Bedfordshire Hospitals
NHS Foundation Trust

# Digital Strategy

Bedfordshire Hospitals NHS
Foundation Trust

12 March 2021

Confidential

# Digital Strategy

**Contents** page



**Change history**

| Version | Date | Author | Issued To | Revisions |
|---|---|---|---|---|
| Draft W to Draft 0-03 | 27/10/2020 to 18/01/2021 | MR | Digital, Key Stakeholders | Internal and initial review from digital leads, Incorporates wider stakeholder review & feedback |
| Draft 0-07 | 11/03/2021 | MR | GL | Revised Exec Summary , includes feedback |
| Draft 1-00 | 12/03/2021 | MR | Dig Strat Bd | |
| | | | | |

# Glossary

Attend Anywhere – A video consultation system.

AD - Active Directory. Microsoft's directory service to manage network resource permissions & access

BI – Business Intelligence. Tools/methods to improve value of data for business/clinical management

BAU - Business As Usual. Normal operations of the organisation.

CDIO – Chief Digital Information Officer

Cyber Essentials +. Scheme recognising achievement of govt.-endorsed standards of cyber hygiene

DPIA - Data Protection Impact Assessments. process to identify and minimise the data protection risks of a project.

DSPT - Data Security and Protection Toolkit. Online self-assessment tool, NHS mandated to provide assurance of good data security & personal info handling.

DCB1596 – Nationally required standard to be implemented for secure email service

DRP - Disaster Recovery Plan. Documented procedures to maximise recovery from loss of critical facilities, infrastructure, or resources.

EDRMS – Electronic Document and Records Management System. The Trust uses EDRMSs to hold & view scanned copies of medical records

EHR - Electronic Health Record. Same as an EPR but tends to imply wider input and usage than a hospital patient record system.

EMRAM – Electronic Medical Record Adoption Model. Method of assessing digital maturity of inpatient facility. (see also HIMSS)

ESR - electronic staff records

FOI - Freedom of Information

HIMSS Analytics – global healthcare advisor on info. & technology. Manages EMRAM, and other, benchmarking and assessments. (see also EMRAM)

IAAS - Infrastructure as a Service. Provision of data centre/compute & storage, etc. as a managed service.

IG - Information Governance. Framework for handling information in a confidential and secure manner to appropriate ethical and legislative standards.

IGSG – Information Governance Steering Group

IoT – Internet of Things. Physical objects using technologies to connecting & exchange data with other devices and systems over the Internet.

ISO/IEC 20000 – International standard for service management

ITIL or ITIL 4 - IT Infrastructure Library. An IT Service Management Best Practice Framework.

LHCRE - Local Health and Care Record Exemplar. National programme to accelerate secure exchange of health & care information between NHS & social care.

MoP - Management of Portfolios. Guidance on best practices/principles in portfolio management.

MPI - Master Patient Index. Provides unique identification & core demographics for patients.

MS 365 – Microsoft 365

MSP - Managing Successful Programmes. Best Practice methodology for programme mgt.

My Care Record – is an East of England initiative to improving care by joining up health and care information across organisations.

NIST - National Institute of Standards and Technology (Cybersecurity Framework)

Order Comms – electronic request and results system

OS – Operating System (e.g. Windows 7 or 10 operating system on a PC), cyber risks arise if the OS is not updated with security patches or is out of support.

PACs – Picture Archiving & Communications System. Provides storage/access to medical imaging.

PAS – Patient Administration System. Manages hospital admin processes, appointments, etc.

PIA - Privacy Impact Assessment, replaced by DPIA (see DPIA above)

PMI - Patient Master Index. Same as MPI (see above)

PoCT – Point of Care Testing. Rapid local testing equipment, more convenient than use of main laboratory.

PRINCE2 – Projects in a Controlled Environment. Best practice methodology for project management.

P3O - Portfolio, Programme and Project Office.

RBAC – Role Base Access Controls. Links data access to user's specific role or legitimate access rights.

SAN - Storage Area Network. Computer network provides access to consolidated data storage.

SARs - Subject Access Request. Individual's right to access/receive a copy of their personal data.

SOPs – Standard Operating Procedures

TIE – Trust Integration Engine. Software that manages secure messaging between multiple info. systems.

UPS – Uninterruptible Power Supply. Provides battery power to equipment until securely shut down.

VDI – Virtual Desktop Infrastructure. Centralises processing that would otherwise happen on a PC.

VNA – Vendor Neutral Archive. Stores images so that they can be accessed by other systems.

VOIP - Voice over Internet Protocol. Technology that enables voice calls using internet connections instead of an analogue phone line & telephone.

# 1 Executive Summary

## The Digital Strategy

Digital systems and services are a critical component in the operation of the Trust – they underpin every aspect of the clinical and administrative processes throughout the organisation.

Digital includes a complex range of computer systems, technical infrastructure such as servers and networks. It also includes the staff and skills needed to plan, implement and support these systems, and the policies and structures which ensure that investments and programmes are directed and managed effectively.

All staff and departments have a role in digital – clinical and business change can be enabled by technology but only when the organisation owns the transformation and is engaged with digital services throughout the change process.

The Digital Strategy sets out the Trust's digital goals and plans. This executive summary provides an overview with more details given in the remainder of the document.

### Shaping the Digital Strategy

The Trust's digital plans have to be developed in the context of changing information needs and expectations amongst staff, patients, care partners and beyond. The main areas are:

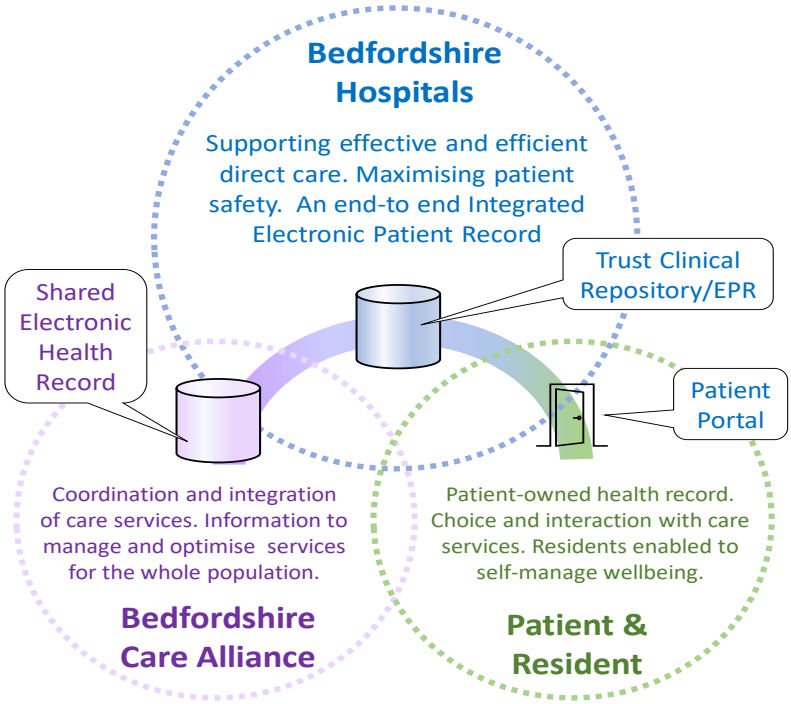
- The Trust's need to support efficient and effective patient care and service management, which includes maximising patient safety using an integrated Electronic Patient Record (EPR). Also improving clinicians' experience of using digital systems.
- The development of services within the BLMK Integrated Care System requires the exchange of electronic information across organisations to support new integrated care services.
- Technology and 'apps' are part of everyday life for many patients and there are national requirements for trusts to offer patients technology enabled services. This includes patient access to their own health record and choice in how they interact with care services.

The diagram below gives a simple view of the overlap between the Trust's own developing electronic records, integrating information with care partners, and increasing digital links with patients and residents.

### Developments within the Trust

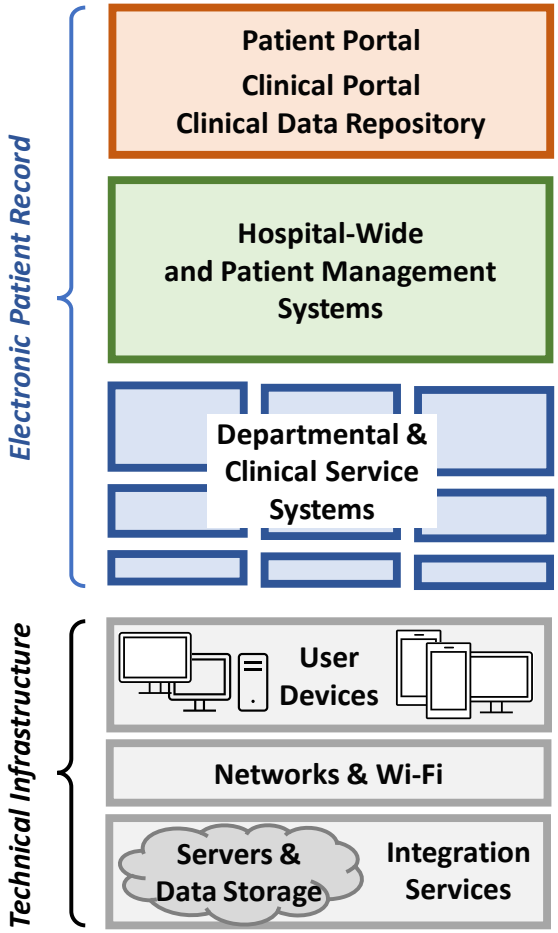
Within the Trust itself two major developments also have a direct impact on planning for digital services.

- The Trust merger has brought the need to rationalise the current duplicated information systems and networks to achieve support for fully integrated Trust-wide services.
- The site redevelopment programme has implications for technical infrastructure and may affect priorities and timetables for some areas of system implementation.



# Digital Systems and Infrastructure

The main elements making up the Trust's digital systems and infrastructure are illustrated in the diagram below. A brief outline of these areas is given here and tables on the following pages give a short summary of the goals, benefits, and plans in each area in turn.




## Electronic Patent Record

A large number of information systems are used to collect and provide information to support clinicians in their care of patients. Information about an individual patient may be held in many systems, each relating to a specific service area or aspect of the care process.

**Hospital-Wide and Patient Management Systems** This area includes the information systems that support the main clinical and administrative processes across the Trust. It is a complex area and the core part of the Trust's Electronic Patient Record development. Plans here focus on expanding the scope of the Nervecentre system and reducing the amount of paper remaining in the care processes.

**Departmental & Clinical Service Systems -** There are a large number of departmental and specialty systems and, following the merger, almost all are duplicated across the Trust's two main sites. The hospitals have some systems in common and the integration of pathology across the organisations has brought a step forward in the overall digital integration process.

**Clinical Portal -** A Clinical Portal is being developed to make it much easier for clinicians to access patient information in one place without hunting through lots of separate systems. This will start at Luton and later be extended to Bedford. It will also form the basis of a broader 'Shared Care Record' which will help in joining up care across partner organisations.

**Clinical Data Repository** – Related to the clinical portal is development of a clinical data repository which will hold data for clinical analytics to enable better understanding of clinical care and outcomes.

**Patient Portal** – a Patient Portal will follow-on from the improvement in clinicians' access to data. This will allow patients to securely view their own healthcare record. There is also a broader agenda to increase patients' choice in interacting with the hospital and to support them in managing their own wellbeing.

## Technical Infrastructure

The urgent need for improvements in user experience of clinical systems, particularly at Luton, is critical to support day-to-day working and retain clinical support for further EPR developments.

**User Devices** - A range of PCs, laptops and mobile devices are used to access information and systems. Maintaining and upgrading very large numbers of devices is challenging. Mobile devices will be widely used for clinical data capture and access, and many staff need to be able to work across both sites.

**Networks & Wi-Fi** – the existing data networks are being reviewed in preparation for upgrading and establishing an integrated network across the Trust's sites. Reliable Wi-Fi is very important to enable clinicians to access information as they move from patient to patient.

**Integration Services** – complex technology and specialist skills are needed to move and join-up data from across the range of information systems.

**Servers & Data Storage** - computer servers and data storage underpin the wide range of information systems. The Trust is migrating from an in-house approach to managed 'cloud services'.

| Key Areas | Description & Goals | Benefits & Impacts | Baseline, Issues , Plans & Longer Term | |
|---|---|---|---|---|
| **Patient Portal, interaction, and enablement** | The Trust goal is to enable patients to access their own health record and to help patients to be involved in managing their own care, including through more choice in how they interact with the Trust's services.<br>A Trust Patient Portal will provide secure patient access to their health record. | Providing choice via digital services (e.g. appointment booking and video-appointments) can improve attendance rates as well as patient satisfaction.<br>Existing work at the trust has shown direct benefits for patients through use of patient 'apps' to improve dialogue and clinical support. | Currently hospital communications with patients are largely by letter or phone, with use of texts for reminders.<br>Use of phone and video consultations has grown during the Covid19 pandemic and should remain as part of the service offering. The Patient Knows Best app will be extended to new patient groups. | Developments in these areas need to be led by clinical services in consultation with patient groups. It will be vital to consider patient choice and equality of access to services as more use of technology is incorporated in patient services. |
| **Integrated care services & population health outcomes** | The further development of integrated care across partner organisations requires the exchange of electronic information to support care services that are focused on individual patients.<br>Information also needs to be anonymised and brought together to enable design of more effective services. | Providing a 'shared care record' will enable more effective joining up and coordination of care. This will improve patient care experience, efficiency, and outcomes.<br>Analysis of information from across agencies will improve health outcomes for the local population. | The Trust will extend its Clinical and Patient Portal (discussed below) to provide a Shared Care Record for use in direct care across the Bedfordshire Care Partnership. This will include, for example, ambulance, mental health and social care services. | There is potential for the 'Clinical Data Repository' (below) to be extended so that it can support some of the analytic requirements, for example, risk stratification or population health analytics, needed at the BLMK Integrated Care System level. |
| **Trust Clinical Portal** | A large number of information systems hold various elements of the patient's electronic record. The goal for the Clinical Portal is to make it much easier for clinicians to access patient information in one place without hunting through lots of systems. | The portal system will be an integrated component of the overall Electronic Patient Record (EPR). It will improve clinical efficiency and remove many of the current frustrations resulting from accessing multiple computer systems. | The initial stage of the Clinical Portal will be implemented in 2021/22 for Luton & Dunstable. It will be extended to Bedford at a later stage and, over time, the breadth of information and usage can be increased. | Plans also include a 'Clinical Data Repository' which will support analytics based on more comprehensive clinical data than is currently possible. |

| Key Digital Areas | Description & Goals | Benefits & Impacts | Baseline, Issues , Plans & Longer Term | |
|---|---|---|---|---|
| **Hospital-wide and patient management systems** | This area includes the information systems that support the main clinical and administrative processes across the Trust, for example, those used across inpatient or outpatient services. These include Patient Administration, Bed Management, Nursing Observations, and Electronic Prescribing. It is a complex area and the core element of the Trust's Electronic Patient Record development.<br>Consolidation to fewer main clinical systems has been a Trust goal for a number of years. Achievement focuses on expanding the scope of the Nervecentre system. The Trust also aims to reduce the remaining paper in the care processes. | The benefits in this area have a direct impact on patient care and on clinical working.<br>• Removing delays/frustrations dealing with paper records<br>• Patient safety improvement by combining clinical information with clinical rules, and by automated checking of processes, measurements and observations linked to alerts and actions.<br>• Enabling mobile and flexible working.<br>• Increased efficiency in outpatient services and cost reduction such as postage and mailing savings. | Two separate and aging Patient Administration Systems (PAS) are currently used. These need to be replaced.<br>Inpatient Care Coordination (ICC), from Nervecentre , has been implemented at Luton and will be expanded to Bedford. Development of the EPR will build on this and the planned implementation for electronic prescribing and paperless A&E at Luton. Increased scope will include order communications, theatres and PAS, paperless outpatients, and infection control. | An EPR development programme needs to be established. Initially to develop requirements and options appraisals then moving onto procurement and implementation. Dependencies between system areas and on technical infrastructure need to be managed.<br>At Luton a number of factors are causing significant problems with clinical logon time and system response times. These must be resolved if EPR goals are to be achieved. |
| **Departmental & Clinical Service Systems** | There are a large number of systems that support specific clinical departments or service areas. This includes diagnostic services such as pathology and radiology, as well as individual clinical specialties such as Endoscopy, Diabetes, Ophthalmology, etc.<br>A single system is needed in each clinical area across both sites. The strategic aim is to incorporate more functionality into the core EPR where possible, reducing the number of separate systems, however, most areas will need specific systems for the foreseeable future. | Departmental systems support the efficiency and effectiveness of many areas – both direct patient care and service management.<br>Realising the benefits of fully integrated services working across the whole Trust is dependent on merging, or replacing, duplicated systems. | There is duplication of virtually all clinical applications across the two hospital sites at the moment. A major step has already made by merging the pathology systems into a single Trust-wide system.<br>A programme of work to prioritise and plan the merging of duplicated systems is underway. | Merging the departmental/specialty systems is generally a second priority after the 'hospital-wide' systems, but there will be areas that can be addressed in parallel. |

## Digital Infrastructure

| Key Areas | Description & Goals | Benefits & Impacts | Baseline, Issues , Plans & Longer Term | |
|---|---|---|---|---|
| **Workstations, VDI & Mobile Devices** | A range of PCs, laptops and mobile devices are used to access information and systems. The digital goal is to provide well supported devices which enable staff to work effectively. Increasingly this includes devices for mobile and cross-site working. | Benefits will come from more efficient central management of devices (more responsive and effective IT services), mobile capture and access to information for clinical staff which allows more efficient working. | Luton is using Virtual Desktop Infrastructure (VDI) which centralises the computer processing and uses simpler devices. The VDI is being upgraded with a new service. Bedford is working through a Windows 10 upgrade programme. | Plans to achieve a unified approach across both hospitals are needed, but the VDI and Windows 10 upgrade at Luton must be completed first to assure that the required capability is delivered. |
| **Networks including Wi-Fi** | The Trust goal is for a single reliable network infrastructure enabling information and system access across both sites and which can support delivery of the Trust's EPR ambitions. | An integrated network will enable more efficient cross-site working, and improvements in Wi-Fi and 4G/5G will underpin 'mobile' EPR and the Trust's paperless/paper-lite ambition. | A review of network infrastructure, including a full Wi-Fi site survey, is planned. This will lead to procurement and, potentially, full replacement of network equipment. | Planning will also incorporate support for the redevelopment programme. Resilience must be built into plans for Wi-Fi, internal and cross-site networks. |
| **Server Infrastructure & data centres** | Computer servers and data storage provide the underlying resources to operate digital systems and services.<br>The Trust goal aligns with national expectations of 'cloud services' for the provision of servers and storage. | The benefits offered by this approach include greater resilience and agility in provision of services. It also frees Trust resources to focus more on clinician and patient facing services rather than managing and maintaining in-house data centres. | Luton has migrated from in-house servers and data storage to cloud based 'Infrastructure as a Service' (IAAS). Bedford services are largely run from an in-house data centre. | As new applications are added or merged they will be set-up on the IAAS service with the Bedford in-house service reducing over time. |

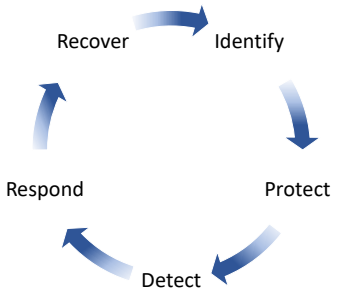
## Resilience and Security

The Trust has a high level of dependence on digital systems in order to function on a day-to-day basis. All aspects of the Trust's systems and infrastructure must be reliable and secure, with measures to counteract the increasing cyber threats that affect all public and private services.

### Cyber Security

The Trust is developing its Cyber Security service to build on the strengths of the teams brough together by the merger. The in-house service draws on external specialist advice and resource as needed.

The Trust is committed to achievement of Cyber Essentials Plus certification. Under this scheme organisations can apply for certification which recognises the achievement of government-endorsed standards of cyber hygiene.




Particular areas of focus in cyber improvements are: Access Management, upgrading PCs to Windows 10, Asset Registers, and cyber security of systems which are not managed by the IT department.

