Performance + Informatics

East Lancashire Hospitals NHS
NHS Trust

ELHT Informatics Strategy

(Supporting Clinical Transformational Change)

2016 – 2021

Safe | Personal | Effective

www.elht.nhs.uk

v.08

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Table of Contents

Forward

*"**Our values haven't changed, but our world has**. So the NHS needs to adapt to take advantage of the opportunities that science and technology offer patients, carers and those who serve them. But it also needs to evolve to meet new challenges: we live longer, with complex health issues, sometimes of our own making. One in five adults still smoke. A third of us drink too much alcohol. Just under two thirds of us are overweight or obese[1]."*

"NHS England sets the direction for NHS information technology and informatics so that commissioners, providers and suppliers can make informed investment decisions, identifying, amongst the alternative approaches, those that deliver the highest quality care for patients. Frontline clinicians leading this agenda will ensure that systems are designed around optimal clinical workflows, enabling health and care professionals to do their jobs more effectively."[2]

Digital systems are the foundation upon which we will build a modern, efficient and responsive health service. Enabling information to flow between care providers within and beyond organisational boundaries, and between care providers and patients, is a key means by which we will achieve a safe, convenient and personalised health and care setting."

Healthcare organisations are becoming critically dependent on information technology whether this is within the hospital setting, a community environment or the patient's own home. Patients and healthcare providers have enormous expectations of the role of technology and the benefits associated with the availability of high quality, timely information available in the right place at the right time. Integrated health systems must be supported by seamless and integrated information systems if we are to see the benefit from our investments.

East Lancashire Hospitals NHS Trust is committed to providing safe and effective care which is personal to the individual and reflective of need. The Trust is also committed to providing modern up to date technology and information systems in order to support the clinical and business needs of the organisation and the patients and citizens that it serves. These systems will be clinically led and where possible part of a wider pan Lancashire Health and Social Care system, allowing for integration and seamless care delivery.

The strategy must be read in conjunction with and take cognoscente of a number of significant documents, such as the emerging clinical strategy, the enhanced approach to Transformational change, the knowledge management strategy, the wider estates strategy

[1] NHS England – Five Year Forward View
[2] NHS England – High Quality Care for All

and the Digital Lancashire approach. For a full appreciation of the strategy, readers should also reference the ePR Outline Business case,

Finally, this document is a ‘living document’ and whilst the overarching strategic direction will remain the same, it is anticipated that the document will be subject to enhancements over its lifetime.

EXECUTIVE SUMMARY

This Informatics Strategy for the years 2016 to 2021, embraces the strategic changes and planned clinical transformation within both East Lancashire Hospitals NHS Trust and the wider pan Lancashire (including Pendle) area. The Strategy, following narrative relating to the Trust, its strategic direction, the current state of Informatics services and the aspirations for the future, sets out 9 key delivery areas.

These delivery areas are:

- Infrastructure
- Systems
- Unified Communications
- User Computer Interfaces
- Information Management
- Governance and Security
- Development
- Health Economy Integration, and
- Procurement

The strategy sets out how the aspirations will be achieved over the next 5 years and how each of the delivery areas fit together. The vast majority of activity takes place in years 1 and 2 as infrastructure is built to prepare the way for the integrated electronic patient record. However, in years 3 to 5, as the Trust consolidates this infrastructure it is able to build on this platform and implement the record. In addition to this, the groundwork is laid, via tactical solutions (eportal, ewhiteboards, video conferencing, unified communications etc), to equip the Trust staff with the skills, knowledge and experience to embrace and deliver the integrated record.

A significant proportion of this strategy focusses upon the patient / citizen and explores how we can use technological advances to increase their involvement in their own health care and support the wider health and social care economy to be aware of their needs and requirements, through such things as population health and ‘big data’.

The strategy, does not go into detail around the costs of its implementation, as it is felt that much of the activity can be done within existing budgets and where necessary (as in the case of the ePR) a separate detailed business case will be produced.

Finally, the strategy firmly puts, at the centre of all this activity, the clinician. The governance of the programme sits squarely with the eHealth and Clinical Reference groups, with a commitment made that no major investments or developments will be passed to the Trust Board or Executive, without being fully (and formally) supported by these groups.

THE REALITY – HOW ARE THINGS NOW?

Local context

About East Lancashire Hospitals NHS Trust

1. Established in 2003 and employing over 7500 staff, ELHT is a large integrated care organisation providing acute secondary healthcare for the people of East Lancashire and Blackburn with Darwen and community healthcare services for the population of East Lancashire. The Trust serves a combined population of approximately 530,000, with wide ethnic diversity and includes some of the most socially deprived neighbourhoods of England. The Trust aims to deliver high quality, high value care and contribute to a health gain for our community.

2. A full range of acute hospital and adult community services are provided, alongside being a specialist centre for Hepatobiliary, Head and Neck and Urological cancer and robotic services. In addition, ELHT provides specialist Cardiology services and is a network provider of Level 3 Neonatal Intensive Care.

3. The Trust has a total bed base of 1081 and care is offered across five hospital sites, and in various community locations. Planned annual turnover for 2015/16 is £446m.

4. In 2014/15 the Trust had over 183,000 Accident and Emergency attendances. In the same year 57,000 patients required inpatient emergency admission and over 54,000 patients chose ELHT services for their elective procedures. The obstetric and midwifery teams delivered over 6,000 babies and 600,000 patients were seen across the Trust's outpatient clinics.

ELHT Strategic Objectives

5. East Lancashire Hospital NHS Trust has the following strategic aims:
   - To be a **Safe, Personal, Effective** provider of generalist hospital, community and primary care services, by working in partnership with others.
   - To be integrated in the health and care economy across Pennine Lancashire as part of a **Sustainability and Transformation Plan**.

- To be a **networked provider** of key specialist services in conjunction with other Trusts across all of Lancashire (including mental health, stroke services, maxillofacial services, vascular services, radiology services and cancer services)
- To be a **regional centre** of excellence for specific services (for example certain urology and hepatobiliary surgery).

6. The Trust's developing Clinical Strategy will drive and deliver:
   - Safe, Personal and Effective Care.
   - Sustainable services which demonstrate affordability.
   - Standardised and consolidated services which demonstrate efficiency.
   - Clinical leadership and professional networking, both *within and between* organisations.

7. The Trust's strategic and transformational themes in 2016-20 are:
   - Agreeing new system-governance principles with Healthier Lancashire and Pennine Lancashire Partners.
   - Increasing primary care involvement and agreeing new models of care.
   - Increasing standardisation.
   - Improving efficiency in elective care.
   - Changing non-elective pathways.
   - Reviewing and Networking specialist services.

8. Key to the delivery of these objectives is the delivery of the Trust's Clinical Strategy. Although still in development, the fundamental strategic and operation drivers are captured in this document. The diagram below illustrates how the local Clinical Strategy meshes with the wider regional and national strategic direction.

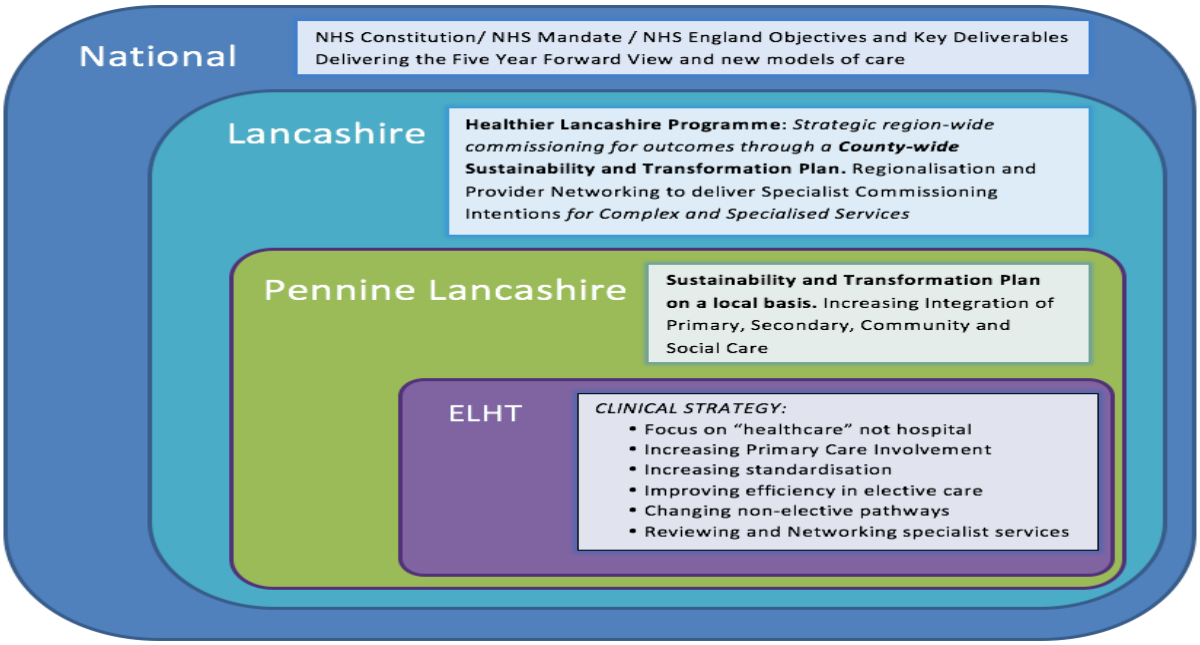


Figure 1 – The context of the Trust's Clinical Strategy

9. The Trust faces some significant challenges which, whilst recognised by many other acute Trusts around the country, have a particular resonance to ELHT due to its demographic, specific health and social care challenges and wider collaborative objectives moving forward. These are summarised below:

Figure 2 – Drivers for change

10. Within ELHT, our Clinical Strategy develops in line with our evolving business planning and the financial modelling of all proposals and transformation programmes. The governance and priorities for these will increasingly be shaped by the influence of Pennine Lancashire (via the Sustainability and Transformation Plan) and Healthier Lancashire Programmes.

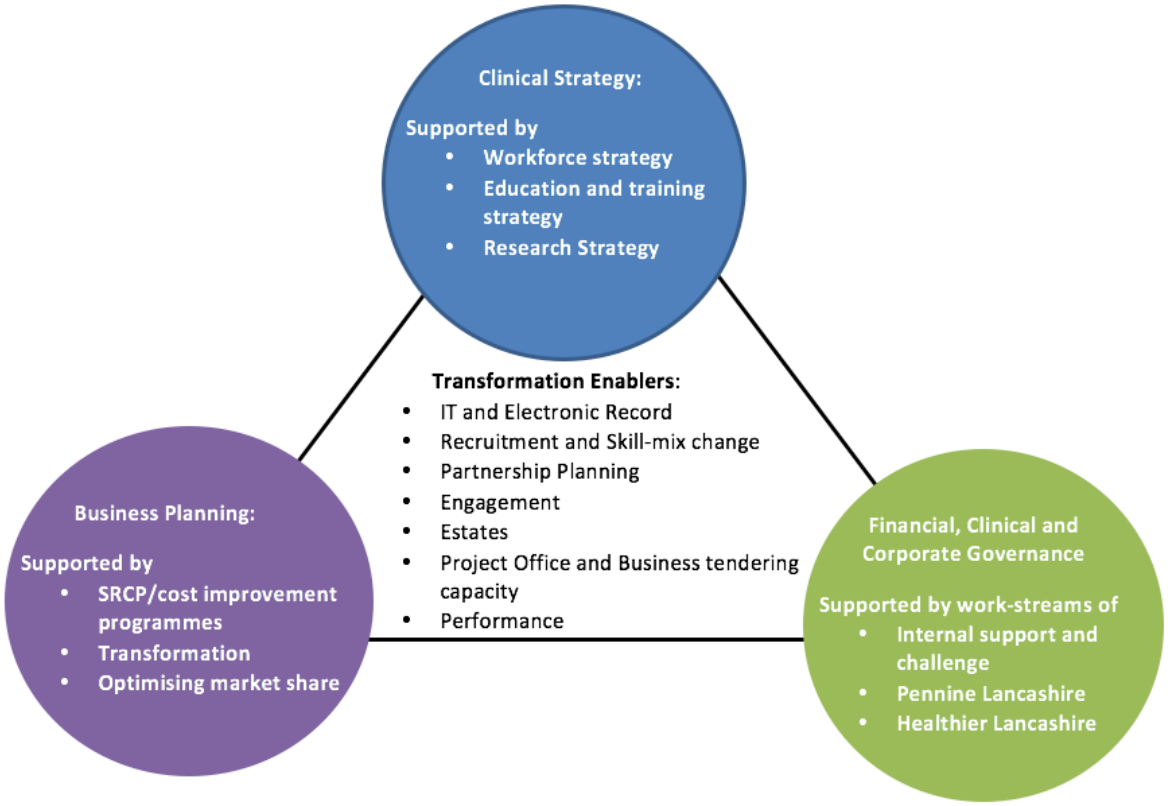


Figure 3 – transformation enablers

11. Specific in each of the key strategic deliverables for the Trust, the Clinical Strategy, the business planning programmes and enhanced financial, clinical and corporate governance, is the requirement to have robust IT infrastructure, enabling and transformational technologies at the point of care which includes an integrated clinical record.

12. In summary, over the coming years the Trust will ensure it continues to improve the patient experience and clinical safety in partnership with colleagues across health and social care. We will continue to do this by clearly understanding and making the links between our Quality Strategy, patient flows and pathways, activity levels, resource requirements and the need for our staff to work differently.

13. In order for the Trust to achieve its strategic goals, particularly transforming care and improving the patient experience, it is recognised that the way services are provided must be transformed. Part of this transformation is to be able to provide seamless care both within the Trust and between the Trust and its partners in the local health economy. This integrated and seamless care can only become a reality if it is underpinned by seamless and integrated information.

14. The Trust Executive is conscious of the importance in ensuring integration of health and social care services to support the local community. Future significant procurements and service enhancements must take advantage of any opportunities for collaboration and thus optimise any available economies of scale that may arise from these partnerships. In addition to this, the emerging Digital Lancashire agenda must be central to future developments.

15. This vision is for a comprehensive patient centric clinical record for each patient, accessible by the patient and by those providing care. Engagement and ownership of the clinical and operational teams is central to choice and deployment of the local health care solution.

16. The key drivers are for: -

- An intuitive yet sophisticated end user experience
- A resilient, highly available mobile solution
- Access to the clinical record in real or near real time
- Improved communications between the GP, members of the community teams, wider health and social care providers and the hospital
- Sharing of clinical information that is accurate and timely
- Reducing the amount of, and reliance on, paper and paper based systems
- A single version of the truth
- A shared record across primary, secondary and social care
- Optimal clinical workflows and more time to care
- Patient access and patient control
- A financially viable and sustainable solution
- Clinical decision support
- Patient decision support.

Pennine Lancashire Health Informatics Vision

17. The vision for informatics across Pennine Lancashire is for a comprehensive patient-centric ePR which enables clinicians, in partnership with patients, to access the right information, at the right time, in the right place in order to make the right decisions and deliver care which is safe, personal and effective. This vision extends to the sharing of information with relevant clinicians across the health economy and in the future, will extend to support the delivery of health and social care across Lancashire. This vision is built upon a robust and stable infrastructure with high quality support and services.

18. In addition to this, it is recognised that the Trust cannot develop its vision in isolation. The Trust is working alongside local and regional partners to deliver an infrastructure to support the strategic direction with a collaborative approach to procurement and technical consistency across all providers, together with a shared vision of patient information flows which both mirror the fluid patient journey between providers and meet the detailed requirements of our collective Clinical Strategies.

Delivering clinical transformation using informatics – the 10 key element of ELHT strategy

19. In order to provide an optimum environment for the delivery of the clinical strategy and ELHT Busness plans (both Trust wide and locally determined), there are 9 key delivery and development areas that this strategy will focus upon, for definition purposes here and in greater detail further in the document. These are represented below.

- Underlying Infrastructure
    - Networks
        - Local
        - Wide Area
        - Wireless
    - Data Centres and Servers
    - Storage
- Systems
    - Clinical Systems
    - Electronic Patient Records
    - Corporate Systems
- Unified Communications
    - Telephony

    - Video conferencing
    - Mobile telecoms
    - Bleep and Pager Systems
    - email and Instant Messaging
    - Social networks and Inter / Intranet

- User computer Interface
    - Desktops
    - Mobile Devices
    - Clinical Environment Displays
    - Patient facing interfaces
- Information Management
    - National returns
    - Analytical Support
    - Information Portals
    - Data Warehousing
    - Benchmarking
    - Coding
- Governance and Security
    - Information Governance
    - Cyber Security
    - Physical Security
    - ITIL standards
    - Informatics Service Accreditation

    - Change management
    - Financial management
- Development and Testing
    - User Acceptance Testing
    - Software Development
    - Device evaluation and field testing
- Health Economy Integration
    - Sustainability and Transformation Plans
    - Digital Lancashire
        - NWSIS
        - LPRES
        - CIO/CCIO networks
    - Healthier Lancashire (including Pendle / Lancashire)
- Procurement
    - Frameworks and OJEU
    - Joint Procurement
    - Contracts

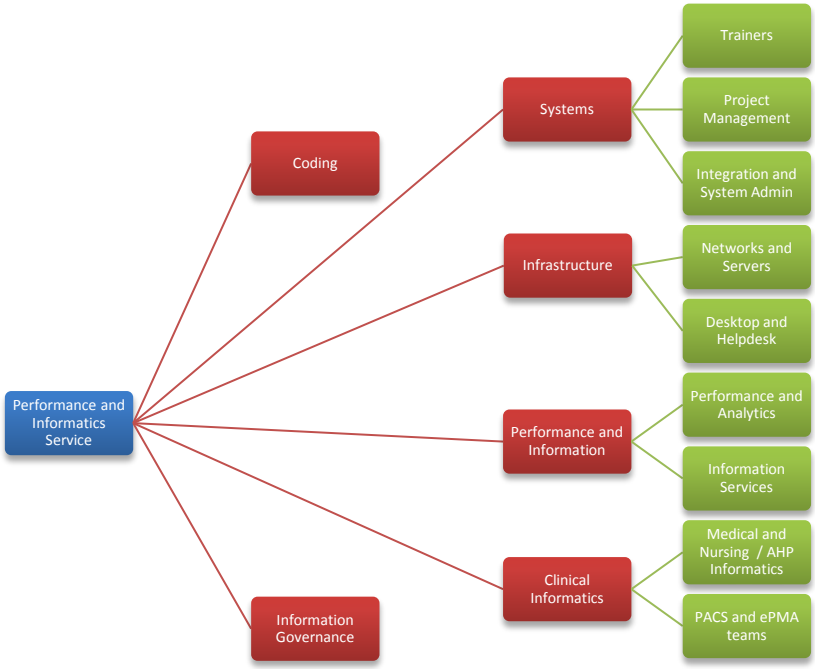
20. Following a review of the current provision each of these areas will be discussed in some detail.

Current Informatics provision

21. The Informatics infrastructure within the Trust is a complex one, made up of a wide range of function based systems with some integration with only limited interoperability.[3] The development of systems has been on a gradual piece-meal basis with deployments being mainly tactical in nature. The next phase of the strategy needs to address interoperability and improved decision making. The current systems in the Trust are not capable of supporting the next level of functionality required to underpin the Trust's strategic goals. This will constrain the ambitions of the Trust in terms of achieving the five high level priorities. It is therefore, timey that a revised Informatics strategy is being published now.

22 The Informatics teams responsible for delivering the service has also undergone a number of significant changes recently. These are mainly viewed as being extremely positive with service users detecting some real difference in the quality and timeliness of the current provision. Now the systems and services are provided by an integrated directorate – Performance and Informatics Directorate, with all services reporting, via an Associate Director, through to the Director of Finance and thus to the Trust Executive. This is represented below.

[3] Source – Trust IM&T Strategy 2012 / 2017



Performance + Informatics

23. A key benefit of this current strucutre is that innovation, service development and integration with clinical enhancement, can be done as a single unit. All senior leaders within the Directorate share a common goal and a common responsibility for delivery. Historical barriers relating to systems delivery, infrastructure provision and information feedback are removed, providing a leaner and output focussed service.

The purpose of Informatics at ELHT.

24. The purpose of the Performance and Informatics services within the Trust is:-

- To provide a robust, secure platform upon which to deliver critical clinical and operational systems to facilitate the delivery of services to patients.

- To provide systems that will support the delivery of care to patients and enable clinical teams to make the appropriate decisions based upon the best available evidence.

- To provide patients with relevant and accurate information about their care and the arrangements for the delivery of that care, including effective communication upon admission, throughout their stay and post discharge.

- 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. Furthermore, specific emphasis is given to connectivity between the hospital and its community services, the Trust and primary care and health and social care.

- To provide a reliable, effective technical infrastructure to support a diverse range of technologies which improve communications both within the Trust and across the local care economy in East Lancashire, and deliver step change efficiencies in the process, delivery of care and reductions in variations in practice.

- To support the strategic and business aims of the Trust in terms of its future status as a lead organisation within the local health and social care economy, its service development strategy and the annual business planning process. Once again special emphasis is placed on the ability to innovate and use Informatics as a real enabler to becoming more productive and efficient. Whilst it is recognised that IT and innovation will not solve all the financial challenges of the Trust it is taken for granted that any future IT investment will provide significant returns on investment both financially and in the support of enhanced clinical care. As with a significant proportion of Acute Trusts in the NHS, East Lancashire Hospitals faces a significant financial challenge in the years ahead. This challenge can only be met by a transformational change in the way services are provided. Alongside a new clinical strategy for the Trust, the Informatics strategy is seen as the fundamental enabler in facilitating this transformation which will ultimately support the move towards a more financially viable organisation.

