/PACS replacement occurs as planned more space will be required urgently. The technical options will need to be shared with the Trust to establish the way forward.

4.1.4 Server Infrastructure

The computer server infrastructure has grown enormously. This has arisen as more and more systems are centralised and more functions require systems. In 2003 there were 87 servers supporting ORH and/or the local health community. In 2007 there are 226. Now there are over 400.
The implementation of centralised data storage facilities known as a Storage Area Network (SAN), gives the Trust a means to incrementally increase robust and secure data storage capacity as required. However the data backed up electronically has increased exponentially with 20gb being backed up in 2002 and as of May 2007 this has increased to 4 tb (a 200 fold increase). Current capacity is running at 30 tb; a further 50 tb may be needed for PACS upgrades in the future. Archiving options are being explored to ensure that less used data is stored on the cheaper storage architectures.

4.1.5 Public Access to the internet

The ORH provides public access to the Internet through the use of BT Openzone. This is paid for by the patient and public but many people with a BT Internet connection at a local level have free access to this. In areas like private patients and Sobell house there are options for providing free services through the payment of a small fee centrally. Procedurally there are restrictions on publicising this too much because of

a) Concerns over potential conflict with the TV service providers
b) The official concern over patient connecting lap-tops to the Trust electricity supply without PAT testing.

4.1.6 Workstations

The Trust has standardised on using Microsoft Windows XP across all PCs utilising the latest version of Microsoft Active Directory for managing security and upgrades. The use of Microsoft System Centre Configuration Manager enables support packaging of installation and remotely managing the desktop. This allows it to automate many upgrades to software on PCs and allows a much quicker response time to user problems.

In addition there has been a significant investment in delivering virtual workspace which is a technology that enables an old PC to become effectively a new PC with all services delivered centrally using Microsoft Terminal Services. Over 250 of these have now been deployed and it is intended to expand this rapidly as EPR is implemented clinically.

The OUH PC age profile is indicated below.

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>OUH</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>55</td>
</tr>
<tr>
<td>&lt; 3</td>
<td>3507</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;3 &amp; &lt;6</td>
<td>2055</td>
<td></td>
<td>32</td>
</tr>
<tr>
<td>&gt;6</td>
<td>838</td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>
This implies that the significant investment in new PCs for the implementation of EPR has had an effect. The figures for January 2011 and January 2007 are shown below (these do not include the NOC).

<table>
<thead>
<tr>
<th>Age Bands for PCs</th>
<th>ORH Jan 2011</th>
<th>ORH Jan 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>2210</td>
<td>3270</td>
</tr>
<tr>
<td>3y - 5y</td>
<td>1398</td>
<td>650</td>
</tr>
<tr>
<td>Over 5</td>
<td>1307</td>
<td>369</td>
</tr>
<tr>
<td></td>
<td>4915</td>
<td>4289</td>
</tr>
</tbody>
</table>

In the strategy approved in 2008 there was a requirement identified to replace over 1000 PCs every year. With the delays in introducing EPR & the financial challenges facing the Trust this has not happened apart from in 2011. It is likely that other priorities will continue to be found. To mitigate the risks associated with lack of investment in the PC stock the following strategy is being adopted:

a) For the EPR clinical rollout there will be a stress on mobile computing for clinical areas with laptops on carts and potentially iPad-like devices to support clinical workflows

b) Investment in virtual Workspace will continue with potentially a further 1000 older PCs being virtualised during next year

c) A continuing investment in both server and desktop technologies will need to be built into the IT capital programme; corporately we will try to ensure the shared clinical areas (e.g. wards and outpatients) have appropriate access supplemented by investment at a local level

4.1.7 Software

Because of the National Licensing arrangement with Microsoft all PCs traditionally have been purchased with Windows Professional and Microsoft Office professional. The Trust has made maximum use of the Microsoft deal to standardise on Microsoft products. This has meant that the Trust uses Windows, SharePoint, Office, Microsoft SQL and Exchange. These all work well together and historically the Trust has not had to worry about paying for Microsoft Access/InfoPath/PowerPoint being installed on all PCs in the Trust while they are only being used by a small minority as the products were free to the Trust. For the future Microsoft Office Professional suites will cost £220 for every new PC in addition to the ones already licensed. The same is true of all other
Microsoft Licensed software, including software access from home. To mitigate the potential for litigation the Trust has standardised on installing Open Office as its default office suite and installing Microsoft Office where there is a real need. This has disadvantages in terms of consistency and training but the financial benefits of doing this are compelling. In addition the principle that PCs and licences are the property of the Trust corporately will need asserting and agreeing through this strategy, with the freedom given for licences to be re-assigned if they are not being actively used.

Software metering and measuring are also required to enable us to be assured that we have the correct level of licensing.

Microsoft’s Sharepoint has been used to underpin the Trusts’s Intranet and to support future functionality (such as document management and control). One of the core driver’s for its introduction was the NHS Licensing arrangement which made Sharepoint free. Before the next generation of Microsoft technologies are introduced with the need for new licences across the estate an assessment of their benefit against the cost of upgrading or changing will be undertaken. This assessment will include Sharepoint.

4.2 Information Systems Standards

The Trust has literally hundreds of systems delivering data collection and operational functionality to a patchwork of departments and clinical teams. Many of these have been locally procured and provide silos of information for their department or for specific research and audit purposes.

Corporately the Trust has had a devolved style of management and has been striving over several years to integrate and utilise its information as a corporate asset to develop services. After several false starts the Trust is moving forward with an integrated information delivery system – ORBIT. This enables Divisions to receive corporate drill down information in a consistent fashion and it is being architected to enable the transition to EPR to be seamless to the information recipient. This is a significant project which is proceeding well.