### Business Continuity and Disaster Recovery

Disaster Recovery Plans (DRP) are in place for each site and will be joined-up for the combined organisation. This will then be updated on an ongoing basis as infrastructure and systems are integrated over time. Resilience and recovery needs to be built into all digital developments from the outset as the Trust becomes increasingly reliant on real-time systems for clinical care and operational management.

### Information Governance (IG)

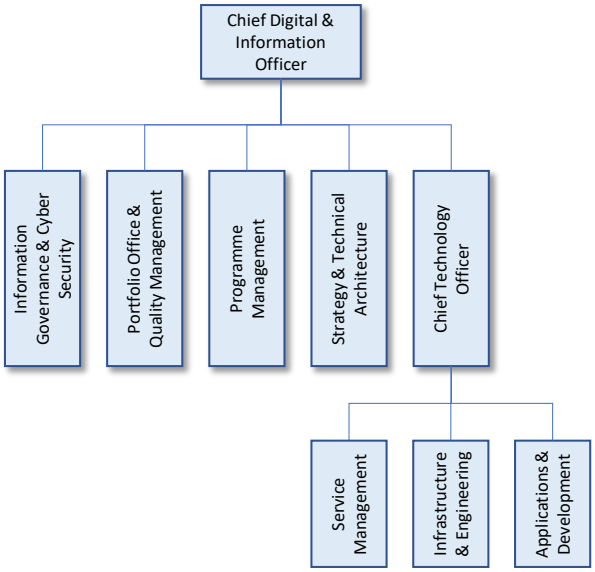
Information Governance has an important role in ensuring that information is managed legally and ethically. For example, through Data Protection Impact Assessments (DPIAs) when changes to data processes are made. Work on compliance with the mandatory elements of the Data Security and Protection Toolkit (DSPT) includes: information asset management, IG training, and managing 'national data opt-out' provisions.

## Digital Staffing & Skills

Achievement of the Trust's digital goals requires skills and resources which can be deployed effectively.

The Trust's digital services face a large number of projects to deliver EPR goals and integrate infrastructure and systems across the two hospitals. A highly customer focused, accessible and responsive organisation is needed.

As the Trust provides 24/7 services which rely on digital systems then IT support needs to match with the clinical service requirements. Out-of-hours services will need to be reviewed and developed as the Trust's EPR agenda develops.




Key aspects of the organisation structure are:

- Development of a new Portfolio Office which has oversight of portfolio planning, and leads on digital quality management
- The Programme Management group will include a clinical team to support clinical involvement in decision, design, and implementation processes
- A Technical Architecture role which will own data and technical / integration planning
- The Chief Technology Officer (CTO) and teams will focus on physical infrastructure, integration, and user support services

The Trust should develop a sourcing strategy to deliver the required digital skills and resource to implement the range of Business As Usual (BAU) and strategic developments planned.

# Digital Governance

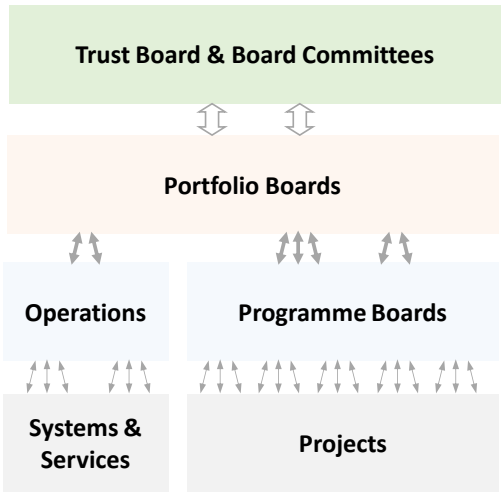
Structures and processes need to be in place to ensure that digital investments and programmes are directed and managed effectively. In particular that they remain aligned with the changing needs of the wider organisation.

## Scope and structures

The governance and programme management arrangements for digital projects have to bring together multiple areas of development and investment, including:

- Two separate Global Digital Exemplar programmes, with NHS Digital as a stakeholder, ending in 2021.
- The Integration Programme - focused on supporting service/system integration.
- Supporting digital implications of the Redevelopment Programme
- The EPR Development Programme focused on hospital-wide clinical processes.
- The e-Portal Programme, including the Care Alliance shared care record development
- Business as usual and capital programmes including major infrastructure development, maintenance, upgrades, and new initiatives.

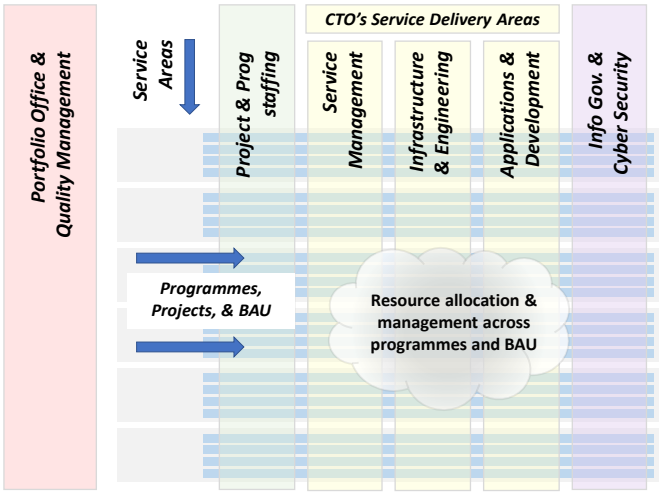
The governance structure will link programmes of work up to the Trust Board whilst ensuring coordination of dependencies and resources, etc. across the various programme areas.




## Portfolio, Programme and Project Management

A new Portfolio Office function is being formed. This will be more than just a consolidation of the existing programme offices and project support functions. The Portfolio Office will also have a wider role in quality management across the range of digital services.

A Digital Operating Model is being implemented to manage planning and allocation of resources. The diagram below shows how programmes and projects (horizontal lines) will draw on digital service lines and resources (vertical columns).




## Portfolio/Programme Risks

At the start of the strategy period the main challenges and risks relate to the level of implementation work resulting when the GDE and capital programmes are combined with that needed to progress the integration of the two hospitals and the redevelopment programme. Additional pressures from Covid19 have also increased the areas needing support.

In the longer term (probably years 2, 3 and 4 post merger transaction) there is the potential for difficult decisions in rationalising/removing some of the current clinical/departmental applications.

## Strategy Implementation

Implementation of the Digital Strategy will build on the existing GDE programmes and the work already in place to support the merger of information systems and IT across the two hospitals. The main areas of initial focus are:

- Establishing governance and programme arrangements.
- Areas of technical and evaluation work and input from the organisation, especially regarding clinical and redevelopment priorities, to inform programme/project plans.
- Development of integrated digital services and an operating model to support management of Business as Usual and development programmes.

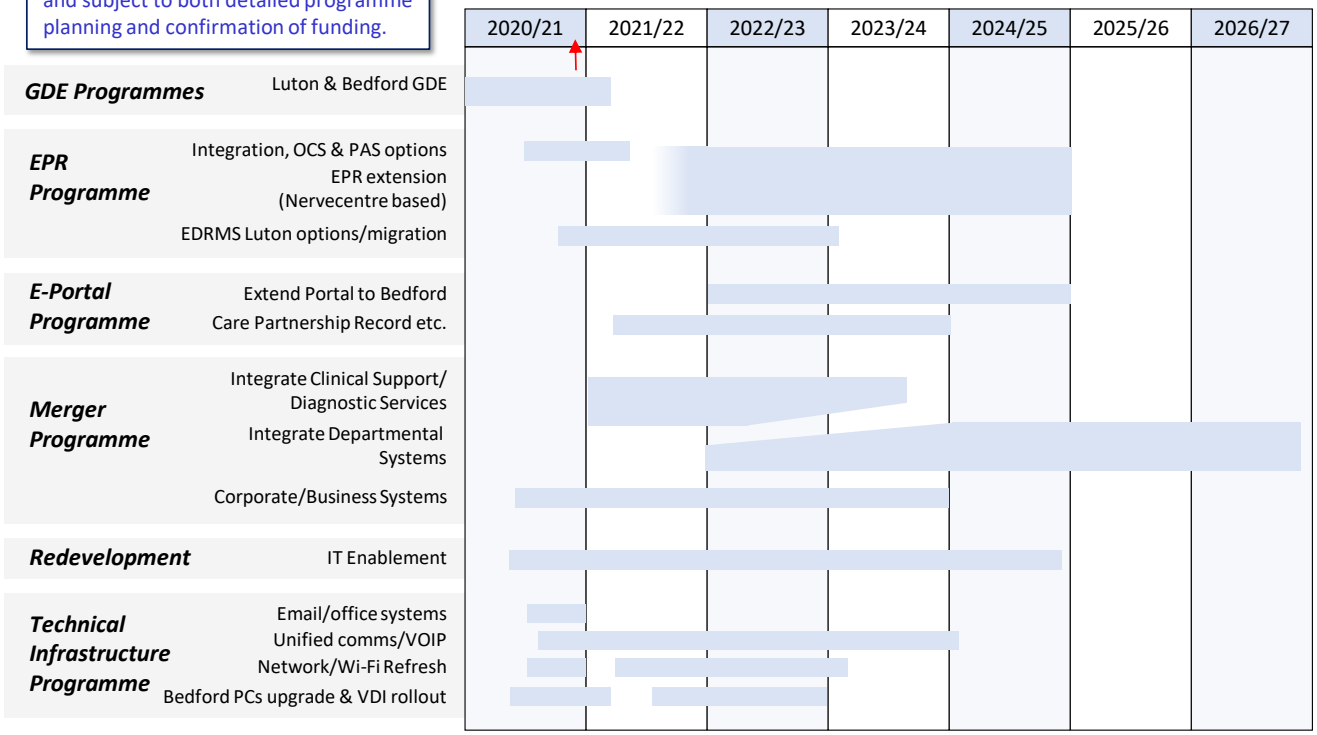
The diagram below shows the overall strategy implementation plan. The timetables shown are indicative; the pace of progress being dependent on capital and revenue resource and organisational capacity.

A spread of time is shown for implementation of the main EPR components as the order of implementation is to be confirmed. Work on developing the integration architecture and regarding PAS options, along with clinical priorities from the Merger Programme, will determine the order for implementation.

### Digital White Papers

Further high-level assessment and design will be carried out in the coming months to build-out areas covered in the digital strategy. This will include producing white papers on specific topics which need wider evaluation and discussion.

Note that this is an indicative outline and subject to both detailed programme planning and confirmation of funding.




# 2 Strategic Context, Vision & Goals

## Strategic Context

Bedfordshire Hospitals NHS Foundation Trust was formed on 1st April 2020 by the merger of Luton & Dunstable University Hospital and Bedford Hospital.

Both hospitals are successful DGHs with strong support and regard from their local communities and reputations for delivering excellent services. The hospitals retain their identity and individual hospital names. A&E, maternity and paediatrics services remain on both sites, and clinical services will work as single teams across the whole Bedfordshire catchment area. The recent merger sets the local context for implementing the Trust's digital strategy.

The tables below summarise the strategic context for the Trust's Digital Strategy. This is divided into the national context, the care system context, and the Trust context.

| ***National Context*** |
|---|
| Digital Technology in the 2020s<br>• Increasing pervasiveness of digital technology in everyday life but use lags behind in accessing the health and care system.<br>• NHS is becoming 'digital', but information is often fragmented. |
| National Context – NHS Long Term Plan<br>• NHS improvement taken forward through Sustainability and Transformation Partnerships (STPs) and Integrated Care Systems (ICSs).<br>• Stronger focus on the integration of services across partners.<br>• Potential development of population-based funding approaches.<br>• Digital implications – patient access to health records, engagement with wellbeing. |
| NHS Long Term Plan - digital milestones<br>• In 2020/21, the NHS App will provide patient access and communications.<br>• By summer 2021, 100% compliance with mandated cyber security standards.<br>• In 2021/22, systems support population health management in every ICS<br>• By 2024, secondary care providers in England will be fully digitised. |

| *National Context Continued* |
|---|
| Service pressures<br>• Increasing pressure, particularly emergency services and growing waiting lists.<br>• Impact on a wide range of services due to local government financial pressures.<br>• BLMK ICS has above average population growth and an aging population. |
| National Context – Digital Plans<br>• Initial challenge for NHS to 'go paperless' by 2018. Timescales later extended.<br>• The future of healthcare: October 2018, set vision for technology, digital and data.<br>• NHS App launched as a 'digital front door' to the NHS.<br>• National programme for Local Health and Care Record Exemplars (LHCRE).<br>• NHS paperless target moved from 2018, 2020, and 2023, now set at 2024 |

| ***Care System Context*** |
|---|
| BLMK ICS and the Bedfordshire Care Partnership<br>• Double the national average population growth over the next 15 years.<br>• Multiple organisations, complex service relationships, with links outside the ICS.<br>• Complexity regarding the operational systems and flows of information between.<br>• ICS priorities include digital technology to enable service integration.<br>• New levels of digital integration and analytic services needed to achieve goals. |
| BLMK Digital Strategy<br>• Focus on capabilities needed to join together around resident's needs.<br>• Shared care record is the main component - supporting a self-care portal, Case Identification, and a System-Wide Intelligence Service.<br>• Close alignment between shared care record the Trust's Clinical & Patient Portal |

| ***Bedfordshire Hospitals – Local Context*** |
|---|
| Formation of Bedfordshire Hospitals NHS Trust<br>• Integration of clinical services, over time, directed by a Transformation Board.<br>• The drivers for the merger have implications for digital plans and services.<br>• The Joint Clinical Vision specifically highlights the role of technology/information.<br>• Sets context for the digital strategy – supporting clinical service integration.<br>• Significant steps have already been made, especially pathology integration. |
| Luton Site Redevelopment<br>• Major site redevelopment is underway over 5 years at the Luton site.<br>• New facilities need flexibility to deploy evolving technology.<br>• Technical infrastructure and systems will need to reach into the new areas.<br>• IT will have to support interim changes as services decant and relocate.<br>• Building programmes at smaller overall scale also planned at Bedford Hospital. |
| Covid19 Pandemic<br>• Huge impact on hospital services and also on priorities for digital support.<br>• Remote working, mobile access, and telehealth services will remain/develop.<br>• Pressure on health and social care services will affect capacity for engagement.<br>• Longer term impacts on clinical services are not yet clear. |

# Digital Vision and Goals

The digital vision held in the former separate organisations has developed in line with national goals and drivers as well as recognition that the role of digitisation is fundamentally important to enable new ways of working and improvements in clinical safety and efficiency.

The main national initiative focusing on digitising hospitals has been the Global Digital Exemplar programme which both Trusts are directly engaged in. Alignment with the ICS Digital Strategy is an important element in the local GDE programme planning.

The merger has added a new dimension, requiring direct integration between the two hospitals in order to support working as a single organisation and to enable ongoing service development and innovation.

## GDE Programmes & EPR Goals

The Trust has two Global Digital Exemplar (GDE) programmes – Luton and Dunstable as an 'Exemplar' site and Bedford as a 'Fast Follower'. These are covered in more detail in the next section, but are a key part in setting the digital goals for the Trust.

The main focus of each programme is developing electronic patient records and the supporting infrastructure necessary to make them work effectively. Luton's commitment to become part of the national programme included achieving Level 7 of the HIMSS EMRAM[1] model for digitisation of hospital records. For the Trust the EPR goal is driven by the quality and efficiency benefits which can be achieved. These are the basis of the EMRAM model and so the GDE programme strongly aligns with the Trust's aims. The timetable of the GDE programme is more aggressive than would otherwise be followed by the Trust – but the Trust remains committed to achieving the GDE deliverables.

The Bedford Hospital GDE programme is committed to achieving HIMSS EMRAM level 5 through its GDE programme.

As a merged organisation the eventual aim is to achieve common digitisation across the Trust, hence Level 7 at both sites.

## Digital Strategy Goals

The overarching vision is that ***Bedfordshire Hospitals NHS Foundation Trust makes maximum appropriate use of digital support and information to deliver safe and efficient care.*** This vision is supported by six key goals, each with underpinning objectives. Digital proposals and investments will be evaluated against these goals and objectives.

[1] The Analytics Electronic Medical Record Adoption Model (EMRAM) is an assessment and scoring method developed by HIMSS Analytics which measures the adoption and utilisation of electronic medical record (EMR) functions for inpatient services.

| ***Digital Strategy Goals*** | |
|---|---|
| Goal 1 | An electronic patient record (EPR) which facilitates safe and efficient patient care. |
| Goal 2 | Clinical information is fully utilised to support safety and efficiency of direct care, patient access, service management and service improvement. |
| Goal 3 | Support development of population wide information services through collaboration with partner organisations in the local health and care economy. |
| Goal 4 | Utilise digital capabilities to improve clinical and business communications and support non-clinical services. |
| Goal 5 | To provide technical infrastructure which enables efficient and reliable access to information and systems where and when needed, with high quality digital operations and support for clinical and administrative activity. |
| Goal 6 | The Trust's information assets are safely, legally and ethically controlled. |

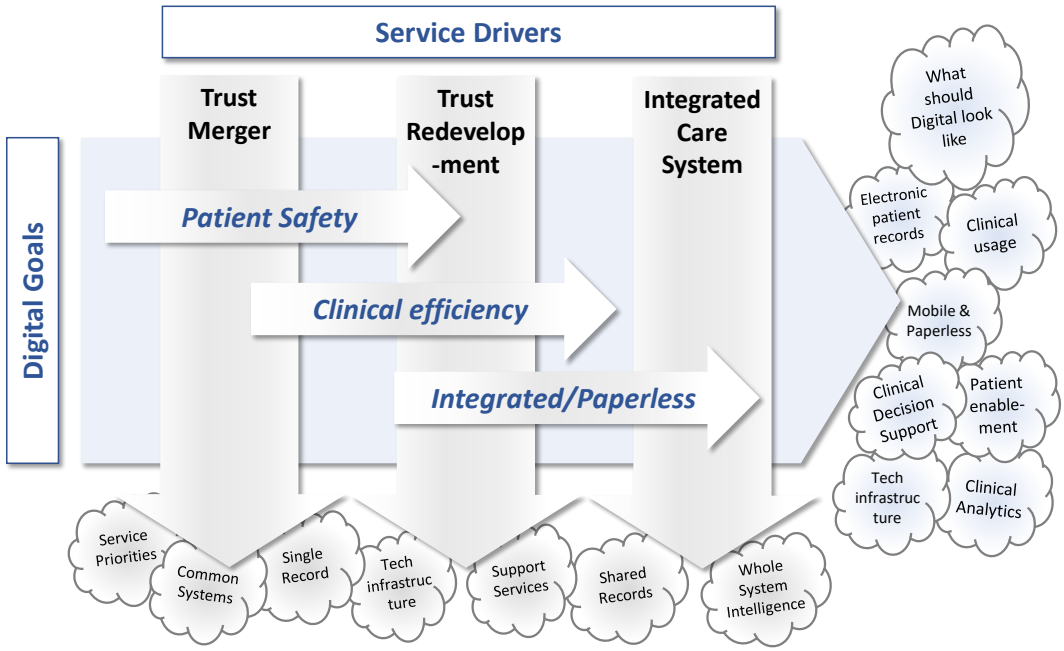
## Strategy Drivers & Target Model

The strategic context and drivers described above set the goals and direction for the Trust's Digital Strategy.

- The ***digital goals*** largely determine 'what digital should look like' within the horizon of the Digital Strategy – these are the capabilities being sought for digital information, systems and infrastructure regardless of the additional requirements of merger or redevelopment.
- ***The merger*** has brought the needing to rationalise the current duplicated systems and achieve support for filly integrated Trust-wide services, this significantly affects the route and priorities for addressing digital goals.
- The ***site redevelopment*** programme has implications for technical infrastructure and may affect priorities and timetables for some areas of system implementation.
- The ***Integrated Care System*** context extends the scope of systems integration, the interaction of information and intelligence across partner organisations and also prioritises areas for integrated working across partner organisations.