- To work in collaboration with other members of health and social care community and where possible will engage in joint enterprises to optimise the benefit from any investments or developments in the Informatics agenda.

- To encourage information sharing in support of patient pathways and safe care with all healthcare partners notwithstanding the need to recognise the contribution from education services, housing associations, the prison service, charities and the third sector.

- To ensure that the strategic direction of the Trust is in accordance with the wider pan Lancashire health and social community and to be an active part of the 'Digital Lancashire' vision. This includes embracing such developments as the Lancashire Patient Record Exchange System and the Infrastructure platforms such as the Community of Interest Network (COIN).

- To be at all times financially prudent in the investment decisions made supporting the Informatics Agenda.

Our current reality – some practical examples[4]

25. In the majority of clinical departments right across the Trust there is a desire to reduce the amount of paper currently being used. In some areas sets of paper case notes not only overwhelm administrative and secretarial staff but also pose a significant threat to patient safety and the environment.

Medical records

26. There are approximately 500,000 sets of patient case notes in active circulation. The cost of providing, administering and transporting paper is high and problematical. A complete health record is not always readily accessible where and when needed, resulting in increased clinical risk, cancelled appointments/admissions, tests repeated unnecessarily and clinical staff time wasted searching for correct documentation.

[4] Source – Conversations with members of ELHT staff and observations by the author

27. There are significant operational issues in managing the paper case notes: i.e. High records handling costs for a 24/7 service (staff, accommodation, transport) In addition: -

- In-house storage facilities are inadequate
- Increasing volumes of paper records – on average 40 pages of documentation are created for an admission
- Increasing cost of off-site storage facilities
- Clinical Coding and Clinical audits extremely difficult when working with the paper case note

28. The use of paper case notes still constitutes an enormous clinical risk. (Information contained on the 'alert sheet' is part of the paper record rather than the electronic record. Any delay with the availability of the case notes could result in patient receiving a drug to which they are allergic or being resuscitated when there is a contraindication or advanced warning in place)

In Patient wards

29. There is a sense of frustration amongst nursing staff that time and effort is being wasted on electronic processes that simply duplicate paper and offer no added value what so ever. There are examples where information is being held electronically but requires printing in order to populate the case note either as a routine task or when a patient is being transferred to a ward that may be less automated. The risk assessment system offered by the current system provides 7 views but with no interoperability between the views. (If for example 2 views require a BMI[5] record to be added, the BMI score would need to be added twice, rather than once and shared) The computerised Waterlow assessment does not generate orders or alerts but appears to exist as an isolated repository.

Intensive Care Unit

30. "Two ends of the bed" - The amount of technology and sophistication at the head of the bed has increased significantly over the last 15 years. The amount of technology and automated data capture at the foot of the bed has hardly changed at all in the last 15 years. Despite being enabled the ventilator, the syringe drivers, the infusion pumps and the oxygen saturation / vital signs monitors are connected to nothing

[5] Body Mass Index

apart from a power supply. There is nothing by way of integration or centralised alerting. The near patient testing / bedside testing devices such as the glucometer and blood gas analyser still produce paper which contains the numerical response / result. This is manually transcribed from the ticket to the observation chart.

Pharmacy and medicines administration

31. At the time of reporting five surgical wards in the hospital had been enabled with electronic prescribing and medicines administration functionality. Verification by a clinical pharmacist is becoming more of a mainstream activity but the current system means that not every patient sees a pharmacist and not every medicine gets verified by a pharmacist before it is administered by a nurse. Automation in the dispensary has improved the accuracy and timeliness of 'picking' packets prior to discharge for TTO's[6] and re-stocking in wards and departments. The Trust is making steady progress with its approach to electronic prescribing and medicines administration.

Pharmacy, Laboratory and Radiology

32. The automation and interoperability within these three major departments together with Order Communications and vital signs monitoring systems can make a significant contribution to patient safety and the effective management of the acutely ill. Whilst the Trust has made an investment in these areas at the moment many of these systems operate in isolation of each other and as a result lose almost all of the value associated with an interoperable environment. In an automated and connected environment the EPMA[7] system would alert the gentamicin prescriber having being informed by the lab system that the patient has gentamicin toxicity. At present the prescriber must determine this position through a series of manual interventions and may well currently go on to prescribe a drug to which the patient is allergic or could not tolerate.

33. The laboratory is still highly dependent on paper and paper driven processes. This involves transcription from paper to the Laboratory Information System creating risk and some margin for error. There are currently few examples of where technology is being used to assist in the identification of the patient or the sample. Observations carried out in the blood transfusion service confirmed that RFID and bar code

[6] To Take Out
[7] Electronic Prescribing and Medicine's Administration

technology were not being used to identify the unit of blood or any other blood product.

Accident and Emergency department

34. The environment is overwhelmed with paper 'Cas cards' and employs a number of individuals whose responsibility it is to 'push this paper'. The casualty card is a paper record of any treatments and procedures undertaken by medical staff whist the patient is in the A&E department, it also contains the patient's demographic details and discharge / admission details. Critically, unless informed by the patient / relative, staff working in A&E have little or no access to any clinical information relating to that patient until the case notes arrive.

Current systems inventory

35. The Trust spends in excess of £2m per annum in contracts for software and hardware maintenance as outlines in the table below.

No	System	Supplier
1	Translator	Sun Quest
2	Dr Foster Information	
3	Pharmacy System with ARX Robotic Interface - excluding prescribing	Ascribe
4	Electronic EMM	Ascribe
5	HEPMA	Ascribe
6	PAS Interface	Ascribe
7	GL Interface	Ascribe
8	Homecare module	Ascribe
9	Results and data viewer	Ascribe
10	GUM DDMS Maintenance Support	Blithe Computer Systems
11	Colposcopy System-system maintenance	IrisSoft

12	Colposcopy System report writer maint	IrisSoft
13	PAS U/G Software Licence Charge	CSC iSoft
14	PAS U/G Support & Maintenance Charge	CSC iSoft
15	PAS patient centre	CSC iSoft
16	Emis support LV	EMIS
17	pathology support (nov 14- nov 15)	EMIS
18	Medcon Cardio-Angio System	Mckesson
19	Rhapsody Integration Engine	Orion Health
20	EPR Portal	Orion Health
21	EPR Portal Support Fees	Insight
22	ICE+ order comms+ discharge letters	Sunquest
23	ice rechargePATH lab	Sunquest
24	Ice service provider list- site wide	Sunquest
25	Bed Board(EPTS)	Hospedia
26	Clinical access bed-side terminals	Hospedia
27	NDL sx (integration tool)	NDL Metascybe
28	NDL mx (app development and mobile apps	NDL Metascybe
29	single sign-on	Caradigm
30	Forms system (CIS)	Caradigm
31	pre-op assessment module	In-Touch with Health
32	Colossus data warehouse tool	Chimera
33	Windip scanning	CIVICA
34	windip Support for large scanners	CIVICA
35	Windip enterprise user, support and capture	CIVICA

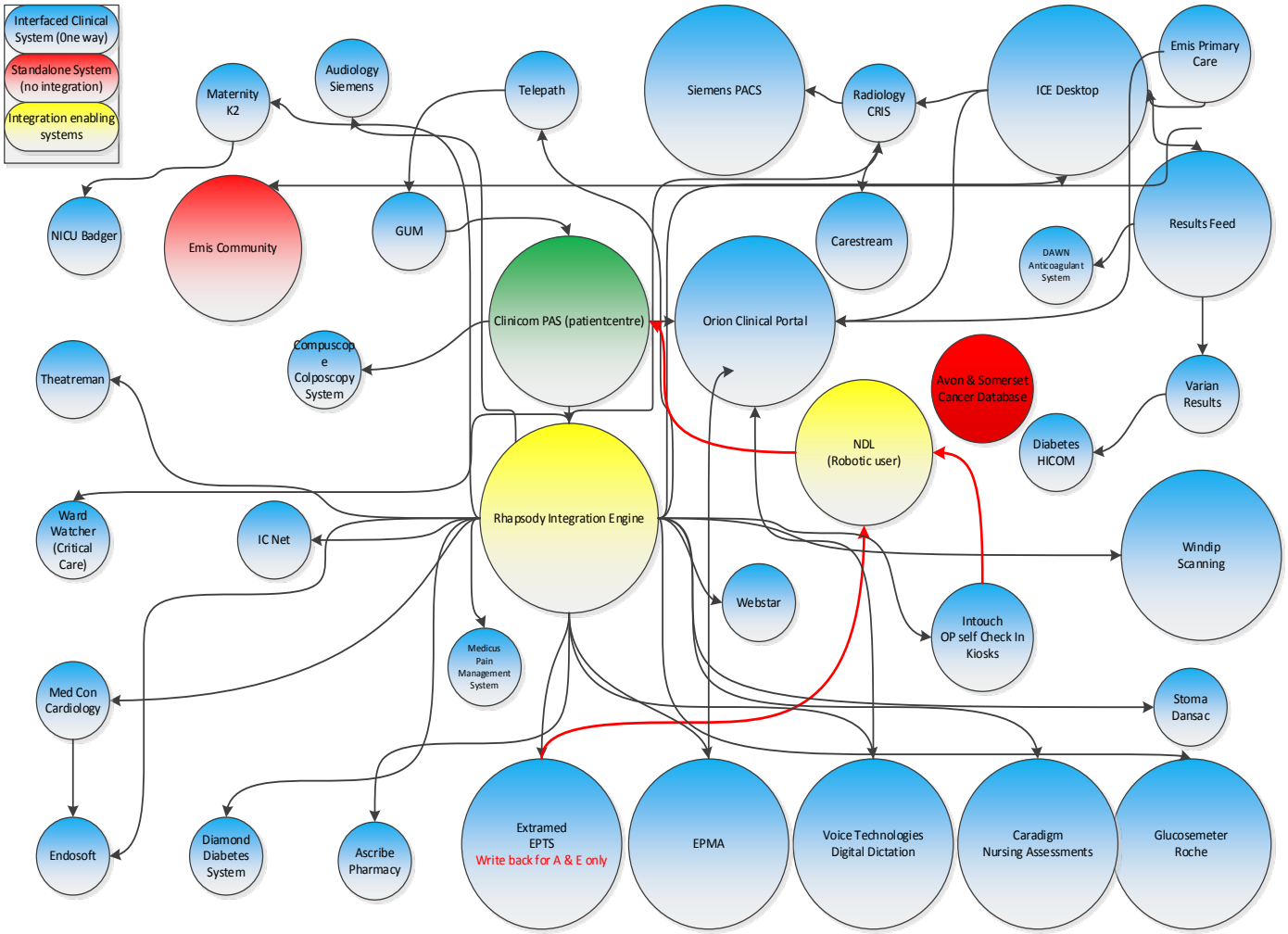
	licences. Supports key areas in Trust already scanning.	
36	EMIS Community system	EMIS
37	Winscribe	Voice Technologies
38	SCR Cancer Register System	Somerset Cancer Register
39	ELHT Intranet	SORCE LTD
40	Compuscope	Irisoft
41	Planet Press	Objectif Lune UK
42	Sostenuto	Sunrise
43	Websense Web Security Gateway	Websense/Foursys
44	Websense WSG V5000 Series Appliance	Websense/Foursys
45	Sophos	Sophos
46	Airwatch	Airwatch
47	Mercato	proband
48	SNOW asset manager	
49	Caradigm SQL licenses	Caradigm
50	SQL Licences - main servers	
51	COIN	Virgin media
52	Additional licenses	

36. As mentioned above information systems in the Trust have been developed and deployed over many years. This has resulted in an environment associated with some significant duplication and overlap. Alongside this the price of alternative solutions have continued to decrease, supporting a clearer commercial rationale to migrate to alternative solutions with clear qualitative and financial benefits.

37. The Trust has developed a Strategic Outline Case and Outline Business Case for the replacement of the existing (and aged) PAS system and the procurement of an electronic Patient Record. These reports have been supported by the Trust Board and are now subject to further discussion with NHS Innovation (formally TDA), HSCIC and commissioners

38. The most significant feature of the above table is the extent to which the annual costs which are mainly derived from revenue streams could be used in part or in total to fund the revenue implications of a full EPR. An estimate would suggest that there is between £1.1m and £1.2m worth of revenue savings that could fund a more suitable alternative.

39. The diagram below highlights how the Trust's systems are currently arranged.



The National IM&T Position

40. In January 2013 the Government set out a timetable for making all records and communications in the NHS paperless. The Secretary of State said that "by April 2018 digital information will be fully available across the NHS and social care services". The strategy is for local hospitals and other health organisations developing their own records, and making systems interoperable, using 'invest to save' principles.

41. A report by the UK trade body Intellect[8] outlines that a paperless NHS is achievable but requires a different way of thinking for users, buyers and suppliers of healthcare information systems. The report, entitled 'Digitising the NHS by 2018 – Intellect response', calls for a focus on capturing and using digital information, rather than just removing paper. It argues that without patients wanting a change in services, it will not happen.

42. The report also highlights that open interfaces and joined up processes are key points to making paperless a reality. The report notes that "we have to demonstrate the tangible value to staff, patients and citizens from the application of information and technology. If they do not see the value, they will not demand and embrace change."

43. The report goes on to note that "the NHS needs to give less priority to improving the digitisation of what is already electronic and more priority to those elements that are not, particularly where information crosses the 'boundaries' between care organisations, and with an emphasis on the boundaries between NHS and non-NHS partners, where digitisation tends to be weakest."

44. A PwC report has claimed that the NHS could find £4 billion of efficiency savings by adopting a short list of big technology measures. These will, of course, only be realised through underpinning changes in the provision of care, which in turn need to underpin the strategic goals of organisations.

45. The overall responsibility for steering this change lies with NHS England. NHS England will set the direction for NHS information technology and informatics "so that commissioners, providers and suppliers can make informed investment decisions, identifying, amongst the alternative approaches, those that deliver highest quality care for patients.

[8] Intellect represents the UK's Technology Industry www.intellectuk.org

NHS England and the National Information Board

46. The Five Year Forward View - recently published by NHS England makes some reference of the need to embrace technology but equally recognises that the adoption especially in secondary care remains slow. The paper acknowledges that there have been three major economic transitions in human history – the agricultural revolution, the industrial revolution, and now the information revolution. For example, in Britain 86% of adults use the internet but only 2% report using it to contact their GP, say NHS England.[9]

47. Part of why progress has not been as fast as it should have been being that the NHS has oscillated between two opposite approaches to information technology adoption – neither of which now makes much sense. At times we have tried highly centralised national procurements and implementations. When they have failed due to lack of local engagement and lack of sensitivity to local circumstances, we have veered to the opposite extreme of 'letting a thousand flowers bloom'. The result has been systems that don't talk to each other, and a failure to harness the shared benefits that come from interoperable systems.

48. Personalised Health and Care 2020 – makes clear that the better use of data and technology has the power to improve health, transforming the quality and reducing the cost of health and care services. It can give patients and citizens more control over their health and wellbeing, empower carers, reduce the administrative burden for care professionals, and support the development of new medicines and treatments.[10]

49. "The Power of Information", the NHS information Strategy, advocates joined up care and access to patient information for healthcare professionals, patients and carers in care settings. In January 2013, the Health Secretary, Jeremy Hunt, stated that he intends the NHS to be paperless by 2018.[11] NHS England's 'Safer Hospitals, Safer Wards' published in July 2013 set out this vision for a fully integrated digital care record (ICDR) across all care settings by 2018:

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

[9] NHS England – Five Year Forward View
[10] NHS England – Personalised Health and Care 2020
[11] Defined in Appendix 1

50. "*The NHS belongs to the People: Call to action*" published in July 2013 further defined a vision for the delivery of integrated care centred on the patient rather than aligned to episodes of care. It proposed that £30 billion funding gap can be closed by applying innovation, transformation and technology to change the NHS service delivery model from acute, episodic based care to integrated care closer to home.

51. The National Information Board (NIB) was established in 2014 to set the strategy and direction for the health and care system on information technology and information. The purpose of the NIB is to:-

- Provide leadership across health and care organisations on information technology and information.
- Design and develop the vision, strategy and direction for the health and care system through engagement with partners and stakeholders, including industry.
- Ensure that priorities for investment and delivery are clear
- Provide the annual commissioning priorities for the Health and Social Care Information Centre (HSCIC) and turn these into an agreed delivery plan

52. The NIB has recently published a number of framework milestones. For illustrative purposes only a number of these milestones have been listed below in order to provide further national context for the strategy in East Lancashire Hospitals Trust.

- By June 2015, the NIB will publish proposals on the regulation, accreditation and kite marking of technology and data-enabled services, including apps.
- By October 2015, the HSCIC will publish enhanced data security standards and requirements and will re-launch the Information Governance Toolkit.
- By October 2015, Digital Maturity Index key indicators for NHS trusts will be published via NHS Choices.
- By April 2016, the NIB will agree a core 'secondary uses' dataset that all NHS-funded providers will have to make available.
- From April 2016, the CQC to take performance against the data quality standards into consideration as part of its regulatory regime.
- By April 2017, core curriculum and associated knowledge frameworks will contain the relevant knowledge, skills and characteristics to enable the workforce to embrace information and technology.
- By 2018, clinicians in primary care, urgent and emergency care and other key transitions of care contexts will be operating without the use of paper records.

- From March 2018, all individuals will be able to record their own comments and preferences on their care record.
- By 2020, all care records will be digital real-time and interoperable.
- By April 2020, the entire health system will adopt SNOMED clinical terminology.

53. We are also aware that digital maturity measurement is likely to be a part of CQC inspections from 2018 onwards and from 2020 providers of health services in the NHS must be able to demonstrate technological improvements in order to retain their licence to operate.[12]

The Electronic Medical Record Adoption Model (EMRAM)

54. Since 2005 the HIMSS Analytics EMR Adoption Model[SM] (EMRAM) has tracked the adoption of EMR applications within hospitals and health systems across the globe. Organisations work to complete the 8 stages (0 - 7), with the goal of reaching Stage 7: an environment where paper is no longer used.

55. Trusts who have reached Stage 7 are recognised for having achieved all the steps necessary towards a paperless environment. They have a very real competitive and quality advantage, as they support the true sharing, information exchange and immediate delivery of patient data to improve process performance, quality of care and patient safety.

56. Stage 7 Designees can:

- Share patient clinical information via electronic transaction with all entities within the entire health information exchange network
- Support the true sharing, widespread and comprehensive use of health and wellness information by consumers and providers
- Use data warehousing and mining techniques to capture and analyse care data to perfect, advance and institute organisation-wide operational, financial and quality improvements

58. East Lancashire Hospitals Trust currently has elements of functionality up to stage 5, however due to a lack of interoperability is likely to be at stage 1 in that ancillary systems in the Pathology, Radiology and Pharmacy are in place. PACS has been widely adopted in the UK, not so in other countries.

[12] NHS England – Digital Maturity Programme

59. The EMR Adoption Model[13]

Stage	Cumulative Capabilities
Stage 7	Complete EMR, CCD transactions to share data. Data warehousing. Data Continuity with ED and OPD
Stage 6	Medical documentation using structured templates, full CDSS and Closed loop medication administration
Stage 5	Full complement of Radiology PACS
Stage 4	CPOE, Clinical decision support (Clinical protocols)
Stage 3	Nursing / clinical documentation (flow sheets) CDSS error checking. PACS outside Radiology
Stage 2	CDR, Controlled Medical Vocabulary, CDS may have document imaging. HIE capable
Stage 1	Ancillaries – Path Lab, Radiology and Pharmacy
Stage 0	Ancillaries not deployed

THE RESULT – HOW DO WE WANT THINGS TO BE?

IT enabled Transformation – what does good look like?

60. Professor Sir Bruce Keogh has outlined NHS England's plans for further developing Technology Enabled Care Services (TECS). In a letter written to around 250 key stakeholders, NHS England's National Medical Director calls on them to support the programme that takes the NHS into a new and exciting technological era that will help empower patients and improve health outcomes.

61. Sir Bruce has told a broad range of organisations from across health, social care, industry, and the third sector:

[13] Himss analytics

"Present and emerging technologies offer opportunities for us to transform the way we engage in, and control, our own healthcare. Imagine the degree of personal control that could be afforded by a smart phone configured for medical applications, coupled with wearable biosensors and capable of sensing, analysing and displaying vital signs and alerting you and your clinicians to significant changes or deterioration wherever you are, rather than through check-ups at a hospital or GP practice. Any escalation in a condition could be identified and addressed in a timely and proactive way. It would lead to better health outcomes while being more convenient for the patient, their carer and their clinician."

"This is the future of healthcare. Twenty years from now, we will use technology to access our health services as a matter of course. That future is fast approaching as technologies constantly evolve, adapt and improve."

62. We have a growing older population – with an estimated three million people living with three or more long-term conditions by 2018 – is only going to increase pressure on the NHS, adding:

"One opportunity lies in the fact that people increasingly want to own and control their own healthcare. By harnessing the power of digital technology we can help by empowering people to manager their care in a way that is right for them."

63. NHS England undertook a review of the programme in April 2013 which has led to a shift in the strategic direction of the TECS programme.