However to make integration work some key standards need to be expressed and enforced. These include requirements for policy to enforce:

- integration at patient level through the use of a common identifier (the NHS Number or PAS ID) in all circumstances;
- scheduling and recording patient encounters on the EPR wherever this is possible and doing this as close to real-time as is possible;
• utilising common reference data including GP, coding, locations and site identifiers;
• ensuring any outputs that are of interest to other clinicians are sent electronically into the EPR and into Case Notes to enable the Trust to have the right in
• formation to support the patient journey;
• standardising on data defined in the NHS data dictionary.

Where either new systems are being procured (either hardware or software) they need to be expressly agreed by the Trust’s IT department (OHIS), the Trust’s information team and the Trust’s Health Informatics Committee. The default will be that if it is possible to record data in the Trust’s EPR this MUST be the first choice. The benefit of having all information in one place is huge as it has the potential make care safer and enhance record keeping across the whole patient journey. If for some reason this is not possible the system MUST deliver clinical outcomes into EPR (either in the form of a diagnostic report or a form of clinical correspondence/note/summary). All coding in the system must conform to Trust standards. Processes need to be established to ensure that gateways are adhered to and that light touch approval processes are made to stick.

Where posts with major information or IT components in the job description they must be reviewed and agreed with the relevant managers and also have professional accountability and lines to ensure Trust data quality and standards can be enforced including the Information Governance requirements

**All departments need to ensure that their systems conform to these standards and discuss with the Trust’s data quality board any deviations from them.**

For clinical purposes, in the short term, Case Notes (the Clinical Intranet) is where diagnostic results are accessed and it also acts as a clinical repository where information from departmental systems should be filed. In advance of EPR the vision of integrated information is to a limited extent supported by ensuring discharge summaries are produced within Case Notes and that outcomes from departmental systems are messaged into Case Notes.

Information is managed through a variety of different databases and frequently delivered by departments to relevant professional or regulatory bodies. **Given many of these external sources can at times be used by the Care Quality Commission for assessing the Trust, all departments need to agree the quality and standards of their data with the Trust’s information department in advance of sending in the returns.**
Contract data sets supported by clinical coding are the main mechanism for recovering the costs of providing care, under Payment by Results (PbR). Lack of coding to the right depth or forgetting to record an encounter with a patient is likely to lead to loss of income. Commissioners increasingly want/need detailed supporting information and will refuse to pay where services have not recorded information correctly. **It is therefore the responsibility of every department and service to record activity accurately and through a process agreed with the information department.**

Activity reporting is undertaken predominantly through a series of standard ORBIT reports and enquiries which are used in different ways across each Division and department. Over time it is planned that this will become a comprehensive data warehouse. In time alternative sources of clinical data such as Cerner’s Power Insight Enterprise Data-warehouse may become available. However it is important that all issues or changes to the user requirement are fed back to enable the central service to meet all divisions needs. A single source of truth on activity is essential.

In time consideration must be given to establishing a corporate data-warehouse where Activity, HR, Finance expenditure and Income data can be modelled and reported on. This needs discussing across the Trust but a common mechanism for reporting all aspects of key performance data is long overdue.

**4.3 Information Systems**

The Trust currently uses over 100 separate IT systems, ranging from large corporate systems with hundreds of users to small specialist departmental systems with one or two key users. It is anticipated that over the lifetime of this strategy, many of the individual clinical systems will be replaced by EPR.

It is clear that much of the diversity of systems in use has resulted from organic growth to meet specific departmental needs within a corporate environment where responsibility is devolved. However, the diversity, duplication and the legacy nature of many of these systems gives rise to clear risks.
It is clear that attention needs to be given to reducing risk in major corporate systems which have a Trust wide impact on care and this implies measures are needed to:

- manage the risks associated with PAS, Theatres and Maternity through the CRS project;
- support the replacement of pathology system in the near future;
- ensure pharmacy has a strategy to manage the risks associated with the Bedford system.

Given the National Programme itself is not without risks, a clear EPR risk management strategy is in place and is regularly monitored by the EPR Steering Group and Programme Board. In addition the Trust has asked the Office of Government Commerce to assist in undertaking gateway reviews at important stages in the project. These are essentially being managed through that Programme Board which is chaired by the Chief Executive.

4.4 Strategic Approach for patient record systems

The Trust has established a strategic oversight group for IM&T, the Health Informatics Committee chaired by Paul Brennan. **Departments seeking further investment in systems are required to make their case to this group.** The group has a strategic brief to reduce the complexity and diversity of applications, to ensure conformance to the Trust’s strategic direction and, wherever appropriate, move to using the EPR or an existing corporate system. Corporate oversight is needed for all systems including Business, HR and Activity. The need for integrated information requires a move towards combining the business agenda leading to patient level costing with the research agenda and underpinning all of this a move to develop a corporate data warehouse that can provide appropriate information to support and identify all parts of the patient journey in a consistent and coded way.

In order for the OUH to become more flexible and manage to improve the efficiency, safety and effectiveness of its operations it has set its goal to become a paper light hospital, with the integrated clinical record being available on the network to whoever needs to see it. **Once EPR has been implemented it will be important to insist on universal use of EPR wherever it can be used, and only by exception to provide evidence as to why EPR is not being used to provide the functions required.**
A critical factor in the adoption of clinical solutions will be to insist on universal adoption with the following goals:

- all tests, all referrals, all discharge summaries and clinical correspondence and all notes will need to be available within EPR;
- once electronic prescribing is available all drug administration will need to be undertaken through the use of EPR;
- all patient contact administrative processes will need to be reflected within EPR;
- the location of the patient will be recorded in real-time with accurate information on the clinician responsible for the patients’ care also being maintained accurately at all times.

