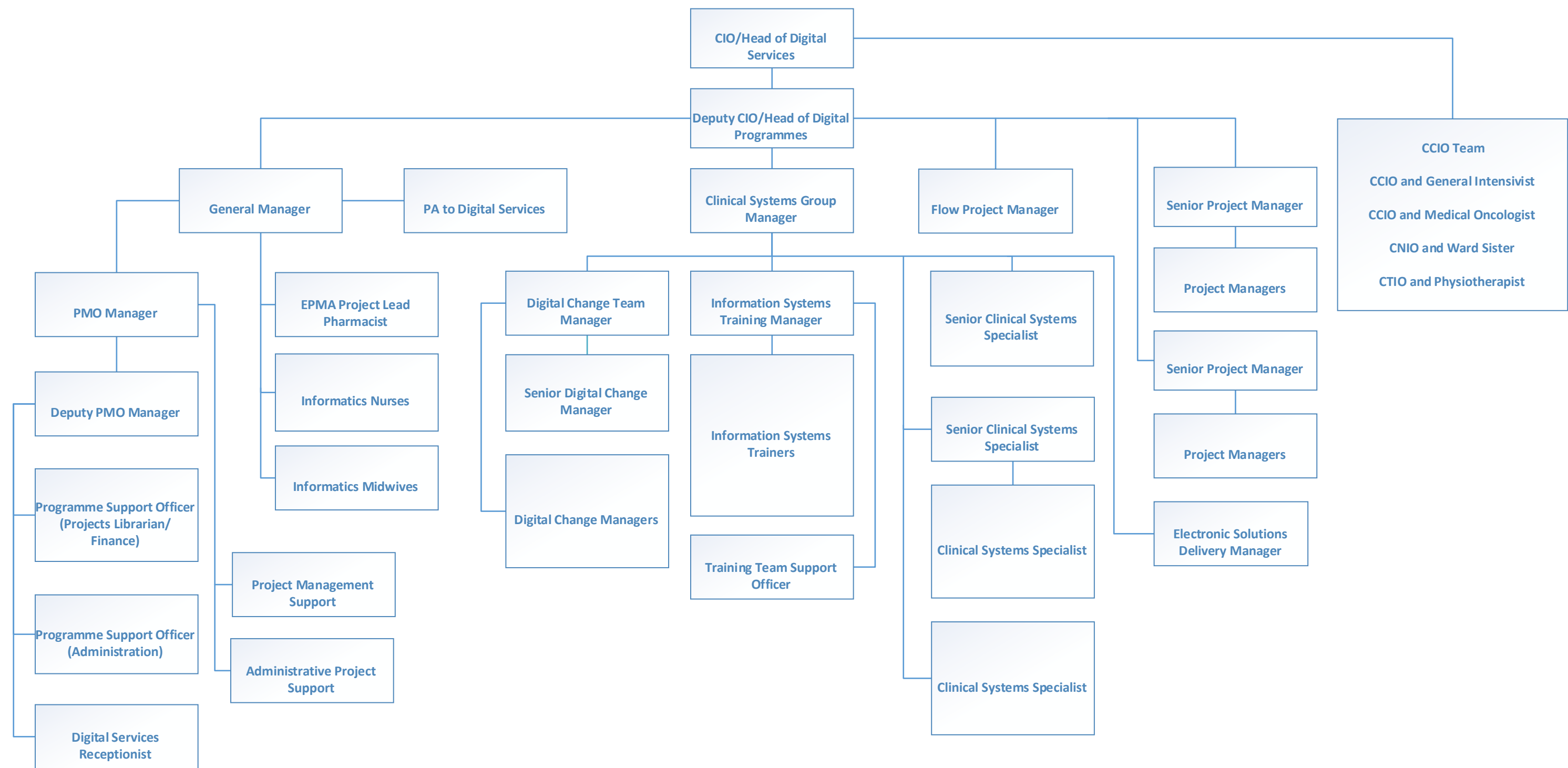


## UNIVERSITY HOSPITALS BRISTOL - PLANNED BEDBASE - JUNE 2019

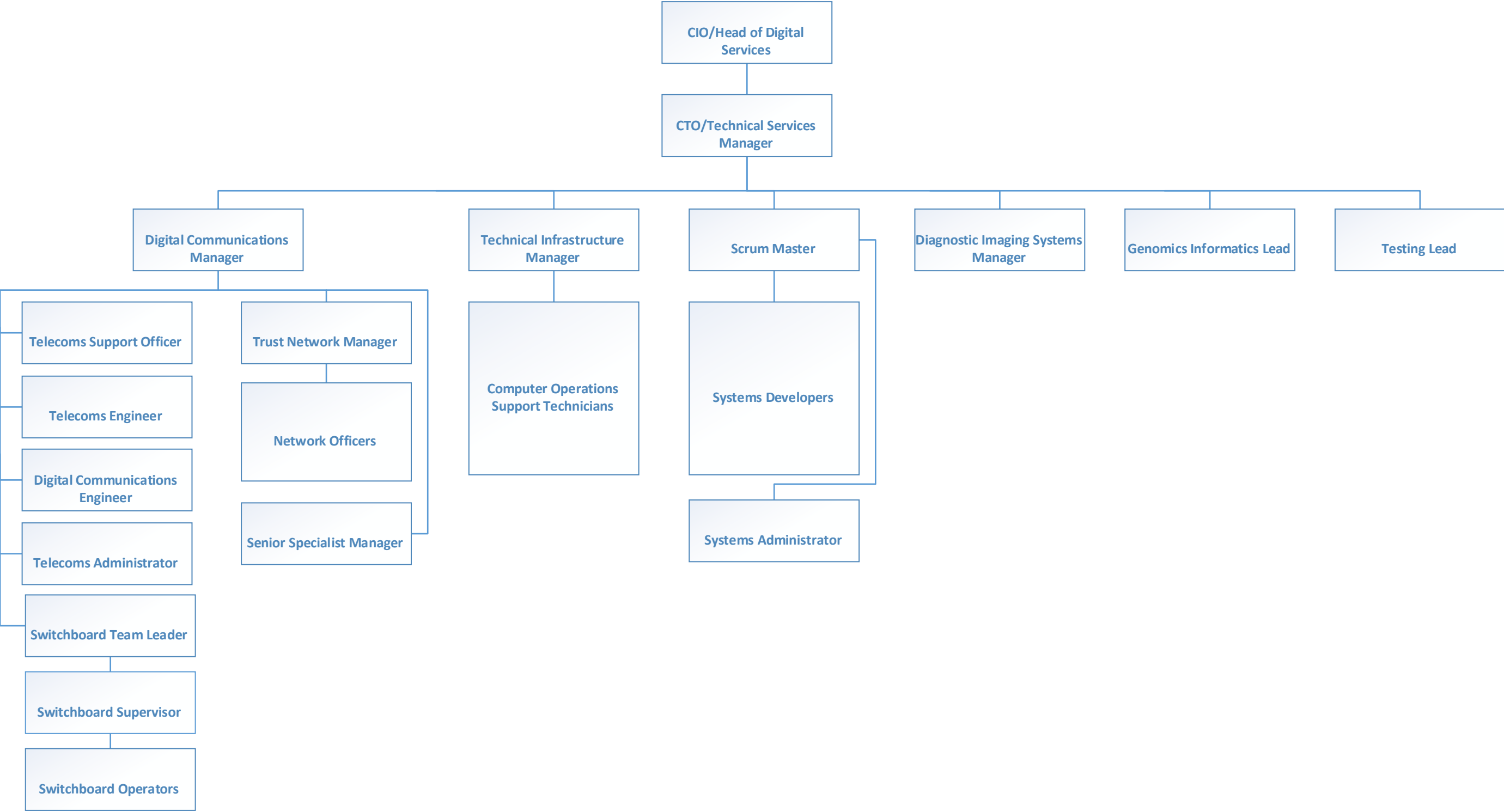
		INPATIENT BEDBASE		DAY WARDS
		Total	Critical Care *	BEDBASE
BRISTOL CHILDREN'S HOSPITAL		165	35	37
BRISTOL DENTAL HOSPITAL		0	0	4
BRISTOL EYE HOSPITAL		11	0	17
BRISTOL HAEMATOLOGY AND ONCOLOGY CENTRE		56	0	37
BRISTOL ROYAL INFIRMARY	<i>Medicine</i>	250	0	16
	<i>Surgery, Head &amp; Neck</i>	147	20	13
	<i>Specialised Services (i.e. BHI Cardiac)</i>	106	35	16
	TOTAL	503	55	45
ST MICHAEL'S HOSPITAL	<i>Maternity/Obstetrics</i>	103	31	5
	<i>Gynaecology</i>	22	0	0
	<i>ENT+Gynae (SDU)</i>	0	0	16
	TOTAL	125	31	21
SOUTH BRISTOL HOSPITAL		60	0	21
<b>TRUST TOTAL</b>		<b>920</b>	<b>121</b>	<b>182</b>

\* Critical Care total is a subset of the Inpatient total

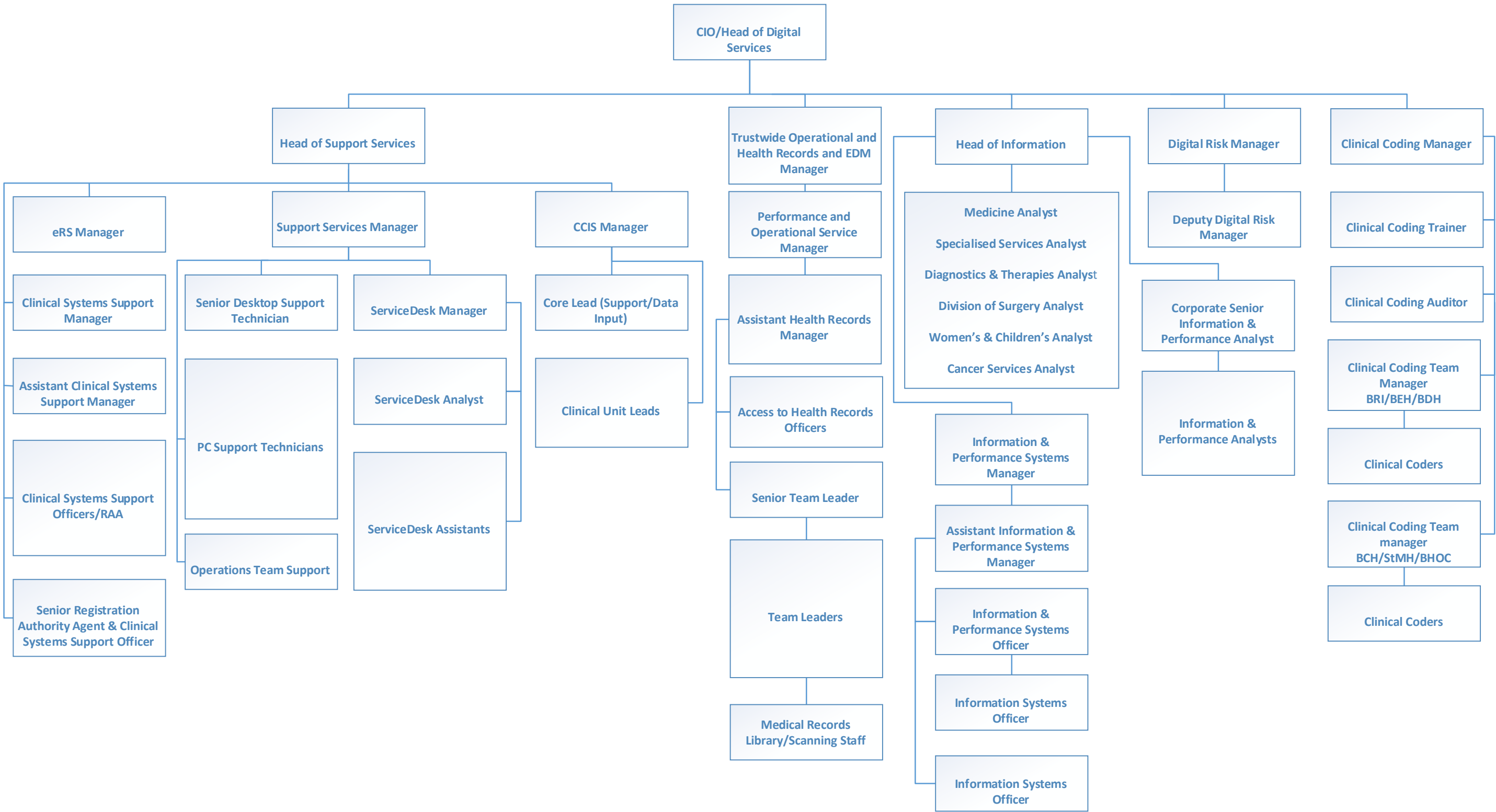
# UHBristol – Digital Services Department Structure