"The TECS programme has been re-focused to address the demand from health and social care professionals for support and practical tools to commission, procure, implement and evaluate technology enabled care services," writes Sir Bruce*. "Our ambition is to create the right commissioning environment that supports and encourages the innovative use of technology to improve health outcomes, empower patients, and deliver more cost-effective services as part of a modern model of integrated care.*

The TECS Stakeholder Forum's collective views and proposals on how to address the barriers to wider adoption now form the basis of the TECS Improvement Plan 2014-17."[14]

[14] Sir Bruce Keogh – TECS Programme 20th September 2014

64. HIMSS Analytics[15] measures the digital maturity of hospitals across the globe and as such is perfectly placed to direct any organisation looking to improve its current position towards international best practice. From a HIMSS Stage 7 hospital perspective (There are 3 Stage 7 hospitals in Europe)[16] one would expect Stage 7 hospitals to be completely paperless. Stage 7 healthcare organisations support the sharing and use of patient data that ultimately improves process performance, quality of care and patient safety.

65. Clinical information can be readily shared via standard electronic transactions, with all entities within health information exchange networks. This stage allows the healthcare organisation to support the true sharing and use of health and wellness information by consumers and providers alike. Also at this stage, organisations use data warehousing and mining techniques to capture and analyse care data for performance improvement and advancing clinical decision support protocols.

66. Equally there are over 50 Stage 6 hospitals throughout Europe all of which can be used as reference sites for organisations seeking to improve their current position. Some of these hospitals are in the UK and can clearly demonstrate extremely high levels of technology adoption.

67. For completeness set out in Appendix 1 is a description of stages 0 to 8 in order to provide an appreciation of the areas that HIMSS use across the globe to measure digital maturity and to emphasise to the Trust the art of the possible.

Aspiration and ambitions within and across the Trust

68. The Trust has a level of ambition based partly on its adoption of technology to date and partly on its experiences and knowledge of other organisations in the North West. The Trust recognises that IT enablement will play a critical role in helping realise the benefits associated with the current clinical strategy.

[15] HIMSS Analytics Europe supports improved decision making for healthcare organizations, healthcare IT companies and consulting firms by delivering high quality data and analytical expertise.
[16] Radboudumc Netherlands – Marina Salud, Departamento Salud Denia – University Hospital Hambourg

"We will deliver enabling strategies that support the implementation of our Clinical Strategy. Absolutely essential in this respect is improving our Information Technology Infrastructure and the use of new technology to innovate. This is a 'golden thread' throughout all of the above service development/transformation plans and aspirations."[17]

69. The development of new technologies, the demands for more integrated care across organisational boundaries and the increasing expectations of patients to be directly involved and informed in their own care, make this an ideal time to present a forward view.

70, The Trust is clear that central and pivotal to supporting clinicians and patients between now and 2020 will be the procurement of a new electronic patient record, both in a community setting (integrating with primary care and other community services) and in the acute setting (providing enhanced clinical decision support and supporting the seamless flow of patient information through the Trust.

71. The Trust is currently taking steps to improve its infrastructure and Informatics expertise in readiness for the EPR with an aspiration of being one of the most technologically advanced healthcare providers in the region.[18] Divisional and Directorate Business Plans currently describe a need to reduce manual processes, remove paper from clinical processes wherever possible and to have electronic records across the organisation within the next 5 to 10 years.[19] A significant proportion of this strategy relates to this improvement path.

72. There is a recognition within and across the organisation that technology can play a significant role in helping the Divisions and Trust meet some if not all of its current priorities for reduction to harms:

- Pressure Ulcer Reduction
- Reducing Falls
- Health Care Associated Infections, including sepsis mortality
- Medication related incidents
- Reducing Hospital Acquired Venous Thrombo Embolism (VTE)
- Mortality Reduction

[17] Trust Operating Plan 2015 - 2016
[18] Trust Operating Plan 2015 - 2016
[19] Children's services and Women, New Born and Sexual Health Services Business Plan

- Early detection of clinical deterioration

"*Having a clever strategy is not enough and successful organisations should proactively develop the internal capacity to implement change faster and more effectively than their competitors."*[20]

73. Colleagues in the Trust are more likely to understand and energetically support an initiative when they observe leadership behaviour that is both credible and supportive. Typically, assessing and developing the effectiveness of change leaders should be tackled once the shared purpose and intent of the change have been sufficiently defined. The Trust Executive Board in this regard has a unique set of responsibilities that include leading by example, having specific roles on the Transformational Board and generally speaking well of the programme.

74. Effective, early leadership from sponsors and change agents is critical in signalling clear intent, building momentum, raising credibility and overcoming initial resistance before early results are visibly achieved. This predominantly is the domain of the Trust Board, the Director team, Clinical Directors and all those with a responsibility for others.

75. Linking technology-associated change with financial recovery is almost as powerful as linking technology with an increase in patient safety. There is a small but growing body of evidence to support the notion that the organisations that survive in difficult economic times are the ones who successfully innovate. The SOC to support this strategy will make a best case that describes a robust return on the investment and at worst a case that describes a cost neutral transaction.

Emerging Technologies

76. There are many emerging technologies that will change the practice of medicine and nursing in the coming decade. Genetics and genomics, less invasive and more accurate tools for diagnosis and treatment, 3-D printing, robotics, biometrics, electronic health records and computerised order entry with clinical decision support to name but a few.

77. Wearable health technology is drawing serious attention in the press and for good reason. Such devices will likely transform medical care in unimagined ways, turning science fiction in science fact. By helping people lead healthier lives, manage chronic

[20] European Business Review

conditions and improve access to care, wearable technology can play a key role in reducing spend. The primary care system costs the UK taxpayer up to £52 billion each year, any technology that engages patients and helps them manage their own symptoms can make a significant difference.[21]

78. A recently commissioned report by Forbes[22] put diagnostic testing of basic conditions into the hands of patients: Close to 42% of doctors are comfortable relying on at-home test results to prescribe medication. Increase patient-clinician interaction – 50% of the doctors surveyed said that e-visits could replace more than 10% of surgery visits, and nearly as many patients indicated they would communicate with caregivers online.

79. Promote self-management of chronic disease using health apps: 28% of patients said they have a healthcare, wellness, or medical app on their mobile device, up from 16% last year. Nearly 66% of doctors would prescribe an app to help patients manage chronic diseases such as diabetes. Help caregivers work more as a team: 79% of doctors and close to 50% of patients believe using mobile devices can help clinicians better coordinate care.

80. The Trust will exploit a range of technologies whilst maintaining the principles set out in this paper the main and most important one being "*Every member of staff has access to the information they need, when they need it, and where they need it, without having to look for a piece of paper, wait for a computer or ask the patient or the patient's relative."* This will mean that a whole cadre of digital technology will be assessed and deployed in order to meet the individual needs of whole groups of users. These technologies will be assessed on their merits nearer the time of the EPR / EDRM deployment and go live.

81. Where possible the Trust will promote the use of devices that clinicians and others are familiar with and those that align closely with future working practices and patterns. It is likely that these devices will in the main be mobile or bedside devices rather than those that force the clinician away from the patient.

[21] PA Consulting
[22] Forbes Pharma and Healthcare

THE RESPONSE – HOW DO WE GET THERE?

The 9 delivery areas.

82. A critical part of the 'How do we get there?' question recognises what has already been done and what needs to be done. This is an entire programme of IT enabled modernisation managed across 9 delivery areas.

Underlying Infrastructure

Networks

83. Over the past few years the Trust has provided capital investment to underpins a robust network infrastructure. As an active Member of the wider North West Shared Infrastructure Services (NWSIS) group, the Trust is fortunate to have a robust and well managed Wide Area Network (WAN). This provides high speed fibre links to all 5 major hospital sites and over 30 other sites across the East Lancashire and Pendle areas. A diagrammatic representation of this can be seen at appendix 4. In addition to this, the Trust is able to take advantage of the NWSIS developed Community of Interest Network – (COIN) which links the majority of providers of NHS services across Lancashire, Pendle and South Cumbria.

84. This WAN is due for replacement during 2016 / 2017 and the Trust is working with NWSIS and the other partner organisations to specify, evaluate and procure a replacement or an enhancement should the existing supplier be retained. The opportunities for providing enhanced services to the clinical and operational teams due to this reprocurement are significant and working alongside Chief Information Officers (CIO's), Chief Clinical Information Officers (CCIO's) and other Informatics and clinical colleagues across the region, ELHT will ensure the optimum benefit is derived from this development.

Action – During 2016/2017 the Trust will work with NWSIS to reprocure a new/ enhanced Wide Area Network.

85. The Informatics teams have been gradually replacing the core network infrastructure of the Trust so as to offer high speed and reliable access to the operational and corporate teams. Whilst this has been relatively easy to facilitate in most of the new build areas (although some costs have been increased due to changes required within the PFI estate), challenges do occur where services are provided in older buildings, such as Accrington Victoria Hospital for example. The Informatics teams are committed to delivering a comparable level of service to these establishments, it is intended to review such provision in the next 2 years to ensure that parity.

Action – During 2016 / 2017 all networks in outlying ELHT establishments will be reviewed and plans for remedial action to enhance coverage will be presented to the Board for investment decisions.

86. In the meantime though, the Informatics team will, where possible, provide short term enhancements to the existing infrastructure until a longer term solution can be identified.

Wireless Access.

87. As part of the wider service delivery offering, the Informatics service has been installing wireless access points around the estate. Wireless networks are available on each main site with continued roll out where feasible.

Action – By July 2016 additional wireless access points will be installed in AVH prior to a wider network assessment.

88. 3 wireless systems are provided by the Trust, these are;

- Corporate Wi-Fi for Trust devices – available only to users of corporate devices. This encrypted system mirrors the ‘wired’ network for functionality and allows access to the full range of Trust services , across the estate.
- Clinicians Wi-Fi – available across the estate to registered clinical and operational users. This system does not allow access to the Trust systems, but provides unlimited internet access to users via their own devices. This system commenced roll out in February 2016.

- Public Wi-Fi – available in all public areas and on the paediatric wards (due to contractual restrictions from the Trust entertainment system provider). Members of the public are able to use unlimited free Wi-Fi after registering for up to 4 days.

  It is the intention of the Trust to invest further in wireless access points and provide uninterrupted signal across the whole estate where possible.

Action – During 2016 the Trust will continue the roll out of clinician Wi-Fi and enhance coverage and stability.

Action – During 2016 the Trust will increase the wireless access points across the estate and ensure coverage across all clinical and operational areas.

Data Centres and Servers

89. In 2014 an internal audit report indicated that the current primary data centre at the corporate offices at the Royal Blackburn Hospital required investment and relocation. During 2015, working with a range of suppliers, the informatics team have developed a robust plan to both move and enhance the Trust primary data centre. The new data centre will use the latest in hot / cold aisle (cooling) technology and be significantly cheaper to run than the existing centre. The Trust will also use the opportunity to provide faster network links to the main site and provide a location for a new storage area network, improved resilience in the secondary data centre and enhanced storage for disaster recovery on the Burnley site.

Action– By June 2016, the Trust will have moved its primary data centre to a new location on the main RBH hospital site.

Action – By September 2016, additional disaster recovery infrastructure will be sited at BGH.

90. The Trust has recently undergone a detailed assessment and analysis of its server environment and both its infrastructure and licencing requirements. Whilst this has had some revenue consequences due to new licensing models from Microsoft, it has allowed the teams to consolidate the technology into a more effective and manageable platform. Where possible, the Trust now uses ‘virtual’ servers, providing both resilience, flexibility and significant cost improvement. The new licencing models

also include ‘software assurance’ as standard which allows the Trust to upgrade to the latest versions of the software at no additional costs.

Action – During 2016 the Trust will review all its SQL (server) estate and where appropriate upgrade to SQL 2016.

Storage

91. As part of the previous audit, it was noted that the Trust was rapidly running out of storage space on its file servers, which not only reduced the availability of storage for clinical applications (i.e. to store images / documents etc.), but also affected system backup, file deletion and application running speed. Measures have been taken to reduce the demand for storage e.g. email archiving, removal of ‘deleted items, all staff email re personal document stores etc.), but a more permanent solution was required. A range of solutions have been assessed and working with colleagues at Lancashire Teaching Hospital a solution has been found (and procured) that provides both ample storage, the ability to ‘flex’ storage as and when required, technologies to reduce the necessity for multiple copies of the same file and the ability to collaborate on resilience and security with other NHS providers, thus supporting a wider future pan Lancashire solution.

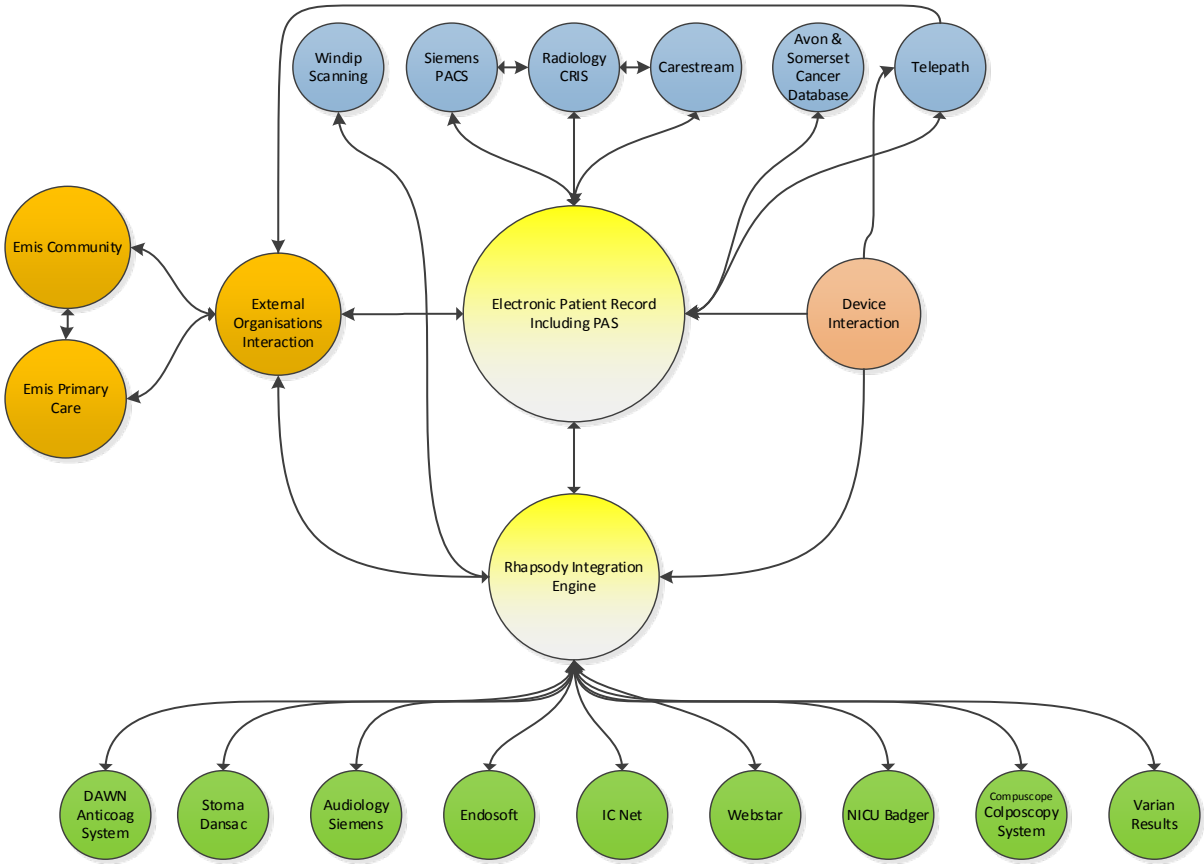
Action – By November 2016, a new Storage Area Network will be fully installed and operational at ELHT.

Systems

Electronic Patient Records

92. ELHT currently has 24 key standalone clinical IT systems including a legacy Patient Administration System (PAS) initially installed in 1986 and a significant number (circa 100) bespoke databases, spreadsheets and the like held within local clinical teams and services. This can be likened to the model described in the Five Year Forward View as ‘letting a thousand flowers bloom’ whereby systems do not talk to each other, and where there has been a failure to harness the shared benefits that come from interoperable systems.

93. The case for change is well made in both the recently produced ePR strategic outline case and the Feb 2016 – ePR outline Business Case. Perhaps the most fundamental change to impact upon the information and clinical environment for some years wil be the procurement and implementation of an integrated electronic patient record. The diagram below provides an ilustraiton of the potential architecture of the system:



94. The timetable for procurement and implementation is set out in the OBC, however, this is dependent upon financing and associated cultural and technical preparation to ensure successful delivery.

Action – By March 2017, ELHT will have identified a preferred supplier for the new integrated ePR.

Action – By April 2018, ELHT will replace the existing PAS system and begun to implement integrated ED systems, patient flow management, order communications, outpatient booking and operating theatre management modules.

Action – By April 2019, ELHT will begin to implement clinical decision support and the electronic capture of clinical notes.

Action – By April 2020 , ELHT will no longer use historical paper notes.

Community Systems

94. ELHT Community Services have historically recorded activity on a legacy PCT Community PAS System (CPAS). Due to the expiry of the Local Service Provider Contract (LSP contract) in July 2016, the current system enables the trust to record activity but will never remove cumbersome paper records from the services. As a result of this a decision was taken to procure the EMIS Community system.

95. The new system will enable the trust to be build a community electronic patient record for community teams, using easily accessible electronic records with the ability to share real-time patient records between primary and secondary care.

Action (PAS replacement & set up data sharing agreements) –by 30th June 2016 the Trust will have completed roll out of PAS functionality, completed PC Refresh, have 100% sign up of data sharing agreements with GP's across local CCG's activated, and ensured all services can order and receive results into EMIS from ICE Desktop

Action Phase 2 (Evaluation of EMIS for non CPAS Services) will be completed by September 2016

Action Phase 3 (Clinical Template & Mobile Access) – will be completed by 30th June 2017 which includes, testing and roll out of mobile devices to support clinical recording of data and roll out clinical capture template building (removing paper records).

Legacy Systems

96. Whilst acknowledging that a future electronic patient record will remove the requirement for a number of the Trust existing systems, some specialist systems will remain in place. Each existing system will be reviewed in light of the successful procurement and evaluation of functionality, migrating to the new EPR where possible.

97. Where departmental (specialised) systems remain, the Trust will ensure that these are correctly interfaced (bi-directional) to the new EPR to minimise duplication of effort and provide a seamless patient record.

Existing Systems

98. The Trust we will continue to support existing systems, ensuring that they are supported and developed, providing 2 bi-directional interfacing as required to support clinical practices.

Action - By December 2016, a full systems review/comparison will be undertaken as part of the ePR procurement and a final decision made on which systems can be removed.

Electronic Patient Tracking Systems

99. In 2008 the Trust introduced a pilot Electronic Patient Tracking System (EPTS). Since this time the system has 'evolved' into a Trust wide system, with varied usage and functionality. However, the importance of such a system is accepted across the Trust and the opportunity to revisit, upgrade and relaunch is being taken during 2016 and 2017. Alongside this new functions will be introduced, new technologies deployed and new ways of presenting data will be examined. This will be a structured programme, lasting for 2 years and overseen by a distinct project group reporting to the eHealth Board. There are a number of key deliverable which form part of this strategy.

Action - By July 2016 – the current EPTS system will be upgraded to version 3 with a two way interface to PAS being developed.

Action – By August 2016, Version 3 of EPTS will be rolled out and used across the estate in real time.

Action – By January 2017 all current nursing electronic assessments will be integrated into the ePTS solution.

Action – By April 2017, Medical Early Warning Scores will be captured and displayed via the ePTS system

Action – By June 2017 – nursing observations will be captured using the ePTS system.

Clinical Portal

100. The previous Trust Informatics strategy was focussed upon the development of a 'Best of Breed' approach whereby multiple systems were presented in a single portal to operational staff. Whilst the new ePR strategy has superseded this, there has been a significant amount of positive development done with the clinical portal which is now proving useful in clinical environments. Not only does the portal provide access to GP records, a subset of PAS data, access to digital dictation, Ice and PACS access, new functionality has allowed the Trust to build data capture forms to support practice. As a tactical solution, before the full implementation of ePR, the intention is to continue to support this approach. Firstly with the development of eCas Cards for the Accident and Emergency Department and thereafter other patient data capture applications as defined by the eHealth Board. The transition of the portal to ePR will be considered by the eHealth and clinical reference groups during 2017 / 2018.

Action – By January 2018, the Trust will have a defined strategy for the use and migration of the Clinical Portal during the implementation of the ePR.

Electronic Prescribing and Medicines Administration

101. Working with Egerton Medical Information Systems (EMIS), the Trust has been implementing electronic prescribing and medicines administration (ePMA) across clinical areas in the Trust. Progress has been relatively slow, due to a range of factors including system speed and operational functionality. However, the feedback from the wards deploying the system has been on the whole positive, with most areas not wishing to return to paper systems. Alongside this, deployment of the system has provided significant benefits due to the ability to interrogate the data relating to medicines administration such as monitoring missed doses, antibiotic

stewardship and supporting discharge medications. Some work still needs to be done with the system and this is ongoing. The intention is, though, to continue roll out of the system, once enhanced functionality promised for the system in terms of usability and speed are embedded. The choice of ePMA system has been influenced by the fact that the same platform is used within the Pharmacy Department allowing a direct link between Medicines Management and Stock control and the prescribing and administration of the products, leading to efficiencies in stock control and procurement.

Action – By May 2016 the Trust will deploy an updated version of the ePMA software which will include interactive medication charts and speed enhancements.

Action – By June 2016, the Trust will begin to extend the roll out of ePMA to the ICG Division and other sites across area.

Action – By August 2017, ePMA will be rolled out across the whole of the Trust estate.