As EPR is introduced these requirements will be managed within a new policy framework enforcing the use of the new processes and standard operating procedures.

### 4.5 Information Management – Clinical Systems

The Trust’s Information department provides a critical corporate service which is essential to the delivery of service line costing, performance-reporting and management decision support. The information provision is dependent on systems utilised by divisions and on processes and operating procedures enforced within each service. As systems move towards EPR it is important that the core information management services are kept running and that business continuity is maintained. However it is also important to recognise that some disruption as systems change is likely and that it is vital to have plans to protect the integrity of both income and information in the event of this occurring. This will be managed through the contracts being negotiated over the transition period and the risk management strategy for the EPR Programme.

The following table indicates some of the core systems and what the plans are as the EPR is introduced:

<table>
<thead>
<tr>
<th>Database</th>
<th>Main purpose</th>
<th>Strategy after EPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPR</td>
<td>Main operational data capture system which has been replaced by EPR.</td>
<td>EPR will capture data and export Additional data from DVDev and potentially IM200 NOC Merger will need planning Further development</td>
</tr>
<tr>
<td>ORBIT</td>
<td>Main database for producing contract data sets from EPR.</td>
<td>To be further developed as the core Data Warehouse for the Trust to underpin Patient Level Costing and Performance-reporting.</td>
</tr>
<tr>
<td>System</td>
<td>Description</td>
<td>Notes</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>EPDS</td>
<td>Real-time copy of PAS</td>
<td>Maintained post EPR – some data inconsistency exists and over time its use will diminish as systems integrate using the Mirth Integration Engines.</td>
</tr>
<tr>
<td>Mirth</td>
<td>The main integration engine used to link EPR with Trust systems</td>
<td>This open source tool may be expanded for other purposes.</td>
</tr>
<tr>
<td>MIR</td>
<td>Historic database for comparative information</td>
<td>This will continue as a data source for ORBIT</td>
</tr>
<tr>
<td>Infoflex</td>
<td>Used for 18 week and Cancer wait monitoring</td>
<td>Retained for use on Cancer 2 week wait but this may be incorporated into EPR later in the year</td>
</tr>
<tr>
<td>Firstnet</td>
<td>Module of EPR used for ED performance-reporting</td>
<td>Further enhancements as required</td>
</tr>
<tr>
<td>Dr Fosters</td>
<td>Used for comparative benchmarking</td>
<td></td>
</tr>
<tr>
<td>Powerchart</td>
<td>Used for reporting on maternity</td>
<td></td>
</tr>
<tr>
<td>Maternity</td>
<td></td>
<td>This has replaced the old OxMAT system and will be further developed to improve the Trust’s CNST rating</td>
</tr>
<tr>
<td>PSCAL</td>
<td>Commissioning</td>
<td>Considering future options</td>
</tr>
<tr>
<td>Renal Proton</td>
<td>Used for some renal data</td>
<td>Continue until replaced by EPR in probably 2 years time</td>
</tr>
<tr>
<td>Datacam</td>
<td>Used for some Cardiac data</td>
<td>As above</td>
</tr>
<tr>
<td>Audit Base</td>
<td>Audiology reporting</td>
<td>This will be replace as soon as it is possible to build equivalent functionality within EPR</td>
</tr>
<tr>
<td>Critical Care datasets</td>
<td>Additional dataset is current entered into PAS – a special form will be developed for this in Millennium for go live</td>
<td>The Millennium Critical Care system is being evaluated by Neuro and Neonatal Critical Care and the licensed version can produce both the Icnarc dataset and the Critical Care dataset as an integrated solution.</td>
</tr>
<tr>
<td>Diabetes Proton</td>
<td>Used for diabetes patient information</td>
<td>Will be replaced by Cerner within 2 years</td>
</tr>
<tr>
<td>Varian Chemo Prescribing and radiotherapy systems</td>
<td>Used for Chemo prescribing and Radiotherapy scheduling</td>
<td>Will be maintained until Cerner can provide similar functionality</td>
</tr>
<tr>
<td>Bluespier</td>
<td>Used in Trauma</td>
<td>Should be replaced by Cerner after 1-2 years</td>
</tr>
<tr>
<td>Janus</td>
<td>Colorectal system</td>
<td>As above</td>
</tr>
</tbody>
</table>
Radiology and lab systems: These systems will link to Order comms and feed into EPR. Radiology systems need to be merged and will probably require a local instance to do this; Radiology may be replaced with Cerner at a future date; Laboratory Medicine will be evaluating options to upgrade their systems over the next 2 years.

TIMS: Legacy Theatre system that is not longer supported. This will be replaced with Surginet during 2012.

Bedford: Pharmacy system. Is only supported by a lone developer – needs to be replaced possibly by Cerner’s integrated solution.

Genetics - Starlims: Specialist Reporting. Will be retained.

Now that EPR has been implemented it is critical to have active business continuity plans for all services.

4.6 Business Systems

Oracle Financials
The Trust uses the Oracle suite of financial systems and is in the process of upgrading them and handling the NOC merger. Reporting from this system is handled differently from the ORBIT reporting system and potentially there may be value over time in having a strategy of a single integrated reporting suite. Further developments may be possible to maximise the benefits of the system and a review should be undertaken to ensure this is working as well as possible.

