Centre of Global Digital Excellence Programme Expression of Interest

Please complete this template and return it to ENGLAND.ccio@nhs.net by Wednesday 24th August 2016.

Organisation details	
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Centre of Global Digital Excellence Programme Expression of Interest

1. In becoming a Centre of Global Digital Excellence, what would success look like for… (500 words max.)	
• …your clinical workforce? • …your patients? • …your local health and care system?	UHBristol's STP presents an ambitious programme of 'things we will do differently' to address the case for change, a set of enabling priorities based on an underlying capability—'the shift to digital'—as the means to harness good practice and drive opportunities for transformation. Embedding these 'digital practices' and associated behaviours within the clinical setting is fundamental to everything we will achieve within this initiative, with its success being measured by the positive impact on every aspect of our business: clinical effectiveness and excellence, patient experience, technical efficiency, operational and financial sustainability, and the confidence and professionalism of the workforce. Simply introducing technology doesn't result in improved clinical efficiency or patient outcomes. This comes from applying well-designed, digitally-enabled techniques to evidence-based clinical processes that can be shown to reduce variation of practice and time taken to respond to changes in circumstance, improve timeliness of communication and response, increase consistency of good practice and deliver benefits that come from doing things right—routinely and at scale. The NIB's 'Clinical Vision 2020' describes a place where unreliable, paper/digital-hybrid processes have been eradicated and clinical staff access the information they need, right-here, right-now and, critically, they know how to use it. This is what we will achieve. Specifically, clinicians will be provided with cohesive, mostly-mobile digital functions that bring together every facet of a patient's current and previous care, allow them to define and record the care they deliver and, as a by-product, create a rich information base that will, for the first time, enable clinical teams to start working with data for secondary purposes to directly improve practice and outcomes. The benefit to the Trust is clear—reduced delays, increased throughput, better outcomes—and this will have collateral benefits for: our local and regional partner organizations, who will see dramatic improvement in the way that we interact, communicate and respond within the community with co-ordinated planning across providers and support for new models of care, and; our patients, who will have confidence that our clinical teams have the information needed to look after them. Success looks like patients with on-line access and participation in their care who don't have wasted journeys to hospital, a reduction in clinical incidents and complaints caused by unwanted variation of practice, staff who no longer wait by the phone for a bleep-response about a deteriorating patient, junior doctors getting timely response and intervention from service departments, transfers of care occurring at the right time of day, and an IT department that recognizes it now has a front-

	line responsibility for delivering patient care. There's a lot to be done to achieve this—new digital techniques and ideas to be designed, agreed, tested and delivered, e.g. evidence-based integrated care pathways and automated order-sets, nudging and alerting through physiological targets, and all of this underpinned by a robust technical infrastructure supporting devices suited to the functions offered, used by a workforce that really understands the point of all this technology and has the know-how and motivation to use it. 499
Good responses will: • Set out how health and care professionals would work differently and what the benefits would be • Describe how you will demonstrate digitally enabled transformation improving efficiency and patient outcomes • Identify any pioneering work that may be involved • Describe the contribution to key priorities and initiatives within the local health and care system, such as New Care Models/Vanguards or key STP priorities	

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2. What do you envisage the key deliverables to be as you move towards becoming a Global Centre for Digital Excellence… (500 words max.)

Four of our main LDR themes play directly into DDM, with 'Paperless 2020', 'Infrastructure and Support', 'Connecting Care' and 'Information Engine' already well advanced with agreed strategies and delivery programmes.

Some deliverables require only procurement and commissioning of technical components, but the two-year challenge set by DDM demands investment in high-quality, experienced deployment resource to augment our existing teams.

Implementation of complex solutions takes know-how and experience. UHBristol has proved its capabilities in this area, but we will require a boost in capacity, much of which will be furnished by our supplier partners, particularly SystemC, whose highly-functional Medway EPR will underpin our CGDE activity.

We will expand the use of other strategic solutions alongside Medway, including Philips' ICCA, Kainos Evolve and, the jewel in the Bristol's digital crown, Connecting Care.