102. Development of the Trust electronic patient record will have an impact upon the deployment and operation of the current ePMA solution. There is no doubt that the implementation of ePMA is a valuable and vital tactical solution to both improve patient safety and prepare the Trust for a more integrated solution. Given the timescales for the procurement and implementation of the ePR it is unlikely that the current ePMA solution will be replaced or integrated into the ePR itself before 2019 (as PAS replacement is the initial priority). A final decision relation to the future of the current system within the ePR will be made in by April 2018.

Action – By April 2018 a decision relating to the future of the current ePMA system will be made and a detailed plan re its future operation / migration will be published.

PACS services

103. The current Picture Archiving and Communications System (PACS) is supplied by Siemens Healthcare Limited and is part of the wider Managed

Equipment Service (MES) delivered as part of the wider managed services arrangements under the Trust PFI deal. This arrangement allows for upgrades and updates to the system as part of the life span of the contract. Since the deployment of the initial PACS system, there have been a number of issues relating to image retrieval, system stability and software functionality. Working with Siemens Healthcare, the Trust has agreed a network and storage upgrade and enhancement package which will demonstrate significant improvements in PACS resilience and functionality, moving towards a 'world class' product.

Action – By August 2016 – A new Vendor Neutral Archive (VNA) will be built by Siemens.

Action - By July 2016 – A new 10gb dedicated PACS only network will be constructed and deployed to the Trust.

Departmental Systems

104. The Trust will continue to support specific departmental systems during the length of this strategy. However, when systems are due for renewal, or if the functionality identified in the ePR will fully meet the requirements of the department, it is the intention to review the system and decide on a migration path (if appropriate) to the single ePR. The principle of the ePR is that as far as possible, unique departmental systems will be absorbed into the ePR with only those that the ePR cannot replicate their functionality sitting outside.

Action – By April 2020, except in exceptional circumstances, all unique departmental systems will be replaced by the ePR.

Office systems

105. In March 2016 the Trust signed a 3 year contract with Microsoft to continue to supply Windows and Office based products to the Trust. The Trust is currently licenced for

5900 individual devices and 400 Office 365 products. With a user base of around 8000 staff the option for individual licencing of products would have added significantly to the annual costs for the Trust. As part of the previous PSA 12 agreement, the Trust is able to continue to deploy Microsoft Office 2010 into areas at no additional costs. However, as Office software moves on, the opportunities for providing enhanced functionality (cloud services, integration with other applications, etc) within the office type software will be reduced. The Trust will need to continuously review its system requirements as services develop and requirements change. The nature of the new licence agreement with Microsoft allows for an annual review of requirements and the ability to flex the contract to meet these new challenges. The development of a virtualised environment in the future (as mentioned in the user computer interface section of this document), necessitates a complete review of the licencing model as the current model does not clearly fit with this new approach. As new technologies and operating systems are developed, for example open source software, cloud based operating systems and storage the current strategy of single vendor procurement for such office systems will need to be reviewed.

Action – In March 2017 and March 2018, the current Microsoft licensing model will be reviewed and licensing requirements adjusted accordingly.

Action – In March 2019 a new contract will be signed with a relevant software supplier which provides for a range of office and operating system requirements required by the Trust.

106. In addition to this, the current blanket coverage policy for office systems, whereby every computer gets a similar build and level of functionality, is neither sustainable or efficient. In the future system builds and machine deployments will be based upon the requirements of the service.

Action – By January 2017 a new policy relating to the base offering of PC's and systems will be produced and deployed.

Mobile and remote working

107. The ability to work from multiple device, but maintaining the same working environment is expected, not desired. The ability to work from anywhere at any time

will assist in making the ELHT workforce more productive, creative and effective. By focusing on the Trust mobile working system and ensuring it integrates with any end user device of our choosing whilst maintaining a high level of encryption on the device and in flight to another device.

This not only gives ELHT the flexibility on where and how they work, but it is also a major contributor to moving towards a paperless environment.

Action –By July 2016 the Trust will upgrade ELHT's Airwatch Mobile Device Management System

Action – By September 2016 the Trust will implement Secure Content Locker (Corporate Drop Box)

108. The Trust will continue to support the use of mobile devices (tablets, iPads, Smart Phones), but this will be in managed environment. In addition to this, there are licence implications relating to access to email via these devices and other back end and patient centric systems. In order to facilitate these innovations, the Trust will develop a 'Bring your own device (BYOD)' strategy whilst, alongside this, enhancing the use of Trust owned mobile devices to facilitate care delivery.

Action – By April 2017 the Trust will have signed off a comprehensive BYOD policy and implementation plan.

Action – By October 2016 all Trust mobile devices will operate in a secure environment with an identified range of specific applications targeted at enhancing care delivery and patient safety.

Unifed Communcations

Telephony

109. ELHT currently run three telephony systems, BT iSDX, Meridian iSDX and Cisco Call Manager. The BT and Meridian systems are what are referred to as Analogue Private Business Exchange (PBX) and are over twenty years old. The functionality of these two systems is limited to mainly sending and receiving calls.

110. The Cisco Call Manager is referred to as a Digital PBX with enhanced functionality which will allow the system to integrate into our NHS neighbours telephone systems which will give the Trust the ability to login to any Cisco phone around the area with their own extension number, link into Video Conferencing suites,act as the infrastructure for enabling Telehealth, interlink with Active Directory to enable cross site extension mobility and a whole lot more. It is this technology that ELHT will be investing in to stay ahead of the technology curve.

111. To ensure continuity of service in the event of a network outage one of the Meridian switches will remain in service to act as an emergency phone in key locations. The remainder of the analogy systems will be decommissioned.

Action – By June 2016 the Trust will upgrade the Cisco Call Manager to the latest stable version.

Action – By September 2016 the Trust will implement extension mobility locally and externally with agreement from our NHS neighbours.

Action – In October 2016 the Trust will start the decommissioning work of the Analogue systems.

Mobile Telecoms

112. ELHT has two mobile phone contracts. All the Trust smart phones and devices are managed through Airwatch Mobile Device Management (MDM) Software.

113. The Trust has lone workers, working right across East Lancashire which is largely rural, therefore good signal coverage is essential to ensure the safety of our staff. One provider currently has the largest coverage in our area and has won the emergency services contract for the UK which commits that service to covering 90% voice and data and 99% voice only coverage by 2017. It is based on these facts that

it is the Directorates intention to move the Trust to single mobile phone contract with this provider.

Action – By May 2016 the Trust will make a direct award for mobile phone / smart device contacts to *a* single provider.

Email, instant messaging and Presence (Video)

114. In late October 2015 ELHT implemented Lync IM&P commonly known as Skype for business. Currently the system is setup for internal use only. 2016 will see a focus on opening up access to other organisation both public and private and to the general public. By opening the door to direct communication via video, voice, or instant messaging between a patient at home and a clinician, moves the ELHT a long way down the path to meeting the governments objectives of moving care back into the community.

Action -By May 2016 the Trust will implement an Edge Server to facilitate communication to other organisations and the general public.

Action - By June 2016 the Trust will implement an Expressway Gateway to enable communication between Cisco IM&P and Microsoft IM&P

Bleep and Pager Systems

115. The main communication method for alerting and contacting clinical staff and senior managers, is the Trust Bleep and Pager system. Purchased 10 years ago the system is reliant upon an analogue radio system, using large antennae on each hospital site. Whilst currently safe and functional, this system does not support the myriad of digital innovations currently available to health care organisations to help support the delivery of care and enhanced communications.

116. The Trust is fortunate that it is now almost entirely covered with a wifi network, through which data may be sent to enhance paging and messaging services via smart devices. The Trust is committed to ensuring that clinical staff have

reliable access to information to support care and effectively coordinate response in times of need. It is the intention of the Directorate to explore further the opportunities for using the emerging digital technologies and working with senior clinical and operational colleagues, present a business case for the replacement or enhancement of the current system.

Action – By November 2016, all current providers of paging and messaging systems will have been contacted and presented enhanced alternatives for paging and messaging to the Teams.

Action – By April 2017, dependent upon an investment business case being accepted by the Board, a new paging system will be in operation across the Trust.

User Computer Interface

Desktop and Virtual Desktops

117. Like all NHS organisations, the PC and desktop estate has 'evolved' rather than been part of a planned expansion and upgrade. With currently 5900 devices operating in the Trust across all hospital and community site, managing and updating this diverse asset can be problematic. Whilst the service deploys software 'agents' to deliver upgrades etc, some of the machines require physical intervention. Trust staff often express tension where machines either take too long to start, work slowly or do not have the correct configuration to run particular software configurations. It is the intention of the Directorate to develop a solution that allows roaming profiles (ie users have the same desktop from every PC), rapid startup and access, enhanced remote working and 'hot swappable' machines should a particular unit fail without intensive engineer support. The use of a Virtual Desktop environment (VDI), will support the Trust in this journey. However, transition to this state is both costly and technologically challenging and requires a degree of 'housekeeping' before being implemented.

118. Currently ELHT has 2965 PC's still on Windows XP, this not only creates a threat to our Trust, but to all Health Care organisations connected to the NWSIS CoIN. An aggressive upgrade path from Windows XP to Windows 7/10 will need to be

undertaken to ensure the safety of the Trust digital information, assets and giving assurances to the other organisation on the CoIN that ELHT is not a security liability.

119. Once ELHT has moved to a secure stable end user computer platform can the focus change to offering our users greater flexibility by moving to a virtual desktop environment supported by single sign on.

Action – By June 2016 the Directorate will engage with external providers to cost out a managed migration.

Action – By November 2016 a 200 client based VDI pilot will be in operation across selected operational directorates.

*Action – By April 2017, fo*llowing the VDI pilot, a decision will be made and costed to move *the solution further into the ELHT estate*.

Action – By April 2018, a VDI environment will be fully rolled out across the ELHT estate.

Clinical Environment Displays

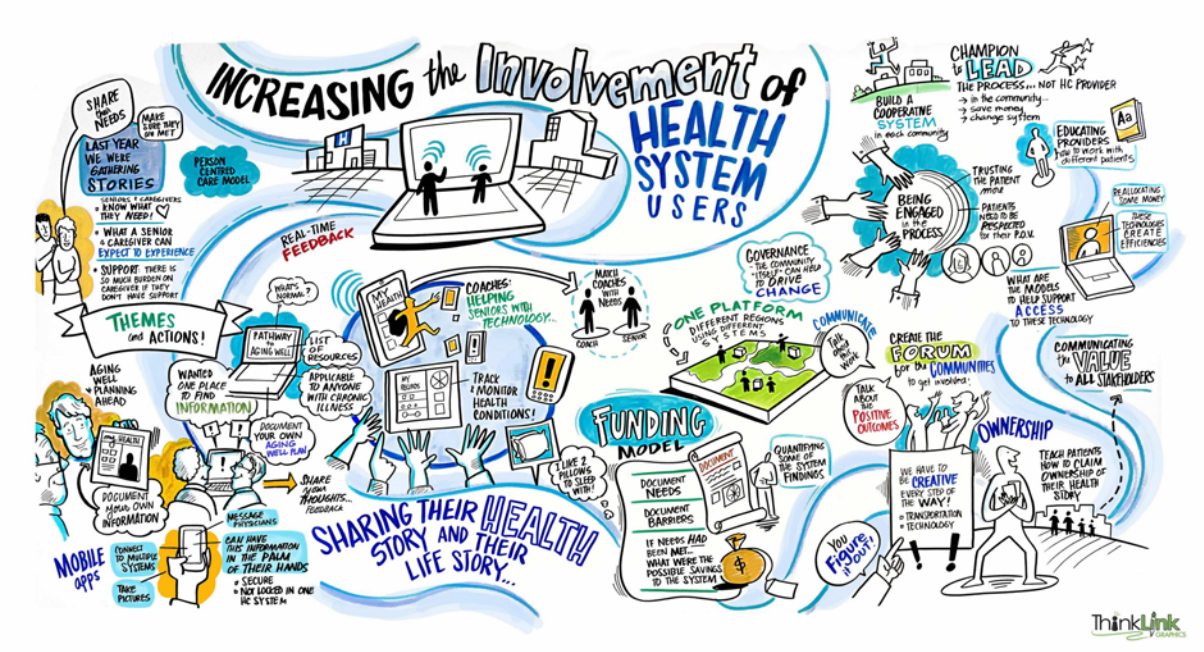
120. As the Trust moves towards a more 'digital' environment, there is a requirement to communicate specific elements of information to the wider operational teams within the clinical areas. There is ample evidence that interactive display in clinical areas improve access to information and data. It is the intention of the Directorate, working with clinical and operational colleagues to install interactive displays in all clinical areas, starting with ward areas. This will allow real time access to electronic patent tracking systems, patient information (with due regard to confidentiality) and provide facilities for training and service reviews. The directorate is also keen to explore the use of short throw projectors for areas that require a larger display and enhanced training facilities.

Action - By August 2016, all wards will have a touch screen display and micro PC wall mounted with wireless access to Trust systems.

Action - By April 2017, all other clinical areas, requiring interactive displays (following assessment) will have them installed and operational.

Patient Facing Interfaces and clinical support.

121. Information systems are seen as the key enabler in ensuring that patients are at the centre of the care relationship. Never before have patients been able to use information to the degree they can now in both informing health professionals of progress, engaging with services and making informed decisions about their own care. This is clearly demonstrated in the graphic below, developed by the Change Foundation (2014)



122. The Directorate is committed to building and supporting these relationships and interfaces. Central to this, is the development of the ePR, however in the meantime there is a range of initiatives that the Trust will be engaged in the support these developments (alongside that done by the Lancashire Digital Health Board and the Pennine Lancashire teams).

Action – During 2016 – 2021 the directorate will work with the Trust patient engagement teams to provide informatics links to patient services and information.

Action – By January 2017, the Trust will publish real time activity and quality information on its external facing website (including waiting times at Trust facilities across the area).

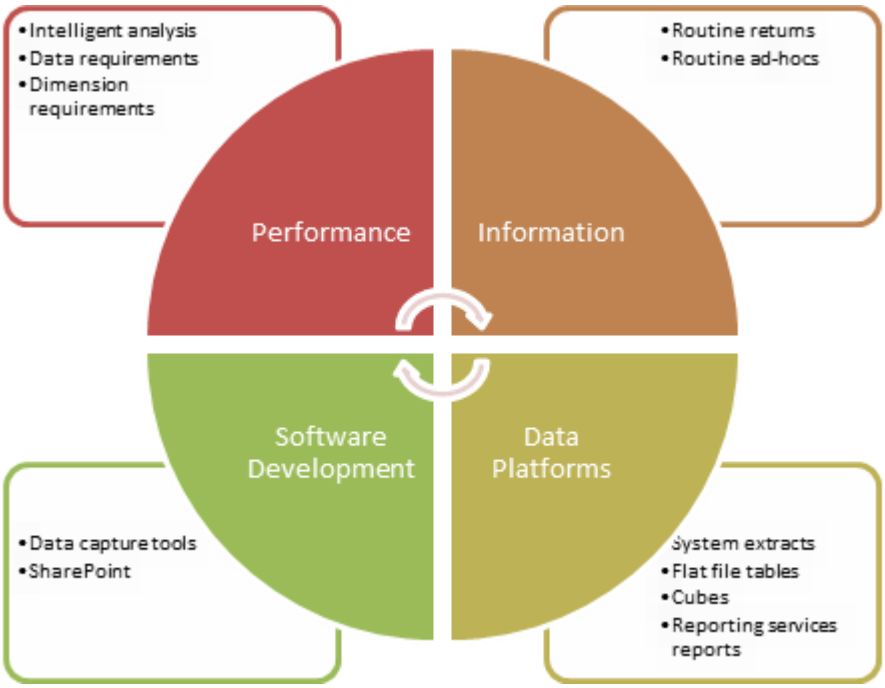
Action – By July 2017 – the Trust will demonstrate the EMIS patient portal for all community services and roll out as appropriate.

Action – By April 2019 – All patients will have on line access to a range of booking and information services directly related to the new PAS and ePR systems.

Information Management

123. The management of information and performance has been centralised into one team during 2015/16. This now provides a single point of contact for data capture, data warehousing, reporting and performance management. The teams are split into four key areas:

- Corporate information
- Performance management
- Data platforms
- Software development



124. The procurement of an electronic patient record in 2017/18 will have a significant impact on the role of information management. The team are currently part of the group reviewing systems and will be involved throughout the life of the project.

Action – By June 2016 the Directorate will have aligned the workforce to ensure that the differing requirements of each Division are effectively serviced.

Action – By March 2017 the directorate will have planned the resource and structure needed to support the implementation of the ePR

National returns and commissioning data

125. The corporate information team are responsible for the management of routine information flows. This ensures that all mandated and local information flows are managed by a standard process including data quality checks and timeliness management.

126. The majority of national submissions are through the department of health online Unify2 tool. All contracted data flows from schedule 6 are reviewed monthly with the commissioners at the contracting and activity sub group.

127. The National and contracted data flows have a robust process with no significant issues escalated through 2015/16. The local internal data flows are undergoing review and enhancement. There are some improvements that can be made to rationalise the production of data flows which will be supported by the improvements in the data warehousing and information areas.

128. The implementation of the ePR will have some impact on the assurance and capture of data but the data flows will still need to be maintained and managed.

Action – By June 2016 the team will formalise all current local data flows managed by the department.

Action – During 2016/17 all data flows will be reviewed and automated were possible

Action - During 2017/18 appropriate data flows will be migrated to the ePR, maintaining the automation were possible.

Analytical support for services

129. The Trust analysts were transferred into the central team early in 2015/16 to ensure a consistent resource was available to all services. The Divisions have a dedicated named information and performance manager that attends relevant meetings to present and support information. Over the last year the team have been reviewing the work the analysts have been producing, to further understand the needs of individual services and the similarities of each.

130. The team is now reviewing the demands of the service and whether the structure of the four teams is appropriate to service the requirements of operational and corporate teams. It has been initially identified that some highly skilled staff are producing routine work (which could be done either automatically or by other staff), there is requirement for dedicated contracting analysis and a gap have been identified relating to a quality improvement analyst for detailed statistical analysis.

Action – By June 2016 one post from corporate information will be transferred to the data platforms team, dedicated to the automation of routine data flows.

Action - By June 2016 the extension of a corporate information analyst role to a dedicated contracting analyst to support the production of contracting data and the direct support of contract queries will be completed.

Action - By April 2016 the team, working with the clinical governance team, will investigate the resourcing of a dedicated quality improvement analyst to support specific quality improvement projects.

Information access and portals

131. There is a requirement for information self-service and interactive reporting identified across many areas of the Trust . This requirement is supported by the informatics teams who are developing reports using new technology and approaches. Previously, however, the creation of reports was unstructured and a substantial unmanaged list of data sources, online reports and self-serve data existed across the organisation. The Directorate is in the process of reviewing all of the current report offerings and planning the migration of these into a single unified, clear and concise platform. This single point of access will have information and links to reports grouped into relevant areas. The current systems of data presentation and analysis within the Trust have limitations in relation to their drill though capability and visualisation of information, during the next 12 months the teams will, working with operational managers and clinicians, review options for presenting data in a more interactive manner.

Scorecards

132. Specific pre-built scorecards are being developed which contain an agreed selection of measures at an agreed level of detail. The scorecard will have a standard look and functionality including the capability to display a suite of graphs for the each measure. Each measure will be part of the assurance framework which will include a detailed specification. These will support Trust committee meeting, Divisional

performance meetings, projects and all other requirements where a fixed measure needs to be monitored.

Online reports

133. Dedicated reports that allows the end user to investigate the data within a controlled environment have been produced. These reports will support numerous trust areas that require further 'drill down' into specific areas. Where possible the data will align with the assurance framework and have signed off measures.

134. The majority of these type of reports are current operational reports used across all services. There are currently over 700 online reports that need review and migration to the new data warehouse structure.

Excel reports

135. There will be dedicated excel reports utilising data directly from the data warehouse and taking advantage of functionality in excel. These reports will be accessed through the single point of access but local copies can be stored. Although similar in functionality to the online reports they allow us to provide a much wider scope on data items and interactivity. The majority of these reports will use data from a 'cube' which will provide specific data set with agreed calculated fields and filters. This will allow the detailed analysis of the specific area while removing the complexity of joining data together and creating calculations.

136. As part of the review of the current online reports were appropriate reports will be migrated into excel reports.

137. The implementation of the ePR could have significant impact on the operational reports as this information would be directly accessible from within the ePR. Once the system has been agreed the team will review which reports will need migrating and which can be archived.

Action – By June 2016 the Trust will go live with the single point of access

Action – By June 2016 the Trust go live with the score card system

Action - During 2016/17 the Trust will migrate all measures to the score card system ensuring all measures are fully documented

Action - During 2016/17 the Trust will review and migrate all online reports to the new data warehouse structure were appropriate

Action - During 2017/18 the information team identify which reports will not be available directly from the ePR

Action - during 2016 the team will review options for the visualisation and presentation of information.

Data warehousing

138. This is the underlying structure to all of the reporting requirements. The data warehousing team have made substantial progress during 2015/16 to develop a reliable structure however a system of this size and nature is complex and although not yet complete work is progressing well. The team review the planned warehouse build and prioritise this alongside the requirements of the clinical and operational teams. The build requires incorporation of all the Trust systems that data is required from for reporting and monitoring purposes. For each system an understanding of the underlying data structure is necessary and the ability to draw this into the DataWarehouse through a reliable process required. This data then needs processing to make it available for any reporting requirements.

139. The team is 'future proofing' the data warehouse by producing complete data dictionaries and developing the structure based on Trust requirements instead of system outputs.