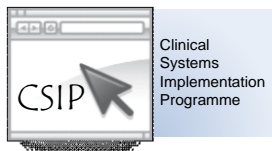


# UHBristol – Digital Services Department Structure



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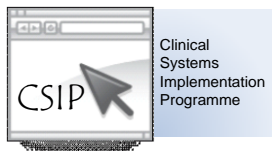


## **Clinical Systems Implementation Programme (CSIP)**

### **Clinical Systems Strategy – June 2012**

# ***The Way Forward***

Version 2.0 26<sup>th</sup> June 2012



### Version Control / Amendment History

Issue Status	Version	Date	Author	Input/Amendment Description
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Draft	1.0	June 2012	[REDACTED]	Final formatting for CSIP Board
Draft	2.0	July 2012	[REDACTED]	Final formatting for Trust Board

### Reviewers:

Name	Title	Date of Issue	Version
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[REDACTED]	IM&T Programme Manager	May 2012	0.1
[REDACTED]	Clinical Liaison & IS Training Manager	May 2012	0.1
[REDACTED]	Director of Finance and Executive In-charge of IM&T	May 2012	0.2
[REDACTED]	Members of the CSIP Board 20 <sup>th</sup> June 2012 (including Divisional General Managers)	June 2012	1.0

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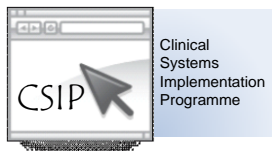
This document requires the following approvals.

Name of Group	Date of Approval	Version
IM&T Committee	6 <sup>th</sup> June 2012	1.0
Trust Management Executive	May 2012	1.0
Trust Board	27 <sup>th</sup> July 2012	2.0

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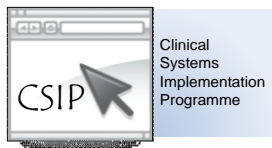
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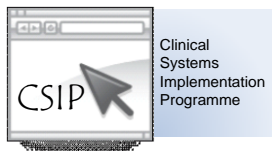
## Table of Contents

1	Executive Summary .....	5
1.1	Delivering the Strategy .....	5
1.2	The primary business cases.....	5
1.3	Protecting our existing investments .....	5
1.4	Accessing, using and sharing our information.....	6
1.5	Making IT Work .....	6
1.6	Funding and Affordability .....	6
2	Introduction.....	7
3	CSIP's Strategic Foundation Principles .....	9
3.1	CSIP's Vision.....	9
3.2	Foundation Principles .....	9
3.3	Other strategic requirements .....	10
3.4	Governance of Information Technology in the Trust .....	10
4	The Current Position .....	12
4.1	Progress against the Strategy .....	12
4.2	Planning for the next Phases .....	13
4.3	Strategic Partnerships.....	13
5	The CSIP Phases .....	14
5.1	Phase 1 - Current Status .....	14
5.2	Phase 2 – Consolidating the Patient Record .....	14
5.2.1	Diagnostic Systems Strategy.....	15
5.2.2	Service Ordering and Reporting System Replacement .....	15
5.2.3	Electronic Discharge Summary Replacement.....	16
5.2.4	Developing the Medway Clinician Desktop .....	16
5.2.5	Building on the Medway Theatres Module.....	16
5.2.6	Electronic Patient Handover Replacement.....	16
5.2.7	Clinical System for Allied Healthcare Professionals .....	16
5.2.8	Electronic Document Management.....	17
5.2.9	Digital Dictation and Voice Recognition System .....	17
5.2.10	Patient Self-Service Kiosks.....	17
5.2.11	Mobile Technologies.....	18
5.2.12	Ophthalmology Electronic Patient Record and Imaging Systems .....	18



5.2.13	Dental Systems.....	18
5.2.14	Assessing and Adopting the Trust’s Existing Departmental Systems .....	18
5.2.15	Telemedicine.....	19
5.2.16	Non-clinical Systems .....	19
5.3	Phase 3 - Delivering Clinical Decision Support .....	19
5.4	The Planning Process .....	20
5.5	Time-scales .....	20
6	Bristol Acute Services – Current IM&T Position .....	21
6.1	North Bristol .....	21
6.2	IT Integration in Bristol .....	21
6.3	Information Sharing and Collaboration .....	21
7	Strategic Benefits and Transformation.....	23
8	Programme Governance and Staffing structure .....	24
8.1	CSIP Governance .....	24
8.2	The CSIP Programme Management Structure .....	25
8.3	Clinical Engagement .....	25
8.4	In-house Capabilities .....	26
8.5	Partnership with McKesson .....	27
9	Hardware and Infrastructure .....	28
9.1	The Data Centres.....	28
9.2	User Access and Devices .....	28
10	Financials .....	30
10.1	External Funding Options .....	30
10.2	Internal or External Solution Options .....	30
10.3	Capital Costs .....	31
10.4	Revenue Costs.....	31
	Appendix A: Electronic Document Management (EDM) .....	32
	Appendix B: Electronic Prescribing and Medicines Administration (EPMA).....	34
	Appendix C: Catalogue of UHB Non-core Systems .....	37
	Appendix D: Glossary of Terms and Abbreviations .....	41





# 1 Executive Summary

## 1.1 Delivering the Strategy

'The Way Forward' describes the next steps in delivering the Clinical Systems Strategy that was approved by the Trust Board in June 2010.

After making this strategic decision to break with the National Programme for IT (NPfIT), UH Bristol has spent the last two years establishing and executing the Clinical Systems Implementation Programme (CSIP) so that, at the end of May 2012, we have delivered the McKesson Medway PAS/EPR, JAC Pharmacy Stock Control and Imprivata 'single sign-on' security solution and are now preparing for delivery of the final components of Phase 1. We are pleased to record that the original Strategy still holds true and our purpose now is to continue with its delivery in the light of our recent experience and on-going developments in the field of healthcare informatics.

Phase 1, 'Establishing the Foundations', has been characterized by a raft of complex activities culminating in a single 'big-bang' go-live of the Medway patient administration system and electronic patient record (PAS/EPR) in April 2012.

Phase 2, 'Consolidating the Patient Record', contains a sequence of equally complex activities building toward a series of go-lives that, while none of them will be as high-impact across the whole organization, will achieve an even bigger step-change in the way we think about and use information technology in the daily business of running the Trust. We see this next Phase taking us from October 2012 through to late 2013.

Looking further ahead to Phase 3, 'Delivering Clinical Decision Support', we can see how work on the previous Phases will have provided our clinical colleagues with a paper-light infrastructure that will promote a more cohesive means for us to collect, view, share and use our patient-based information.

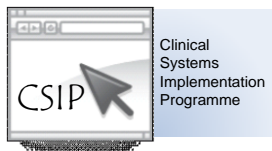
## 1.2 The primary business cases

Following detailed research we have produced draft business cases for the two most substantial systems on our shopping list. These systems, Electronic Document Management (EDM, scheduled for Phase 2) and Electronic Prescribing and Medicines Administration (EPMA, scheduled for Phase 3), are notable in terms of their relative size, investment and anticipated benefits compared to other systems that we have considered.

For this reason the business cases have been commissioned to demonstrate that there is evidence of affordability. Electronic Document Management, in particular, requires a significant initial investment but, properly managed, will provide savings and tangible efficiencies at an early stage. The case for Electronic Prescribing is compelling but the payback period is less clearly evidenced and, for this reason, we are seeking to supplement our own investment with National funding through the South Acute Programme being conducted by the Department of Health Informatics Directorate.

## 1.3 Protecting our existing investments

However, whilst these two major systems may provide the functional nucleus of their respective Phases, we need to put equal emphasis on maintaining, developing and, where appropriate, adopting into the CSIP fold the wealth of small departmental and 'stand-alone' information systems that are in wide use around the Trust. These systems represent a huge on-



going investment and have for some time provided the detailed functional applications that have been relied upon by clinical colleagues.

Other major systems currently in use by the Trust are coming to the end of their service life-cycles and will be replaced, mainly during Phase 2. These include our current diagnostic ordering and results system (ICE), and the diagnostic imaging system (PACS). By integrating these functions into our new electronic patient record (EPR) using modern, easy-to-use and consistent systems we will ensure that our clinical and administrative colleagues will gain the direct benefits of a consolidated patient record.

## **1.4 Accessing, using and sharing our information**

We will ensure that, having developed and delivered our new systems, we provide all of our staff with the means to access and use them whenever and wherever they need to using the most appropriate device for the job; whether it is a traditional desktop terminal or a hand-held mobile device, and whether data is collected using keyboard input, voice recognition or proximity reader.

Our focus here is to remove the barriers that often exist that result in data not being collected accurately, in real time, or even at all, and that no patient should be exposed to greater risk simply because we have failed to give our colleagues the means to get at critical information when they need it.

## **1.5 Making IT Work**

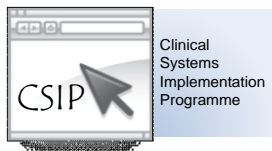
Delivering this ambitious Programme requires detailed planning and deployment techniques. Following the successful go-live of Medway, the CSIP and IM&T team has adapted its support and delivery structure to cater for the increased demands of a more clinically-orientated user-base. As our reliance on these systems increases in the coming years, our capability to support and protect them becomes more important and we expect to move towards extended hours cover during Phase 2.

Similarly, our deployment team will engage and relate more closely with clinical colleagues to ensure that what we deliver meets requirements that are practical and properly applied. We will introduce an Informatics Transformation workstream that will be applied to all of our projects to ensure that we align with the Trust's Transformational goals--this will be increasingly important as our systems become more fundamentally involved with the delivery of care.

## **1.6 Funding and Affordability**

We will be unable to make our Strategy work without proving the affordability of our proposals and providing the right levels of funding.

This will be achieved through a combination of direct investment in our informatics infrastructure, benefits-funded business cases, National funding where available, spending to save and, not least, making the best of our relationship with McKesson to secure innovative solutions and good value through our unique position as a Strategic Reference and Development Partner.



## 2 Introduction

UHBristol's Clinical Systems Strategy was originally approved by the Trust in June 2010 and resulted in the adoption of the Strategy and subsequent planning and delivery of the components identified as Phase 1 of the Trust's Clinical Systems Implementation Programme (CSIP).

With the successful deployments of the Pharmacy Stock Control solution in November 2011 and the Medway Patient Administration and Electronic Patient Record (EPR) system in April 2012, the core components of Phase 1 of CSIP are now in place and the Trust is on course to deliver the additional Medway functions identified as Phase 1b during the summer of 2012. This sub-phase will allow us to use Medway to its full potential in terms of improvements to the software and to local processes.

Having successfully delivered Phase 1 of the Programme we have taken stock of the current position, which is now based on solid foundations, considered opportunities offered by new technologies and software engineering, reviewed IM&T in the light of the environment (both in and outside of the NHS) and created this update entitled 'Clinical Systems Strategy – The Way Forward'.

The Strategy is intended to cover a three to five year period from 2012 and is designed specifically to be visionary yet realistic and affordable. We can take considerable confidence from the way Phase 1 has been delivered as we now have the assurance that our original Strategy was fit for purpose and that the Trust has the wherewithal to deliver modern IT systems despite the huge complexity of hospital operations. The April Medway go-live can be considered to be one of the best implementations of its type ever achieved in the NHS.

This document then describes our progress to date and, by looking at the Trust's immediate and on-going requirements for Clinical Systems and associated IM&T facilities, defines and restates the underlying purpose of the successive CSIP Phases and proposes functional business solutions and enabling technologies as appropriate contents for each Phase.