The areas listed in the table below also set direction for the digital strategy and priorities for supporting clinical services.

| ***Digital Strategy Principles*** |
|---|
| Digital Strategy Principles have also been developed which should be applied to manage the impact on users when planning or implementing digital systems. |
| ***Digital Goals for the Merger*** |
| As part of the merger planning process, digital goals which relate to the merger of management and services across the two hospitals were also developed. |
| ***Optimising the clinical model*** |
| The broad digital implications of the optimised clinical model for services between the two sites have been assessed. |

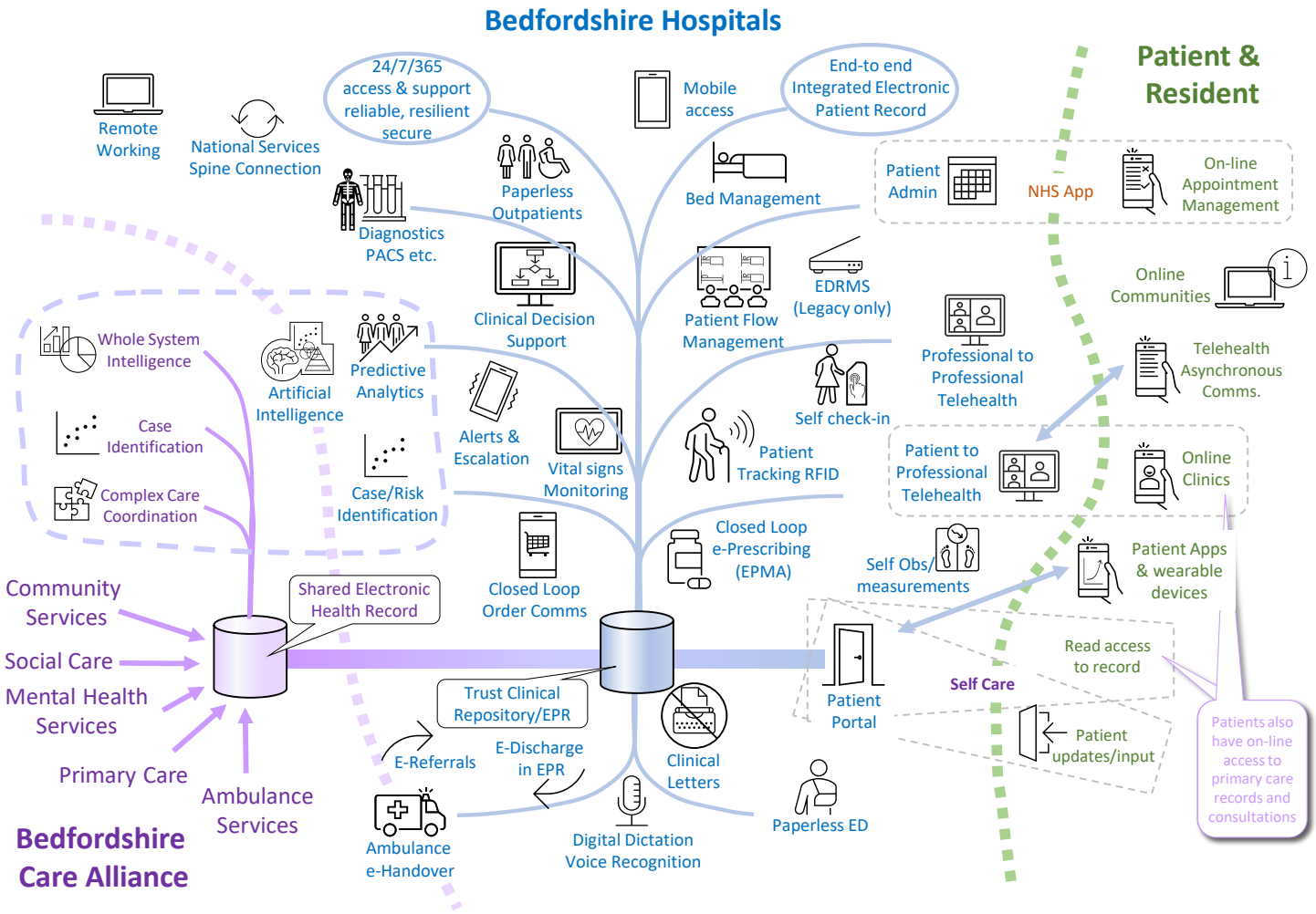


## Information and Systems – Context & Vision

The diagram below illustrates the main elements making up the local context and vision for clinical information systems. The central section shows the areas included in clinical system goals for the Trust. The lower left-hand side shows the Bedfordshire Care Alliance focus around a shared health record supporting both operational and strategic information needs.

The right hand side shows the patient and resident interaction with information and information systems.

The shared electronic health record and the Trust clinical repository/EPR are shown in their two areas of focus, however in practice this would be a single technical and data platform which meets the wider community needs as well as the those of the Trust.



## Digital in the Hospital Environment

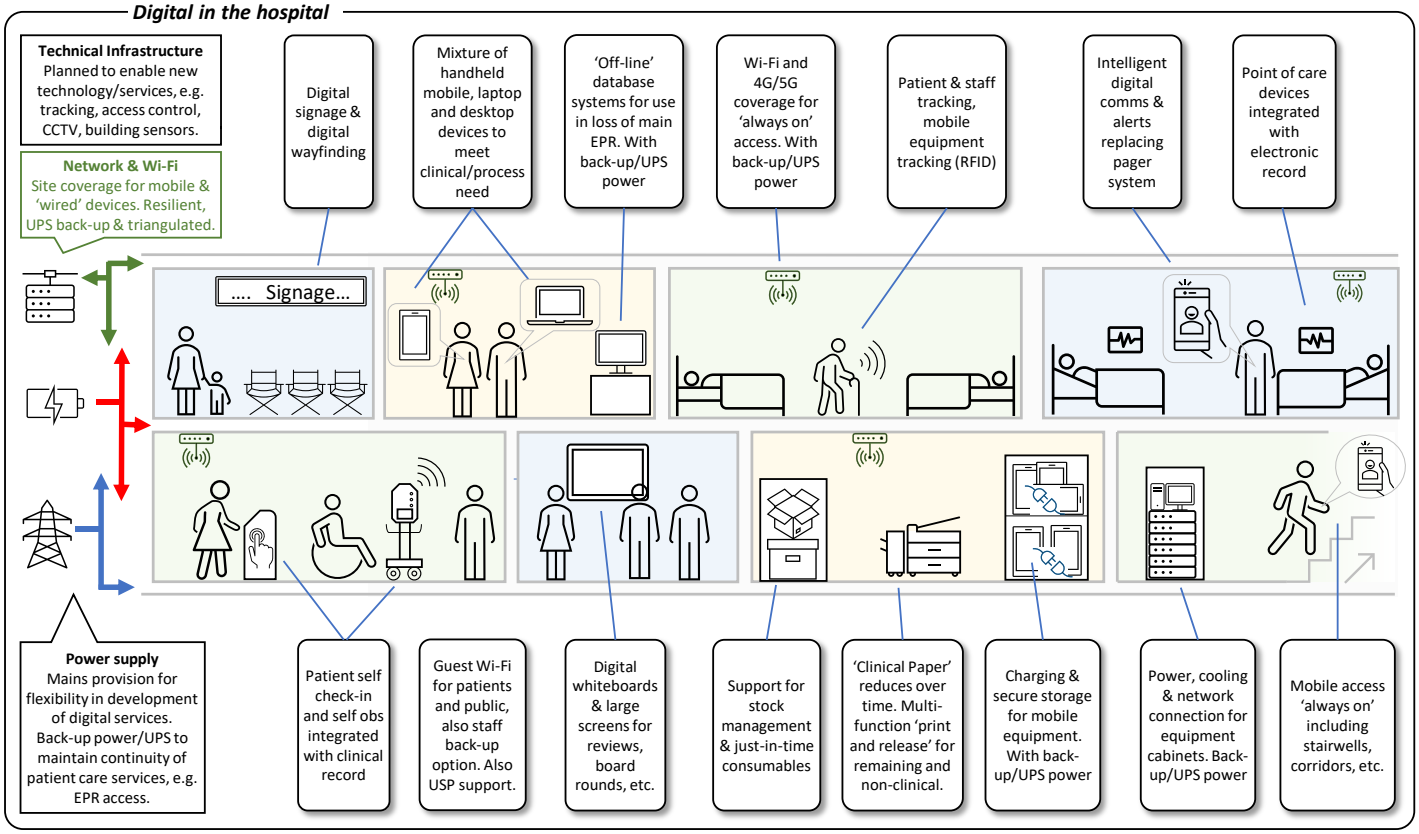
The diagram below looks at how some of the Trust's main digital goals relate to the hospital environment. This includes the way systems are used and the technical infrastructure that underpins them.

Reliable and resilient technical infrastructure provides the backbone for clinical systems and also for a range of supporting services. This needs to have flexibility to support changing service needs and new areas of technology as they develop.

In accessing information systems a range of user devices will be needed, although a 'mobile first' approach is central, laptops, desk-tops, and digital whiteboards will also have a role.

Development of the electronic patient record includes integrating data from point of care devices, and there is also interest in direct involvement of patients by providing self-check-in and self-obs for day surgery patients.

Additional areas of technology use to support services include improved clinical communications (removing the bleep system), patient tracking, digital signage, and support for management of consumables.




### Environmental Agenda

Digital Services have a role in supporting 'green' initiatives and a more active agenda can be developed. There are direct impacts from supporting remote working and reducing unnecessary travel. Within digital operations then review of procurement criteria, handling of consumables, and recycling effectiveness can all be considered.

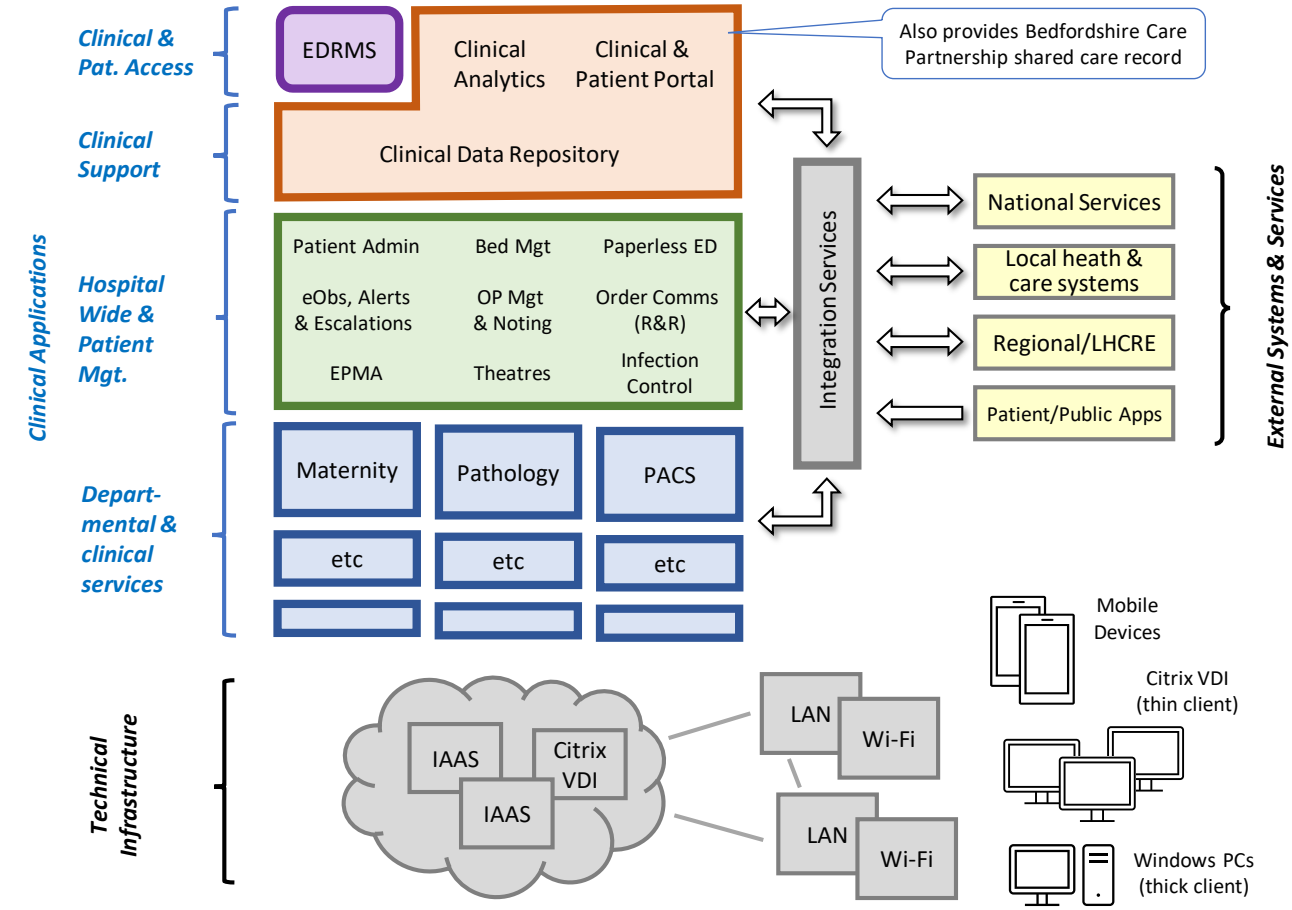
## Target model for digital systems and infrastructure

The diagram below sets out the main clinical application areas and infrastructure elements in the target model for digital systems and infrastructure.

The target model is for a single set of systems used across both hospital sites. The EPR will be delivered by consolidation on a single set of hospital wide clinical systems plus a single data repository providing both clinical and patient access, and also the wider shared care record. Mobile devices will be widely used for clinical data capture and access. There will be increasing patient enablement through on-line Trust processes and use of third party apps.

Data storage and servers will be provided as cloud services (IAAS). VDI access will be extended if proven to deliver the improvements required in access and response times.

Note that there are many web services, not shown here, which are accessed or updated but not necessarily integrated with Trust systems.




# 3 Baseline and Priorities

## Overview of the digital baseline

At the point of merger the two hospitals start with:

- Two sets of clinical and patient admin systems, and two sets of business support systems
- Two separate digital networks (with some cross site access provided)
- Differing approaches regarding management of servers and desktops.
- Two separate teams of technical and programme staff, but working jointly in some areas.

The Digital teams at the two sites worked closely together in several areas prior to the merger. This included in support of services which span the two organisations, in the context of the STP-wide digital strategy and, in particular, through the Global Digital Exemplar (GDE) Programme.

Luton and Dunstable Hospital has a high level of digitisation and a track record of IT enabled transformational change. This was recognised in the Trust being awarded GDE status. Bedford Hospital has a lower level of digitisation but, as a 'GDE Fast Follower' is accelerating the pace of digital support for clinical services.

The hospitals have some core systems in common and the integration of pathology across the organisations has brought a big step forward in the overall digital integration process. There are a number of areas where the hospitals have different approaches or systems in place, but the GDE programme is bringing closer alignment in some key areas.

Both hospitals have historically followed a 'best of breed' approach towards hospital systems and electronic records. This approach enabled relatively early adoption of systems across a wide range of service areas and was based on selecting systems that fitted well for the relevant department/service and then linking the patient ID across systems, in many cases using an interface engine. Some of the core systems which were advanced when first implemented are now dated and are limited both technically and functionally.

Over time, this has become increasingly complex and additional solutions have been adopted to make use easier for clinicians, for example 'single sign-on' to reduce the need to logon separately to multiple separate systems, also to link the 'clinical context' so moving between systems keeps the same patient selection.

Luton has moved the approach further regarding technical infrastructure with migration to 'Infrastructure as a Service' (IAAS) for server provision and management, also in partial use of Virtual Desktop Infrastructure (VDI) which uses a server and 'thin client' rather than access to systems via a traditional 'fat' PC. There are also fairly high levels of mobile device use.

At Luton a number of factors, including the current VDI solution (which is being replaced) and the need to access multiple clinical systems, are causing significant problems with clinical logon time and system response times.

Bedford Hospital manages an in-house server estate and 'fat clients' (PCs and Laptops) for user access. There has been significant investment in Bedford's digital resourcing over the last two years, largely aligned around the GDE programme, to provide better capacity for major digital projects.

Manual processes or spreadsheet records are relied on for aspects of support and infrastructure management. Better use could be made of digital tools to support provision of digital services.

Both hospitals have programme office arrangements, primarily around the two GDE programmes but also covering capital programmes.

It is important to note that discussion of the digital baseline should not imply a static position, in practice digital areas are rapidly developing at both hospital sites, primarily due to the GDE programmes, and through more recent work arising from the merger and in response to the Covid19 situation.

## The GDE Programmes

Luton and Dunstable Hospital was accepted as a Global Digital Exemplar and planned a programme of work to achieve specific GDE milestones and take the Trust to HIMMS Level 7 by December 2020, the end of the 3.5 year programme. Bedford Hospital was approved as a GDE Fast Follower (to Luton) to accelerate the pace of developing digital maturity with the goal of reaching HIMMS level 5 by the end of their programme, June 2021.

The GDE programmes were not developed to enable the merger of the two trusts, but some elements have contributed to alignment and place both hospitals in a stronger digital position to complete the integration process as a single Trust. The potential for a merger between Luton and Bedford was considered in the internal business case for the GDE programme.

Changes in the basis of the HIMSS assessment during the GDE programmes has resulted in an extensive re-planning exercise at both Trusts. Both programmes have substantial systems and organisational change to deliver against tight timescales at a greater pace than would have chosen otherwise. Both hospitals had to extend the scope of their programmes in order to achieve the agreed HIMSS 7 and 5 goals. More recently extensions to the timescales have been agreed, largely due to delays caused by Covid19.

The table following provides a brief summary of the main project areas in the programmes at each trust.

| ***Scope of the GDE Programmes*** |
|---|
| **Luton & Dunstable GDE Programme** |
| • Inpatient Care Coordination -modules for e-Observations, e-handover, bed mgt, alerts & escalation, hospital at night (Nervecentre).<br>• Closed loop medicines admin (Nervecentre).<br>• e-Portal and business intelligence.<br>• DASH Outpatient Clinic Flow.<br>• Infrastructure as a Service (IAAS), and upgraded Citrix/VDI desktop.<br>• Additional elements have been added to achieve the redefined HIMSS 7 level. |
| **Bedford Hospital GDE Fast Follower** |
| • Inpatient Care Coordination – subsequent Nervecentre implementation using the same instance as Luton.<br>• EDRMS –medical records service outsourcing, and record scanning service (Xerox and MediViewer).<br>• Clinical Portal pilot.<br>• A&E system implementation (Symphony).<br>• Continuity of Patient Care (CoPC) – includes e-discharge and Cardiology CPOE. |

## Implications of the merger on GDE Programmes

The GDE programmes are a major area of focus at both hospitals, with large teams in place and significant implementation work to complete over the remainder of the programme periods. During the lead up to the merger and in post-merger implementation there are aspects of the GDE programmes that have been changed or which will affect the plans for integration between the two hospitals:

- Inpatient Care Coordination (Nervecentre) has been revised so that Bedford will implement on the same instance as Luton.
- Emergency Department – Migration to a common Nervecentre system at the end of the Bedford's contract period for Symphony was proposed in the merger planning.
- e-Pharmacy – There will be a need to migrate into an expanded Nervecentre EPMA system across both sites.
- Luton's GDE plans for Clinical/Patient Portal includes clinical/business intelligence capability will need to be expanded to include the Bedford site in scope.
- Bedford's EDRMS service with have the same prime contractor, but a different technical solution to that in place at Luton. As the
- Luton's EDRMS contract is in its final years end the potential to migrate legacy records into the new Bedford system should be explored.

## GDE timetables and risks

By the summer of 2020 delays in some programme areas have arisen, Covid19 being one of the main factors. Both sites have completed re-planning with NHS Digital and agreed CCNs (Contract Change Notice) for revised timetables.

- At Luton the completion of the full ICC implementation, and other projects have been delayed. The programme has extended to June 2021.
- At Bedford the EDRMS and ICC go live dates have been delayed. EDRMS is underway. The final element of ICC, Bed Management, is planned for October 2021.

There remain timetable risks, primarily relating to the ongoing impact of Covid19 and resourcing competing priorities with the addition of the merger and redevelopment programmes.

# Merger Priorities

## Role of Digital & Merger Preparation

The Trust recognised the significance of the role of Digital in the operational security of the organisation as the two hospitals came together and for the dependency in delivering efficient clinical services for patients. Investment in Digital is key to driving clinical standardisation and more efficient working within the new Trust and across the health and social care economy with partners.