We will deliver all of the functionality in Appendix One including:

- High-quality, software modules designed to perform specific functions throughout our hospital and community-wide operations, including:
  - Accelerated production and roll-out of Medway clinical-noting and department service orders to achieve paper-free operation across our hospitals
  - Completion of our Medway EPMA roll-out
  - Enabling a fully-mobile, integrated EPR across all of our care settings through the use of Rapport
  - Introduction of clinical alerting, decision support, evidence-based workflows and collaboration across the Trust and local health and social care community based on Careflow
  - Integration between Liquidlogic social care solutions used across BNSSG with Medway to improve discharge and associated care processes
  - Development of new care models into priority specialities through Connecting Care, re-designing care by involving patients, integrating wearables and targeted apps, and providing condition-specific dashboards with remote management and clinical escalation where needed
  - Roll-out of SystemC's Patient Portal for direct access to Connecting Care and interaction with Medway functions for reciprocal communication, appointment changes, etc.
  - Deployment of integrated e-observations with device integration for improved visibility and early alerting of deteriorating patients, including risk identification such as sepsis, AKI and infection
  - Use of Connecting Care data in anonymised, pseudonomised or open form for risk stratification and other purposes (subject to IG/consent considerations)

- End-user access devices capable of deployment across our care settings, including mobile use of all solutions

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- High-performance local and cloud-based technical infrastructure and network components

- Expansion and professional development of our informatics and transformation teams to ensure the capability and capacity to meet the challenge

- Enlightenment and motivation of our user-base to embrace the digital opportunity including training and education to make 'every user an expert user'. This is the most important deliverable—nothing else will be achieved without it

- Embedding the new practices and functions into routine operation to become 'the way we do things at UHBristol' and across our community.

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Good responses will:

- Describe how you will deliver the aims outlined in Appendix one

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3. In becoming a Centre of Global Digital Excellence how will you contribute to developing digital maturity in… (1000 words max.)	
• …your partners in the local health and care system? • …other providers with the same principal EPR vendor? • …other organisations across the country?	UHBristol's Clinical Systems Programme (CSIP) has been characterized by steady local investment and the successful delivery of infrastructural and functional building blocks needed to build our digital capability over the past five years. Our Exec Board recognizes that the original CSIP strategy is aligned with what is now national strategy, delivering a good level of digital maturity with limited external investment. UHBristol has actively shared its experience with NHS colleagues, hosting reference-site visits as a formal first-of-kind for SystemC and Philips, and informal visits for Trusts to share best practice in deployment and productive use of solutions with colleagues facing similar challenges. We have been consulted by several Trusts embarking on historical casenote scanning who are aware that we have taken the relatively unusual step of recruiting our own medical records library teams into an in-house scanning bureau operating at scale rather than simply outsourcing to a third-party; and hosting a lively best-practice seminar on Connecting Care on behalf of the CCIO/CIO network. UHBristol has shown that it sets a good example in the delivery of technology-based solutions and this will continue and expand as we move forward with DDM. We will: • Formalize arrangements with health economists at CLAHRC and WE-AHSN to demonstrate cost-effectiveness of interventions and the impact of new care models; • Continue to participate in special interest groups and industry expert panels where our leading role in, e.g. the use of critical care systems for innovative design of interventions and behavioural nudging has been recognized; • Establish a virtual academy with our primary industry partner and EPR supplier, System C, designed to take the transformational and technical lessons learned from the accelerated deployment of new Medway modules and integration techniques and act as a 'digital mentor' to the 20-plus Medway customers across England, and other organizations that wish to take advantage of our experience; • Capitalize on the inclusion of other Medway sites within the CGDE programme to compare and contrast different technical approaches to solving similar operational problems with the same underlying EPR platform—critical for spawning lessons learned across the user base, because one size doesn't always fit all; • Invest further in the City's Connecting Care partnership and product-set to realize the LDR, lifting the technical capability of our partner organizations with us, driving work on cohesive models of