Patient-Level Costing
The Trust is in the middle of procuring a patient level costing system; this needs to feed from the data in Orbit and in EPR to ensure there is a single source of information. The potential for improving allocations using an integrated EPR is enormous. This system needs to be reviewed as soon as EPR is in widespread clinical use.
4.7 Telecommunications

The Trust’s telecommunication infrastructure consists of a number of Siemens legacy IDX exchanges, and the new Cisco Voice over IP infrastructure used in the West Wing, the Children’s Hospital, the Oxford Heart Hospital and the Cancer Centre as well as most other places that have been refurbished over the past 4 years. The Trust benefits from having two independent systems on all sites now with options for having alternative “red phone” backups across each site. However a review is under way to establish if there are significant savings to be made if the Trust can consolidate its phone systems onto the Cisco Voice over IP solution by replacing all the analogue handsets reasonably rapidly. This replacement could be undertaken over several years by phasing out the handsets site by site.

The Trust is benefits from extremely competitive call rates and uses many intelligent ways of reducing call costs.

The current policy of ensuring all new or refurbished sites use voice over IP needs to continue. The objective of reducing the number of legacy exchanges is also important. Consideration of consolidating where the operators are present is frequently under review but this is complex and needs to take account of the other services a 24/7 desk does provide.

5 Information Management

5.1 Overview

As part of the Trust’s strategic review, development of information management capacity was seen as an important theme. Over the next year the Information department continue to develop and enhance ORBIT whilst implementing EPR. The pressures on the information team will grow with:

- The introduction of EPR
- Need for Information to support the performance and cost improvement programmes
- The need to support the FT application
- The need to handle all the impacts of the NOC merger
- Further developments to ORBIT
The Trust faces many internal and external pressures to provide management information of a higher quality, which is more timely, sometimes in new, yet to be defined, currencies, which can be analysed and reported easily and flexibly. The drivers behind this required “step change” in information management include payment by results (PBR), new commissioning arrangements, requirements from the Care Quality commission and the preparation for FT status.

Increased competition, service line management and the new divisions all require more information, outcome measurement, performance metrics, dashboards and benchmarks. This requires detailed records of what is being undertaken for each patient, so that the time and costs can be recorded systematically and analysed at a patient level. Cerner Millennium will increase the accuracy and detail of this but the information will need to be collated and presented.

The Trust needs to respond to these pressures with initiatives to address:

- Data quality and standards;
- Systems and databases;
- Analysis tools and skills;
- Roles and responsibilities.

Initial proposals for each of these are outlined below. These will be developed further over time.

### 5.2 Data quality and standards

The Trust has established a Data Quality Group to provide a focus for improving data quality. This is backed up by training and training materials, however with high staff turnover in some areas this remains a major issue to manage. The introduction of EPR provides a major opportunity to address key Data Quality issues as all staff will have to be re-trained. Part of the training will need to be in the process and reasons for needing the information. It is important that the training materials are signed off for Data Quality as well as functional approval. It is important to code accurately and adhere ruthlessly to standards. Much greater effort is needed to improve the quality of data in each system. There are many services where activity data is poor. In parallel with the Data Quality Group and Information Governance Group has been established to ensure the Trust adheres to information governance requirements and monitors its progress against the Information Governance Toolkit. Services need to ensure that all systems adhere to these standards and that information asset owners are aware of their responsibilities.
The Trust is committed to collecting and processing data according to nationally and locally defined standards. Where national standards are not broken down sufficiently to give quality data for the Trust, local standards will be implemented. Standards are essential to ensure that: data collection is consistent throughout the Trust; is accurate and up to date; and data outputs can be compared across the organisation and with other organisations.

5.3 Systems and databases

5.3.1 Patient and Activity Data

Patient and activity data is centred on the Patient Administration System module of EPR. A detailed mapping exercise has been undertaken comparing information derived from the previous PAS with EPR and most gaps have been filled. However it is likely that further work may be needed if the outputs from EPR are not what is expected.

5.3.2 Commissioning

The Trust has built up a good relationship with PSCAL to ensure that patient level costing is developed in line with the Trust’s requirement and at reasonable cost. It has been upgraded to the SQL version and developed to meet most of our needs.

The role of PSCAL is complementary to an activity warehouse. The key business objective of developing proper service line costing needs to be developed together between the information and finance teams.

5.3.3 Service Line reporting and Patient Level Costing

In order to deliver financial sustainability it is essential to develop systems that reflect the true costs of delivering a service and to reflect back the income received for the service. The ability to do this responsively is essential if performance improvement and clinical pathways are to be improved. Systems to support this need to be developed and a strategic approach adopted. The complexity of this should not be underestimated. A new patient level costing system is being procured and GOMLA the current system will be replaced. One of the problems with the GOMLA approach was that all the rules were hand-crafted and were not transparent to the services. It is essential that this time the solution is kept in line with the way EPR works to ensure consistency. While there may be timing issues in the first year as wider use of EPR is promulgated this principle is an essential pre-requisite for success.
5.3.4 Benchmarking

Understanding our performance relative to others is a critical factor in developing our service strategy. Currently the Trust uses Dr Fosters to measure this. This facility will need to be developed further.

5.4 Analysis tools and skills

As part of the drive to develop information rich services the need to establish core competencies that can be applied in many areas is critical. As part of the ORBIT development Information Analysts have learnt new report writing and SQL skills. The database team have helped in the preparation of cubes and new working arrangements are developing well.  
Alongside the implementation of a data-warehouse there is a requirement to develop a strategic approach to manage, report and distribute data using common toolsets. Preferably this will try to provide a series of common facilities for key corporate services (Information, HR, and Finance)

5.5 Roles and responsibilities

Services are all responsible for ensuring that data quality and standards are maintained. Generally unless there is a good reason not to, analysis of information will be undertaken through the information team. Exceptions to this need to be justified. Equally the information team has a responsibility to provide a responsive service and to ensure that all services are aware of data quality issues.