Attempting to complete integration of IT infrastructure and systems prior to merger of the hospitals was not feasible and was not necessary to support the new organisation on day-one. Full integration of infrastructure and systems was recognised as a long and complex process.

## Digital priorities for the merged organisation

The Digital priorities for supporting the development of the merged organisation were defined as part of merger business case and implementation planning, and are listed in the supporting papers, a brief summary is given below.

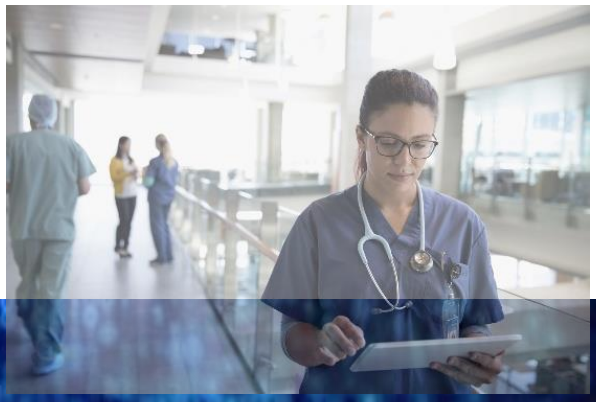
- The highest level priorities relate to clinical and business systems: continue development of the digital integration work programme; technical infrastructure reviews followed by addressing deficits; providing access to diagnostic information; merger of key corporate systems; and keeping GDE projects on track.
- The second priority area is to address consolidation onto a single suite of core clinical information systems, including a new Patient Administration Systems (PAS).
- The next level priority is to address merger of further speciality/departmental clinical systems once the core integration capability is in place.

# Benefit Opportunities

There are many potential benefits from improving digital support or clinical services and service management, however it is essential that there is investment in careful design of the 'digitally enabled clinical process'.

A Nuffield Trust research report[2] identified the following areas as possibilities to transform health care offered by digital technologies:

- More systematic, high-quality care
  - Shared EHRs, real-time data, decision support & e-prescribing, standardised workflows
- More proactive and targeted care
  - Vital signs monitoring, predictive analytics/risk stratification, shared EHRs, real-time data
- Better-coordinated care
  - Mobile working, professional-to-professional telehealth, shared EHRs, real-time data
- Improved access to specialist expertise
  - Shared EHRs, real-time data, professional-to-professional telehealth, telehealth/telecare
- Greater patient engagement
  - Shared EHRs, real-time data, wearable apps, telehealth/telecare, patient portals/records, online communities
- Improved resource management
  - Mobile working, business process support, patient flow management, e-rostering, shared EHRs, real-time data
- System improvement and learning
  - Standardised workflows, patient outcomes/registries, shared EHRs, real-time data, predictive analytics/risk stratification



[2] Imison C, Castle-Clarke S, Watson R and Edwards N (2016) Delivering the benefits of digital health care. Nuffield Trust

# 4 EPR & Clinical Information

## Scope and goals

This section describes the requirements, issues, and plans related to Digital goals 1 and 2. The scope covered focuses on the individual patient record: the hospital-wide information, systems and paper that together make up clinical records. As the core administrative aspects are so closely aligned with the development of a Trust-wide EPR the Patient Administration System (PAS) is covered. Patient access and enablement is also covered in this section.

| | |
|---|---|
| Goal 1 | An electronic patient record (EPR) which facilitates safe and efficient patient care. |
| Goal 2 | Clinical information is fully utilised to support safety and efficiency of direct care, patient access, service management and service improvement. |

This is the largest and most complex area in terms of digital systems and services for the Trust. Much of the work under the two GDE programmes has contributed in this area, but there is a big challenge to support the merger of services due to the range of systems and dependencies involved.

## Electronic Patient Record

### EPR and HIMSS Level 7

The aims for a Trust-wide EPR are driven by patient safety and service efficiency. The GDE programme also commits the Trust to achieving HIMSS EMRAM Level 7 as a measure of digitisation of the clinical services. The GDE deadline makes this a challenge.

***Key characteristics of HIMSS EMRAM 7***

- Appearance of one platform, consistent look/feel.
- High quality intelligent data entry at the point of contact – predictive text & dictionaries.
- Data then instantly available for use many times.
- Clinical Decision Support providing checks and guidance based on rules and patient data.
- Automated escalations of critical information/events with closed loop safety.
- Business Intelligence and Predictive Analytics.
- Purposeful display for the individual user – RBAC and the user profile linked with rules.
- Relevant data in a thumbnail view on front page.
- Intelligent routing of data to GP's, Patient Portal, uploads to repositories, LHRCE's National Record.
- User devices matched to operational need – no paper needed unless outside the record.
- Unified Communications built into the workflow – alerts & escalations etc.

The GDE timetable has set a pace that is faster than the Trust would otherwise follow and achieving HIMSS 7 as part of the GDE programme will only apply to Luton & Dunstable Hospital. However, this will still provide a basis for extension into a Trust-wide approach aiming to have uniform capability across the Trust.

Note that HIMSS EMRAM is a helpful model but it does not cover all aspects of the Trust's goals; EMRAM is inpatient focused and does not fully cover outpatient activity or areas beyond the hospital such as 'community wards' or approaches for patient access and enablement in self-management (patient apps, etc.). Neither does it cover the wider shared care record agenda.

Achievement of the HIMSS 7 goal needs to be balanced with providing an optimised approach to support clinicians and patients.

### EPR Baseline

Both hospitals have been using a best of breed model with numerous clinical and departmental systems running clinical applications. There is a difference in the overall levels of digitisation but current/planned GDE implementations will help convergence. Luton is targeting HIMSS level 7 and Bedford HIMSS Level 5 within their respective GDE programmes. A joint pathology service (and system) has been established and this work provides a mechanism to support further integration of systems.

There are some areas where unresolved issues with the current systems are having impacts on new system plans as well as affecting existing system use or reporting. These systems need to be evaluated to assess the work involved, the wider impacts where relevant, and whether the system involved has long enough remaining life to warrant the effort to complete upgrades or fix problems.

Issues include bugs in interfaces that have direct and knock-on implications, and systems that aren't fully supported because they haven't been upgraded for a long time, which can hamper wider system plans.

A brief summary of the main elements in the Electronic patient Record (EPR) at the Trust is given in the table below. A broad scope for EPR has been included so, for example, PAS and EDRMS are included here as they are closely interrelated with the EPR or are part of the 'paperless' agenda.

| EPR Elements | Digital Baseline L&D | Digital Baseline Bedford |
|---|---|---|
| PAS | Both using iPM PAS (SQL platform) but different versions – need replacement.<br>Not spine connected with implications for data quality effort. | |
| Clinical & Patient Portal | Currently implementing Intersystems, includes Patient Portal and analytics | Viper 360 gives useful single page view of interfaced clinical systems. |
| Inpatient Care Coordination | Nervecentre being implemented – replaces legacy and extends scope | Will implement Nervecentre on same instance as Luton |
| e-Prescribing | JAC to be replaced with NerveCentre | Medchart |
| Theatres | iPM used – so linked to plans for PAS | Opera system used |
| Emergency Department | Replacement of Symphony with Nervecentre planned | Extramed recently replaced by Symphony (well received in the dept.) |
| EDRMS -scanned paper records | Legacy paper records scanned & viewed via Kainos EDRMS. (On-site scanning & records by Xerox). Contract end in 2022. | Paper medical records/library.<br>Implementing records scanning (Xerox) with MediViewer EDRMS. |
| EDLs, Letters & Digital Dictation | Electronic Discharge Letters produced using ICE. BigHand dictation with manual transcription for clinical letters. | Moving EDLs to ICE. Also integrating Medchart (drugs) to ICE. BigHand dictation with manual transcription. |

## EPR Gaps to address

Regarding the development of the Trust EPR, overall issues regarding the current position are:

- Different systems and levels of development across the two hospitals
- Issues with usability of current clinical systems – logon and response times are a problem
- The need for re-entry of data between systems or photo-copying paper
- Limits on access to clinical/admin data which constrains on real time decision making
- Reaching HIMSS 7 is difficult with the current systems portfolio

Gaps and issues regarding the main systems in current use are:

- The iPM PAS systems are old, have limitations and cyber weaknesses.
- The Sunquest ICE systems have been valuable, but are old and have significant limitations.
- EPMA and Paperless ED are planned to move to the Nervecentre system at Luton. There will be a need to bring Bedford in line and onto same system instance.
- Outpatient clinical work remains largely paper based (albeit scanned) and this remains a significant gap in the clinical information flow along the patient pathway.
- The portal developments at Luton will need to be extended to the Bedford site if a single EPR system is to support integrated clinical services and wider care records.
- There is a need to drive the 'paperless agenda' with structured clinical data capture at source replacing 'day forward scanning' – relevant to both inpatient and outpatient activity. Also relevant to removing or reducing transcribed dictation.
- Single solution options for EDRMS should be explored as Luton nears the end of the current contract. Also the approach for handling the remaining unscanned records.

## EPR Choices

The Trust has considered alternative approaches for developing the EPR over a number of years. Work during the Luton GDE programme has shown that the ability to realise the full benefits of the EPR cannot be achieved with a 'best of breed' approach. An assessment of the broad approaches is included in the supporting papers.

In practice the Trust has already moved on from a 'best of breed' approach with the GDE programme. Consolidation to fewer main clinical systems has been a Digital Strategy goal for a number of years as the overheads of integrating and managing many separate systems became increasingly complex.

## Approach for Core EPR systems

Achieving the benefits of EPR requires a level of integration to deliver genuine clinical decision support and provide a central clinical data repository. Given the Trust's current baseline, work already in progress, and the much higher financial and 'change' costs of adopting a fully integrated EPR the Trust's strategy is to develop a 'best of Suite' approach.

This will extend the Nervecentre functionality and the Luton portal to deliver the Trust's EPR goals. It involves extending the scope at Luton and reaching across to incorporate Bedford Hospital. Nervecentre are actively developing a broad range of EPR functionality, with many components in place or nearing initial usage.

The Nervecentre components will build on the joint ICC implementation and the planned implementation for EPMA and Paperless ED at Luton. The Nervecentre based approach can be extended to also include paperless outpatients, order communications, infection control, theatres and PAS. The portal system will be an integrated component of the overall EPR and will provide clinical and patient access as well as clinical analytics services.

In implementing this approach there are some issues and dependencies that need to be managed:

- Dependency on the technical infrastructure, including networks and desktop/VDI
- The supplier's delivery of new functionality and their capacity to support deployment
- Ensuring value for money and long term control of supplier costs (applies to other options)
- The Trust's change management capacity and clinical/technical staffing for the programme
- Availability of capital and revenue funding – the merger capital planning process included funding for most, but not all, areas in the EPR vision and so choices about scope and timing will need to be made as the programme develops.
- There will be some areas, such as NICU and possibly Maternity, which will not be supported by Nervecentre's scope of functionality. The approach in these areas needs to be agreed.

The implementation approach needs to follow the Trust's principles for managing implementation of clinical systems.

A brief summary regarding options and plans for the main EPR system areas is given in the table below.

| *EPR Element* | *EPR Options & Plans* |
|---|---|
| Nursing Obs. | Will be incorporated in the single instance of ICC (Nervecentre) at both sites |
| Bed Mgt. | Included in Nervecentre implementation (above) replacing Extramed system |
| EPMA | Luton replacing JAC with Nervecentre for e-prescribing. Bedford uses MedChart e-Prescribing. No local pressures for changing MedChart, but will need to migrate to common Nervecentre. |
| ED (A&E) | Luton plans for 'paperless ED' using Nervecentre to replace Symphony. Bedford using Symphony. Will need to extend Nervecentre to Bedford at contract end, summer 2022. |
| Outpatients | Proposed extension of Nervecentre to include & configure the OP module to meet the range of needs. Timing at each site within EPR/PAS programme to be decided. Will reduce EDRMS scanning. |
| Order Comms | Cross site access to results (using ICE) in the short term – either two ICEs or merge to one.<br>Nervecentre OCS is proposed as a Trust-wide replacement for ICE – this resolves issues with ICE. However, need to confirm GP needs can also be met (may need to retain ICE for a time to serve GPs). e-discharge letters should move from ICE to be part of the core EPR. |
| Diagnostics | NB. diagnostic/imaging is covered later under *'Clinical Support & Specialty/Departmental Systems'* |
| Clinical and Patient Portal | The EPR strategy is to extend the Luton Portal to replace Viper 360 at Bedford when infrastructure is in place and functionality matches or exceeds Viper 360. This leaves a gap in access to the wider care portal at Bedford until a unified system is in place. Links between the two portals maybe a more effective interim measure. The Luton portal will be the basis of the wider shared care record and analytics for the Bedfordshire Care Partnership. See section 5 for more details. |
| Clinical Analytics | Luton portal (above) will includes clinical analytics working on the single clinical data repository. Alignment with the Information Dept Data Warehouse needs to be defined. |
| PAS Replacement | There is a choice between Nervecentre (the ICC/EPMA/ED supplier) or InterSystems (portal supplier), although other systems could be considered. Preferred route is Nervecentre as this simplifies integration, support, clinical information flow etc. with the rest of the core EPR.<br>An option evaluation and decision point is needed to fit with overall clinical integration plans. |
| Theatres | Theatre management options need to be included in the PAS evaluation. Functionality is planned by Nervecentre, and Opera is used at Bedford. |
| EDLs, Letters & Digital Dictation | The EDL process should be integrated into the clinical workflow as part of the Nervecentre functionality (addressed prior to ICE replacement). Letter content should use structured data capture, but options to integrate dictation (or voice recognition) should be explored, aiming to replace BigHand (and transcription) with an EPR integrated voice recognition. |
| EDRMS | New information should be captured as structured data at source, avoiding scanning.<br>An options assessment is required in preparation for the end of the Luton EDRMS contract. Migration of the Luton data base onto the Bedford EDRMS system looks to be preferred. Handling of remaining Luton paper medical records needs to be determined. |

It is important to note that there may be resistance to changing systems in areas where the current system is either relatively newly implemented or it is seen to work well for users as a local system, for example, replacing Symphony or Medchart at Bedford.

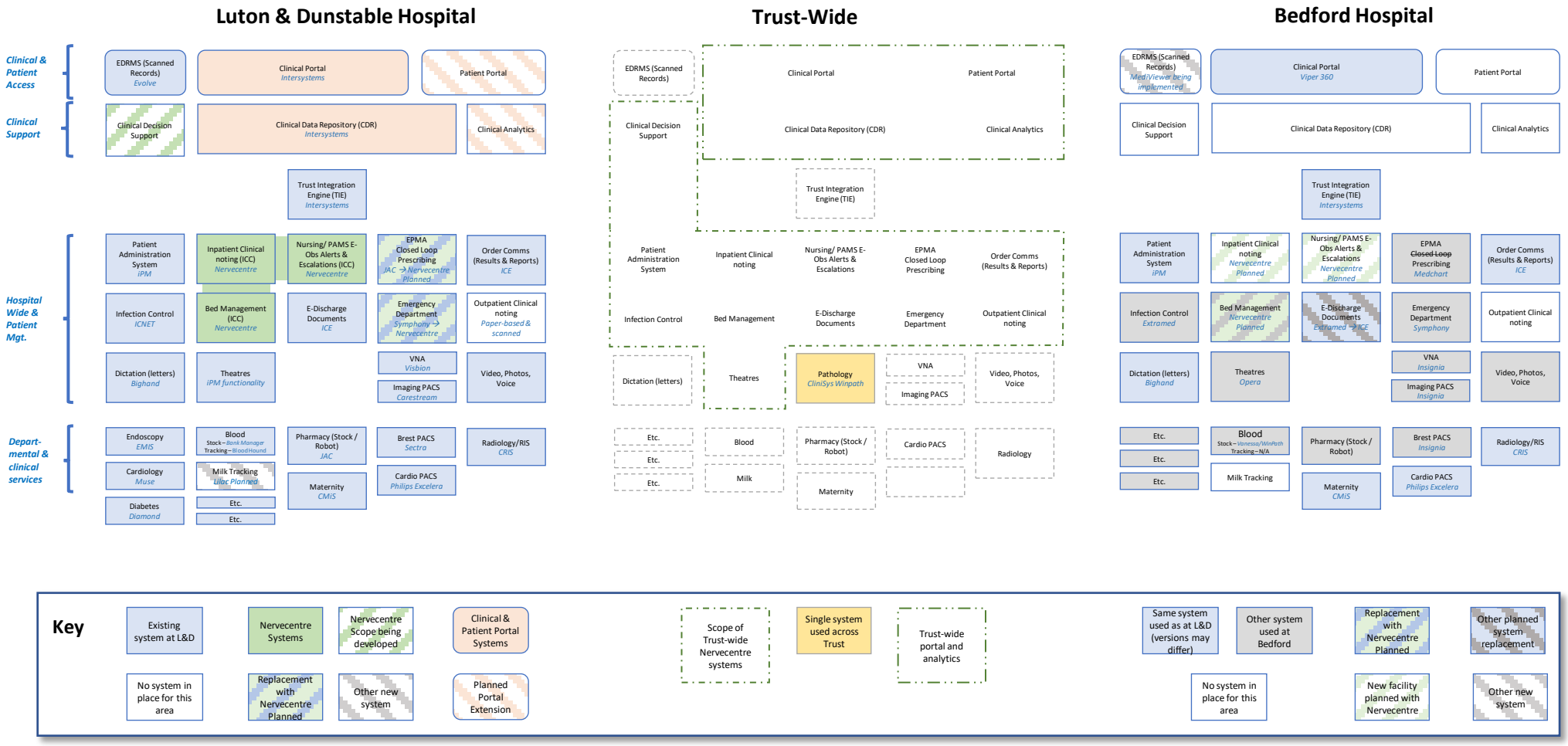
## EPR Development – baseline and goal

The diagrams on the following pages show the current position and the goal for EPR applications.

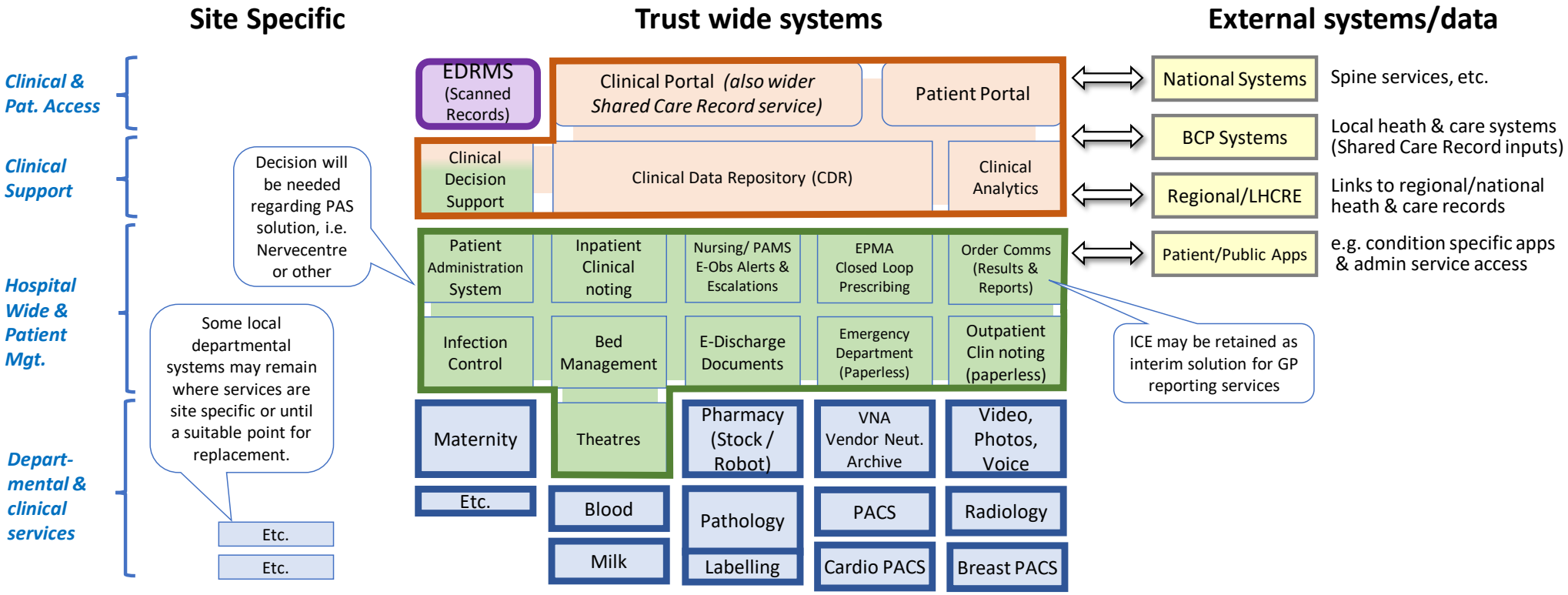
This first page illustrates the current position, including projects that are planned or in progress. It shows the L&D position on the left and the Bedford position on the right, with systems operating across the whole Trust in the centre section. It can be seen that although there are lots of systems in common, only Pathology is supported by a single Trust-wide system at the moment. Nervecentre ICC will be added to this as GDE projects are completed.