Specifically:

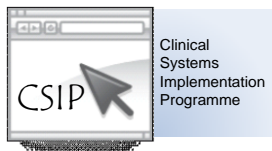
- **Phase 1 – Foundations**

This Phase has been designed and delivered to provide a firm foundation upon which to build the complex applications and business process changes that will be required to gain the benefits demanded of successive Phases.

Live across the Trust with all PAS functions, theatres, ED and Maternity, Medway now provides the Trust with a fit-for-purpose, functionally rich and flexible foundation upon which to build additional clinical functionality as part of a comprehensive Electronic Patient Record (EPR) and we are now ready to capitalize upon this. Alongside the JAC pharmacy stock control system and single sign-on infrastructure, Medway completes the major deployments planned for this phase.

- **Phase 2 – Consolidating and Using the Patient Record**

Giving clinicians appropriate single-view access to an up to date, unified patient record that is available anywhere, at any time, is a critical part of building towards a trust-worthy EPR that clinicians and colleagues can use to support the delivery of high quality patient care and reap the benefits that can be gained from a more cohesive and comprehensive record.



Industrial-strength, Trust-wide systems that have been proposed to meet this purpose include powerful electronic document and casenote management, better data capture technologies including digital dictation and voice recognition, stronger links to GP systems and a secure refreshed medical and general imaging capability. Alongside this we will conduct a systematic review of the information systems used around the Trust and, wherever possible, work with their owners to ensure that they are secure, resilient and provide the right levels of service.

- **Phase 3 – Delivering Clinical Decision Support and Transformation**

Around the Trust we are already using advanced technology and informatics to provide clinicians with the tools they need to make better, more informed decisions about patient care.

Our aim in Phase 3 will be to harness this existing demand and capability and to underpin it with investment in fundamental, Trust-wide systems that will deliver advanced clinical benefits across the board and provide an even more effective basis for innovation and transformation.

For example, electronic prescribing and medicines administration, advanced imaging techniques and the availability of rules-based pathways management can make a fundamental difference to the Trust's clinical effectiveness and are capable of delivering significant financial benefits.

It can be seen that these Phases are defined according to purpose, not to time-scale. Independently, departments and business functions are already making investments in all of these areas. Our responsibility will be to provide a properly constructed framework into which existing solutions and technologies can be integrated with enterprise-wide capabilities delivered by the Programme.

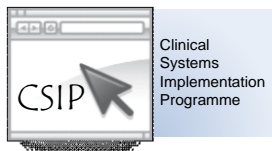
Whilst each Phase will be self-contained in terms of its business case, benefits and change agenda, the sequence of the Phases needs to be retained to take advantage of the building-block approach, but we can see that Phases may well overlap as preparation for some later solutions may commence before earlier components have been fully deployed.

The following sections of this Strategy describe the Trust's current position in more detail; outline the business and benefits proposition for each Phase; present an outline plan for each Phase including the solution content and overall timescales.

Extracts have been provided from the Outline Business Cases that have been worked up for electronic document management (EDM) and electronic prescribing and medicines administration (EPMA) as examples of two of the more significant solutions that have been proposed to fulfil the Trust's Clinical systems Strategy.

The existing CSIP team will need to be re-modelled to present different skill sets for the next phases of the Programme, which will include a high level of clinical change management and a dedicated professional project management function to underpin the proven specialist workstream functions that have been used to deliver Medway. The initial success of the Medway project has reinforced the need for a permanent CSIP Programme Director to lead the team for the next three to five years.

Finally, we expect to capitalize upon the relationship we have established with McKesson, the supplier of our Medway PAS-EPR, by establishing a Strategic Partnership as an effective means to deliver this Programme in the most practical and economically advantageous way.



### 3 CSIP's Strategic Foundation Principles

The first iteration of the Clinical Systems Strategy communicated the challenges and opportunities of procuring and implementing replacement 'core' systems outside of the National Programme for IT. Reviewing the first version we have noted that the Core Statement and Foundation Principles are as valid today as they were in June 2010 and continue to guide the Trust's Information Management and Technology strategy and plans. They are re-iterated here to set the scene for the rest of the document:

#### 3.1 CSIP's Vision

Our vision for the outcome of the Clinical Systems Implementation Programme is that it should be:

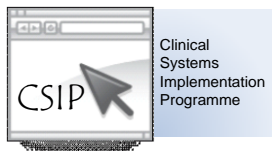
***"A systematic programme of activities to deliver a cohesive set of clinically-focused software applications and technologies that will transform and underpin our business processes and provide clinicians and colleagues with the practical means to derive tangible benefits from improving patient care and better use of our assets and resources"***

#### 3.2 Foundation Principles

"Information Management and Technology will increasingly underpin service delivery and the Trust's success as a Foundation Trust. It will therefore provide fast, accessible and reliable services to make the capture, processing and display of information as relevant, quick and easy as possible for users. Building on existing strengths, it will be responsive to changing service and user needs, and will promote the delivery of leading-edge technology delivered to a high standard"

"The trust has built its Information Management and Technology strategy on these eight foundation principles:

- Putting in place an appropriate infrastructure and modernising the way the trust stores and communicates information
- Taking a lead on researching new technology to support changing patterns of working, making better use of existing technologies and ways of accessing and presenting information
- Working to national and international quality standards in the storage, use and transmission of patient data and wider information governance principles
- Having a formal methodology for working with local service providers. In particular adhering to the well proven Government recommendations of the Projects in a Controlled Environment (PRINCE) project management methodology supported by appropriate Office for Government Commerce Gateway Reviews
- Ensuring careful preparation by staff at all levels. Recognising that deploying an Information Management and Technology system is not a technology task, but a change management and benefits realisation challenge
- Following a structured management response to risk. Mitigation plans being drawn up in a proactive manner, addressing threats prior to them materialising and not simply being reactive after the event.



- Ensuring any contractor has proved the concept of its approach and that, where appropriate, Connecting for Health has validated that all of the core systems elements are working correctly before making an irrevocable commitment to implement
- Adopting financial prudence. The Trust will deploy a significant in-house Information Management and Technology capability to complete implementations successfully and avoid the need to spend large sums of money on purchasing external resources.”

### **3.3 Other strategic requirements**

There are also specific information technology requirements that a Foundation Trust must meet:

- Demonstrate that the information technology systems covering financial reporting and procedures are fit for purpose
- Demonstrate governance of information technology within the Foundation Trust committee structure
- Provide an overview of information technology systems including readiness for national initiatives such as the National Programme for Information Technology, choose and book, etc.
- Provide a summary of key risks for information technology that may impact the trust’s plans, assessing likelihood, describing mitigation actions and detailing potential financial and non-financial impact, including describing the worst case scenario.

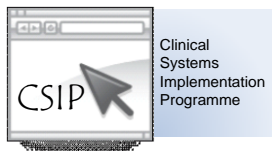
These principles and requirements have all been followed since the Information Management and Technology strategy was written and will continue to govern the implementation of the new Clinical Systems Strategy.

### **3.4 Governance of Information Technology in the Trust**

To ensure that the Trust’s information and technology systems are properly managed an Information Management and Technology Committee chaired by the Director of Finance operates with representative membership from other Executive Directors, General Management, Heads of Division and the IM&T Department. The Committee reports to the Trust Management Executive and undertakes the following core functions:

- To provide overall control, leadership and direction for all aspects of Information Management and Technology within the Trust
- To approve strategies, projects and implementation plans and monitor progress against plans
- To approve business cases within delegated limits or refer to the Trust Board for approval at, as defined in Trust Standing Financial Instructions and Standing Order
- To maintain oversight on projects authorized by the Committee, including achievement of project objectives and deliverables, realisation of identified and agreed benefits and assure adequate funding is available for projects, and to monitor expenditure against budget allocation
- To ensure integration with the Trust's modernisation agenda, change programme and redevelopment programme
- To oversee Risk Management including regular review of the high residual risks relating to IM&T issues



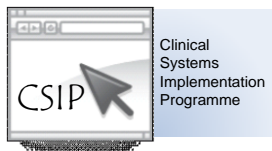


The Trust takes its Information Governance responsibilities very seriously and actively manages this function through the Information Governance Management Group that meets bimonthly. Specifically, purpose of the Information Governance Management Group (IGMG) is to:

- Establish, maintain and performance-manage an Information Governance Action Plan to achieve appropriate levels of compliance with the standards of information governance set out in the Monitor Compliance Framework and the various Care Quality Commission Essential Quality & Safety Outcomes
- Scrutinise and peer review draft Trust-wide procedural documents related to Information Governance and the Caldicott Principles in accordance with the Trust framework for procedural documents
- Provide the Trust Executive Group with advice and guidance on compliance with related Trust-wide standards and policy, and the management of associated risks
- Provide the Senior Information Risk Owner (SIRO) with advice and guidance on information policy,
- Ensure the Trust's Information Governance Management System, including its processes, procedures, protocols, training and awareness programmes, is in compliance with applicable legislation and regulation
- Monitor the implementation of the Trust's Information Governance Management System (IGMS).

The Trust has a structure in place to identify and mitigate information risks, which is headed by the Medical Director in his role as Senior Information Risk Owner (SIRO). The SIRO is supported in this role by Divisional Managers in their role of Information Asset Owners and the System Managers acting as Information Asset Administrators, each of whom are responsible for identifying risks and escalating them as necessary.

Other controls are achieved through staff training at induction and annual refresh; specific IT system controls (e.g. encryption of USB sticks and Laptops) to protect confidentiality and the identification and investigation of specific information governance incidents.



## 4 The Current Position

Progress on the CSIP Programme has remained true to the original vision and direction for Phase 1 as defined within the Strategy. Procurement and deployment have been successfully completed for Pharmacy Stock Control (PSC) with the JAC System in November 2011, and the Patient Administration System/Electronic Patient Record (PAS-EPR) with System C's Medway System, in April 2012.

The Strategy identified single sign-on as a 'key enabler', given the large number of UH Bristol clinical systems already deployed as well as the capability required for the PAS-EPR Clinical Desktop integration. Single sign-on has been successfully implemented and is now deployed to some 5,400 workstations with on-going benefits in terms of speed and convenience for logging on.

The PAS-EPR contract was awarded to System C Healthcare Ltd (now a McKesson-owned company) in May 2011 following an open and comprehensive procurement exercise. An implementation plan was developed and a go-live date of late-March 2012 was set. After an enhanced level of solution testing and user readiness was deemed necessary a new go live date was set and achieved in late-April 2012. The Medway solution covers all of the functionality defined within the Strategy – Patient Administration System functions, Emergency Department, Operating Theatres and Maternity – within an integrated, affordable offering and also provides the Trust with a toolkit for developing Clinical data capture forms (Medway 'Proformas') and easy-to-use connectivity to our existing systems through Medway's Clinician Desktop, which uses advanced Portal technology that is compatible with our existing single sign-on capability.

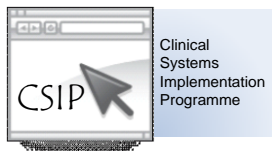
In the original strategy a phased approach to the deployment of the PAS-EPR was planned to manage the risks associated with changing core systems in a large Trust. However, the approach was subsequently reviewed with the selected supplier and it was agreed that a 'big bang' approach was in fact less risky and more beneficial for the Trust, and this has been proved to be the case.

A further stage, Phase 1b, is planned for delivery during the summer of 2012. Featuring some new functionality and software fixes identified at go-live, this stage will complete deployment of the core functionality of Medway and provide a base for the next Phases of the Strategy.

### 4.1 Progress against the Strategy

- Single Sign-on has been rolled-out successfully across the Trust and is now being maintained via 'business as usual' processes.
- Medway has replaced the HP-EDS Swift system – PAS, A&E, Theatres and Maternity went live on April 21 2012. Given the integrated nature of both the Medway and HP-EDS Swift suites, continuing with parts of both in use would have been technically challenging and confusing to users. Single go-live offered economies in terms of training and earlier overall delivery of benefits.
- The HP-EDS Swift legacy system has been set to 'read only', preventing users from making changes and enabling staff to refer back to it during cutover should the need arise. Later in 2012 data will be extracted and migrated into a Historical Data Viewer for any future uses (freedom of information, medico-legal, etc.) and the system will then be decommissioned.