5.6 Outcome measurement and Clinical Informatics

Increasingly patient care is being monitored and payment is being given based on outcomes. Given the Trust’s research agenda and given the need to invest further in systems. Closer liaison between operational use of data and the research agenda will be a core deliverable over the period of the strategy. Improving efficiency in research through establishing mechanisms to reduce the transcription of results and enabling appropriate access to anonymised operational data is fundamental to the strategy over the next 5 years. Options exist to implement Cerner’s Power Insight EDW product which will give enormous benefits to the research community. In addition there is a growing movement to publish pseudonymised data using a google-like search algorithm to enable the mining of clinical information to establish patterns. There is a need to consider developing capacity in outcome measurement. Cerner have a number of US partners in this and they are seeking to develop the same approach with Oxford.
Within the BRC there is substantial support for this. Alongside these options working with other BRCs to share cohorts of patients and to share data in a structured way to improve the ability to deliver translational research is one of the priorities for the future.

6 IM&T Management and Governance

6.1 Overview

The scale of the IM&T agenda and the critical dependence of the Trust’s strategy on delivery of information and IT solutions mean that the management and governance of IM&T must be robust and fit for purpose. This section covers the Trust’s approach to:

- IT Procurement;
- Project and Programme Management;
- Benefits Management;
- Programme Governance;
- IM&T Training;
- Health Informatics Services;
- Systems Development;
- Information Governance.

6.2 IT Procurement

IT Procurement needs to fit in with agreed contracts and utilise the catalogue on the system and the procurement web site to ensure the right models are purchased. The current contract with Dell ensures that PCs are imaged appropriately in the factory, ensure they are asset-tagged and provides three-year onsite maintenance. In addition optional services for delivery, installation and data transfer enable the service to be responsive to urgent needs.

All IT hardware that will be attached to the Trust network must be approved by the IT department before being purchased. The department will normally have standard desktop computer, printer and software that will be approved for users. Non standard purchases of hardware or software must be approved by the IT Manager and be installed by Trust IT staff. Any hardware installed without the knowledge of the IT department will not be supported and may be removed if it poses a risk to security of data or system operations.
Any significant IT system purchase, which could be a departmental system or a significant piece of equipment attached to the network, will need to be approved by the Information Systems Management Group. The request will be assessed in terms of:

- degree of fit to local and national strategy and policies;
- ability to link to core systems particularly EPR;
- whether the core EPR can provide the information – where it can it should be mandated
- Information Governance, security and robustness;
- completeness of data sets measured against local and national requirements where relevant;
- reporting and data extraction support;
- viability of the supplier and ability to provide necessary support.

The Trust’s IM&T department (OHIS) may be asked to provide an assessment to inform the Board’s decision. Ideally a senior member of staff nominated by the Director of IM&T should be involved early in the procurement exercise to ensure the assessment criteria will be met.

Medical device standards will need to be developed as part of this strategy to ensure that all devices that can and should be connected to EPR are procured with that in mind and that standards are applied to do this in the most sensible way. Pervasive wireless access can be assumed and usage of HL7 and similar standards are essential. This will require close working between those responsible for Medical Devices with other technical teams.

The Health Informatics Committee is responsible for accepting bids and allocating IM&T capital according to priority. The Trust’s Director of IM&T is responsible for managing allocated IT capital with specific projects bidding for resource through the standard business planning process.

6.3 Project and Programme Management

All significant software system implementations will be managed according to Prince 2 project management methodology. Any large system implementation (a total cost of over £100,000) should have a Prince 2 qualified Project Manager appointed and have a properly constituted Project Board and Project Team appointed according to the Prince 2 standards.
A supplier Project Manager should be expected as well as supplier representation on the Project Board. The Chairperson of the Project Board will be a senior executive at Director level or immediately below, depending on the value of the project and the likely impact on the Trust.

6.4 Benefits Management

Any IT system, no matter how well implemented, will not deliver significant benefits unless the organisation makes the necessary changes to processes to deliver benefits. All significant IT deployments (including CFH products) will take a systematic approach to benefits management. This means that the benefits should be stated up front and should contain, as a minimum, the following:

- what the benefit is to the Trust;
- who is responsible to making the changes and hence delivering the benefit;
- if possible how the benefit is to be measured and baseline values;
- expected timescale for the benefit will accrue.

These benefits should be held in a Benefits Register and the Project Board should ensure that the expected benefits are being realised. It is often the case that many benefits will continue to be delivered long after the project is complete, so the IM&T strategy group may monitor delivery of benefits on the Trust’s behalf.

6.5 Governance for the IM&T Programme

System-wide governance arrangements for the County wide programme have been described earlier with a system wide Programme Board reporting in to a system wide Change Board. For the ORH governance is maintained through the Trust’s Health Informatics Committee reporting in to the Trust Board.

6.6 IM&T Training and Development

For the successful exploitation of IT systems, considerable training will be required for all staff. Training requirements will be integral to each major system deployment project plan and intended users will not be given access to any significant Trust systems without appropriate prior training.
IT and systems training is undertaken by a dedicated Applications Support and training team who are responsible for:

- basic PC skills including use of keyboard, mouse and Windows;
- office application skills from basic use of Email and the Internet up to European Computer Driving Licence (ECDL) standards including the examinations;
- corporate application training which will be predominantly focussed on EPR in all its modules and the Case Notes interim application until it is replaced; training in these is undertaken in the context of trying to train in the process rather than the system re-inforcing messages around data quality.

As well as scheduled courses there will be targeted training where a significant need is identified for a particular group of staff or for using a specific part of a system.

Professional training for both Information and IT technical skills is essential to ensure that best use of the systems and resources is maintained.

Information staff will be required to develop their technical database skills, in particular use of Structured Query Language (SQL) and other reporting tools as well as maintaining current knowledge of NHS data sets and standards.