The second page shows the longer term aim of consolidating systems to develop the Trust EPR based on two main components, the Nervecentre EPR application and the Clinical Portal/Repository. This is how the middle section of the first page should look in future years.

## EPR/Clinical Systems – Current Position & Plans



## Aim for Trust-wide EPR & Clinical Systems



## EPR Programme Development

An EPR development programme needs to be established. Initially to develop EPR requirements and options appraisals then moving onto procurement. The initial work should start in parallel with the remainder of the GDE Programme implementation work (completing ICC, EPMA, ED, etc.).

The programme development (including evaluation, design, requirements, and procurement) should be separate from the programme delivery arrangements (implementation work through to handing over to BAU).

The EPR Programme Development scope should include:

- Options evaluation for PAS and Theatres and for the Luton EDRMS service
- Clinical process and access planning
  - Map clinical roles/processes across systems, e.g. usage of portal vs Nervecentre vs other for what tasks/settings
  - Clarify clinical interaction with EPR/data, e.g. read/write across systems.
  - Define optimum use of devices (hand-held/laptop/white board/etc.) for tasks/settings
  - Consider impacts of changing practice such as remote clinics etc.
  - Develop use cases to inform implementation
- Clinical letters assessment, including potentially integrated voice recognition or dictation
- Planning a drive towards paperless working as default approach, cutting across areas
- Planning and implementation of additional EPR components, including:
  - Extension of planned systems to include Bedford (EPMA and paperless ED)
  - Order communications – replacing ICE and incorporating EDLs into core EPR
  - Paperless outpatients (and clinic management if not addressed with PAS)
  - PAS (and Theatres) replacement following outcome of option evaluation
  - Migration to common EDRMS, subject to options evaluation
- A programme to engage and review the areas that will not be addressed by the Nervecentre plans.
- The EPR programme planning work needs to consider:
  - Priorities for implementing digital support to enable service integration.
  - Interdependencies between EPR areas and with the required integration architecture
  - Supplier readiness with both system functionality and implementation resources
  - Realistic allowance for business case and procurement timescales and for contingency
  - Change capacity within affected clinical/admin areas and digital departments
  - Digital implementation resources and technical skills capacity (in-house or third party)
  - Capital and revenue capacity for implementation and ongoing support
  - Choices regarding implementing across both hospitals simultaneously, or in sequence
  - Readiness of digital infrastructure to support new systems and users
  - The potential for changing priorities (or progress) in other Trust programme areas
  - Related development of technology which will integrate with the EPR, for example, patient tracking (RFID), self-check-in, self-observations, baby tagging, etc.
- Work on the PAS and Theatres option evaluation will need to consider:
  - Development of Trust functional requirements
  - Nervecentre readiness with PAS and Theatres functionality
  - The impact of PAS timing on cost and complexity of system/data integration work (later PAS replacement may reduce risks of change but achieving a single PMI earlier will simplify data integration)
  - Point to point interfaces need to be replaced with TIE integration before changing PAS
  - Note that a single PAS will not affect clinical data access (greatly) but will affect service operations and management

The Clinical and Patient Portal should be taken forward as part of a broader Bedfordshire Shared Record Programme. This programme will include extending facilities across to Bedford, replacing Viper360. There will be a need to manage alignment with EPR programme goals and interdependencies with both the EPR and integration programmes as well as with the wider care community requirements.

# Patient Access, Interaction and Enablement

## Baseline

In general, NHS developments in providing patients with direct electronic access to hospital services (appointment booking, etc.) and to their hospital electronic patient records have been limited. Patient access to GP records is widely availble, although patient take-up is relatively low, and the Electronic Referral Service supports patients in the initial booking of a first OP appointment. The national expectation is that direct patient access will include secondary care services and that increased use of apps will support patients/public in wellbeing and self-care.

The Trust does not offer online appointment booking; letters and text reminders are used, with follow-ups primarily arranged at clinic, and phone access to an OP appointments service. Patient access to electronic records is not availble but will be included in the Luton Portal project.

Patient Knows Best is being used successfully by the gastro team to support adults with Irritable Bowel Disease (IBS) and there is wider interest.

## Options & Approach

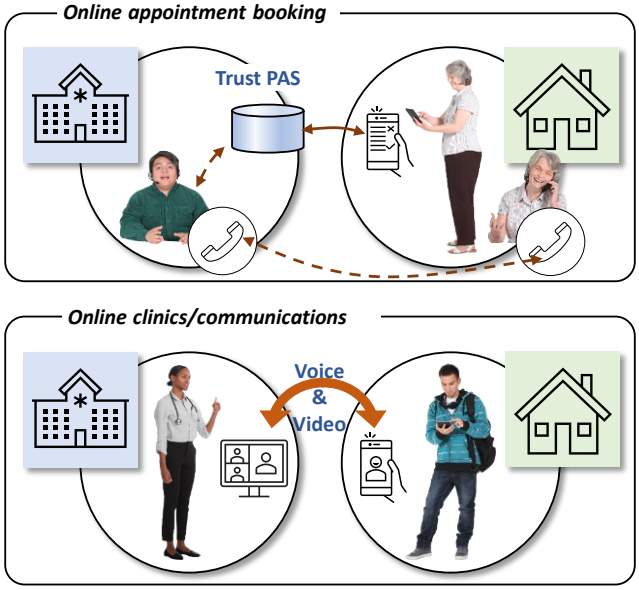
An important area of development, supported by digital technology, is enabling patients in managing their own care through access to their clinical information, easier dialogue with clinicians, and access to guidance and support information. There are also benefits to be obtained by modernising aspects of the patient administration process to improve patient experience. Note that some aspects relate to PAS/OP earlier and Unified Comms in section 6.

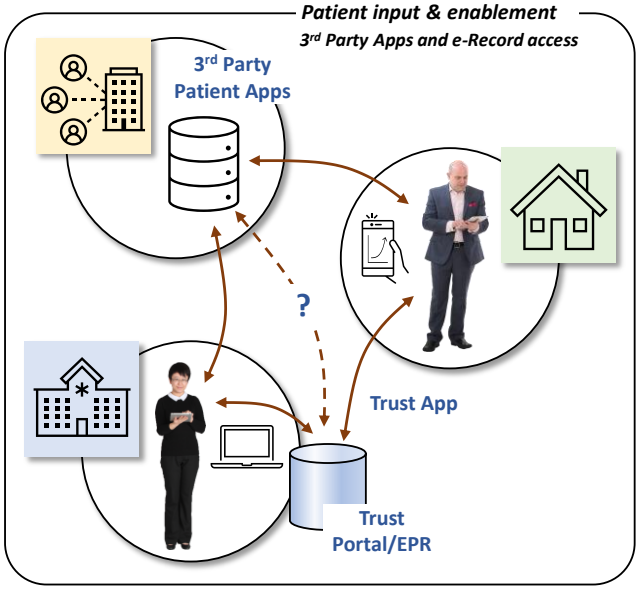
| ***Patient Access, Interaction and Enablement - Options & Plans*** |
|---|
| ***Online access for appointment booking etc*** |
| Options and benefits of on-line access to appointment booking should be explored. Efficiencies expected (including print and postage savings) in using email for willing patients. Include when looking at changes regarding PAS and OP management. |
| ***Access to hospital e-record*** |
| The Patient Portal project will provide for Luton patients, with later extension for Bedford. Current plans are read-only, but the potential for patient updates should be considered. |
| ***Patient input, enablement & communications*** |
| There will be increasing use of wellbeing and condition based apps to support patient communications and self-care (part of the NHS's app strategy). Additional use of Patient Knows Best for Children with Complex Epilepsy is planned by the Paediatric Dept.<br>The longer term approach to how external patient apps will sit alongside the Trust's clinical record needs to be developed (see also section on Data Mgt.), also whether there is a role for some of this need to be met through the Trust's Portal/EPR systems. |

Developments in this are must consider, digital inclusion (language, skills, access to devices, etc.) and significant user support implications.

# Patient interaction at hospital

Areas of potential development for surgical patients include patient tracking, self-check-in, and self-observations. Other technology considered includes digital signage and wayfinding.



# Clinical Support & Specialty/Departmental Systems

## Baseline & Gaps

There is duplication of virtually all clinical applications across the two hospitals, with a mixture of common or different systems in each of the relevant departments. For example, to provide patient diagnostics and Order Communications each site is running separate instances of Sunquest ICE, separate CRIS (Radiology information) and five PACS between the two hospitals. A number of other departments have duplicates of the same system, these include Diabetes services, Pharmacy stock control, and Maternity departments. Areas where different solutions are used at each site include Endoscopy, Cardiology, Infection Control, and Theatres.

The overall gaps and issues to address regarding department and speciality systems are:

- The duplication of systems across the two sites
  - A mix of systems with varying strengths and weaknesses,
  - and a need to rationalise and support clinical integration
- Lack of integration of clinical data to feed into a common electronic clinical record
- Some tensions between meeting wider clinical network information/system requirements and developing the hospital level EPR.
- Management of IT systems outside the IT department can lead to risks regarding data integrity and security.

In some areas the same system is used and is likely to be adopted as a single system across both sites, in others there are differences or limitations with both systems.

## Options & Approach - Clinical Support & Departmental Systems

The initial focus for merger of systems will be on the main hospital wide and diagnostic service systems as these will affect the main flow of patients through all clinical areas and simplify access to clinical data for staff who work across sites. Generally work on merging the remaining departmental/specialty systems will be a second priority although it is likely there will be exceptions where there are pressing needs for specific areas. The strategic aim should be to incorporate more functionality into the core EPR where possible and reduce the number of separate specialist systems, however, most areas will need specific systems for the foreseeable future.

Work on the migration to common clinical applications will be a long process, based on clinical priorities and building on previous PMI and integration architecture work. The timing and approach for integration of the clinical systems has to be developed in tandem with the broader integration planning. Until completion of the PAS replacement there will be two PMIs and this will complicate the integration required if departments move to a single system prior to establishing a single PMI.

Divisional business cases will also be needed to enable system migration or replacement in order to support service integration. Savings in duplicated licence/support costs will offset some of the implementation costs.

### Clinical support/diagnostics

Early movement to a single RIS and to common PACS/VNA solutions is likely to be required. For ICE there is a choice to be made whether to move to a single version of ICE at an early stage, or continue with two ICE systems each of which can be viewed from each site, until replacement with a new single system. Relevant to this decision will be technical plans and options for managing two separate PMIs and the ability of the ICE system to handling PMI feeds.

Point of Care Testing (PoCT) devices should be integrated into the electronic record (rather than just local printing or results which then are scanned into EDRMS).

### Departmental and Specialty Systems

There are a large number of additional clinical and departmental systems which are duplicated across the two hospitals. A process is being established to review the requirements and options in each area and agree a programme of work to migrate or replace systems. Decisions regarding priorities will reflect plans for clinical service integration and will need to be under clear governance arrangements. In addition to funding and resourcing, there will be other factors that affect timing, for example contract lengths and break points may also affect the opportunities for system change.

Input on system and information requirements will be led by the relevant clinical groups and digital staff will support clinical areas in considering the options and planning implementation work.

Expectations need to be managed as establishing hospital-wide systems will have higher priority and some decisions will require compromise as a choice between two well accepted systems may be needed.

# Medical Equipment

## Cyber & Operational Support

There is increasing use of medical equipment that have a large IT component but which are managed outside the IT department. This can lead to cyber security issues if local measures are not being taken to assess risks and ensure security controls are in place, including manging patches and upgrades. An audit and risk assessment is required to understand the range of equipment, risks, and opportunities for improving controls.

Agreement is needed on how management of Clinical Devices (as IT end points) can be best managed to address cyber risks and support operational services. This should also include policies regarding specification, procurement and supplier obligations.

## Clinical Data Integration

The audit of medical equipment should also feed into an assessment of data integration requirements and feasibility. Ideally clinical data should be incorporated in the common electronic patient record. This may not be practical for some existing equipment but should be an essential capability in future procurements.

Paper scanning will continue where local paper output is produced from 'point of care testing' (POCT) and the relevant data is not also directly transferred to the patient e-record through data integration. And so, without real-time integration to a mobile e-record the paper will persist.

The approach regarding patient monitoring equipment (point of care devices) is also relevant and needs to be assessed. This area should be incorporated in more detailed EPR programme development.

## Equipment management & tracking

RFID tracking is an area of potential development for patient and staff tracking. There is also potential application to medical equipment – to help rapid location of specific devices.

There are also practical issues such as equipment on crash trolleys being charged and ready for use when needed. Electronic monitoring may provide ways of supporting the management of equipment by automating alerts regarding equipment status and actions that are required.

# Wider Engagement & Review

Engagement and review is needed, from digital services, across a wider range of users and systems to understand how staff are using systems and technology and to identify opportunities to improve effectiveness of support from existing systems as well as from the new developments.

# Systems Integration Strategy

Detailed assessment and planning is needed to develop the integration strategy for bringing together data and information flows from the two sets of IT systems. The integration strategy should be focused on rationalising and simplifying the integration architecture, aligned with the portal as the main route for access to systems. The integration strategy (and merger) programme will be lead by clinical priorities except where technical constraints apply.

The strategy needs to address multiple steps during the further development of the Trusts electronic patient record and the migration from duplicated systems to a single set of Trust-wide applications. Migration to a single Trust Integration Engine (TIE) and implementation of a single replacement PAS are key steps.

Dealing with two separate Master Patient Indexes (MPIs) will be a challenge until a single replacement PAS is implemented. In the meantime, implementation of a single Nervecentre system will take feeds from the two separate MPIs, as has been done with the joint pathology service.

Development of the detailed integration strategy will be closely tied to planning the extension of EPR systems and the development of the Trust's portal/clinical data repository.

# 5 Wider Care Services & Care Alliance

## Scope and Alignment with STP/Care Partnership Aims

This section describes the requirements, issues, and plans related to Digital goal 3, the scope primarily relates to the development of a Bedfordshire Care Partnership Shared Care Record.

| | |
|---|---|
| Goal 3 | Support development of population wide information services through collaboration with partner organisations in the local health and care economy. |

The supporting objectives for this goal include take a leading role in the development and support of the STP Shared Care Record, ensuring interoperability between the Trust level EPR/Portal and the Care Partnership Shared Care Record, and supporting longer term developments of the Integrated Care System as the digital implications develop.

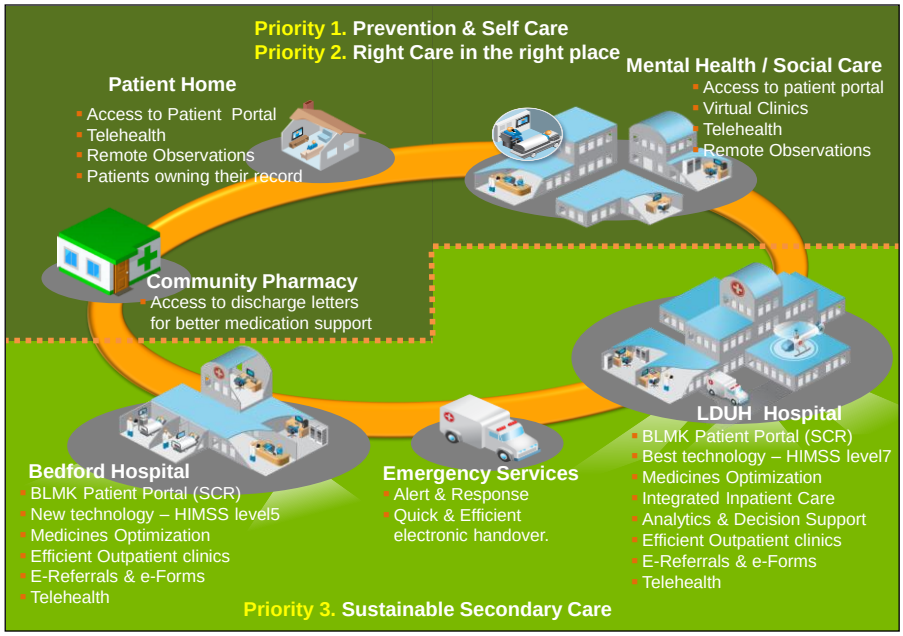
The STP's priority 3 - Sustainable Secondary Care, was directly relevant to the Trust merger. However, the Trust's GDE programmes and the broader digital integration is also strongly aligned with the STP 'Digital' priority work stream. Particular areas of note are:

- Clinical/Patient Portal developments at Luton have incorporated the ability to provide a foundation for the larger scale Care Partnership Shared Care Record system.
- Out-of-hospital access and communications to support initiatives to reduce unnecessary admissions, for which nursing/care home links are a priority. For example, extending the clinical and diagnostic capabilities of the hospital via unified communications can support these initiatives.

STP priorities are illustrated in the picture to the right, along with some of the digital developments which can support these priorities.

The digital capabilities required to transform the system include a number of different functions that are all tightly linked. The main digital capabilities at the ICS strategy level are summarised in the following table.

| ***Digital Capabilities and Description*** |
|---|
| **Whole System Intelligence** |
| Information pseudonymised in near real-time, to support tactical commissioning, service management, and economic functioning of the Health and Care system. |
| **Self-Care** |
| Residents have their clinically relevant information available to them, to own and enrich. A critical step in activating & releasing peoples' potential to maintain their own well-being. |
| **Support Direct Care - Case Identification** |
| Timely case identification based on near real-time updates to information that capture the whole patient journey. |
| **Direct Care - Complex Care Coordination** |
| Enables individuals with multiple morbidity to be coordinated among multiple providers, and transitions across care settings actively managed. Used by complex care coordinators. |
| **Direct Care - Shared Care Record** |
| Patients' clinically relevant information made available to all providers at the point of care. Those focussed on co-ordination of care or transitions of care would be the regular users, others would access the Shared Care Record from within their own main system. |



# E-Portal & Care Alliance Programme Development

## Approach and issues

The intention is that the Trust's GDE Portal project at Luton will provide the basis for a broadened scope programme that addresses some of the digital capabilities planned at the Bedfordshire Care Alliance level.

Planning for the broader scope needs to be developed – this should confirm scope, requirements, timescales, information governance/controls, and programme governance arrangements.

The programme governance arrangements will need to manage the wider stakeholder involvement in the shared care record development and also the Trust's internal requirements for development of the portal.

An assessment is needed of the functionality that can be developed from extension of the Luton Portal and those areas which will need a different approach or additional solutions/services such as the extent of resident owned updates and enablement or the range of analytic capabilities needed.

Having a different portal at Bedford Hospital will be a limitation to access by Trust users to broader care records if this becomes availble before the Trust moves to a single portal (or links its two portals).

Information governance considerations include access management. This applies to users in a range of roles across the Trust and partner agencies and regarding patient/citizen access to personal records.

## Linkage to wider care records

The Care Partnership shared care record will be developed to link to the care record covering the Milton Keynes area and also to wider East of England initiative My Care Record.