	care, and contributing to the delivery of the City-wide vision described in our STP. Our plans for CGDE will be articulated as a storyboard showing how we will achieve the aims of this initiative, illustrating the diverse roles to be played by each of our stakeholder groups and their contribution to the whole, including the specific responsibility to act as an exemplar or digital mentor within their peer networks. The main stakeholder networks that will set the example from UHBristol's CGDE are: • Within our clinical community: reaching out across our hospitals, divisions and departments; into our sister organizations across the City; regionally through operational networks; and nationally into like-minded organizations, AHSNs, the Royal Colleges and various professional and research networks. Led by the CCIO and CNIO team in finishing the shift to digital, the clinician community is the primary focus of our work and to whom we currently have the most to prove, but they will also be the greatest positive influence on colleagues elsewhere • The management and operational delivery teams who rely on a mass of accurate, real-time, meaningful information to keep our business running smoothly and safely, and who understand that this information only results from consistent use of well-designed processes across the organization, and that improvement and efficiency comes from bold transformation. Their CGDE experience will be demonstrated across local and professional networks • The Informatics professionals and transformation teams that have gained experience of designing and adapting processes to meet complex operational and clinical demands will now have the opportunity to work with colleagues and suppliers to deliver digital transformation at pace and scale, developing digital know-how within our own organization and perhaps take a career step into the next wave of organizations on this path. We should recognize, however, that for many of these individuals delivering at the pace set by DDM may require a step change in their thinking and performance, so we must be ready to help with their professional development • The user communities associated with our strategic supplier partners, particularly SystemC and Philips, will benefit directly from the experience gained by the deployment teams and materially from the surge in development of more advanced software capability. The whole-hearted buy-in of suppliers to this process will render the biggest financial benefit to the NHS as a whole. UHBristol will not expect to hold any IPR resulting from DDM, and SystemC has agreed to pass on the benefit of assets

	such as clinical forms, processes and benefits plans to its subscribed user base • The 'digital community', represented by our colleagues in local health and care organizations and their service users, all of whom stand to benefit from any improvement of communication, operational efficiency or clinical safety within UHBristol and direct investment in Connecting Care that must be part of DDM. The diversity of these stakeholder groups indicates the complexity of the task ahead. Our role as digital leaders is to harness the capabilities of each group to achieve that common objective and articulate the lessons learned in a way that makes sense to other organizations. Investment is required to release time from people across all of these groups to make DDM happen in UHBristol and to support other organizations in their own DDM journey—relying on goodwill and 'time out of the day-job' is not an option. Setting the example starts at the outset of this work—we can't wait until we've finished before we open our doors to others, so a framework for collaborating and disseminating will have to be established at the start. The national CCIO/CIO networks are ready-made examples for this, and we will promote similar networks to support sharing of specialist experience about procurement, contracting, IG and leveraging infrastructure components. 1000
Good responses will: • Describe how knowledge, lessons and experience would be shared • Set out how the time and commitment of key stakeholders would be secured to support other organisations • Describe how value could be realised by others with regard to their future procurement activity • Describe any IP that could be made available to others • Describe how any infrastructure could be leveraged	