- The Clinician Desktop is an integrated part of the Medway suite rather than a stand-alone solution and hence was incorporated into the April 2012 go-live. We have delivered the first tranche of the Clinician Desktop for existing systems:
- Sunquest ICE Orders and Results;
- Clinical Documents Service (CDS) including Sunquest's e-Discharge Summary;
- Diagnostic Imaging viewer;
- Clinical Coding using 3M-Medicode.

Further systems will be integrated into the Clinician Desktop by the in-house Systems Development team over the coming months including other imaging and ITU solutions.

- Medway's Clinical Support Toolkit (CST) is integrated within the Medway solution and enables UH Bristol to develop simple forms for capturing clinical data in many settings. This has already been used to replace some of the HP-EDS Swift legacy MDI functions but may allow the Trust to retire many of the small, stand-alone systems currently in use and to develop new clinical applications. There is clear benefit in bringing clinical data into the EPR, removing 'information silos' and providing effective information governance across all such data. IM&T will lead work on new developments.
- Pathology and Radiology results are being migrated into Medway to enable clinicians to view them without having to log into the Sunquest ICE orders and results service.
- Pharmacy Stock Control went live in November 2012. It is interfaced with the Pharmacy 'Apostore' robot and also provides information for the Finance department on drug issues and supplier payments.

## 4.2 Planning for the next Phases

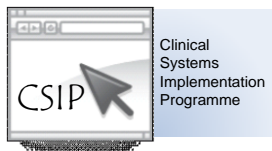
As part of preliminary planning for subsequent Phases, an Outline Business Case is being developed for Electronic Document Management and, subject to approval; a procurement process could be commenced in summer 2012. A summary of the benefits and case for change is included as Appendix A.

Initial evaluation exercise of Electronic Prescribing options commenced in December 2011 with supplier demonstrations of current solutions, to inform our thinking in this area. A summary of the benefits and case for change is included as Appendix B.

As a part of the contract for the supply of the Medway PAS-EPR, the Trust negotiated the optional inclusion of several optional Medway modules including Order Communications and Results Reporting, Clinical Noting and Electronic Prescribing. It is likely that we will take advantage of at least some of these options as we move forward in to the next Phases.

## 4.3 Strategic Partnerships

Following on from the successful deployment of Medway with McKesson, the Trust recognizes that this supplier has demonstrated a high level of commitment and capability in many of the areas covered by the CSIP Strategy. We have commenced discussions at a senior level within McKesson to establish how we can make the most of our unique position as a Medway reference and development partner, and to ensure that strong technical and business integration is featured in each Phase of our Strategy's development.



## 5 The CSIP Phases

This section presents further detail on the earlier Phases of the Programme that are introduced in section 3.1, the CSIP Vision. Whilst this section is not intended to constitute a plan, it does list many of the candidate systems that are expected to be deployed within each Phase.

### 5.1 Phase 1 - Current Status

With the go-live of Medway PAS-EPR we have now moved into the delivery of the second stage of Phase 1 (Phase 1b), where we can concentrate on consolidating and enhancing the Medway solution and aligning the overall IM&T support arrangements with the needs of a more clinically-orientated, real-time solution:

- Consolidation of Medway phase 1 components including bug-fixes and go-live issues such as Casenote management enhancements and the ED attendance deletion
- Additional Medway functions provided under Change Requests such as VTE assessment compliance
- On-going development of Clinical data collection using Medway Proformas
- Continued delivery and support of systems through the IM&T Development Team
- Review and audit of Departmental Systems and Support
- The wider application of smartcard-based quick-logon for use in areas where terminals are shared by several members of staff (already used successfully in the emergency departments)
- The introduction of 'follow-me' desktops that allow staff to take the 'set-up' of their computer desktop wherever they go in the Trust using low-cost Virtual Desktop Integration (VDI) technology.

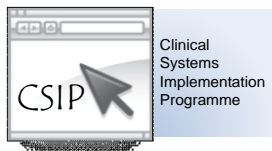
A project has been initiated to manage the delivery of this stage, which will also include the verification and acceptance of the overall Medway solution as the closure of Phase 1.

### 5.2 Phase 2 – Consolidating the Patient Record

As indicated previously, the purpose of this Phase will be to give Trust users appropriate single-view access to an up to date, united patient record that is available anywhere, at any time. It is a critical part of building towards a trustworthy EPR that clinicians and colleagues can use to support the delivery of high quality patient care and reap the benefits that can be gained from a more cohesive and comprehensive record.

Some work, e.g. the further development of Medway's Theatre Management module, will be treated as 'business as usual' activity as a part of our partnership with McKesson.

The following paragraphs provide a summary of some of the systems that have been proposed to meet the objectives of this Phase, some of which are replacements for existing solutions and others are new initiatives. Alongside these specific items the Programme will continue to support the selection and delivery of departmental solutions that have been proposed by Divisions and agreed by the IM&T Committee.



### 5.2.1 Diagnostic Systems Strategy

#### a) PACS and RIS Replacement

With the closure of the National Programme's contract with Computer Sciences Corporation (CSC) for Diagnostic Imaging (PACS) and Radiology Information Systems (RIS), the Trust is required to formulate and agree an exit plan that gives us full self-sufficiency before June 2013, at which point the Trust would be required to pay punitive costs to CSC.

Following consultation with neighbouring Trusts and other parties, we have initiated a project aimed at defining our requirements, procuring and implementing the various components needed to achieve this objective, which includes not only provision of the technical infrastructure and diagnostic imaging tools, but also the recovery of our diagnostic image data, much of which is currently held off-site at CSC's data centre.

We will work with other Trusts in our region on some elements of the procurement, particularly for those components concerned with sharing images and diagnostic information across organizations.

The delivery of our new Diagnostic Imaging and Radiology Information solutions will be managed as a part of a Trust-wide Medical Imaging Strategy that will take account of the needs of all departments who have an interest in this technology.

#### b) Pathology Systems Replacement

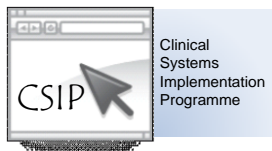
Depending upon the outcome of the North Bristol Trust 'Severn Pathology' proposal under consideration in autumn 2012 the Trust may need to replace its existing GE Ultra Pathology system, which is nearing the end of its supported life. This uncertainty has prompted us to make an appropriate allowance in the event that the Trust decides to not relinquish its Pathology Services.

### 5.2.2 Service Ordering and Reporting System Replacement

Recognizing that the Trust's operational requirements have moved on significantly since Diagnostic 'Order Communications' were introduced some years ago, UH Bristol plans to invest in a more broad-based Service Order Entry functionality that will allow clinicians to access all service requests in the same way and start the journey towards pathways-based ordering.

In terms of our current diagnostic ordering service, Sunquest ICE is deployed across the Trust for Pathology and Radiology Requesting and Reporting and has been integrated into Medway via the Clinician Desktop. We are importing laboratory and radiology result data into Medway to facilitate trending of numeric results and avoid delays to users when having to query ICE for large numbers of results, but the continued use of ICE does reduce the benefits available from full integration and involves the management of additional technical interfaces.

As a first step towards full Service Order Entry, it is therefore proposed that the Trust should exercise its contractual option for Medway Order Entry and Results Reporting so that ICE can be replaced and a far more extensive order catalogue can be implemented to include departments and services outside of the current radiology and pathology services.



### **5.2.3 Electronic Discharge Summary Replacement**

Sunquest ICE e-DIS has been deployed across the Trust. It has been reported that it can take 15-20 minutes of junior medical staff time to complete each summary. It is proposed that this system should be replaced by using the functionality in Medway and to that end a requirements specification has been drafted so that the supplier can help us to design the necessary configuration to be built into Medway.

### **5.2.4 Developing the Medway Clinician Desktop**

An integral part of Medway, the 'Patient Home Page' is the focal point from which clinicians can gain access not only to information collected in all of Medway's functional modules but also portal access, via single sign-on and in 'patient context', to other systems in an outside the Trust.

We already have links to the Trust's PACS digital imaging solution, diagnostic results and reports and the Clinical Document Store and plan to introduce additional links over the next few months, but during Phase 2 we want to extend the range of systems available through the Patient Home Page beyond the Trust's boundaries to include Social Services, Child Health and Safeguarding, GP direct access, etc. We hope to capitalize on McKesson's commercial ownership of the CarePlus Child Health systems and Liquid Logic Protocol, which is used by Bristol City Council children's services, to promote early integration with these areas.

The use of Medway as a common, single point of access for all of our staff will enable us to maintain a much more cohesive view of the patient record, and supplementing this with patient information from elsewhere will deliver significant benefits in promoting cross-organizational working.

### **5.2.5 Building on the Medway Theatres Module**

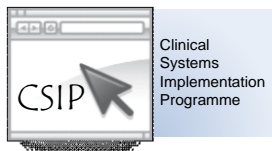
During Phase 1 we implemented the first version of the new Medway Theatres module, which is now in use across all theatre suites in the Trust. Phase 1b will introduce some additional features including simple resource conflict checking and theatre whiteboards. In Phase 2 we want to deploy more Medway features as they become available as well as looking at the potential for automated patient tracking and using our single sign-on capability to support fast proximity logons.

### **5.2.6 Electronic Patient Handover Replacement**

The Trust developed an eHandover application but the uptake had been fairly low. It is proposed that the current system be replaced by using Medway functionality, although it is possible that an additional Medway module will need to be procured to achieve this. We are preparing a specification that can be used to determine whether Medway can provide this facility without upgrade once the user requirement has been realistically assessed.

### **5.2.7 Clinical System for Allied Healthcare Professionals**

The Clinical Information System Suite (CISS) system has been used successfully for several AHP developments. Some AHP usage of the old HP-EDS Swift system is also made. The proposed strategy moving forwards is:



- For some new AHP systems, Medway's Proformas offer an integrated solution whereby AHP data can be shared with all clinicians. The IM&T will manage any new developments using Proformas where they provide an appropriate platform.
- Departmental databases that had previously been incorporated into the HP/IHCS PAS have been replaced using the Medway Proforma solution.
- Existing Clinical Information System Suite (CISS) solutions will remain for the time being until UH Bristol prioritizes the migration to Medway Proformas or other solution if this does not prove to be suitable.

### **5.2.8 Electronic Document Management**

An outline business case is being prepared to deploy a comprehensive Electronic Document Management (EDM) and Workflow solution. A summary of the benefits and case for change for Electronic Document Management is included as Appendix A.

One of the high level aims for this project will be to ensure the Trust does not continue to rely on a mixture of electronic and paper-based information to support clinical care. It will also help to reduce the amount of paper that needs to be stored and retrieved by the Trust. Digitising a proportion of our existing paper store over time will release some storage space and reduce the overall cost of records management. The primary challenge will be to design a solution that is affordable within a realistic timescale.

### **5.2.9 Digital Dictation and Voice Recognition System**

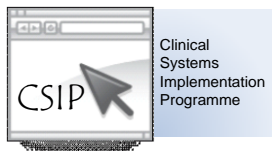
A business case has been approved in principle and procurement has commenced to deploy a Trust-wide Digital Dictation and workload management solution with a view to the introduction of Voice Recognition for clinical information capture at a later stage. Integration of the text-based end-product with Medway will be via CDS on the Clinician Desktop.

A key benefit of using this technology will be an improvement in the quality and timeliness of outpatient clinic letters to GPs.

### **5.2.10 Patient Self-Service Kiosks**

Customer self-service capability in other industry sectors such as travel, banking and retail has increased the public's acceptance of properly applied technologies that allow the process of patient arrival and reception, amongst other things, to be automated for many outpatient areas. Alongside improvements in the formatting and content of documentation such as patient letters, the 'kiosks' generally employed for this purpose can often be used for other purposes such as providing patient information and directions. Benefits can include more convenient access and better throughput for some patient groups.

Many self-service solutions rely on technical interfacing with a Trust's patient administration systems, effectively duplicating much of the information that is used. Medway offers us the opportunity to develop and deploy a fully integrated option that could reduce both the overall cost and technical complexity. As a first step, installing a limited number of these devices in selected areas will allow us to prove the concept and develop the most appropriate level of service to meet our needs.



### 5.2.11 Mobile Technologies

With the introduction of new systems and services, we will commence a series of tests on various mobile platforms. Primary objectives will include the identification of appropriate use cases, proving the security, safety and robustness aspects of the various devices and establishing whether there is value for money in this area, e.g. is a 'bring your own device' (BYOD) policy practical.