140. The full impact of an ePR will be to accounted for when a specific system has been identified. It is anticipated that the majority of data flows will migrate from current systems to the new ePR ensuring the continuity of reporting.

Action - By June 2016 a detailed plan of all systems, data tables and cubes that will be required for reporting will be produced.

Action - During 2017/18 all data required to support the ePR will be migrated to the new system.

Benchmarking services

141. The Trust is currently engaged in a procurement exercise (March 2016) to purchase a clinical benchmarking tool benchmarking tool. The requirement is to procure a system that supports both the Trusts high level benchmarking requirements and individual clinical team needs (specifically focussing upon outcomes and revalidation).

142. This procurement is led by a project group which includes clinical, divisional, procurement and corporate representation. The group have developed an Output based specification for the system of essential and desirable requirements and will be choosing a compatible system following representation by the suppliers during 2016. Recognising the importance of having a longer term relationship with suppliers, the challenges of implementation and the requirements to obtain the best value for money, the Trust will be looking at a long term (5 years) investment and commitment. Upon selection and contracting the teams are committed to ensure the benefits are realised by fully utilising the functionality, supporting divisional use and maximising the support from the supplier.

Action - By August 2016 a preferred supplier of benchmark services will be identified

Action - Ongoing from August 2016 a benchmarking group will be set up to ensure the system is fully utilised and embedded within the organisations reporting structure

Clinical Coding

143. The Clinical Coding department currently uses the paper case note to code approximately 170,000 Inpatient discharges per year. Clinical data must be accurately and consistently recorded to well defined national standards to enable it to be used for statistical analysis and to enable payment through pBR. Information drawn from accurate Clinical Coding better reflects the pattern of practice of Clinicians and provides a sound basis for the decision making process.

144. Accurate documentation, clinical engagement in the coding process and robust Clinical Coding audit / training programmes are key to ensuring that the trust is able to provide accurate and timely clinically coded data. Over the past twelve months the department has looked to increase its establishment in order to provide; audit, training and clinical engagement functions, whilst also continuing to meet pBR deadlines and achieving Level 3 IG Toolkit scores in the most recent IG Toolkit external audit.

145. Coding from electronic systems provides significant opportunities to improve the documentation and share information more easily. By 2020 SNOMED CT will have to be embedded into electronic systems. This means the coding process can be started at the point electronic documentation is created. The potential for clinicians to be more directly involved in the coding process and the creation of an EPR containing; accurate, complete and timely data, will mean the Coding department needs to adapt. The most important part of this adaptation will involve improving its coding audit function in order to support future coding systems and ensure the trust continues to produce accurate and consistent coded data to support statistical analysis.

Action – By April 2018, the Coding department will be coding 25% of in-patient activity using current electronic systems. By 2020, all coding to be done from EPR.

Action – From December 2016 the department will aim to provide a robust Clinical Coding audit / training programme that incorporates clinical input into the audit process. Both programmes will be adapted to meet the demands of the EPR introduction in 2018.

Action – From April 2016, the Coding department will continue to involve clinicians in the coding process and engage with them in regards to electronic coding solutions. The department will also support the introduction of automated electronic coding solutions in the medium term (post 2020).

Governance and Security

Information Governance

146. Information Governance (IG) is key to the successful procurement, delivery and running of systems. This is because effective IG delivers assurance around the handling of information and data by staff, by I.T systems and related processes. ELHT has been building up it information governance function so that it is embedded in the delivery of all projects and programmes. This means it is now mandatory for all informatics programmes and projects to complete Information and information security risk assessments at the start and to consider and mitigate any information security and management risks. IG assurance also extends to the use of correct project and programme management methodology as this is central to information risk and assurance. To this end guidance has been produced for project managers on good project management practice and ensuring quality. Given the importance of IG this is seen as area for action and where additional resources will need to be reallocated compared to other areas in informatics.

Action – By April 2017, all Information security policies will be reviewed and updated

Action – By April 2017, all procurement terms and conditions for procurement, delivery, running and decommissioning of systems that deal with Information will be review

Action – By April 2017, guidance for individuals and department to support the compliance agenda additional bespoke guidance will be published.

Action - During 2017-18 pre and post-delivery project assessment to ensure adherence to quality and IG compliance standards will be introduced

Action – From April 2016 all potential system purchases will need to pass through a full information security assessment and have conformance approved by the Information Security sub-group of the E-Health Programme Board.

Cybersecurity

147. Today's world is more interconnected than ever before. Yet, for all its advantages, increased connectivity brings increased risk of theft, fraud and abuse. As the NHS become more reliant on modern technology, the Trust also become more vulnerable to cyberattacks such as information security breaches, spear phishing, and social media abuse. Working closely with HSCIC's Care Computer Emergency Response Team (CareCert) ELHT will embark on a major review of its information security, policies, processes and training to ensure the Trusts information is only accessible to authorised persons and our staff are trained to identify potential attacks and have a clearly defined escalation path into IT and Information Governance.

Action – By May 2016 an Information Security Group to monitor and advise on all matters of Information Security will be implemented.

Action – By May 2016 a dedicated Asset & Information Security Officer post will be created.

Informatics Skills Development Network (ISDN) Accreditation

148. The Trust is an active member of the ISDN, part of the North West Skills Development Network which also incorporates Finance (FSD) and Procurement (PSD). The network is funded by North West Organisations and its aim is to deliver excellent value for money for NHS organisations across the North West on a range of learning and development activities.

149. In 2014, the network developed an overarching accreditation model to measure the effectiveness of an informatics organisation in working towards becoming an excellent learning and development service. The accreditation model is based on a series of standards for informatics departments, including development pathways for informatics staff as agreed by ISDN Strategic Group.

150. The Trust has undertaken an initial gap analysis against the accreditation framework, with initial assessment by the ISDN accreditation leads planned for June 2016 with a view to completing the final assessment by November 2016.

Action - By April 2017 the Trust Performance and Informatics Teams will be ISDN Accredited.

eHealth and Clinical Reference Groups

151. Central to any informatics development in the Trust (and any service for that matter), is the active engagement and involvement of clinical and operational staff. Previously in many organisations, informatics developments we're progressed with the main drive being from the IT department rather than the clinical teams. These developments had limited success and in almost all cases withered after a relatively short period of time. The input and ownership of operational staff cannot be understated or underestimated. To that end, the prominence and influence of the eHealth Board and the Clinical reference groups at the Trust is being significantly strengthened and enhanced. In the future these groups will always be chaired by a practising clinician or operational lead and as from 1st April 2016, no significant procurement decision or informatics initiative will be taken or commenced without the express permission or support of these groups.

Action – As from April 2016, no significant procurement decision or informatics initiative will be developed without first being supported by the eHealth Board.

Action – As from April 2016, no clinical software (including ePR) will be purchased without the support of the Clinical Reference group.

152. To further support the prominence of these groups, as from March 2016, the eHealth Board will report all minutes to the Trust Finance and Performance Committee.

153. In addition to this, the Trust will continue to support a full time Chief Nursing Information Officer and a part time Chief Clinical Information Officer. The Trust will also explore the addition of Divisional Chief Clinical Information Officers as the informatics agenda moves forwards towards full ePR.

Development

Software development

154. No one solution bought 'off the shelf' can hope to meet all the requirements of a complex organisation such as ELHT. There is a requirement to develop small 'bespoke' solutions (which integrate with the wider systems), to deliver to specific challenges. The software development team, provide this facility. Using a range of industry standard tools, the team will, if required, create unique solutions to the specifications agreed with services. However, ultimately, it is intended that these unique solutions are kept to a minimum as software suppliers develop open API's (Application programme interfaces – connectivity), open source solutions and mobile applications. These will allow enhanced integration and a reduced reliance upon complex 'from scratch' developments.

155. The software development team are creating data capture solutions to support the Trust until the full implementation of an ePR. The majority of developments are to support clinical care that ELHT current systems do not have the functionality to capture. The biggest projects are the agreed care bundles and the accident and emergency complete electronic record.

Action - during 2016/17 develop and implement a complete accident and emergency electronic casualty card.

Action - during 2016/17 the software development team will develop and implement a range of agreed electronic care bundles

Action – by April 2018, the software development team will be trained in new programming interfaces and the use of the preferred ePR supplier forms creation software.

Service development and education

156. The Directorate is committed to continuously developing its staff and thereby its offer to the clinical and operational community. 2015 / 2016 saw the introduction of an apprentice scheme in the department with the teams taking on pre and post graduates from local universities for the first time for long term placements.

157. A range of staff in the teams have access to over 3500 online training courses and this access is set to increase during the next few years. The Directorate actively supports staff in continuing professional education and is committed to continue this moving forward.

158. The new licence agreement with Microsoft allows access to a range of training resources, not just for Performance and Informatics staff but also all staff in the Trust.

Action – By June 2016 – working with the Learning and Development team all ELHT staff will be made aware of free Microsoft training available to them.

Action – between 2016 – 2021 the Trust will continue to work with local educational institutions to provide support for trainee programmes and seize opportunities for service development based on best practice and feedback.

Health Economy Integration

Sustainability and Transformation Plans

159. ELHT will be part of the Lancashire and South Cumbria Sustainability and Transformation Plan (STP). This is line with the Healthier Lancashire transformation programme. Within Lancashire and South Cumbria there are five health economies. ELHT is part of the 'Pennine Lancashire' health economy.

160. Lancashire and South Cumbria has some significant issues of health inequality with an average life expectancy which is significantly worse than the national average. It is recognised that the majority of the required transformation will need to be owned and driven within these health economies. There will be a need in some areas to transform service across Lancashire and potentially beyond.

There are 3 key objectives;

161**.** **Financial improvement -** It is estimated that there is a recurrent resource gap of £800m facing the Lancashire health and care community over the next five years (£250m in Pennine Lancashire, £100m in ELHT). The intention is to close this gap by greater standardisation of clinical processes, by rationalising our estates and continuing to transform our workforce.

162. **Access standards –** With the exception of the four hour standard, ELHT performance is robust. In the course of 2015-16 the Trust has altered the acute pathway which has seen a marked improvement in performance, the Trust needs to continue to drive improved access to out of general hospital beds and find more resilient solutions to workforce needs. Improvements to seven day services will continue to help (particularly in weekend diagnostics) and the ability of partners to provide an equality of services through the entire week.

163. **Transformation –** As a health economy the variability of the services that are provided and the duplication across a range of providers across health and care is problematic. The Trust is keen to accelerate transformation in those areas where it is pragmatic to do so. Programme Management Offices have been established at organisational, area and County level. The case for change has been described and services are now entering the 'solutions phase'. This is likely to lead to a consultation phase in 2017 followed by implementation from 2017 through to 2020.

Local health and care system vision

164. The Pennine Lancashire leadership (ELHT, ELCCG, BWDCCG, Lancashire Care FT, BWD Local Authority and Lancashire County Council) have confirmed an intention to work together on the formation of an accountable care system. Within this it is currently assumed that ELHT will continue as the single largest provider of secondary care services to the community of Pennine Lancashire. Working with key partners ELHT is likely to help to provide solutions in element of primary care and the development of neighbourhood services. In line with the five year forward view this is likely to involve the inclusion of adult social services.

165. Such service reviews and transformations require access to robust, accurate and timely data sets for planning and monitoring, high resilience informatics infrastructure for care delivery and enhanced communication systems for service coordination. Working alongside partners the Performance and Informatics Teams are part of a wider 'Systems Enablers Group' that will support and facilitate change.

Action – Between 2016 and 2021 the Directorate will fully support the STP and the Systems Enablers Group.

Digital Lancashire

166. Lancashire has an established Digital Health Board which draws representation from health and social care providers, the third sector, Universities and the Lancashire Enterprise Partnership. This Board and the associated programme of work, forms part of a system-wide transformation programme called Healthier Lancashire. Through this governance structure a mechanism has been established that links into the Lancashire Collaborative Commissioning Board, local Vanguard programmes and other regional partnerships.

167. To ensure there is strong clinical leadership and co-production in the design and implementation of our digital roadmap, Lancashire has an established Digital Health Clinical Advisory Group which forms part of the governance described above.

168. The Lancashire Roadmap will seek to ensure the continuity of care for patients flowing into and out of Lancashire through collaboration on interoperability, alignment of clinical documentation and sharing of our technical plans with boundary partners.

169. Many aspects of our digital roadmap are already being developed through the Lancashire Digital Health Board, which has been established for over 12 months, as part of the Healthier Lancashire Programme. The membership of this group draws representation from across the health economy, to support the delivery of projects, such as the Lancashire Person Record Exchange Service (LPRES). The Board also acts as a coordination point for projects that are delivered at a local level and into individual organisations.

Action – Between 2016 and 2021 the Directorate will continue fully support the Digital Lancashire Agenda

NWSIS

170. The North West Shared Infrastructure Service (NWSIS) Management Board is responsible for the management of the North West SIS Programme of Work. The NWSIS Management Board oversees the programme of work being undertaken in each of the agreed task and Finish groups.

171. The NWSIS Management Board agrees in the first instance projects within the Programme portfolio that meet with the Digital Health Board Strategy. Projects outside of the Digital Health Board Strategy are agreed on a case by case basis by the North West SIS Management Board voting members and will be ratified by the Digital Health Board.

172. Current programmes of work being discussed within the NWSIS management board include;

<u>Data Centre</u>

a) Cloud
b) Hybrid
c) On Premises
d) BI

<u>Interoperability</u>

a) LPRES
b) MIG
c) EDT Hub

d) IG

Harmonised end user computing

a) AD group policy rationalisation
b) Standardised Desktop
c) Application Delivery
d) Desktop Presentation i.e. VDI, Citrix etc.

Unified Communications

a) Email (with HSCIC support)
b) UC
c) Voice

WAN Services Re-Procurement and alignment

a) Definition (with HSCN support)
b) Procurement
c) Inter-Connects (with HSCN support)

Identity Management

Action – Between 2016 and 2021 the Directorate will integrate local developments with NWSIS workstreams and programmes.

Population Health

173. Integrated care has become a key focus of health service reform in England in recent years, as a response to fragmentation within the NHS and social care system. Yet efforts to integrate care services have rarely extended into a concern for the broader health of local populations and the impact of the wider determinants of health. A recent document from the Kings fund challenges those involved in integrated care and public health to 'join up the dots'. This challenge recognises that population health is affected by a wide range of influences across society and within communities. The authors state that improving population health is not just the responsibility of health and social care services, or of public health professionals. Instead, they argue that it requires co-ordinated efforts across population health systems[23].

174. They also show that integration of care is supported by population risk stratification, an emphasis on prevention and self-management, disease management and the use

[23] Alderwick, Ham, Buck (Feb 2015) Population Health Systems, Kings Fund, London

of care pathways for common conditions, case management for patients with complex needs, extensive use of technology and population data, and a model of multispecialty medical practice where unplanned hospital admissions are seen as a 'system failure'. They indicate that successful systems use data about the population they serve, available through system-wide electronic health record, to understand members' health needs and the distribution of health outcomes. Using these data other health systems offer a range of interventions tailored to the needs of different individuals and population groups to support people to remain healthy and to deliver the right treatments when they become ill. They also identify the requirement to promote the sharing and pooling of data across organisations to identify challenges and needs.

175. Working alongside the Greater Manchester Academic Health Sciences network and the Lancashire Digital Health Board, the Trust will, via the Performance and Informatics Directorate, support development in the collection, collation and analysis of data to support population health analysis and promote positive change through the effective use of such data.

Action – During 2016 – 2021, the Directorate will remain committed to providing resource to enhance data collection to support population health analysis.

Procurement

176. Currently (as at 2016), the Performance and Informatics team spends around £4m annually both maintaining the Trust current systems and procuring new items of computing and equipment to support clinical practice and the operation of services. The directorate recognises the necessity to ensure that the Trust operates with high levels of probity and transparency whilst optimising value for money and return on this significant investment. Working alongside the Trust procurement department, a dedicated procurement link has been identified and provides both expertise and advice relating to all matters of purchase.

177. In addition to this, a monthly procurement meeting is held where all decisions relating to the direction of purchasing, opportunities for savings or cost efficiencies and technology developments are discussed. Feedback from this meeting is presented to the eHealth board which is the ultimate arbiter as to whether a significant investment

is to be made by the Directorate prior to forwarding to the Executive team and Board for sign off.

Frameworks and OJEU

178. Where available the Division will use Framework contracts to support major procurement decisions. These frameworks not only expedite the procurement process but provide assurance as to the quality of service and product delivered.

Joint Procurement / Collaboration

179. In line with the recently agreed Memorandum of Understanding (MOU) with other local health care providers, the Trust will, in future, explore every opportunity to collaborate on procurement for major items of equipment and services. This approach both ensures value for money (through economies of scale) and provides opportunities for future joint service provision should the requirement arise. (Appendix 6)

180. Joint procurement and collaboration will not be limited to other local health care providers, but extended to other organisations where opportunities present themselves (eg Crown Commercial Services).

Action – As from April 2016, no major procurement decisions will be made by the Directorate without formally exploring the opportunities for collaboration and joint procurement.

Contracts

181. Historically, performance and Informatics procurement decisions and contracts have been developed through a ‘proof of concept’ arrangement with suppliers and then moving towards a more formalised contractual arrangement following a period of time (based around a statement of works). In the future, these arrangements will be kept to a bare minimum (in only exceptional circumstances) and where the Trust needs to commission a service, software system or major infrastructure investment, a formal, monitored and time limited contract will be developed and signed. Whilst this may

increase the procurement times, the benefits of such formal arrangements outweigh this.

Action – As from April 2016, all major procurements of services, systems or infrastructure will be accompanied by a formal contact with periodic quality review milestones being set.

182. By consolidating ELHT's printers and working closely with our NHS neighbours on procuring a single managed service will reduce printer costs, improve efficiency and reduce the amount of call incurred by the Technical Support Technicians enabling them to focus on the strategic deployments of the Trust.

Action - By May 2016 engage with our NHS neighbours to work collaboratively on a single managed printer service.

High level benefits

183. There are a number of benefits associated with this multifaceted programme of IT enabled transformation that are both cash and non- cash releasing in nature.

Quantitative Benefits associated with the strategy

184. The quantitative benefits associated with the strategy can be summarised as:

- Reduction in workforce costs associated with medical records storage
- Reduction in workforce costs associated with clinic preparation.
- Reduction in costs associated with transporting medical records
- Reduction in the costs of third party storage requirements for deceased records
- Reduction in costs associated with storage of all records
- Reduction in stationary expenditure required for paper document and record creation
- Reduction in the costs of printing bespoke paper forms and records
- Reduction in the licensing costs for existing clinical applications.
- The potential to close beds and wards as LOS is reduced
- Reduction in travel costs and non-value added time in community services

Qualitative Benefits associated with the strategy

185. The qualitative benefits associated with the strategy are summarised as:

- Improved patient care and clinical safety/effectiveness through the reduction of documentation and transcribing errors and improved quality of clinical effectiveness in line with CQC recommendations.
- Improved clinical efficiency through having the information in one place, providing a single electronic view to a patient's case note and current episode.
- Improved patient care and clinical safety through the simultaneous access to a single document or record in multiple locations, ensuring a consistent understanding of the progress of the patient's care.
- A secure store, minimising the risk of loss of key information (putting the patient care at risk).

- Enhanced accountability, due to having a robust audit trail for any appropriate document or record within the trust.
- The Trust being future proofed to deliver the paperless/paper light elements of the IT enabled transformation programme
- Clinical users being keen to adopt a full EPR, after having a positive experience of a paper light solution through EMDS
- Reduced environmental risks issues associated with the storage of large volumes of paper i.e. Health & Safety, Fire risk etc.

Timeline and key deliverables

The full list of actions for the programme are outlined below.

Action	Period / date

Action	Period / date

Action	Period / date

ACKNOWLEDGEMENTS

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Chris Pearson – Chief Nurse
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Ian Woodburn – Chief Nursing Information Officer
Simon Hill - Associate Medical Director
Jonathan Wood – Director of Finance
Dr Rinecke Schram – Chief Medical Officer
Eileen Fairhirst – Trust Chairman
Kirsty Slinger – MHS East Lancashire CCG
Rosemary Duckworth – Manager Outpatients and Administration
Leslie Stove – Deputy Chief Executive
Teresa Callaghan-Shepherd – Executive PA
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Mr Rob Salaman – Consultant Surgeon
Dr Tom Newton – Consultant Radiologist
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Joanne Carter – Trust EPMA team
Ray Gough - Head of Information & Communication Technology
John Rayner- Inform Health and Associates

Appendix One - EMRAM

Stage 0: The Trust has not installed all of the three key ancillary department systems (laboratory, pharmacy, and radiology).

Stage 1: All three major ancillary clinical systems are installed (i.e., pharmacy, laboratory, and radiology).

Stage 2: Major ancillary clinical systems feed data to a clinical data repository (CDR) that provides clinical access for reviewing all orders and results. The CDR contains a controlled medical vocabulary, and the clinical decision support/rules engine (CDS) for rudimentary conflict checking. Information from document imaging systems may be linked to the CDR at this stage. The hospital may be health information exchange (HIE) capable at this stage and can share whatever information it has in the CDR with other health care providers.

Stage 3: Nursing/clinical documentation (e.g. vital signs, flow sheets, nursing notes, eMAR is required and is implemented and integrated with the CDR for at least one inpatient service in the hospital; care plan charting is scored with extra points. The Electronic Medication Administration Record application (EMAR) is implemented. The first level of clinical decision support is implemented to conduct error checking with order entry (i.e., drug/drug, drug/ food, drug/lab conflict checking normally found in the pharmacy information system). Medical image access from picture archive and communication systems (PACS) is available for access by clinicians outside the Radiology department via the organisation's intranet.