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4. How will you further develop and enhance your organisational readiness for digitally-enabled transformation through… (500 words max.)	
• …board-level leadership • …clinical leadership and engagement • …strategic alignment • …governance • …programme resourcing • … change management and benefits tracking	Bristol is ready for this investment. UHBristol's DMSA showed high Board-level leadership commitment, governance and readiness to move forward with our 'shift to digital', but we scored less well on the roll-out of some functional capabilities because, as indicated by our LDR DM trajectory, operational capital for those functions is scheduled for a later point in the Programme. DDM introduces a level of complexity to this picture. We cannot simply inflict our good digital fortunes onto our local partners—their commitment to Connecting Care doesn't give us licence do whatever we want—so we will engage the STP-level governance model as the means of taking our partners with us, focusing on richer content and functionality around Connecting Care, particularly as the basis of our PHR. Readiness is not just concerned with the measurement of technical factors. Experience shows that projects concentrating on the delivery of a technical capability can tick all of the boxes but, unless the appetite of the prospective user base is properly whetted, they will seldom achieve the emotional readiness or motivation necessary to undertake the transformations we need. UHBristol has achieved excellent digital uptake by users in many areas, but we have yet to turn this into a social movement—a routine acceptance that 'doing it digitally' is quite normal and definitely preferred. Key to this is the Clinical leadership and engagement work of our CCIO/CNIO team, appointed by the Medical Director and Chief Nurse to promote and steer our digital strategy to meet the needs of clinical colleagues, identifying and articulating transformation opportunities in terms that make sense, and demystifying the purpose and intent behind the strategy. This team has embraced the opportunity offered by CGDE and has already framed the strategic alignment, with themes drawn from our LDR and STP that will be woven into our digital storyboard—they can't wait to get started. We know at a Senior Exec level that the nature of the CGDE challenge will stimulate the behavioural changes that are needed to drive real-time compliance and data quality. We know that, to do more work in less time, investment in more and better professional informatics and transformation resource will be required within UHBristol and into the Connecting Care Partnership for the duration of the initiative and the follow-up period. This will be pump-primed by the supplier community in the early stages, with resource being shifted as products and practices become embedded. Our stakeholders will have clear expectations of the changes and benefits that must be derived within their domains, whether it's clinical quality and

	safety, patient satisfaction or optimum throughput, we will baseline our current position and measure the results throughout the programme alongside active benefits identification, tracking and realisation. We recognize, however, that real benefits are seldom released early in the transformation lifecycle, so our business case for participation as a CGDE will be framed around lifetime costs and benefits rather than the two-year delivery period. 488
Good responses will: • Reference the readiness content from your current Digital Maturity Self-Assessment and identify how gaps would be addressed	

NHS England

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5. What relationships do you have in place to help you become a Centre of Global Digital Excellence… (500 words max.)	
• …with your principal EPR vendor? • …with other suppliers? • …with any academic institutions, Academic Health Science Networks? • …with any other delivery partners? • …with any international organisations?	The excellent relationship across all levels of our principal EPR vendor, SystemC, is based on mutual trust, performance and a formal contract. We have worked together for six years and achieved several successful deployments, acting as a primary reference site and development partner, active within the Medway user group and in the planning of the Medway roadmap The relationship includes a formal output based licence, supply and support contract. This has the capacity to cover the additions required for GCDE and the scope will be amended accordingly. We are pleased that we have similar good relationships with other suppliers including Philips, who provide the intensive care and anaesthetic monitoring system used across all four of our ICUs; Orion Health, the supplier of product underpinning Connecting Care who have several internationally-renowned shared-care sites. All of our suppliers are engaged through robust contracts with a secure future roadmap, and all have committed to meeting interoperability standards and the ITUK Charter. The organizations local to us that will benefit from our CGDE participation include the local health and care economy, BNSSG, and farther afield into the Southwest and South Wales. We treat the same patients, share the same boundaries and communication challenges, and we compete in the same funding and resource pool. Local relationships of particular importance in DDM include the BNSSG System Leadership Group, the 100-practice GP community, three local authorities, community and MH Trusts. As explained in our LDR and STP, our focus for digital in BNSSG is Connecting Care with its extraordinary maturity of shared vision and purpose. This group is bound through formal partnership and information sharing agreements, with an agreed development roadmap and We have formal and informal ties with a strong network of delivery and academic partners, with productive collaborations with University of Bristol, CLAHRCWest and WEAHSN, developing interventions and products, evaluating the impact on patients and processes, and bringing them to market. Further academic and social collaboration is achieved through organizations such as Bristol Health Partners and Better Care Bristol. International collaboration is being proposed by SystemC, whose sister company, Maincare, is EPR market leader in France and they will be introducing us to French hospital groups to promote ideas exchange. Symphony Technology Group, one of their major shareholders, has a significant presence in the US population health market and we intend to harvest their experience with Kaiser Permanente and others.