**6.7 Information Governance**

The Trust Information Governance Strategy is consistent with the legal requirements and guidance from the NHS and the Office of the Information Commissioner, including the NHS Confidentiality Code of Conduct, NHS Records Management Code of Practice and the Information Governance Toolkit. The Information Governance Policies and Procedures are available to all staff and the public on our website. These documents are regularly reviewed in light of changes to legalisation or policy.

There is a small Information Governance Team within the Trust dealing with Freedom of Information requests, Data Protection, patient access to medical records, IT security. They also work closely with the Trust’s Caldicott Guardian and report progress through the Trust’s Information Governance Group.

The Trust has various high level sharing protocols in place including Information Sharing Protocols across Oxfordshire which incorporates all Acute, Primary Care and Ambulance services. Other protocols with other agencies will be developed as required.
The Trust has Disaster Recovery plans for key systems and infrastructure that will be updated in line with system and technological changes. There is also an IT security policy in place that details the measures in place to maintain data confidentiality. All systems with confidential or other important information are secured with password entry and access levels appropriate to the individual user’s job requirements. Software is employed to protect against virus or other software attacks and secure firewalls are in place to secure the network at all entry points.

An initial Registration Authority (RA) has been established to register Trust users and issue smartcards to users of EPR and other applications (currently Choose and Book and SUS). It has been agreed that, in future, the operational responsibility for managing this service will sit within HR.

6.8 Health Informatics Services

Oxfordshire Health Informatics Service (OHIS) is the organisation which provides IT support across Oxfordshire and is hosted by the OUH and formed from the ORH IM&T Department. However following the geographic expansion of the Mental Health Trust and the subsequent takeover of Community health Oxfordshire to form Oxford Health NHS Foundation Trust the non-ORH/NOC services provided by OHIS have been reduced substantially. Currently this covers the remnants of the PCT, Network support across all of Oxfordshire and part of Buckinghamshire (on behalf of Oxford Health) and the Ridgeway Partnership. However it is likely that the Ridgeway Partnership will be acquired or merged within the next 12-18 months and the future requirements of the GP Commissioning function have yet to be determined. There may be opportunities to support all or part of the Commissioning Support Service which is planned to cover a wider geographic as well as the local Clinical Commissioning Group. This will be discussed further as plans are developed and legislation is passed.

It is clear that OHIS will be predominantly the IM&T function supporting the ORH and the NOC. This probably means that new internal governance arrangements will need to be introduced as well as a financial settlement that enables the service to function with less external income.

The framework OHIS currently operates with the divisions is one in which when additional services are required they are quoted for (for additional servers or file and print capacity for directorates) and the costs of service provision are re-used to invest in the services either through additional staff or through creating additional capacity for new services.
6.9 Devolved IT staff

Within the Trust there are a number of departments who have their own system management staff and in some areas more technical staff. This occurs in Cancer, Cardiac, Pathology, Radiology and Renal with some other part time assistance in other departments. In addition the working between the Information Department and OHIS is not always as strategic as it should be (with pressures pulling people in different directions).

It the Information Governance agenda is to be met professional accountability and standards need to be established firmly by the Trust’s IM&T department (OHIS). There are many arguments for and against having a centralised system management service covering many specialties and the benefits of local support, and from a strategic perspective the import conclusions must be that for information issues the professional lead resides with the Information department and from a technology perspective the corporate IM&T function (OHIS) has a leadership role.

6.10 Information Management and support

If the Trust wishes to become an information rich organisation the current methodology and skills set will not deliver this agenda. Having numerous Access databases which come from diverse sources and do not necessarily track back to common reference data or common definitions is a recipe for chaotic information delivery. This is not a criticism of the team as they are extremely productive and work well to deliver a service within the current skill levels and constraints. However if accurate administrative data needs to be integrated with accurate finance and clinical data there needs to be a fundamental upgrade to the technology and levels of skills over a period of time.

In terms of a strategic approach to Information Management there is an absolute need to increase the level of technical support and technical skills to integrate and standardise information systems. It is recommended that a strategy is developed and a case is made to consider the development of both data warehouse approaches (there are initiatives on this) and much greater resource to support delivery of information to managers and clinical teams. This needs to be based on delivery of common technologies across Information, Finance, HR and clinical information units; the potential to develop a clinical informatics team needs to be explored and additional focussed Database support for these functions needs to be considered (perhaps by re-establishing posts taken out in previous savings rounds).
6.11 System Development

The Trust has some limited capacity for internal systems development through a combination of in sourcing the OxPAS development team, and the requirement to maintain Case Notes after the supplier went out of business. This is combined with a systems integration and database development service. In the future developments will generally be based on:

- Ensuring that there is a robust systems integration facility
- Developing EPR both through the use of the configuration service and add-on capability through Power Notes and M Pages
- Continuing to develop the data warehouse and enhance to meet the Trust’s needs
- Ensuring that there are robust contingency and system back up plans through maintaining Case Notes for at least some years.

Other developments may be considered but the general rule of exploiting EPR to the maximum must be the central way forward.

The current team will be focused on delivery of:

- EPR developments and configuration management
- Delivery of the integration agenda
- Development of the ORBIT data warehouse
- Data migration for CRS
- Support for the research and BRC research agenda as appropriate

6.12 Web Development

OUH has a small web development team which does as much as is possible within the constraint of resources. It is proposed to retain this capability to ensure that the Trust can provide a responsive service that meets the need to continue improving our communications capability.

7 Plans

7.1 Financial Planning Regime

With the new capital regime and as a precondition for foundation Trust status improved planning is required for both capital and revenue. Historically IM&T planning has revolved around a level of internal funding supported by additional targeted investment. Given the criticality of IM&T for clinical service delivery it is important to have on-going investment at an appropriate level to ensure clinical access to EPR & PACS is safe for care. Additional planning is needed to ensure routine investment is
maintained as well as the essential developments. Historically there has been an IM&T capital allocation and the investment has matched the in-year priorities to the resource available. In the future a replacement programme will be needed as well as the discipline of business cases being applied to departmental projects.