This exercise will be undertaken as a part of our on-going IM&T infrastructure development programme, which is discussed in a later section of this strategy.

### 5.2.12 Ophthalmology Electronic Patient Record and Imaging Systems

Ophthalmology currently has two main systems that it uses alongside the Trust's core systems:

- Medisoft – a specialized Ophthalmology system interfaced with Medway that has now been in use for almost ten years. A procurement process for a replacement system is due to be commenced soon, the outcome of which may be renewal of the existing contract, although a more detailed requirements definition will need to be developed.
- Digital Imaging – a procurement process has been commenced for this requirement, which we need to align with our overall Imaging Strategy and to engage as part of our Digital Imaging (PACS) replacement to ensure that opportunities for cost savings can be identified.

### 5.2.13 Dental Systems

The Dental Hospital has previously implemented a specialist system known as Salud from Two Ten Healthcare. The use of the system has met with mixed results around the country and uptake at the BDH has been poor. We need to review the position with this system as the current contract is due to expire later this year and BDH has no provision for a replacement.

### 5.2.14 Assessing and Adopting the Trust's Existing Departmental Systems

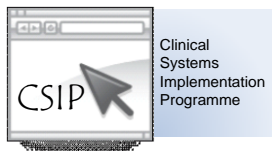
The IM&T department is aware of at least 150 departmental systems (and many more that have not been 'discovered') used around the Trust that are being used for a wide variety of purposes and will be contributing operational benefits. We are currently providing interface-based data to feed many of these systems with patient registration and activity data from Medway.

CSIP will embark on an audit of as many of these systems as possible to establish the level of supplier and local support used, compliance with information governance, technical resilience and other factors according to the application involved. We envisage that some of these systems may, with the agreement of their owners, be good candidates for replacement using Medway's clinical data collection facility, Proforma.

Other departments may choose to take advantage of IM&T's capabilities so that the systems can be 'adopted' and managed centrally (subject to resource availability), although it is acknowledged that many will prefer to continue operating and supporting their own solutions once we have completed the audit process and assisted the departments in getting their systems up to the necessary compliance levels.

Appendix D contains a table of existing Trust systems known to the IM&T department.





### 5.2.15 Telemedicine

The development of robust, cost-effective Telemedicine has long been hampered by mixed results of its use in various health settings. Recent Department of Health initiatives have been inconclusive but it has been noted that they have tended to focus on smaller-scale exercises where benefits will always be difficult to extrapolate.

We propose that a review of Telemedicine-related opportunities around the Trust should be conducted to assess what we have been able to achieve so far and whether a structured investment could deliver more predictable benefits. We may identify some current Telemedicine activities during our audit of the Trust's existing systems and use this information to start the process.

### 5.2.16 Non-clinical Systems

The Trust operates a wide range of business systems that do not have a direct impact on clinical practice, yet are nonetheless critical to the Trust's business operations. It is suggested that these systems should also be reviewed and support arrangements revised as appropriate.

## 5.3 Phase 3 - Delivering Clinical Decision Support

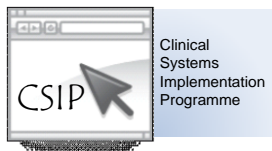
Our aim in Phase 3 will be to further harness advanced technology and informatics to provide clinicians with the tools they need to make better, more informed decisions about patient care. To do this it will be necessary to invest in Trust-wide systems that will deliver advanced clinical benefits across the board as well as ensuring that existing investments are protected and incorporated into the overall solution wherever possible.

We are currently evaluating practical candidate solutions and enabling technologies that can contribute to this Phase. For example, the use of Electronic Prescribing and Medicines Administration (EPMA) may help us to reduce the number of Adverse Drug Effects recorded by the Trust, which will improve patient safety and contain our cost of litigation. There is also evidence that the introduction of this facility will, over time, reduce our drug spend and support our clinicians in achieving prescribing best practice.

Again, identifying an affordable solution will be a challenge so the Trust has applied to participate in the South Acute Programme (SACP) being run by the Department of Health's Informatics Directorate in a group that is collaborating in the specification and procurement of Electronic Prescribing systems and through this hopes to benefit from National funding to assist in the necessary investment. A summary of the benefits and case for change for Electronic Prescribing and Medicines Administration is included as Appendix B.

Our work on proving the value and practicality of mobile access technologies during Phase 2 will also be applied here, where clinical decision support use cases are likely to feature the most appropriate applications for this technology.

The use of decision support systems and mobile technology within this phase will transform the way clinicians work across the Trust, so buy-in from the clinical community is a key factor in its success.



## 5.4 The Planning Process

Having identified the content of each Phase of the Programme we will need to agree an overall plan, which will need to take into account that each component is likely to require a separate, self-sustaining business case and must mesh in with the rest of the Phase.

In the case of Phase 2, we can see that this will be a complex plan that could potentially contain competing priorities, so an early stage in this process will be to determine the relative priorities of the candidate solutions through their respective business cases and from there derive their inter-dependencies and sequencing. The next stage will be an outline resource plan that will enable us to assess how achievable the combined projects will be, and finally a realistic modelling of the various projects and their stages.

The Medway PAS-EPR project has given CSIP some experience in the level of output and resourcing required to deliver major deployment projects. Whilst none of these projects will be of quite the same scale of the Medway deployment, the sheer variety of the candidate projects and their inter-dependencies are likely to be of a comparable level but with more 'go-lives' over a longer period, so the Programme will need to maintain access to a strong resource pool and good working relationships with the respective suppliers.

## 5.5 Time-scales

The timescales for delivery of the CSIP Phases are expected to be as follows:

### **Phase 1b                      July to September 2012.**

Planning for this sub-phase is well developed and we expect to provide detailed time-lines in June 2012.

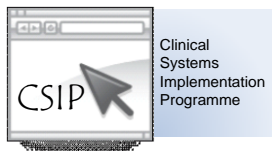
### **Phase 2                      October 2012 to October 2013**

Whilst we have a good grasp of the overall content of this phase we need to do more work on the sequencing and inter-dependencies before we can develop a firm plan that can be fully resourced, although the overall workload has been estimated and included in the revenue figures.

### **Phase 3                      November 2013 onwards.**

Electronic Prescribing and Medicines Administration could potentially be brought forward if the South Acute Programme delivers funding at an earlier stage.





## 6 Bristol Acute Services – Current IM&T Position

### 6.1 North Bristol

NBT went live on Cerner Millennium PAS delivered through the National programme and BT in December 2011. This implementation is recognized as having been problematic and issues are on-going. Millennium covers all functional areas except Maternity where NBT continues to use the Euroking solution. As yet the Trust has not replaced its Pharmacy Stock Control system.

The Cerner Millennium PAS at NBT is believed to be contracted until June 2015. The continuance and/or exit costs are not known to UHBristol at this stage but some other trusts in London and the South are known to be actively seeking to either replace Cerner or find cheaper alternatives away from the programme to maintain their solutions.

### 6.2 IT Integration in Bristol

Should a decision be taken to form a single Acute organization in Bristol the integration of the main clinical systems will become a major task and a prerequisite for realizing the benefits from such an organizational integration.

Essentially, a decision would need to be made as to which system would become the primary candidate to be developed and used into the future. This would either be Cerner Millennium (implemented at North Bristol) or Medway (UH Bristol). A full evaluation would be undertaken to reach the necessary conclusion. Due to contractual positions such integration cannot be achieved prior to 2015.

Whatever option is adopted in this eventuality, careful consideration must be given to the ways and means by which historical data can be extracted and loaded into the ‘dominant’ system so that a true, united patient record can be constituted. In practice this may not be possible for co-terminus periods and it may be necessary to provide an historical data viewer to make available those records that cannot be migrated reliably.

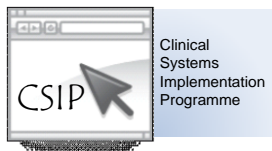
### 6.3 Information Sharing and Collaboration

In 2010 the Bristol, North Somerset and South Gloucestershire Interoperability Project Board (or ‘Connecting Care’ Project Board) was formed to examine ways to share data across the numerous care settings involved in the provision of patient care locally.

The Connecting Care Project Board considered that it would be advantageous to test out some form of system integration within three local areas. The three areas that were proposed were:

- **Urgent care**

This is an important focus area within the NHS ‘Quality, Innovation, Productivity and Prevention’ (QIPP) challenge. Locally this area involves close interdependencies between GPs, Minor Injuries Units (MIUs) / Out of Hours (OOH), community nursing, and hospital emergency care.



- **Intermediate Care services**

Locally this area involves close inter-dependencies between health and social care teams, although there are also links in with ambulance services, GPs, community nursing, and hospital emergency care.

- **GP to Child Health**

Locally this involved a proposal to provide a link between GP systems and the Avon-wide Child Health system.

A procurement is currently underway to complete a proof of concept that will:

Deliver a 'quick win', i.e. something tangible within a couple of months

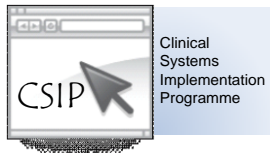
Test out the technical aspects and prove the technical viability

To see if the technical solution triggers a genuine interest and involvement from local clinicians and social care staff

To use any successes in these areas to inform and build up the strategic programme

The Connecting Care Programme board has requested funding from UB Bristol to take part in the pilot project. It was deemed that without a business case to support the procurement we would not at this stage take part in the pilot but keep a watching brief on both the procurement and the subsequent pilot project to understand what benefits if any may accrue to the Trust.

However, it is our clear Strategic intent to support this initiative by working with our partners. An affordable proposal with clear benefits is awaited and a sum has been included for this project in the Business Plan.



## **7 Strategic Benefits and Transformation**

Identifying and delivering cashable savings has traditionally been a major weakness in NHS Clinical IT implementations. It is the norm for anticipated savings to be listed and claimed in Business Cases but rarely delivered in practice, even when a structured benefits realizations plan has been put in place.

The UH Bristol approach is therefore to fully assess the costs of the Strategy and include these explicitly in the Long Term Financial Plan. Divisions are then able to utilize the new and improved systems to generate real savings in support of their CRES and Transformation Programmes.

It is proposed that a Technology Transformation workstream should be established with representation from all Divisions to identify practical and realistic ways to exploit the opportunities available from the new systems and to do so in a co-ordinated manner to avoid double-counting savings from multiple initiatives such as Electronic Document Management and Voice Recognition, both of which can have impacts in the same areas of efficiency and cost.

## 8 Programme Governance and Staffing structure

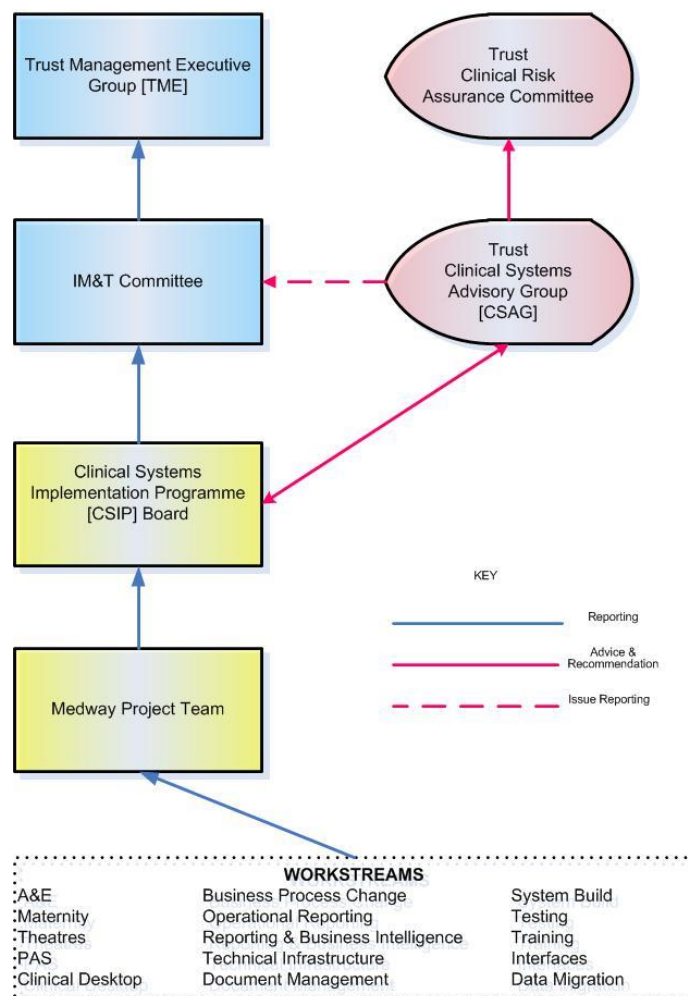
The Programme Governance and Staffing structure previously established has proved to be fit for purpose and continues to operate effectively. In terms of Programme staffing, the relationship between the IM&T department and staff assigned to CSIP is excellent, with individuals across the organization working together as required by their respective projects—this in itself has been a key factor in the success of the Programme so far.