Stage 4: Computerised Practitioner Order Entry (CPOE)(Order Communications) for use by any clinician licensed to create orders is added to the nursing and CDR environment along with the second level of clinical decision support capabilities related to evidence based medicine protocols. If one inpatient service area has implemented CPOE with clinicians entering orders and completed the previous stages, then this stage has been achieved.

Stage 5: The closed loop medication administration with bar coded unit dose medications environment is fully implemented. The eMAR and bar coding or other auto identification technology, such as radio frequency identification (RFID), are implemented and integrated with CPOE and pharmacy to maximise point of care patient safety processes for medication administration. The "five rights" of medication administration are verified at the bedside with scanning of the bar code on the unit does medication and the patient ID. [24]

[24] The EMRAM will recognise that unit dose administration is not common in the UK as such the model requires technology assisted identification of patient and drug where possible

Stage 6: Full clinical documentation with structured templates and discrete data is implemented for at least one inpatient care service area for progress notes, consult notes, discharge summaries or problem list & diagnosis list maintenance. Level three of clinical decision support provides guidance for all clinician activities related to protocols and outcomes in the form of variance and compliance alerts. A full complement of radiology PACS systems provides medical images to clinicians via an intranet and displaces all film-based images. Cardiology PACS and document imaging are scored with extra points.

Stage 7: The hospital no longer uses paper charts to deliver and manage patient care and has a mixture of discrete data, document images, and medical images within its EMR environment. Data warehousing is being used to analyse patterns of clinical data to improve quality of care and patient safety and care delivery efficiency. Clinical information can be readily shared via standardised electronic transactions (i.e. CCD) with all entities that are authorised to treat the patient, or a health information exchange (i.e., other non-associated hospitals, OPD clinics, sub-acute environments, employers, and patients in a data sharing environment). The hospital demonstrates summary data continuity for all hospital services (e.g. inpatient, outpatient, A&E, and with any owned or managed Community clinics).

Appendix 2 – Strategic Risks

Procurement

There is no supplier with a proven record of delivering in the UK. The may not be able to procure the systems needed or may procure a potentially acceptable solution which fails to deliver what is required.	Other organisations are progressing with existing products which are maturing over time. As such, it is likely that there will be products in use in the near future. We shall work with the supplier / product with the greatest potential, jointly developing an appropriate solution
There is uncertainty about any central, NHS funding arrangements. The overall programme is too expensive for the Trust, and may need to be reduced in scope.	The trust is committed to use income (capital and revenue) to implement the overall solution as the long-term benefits outweigh the cost. Central funding would be used to speed up the implementation if it were available and hence the realisation of benefits

Planning

Change management strategy is not sophisticated enough to cope with the level of transformation.	External resources and skills will be fully identified in the outline plan We shall share with other sites going through the same process, learning from others as well as advising others.

Implementation

The programme is overly ambitious and fails to deliver to timescales.	Significant planning before embarking on the Programme building on input from external consultancy will enable the development of a realistic plan. The programme shall be managed using proven methodologies. Full commitment from the Trust Executive Board will enable issues which could delay the programme to be addressed effectively
Levels of clinical engagement are insufficient to provide wholesale	Commitment from the executive team (especially CEO and Clinical Director)

adoption.	Having dedicated clinical involvement in the programme from the CCIO, the eHealth Board and other key clinical leaders . Proper Appropriate marketing of the benefits to clinicians Turnover of staff will lead to a critical mass for whom electronic working is the norm.
Suppliers of all or part of the ideal solution will be unable to provide adequate skill or resources due to the demand placed on them by the national approach. (Every Trust is attempting to reach the same end-point as ELHT over the same timescale)	By being early, we should be able to adequately meet the internal resource requirement and suppliers will commit to us at the expense of late-comers.

Post Implementation

Benefits not realised in the early years to fund the rest of the programme.	SOC reflects realistic funding. However, if there are any financial benefits realised early in the programme, there could be a reinvestment into the programme, allowing selected elements to be brought forward, thus realising other benefits sooner than planned. A delay in realising financial benefits, will not delay the Programme, but it may be wise to extend the overall timescales in order to focus on the realisation of the work undertaken up to that point.
We fail to realise all the identified benefits in patient safety, experience, quality and outcome.	All benefits are realistic in that they CAN be realised (and other sites have achieved them) Proper change management (see above) should ensure the majority will be realised to plan - others will come over time.

Appendix 3 – Patients, Staff and Possibilites

What our patient's told us…

"I want to be able to add to own record important information that I want those caring for me to see. I would want to control access to this."[25]

"I want the care plan to be built around me not around the doctors and nurses that provide my care. I want a person centred plan that contains my relevant personal details, my preferences, such as what I like to be called and how I wish to be treated when I come into hospital."[26]

"I want the results of all my blood tests and X-rays to be shared across the hospitals and organisations that treat me. I once had the same blood test done twice on the same day."

"I want my information to be shared across all the appropriate organisations, irrespective of where I live, even when I have to travel to other hospitals within Lancashire. My social care team need to be updated on my health issues, and my doctors and nurses understand my social care issues too and can manage my discharges and after care properly."

"I want to be able to communicate with the hospital, my GP and my community nurse using text and email and occasionally by telephone. I don't see why I should be restricted by the technology my doctors use. I want to use what I use."[27]

"Some parts of my life are very personal and I do not want everyone to know about these. I spoke to my GP and she said she will secure this part of my record at my request, so it is not viewable by everybody when I go into hospital."

"I am fed up of having to answer the same questions every time I come to the clinic. I expect to tell the hospital once in the hope that they will share it electronically so that my information is always up to date.'

"I want my parents to be able to book an appointment for my asthma clinic online and my hospital doctor to be able to see information about my last asthma attack and what inhalers I take. "

"I want online access to other kids who have diabetes who I can talk to about and communicate with." [28]

[25] Teenage patient
[26] Patient with a long term condition
[27] Teenage patient
[28] 13 year old diabetic patient

What our providers of care told us…..

"We want to be able to view recent letters sent between care settings. I don't have time to wait for forms and assessments to be returned by fax or post."

"We need a shared patient record that alerts us to important information. This is especially relevant in urgent care when we need to know about resuscitation and end of life wishes, mental capacity and drug interactions."

"I want to receive an alert when a patient is starting to deteriorate. I want to receive the alert directly to my mobile phone or handheld device so that I can then intervene and help before it's too late."

"I want all the information about the patient to be in one place, possibly in the same system. I certainly don't expect to be coming out of one system and into another to find information that is clinically relevant. "

"I want the IT to just work – I want mobile access and I want to be able to transmit and receive information whilst I am on the move. I don't want to be tied to my desk – I need to improve my work life balance."

"As a secondary care clinician, I want to be able to see relevant information from primary care, including medications and allergies. I want to be able to quickly and simply exchange information, thoughts and discussions through annotating and sending parts of the electronic record to my clinical colleagues."

"I am drowning under the sea of paper. My office is full of paper, patient test results, case notes and post-it stickers reminding me to do things with the paper. I have a set of case notes that is over 14 inches thick – no one ever looks at them but I take them to clinic every time the patient attends."[29]

"I need a complete picture of my patient's medical and social care records across the patch in one place, at the click of a mouse. This will make their management safer and more effective, as well as reducing wasted resources and duplicated work. "

"All the information to and from medical devices where appropriate needs to be automatically stored in the patients electronic medical record. It's crazy that we are capturing information electronically and then either manually transcribing or printing in order to get this information into the record."

"I want to use technology to keep patients safe. I want technology to help me make decisions when I am tired and remind what to do when I see patients with an unusual presentation."

[29] See appendix one – Table 1

“When I am prescribing medication, undertaking a surgical procedure or obtaining patient consent I need assurance that all the information that I need to do these things safely will be available to me. This is not how it is at the moment.”

“I want technology to make life easier for me and my patients. We both need access to information in the right form at the right time in a format that we can both digest and understand.”

“We need fewer systems and more interoperability.”

“We need much more automation in our operating theatres in order to improve our own productivity and the utilisation of the operating theatres over all. Accurate information can help us become better more efficient doctors.”

“Our MDT meetings would benefit enormously from an easy to use video-conferencing facility that allowed everyone no matter where they were to see the notes, the reports, the histology and sometimes even the patient.”

“There is an acknowledgement that in the past the Trust has invested in isolated standalone systems that have added little in the way of benefit to the clinician or the patient. We must stop doing this if we are serious about creating an attractive place to work.”

“We need a more targeted approach to health and social care population management; we must look externally with an eye to managing across the whole system. Our information systems must be able to support this 5 to 10 year vision.”

“We need good connectivity across secondary care, primary care and community care – the obvious solution would be for everyone to be on the same system. The care system needs to use technology to keep people out of hospital through the greater use of tele-medicine, tele-surveillance and home monitoring systems.”

“In the future we should be providing information only once. There is an expectation that this information will then be shared across information systems and across care systems. The more functionality that can be obtained from a single system supplier the better.”

“We expect so much from technology in our private and personnel lives but seem content with so little in our professional lives both as patients and care providers. The NHS is quite unlike any other industry in this regard.”

“We don’t have the time to undertake ‘notes based’ reviews for purposes of clinical audit or trials. We need a computer system that has everything in the one place to ensure that we can review multiple cases quickly and efficiently.”

"We need a facility to view all our patients at the same time so that at a glance we know who is sick and what their management plan is."

"An electronic patient record system must make it easy to do the right thing and difficult for us to do the wrong thing."

What does 'good' look like – the art of the possible?

1. *"The digital hospital is as much a way of thinking about the future of healthcare as it is about technology. It's not about the EMR or about the data. There is no single "solution" for digital hospitals to implement, no magic data integration that suddenly creates a digital hospital.*

   Digital hospital is not a technology story. It's about the customer value mind set and those healthcare organisations that are offering their traditional and very new global customers a more compelling patient, client, or member experience than a visit to the local doctor's office or Emergency department."[30]

Case study 1

At the Ottawa Hospital in Canada, care teams were struggling with very high occupancy and highly variable manual processes. As a result, patients experienced delays in their care, clinicians were frustrated, and the hospital was not satisfied with the overall patient experience they could offer. The hospital equipped every Doctor with a tablet and implemented a care process orchestration engine to model the readiness for discharge process from admission to post discharge.

The system dynamically creates communication and knowledge links between a patient and the circle of care providers around them and allows automatic texting and videoconferencing between members of the team to help the Doctors, nurses and therapists review what the patient can and can't do and make different therapy decisions or revise the date of discharge.

Case study 2

[30] A Digital hospital – a way of thinking about the future

When visiting the A&E department in a digital hospital you would firstly

Check- in from home via a patient portal available through your Blackberry, Android, iPhone or other mobile device or, at the hospital, via a Patient Care Station (kiosk).

In the language of your choice, you provide preliminary triage information such as presence of allergies, pain, its location and how long you've been experiencing it using an interactive touch screen tool on your device. You receive an RFID tag containing your information either from the kiosk or when you check in at the hospital. The triage nurse may take your picture and add that to your EMR for future verification.

After triage, the clinician can easily locate you in the emergency department using a smartphone and electronic white board that has a digital version of the ER layout. Any staff member with the proper security and authorisation can access your EMR anywhere in the hospital on their mobile device, no matter where you are located.

He or she has already reviewed your integrated health and

medications history, and has a treatment plan in place. You are on your way in less than two hours.

Case study 3

Today's highly mobile hospital staff want patient information readily available on their mobile devices so they can do their work efficiently and offer the best care. Successful smartphone implementations at Toronto East General Hospital (TEGH) and Kingston General Hospital have addressed nursing

shortages while delivering improved patient care and better staff communication.

Nurses and other staff wear smartphone devices integrated with Vocera that, through voice prompts, put them in immediate touch with any other communicating staff member for instant consultation or help. Thanks to Vocera and its integration with Nurse Call, "nursing efficiencies are

enhanced, direct care time has improved and responsiveness improved.

Case study 4

In the Digital Hospital, secure supply cabinets can be opened with a biometric thumbprint reading and area access will be granted through retinal scanning. Supply replenishing systems alert nursing staff when supplies are running low and can automatically place orders for restocking. Patients will eventually be able to access their own record via bedside terminals that enable them to inform clinicians of new decreased or increased symptoms.

Case Study 5

May Ling is ready for discharge. Her discharge plan is generated by the digital hospital's massive database and rules-based decision-making

Intelligence is available to her doctor, who reviews it on his tablet, makes a few changes, and certifies it. The system notifies transportation to be ready,

uploads after-care instructions and patient education modules onto May Ling's bedside device and informs her primary care doctor through her smart device, including all records, test results, and the after-care plan.

The system notifies May Ling's nurse that the discharge plan is confirmed and advises transportation to pick her up at 10:45 a.m. She goes to May Ling's room and reviews the entire plan with her on the bedside device. Once May Ling's questions are answered and entered into the system, it transmits the plan, education modules and follow-up appointment reminders to May Ling's smartphone. Her husband is notified through his desktop computer that she will be at the entrance at 11 a.m.

The system sends an e-prescription to her pharmacy and calls transportation. Her husband's car pulls up to the entrance identified by smart signage picks up May Ling, and they head home.

Some of the benefits associated with where we want to be

2. **Recognising Sepsis** is a huge problem in healthcare accounting for over 37,000 deaths per year in the UK. The EPR suppliers have developed a recognition algorithm based initially from the Surviving Sepsis Campaign. The first implementation of the 'Sepsis rule' dates back to 2008 and since then the full Sepsis Management Solutions are in thousands of hospitals across the globe.

Trinity Health has 46 hospitals based in 9 American states. They were an early adopter of the Sepsis rule. This has enabled them to study a huge amount of data (January 2010 to March 2012)

Results

- Over $22.1 million in cost savings
- Sepsis Mortality Rate: 15.8% to 12.9%
- Septic Shock Cases Reduced by 12%
- Severe Sepsis LOS reduced from 9.8 days to 8.3 days
- Increase in Sepsis Case Volume of 33%
- 506 Lives Saved

Their data revealed, just as we have seen broadly across the client base that Sepsis SIRS is significantly under diagnosed.

3. A number of UK Trusts due to implement or have recently implemented Electronic Prescribing and Medicines Administration (EPMA) are currently baselining and measuring the improvement of the impact of EPMA. It is envisaged that as hospitals in the UK start to digitally mature we expect to see positive results relating to EPMA including reduced potential ADEs and workflow efficiencies. Key achievements across the globe to date include:

HIMSS Analytics announced Children's Hospital of Pittsburgh of UPMC as the first children's hospital to receive its Stage 7 Award. Successful CPOE introduced in 2007.

Results

- Reduced Adverse Drug Events by 50%
- Reduced drug omission errors by 43% and dispensing errors by 30%
- Closed loop medication process
- Weight-related ADE's eliminated
- Transcription errors/legibility questions

4. **Hospital-acquired pressure ulcers** can be difficult to prevent and manage on manual paper processes and automating the workflow through calculated risk scores, suggested plans of care, reminders and tasks lists can all attribute to an improvement in prevention of pressure ulcers. In addition, capturing the data as part of the workflow allows pressure ulcer prevention metrics to be monitored and the ability to focus improvements in particular areas. This has led to positive results for many hospitals across the globe.

   Results: The Truman Medical Centre reports a reduction in pressure ulcers of 70% through clinical decision support and performance improvement solutions saving $6m over 2 years.

   Results: The Detroit Medical Centre's (DMC) record of service has provided medical excellence throughout the history of the Metropolitan Detroit area and has reached HIMSS Stage 6. The results show a 67% reduction in hospital-acquired pressure ulcers in the first 6 months of implementation.

5. **Falls** are typically under-reported and evidence of improvement can be more challenging, in addition prevention can be challenging and costly. However, embedding evidence-based content into the workflow has been proven to have an impact on falls prevention by standardising assessments and alerting to those patients whom may be at risk.

   Result: In Marina Salud, Hospital de Dénia, Spain, falls were reduced by 30% saving 83,000 Euros.

The Result in the Trust – Some practical examples

6. **Medical records** – Prior to deploying the EPR the Trust will have developed, approved and deployed a system for scanning the paper records and in doing so will have created thousands of static digital images instantly available anywhere in the Trust 24 hours a day 365 days a year. When working with the EPR clinicians will be generating electronic records and in doing so will only require the scanned record for longer-term reference. Eventually the legacy-scanned record in the majority of specialties will become redundant. The process of coding in the short term will be done from the EPR and in the medium-term will be automatically generated from the EPR.

7. **In patient wards** – Data will be entered once and shared or captured automatically by sensors in the ward or those attached directly to the patient's body. 'Wearables' are likely to provide vital sign information directly to the EPR running alongside early warning and alerting systems that inform the clinician if the patient is at risk or in danger. RFID[31] technology will track patients, beds and equipment as well as controlled drugs or chemotherapy agents. Orders from clinical risk assessments are likely to automatically request / locate pressure mattresses, anticoagulant therapy or special diets. Clinical decision support systems will enhance the quality of care and speed up the diagnostic journey time.

8. **Intensive Care Unit** – All medical devices including the near patient test devices / analysers will provide results directly into the EPR. The ICU will be a paperless environment. Infusion pumps and syringe drivers will automatically dose adjust as a response to a change in the vital signs of the patient. The main focus will be on the synchronisation of time across all bedside devices and systems to achieve a stable electronic flow sheet and medical record. This is a highly interoperable environment that will require a very close working relationship between suppliers, informaticians, clinicians and EBME[32].

9. **Pharmacy and medicines administration** – There is absolute control at all levels of medicines management, stock control, dispensing and Electronic Prescribing and Medicines Administration processes. EPMA. Robotics may play a role as they do now in the Trust in 'picking' medicines prior to dispensing as well as delivery and administration as a unit dose package. The closed loop process would see technology assisting in the identification of the patient, the administrator, the drug, the dose as well as all the associated cross checks for allergies, reactions etc. Algorithms would link pharmaceutical data with the labs, radiology, vital signs to prevent medication error.

10. **Pharmacy, Lab and Radiology** - In an automated and connected environment the EPMA system would alert the gentamicin prescriber having being informed by the lab system that the patient has gentamicin toxicity. The clinician would be alerted to the fact that the patient with deteriorating vital signs, on this particular regimen of drugs alongside a specific and abnormal haematological profile would be developing sepsis in approximately 24hrs time! The evidence based alert would be calibrated in such a way to ensure that the clinician had enough time to adjust the management of the patient in order to prevent a catastrophic consequence.

11. **The hospital laboratory** – As a minimum there is seamless transfer of electronic requests directly from the EPR in all aspects of hospital and community medicine into the Laboratory Information Management System. (LIMS) There is seamless transfer of electronic results directly from the LIMS to EPR and to other systems used by community workers and GPs. It is quite possible that over time laboratories move out of hospitals to serve wider geographical communities to service the number of samples / specimens that cannot be analysed and measured at the bedside / patients home or from some 'wearable' device that is capable of transmitting the data directly to the EPR or to the clinician responsible for the patients care.

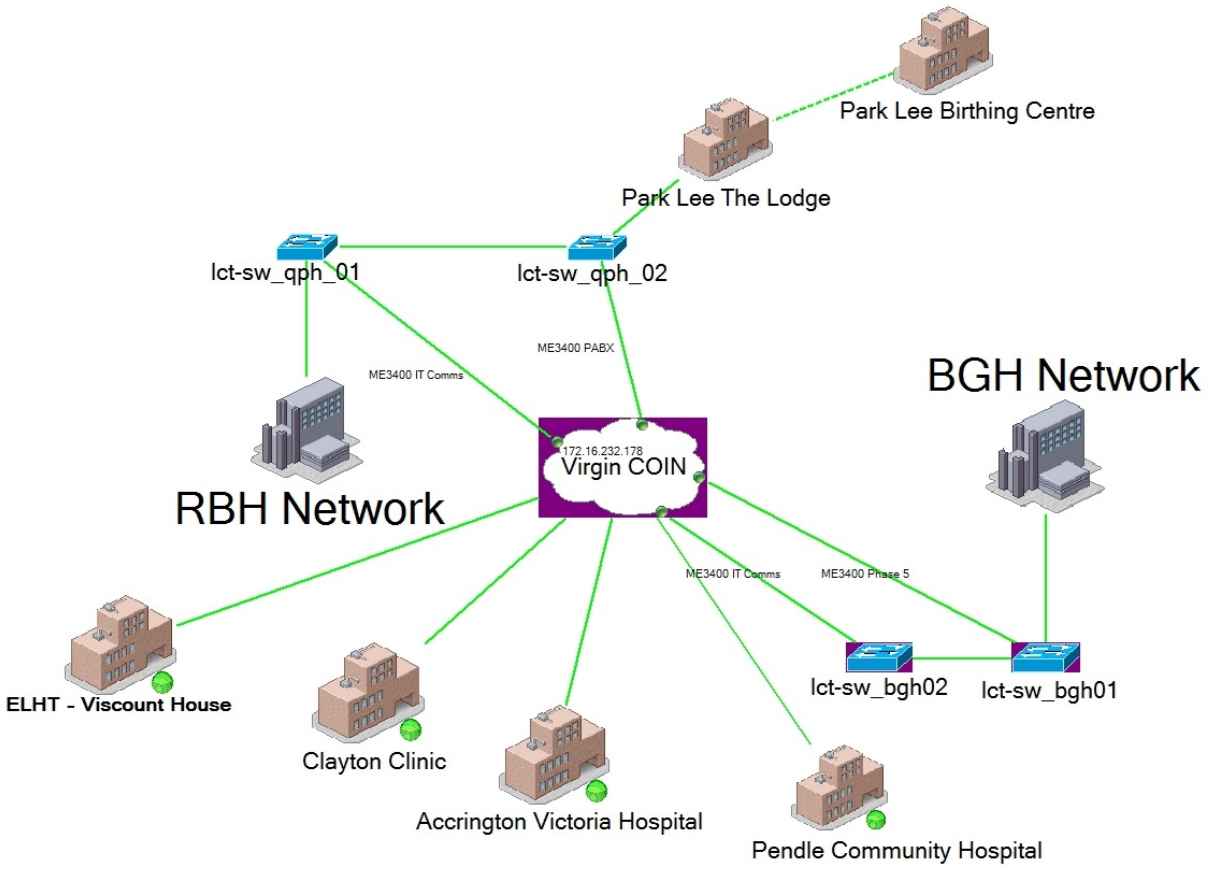
[31] Radio frequency identification
[32] Electro-Biomedical Engineering

12. **Accident and Emergency department** – Clinical data is being transmitted directly from the patient and the paramedic crews as the moving vehicle approaches the A&E department. The staff within the department will have automatic access to other sources of information from primary, community and social care records before the patient arrives in A&E. The electronic record would be initiated in A&E regardless of whether the patient was being admitted or not. (The 'Cas card' would be gone for ever) In the case of the acutely ill CDSS[33] would assist with the provisional diagnosis and voice recognition capabilities would capture vital aspects of the resuscitation process. Real time ADT would identify the most appropriate in-patient bed and the decision to admit would automatically request a porter to help with the trolley transfer, a dietetic assessment and an MRSA screen.