7.2 Infrastructure

The criticality of the IT infrastructure for clinical services should not be under-emphasised. Currently, the core network runs 3000 IP based phones, and over 4000 PCs. PACs relies on the network to deliver images to clinicians; the clinical intranet currently delivers all diagnostic results to teams; increasingly patient monitoring utilises the corporate IT infrastructure; internal communications are dependent on intranet and email. The IM&T infrastructure has grown organically and the dependence on its service has to be recognised with an appropriate level of recurring investment.

The table below summarises the minimum requirements for routine maintenance for the Trust’s IM&T Infrastructure. As dependence on IT grows, it is essential that levels of investment are kept in line with the real requirements.

**Summary of Annual Funding Requirements for IT Infrastructure Maintenance**

<table>
<thead>
<tr>
<th>Routine Infrastructure Maintenance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PC Replacement</td>
<td>£500k either funded through corporate projects or locally</td>
</tr>
<tr>
<td>Server and Computer room maintenance</td>
<td>£200k</td>
</tr>
<tr>
<td>Network Maintenance</td>
<td>£150k</td>
</tr>
<tr>
<td>Routine System Capital Budget</td>
<td>£100k</td>
</tr>
<tr>
<td>Departmental System Maintenance</td>
<td></td>
</tr>
<tr>
<td>Corporate System Development</td>
<td>£50k</td>
</tr>
</tbody>
</table>

7.3 Deploying EPR across the Trust

The Trust has implemented EPR as a core PAS and clinically in ED and Maternity; the deployment of EPR clinically across the Trust will probably take most of 2012/13; Surginet will be introduced by the Summer of 2012; following these implementations there are plans for further developments including options for:

- Electronic Document Management
- Prescribing
- BMJ action sets
- Critical Care
The key strength of Cerner Millennium system is its clinical functionality. Current deployments in other Trusts have focussed on implementing the weakest part of Cerner (its Patient Administration Module), where the core American product is not built on the UK data model and the functionality fit is not ideal. It is therefore essential for OUH to focus on a rapid clinical rollout of Cerner Millennium with project gateways built in to the implementation to ensure clinical acceptance.

For most large secondary care organisations without existing systems delivering electronic requesting, the biggest change in working practices will be seen in 3 areas:

- Real-time patient location;
- Electronic requesting and resulting;
- Electronic clinical documentation (correspondence, notes, discharges) and communications (inbox and proxy functions).

The Cerner Millennium product delivers this in a single integrated database (with Accident & Emergency and Theatre scheduling and management as built-in modules). The advantages of the single database architecture are many and include speed, data integrity, ability to extract information easily, and apply rule-driven alerts and actions triggered by changes to almost any field in the database. Such an implementation alone would represent the biggest change in working practice seen in the last two decades, and will require very positive engagement with clinicians as well as clerical staff.

Within the deployment programme it is essential that every clinician uses the system in all possible circumstances to ensure the complete patient record is captured. The objective of a planned move away from the paper record demands universal use of EPR wherever this is feasible. If this is to happen appropriate resource will be required to ensure staff adapt to the changes in working practice smoothly.

7.3.1 Cerner development capacity

Following contract re-set it is likely that Trusts will be able, if they so wish, to develop components of the software themselves to meet the needs of their organisation. For the OUH it would seem beneficial to support this and aim to build a team having the capacity to make the most out of the software to support our business and clinical processes.
7.3.2  Back Office, Configuration Management and Training

The OUH has benefited from the implementation of the CRS at the NOC and has an established Back Office, EPR application support and training function. Given the criticality of EPR this function has been and will continue to be sized to deal with the level of changes that are routinely generated by the services. Given the complexity of Cerner it is important that these services have robust change management authorisation procedures to ensure that requests for change are approved, validated as being required and approved by the commissioning team and the Design Authority as being commissioned and sensible to be built.

7.3.3  Radiology & PACS

The current contract for RIS and PACS ends in June 2013. Initial discussions on replacement have focussed on the need to:

a) Avoid the rush of all Trusts wanting to replace at the same time
b) Merge the RIS and PACS instances of the NOC and ORH to resolve numerous current problems

This means that while an EPR based solution may be right in the long-term an interim move to local versions of the current product suites represent the most pragmatic way forward enabling relatively quick merging of the solutions and enabling a longer term review of the best solution once the initial bedding in of EPR has been completed.

7.4 Corporate Application

Arising from the risk analysis in section 4 above there needs to be a clear risk mitigation strategy for our core corporate applications. It is proposed that responsibility for risk management of corporate applications needs to be reviewed centrally through the Health Informatics Committee as well as within the specific service. The corporate applications detailed below are the key ones which will affect the whole Trust in the event of failure. A risk assessment has been made for all systems deemed to be in this category and those that have been marked as high risk are:

- EPR (all Modules)
- Pathology (LIMS)
- Pharmacy
- Theatres
- Cisco IP Telephony
7.5 Other Applications

7.5.1 Finance

The Trust has implemented Oracle financials and wishes to roll-out a deeper and more pervasive use of its functionality to deliver real benefits across all services. This will include devolved procurement from the catalogue and automated delivery of the accounts.

7.5.2 Human Resources

The Trust has implemented the National Electronic Staff Record and wishes to maximise its use in all divisions and directorates. The strategic approach will be to try to devolve management of critical financial and human resource management to the lowest level possible maximising the use of the systems while retaining central controls through the facilities available.