Some changes have been undertaken, not least of which is the requirement for a more extended support organization since the go-live of Medway. The more extensive nature of the system and its operation has meant that out-of-hours support has been required, i.e. overnight and at weekends. We are adapting the support teams to meet this change in demand but have taken this as an indication that, with the introduction of more clinical systems, this level of support and its associated cost may need to continue.

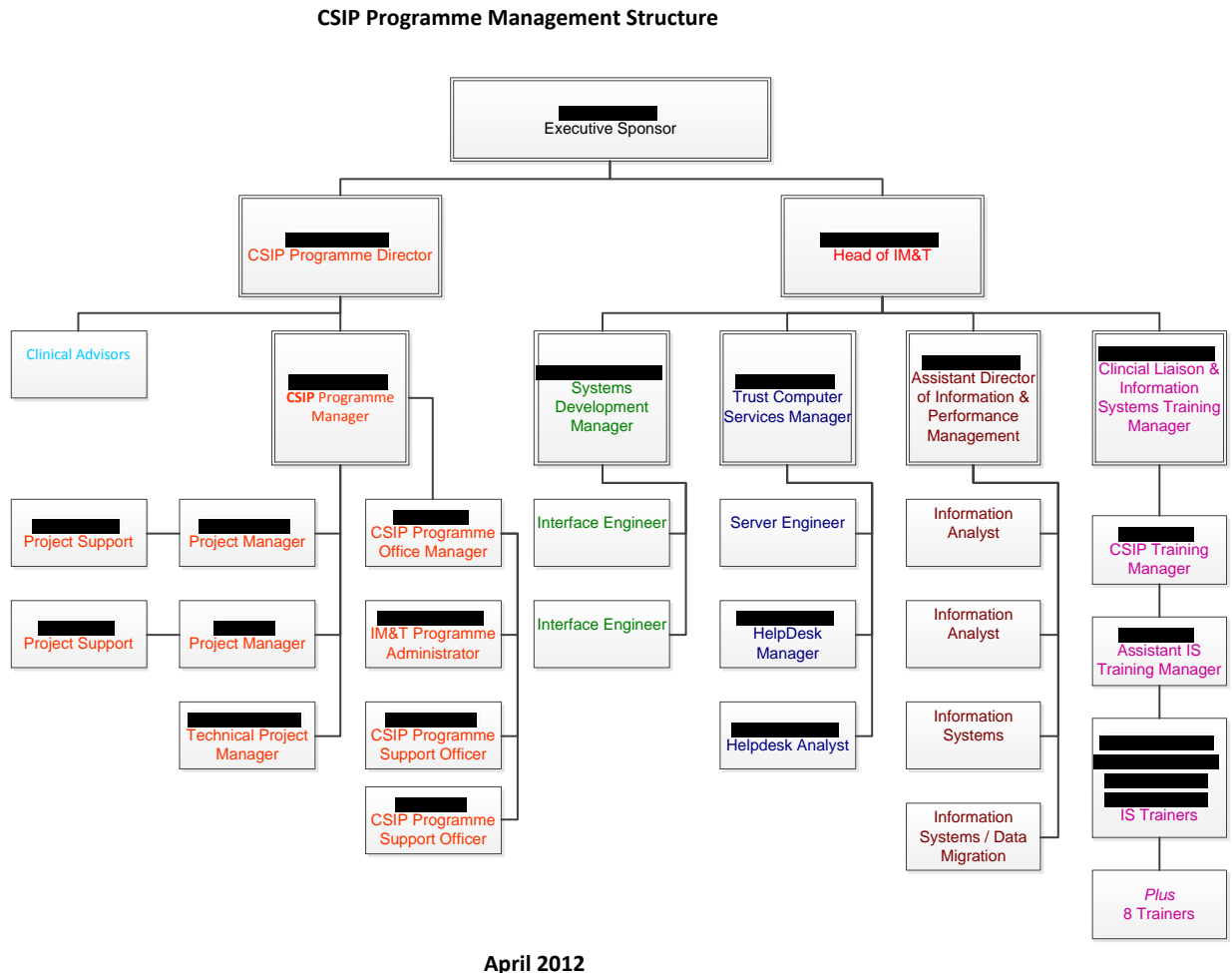
### 8.1 CSIP Governance

The Overall governance of Phase 1 is illustrated below. It is envisaged that this will continue into subsequent Phases.

#### CSIP Medway Phase-1 Governance



## 8.2 The CSIP Programme Management Structure

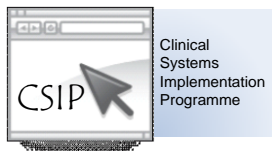


## 8.3 Clinical Engagement

The Transformation Team has created an engagement plan that has been devised to work with clinical teams and clinical champions to improve service and patient pathway design. It is envisaged that CSIP will work within this plan where it provides a good conduit for the delivery of the strategy and its component solutions, although it is acknowledged that some of the CSIP projects may require more detailed engagement.

In addition, it is proposed that the Clinical Systems Advisory Group (CSAG) that was constituted to support Phase 1 by providing clinical advice and a resource to IT projects in the trust should be revised as a voluntary interest rather than remunerated group. In outline, the proposal is that the new CSAG will:

- Contain clinicians, including Nurses and Allied Health Professionals, who will contribute and have a genuine interest in clinical IT
- Be representative of each of the major clinical groupings in the trust.
- Include an IT department representative and one from management.



- Appoint a Chair and Vice Chair.
- Have a membership of 15-20 people.
- Be represented on the IM&T Committee.
- Meet on a monthly basis with a remit to review clinical IT projects with new or current project presented by an invited speaker for discussion.
- Receive clerical support from the CSIP Programme Office.
- Comment and contribute ideas on specific IT projects, e.g. ePrescribing or the replacement PACS system.
- Contribute members to be involved in specific project groups.
- Make suggestions concerning any aspects of the Trust's IM&T activities and drive development of ideas that can benefit clinical services.

Membership of this committee will be recognized as an allowable activity under 'Managed SPA' in job plans.

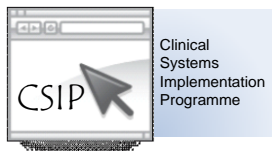
## 8.4 In-house Capabilities

As a result of previous investment and recent experience during Phase 1, UH Bristol now has a strong, diverse team of professionals to form the nucleus of the project teams required to deliver the next CSIP Phases.

The IM&T department has a long-standing capability in the form of the Web Development Team of ten professional staff that has developed and supported a range of clinical and business solutions, many of which are still in use across the Trust. This capability will be maintained and used to provide on-going support for the extensive integration facilities that have been deployed, continued support for in-house solutions, and also to develop new clinical applications, particularly for mobile technologies, based upon Medway's published Web Services interfaces. This will allow us to take the initiative in delivering innovative clinical applications that meet our own requirements.

The development and implementation of in-house solutions will be managed in a more formal way than has previously been the case, to avoid dis-jointed application design with poor uptake and control of usage. The use of Medway as the core EPR around which new in-house modules can be developed will help to ensure that the solutions are more targeted and contribute to a more cohesive data model.

Alongside our core team members, we have made extensive use of specialist contractors, some of whom have contributed directly to the success of Phase 1 through previous experience that would not otherwise have been available within the Trust. The use of contractors allows us to flex the size of our project team to meet the sporadic demands of project work. However, contractors are an expensive resource and we may be advised to recruit into some of the more generic project roles to reduce overall costs and ensure that expertise is retained within the business.



## 8.5 Partnership with McKesson

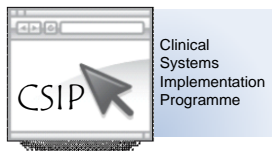
McKesson describes itself as “the trusted healthcare technology solutions and services provider dedicated to helping its customers deliver high-quality healthcare by reducing costs, streamlining processes, and improving the quality and safety of patient care”.

Following on from the successful deployment of Medway with System C (now a McKesson owned company), the Trust recognizes that this supplier has demonstrated a high level of commitment and capability in many of the areas covered by the CSIP Strategy. We have commenced discussions at a senior level within McKesson to establish how we can make the most of our unique position as a Medway reference and development partner, and to ensure that strong technical and business integration is featured in each Phase of our Strategy’s development.

Our Partnership with McKesson will consist of two main activity areas:

- As a Reference Partner for prospective Medway customers to assess McKesson’s Medway product and the performance of the company and its staff, and also as an informal point of contact to discuss how UH Bristol worked with McKesson to achieve the Gold Standard deployment and how this could be applied elsewhere.
- As a Development Partner for McKesson products including Medway.

The benefit of this activity, which will require the Trust to invest resource in both areas, will be to retain close links with the Company and, where appropriate, derive significant cost savings on products and services as well as reduced procurement expenses.



## 9 Hardware and Infrastructure

UH Bristol has invested in state-of-the-art IM&T facilities and staffing that permit us to create and maintain a professional, reliable infrastructure on which to deploy our clinical systems. Looking at the sequence of deployments within the CSIP Phases, it can be seen that incremental increases in storage and processing capability will be required to ensure that the performance and reliability of our systems is maintained as our reliance on electronic systems increases.

Anticipating the Trust's enterprise-wide Imaging Strategy, we have recently invested in a powerful Vendor Neutral Archive (VNA) storage farm, initially to be used to house our PACS images once they have been repatriated from the CSC data centre. Later in Phase 2 this facility will be used to host and share a variety of image sources.

The following section summarizes the additional and enhanced infrastructure that will be deployed to support the Clinical Systems Strategy, providing a high level of performance and resilience. It should be noted that some of the underlying infrastructure used by CSIP applications will be provided under the general IM&T capital budget.

### 9.1 The Data Centres

Our two main computer rooms already provide a high level of resilience that, over the coming months, will be improved to give us an even more reliable service. For example, we will be implementing:

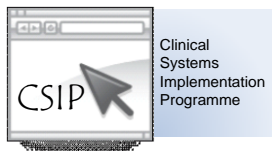
- 'Data Centre Virtualization', which effectively gives the Trust a 'Private Cloud' that will allow us to manage and protect our systems more flexibly without the user community needing to understand the whereabouts of the systems that they use.
- Additional data storage space by increasing the capacity of our Storage Area Network (SAN), which is our enterprise-wide data storage facility. It is of interest that the volume of data being stored and managed within the IM&T department is doubling every 18 months.
- An industrial-grade back-up and transaction recovery capability to protect our SAN data storage facility. This will not only make the management of our data back-up processes quicker and easier to manage, but it will provide the means to ensure that in the event of a major system failure the Trust's data can be restored and operational as quickly as possible.

### 9.2 User Access and Devices

As we roll out more complex clinically-orientated systems we will increase the demand of colleagues to be able to use these new facilities and must therefore make it easy for people to access and use our Clinical Systems. As our Programme delivers, staff will be able to see an increasingly unified view of the patient record, including clinical, administrative and management information, all of which needs to be captured and viewed.

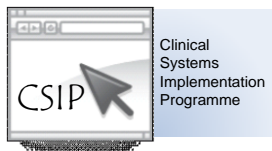
Staff need to be able to use whatever technology is the best for them to tackle the task in hand and over time we plan to make use of the best of proven technologies including wireless networks, laptops, hand-held devices, voice recognition systems, barcodes or conventional desktop computing, etc. Whatever devices we employ must be fast, relevant, flexible and easy to use.