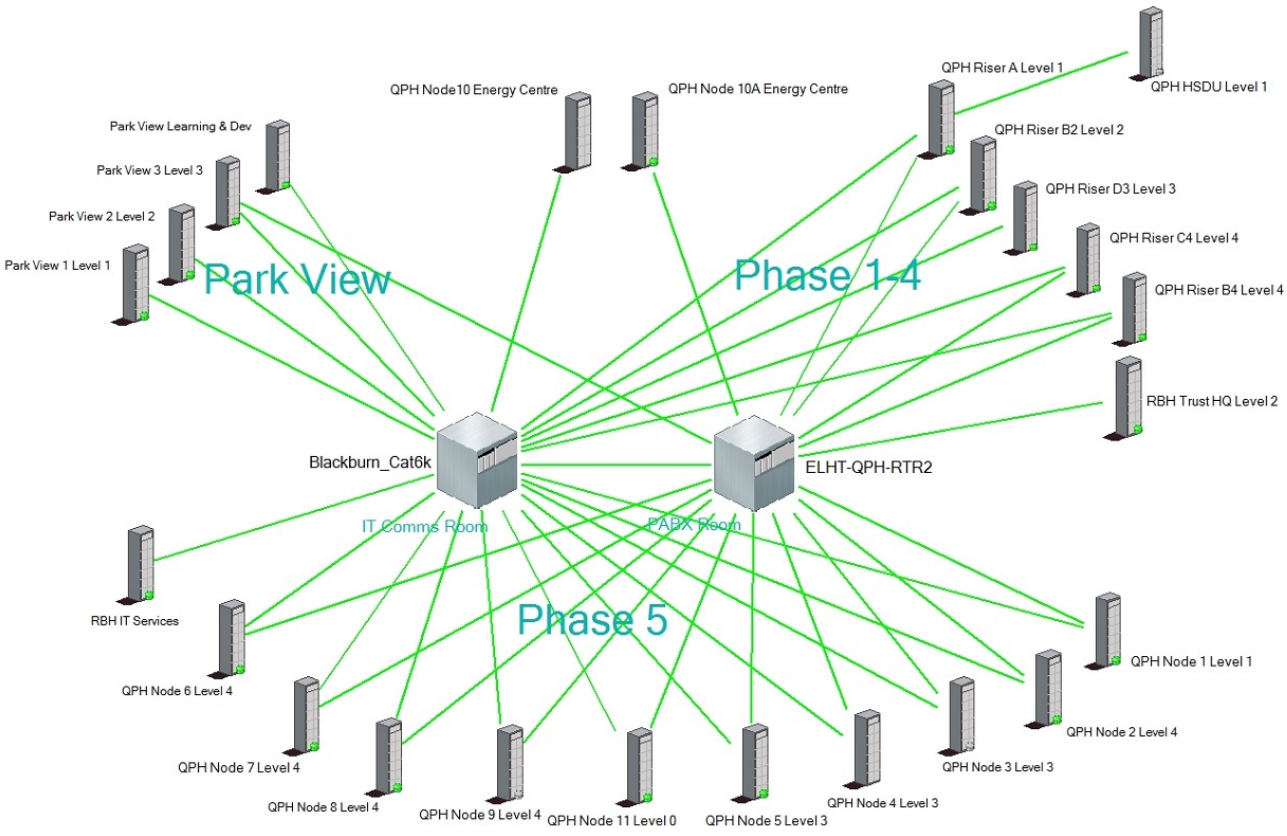
[33] Clinical Decision Support System

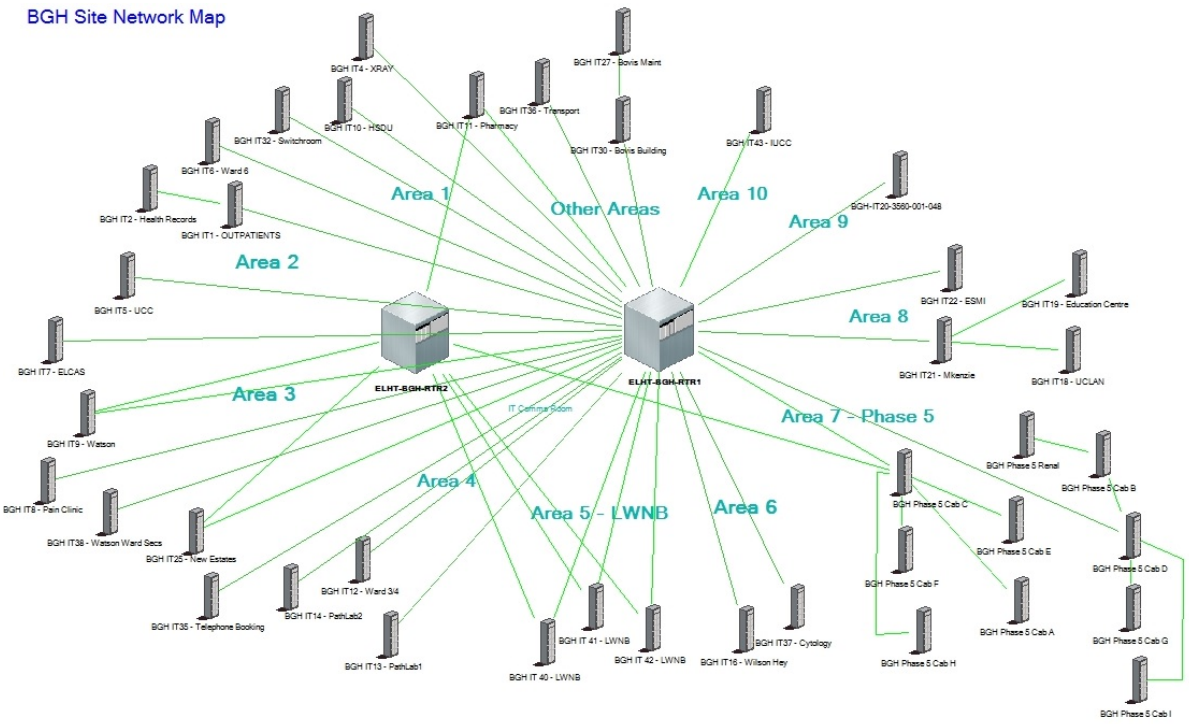
Appendix 4- Network infrastructure at ELHT

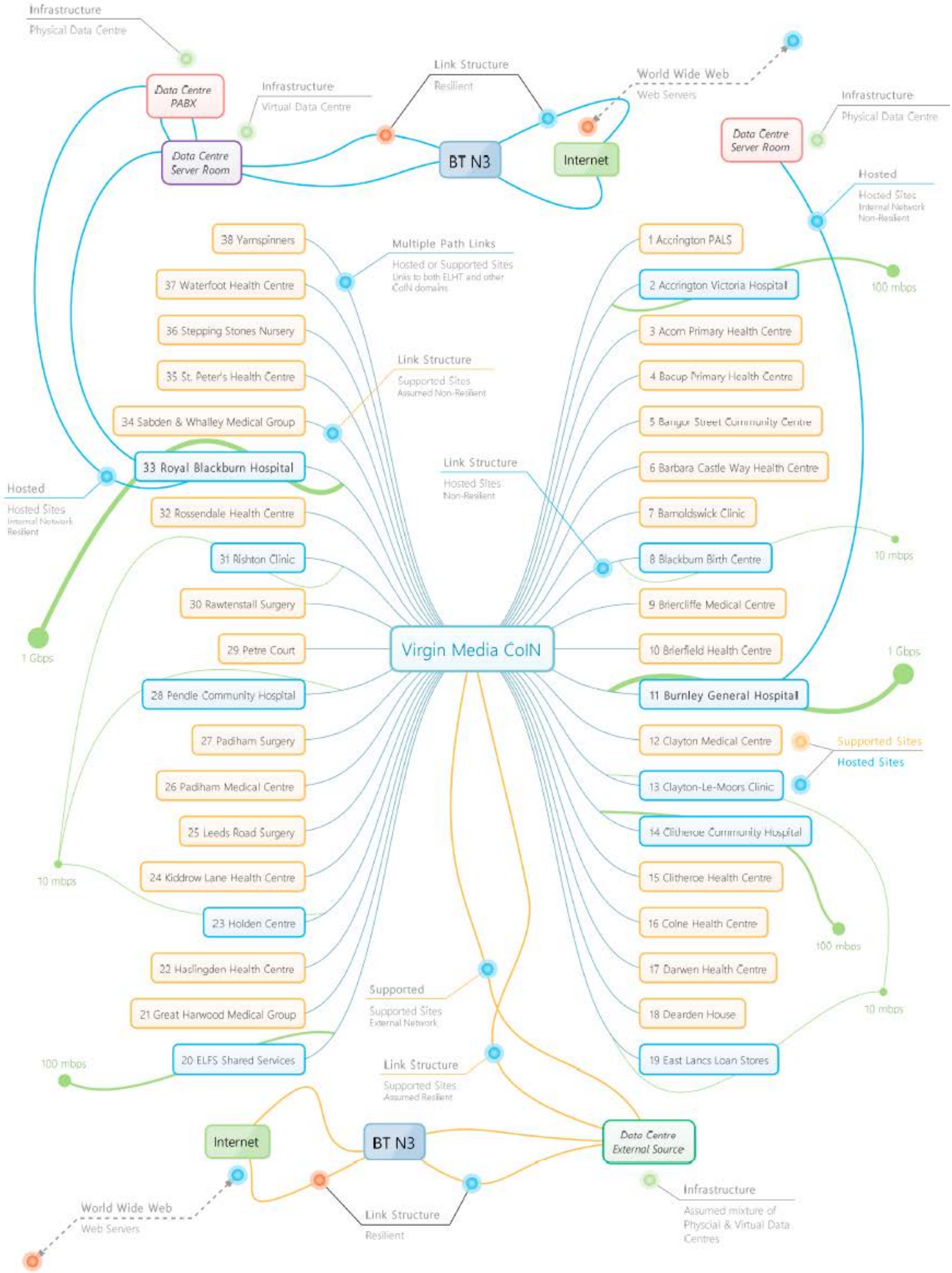
ELHT Site Network Map



RBH Site Network Map



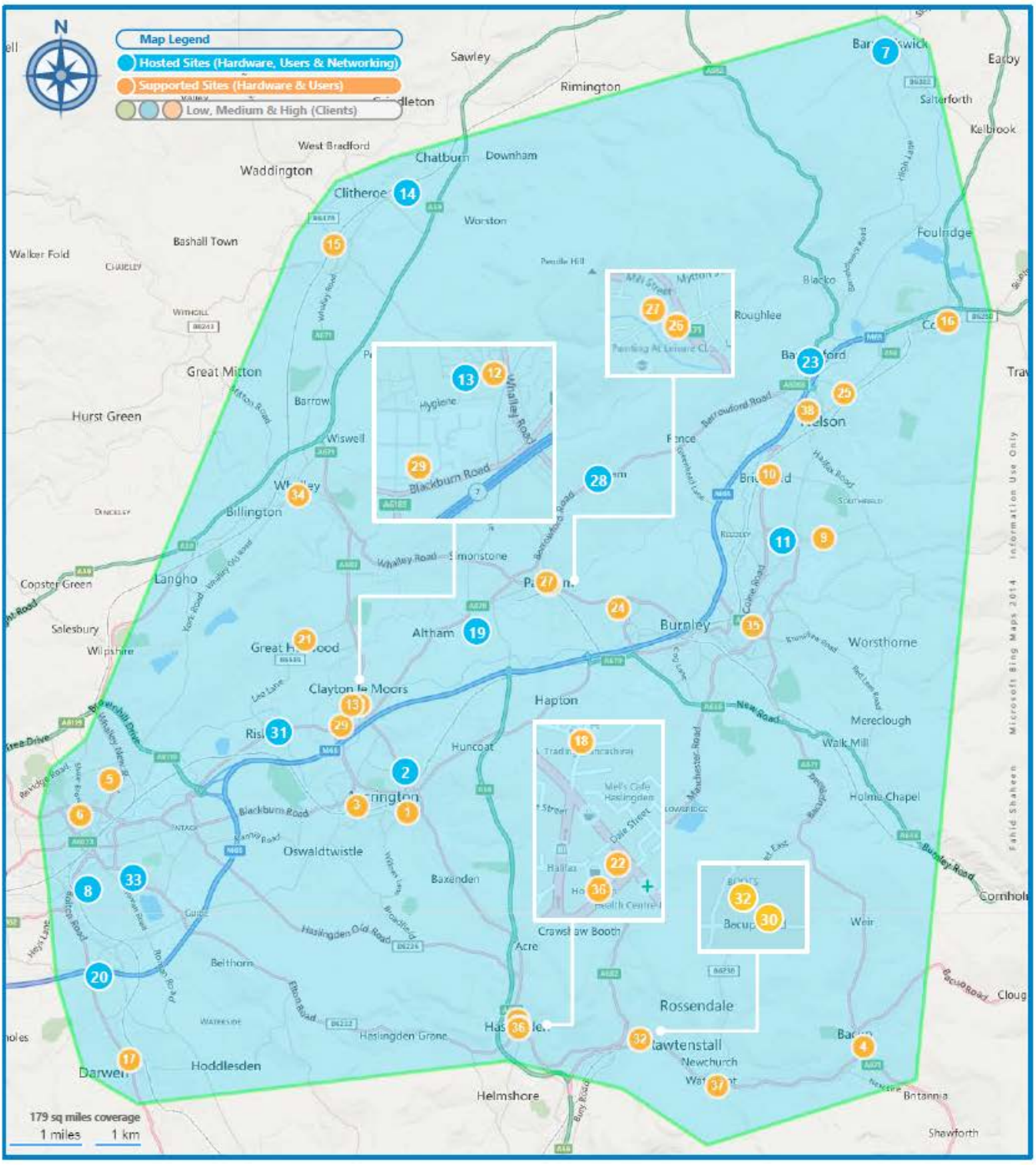

BGH Site Network Map
BGH IT4 - XRAY
BGH IT27 - Bovis Maint
BGH IT10 - HSDU
BGH IT36 - Transport
BGH IT71 - Pharmacy
BGH IT32 - Switchroom
BGH IT30 - Bovis Building
BGH IT43 - IUCC
BGH IT6 - Ward 6
BGH IT2 - Health Records
BGH IT1 - OUTPATIENTS
BGH-IT20-3560-001-048
Area 1
Other Areas
Area 10
Area 9
Area 2
BGH IT5 - UCC
BGH IT22 - ESMI
BGH IT19 - Education Centre
Area 8
BGH IT7 - ELCAS
BGH IT21 - Mkenzie
BGH IT18 - UCLAN
ELHT-BGH-RTR2
ELHT-BGH-RTR1
Area 3
IT Comms Room
Area 7 - Phase 5
BGH IT9 - Watson
BGH Phase 5 Renal
BGH Phase 5 Cab B
Area 4
BGH IT8 - Pain Clinic
BGH Phase 5 Cab C
Area 5 - LWNB
Area 6
BGH IT38 - Watson Ward Secs
BGH Phase 5 Cab E
BGH IT25 - New Estates
BGH Phase 5 Cab D
BGH Phase 5 Cab F
BGH IT12 - Ward 3/4
BGH IT35 - Telephone Booking
BGH IT14 - PathLab2
BGH Phase 5 Cab A
BGH Phase 5 Cab G
BGH IT41 - LWNB
BGH IT37 - Cytology
BGH IT42 - LWNB
BGH IT13 - PathLab1
BGH IT16 - Wilson Hey
BGH Phase 5 Cab H
BGH IT40 - LWNB
BGH Phase 5 Cab I


Infrastructure
Physical Data Centre
Data Centre PABX
Infrastructure
Virtual Data Centre
Link Structure
Resilient
World Wide Web
Web Servers
Data Centre Server Room
BT N3
Internet
Infrastructure
Physical Data Centre
Data Centre Server Room
Hosted
Hosted Sites
Internal Network
Non-Resilient
38 Yarnspinners
37 Waterfoot Health Centre
36 Stepping Stones Nursery
35 St. Peter's Health Centre
34 Sabden & Whalley Medical Group
Multiple Path Links
Hosted or Supported Sites
Links to both ELHT and other CoIN domains
Link Structure
Supported Sites
Assumed Non-Resilient
1 Accrington PALS
2 Accrington Victoria Hospital
3 Acorn Primary Health Centre
4 Bacup Primary Health Centre
5 Bangor Street Community Centre
6 Barbara Castle Way Health Centre
7 Barnoldswick Clinic
8 Blackburn Birth Centre
9 Briercliffe Medical Centre
10 Brierfield Health Centre
11 Burnley General Hospital
12 Clayton Medical Centre
13 Clayton-Le-Moors Clinic
14 Clitheroe Community Hospital
15 Clitheroe Health Centre
16 Colne Health Centre
17 Darwen Health Centre
18 Dearden House
19 East Lancs Loan Stores
100 mbps
Hosted
Hosted Sites
Internal Network
Resilient
1 Gbps
33 Royal Blackburn Hospital
32 Rossendale Health Centre
31 Rishton Clinic
30 Rawtenstall Surgery
29 Petre Court
28 Pendle Community Hospital
27 Padiham Surgery
26 Padiham Medical Centre
25 Leeds Road Surgery
24 Kiddrow Lane Health Centre
23 Holden Centre
22 Haslingden Health Centre
21 Great Harwood Medical Group
20 ELFS Shared Services
10 mbps
100 mbps
Link Structure
Hosted Sites
Non-Resilient
Virgin Media CoIN
10 mbps
1 Gbps
Supported Sites
Hosted Sites
100 mbps
10 mbps
Supported
Supported Sites
External Network
Link Structure
Supported Sites
Assumed Resilient
Internet
BT N3
Data Centre External Source
Infrastructure
Assumed mixture of Physcial & Virtual Data Centres
Link Structure
Resilient
World Wide Web
Web Servers

Sites & Network Schema

2014

East Lancashire Hospitals NHS
NHS Health Informatics



1 Accrington PALS
2 Accrington Victoria Hospital
3 Acorn Primary Health Centre
4 Bacup Primary Health Centre
5 Bangor Street Community Centre
6 Barbara Castle Way Health Centre
7 Barnoldswick Clinic
8 Blackburn Birth Centre
9 Briercliffe Medical Centre
10 Brierfield Health Centre
11 Burnley General Hospital
12 Clayton Medical Centre
13 Clayton-Le-Moors Clinic
14 Clitheroe Community Hospital
15 Clitheroe Health Centre
16 Colne Health Centre
17 Darwen Health Centre
18 Dearden House
19 East Lancs Loan Stores
20 ELFS Shared Services
21 Great Harwood Medical Group
22 Haslingden Health Centre
23 Holden Centre
24 Kiddrow Lane Health Centre
25 Leeds Road Surgery
26 Padiham Medical Centre
27 Padiham Surgery
28 Pendle Community Hospital
29 Petre Court
30 Rawtenstall Surgery
31 Rishton Clinic
32 Rossendale Health Centre
33 Royal Blackburn Hospital
34 Sabden & Whalley Medical Group
35 St. Peter's Health Centre
36 Stepping Stones Nursery
37 Waterfoot Health Centre
38 Yamspinners