7.6 Local IT Systems

As stated in the inventory above our strategy is to converge where possible on CRS and central systems. However it is likely that there will be multiple systems for a number of years. Where there are multiple systems we need, strategically, to try to maximise the usage of systems from a common set of suppliers and minimise the number of systems in use. Multiplicity of systems causes difficulties and imposes additional costs. Local systems need to conform to centrally applied standards and information from them needs to be made available to the Trust’s Information Team as appropriate with support wherever possible provided by OHIS or to the central standards set as part of the Information Governance agenda set out by the Department of Health.
7.7 Telecoms
During the next 6 months a telephony strategy for the Trust will be developed. There are a number of strategic opportunities opening up which need to be considered including:

- using IP telephony and VPN technology to support home working;
- establishing a voice activated front end to the phone system to reduce dependence on operators;
- reducing the number and cost of legacy switches and number ranges;
- consideration of replacing legacy analogue technology over a 2-3 year period
- Establishing a pager and bleep strategy
- Consideration of integrating GP practices into the rest of the county infrastructure.

The telecoms strategy will explore these options and provide recommendations for the future.

7.8 Outline Implementation Plans
As indicated above, many uncertainties exist regarding the precise scope and timing of key developments, particularly those relating to CfH / national products. Nonetheless, an initial high-level plan has been produced which attempts to indicate what will be delivered over the coming 5 years, the likely costs and sources of funding.

7.8.1 Key Projects and Milestones
The following table summarises the main projects which the Trust will be taking forward over the next 5 years, with some indicative milestones.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure</td>
<td>Ongoing maintenance and upgrades - Network, Servers, Computer room, PC replacement. Development towards NIMM level 4??</td>
<td>1000 PCs (£360k) Wireless complete (£60k) CoWs (£100k)</td>
<td>1000 PCs (£360k) Comp Room pt 1 (£100k)</td>
<td>1000 PCs (£360k) Comp room pt 2 (£150k)</td>
<td>1000 PCs (£360k) Network refresh (£100k)</td>
<td>1000 PCs (£360k)</td>
</tr>
<tr>
<td>Legacy systems</td>
<td>Corporate and departmental systems minor enhancements to meet tactical requirements</td>
<td>£50k</td>
<td>£50k</td>
<td>£50k</td>
<td>£50k</td>
<td>£50k</td>
</tr>
<tr>
<td>EPR</td>
<td>Phased implementation of additional functionality</td>
<td>Implementation of Surginet and Powerchart across the Trust Preparation for e-Prescribing; Initial 5 action sets £1.5m</td>
<td>Commence Meds management Implementation Neonatal Critical Care Phase 2 Powerchart More action sets £1m</td>
<td>Medical Devices integration Complete meds Management Renal, Cardiac, Diabetes replacement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pathology</td>
<td>Replacement of separate LIMS systems with integrated single lab system</td>
<td>Business case, Procurement, Planning</td>
<td>Commence Go-live (£1m)</td>
<td>Complete go live</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local systems / Short-term developments</td>
<td>BRC Projects Health Information Exchange</td>
<td>Diabetes COPD Psychiatry HIE (Pilot) All externally funded</td>
<td>Other Long-term conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Warehouse</td>
<td>Repository for activity data from EPR and feeder systems</td>
<td>Phase 1 developed</td>
<td>Phase 3</td>
<td>Phase 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAS / EPR</td>
<td>Joint development with NOC. Further developments through the year ready to implement phase 1 &amp; 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecoms</td>
<td>Develop strategy, then implement priority recommendations Strategy developed. Replace Horton phones. Reduce Churchill analogue switch to one.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Governance</td>
<td>Implementation policies in relation to confidentiality, data security, data quality. Agree further policies in relation to RA fully embedded within HR.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance</td>
<td>Further roll-out and devolvement of Oracle system Roll out of remote requisitioning Further access for budget managers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR</td>
<td>Further roll-out and devolvement of ESR Phase 1 Phase 2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes Digitisation</td>
<td>Scanning case notes when needed Business Case agreed Commence implementation Implement over 10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Business Cases will be prepared for specific programmes of work and the required capital and revenue resources. It is clear that the ambitions of the Trust will need a step change in funding in order to deliver the EPR in all its facets and an information rich organisation.

7.8.2 Meeting National Expectations

As part of meeting local priorities, the Trust must also ensure that national IM&T priorities are addressed. The national IM&T Planning Guidance, associated with the 2012/13 Operational Plan, identifies the following as priorities for 2012/13 [NB this drafted before final version available – so list may need modifying]:

- Information Governance;
- Patient Demographic Service (PDS);
- Use of NHS Number;
- Summary Care Record (SCR);
- Choose and Book (CAB);
- Planning for the Picture Archiving and Communications Service (PACS) contract end
- Further realisation of benefits.

Many of these are being addressed as integral components of the Trust’s strategy.
8 Key Risks

Many risks are both explicit and implicit from the strategies that set the direction for IM&T and each impact on the associated work programme, in terms of creating additional work and affecting the ability to complete tasks. This section lists the headline risks to delivering the strategy. This is supported by a more detailed risk log exists for each of the key projects, e.g. EPR.

- Failure of BT and Cerner to deliver a system of appropriate quality and reliability

- Lack of resources to deliver the strategy with Cost Improvement Programmes threatening both the User resource to deliver and the central project resource for the core service

- IM&T Education Training and Development (ETD) - Staff require a level of basic IT competency and specific system skills to utilise EPR; this may be particular problems in some services where some of the clinical staff are frightened to use a computer

- Change Management is often the biggest risk to successfully exploiting a new IT system. There is usually resistance to change and a temptation to use the system like the old one, rather than utilise the newer features to support process improvement. This can lead to loss of efficiency rather than productivity gains.