Some of these technologies are mentioned elsewhere in this document, but other products that we are actively working on include:

- ‘Virtual Desktop Integration’ (VDI), which gives us the ability to use inexpensive and secure desktop devices to support the ‘follow-me’ desktop, whereby a user can log out of a workstation and then log in again at any other workstation and be returned to the same point in any open applications that they were using previously. Combined with proximity login devices, this will provide big benefits to users who are mobile or work in clinical areas with shared devices. We will be following up a recent ‘proof of concept’ by rolling out these devices in selected areas including ED.
- Electronic ‘Whiteboards’ supported by nearby touch-screens that can be used to broadcast and interact with displays of information relevant to their location, e.g. wards, ED, theatres, so that users can find the information they need with the minimum of fuss.
- Mobile technology covers a vast range of options for access and input techniques. We have already trialled a number of tablet devices and smart-phones and our intention now is to establish how to assure and standardize the physical and data security of the devices, controlling the use of ‘bring your own device’ (BYOD) environments, how to publish only Trust-approved applications, and the design of applications that are most relevant to operation on small screens. This is an exciting and rapidly developing topic that impacts several other areas that we are interested in, including telemedicine and off-site access.
- We expect to roll out more ‘semi-mobile’ devices across the Trust, for example, computers on wheels (COWs) that make better use of scarce desktop and floor space and can be moved nearer to the place it is needed.
- Proximity cards (RFIDs) offer a wide range of tracking and identification tools that can be used in many applications. We have already deployed smartcards in this context in ED, where they are being used for quick logon/off and user swapping and we hope to roll this out to more departments in the coming months. With appropriate tagging this technology can also be used to track equipment, patients and other assets in real time and we expect to trial some ideas for this during Phase 2. Similarly barcodes, now relatively old technology, offer excellent opportunities to register and track labelled items including patient wristbands, etc.
- Clinical colleagues in many departments are often the first to identify new ways of using new technology and we are keen to work with them to assist in making the best of these opportunities by bringing our knowledge of data and information security and integration to bear where it can be of use.



## 10 Financials

### 10.1 External Funding Options

Within the Strategy it was recognised that UH Bristol would have to fund the core systems but that other national initiatives which were only in early conceptual or discussion stages may provide funding. In the event of funding becoming available, UH Bristol would naturally seek to secure any funds available by those routes.

At the time the procurements were being awarded, the future direction and funding of both the National Programme (NPfIT) and the other Department of Health funding options were undecided. From documents released via the Strategic Health Authority, it was considered possible that such funding might be realized and solutions would be made available for Trusts from around the end of 2011. This funding route did not materialize.

A new potential funding route, the South Acute Programme, has been created again led by the DH Informatics Directorate (formerly CfH) on a regional basis. UH Bristol has recently applied to participate in one of the collaboration Groups working on Electronic Prescribing and Meds Administration.

### 10.2 Internal or External Solution Options

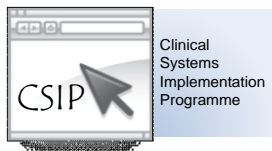
Given the uncertainty over National Programme funding levels the approach of including options for the purchase of additional functional modules within the PAS-EPR contract is sensible and avoids UH Bristol being locked into the national solution or having to run additional procurements for every part of the Trust's IM&T programme.

However, McKesson solutions will not be adopted unless they are proven to be appropriate for the Trust, competitively priced and fit for purpose. Potential solutions that could be selected through this route include Clinical Service Ordering and Results Reporting, Clinical Noting, Electronic Prescribing and Patient Self-Service Kiosks. As a development partner, UH Bristol may also benefit from joint working with McKesson to develop additional Medway modules that could fulfil other requirements.

Where existing procured contracts allow for additional modules to be purchased the Trust will not engage in open procurements where a clear value-for-money benefit can be evidenced. This is, however, only likely to apply to Medway and associated products through the benefits offered by the proposed Strategic Partnership with McKesson.

For most of the candidate solutions within the Strategy (as well as departmental systems requested through the IM&T committee) it is envisaged that open procurements will be used, thereby ensuring that we gain a wide choice of solutions at the initial stage of negotiations.

The IM&T department has a long-standing development capability that has developed and supported a range of clinical and business solutions, many of which are still in use across the Trust. It is envisaged that this capability will be maintained and used to provide on-going support for the extensive integration facilities that have been deployed, continued support for in-house solutions, and also to develop new clinical applications, particularly for mobile technologies, based upon Medway's published web services interfaces.



### 10.3 Capital Costs

The Trust's current Long Term Financial Plan (LTFM) includes provision for CSIP at £4.0m in 2012/13 and £2.0m in 2013/14. Of this £2.0m is required to fund the costs from Phase 1 leaving the balance of £4.0m to deliver Phases 1b and 2. In addition, £2.0m has been provided in respect of diagnostic systems replacement cost.

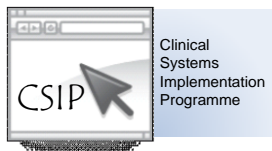
The costs of Phase 3 have not yet been fully identified. Specifically, the cost of ePrescribing (EPMA) and assumed to be at least in part financed by the South Acute Programme.

### 10.4 Revenue Costs

It is anticipated that the non-recurring revenue costs of implementing Phase 1b and Phase 2 will be up to £1.0m in 2012/13, 2013/14 and 2014/15. These sums are already identified in the Trust's LTFM.

The need to keep pace with the growth of data being produced and retained by the Trust (currently doubling every 18 months) will create a net recurring cost pressure of £0.3m per annum.

The savings from harnessing opportunities provided by the new technologies are not included, however. These will be developed as benefits realized through the newly-formed technology transformation workstream through which we anticipate a net revenue benefit throughout the life of the Programme and beyond.



## **Appendix A: Electronic Document Management (EDM)**

### **Summary of the Case for Change**

- the current mixed paper and electronic systems of record-keeping create unacceptably high levels of clinical risk through a lack of cohesion and no 'one place to look' for a patient's history
- the Trust requires an EDRM system that is capable of integrating easily with the Trust's Medway EPR solution;
- the hospital requires a 'paper-light' environment which is not achievable with the current IT and record-keeping systems;
- the current paper-based system does not facilitate the rapid delivery of essential patient information to the point of care, which may be geographically a significant distance away i.e. the South Bristol Community Hospital. It will also support the recentralisation of Oncology and Urology services and any future amalgamation with North Bristol NHS Trust
- staff spend significant time retrieving notes from around the Trust and less time on front line operational work which will affect the availability of notes to clinics and wards;
- business activity and performance is affected by missing case notes
- the main onsite library space (BRI) could be released for direct clinical activity or other purposes and hence assist with alleviating the Trust's need for additional estate;
- physical storage of paper records is expensive, as is filing, retrieving, searching and transporting hard copy records.

### **Summary of High-Level Anticipated Benefits**

#### **Staff Time and Cost Reductions in:**

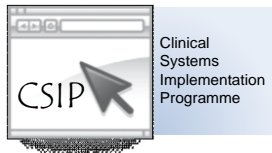
- Clinic preparation of hard copy casenotes
- Filing, retrieval and management of casenotes.
- Transport and portering costs.
- Chasing, managing and reviewing casenotes.
- Transport to and from remote locations such as the South Bristol Community Hospital.
- Stationery costs (folders, binders, dividers).

#### **Space:**

- Recovery of space – no more records added to the stores; no new physical space and investment in storage systems.

#### **Availability:**

- 24/7 available records permitting record sharing with multiple users and across multiple sites.
- Improved customer and reduction in cancelled clinics, operations, etc.



**Clinical and Information Governance:**

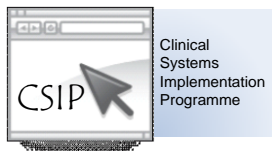
- Improved privacy protection and confidentiality.
- Permits legal admissibility.
- Permits organisation-wide integration and unification of patient-identifiable records
- Eliminates multiple and duplicate copies of documents.
- An end to loose unfiled documentation.
- Minimises the risk of missing records.

**Improved business processes:**

- Improved productivity and efficiency
- Time saved storing and retrieving records and filing of paper documents.
- ‘Workflow’ facility available to manage the progress of common tasks.
- Reduction in costs of complying with Subject Access Requests.

**Innovation:**

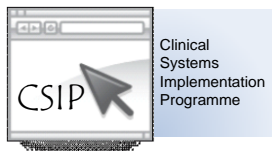
- Platform for e.g. a GP access service; advanced audit tools.
- Support for increased information analysis of data (dependant on level of indexing);
- Improved support for MDT, research and shared clinics.



## **Appendix B: Electronic Prescribing and Medicines Administration (EPMA)**

### **Summary of the Case for Change**

- There is a need to improve the legibility and accuracy of prescriptions and medicines Administration records. Annual prescribing audits frequently identify prescriptions with missing or inaccurate information. Audits of medicines administration records also show incomplete entries, raising doubts whether treatment has been given or not.
- There is an urgent demand to reduce drug prescribing and administration errors which in turn will reduce the large number of costs due to mistakes and litigation.
- Poorly prescribed or inappropriately administered medicines often result in an extended length of stay, serious harm or patient death. The number of Adverse Drug Reactions reported in the Trust during the six month period between 2011 / 2012 was 568. Adverse reactions result in increased length of stay, the prescribing of additional medicines, admission to Intensive Care.
- A considerable amount of staff time is spent retrieving, reviewing or rewriting written prescriptions and medication charts to raise their quality to an acceptable standard, which can give rise to confusion and delays to patient treatment
- The current mixed paper and electronic systems of record-keeping create unacceptably high levels of clinical risk through a lack of cohesion and no “one place to look” for a patient’s medication history.
- The hospital requires a ‘paper-light’ environment in which paper is produced, managed, transported and stored only at an absolute minimum level.
- Each paper chart can only be in one place at a time and even on the ward, the chart may often not be where it is needed, necessitating a search and wasting staff time.
- Most prescribing is performed by the most junior staff, who are less aware of the potential for prescribing errors and their impacts. This, combined with the poor quality of the written prescriptions, poses a very high risk of patient harm and consequent litigation due to prescribing and medicines administration errors.
- There is a requirement to provide access to relevant patient information at the point of prescription and drug administration, including patient allergies, assessments, risk scores, medication and consultation history, and hence a need to integrate the EPMA solution with the Medway EPR.
- There is a requirement to promote or enforce the substitution for generic brand drugs from branded expensive drugs.
- There is a need for reliable and easily accessible audit trails and the ability to access who played a role in each patient’s care (i.e. who prescribed medicines and who administered them and when).



## **Summary of High Level Anticipated Benefits**

### **Operational Benefits**

- Prescriptions always available at point of need and at multiple sites
- Facilitates compliance with policies (E.g. antibiotics) and formulary
- Accurate and timely record of all medicines administered;
- Information on medicines availability at the point of prescribing
- Ability to target Clinical Pharmacist activity to patients with greatest need.

### **Patient Care and Safety Benefits**

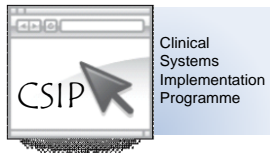
- No legibility or transcription issues;
- Identifies medicines interactions at the point of prescribing;
- Allergy warnings always available and linked to medicines selection;
- Reduce selection, dose, frequency and duration errors;
- Reduce risk of administration errors;
- Reduced delays in treatment
- Enforce national policies e.g. NPSA Safer Practice Alerts;
- Ability to quickly identify high risk patients;
- Ability to restrict the prescribing of high risk medicines;
- Accurate medication histories able to be transmitted to GPs including changes to therapy.

### **Financial Benefits**

- Ability to accurately cost medicines treatment to the level of what patients have actually received
- Ability to accurately track PbR excluded medicines;
- Reduced cost of dealing with medicines-related adverse events;
- Staff time saving as no more searching for missing medication charts;
- Management and control of medicines expenditure through enforcing Trust formulary policy
- Reduction of medicines waste from poor prescribing;
- Improved Working Practices and Quality
- flexibility to allow better working practices;
- optimised production of clinical correspondence;
- no rewriting of prescriptions needed due to poor handwriting and misspelling.