Appendix 5 – Actions and Timelines

No	Action	2016-17				2017-18				2018-19				2019-20				2020-21			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	Networks																				
1	During 2016/2017 the Trust will work with NWSIS to reprocure a new/ enhanced Wide Area Network.																				
2	During 2016 / 2017 all networks in outlying ELHT establishments will be reviewed and plans for remedial action to enhance coverage will be presented to the Board for investment decisions.																				
	Wireless Access																				
3	By July 2016 additional wireless access points will be installed in AVH prior to a wider network assessment.																				
4	During 2016 the Trust will continue the roll out of clinician Wi-Fi and enhance coverage and stability.																				
5	During 2016 the Trust will increase the wireless access points across the estate and ensure coverage across all clinical and operational areas.																				
	Data Centres & Servers																				
6	By June 2016, the Trust will have moved its primary data centre to a new location on the main RBH hospital site																				
7	By September 2016, additional disaster recovery infrastructure will be sited at BGH.																				
8	During 2016 the Trust will review all its SQL (server) estate and where appropriate upgrade to SQL 2016.																				
	Storage																				
9	By November 2016, a new Storage Area Network will be fully installed and operational at ELHT.																				
	Systems																				
10	By March 2017, ELHT will have identified a preferred supplier for the new integrated ePR.																				
11	By April 2018, ELHT will replace the existing PAS system and begun to implement integrated ED systems, patient flow																				

	management, order communications, outpatient booking and operating theatre management modules.	
12	By April 2019, ELHT will begin to implement clinical decision support and the electronic capture of clinical notes.	
13	By April 2020 , ELHT will no longer use historical paper notes.	
	Community Systems	
14	(PAS replacement & set up data sharing agreements) –by 30th June 2016 the Trust will have completed roll out of PAS functionality, completed PC Refresh, have 100% sign up of data sharing agreements with GP's across local CCG's activated, and ensured all services can order and receive results into EMIS from ICE Desktop	
15	Phase 2 (Evaluation of EMIS for non CPAS Services) will be completed by September 2016	
16	Phase 3 (Clinical Template & Mobile Access) – will be completed by 30th June 2017 which includes, testing and roll out of mobile devices to support clinical recording of data and roll out clinical capture template building (removing paper records).	
	Legacy Systems	
17	By December 2016, a full systems review/comparison will be undertaken as part of the ePR procurement and a final decision made on which systems can be removed.	
	Electronic Patient Tracking Systems	
18	By July 2016 – the current EPTS system will be upgraded to version 3 with a two way interface to Pas being developed.	
19	By August 2016, Version 3 of EPTS will be rolled out and used across the estate in real time.	
20	By January 2017 all current nursing electronic assessments will be integrated into the ePTS	

	solution.	
21	By April 2017, Medical Early Warning Scores will be captured and displayed via the ePTS system	
22	By June 2017 – nursing observations will be captured using the ePTS system.	
	Clinical Portal	
23	By January 2018, the Trust will have a defined strategy for the use and migration of the Clinical Portal during the implementation of the ePR.	
	Electronic Prescribing and Medicines Management	
24	By May 2016 the Trust will deploy an updated version of the ePMA software which will include interactive medication charts and speed enhancements.	
25	By June 2016, the Trust will begin to extend the roll out of ePMA to the ICG Division and other sites across area.	
26	By August 2017, ePMA will be rolled out across the whole of the Trust estate	
27	By April 2018 a decision relating to the future of the current ePMA system will be made and a detailed plan re its future operation / migration will be published.	
	PACS Services	
28	By August 2016 – A new Vendor Neutral Archive (VNA) will be built by Siemens.	
29	By July 2016 – A new 10gb dedicated PACS only network will be constructed and deployed to the Trust.	
	Departmental Systems	
30	By April 2020, except in exceptional circumstances, all unique departmental systems will be replaced by the ePR.	
	Office Systems	
31	In March 2017 and March 2018, the current Microsoft licensing model will be reviewed and licensing requirements adjusted accordingly.	
32	In March 2019 a new contract will be signed with a relevant	

	software supplier which provides for a range of office and operating system requirements required by the Trust.	
33	By January 2017 a new policy relating to the base offering of PC's and systems will be produced and deployed.	
	Mobile and remote working	
34	By July 2016 the Trust will upgrade ELHT's Airwatch Mobile Device Management System	
35	By September 2016 the Trust will implement Secure Content Locker (Corporate Drop Box)	
36	By April 2017 the Trust will have signed off a comprehensive BYOD policy and implementation plan.	
37	By October 2016 all Trust mobile devices will operate in a secure environment with an identified range of specific applications targeted at enhancing care delivery and patient safety.	
	Unifed Communications	
38	By June 2016 the Trust will upgrade the Cisco Call Manager to the latest stable version.	
39	By September 2016 the Trust will implement extension mobility locally and externally with agreement from our NHS neighbours.	
40	In October 2016 the Trust will start the decommissioning work of the Analogue systems.	
	Mobile Telecoms	
41	By May 2016 the Trust will make a direct award for mobile phone / smart device contacts to *a* single provider.	
	Email , Instant messaging and Presence (video)	
42	By May 2016 the Trust will implement an Edge Server to facilitate communication to other organisations and the general public.	
43	By June 2016 the Trust will implement an Expressway Gateway to enable communication between Cisco IM&P and Microsoft IM&P	

	Bleep and Pager Systems	
44	By November 2016, all current providers of paging and messaging systems will have been contacted and presented enhanced alternatives for paging and messaging to the Teams.	
45	By April 2017, dependent upon an investment business case being accepted by the Board, a new paging system will be in operation across the Trust	
	User Computer Interface	
46	By June 2016 the Directorate will engage with external providers to cost out a managed migration.	
47	By November 2016 a 200 client based VDI pilot will be in operation across selected operational directorates	
48	By April 2017, following the VDI pilot, a decision will be made and costed to move the solution further into the ELHT estate.	
49	By April 2018, a VDI environment will be fully rolled out across the ELHT estate.	
	Clinical Environment Displays	
50	By August 2016, all wards will have a touch screen display and micro PC wall mounted with wireless access to Trust systems.	
51	By April 2017, all other clinical areas, requiring interactive displays (following assessment) will have them installed and operational.	
	Patient Facing Interfaces and Clinical Support	
52	During 2016 – 2021 the directorate will work with the Trust patient engagement teams to provide informatics links to patient services and information.	
53	By January 2017, the Trust will publish real time activity and quality information on its external facing website (including waiting times at Trust facilities across the area).	
54	By July 2017 – the Trust will demonstrate the EMIS patient portal for all community services and roll out as appropriate.	

55	By April 2019 – All patients will have on line access to a range of booking and information services directly related to the new PAS and ePR systems.	
	Information Management	
56	By June 2016 the Directorate will have aligned the workforce to ensure that the differing requirements of each Division are effectively serviced	
57	By March 2017 the directorate will have planned the resource and structure needed to support the implementation of the ePR	
	National Returns and Commisioning Data	
58	By June 2016 the team will formalise all current local data flows managed by the department.	
59	During 2016/17 all data flows will be reviewed and automated were possible	
60	During 2017/18 appropriate data flows will be migrated to the ePR, maintaining the automation were possible.	
	Analytical Support for Services	
61	By June 2016 one post from corporate information will be transferred to the data platforms team, dedicated to the automation of routine data flows.	
62	By June 2016 the extension of a corporate information analyst role to a dedicated contracting analyst to support the production of contracting data and the direct support of contract queries will be completed.	
63	By April 2016 the team, working with the clinical governance team, will investigate the resourcing of a dedicated quality improvement analyst to support specific quality improvement projects	
	Information Access and Portals	
64	By June 2016 the Trust will go live with the single point of access	
65	By June 2016 the Trust go live with the score card system	

66	During 2016/17 the Trust will migrate all measures to the score card system ensuring all measures are fully documented	
67	During 2016/17 the Trust will review and migrate all online reports to the new data warehouse structure where appropriate	
68	During 2017/18 the information team identify which reports will not be available directly from the ePR	
69	during 2016 the team will review options for the visualisation and presentation of information.	
	Data Warehousing	
70	By June 2016 a detailed plan of all systems, data tables and cubes that will be required for reporting will be produced.	
71	During 2017/18 all data required to support the ePR will be migrated to the new system.	
	Benchmarking Services	
72	By August 2016 a preferred supplier of benchmark services will be identified	
73	Ongoing from August 2016 a benchmarking group will be set up to ensure the system is fully utilised and embedded within the organisations reporting structure	
	Clinical Coding	
74	By April 2018, the Coding department will be coding 25% of in-patient activity using current electronic systems. By 2020, all coding to be done from EPR	
75	From December 2016 the department will aim to provide a robust Clinical Coding audit / training programme that incorporates clinical input into the audit process. Both programmes will be adapted to meet the demands of the EPR introduction in 2018.	
76	From April 2016, the Coding department will continue to involve clinicians in the coding process and engage with them in regards to electronic coding solutions. The department will also support the introduction of	

	automated electronic coding solutions in the medium term (post 2020).																					
	Governance and Security																					
77	By April 2017, all Information security policies will be reviewed and updated																					
78	By April 2017, all procurement terms and conditions for procurement, delivery, running and decommissioning of systems that deal with Information will be review																					
79	By April 2017, guidance for individuals and department to support the compliance agenda additional bespoke guidance will be published.																					
80	During 2017-18 pre and post-delivery project assessment to ensure adherence to quality and IG compliance standards will be introduced																					
81	From April 2016 all potential system purchases will need to pass through a full information security assessment and have conformance approved by the Information Security sub-group of the E-Health Programme Board.																					
	Cyber Security																					
82	By May 2016 an Information Security Group to monitor and advise on all matters of Information Security will be implemented.																					
83	By May 2016 a dedicated Asset & Information Security Officer post will be created																					
	Informatics Skills Development Network (ISDN) Accreditation																					
84	By April 2017 the Trust Performance and Informatics Teams will be ISDN Accredited.																					
	eHealth and Clinical Reference Group																					
85	As from April 2016, no significant procurement decision or informatics initiative will be developed without first being supported by the eHealth Board.																					
86	As from April 2016, no clinical software (including ePR) will be purchased without the support																					

	of the Clinical Reference group.	
	Software Development	
87	during 2016/17 develop and implement a complete accident and emergency electronic casualty card.	
88	during 2016/17 the software development team will develop and implement a range of agreed electronic care bundles	
89	by April 2018, the software development team will be trained in new programming interfaces and the use of the preferred ePR supplier forms creation software.	
	Service Development and Education	
90	By June 2016 – working with the Learning and Development team all ELHT staff will be made aware of free Microsoft training available to them.	
91	during 2016 – 2021 the Trust will continue to work with local educational institutions to provide support for trainee programmes and seize opportunities for service development based on best practice and feedback.	
	Sustainability and Transformation Plans	
92	Between 2016 and 2021 the Directorate will fully support the STP and the Systems Enablers Group.	
	Digital Lancashire	
93	Between 2016 and 2021 the Directorate will continue fully support the Digital Lancashire Agenda	
	NWSIS	
94	Between 2016 and 2021 the Directorate will integrate local developments with NWSIS workstreams and programmes.	
	Population Health	
95	During 2016 – 2021, the Directorate will remain committed to providing resource to enhance data collection to support population health analysis.	
	Joint Procurement /	

	Collaboration																						
96	As from April 2016, no major procurement decisions will be made by the Directorate without formally exploring the opportunities for collaboration and joint procurement.																						
97	As from April 2016, all major procurements of services, systems or infrastructure will be accompanied by a formal contact with periodic quality review milestones being set.																						
98	By May 2016 engage with our NHS neighbours to work collaboratively on a single managed printer service.																						

Appendix 6 – Memorandum of Understanding

A MEMORANDUM OF UNDERSTANDING
BETWEEN
THE NHS PROVIDER TRUSTS IN LANCASHIRE

HEREINAFTER REFERRED TO AS "THE PARTICIPANTS"

Purpose

This Memorandum of Understanding (MoU) sets out the framework for the intended working relationship between NHS provider Trusts in Lancashire. It has been developed with the contributions of representatives from each organisation (CIOs) and describes a programme of collaboration with objectives set around sharing common values across Health Informatics (HI) and health data. In doing so, the programme of collaboration should leverage the strengths of each Participant and identify opportunities to improve the health IT economy as well as the health and well-being of the population in line with the Heathier Lancashire objectives.

All Participants recognise the importance of informatics as a key enabler of health and social care provision and improvement in Lancashire. In particular, the Participants recognise the importance of the development of clinical outcome indicators, standards harmonisation and increased interoperability, open data initiatives, , shared systems, advancing Health IT adoption, and priming their respective organisations for collaboration and innovative new Health IT products and services.

> "Collaboration is working with others to do a task and to achieve shared goals. It is a recursive process where two or more people or organisations work together to realize shared goals, (this is more than the intersection of common goals seen in co-operative ventures, but a deep, collective determination to reach an identical objective for example, an endeavour that is creative in nature — by sharing knowledge, learning and building consensus. Most collaboration requires leadership, although the form of leadership can be social within a decentralized and egalitarian group. In particular, teams that work collaboratively can obtain greater resources, recognition and reward when facing competition for finite resources."

Introduction

Lancashire faces the same challenges in Healthcare that are common to all organisations and whilst the organisations differ in constitution they do not differ in their ultimate objective to provide healthcare to the population and their patients.

Despite the differences across healthcare systems, there are often common approaches to addressing these challenges and recognising opportunities for improvement. Approaches can be predicated on the increased availability and cultural willingness to make use of quality health data and health information technology tools by clinicians and to patients, commonly known as Health Informatics (HI), Health IT (HIT), or digital health. Accordingly the framework set out in this MoU takes account of these common aims and intends to complement respective priorities around key digital strategies. This MoU details ways in which the Participants may work together while also delivering such respective statutory functions.

The participants are also part of the Lancashire Digital Footprint for planning a paperless NHS by the year 2020 as part of the national target. There is also a willingness to work across Lancashire as described in the Vanguard bid that remains the mandate for such collaboration.

The MoU is intended to set out principles for the Participants to follow in the course of their working relationships. The Participants expect that the MoU may be supported by protocols or other documents not included here that set

out a detailed work programme (Digital Roadmap) as well as any operational and governance considerations for how the Participants plan to work together, either in total or as subgroups.

This collaboration is the result of discussions held with Directors of Finance, Chief Clinical Information Officers (CCIOs), Chief Information Officers (CIOs) and Health Informatics Programme Directors, the aims of which were to discover if a collaborative approach is supported and to align approaches within the NHS provider Trusts in Lancashire. Throughout, the discussions aimed to feed into the areas of cooperation and collaboration identified which inform strategic decision-making both locally and across Lancashire to feed into national strategy.

The Participants

Blackpool Teaching Hospitals NHS Foundation Trust (BTH) is a combined provider Trust providing a comprehensive range of acute hospital services to the population of the Fylde Coast, as well as the millions of holidaymakers that visit each year. The Trust also provides a wide range of community services to residents in Blackpool, the Fylde Coast, Wyre and North Lancashire.

BTH is one of four tertiary cardiac centres in the North West of England, providing specialist cardiac services to heart patients from Lancashire and South Cumbria.

http://www.bfwh.nhs.uk/about-our-trust/

East Lancashire Hospitals NHS Trust (ELHT) is a large Acute Trust with a range of community services providing care to people in the East of Lancashire (including Pendle). The Trust provides care to all age ranges from its 5 hospital sites and 38 different community locations across the area, moving as far south as the northern border of Greater Manchester and east to the West Yorkshire border. The main hospital sites are at Blackburn and Burnley with the emergency and urgent care departments receiving around 600 attendances per day.

http://www.elht.nhs.uk/home.htm

Lancashire Teaching Hospitals NHS Foundation Trust (LTH) is one of the largest and highest performing NHS Trusts in the country, providing district general hospital services to 370,000 people in Preston and Chorley, and specialist care to 1.5m people across Lancashire and South Cumbria. LTH provides care from three facilities: Chorley and South Ribble Hospital; Royal Preston Hospital; and the Specialist Mobility and Rehabilitation Centre.

Established in 2005 LTH was the first Trust in the country to be awarded 'teaching hospitals' status.

In 2013 LTH became the regional vascular centre for Lancashire and South Cumbria.

http://www.lancsteachinghospitals.nhs.uk/about

Lancashire Care Foundation Trust (LCFT) provides health and wellbeing services for a population of around 1.4million people. The services provided include community services such as health visiting, podiatry, sexual health and dentistry as well as inpatient and community mental health services. The Trust covers the whole of the county of Lancashire and employs around 7,000 members of staff across more than 400 sites. The clinical services are delivered through four networks Adult Community, Specialist Services, Adult Mental Health and Children & Families.

https://www.lancashirecare.nhs.uk/about-us

Southport and Ormskirk Hospital NHS Trust provides healthcare in hospital and the community to 258,000 people across Southport, Formby and West Lancashire. The Trust is an "integrated care organisation" (ICO) delivering care in hospital and the community and employs 3,472 staff. Acute care is provided at Southport and Formby District General Hospital and Ormskirk and District General Hospital. This includes adults' and children's accident and

emergency services, intensive care and a range of medical and surgical specialities. Women's and children's services, including maternity, are provided at Ormskirk hospital. In addition, the Trust is responsible for many adult community health services, mainly in north Sefton and West Lancashire, which are provided in health centres, clinics and at patients' homes.

The North West Regional Spinal Injuries Centre at Southport hospital provides specialist care for spinal patients from across the North West, North Wales and the Isle of Man.

http://www.southportandormskirk.nhs.uk/about.asp

University Hospitals Morecambe Bay Foundation Trust (UHMB) provides acute hospital services for a population of 365,000 from 3 hospital sites and 2 main outpatient centres spread across 1,000 square miles in the southern part of Cumbria Barrow in Furness (Furness General Hospital) and Kendal (Westmoreland General Hospital) and North Lancashire (Royal Lancaster Infirmary). This includes emergency departments and maternity services in Furness and Lancaster. It is a partner in a national primary and acute care vanguard involving all health social care organisations working in Morecambe Bay.

http://www.uhmb.nhs.uk/about-us/

Other Agencies and Interfaces

The Participants intend to draw on their own and other underlying resource for subject-matter expertise and the implementation of any activities conducted under this MoU (which would be at the discretion of each).

Resources will also be drawn from Healthier Lancashire, the shared infrastructure service (SIS) and from National departments such as NHE England and HSCIC. CCGs will also form part of the wider agencies as will Social Services and local councils.

Other existing and future arrangements may also drive success. For example, the Vanguard status of some of the participants may also help with resources.

The Aims and Scope

The aims and scope of this MoU are intended to reflect prior decisions and discussions on topics held at collaboration meetings, and to recognise the need to economise on innovation and best practices. The potential activities foreseen within the framework of this MoU include the following:

Sharing Quality Indicators

Review a set of jointly decided quality indicators that are currently in place.

Identify alignments across existing organisations with the potential for further collaboration and harmonisation, particularly in the area of longitudinal patient indicators across organisations.

Liberating Data and Putting It to Work

Discuss and identify areas of collaboration around Open Data and data transparency of secondary stores.

Examine potential areas for mutual learning and harmonisation concepts in supporting patient's to access and use their health data in managing their care.

Lever shared interests and accelerate the development of standards and interoperability that enhance patient care and create more open systems.

Adopting shared Digital Health Record Systems

Explore ways to maximize, prioritise and implement the successful widespread adoption of digital records systems.

Encourage the development of a robust Health IT workforce and reduce the administrative burden on front-line staff.

Shared Digital Infrastructures

Explore ways to maximize the successful widespread adoption of shared digital infrastructures.

Other Activities

Other activities undertaken by Participants may include:

- promoting the exchange of expertise and organising events
- sharing procurement knowledge and expertise
- sharing knowledge and capability in design, architecture and standards
- collaboration to ensure effective capability for work stream efficiency
- conference and showcasing
- formation of joint working groups and networks
- shared Health Informatics Operational Plans and Digital Roadmaps
- collation of outcomes and its application to policy and strategy

Principles of Collaboration

Working relationships would be characterised by the following principles:

- Promoting best practices, patient safety and high quality care;
- Respecting each organisation's independence and Governance responsibility;
- Working in an open and transparent fashion, acknowledging that each Participant has statutory duties and that sometimes cooperation may not be necessary;
- Using human resources efficiently, effectively and economically; and
- Keeping each other fully informed about developments in their approach and methodologies.

What we can expect from collaboration

Collaboration can be characterised by the following outcomes:

- Higher impact
- More creativity
- Future potential
- Less work

- Constructive Criticism and Challenge
- Ability to bring more experience to bare
- Efficient learning
- A Wider array of techniques
- Deeper knowledge
- Better and more targeted funding
- Increased number of unique projects
- Staff motivation and development
- Better outputs
- Higher likelihood of success
- Fun
- Knowledge
- Reduced risk
- Agility
- Early adopter status
- Ability to Impress investors

Financial Principles and Governance

The Participants will ensure that collaboration enables bet value for money for the NHS as a whole and will work on each business case on a case-by-case basis.

Operational Governance

The Participants intend to maintain dialogue with each other and other key stakeholders, particularly around governance, status reporting and monitoring of risks, issues and challenges. Any status reporting would be collated and disseminated to the Digital Lancashire Board. In addition, senior leads from each Participant would be identified and provide appropriate leadership for each work stream, generally assumed to be CIOs or Programme Directors. Interfaces with existing programmes of work impacted by the outcomes of this collaboration would be acknowledged; and expertise/integration sought as required, e.g. the SIS workstreams.

Terms and Review

This MoU does not create legally binding obligations. The MoU may be modified at any time by mutual written consent of each Participant. All activities undertaken pursuant to this MoU are at the discretion of each of the participants and are subject to the availability of appropriated funds as well as any other applicable laws and regulations that may govern a given participant. This document does not replace existing business plans, reporting systems or accountability lines of each Participant.

The MoU is effective from the date of the signature of each Participant thereof, and is intended to continue for a period in line with the Lancashire Digital Roadmap unless discontinued by Participants on mutual agreement. A Participant wishing to discontinue this MoU should provide written notice to the others and the Digital Lancashire Board. Its terms may be renewed or modified following a review of the operation of the MoU at regular periods and after the first 24 months. The MoU may be renewed for a period of 12 months at a time.