## Support services

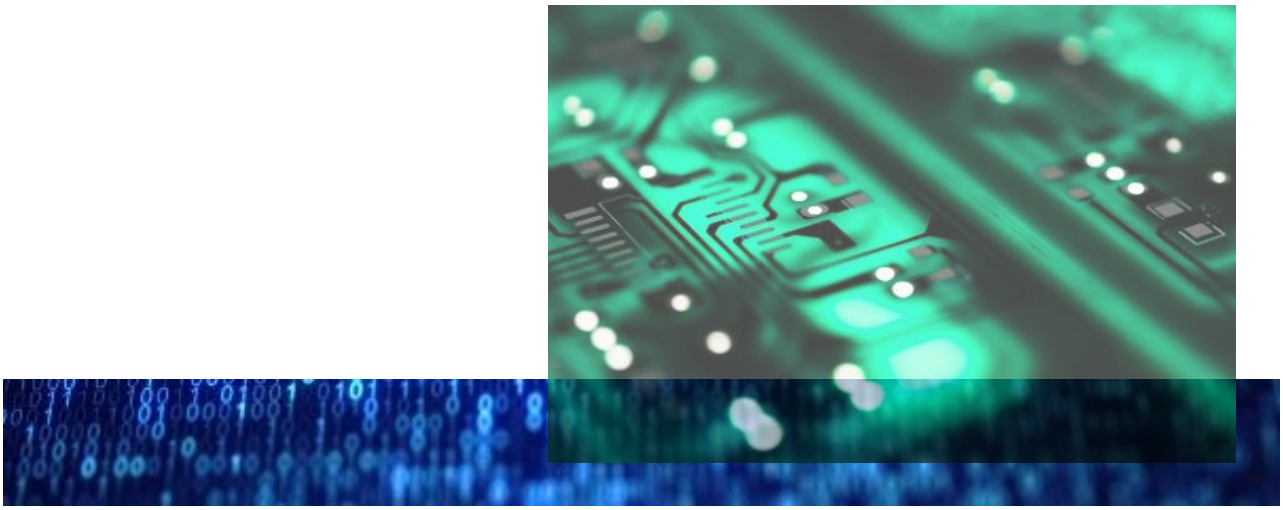
The Bedfordshire Care Alliance shared care record is expected to have very large number of users – in addition to staff within the partner organisations there will be access to personal records by patients and citizens through the patient portal. The support implications of this wide range of use by a very large user population needs to be assessed carefully and the required arrangements and resourcing planned for.

Issues regarding digital inclusion, such as differing languages, skills, physical impairments, access to devices, etc. need to considered in the design and the support of patients/citizens using the wider shared care record.

## Other developments

It is likely that other initiatives will arise from the Bedfordshire Care Alliance Programme that have direct Trust involvement. This may include support for improvements in integration of direct care and support for care system strategic planning.

The Trust's role in longer-term development and support of a care alliance-wide information system also needs to be considered. There may be potential to consolidate other currently fragmented services into an expanded digital support hub.



# 6 Communications and Business Services

## Scope, goals and Priorities

This section describes the requirements, issues, and plans related to Digital goal 4. The scope covered in this section is the provision of support for digital communications (including phone, telehealth and cross site working, etc.), email and office systems, and the digital requirements of non-clinical service areas such as Finance, Human Resources and Estates.

| | |
|---|---|
| Goal 4 | Utilise digital capabilities to improve clinical and business communications and support non-clinical services |

The merger of key corporate systems to support integrated management is one of the highest level priorities for the Trust integration. Also important is communications infrastructure to enable efficient functioning as a single organisation, including email, phone systems and video links between sites. The impact of the Corona Virus pandemic has added new projects to support remote working, mobile access to systems, and telehealth services to enable online clinics. The longer term impacts are not yet clear but it can be expected that some of these areas of digital support will remain of high importance.

## Unified Communications, etc.

Both hospitals have similar arrangements in place regarding the main elements of unified communications and other support for business and clinical communications. The main difference being that Bedford lags behind regarding the rollout of VOIP phone systems. There have been recent development in business and clinical communications both to support the merger and in response to the changes brought by the Covid19 Pandemic, for example, Microsoft Teams has been used for tele/video meetings (provided under a short-term national contract) and Attend Anywhere has been used as the main remote OP facility in response to Covid19. Further development and consolidation of approaches will be needed. The largest element to address is moving to a single unified communication systems across the whole Trust.

A summary regarding options and plans for unified communications and other support for business and clinical communications is given below.

| ***Unified Communications, etc. Options & Plans*** |
|---|
| ***Unified comms and phone systems*** |
| An assessment of requirements and options is needed regarding achievement of a single (or fully integrated) unified comms system with full VOIP over the two sites and 'seamless' handling of voice and video communications. This should be completed at an early stage as it may inform plans for the remaining VOIP rollout at Bedford (currently 10% complete). A Microsoft based phone system is being considered which would provide integration with MS Teams (calls & video, etc.) – this approach would mean retaining some current switchboard functionality as Microsoft Teams facilities will not yet meet all Trust requirements. |
| ***Cross-site communications and working*** |
| Planning for replacement of the current national contract for Microsoft Teams is needed. (See below also under email and office systems). A trusted relationship between the site networks is being developed which will gives mutual login and access to shared drives. |
| ***Remote Working support*** |
| Increased remote working is likely to continue in addition to cross-site working by some staff. Digital planning needs to respond to Digital planning needs to respond to developing staffing arrangements and HR strategies, this may include higher levels of laptop use and off-site IT equipment. |
| ***Phone and online clinics*** |
| An early assessment of requirements and options should be made to allow time for procurement before the national contract for Attend Anywhere ends in March 2021. |
| ***Appointments*** |
| Section 3 covers the need to look at online booking and email communications alongside PAS. |
| ***Replacement of pager system*** |
| There is a national requirement to replace pager/bleep systems in the NHS. The Trust needs to agree and approach, however at this time there is reluctance to rely on the current IT infrastructure as an alternative basis, due to issues with power supplies, Wi-Fi and mobile signal coverage, etc..<br>Automated alerts and escalations, based on patient observations, etc. will be managed through the Nervecentre application. |

# Email and Office Systems

Similar arrangements are in place at the two hospitals regarding Email and office systems. Both host Microsoft Exchange email services, which are not compliant with the DCB1596 Secure email requirement, and both sites also use NHS mail accounts for secure transfer. Luton is typically using MS Office 2013 and Bedford MS Office 2016.

Migration to Microsoft 365 for office systems and email has been agreed as common approach and procurement of support for the implementation work has begun. The approach regarding users with very little or no email use needs to be confirmed. Migration for all staff is a large project. Proposals are to address email, then office systems, followed by unified communications.

# Corporate/Business Systems

## Integration

Arrangements regarding corporate/business systems are managed by the relevant departments. Application support may be provided by the system supplier and the own Trust's digital services will provide support regarding related infrastructure etc.

The various Finance related systems are largely different between the two sites as are those used in Estates. The main Human Resources and Payroll systems are used at both sites, although different e-rostering systems are used. The same version of DATIX is used for risk management at each hospitals.

The relevant departments are assessing the best way forward based on information and system requirements, the priority to move to common information systems, and the potential fit of existing solutions.

There is also an important link regarding planning changes in information feeds to the Trust's data ware house for management reporting.

## New technologies

In conjunction with the redevelopment programme, there is interest in additional use of technology to improve the management of resources in the hospital. For example, to support just-in-time delivery of consumables, such as linen and pharmaceutical ward stocks. Also to assist with ordering, stock management and tracking expiration dates.

# 7 Data Management & Data Quality

## Context and Current Developments

There are overlapping data management developments underway in the Information Management and Digital/IT departments which are addressing different areas of scope and users. There is coordination between the areas but the planning is not closely aligned. Current developments which set the context for development of data management are summarised below:

| ***Developments and Summary description*** |
|---|
| **Management and Contract Reporting** |
| New data warehouse development at Luton following the approach at Bedford Hospital, with subsequent merger to a single Trust data warehouse. This incorporates business system feeds as well as PAS and some clinical system feeds. It supports national and contract activity reporting as well as service management and performance reporting. The scope includes provision of local information dashboards.<br><br>Currently Referral to Treatment (RTR) management sits outside the PAS. It is managed in the Trust's data warehouse using the data fed from the iPM PAS. |
| **Clinical Data Repository** |
| The Clinical Repository element of the Luton's Portal will include data from hospital systems and other ICS services. It will provide the basis for new clinical analytics. |
| **External data developments** |
| External data being brought into the Trust's clinical and information processes will include the wider scope of the Care Partnership Shared Care Record and patient data uploaded to third-party applications such as 'Patient Knows Best'. |

## Data Strategy Requirements and Issues

The strategy for data management needs to be developed as the Trust moves to more complex data sets which hold internal and external data from multiple sources and which need to support wider ranges of users and uses. The current developments at the Trust will not address all aspects of data that are becoming relevant over the next few years.

A project is required to develop a longer term data management strategy which recommends the approaches needed for the expanding scope and usage of data. This requires collaboration across the Trust's Information Management and Digital teams and also with partner organisations involved in the development of the Shared Care Record. The issues to be considered relate to the areas listed below (this is expanded in the strategy supporting papers).

- The broader range of internal and external patient/care and business data sources
- A much larger number of users with differing access, information and support needs
- Information Governance and management of user access
- Handling data quality and data of differing reliability and scope including unstructured data
- Role of a data management layer to enable data sets to be used and managed effectively
- The technical/integration approaches regarding access and storage of external data
- Data exchange beyond the Bedfordshire Care Partnership/Local ICS
- Sourcing and development of the required resource and skills
- Tools for analysis and AI in conjunction with the Bedfordshire Care Partnership programme

A specific decision will be needed whether to continue with the clinical repository and management reporting data warehouse on separate data platforms. This is likely to be informed by the data management strategy and by experience of the two solutions when more developed.

The purposes and data scope required in the Portal/Clinical Repository will need to be determined. Direct access to clinical systems can be met through the 'clinical context' click-through facilities, however, some purposes may need content to be retained in the clinical repository. For example, this may be needed for reporting and for analytic use including risk identification, and to provide feeds to external shared care records.

## Data Quality

A target to improve data quality should be built into the EPR and clinical systems programmes. Key elements of this should include:

- Data capture at source, including mobile, with data captured once and used many times. Making data useful (streamlining, reducing duplication, reducing errors/mistakes) will incentivise effective capture.
- It needs to be easier to put data into the correct system in the first place than it is to record on paper and then deal with this later.
- Digital planning needs to understand the patient and information process and how staff interact with both patients and systems to optimise the capture and flow of information.
- The use of analytics and providing feedback on data quality to service areas to drive up data quality.
- The wider organisation has to own data quality with Divisions responding to issues with quality and reinforcing staff responsibilities, training, etc.

## Reporting from New Systems

As new systems are planned and implemented, the arrangements for developing and supporting reports need to be clear. This can be a grey area at the moment with responsibility not clearly falling with IT, the Project Team, the Information Department, or the system user department.

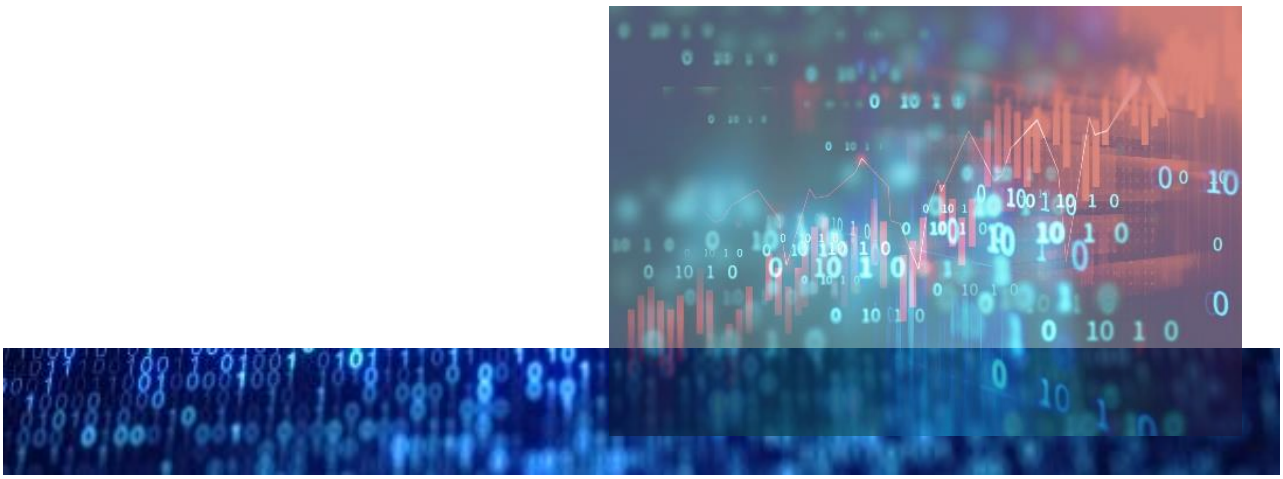
The implications of reporting requirements need to be costed into the system business case and plans. For example, the user department may need new skills or resources, and IT already spend a lot of time running scheduled tasks to deliver reports to areas of the Trust.

New systems are unlikely to meet the Trust's 'dashboard' reporting needs and tools will be required. This needs to be considered in the Clinical Repository planning and the wider data strategy. The aim should be to maximise what can be provided through self-service facilities.

## Data Migration

Handling data migration is an issue when moving from one system to a another one. The EPR agenda and especially the Merger Programme requirements mean that there will be a lot of transfers between systems. The handling of legacy data needs to be carefully considered in the planning for these transfers, whether as the result of service mergers or general replacement/upgrade of systems.

There may be practical issues, cost, or data quality considerations, which prohibit moving data from an old system to a new one. However, the principle should be to avoid ending up with data stuck on an old unsupported system which has to be kept going just to provide legacy data access.



# 8 Digital Infrastructure

## Scope, goals and baseline

This section describes the requirements, issues, and plans related to Digital goal 5, the scope covered is the provision of IT Infrastructure including desktop and mobile device, networks and servers.

| | |
|---|---|
| Goal 5 | To provide technical infrastructure which enables efficient and reliable access to information and systems where and when needed, with high quality digital operations and support for clinical and administrative activity |

Supporting objectives for this goal include improving; the quality of service provided to clients using Digital services, user access and response times for applications, system resilience and availability, and the technical infrastructure to support a highly available EPR.

Regarding the Trust merger, the aim is to provide a digital experience for staff which is seamless; where access to information and use of systems is uniform and of high quality across the new organisation, regardless of role, location or site, and service or department.

The technical infrastructure is covered in this section but the development of digital support services are covered later in the section on 'Digital Staffing & Skills'.

## Infrastructure Baseline

The table below provides a baseline summary of the main areas of IT infrastructure. Some of the recent infrastructure and applications work has been planned to enable further integration, for example, implementation of Luton desktop infrastructure services to allow wider extension.

| Areas | Infrastructure Baseline L&D | Infrastructure Baseline Bedford |
|---|---|---|
| Desktops | Mixed Citrix/VDI and fat clients. Probs with VDI, upgrade underway. Many devices with out of support window OS. | Fat client desktops. Windows 10 on 51% of PCs. 4 on XP, remainder Win 7 or 8. |
| Mobile devices | IOS mobiles used for eOBS | Android - lower usage, ICC will change |
| Networks | Reasonable coverage but aging equipment. Bedford WiFi not tested for 'always-on mobile access'. WiFi not resilient to power losses. Review planned to identify gaps. | |
| Cross—site n/w | Data link established to support Pathology Integration. Two dedicated fibre links. | |
| TIE | Trust Integration Engine - separate versions of InterSystems Ensemble used | |
| Single Sign-on | Caradigm SSO, will be replaced as part of current portal project | Viper 360 does not provide full SSO facilities but launches apps in context |
| Servers | Migrating to fully managed Infrastructure as a Service (IAAS) with minimal onsite servers. (Hyper-V / HP). | In-house management in Trust datacentre. virtualisation & Storage Area Network (SAN). (Vm-Ware). |
| Print Services | Leased multifunction copier/printers. Scope for further rationalisation | Rationalised with contract for shared large multifunction devices |

## Gap to address

The main gaps and deficiencies in infrastructure that need to be addressed are:

- Urgent need for improvements in user experience of clinical systems, particularly at Luton, is critical to support day-to-day working and retain clinical support for further EPR developments.
    - This relates to several aspects of infrastructure severely affecting logon and response times.
    - System availability/reliability is also an issue.
    - Reducing the number of logons required (covered earlier in section 4).
    - Current migration to IAAS and Citrix Cloud VDI must be completed and must deliver the planned improvements in access and response times.
- Establishing a single network infrastructure which enables information and system access across both sites and which can support delivery of the Trust's EPR ambitions.
    - Infrastructure refresh is needed at both hospitals to address gaps in coverage, bandwidth, reliability and resilience (through redundancy and improved UPS etc.).
    - Resilience in network links (triangulation) between sites and external cloud services.
- Cyber issues relating to PC operating systems: Bedford is just over halfway working through upgrades, steady but slow progress; Luton larger issues regarding OS and browsers with many devices waiting for a solution via the VDI upgrade.
- There are a number of point-to-point interfaces remaining which will complicate further integration work, especially movement to a single TIE and PAS replacement. The point-to-point interfaces need to be replaced by integration via the TIEs as preparatory work.

A priority action is to review current technical infrastructure to assess capability/deficits and identify the work needed to implement the level of service needed.

In addition to addressing the list above, areas also needing attention are:

- Limitations in current configuration, process, and asset management – documentation is fragmented and relies on largely manual/spreadsheet processes
- Different approaches regarding management of servers/storage and desktops which will need to be resolved.

The ongoing demand for increased processing and data storage needs to be noted. The Clinical Repository and EPR developments along with wider information exchange will increase this pressure.

## Options & Approach

### IT/Infrastructure Management Approach and Tools

Formal adoption of an overall methodology or standard for digital service design and operation is recommended, and digital services will assess options for digital service management standards, for example, ISO/IEC 20000, IT Infrastructure Library (ITIL/ITIL 4), and IT4IT. (Standards for programmes and projects are covered in the Digital Governance section).

There are some areas where documentation and process management could be improved; largely an issue of resource pressures, but there need to be processes in place for ongoing implementation and review of process/control documentation. Also to ensure that configuration changes are documented as part of the planned change process not as a retrospective task.

A single cohesive approach is needed across sites, incorporating and extending areas of best practice. A risk-based assessment will identify and prioritise areas to be addressed.

The opportunities to improve service management and efficiency through investment in IT Tools to automate processes and improve quality controls should be assessed. Anticipated growth in the service user base to include care partners and patients makes this even more important.

Assessment needs to consider tools/support through all stages of the infrastructure and systems lifecycle. Specific areas identified at this stage are further development of self-service user support facilities and integrating asset management records to support physical device management and IG controls.

## IT Infrastructure Approach

| ***Areas*** | ***Technical Infrastructure - Approach*** |
|---|---|
| Server infrastructure & data centres | The Trust is aligned with the national 'Cloud-First' approach. The Trust is continuing migration to IAAS, with the ability to expand and control use of both private and public cloud in order to obtain best overall value. As new applications are added or merged they will be set-up on the IAAS service with the Bedford in-house service reducing over time. Completion of clinical systems planning will enable an assessment of whether accelerating the pace of transfer to IAAS is beneficial.<br>Cloud service management needs further development, particularly to ensure robust controls where aspects of maintenance and cyber work are divided between the service supplier and Trust teams. |
| Networks inc. Wi-Fi | A review of network infrastructure, inc. a full Wi-Fi site survey, is planned. This will lead to procurement/ supplier selection and, potentially, full replacement of equipment. Specs should reflect 'mobile' EPR and paperless/paper-lite ambition and planning incorporate the redevelopment programme. Resilience must be built into Wi-Fi, internal & cross-site N/Ws. |
| Workstations, VDI and Mobile Devices etc. | Findings from the EPR Prog. on clinical device will help to inform devices demand/usage. Reducing the range of device types is a goal, but is subject to meeting clinical needs.<br>Plans to achieve a unified approach, across both hospitals, are needed but VDI and Windows 10 upgrade at Luton must be completed first to assure capability is delivered. (Completion of the Luton VDI and windows upgrade is urgent as cyber risks are extended). The Bedford Windows 10 upgrade prog. needs resourcing to accelerate progress, unless it is certain that a switch to VDI will provide an improved and upgraded service more quickly. |
| Print Services | Printing requirements, relating to patient documentation/letters etc., will reduce over time as increasing use of direct capture of data, e-forms, etc. (Scanning for EDRMS should also decrease in parallel). Integrated systems will reduce the need for photo copying for patient care. However, paper will continue for some time, including non-patient specific documents.<br>Address redevelopment implications. Multi-function devices (printer/scanner/copier) with 'print and release' will continue. Later review in light of EPR/paperless progress. |

# 9 Information Governance & Security

## Scope, goals and baseline

This section describes the requirements, issues, and plans related to Digital goal 6, the scope covered is the Trust's Information Governance responsibilities and associated requirements for safeguards to ensure information is secure.

| | |
|---|---|
| Goal 6 | The Trust's information assets are safely, legally and ethically controlled. |

Information Governance (IG) is a framework for handling information in a confidential and secure manner to appropriate ethical and legislative standards.