### **Improved Support for Patient Care**

- clinicians 'single system' view of patient information;
- alerts rules for abnormal results/risk re allergies, dose, frequency etc;
- real-time clinical decision support, protocols etc;
- improved safety & security (positive patient I.D.);



- facilitates timely discharge;
- Better Patient experience

#### **Improved Management of Litigation Risks**

- reduction in litigation risks;
- ability to carry out for accurate audits in a timely fashion.

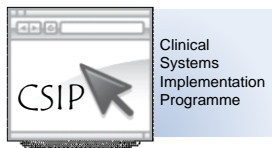
#### **Improved Administration (& Reducing Paper)**

- reduces administrative time;
- reduced reliance on paper and filing;
- improved data quality to support coding, costing and improved management reporting.

#### **For the Trust**

- better data quality and real time information to support audits and reporting;
- more satisfied patients;
- EPMA systems are also able to produce discharge letters, reducing the number of systems clinical staff need to be familiar with;
- IT infrastructure being installed as part of this project, i.e. mobile devices, can be used for other clinical data capture e.g. patient observations at the bedside.

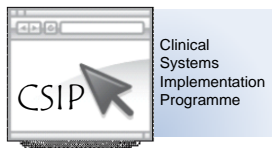




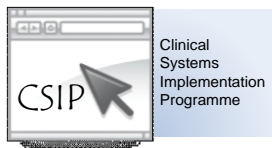
## Appendix C: Catalogue of UHB Non-core Systems

The following systems are being actively used across the Trust. IM&T is aware of these systems and in many cases supports their use and provides a hosting service for the central hardware components. We expect to expand this list as new systems are uncovered during our Trust-wide systems audit.

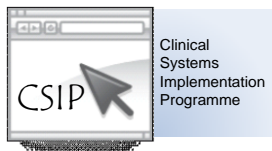
Department	System	Hosting	Interfaced?
Audiology	Auditbase – Paediatric Audiology	Internal	Yes
Audiology	Practice Navigator – Adult Audiology	Internal	Yes
Audiology	EARS – Paediatric Audiology		
Audiology	eSP – Paediatric Audiology		
Audiology	Cochlear Implant – Paediatric Audiology		
Audit	Clinical Audit server	Internal	
Bank	Rosta Pro system	Internal	
Cancer Services	Bristol Cancer Register	Internal	Yes
Cardiac	MUSE (ECG storage)	Internal	Yes
Cardiac	Innovian CIS (chart assist no longer applies)	Internal	Yes
Cardiac	Cardiac Audit PATS (Dendrite)	Internal	Yes
Cardiac	HeartSuite	Internal	Yes
Cardiac	CARDASS	Internal	
Cardiac	Clinical Trials		
Cardiology	EAServer (PACS)	Internal	Yes
Cardiology	Image Vault	Internal	Yes
Child Health	CarePLUS Child health	External	Yes
Clinical Coding	Medicode	Internal	Yes
Clinical Liaison	CISS AHP System	Internal	Yes
Clinical Trials	CRISP, PROMIS, TANDEM, TITRe2, VERDICT		
Colposcopy	Colposcopy	Internal	
Critical Care	RapidComm	Internal	
Critical Care & CICU	ITU Monitoring- Innovian (ChartAssist)	Internal	Yes
CSSD	CSSD	Internal	
Dental	Labtrac (Dental Laboratories)	Internal	Yes
Dental	Dental EPR (Salud)	Internal	Yes
Dental	Community Dental (PDS)	Internal	Yes
Dental	Mediadent (Dental PACS)	Internal	
Dermatology	ADIS	Internal	Yes
Dev Team	Integration Engine	Internal	Yes
Dev Team	Non Clinical Web Applications	Internal	Yes
Dev Team	Clinical Web Apps	Internal	Yes
Dev Team	CONNECT/WORKSPACES	Internal	
Digital Dictation	G2 Speech Recognition Pilot	Internal	
Digital Dictation	Soliton Radiology Speech Recognition Pilot	Internal	
Endocrinology	Endocrine		Yes



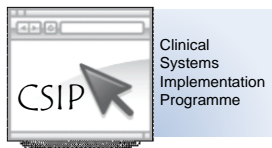
Department	System	Hosting	Interfaced?
Endoscopy	Scorpio	Internal	Yes
EROS	Supplies requesting	External	
Estates	Estates Cluster	Internal	
Estates	HelpDesk	Internal	
Estates FM Services	Blick Time management		
Department	System	Hosting	Interfaced?
Finance	All Finance Systems	Internal	
Foetal Medicine	ViewPoint (Foetal Med)	Internal	
Genetics	Shire (Clinical Genetics)	Internal	
HR	ESR	External	
HR	Employee Services	Internal	
Infection Control	ICNet	Internal	Yes
Information	PHD	Internal	Yes
Information	CACI (PAD)	Internal	Yes
Information	CACI (InView)	Internal	Yes
Information	Op		Yes
IT Services	Aventail Remote access server	Internal	
IT Services	Exchange (Email & Fax Server)	Internal	
IT Services	Helpdesk	Internal	
IT Services	Mildred (Personal & Group Shares)	Internal	
IT Services	Phone Mail	Internal	
IT Services	Office Communicator	Internal	
IT Services	NightWatchman		
IUVO	IUVO		Yes
Mattress Loans	eTrace	Internal	
Medical Director Team	NET Consent	Internal	
Medical Illustration	WABA (Medical Illustration Database)	Internal	
Medical Records	Aurora	Internal	Yes
Medical Records	PROSE/DOC1/WinDip	Internal	
Medway	Medway (A&E, PAS, Theatres, Maternity)	Internal	Yes
Medway	Choose & Book	Internal	Yes
MEMO	SEMS, Asset register and call logging system	Internal	
MEMO	SEMS (Equipment Management System)	Internal	
Neonatal	Neonatal DB	Internal	Yes
Neonatology	Badger 3 (CleverMed)	Internal	Yes
Neurophysiology	EEG recording and review	External	
Occupational Health	OPAS	Internal	
Oncology	Adult Chemo Care	Internal	Yes
Oncology	BRCH Chemo Care	Internal	Yes
Oncology	Mosaic	Internal	Yes
Oncology	VARiS	Internal	Yes
Oncology	WinDIP (Scanned Patient Notes)	Internal	
Oncology	VARiS Acuity	Internal	



Department	System	Hosting	Interfaced?
Oncology	BHOC-1 (Personal & Group Shares)	Internal	
Oncology	Visir (OncologyManagement System)	Internal	
Oncology	OMP Treatment Planning	Internal	
Oncology	X-knife	Internal	
Oncology	IRREG	Internal	
Oncology	BrachyVision	Internal	
Oncology	IMSure MU calculator	Internal	
Oncology	CASS Planning workflow manager	Internal	
Oncology	AcQsim CT simulator	Internal	
Oncology	Haemophilia Clinical system		Yes
Ophthalmology	BEH Medisoft	Internal	Yes
Department	System	Hosting	Interfaced?
Ophthalmology	BEH Databases	Internal	Yes
Ophthalmology	BEH EPR	Internal	
Ophthalmology	Diabetic retinopathy	Internal	
Ophthalmology	TopConn Imaging solution	Internal	
Order Comms	ICE Order Communications	Internal	Yes
Out Reach	MedICUs	Internal	Yes
Pain Management	MedICUs	Internal	Yes
Pathology	Ultra Lab Management System,	External	Yes
Pathology	Pathology Group Shares		
Pathology	Ward based blood glucose monitoring		
Pharmacy	JAC Stock control	Internal	Yes
Pharmacy	South West Drug Info – MI DataBank	Internal	
Pharmacy	Pharmacy Webtracker	Internal	
Pharmacy	RAID anticoagulation dosing system	Internal	
Pharmacy	Radiopharmacy Unit	Internal	
Pharmacy	ADIOS	Internal	
Pharmacy	PSU (Cytobase)		
Pharmacy	Blood Products (Vigam)		
Pharmacy	Pharmacy Group Shares		
PICU	PICU Badger	Internal	Yes
PICU	MedICUs	Internal	Yes
PODS	PODS		
Radiology	GE PACS Imaging system	External	Yes
Radiology	HSS CRIS	External	Yes
Radiology	BBRad	External	
Radiology	Avon Brest screening (NBSS) ABS/Insignia	Internal	Yes
Radiology	Radwise	Internal	
Radiology	IUVO	Internal	
Radiology	Pukkaj	Internal	
Radiology	Medstamp	Internal	
Radiology	Orthoview	Internal	
Radiology	Terrecon or AquarisNet	Internal	



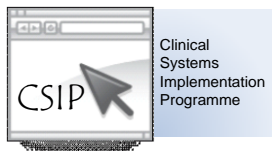
Department	System	Hosting	Interfaced?
Radiology	Magicweb		
Radiology	Cedera		
Radiology	FTP Service		
Renal	Renal Clinical system	External	
Risk Management	Ulysses	Internal	Yes
Sexual Health	Mill (Telecare)	Internal	
Sleep Service	Sleep unit	Internal	
Thoracics	Thoracics	Internal	
Trackpoint EPR	Trackpoint EPR		Yes
Training	Learning Management system	Internal	
Urology	Mandata	Internal	Yes
Vascular	Vascular Clinical system	Internal	
Vascular Studies	VSU 2000	Internal	



## Appendix D: Glossary of Terms and Abbreviations

Several technical terms and abbreviations have been used in this document.

Term	Abbreviation (where relevant)	Meaning
Clinical Systems Implementation Programme	CSIP	The Trust's clinical IT systems programme endorsed by the Trust Board in June 2010. Implementation began in 2011/12 with Imprivata Single Sign-On, the JAC Pharmacy system and the Medway PAS (including ED and Theatres) and Maternity Systems.
Digital Dictation	DD	A system which records voice files and stores them digitally for subsequent retrieval and manual conversion to text for incorporation into the EPR
Electronic Document Management	EDM	Provision of documentation in electronic form, typically sourced from scanning paper originals. The Trust plans to scan patients' clinical casenotes to move away from paper and contribute to the EPR
Electronic Patient Record	EPR	A system, or more typically a suite of integrated systems, which holds the majority of clinical information about individual patients, viewable in one place by those who need to see it. EPRs are usually built incrementally, and the UHBristol CSIP strategy supports this approach.
Electronic Prescribing and Medicines Administration, also known as ePrescribing	EPMA	A computer system which provides intelligent support for prescribing and administration of medicines to individual patients to improve safety, effectiveness and efficiency. The system is linked amongst others to the EPR, an up-to-date drugs database and the Pharmacy stock control system.
Information Management and Technology	IM&T	The Trust department responsible for IT provision and support, including hardware (servers, network, PCs etc), IT systems and interfaces, information and reporting, IT training, clinical coding and medical records management
JAC Computer Services Ltd	JAC	The company that supplies and maintains the Trust's Pharmacy Stock Control system
McKesson		A large US healthcare company with a significant presence in the UK, which acquired System C Healthcare in May 2011.
Medway		The computer system supplied to the Trust by System C/McKesson which records patient information for hospital-based episodes of care, including emergency care, inpatients, theatres and outpatients



Term	Abbreviation (where relevant)	Meaning
Medway Clinician Desktop Also known in Medway as the 'Patient Home Page'.		The function within the Medway system that integrates multiple systems into Medway to enable clinicians to access clinical information about individual patients all in one place. It includes single sign-on and single patient search across all the integrated systems and enhances efficiency and clinical safety.
Medway Maternity		A specialist module designed for recording information about mothers and babies around pregnancy and birth
Picture Archive and Communication System	PACS	A system that manages the storage and routing of digital images such as radiology and cardiology diagnostic examinations.
Patient Administration System	PAS	A computer system which records patient information for hospital-based episodes of care, including emergency care, inpatients, theatres and outpatients
Pharmacy Stock Control	PSC	A system for maintaining stocks and issuing medicines, with links to the EPR, the pharmacy robot, a drugs manufacturing system and the Trust's finance systems
System C Healthcare	SCH	The company that originally produced and owned the Medway and Medway Maternity systems, and which is now owned by McKesson
Virtual Desktop Integration	VDI	The use of inexpensive devices that can be used to provide access to Trust applications together with a 'follow-me' desktop, whereby a user who logs out of a workstation can log in again elsewhere and see their desktop the same as it was in the previous location.
Voice Recognition	VR	A system which records dictated information and automatically converts it to searchable text for incorporation into the EPR