Supporting objectives for this goal include; compliance with the Data Protection Toolkit, meeting standards for IG and security including compliance with Cyber Essentials +, ensure requirements as Data Controller are securely met, implementing RBAC (Role Based Access Controls) and appropriate user identification, and the extension of controls to include all medical and admin equipment.

The IG team manage Freedom of Information (FOI) and Subject Access Requests (SARs) at both sites.

At Bedford the Cyber service is provided by an in house team of three and at Luton a contracted service provides a single resource. Bedford security arrangements appear more mature with the higher resource level allowing more areas of focus with better tools/policies etc. in place.

## Information Governance

The Trust has developed an IG Strategy that sets out the approach to be taken to ensure legal and regulatory compliance for the management of Information. Effective Information Governance will ensure that information is available and fit for purpose, while making sure that individual's rights are respected and personal information is recorded accurately, used appropriately and legally.

The IG Strategy sets out an overall framework and promotes a culture of best practice around the processing of information and use of information systems. The aim of this Strategy is to ensure the five primary objectives below are achieved:

- Information will be classified and where appropriate, kept confidential
- Information is adequate, relevant and limited to what is necessary
- Integrity, security & confidentiality of information will be assured, monitored & maintained
- Availability and accessibility of information for operational purposes will be maintained
- Awareness & understanding of all staff will be developed regarding their responsibilities

An IG Management System is in place through organisational and management structures, with a clear scheme of delegation and personal accountability for IG. This is accompanied by other systems, policy and a procedural framework.

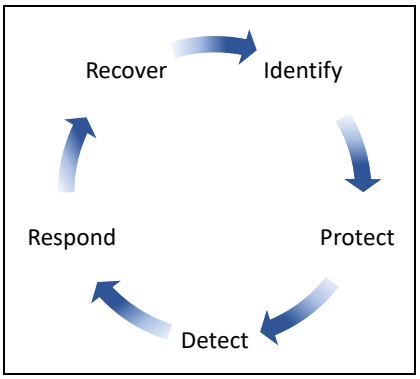
The digital department will increase its role in supporting Information Asset Owners in carrying out their responsibilities. Digital also has a role in increasing the review of access audit trails.

IG has an important role is the process of merging services and the underlying processes and systems, for example, mandatory Data Protection Impact Assessments (DPIAs). Planned developments also include wider information exchange with partner organisations for which IG is a critical element.

## Cyber Security

The provision of logical and physical solutions for information security are essential components in the Trust's Digital Strategy. Many of the measures involved are illustrated in the diagram on the following page.

The National Institute of Standards and Technology (NIST) Cybersecurity Framework structure is helpful in ensuring a balance approach to security planning:




The Trust is committed to achievement of Cyber Essentials Plus certification. Under this scheme organisations can apply for certification which recognises the achievement of government-endorsed standards of cyber hygiene.

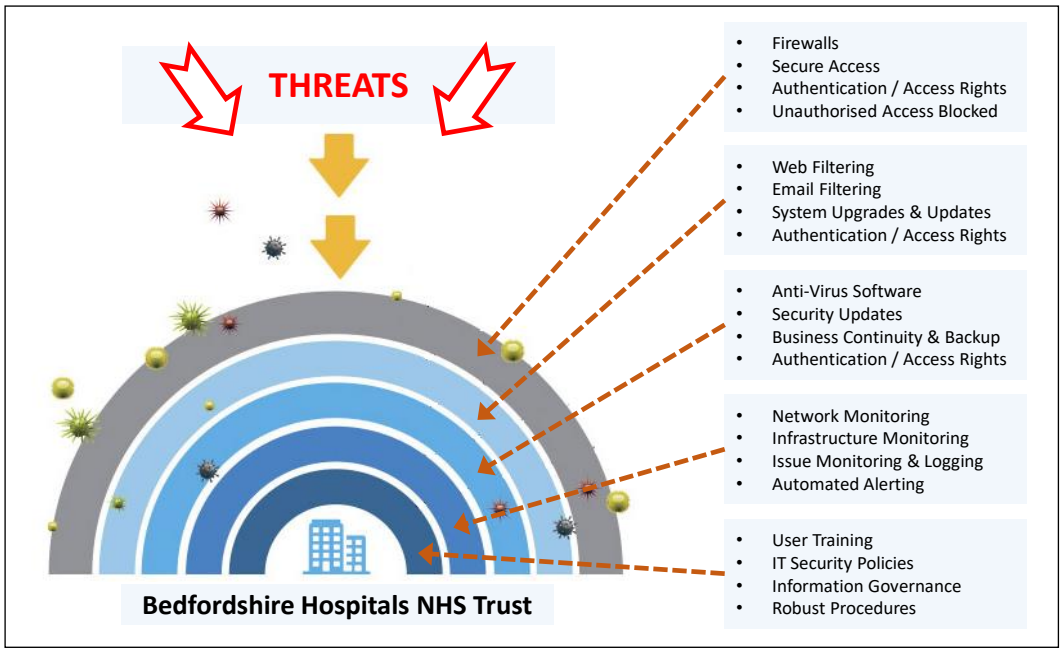
## Cyber Issues & Plans

Cyber resourcing needs review as part of the integration of digital services. The arrangements at Luton arrangements provide flexibility and the ability to draw on further specialist input but the standing resource level is insufficient to address the breadth of issues at that site.

At Bedford a Unified Cyber Risk Framework assessment has been recently completed by a 3rd party and an IT Health Check carried out. These have fed into the cyber risk improvement plan.

Luton has developed a four stage Cyber Security Improvement Plan. Phase 1, taking six months to a year, is focused on establishing a monitoring and logging platform to improve notification and response. It also includes work on access management and education.

The table below gives a summary of the main issues which need further attention and are included in cyber improvement plans.




| Issues | L&D | Bedford |
|---|---|---|
| Access Management | Management of staffing information (from ESR) to maintain active directory controls is poor. Semi-automated links are being explored, but gaps will remain. | |
| Desktop upgrading to Windows 10 | Windows 7 and about 300 XP machines remain in use until resolved by new VDI.<br>The VDI build must be fully tested (and maintained) regarding cyber risks. | Upgrade from Windows 7 to 10 is about half done, about 40 PCs per week are completed by out-of-hours Effort. |
| Medical Devices and IoT | Cyber risks need to be managed regarding Medical Devices. A validated register and risk assessment is needed, with a process for procurement and implementing controls and mitigations. Responsibilities for cyber aspects must be defined.<br>The broader need is to respond to the Internet of Things – existing and new devices. | |
| Asset Registers | Asset registers at both sites need improving – info. is fragmented and does not link physical assets and information assets. IT tools should be able to help in this area. | |
| PAS related cyber issues | iPM PAS has cyber issues such as lack of audit capability, poor account management controls, etc. | |
| Process Controls | Process definition and documentation needs to be improved. | |
| Systems not owned by IT Department | Systems which are not managed by the IT dept. need to be incorporated in a managed asset register and a risk audit completed. Cyber responsibility must be defined and resourced for all systems/departments. | |
| Server patching | Regime & responsibilities needs tight definition and controls for OS, applications, and end points. | |
| Vendor security | Controls around vendor and external network access need review. | |

# Data Security & Protection (DSP) Toolkit

## DSPT approach

One of the IG strategic aims is to ensure compliance with the mandatory elements of the Data Security and Protection Toolkit. The DSP Toolkit is an online self-assessment tool that allows organisations to measure their performance against the National Data Guardian's 10 data security standards.

## DSPT status and IG actions

DSPT assessment involved review and monitoring of all registered risks with support from both internal and external agencies. An improvement action plan will be followed to address areas of non-compliance at each annual submission. The main areas that need further work are:

- Information Asset Management – information has been brought together from the two hospitals but currently relies on manual processes and multiple spreadsheets.
- Information Governance Training - Significant improvements have been made, work is ongoing between IG and training staff to improve coverage.
- Managing provisions of the national data opt-out requirement

Other areas needing focus are:

- The Information Asset Owner role needs improving, primarily through training and developing awareness.
- Engaging staff to have a better understanding of password management and cybersecurity.
- Staff access management (also raised under Cyber).

# Business Continuity and Disaster Recovery

Effective Business Continuity and Disaster Recovery arrangements are essential – there is increasing dependence on electronic records, equally dependence has increasing on infrastructure and devices as well as the applications and data. Digital strategy implementation and future developments should include:

- A risk assessment of the 'end-to-end' resilience of digital processes
- Building continuity planning and recovery into programme and project planning
- Contingency access must be planned in the event of loss of systems

A specific issue that has been highlighted is the need to ensure resilience of Wi-Fi service as well as wired network equipment. This includes emergency power connection.

A joint Disaster Recovery Plan (DRP) needs to be developed for the combined organisation. This will then be updated on an ongoing basis as infrastructure and systems are integrated over time. The development of a joint DRP will also be informed by the Infrastructure Discovery review work which is being commissioned, covering networks, Wi-Fi, and Cyber Security.

Revisions to DRPs should be incorporated as a mandatory part of system replacement or major upgrades so that the DRP is up to date at the point of go live, rather than addressed retrospectively.

Becoming a 'digital hospital' includes recognising that the costs of ensuring resilience are not optional. Costs increase as greater levels of resilience are achieved.

# 10 Digital Staffing & Skills

## Background and Aims

The Digital teams at the two sites worked closely together in several areas prior to the merger. There are some differences in IT team scope between the two hospitals but most areas are comparable with Luton being of larger scale.

### Pressures

There are a number of pressures that affect digital skills and resources:

- Maintaining highly skilled digital teams is a challenge
- There is a large project pipeline to deliver strategic goals and to integrate systems – specialist skills are stretched.
- Existing programmes need to be kept on track whilst taking on integration work
- There is a lot of business change work that requires high levels of clinical involvement
- The technical integration agenda is large and complex
- Digital systems must be 'always on' with user/technical support on a 24/7 basis
- The hours of support funded and provided have not increased to match the extended hours of system usage or the much higher criticality of electronic records.
- Covid19 has had an impact on digital services and support pressures
- Planned developments will also have implications skills and resources

### Workforce Aims

Development of the digital services set out in this strategy needs a digital workforce, integrated across the two hospitals, that has the skills and resources necessary to implement and support the range of technology and systems planned. This needs a highly customer focused, accessible and responsive service organisation, which has:

- A flexible structure which manages 'business as usual' alongside development
- Appropriately skilled staff, or service providers
- Responsive user support underpinning 24/7 digital healthcare services
- Resources to ensure effective technical architecture design and management
- A strong clinical element that engages in both projects and business as usual
- Infrastructure services primarily managed/supported by external specialist

There is potential for the Trust to provide a wider range of technical and project services within the wider local health and social care sphere.

## Workforce and Resource Development

In the short term work is needed to form an integrated service from the two hospital based teams, but the larger challenge is to develop and maintain the ongoing skills and resources needed to deliver the Trust's digital goals. This includes:

- Ensuring the ability to scale management and service capacity
- Reduction in duplication of effort across sites
- Increased responsiveness and the ability to support service improvement
- Increase IT service/quality management
- Provide depth in structure and expertise to reduce dependency on a few individuals

As the Trust provides 24/7 services and is becoming increasingly reliant on electronic digital systems then IT support needs to match with the clinical service requirements. Out-of-hours services will need to be reviewed and developed as the EPR agenda develops.

### Resourcing/Sourcing Strategy

The Trust should develop a sourcing strategy to deliver the required digital skills and resource to implement the range of BAU and strategic developments planned over the coming years. This should include a range of elements:

- Resource planning to identify skills needs and resourcing levels for a multi-year horizon
- Digital staff recruitment and retention
- Continuing professional development to build staff skills and local expertise
- Development of a permanent core for project resourcing to improve stability and value
- Evaluation of external skills options and outsourcing to compliment inhouse staffing
- Consider hybrid options which create flexibility and mitigate staffing risks
- Include out-of-hours support requirements

### Training and user/staff skills

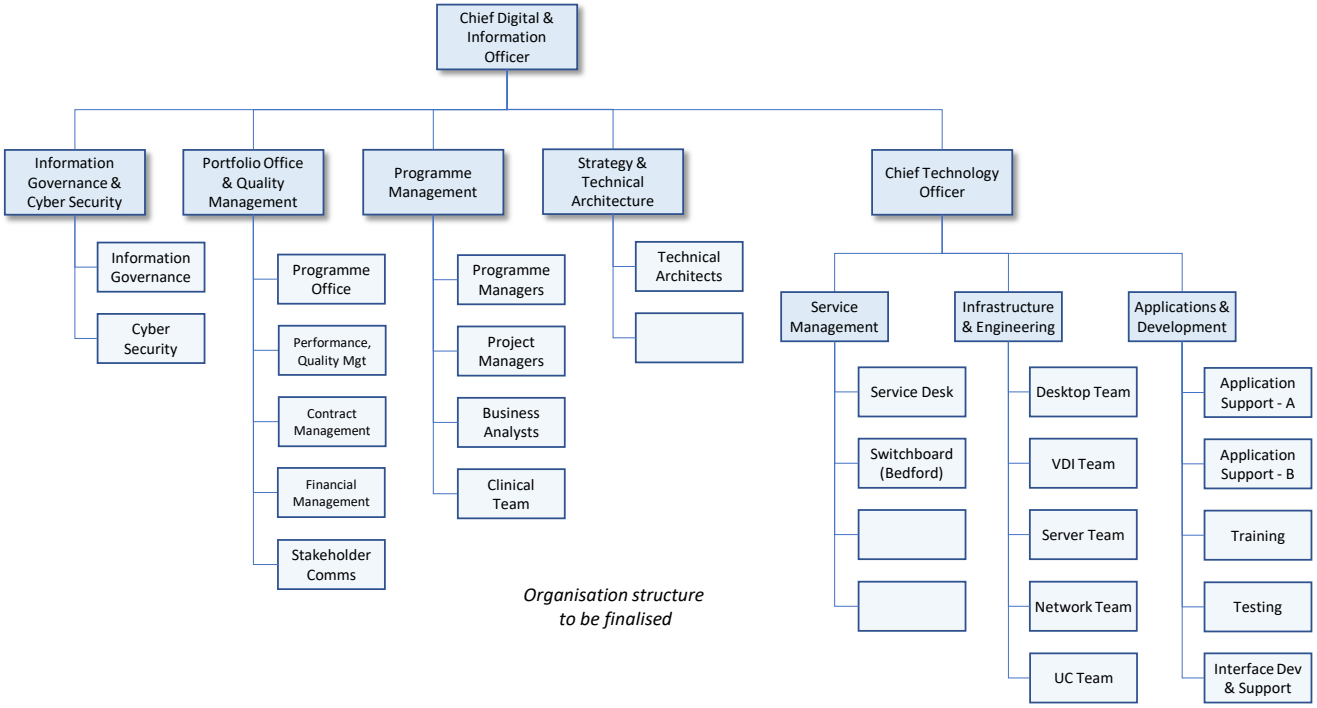
The training for end users needs to be reviewed. This is in two areas:

- General IT usage skills for staff – some staff have little idea of basic computer usage.
- Training in use of applications, aligned to roles and service SOPs, and regarding existing systems as well as new systems

Development of e-training should be part of the response to improving training support/options.

## Organisational Structure

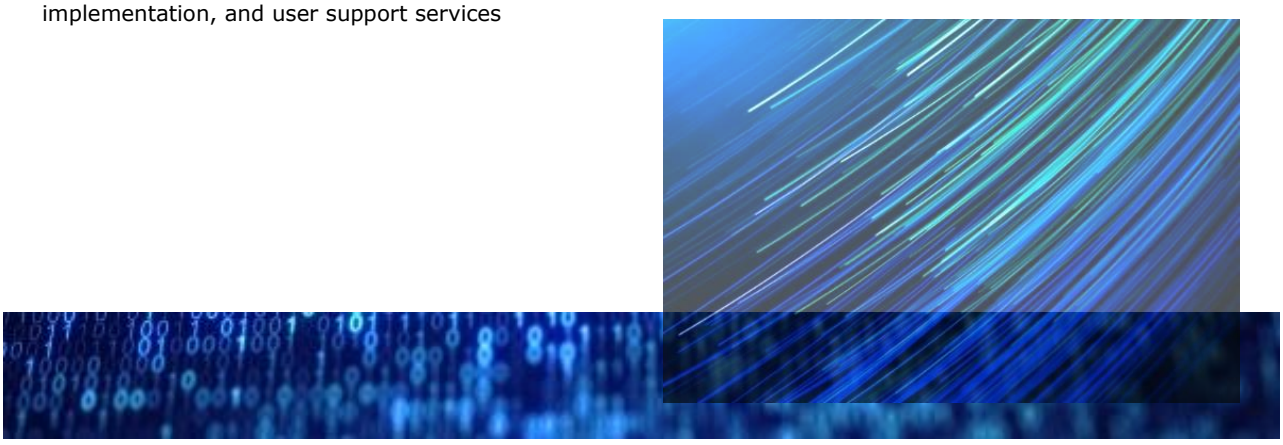
An outline for the organisational structure is given in the diagram below. This will be finalised as strategic plans are developed in more detail and as part of the consultation and realignment of hospital teams.




*Organisation structure to be finalised*

Key aspects of the structure are:

- Development of a new Portfolio Office which has oversight of portfolio planning and coordination and also has an important role in digital quality management
- The Programme Management group will include a clinical team to support clinical involvement in decision, design, and implementation processes
- A Technical Architecture role which will owns data management planning and technical / integration architecture planning
- The Chief Technology Officer (CTO) and teams will focus on physical infrastructure, integration implementation, and user support services



# 11 Digital Governance

## Context and requirements for Digital Governance

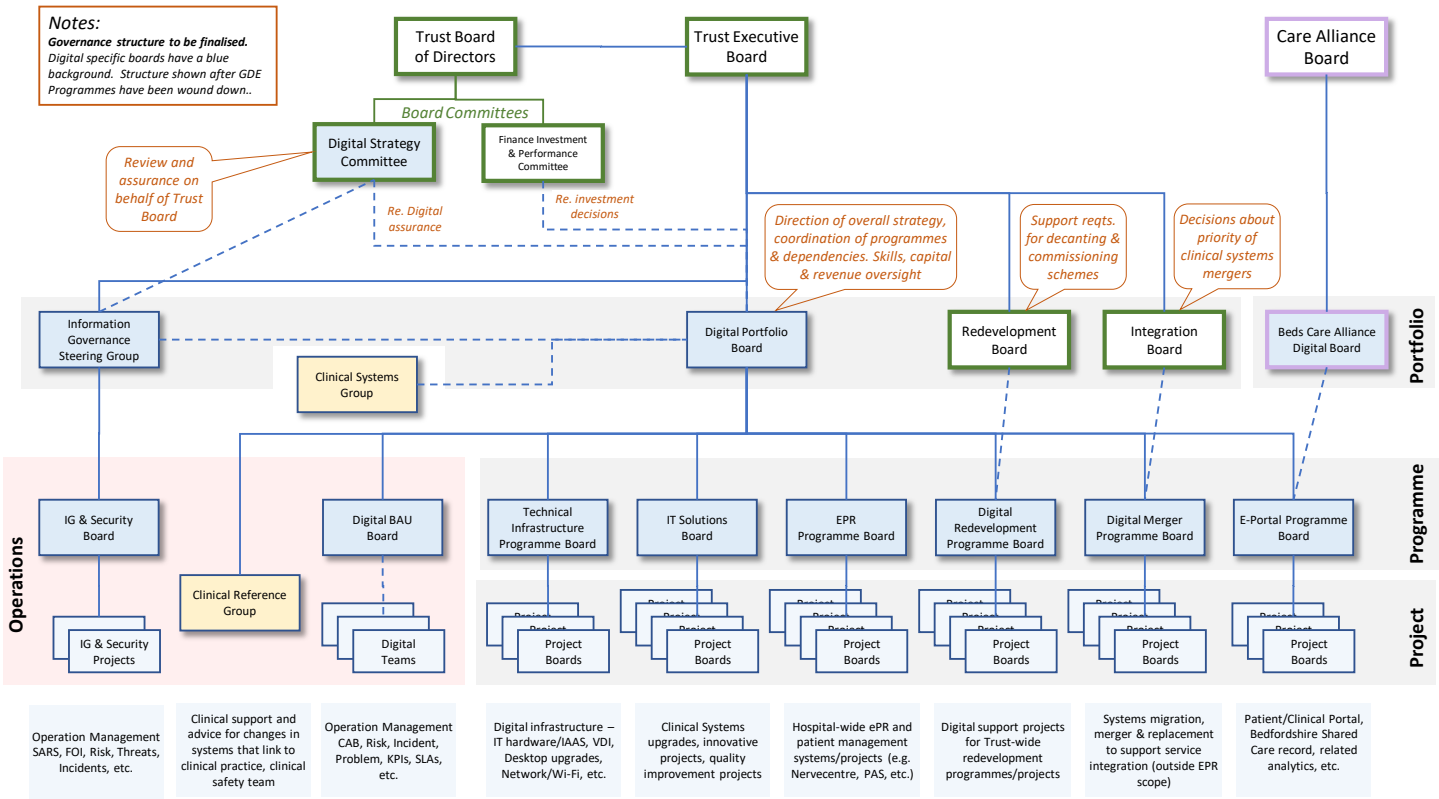
The two separate trusts had similar arrangements in place to provide oversight and controls regarding their digital programmes. Digital Governance arrangements need to be revised to align across the Trust and to reflect the changing programmes. This includes managing the two GDE programmes which now come under one Trust and which will run during the initial period of this Digital Strategy, also oversight of the developing EPR agenda, digital aspects of the Trust integration programme and digital support for the site redevelopment programmes.

The governance and programme management arrangements for the Digital programmes have to bring together multiple areas of development and investment, including:

- The two separate GDE programmes, with NHS Digital as a stakeholder, ending in 2021.
- The Integration Programme - focused on supporting service/system integration.
- Supporting digital implications of the Redevelopment Programme
- The EPR Programme focused on hospital-wide clinical processes (with separate development and implementation arrangements).
- The e-Portal Programme, including Care Alliance shared care record development
- Business as usual and capital programmes including major infrastructure development, maintenance, upgrades, and new initiatives.

The diagram below shows the proposed governance structure and the relationship between delivery of the digital programmes and the Trust Board. This is to be finalised and agreed. For clarity, the two GDE programmes are not shown in the diagram.

Terms of reference for the 'new' Digital Portfolio Board needs to be agreed, including the relationships for approval, direction, and consultation. New programme areas also need to be formalised.



# Portfolio, Programme and Project Management

## Developing a Portfolio Office

Development of a new Portfolio Office function is planned. This will be more than just a consolidation of the existing programme offices and project support functions. Best practice guidance in 'Portfolio, Programme and Project Offices' (P3O) will be followed, this aligns with the best practice methodologies followed at programme and project level. Regarding the digital portfolio, the Portfolio Office will:

- Maintain overview of the business change portfolio
- Provide a central reporting function
- Coordinate resource planning & finance overview
- Develop detailed plans with wider input across digital and from clinical and other stakeholders
- Provide standards, processes and guidance to ensure consistent delivery
- Provide independent oversight and scrutiny of programmes and projects
- Support management to ensure the right programmes/projects are commissioned
- Provide central project support functions
- Provide coaching, mentoring and support for workforce development
- Facilitate stakeholder communications regarding programmes and the broader digital strategy

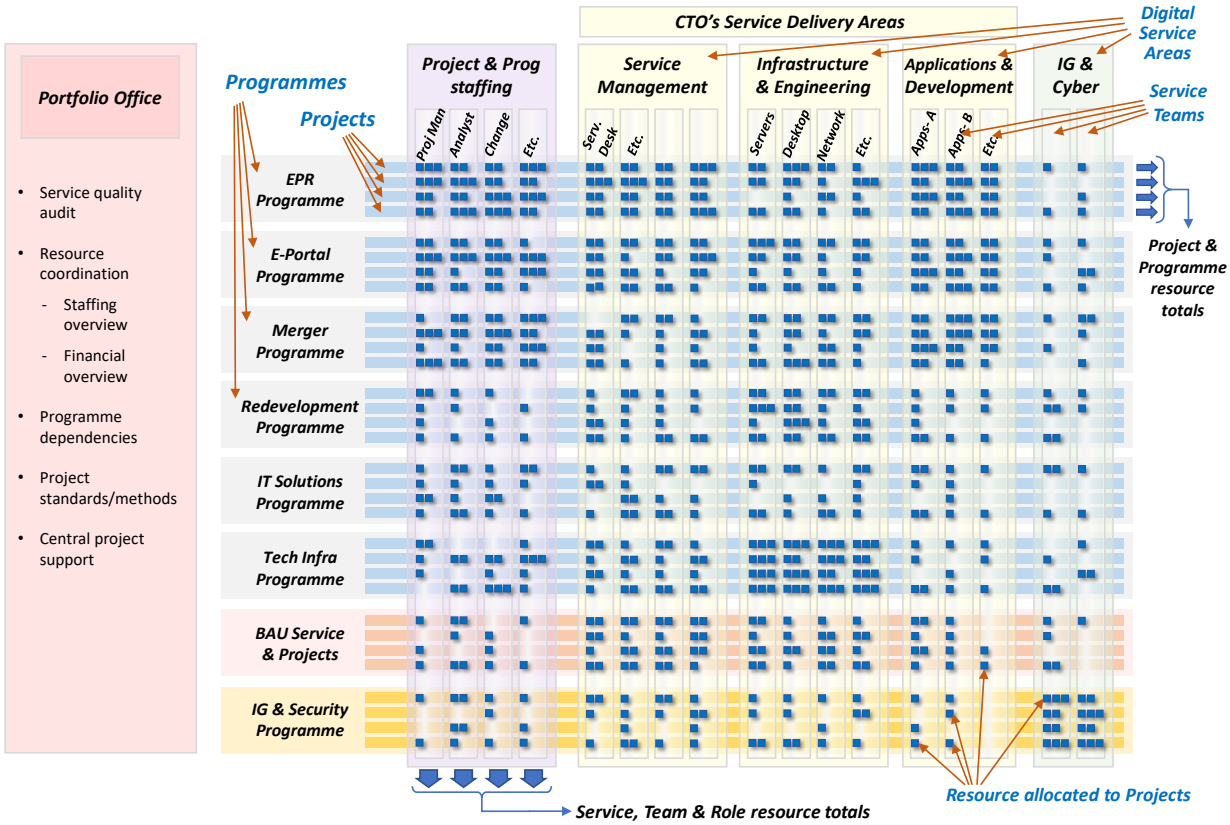
The Portfolio Office will also have a wider role regarding quality management across the range of digital services.

## Operating Model and Programme/Project Arrangements

The digital programmes will follow Trust project governance procedures to provide the required internal controls while assuring the Trust and other stakeholders regarding benefits realisation and cost management. Best practice methodologies will be applied - PRINCE2 at a project level, and MSP (Managing Successful Programmes) at the programme level and Management of Portfolios (MoP) at the portfolio level.

A dedicated Programme Manager will be responsible for day-to-day management of each programme area, reporting to the relevant programme board.

The diagram below of the Digital Operating Model shows how programmes and projects (horizontal lines) will draw on digital service lines and resources (vertical columns). Resource management will need to optimise allocation of staffing across programmes and projects. The diagram only shows a snap shot as project resourcing will change over time and projects will be started and closed. Improvement in resource planning is urgent given current programme demands.



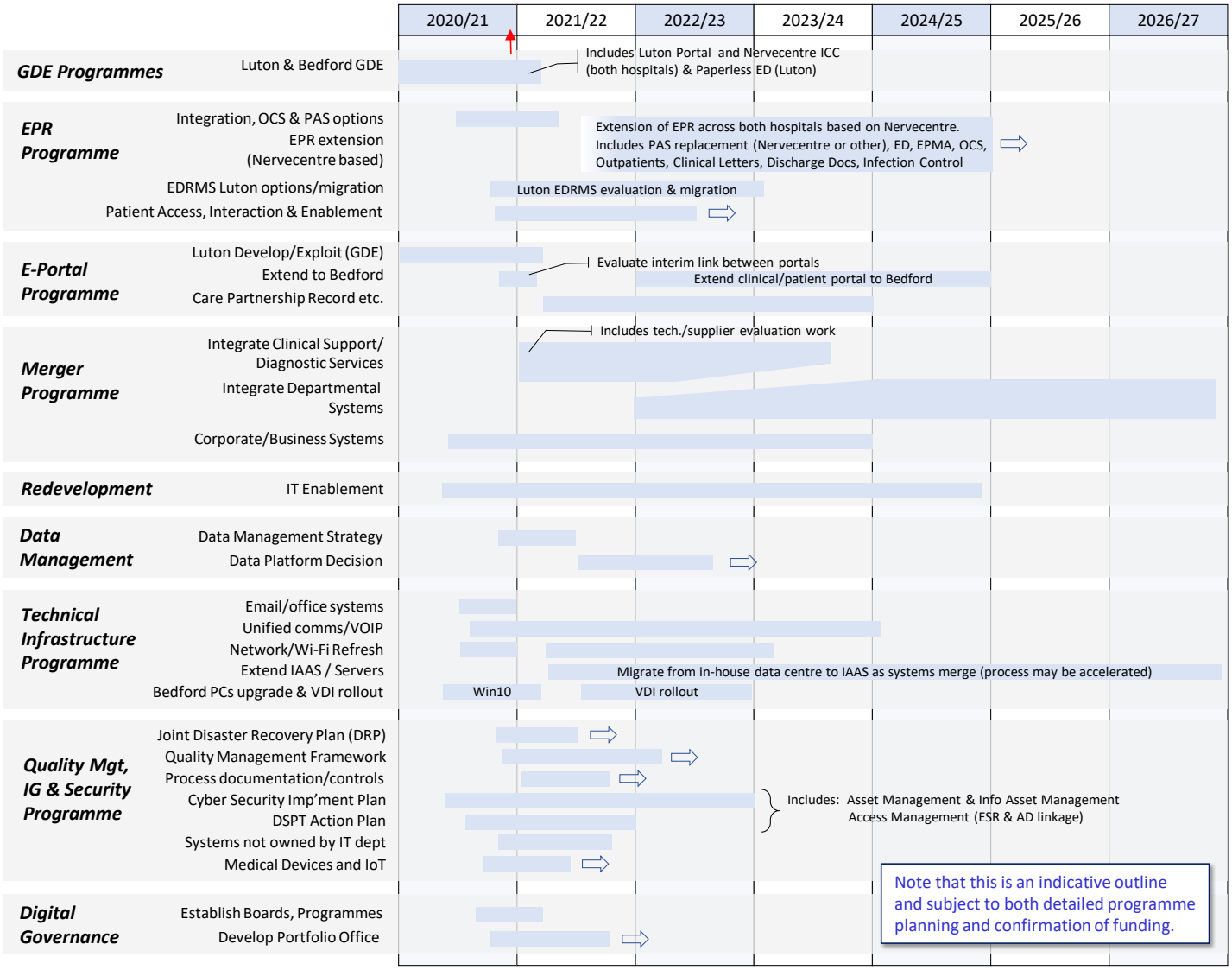
# 12 Strategy Implementation

## Digital Strategy Plan

Implementation of the Digital Strategy will build on existing GDE programmes and the work already in place to support the merger of information systems and IT across the two hospitals. The main initial areas of focus are:

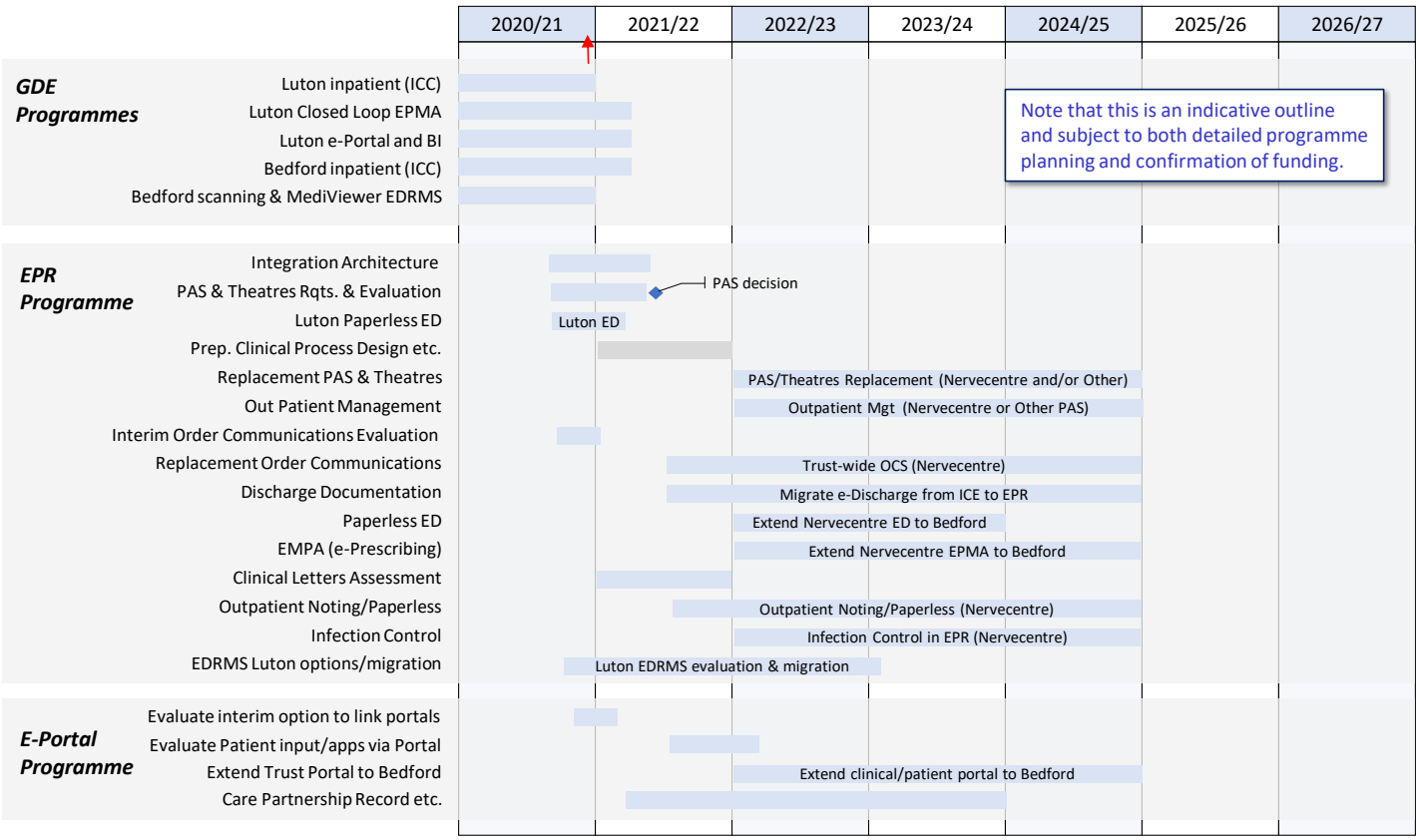
- Establishing governance and programme arrangements.
- Areas of technical and evaluation work, and input from the organisation especially regarding clinical and redevelopment priorities, to inform programme/project plans.
- Development of integrated digital services and an operating model to support management of Business as Usual and development programmes.

The diagram below shows the overall strategy implementation plan, with a more detailed view of the EPR related elements in a second diagram. The timetables shown are indicative; the pace of progress will be dependent on capital and revenue resource and organisational capacity.



The diagram below shows the core EPR related areas in more detail – including the relevant GDE projects and the e-Portal Programme. Note that there are also strong dependencies on the Technical Infrastructure Programme in order to deliver the Trust's EPR goals.

A spread of time is shown for implementation of the main EPR components as the order of implementation is to be confirmed (each component would take part of the overall elapse period). Work on developing the integration architecture and regarding PAS options, along with clinical priorities from the Merger Programme, will determine the order for implementation.



# Investment Plans

More detailed financial planning will come from reviews with clinical areas, and further assessment of merger requirements and priorities.

An additional paper will follow the strategy document to cover more detailed implementation plans and the financial profile.

## Ensuring quality and resilience

Digital investment planning must take account of the increasing reliance on technology and systems to provide critical clinical information at all times. This requires investment in service quality and resilience. Some of the key points covered in earlier sections are summarised below.

### Service quality

- Ensuring staffing skills and availability to meet the needs of 24/7 care services
- A responsive customer focused service, based on best practice methods and procedures
- Digital service SLAs and clear business area responsibilities
- Effective management of supplier services – including Trust contract management, SLAs, and performance management

### Resilience and recovery

- Resilience and recovery capability which is provided 'end to end', for example, having data backed up and restored does not help if users cannot access systems due to lack of power or networks.
- Resilience designed into processes, systems and infrastructure – for example, avoiding single points of failure, providing triangulation and redundancy, preparing for recovery to minimise the time to restore normal services, etc.
- Risk based assessment of investment in resilience and recovery – recognising that costs increase rapidly as higher levels of resilience and faster recovery are enabled.

# Digital White Papers

Further high-level assessment and design will be carried out in the coming months to build-out areas covered in the digital strategy. This will include producing white papers on specific topics, these are likely to include:

- EPR programme development – including PAS and Theatres options, approach and order for extending Nervecentre modules, developing model for clinical access across Nervecentre, the portal, and other systems, interdependency with other programme areas.
- Systems integration – approach for bringing together data and information flows from the two sets of IT systems, rationalising and simplifying the integration architecture. This is closely related with the extension of EPR systems and the clinical portal development.
- Data management - longer term data management plans for the expanding the scope and usage of data to make sure different needs and uses are understood and met. Collaborative work with the Trust's Information Management and Digital teams and also with partner organisations.
- Digital outpatients – a specific area within the broader EPR development, including approach to incorporate physical/virtual consultations, improve OP letters/dictation, and Nervecentre OP management, clinical noting and order communications (electronic requests and results).

# Portfolio/Programme Risks

## Scale of digital programmes

At the start of the strategy period the main challenges and risks relate to the level of implementation work resulting when the GDE and capital programmes are combined with that needed to progress the integration of the two hospitals and the redevelopment programme. Additional pressures from Covid19 may also be relevant.

This has an impact on digital staffing and skills during at least the first year of the strategy period until the GDE programmes complete. Beyond this, development of the EPR Programme (which also addresses integration) needs to be phased so that the overall scale remains achievable and affordable.

## Main areas of risk

### Broader risks

The addition of the merger programme to the GDE programmes creates a large and complex programme. These include significant system implementations in progress or planned for the coming months. Risks relate to:

- Undermining planned GDE implementation and change work through withdrawal of technical resource or loss of business focus.
- Digital capacity and ability to take on resources and skills for merger work in the timescales required.
- Business and clinical capacity to support evaluation, planning and decisions required in the Digital programme.
- Organisational change capacity for the level of implementation and transformation implied, especially in years 1 and 2 post transaction.
- Dependencies between systems/information flows makes the integration and migration programme very complex.

In the longer term (probably years 2, 3 and 4 post transaction) there is the potential for difficult decisions in rationalising/removing some of the current clinical/departmental applications.

### Project/system specific risks

Some areas included in the GDE programmes have differing approaches that will need to be reconciled. This can be planned and managed but will have some risk associated with using different approaches in the short term and the change involved in migrating to a unified approach at a later stage. Risks relate to:

- Different products being implemented for clinical portal facilities (LDUH scope additionally includes a patient facing portal).
- Different approaches in A&E development will need to be resolved.
- Different approaches in closed loop electronic prescribing have to be reconciled

There is also potential for different approaches and capacity in infrastructure which could affect ability or pace of movement to common integrated systems.

### Risk management and mitigation

Risks will be manged through the formal programme governance arrangements (covered in the previous section).