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Good responses will: • Cover the tangible (e.g. contracts, agreements, joint plans) • Cover 'the intangible' (e.g. relationships, joint successes)	

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6. What support do you have to join this Programme… (500 words max.)	
• …from your Board? • …from your clinical informatics leader(s)? • …from your STP footprint? • …from your principal EPR vendor?	Support for UHBristol's participation as a first wave CGDE has gathered pace following the invitation and release of further details of the initiative. Whilst there has not been an Exec Board meeting since the invitation, the CEO, DoF and Medical Director have participated in calls with England.ccio and, recognizing that the timing and nature of DDM is particularly good for us, directed that UHBristol will submit a compelling application and secure the status of Centre of Global Digital Excellence. We look forward to advising the Trust Board of a positive outcome in September. The CCIO/CNIO team has been particularly enthusiastic in its response to DDM. The scale of the opportunity is clear to the team and other influential digital champions across the organization; all see that this investment will allow us to deliver boldly and rapidly what we would otherwise have to do incrementally. Our CCIO team has recognized that CGDE is a game-changer and that some of our existing transformation projects may be accelerated, superseded or even bypassed because of the opportunity offered to us. Planning around this shift is already underway, of course, with reassessment of our forward capital priorities and review of the resourcing of the CCIO and associated Clinical Systems Programme (CSIP) teams, which are central to our on-going stakeholder management for all digital matters, and includes our governance route to the Exec Board. The common purpose, vision and commitment of our partners to Connecting Care is the clear digital focus of BNSSG's STP. UHBristol anticipates that a good proportion of CGDE investment will be directed into this space and, unsurprisingly, discussion within the CC Management Board, which includes representatives from the principal health and local authority partners, has indicated that this would be welcome, allowing the city to move forward more quickly with high priority enablers including the PHR and patient-centred models of care. This arrangement will need to be formalized with the CC Programme Board in due course. The deliverables for CGDE investment will come from several sources but the initiative will stand or fall on the quality of new software functions associated with our EPR and the competence of our principal supplier, SystemC. We are particularly fortunate that SystemC is not only a competent and visionary organization, but it has recognized the opportunity offered by DDM and engaged with us in detail to understand how we can both derive the maximum benefit for our respective organizations, BNSSG, and the wider SystemC user-base. This has resulted in a firm commitment from SystemC and UHBristol to extend our existing strong relationship to deliver on this initiative. Medway and SystemC have served us well over the last four years; this

	fresh commitment will give us the means to transform our digital maturity beyond recognition which is, after all, the object of this exercise. 467
Good responses will: • Describe existing or planned formalised support • Describe existing or planned wider stakeholder support • Demonstrate that your supporters understand the objectives and expectations of the programme	

University Hospitals Bristol NHS
NHS Foundation Trust

Business Case and Rationale for becoming a Centre of Global Digital Excellence (GDE)

Version 2.0

Status: Issued

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1 Introduction and background

This document presents the case for UHBristol's appointment as a Centre of Global Digital Excellence. The Trust was invited in early August 2016 to submit an Expression of Interest (see Appendix D) to participate in the scheme. This bid was successful and lead to the announcement by the Secretary of State for Health on 7 September that UHBristol had been selected as one of a group of 12 Global Digital Exemplar (GDE) sites.

Further selection activity has followed and we are currently engaged in a due diligence process that, if successful, will result in our appointment as a GDE with funding and support up to £10m for a three-and-a-half year programme that will give UHBristol, and Bristol, North Somerset and South Gloucestershire (BNSSG), a significant boost in its digital capability and usage to rival the best in the world.

This opportunity has emerged from a growing conviction within NHS England and NHS Digital that NHS providers and other organizations must be supported in practical and tangible ways to achieve better uptake and productive use of digital information and technology. Much of this has been focused on the importance of clinical engagement and participation in the delivery of these new technologies, the recruitment of Chief Clinical Information Officers (CCIOs) as a social movement for change across the health informatics sector, and the publication by the National Information Board of guidance to help us define our Clinical System roadmaps.

Most recently, direct guidance has been sought from outside the UK, notably the engagement of Robert M Wachter MD, Professor and Interim Chair of the Department of Medicine at the University of California, San Francisco, the Wachter Review ('Making IT work: harnessing the power of health IT to improve care in England' September 2016) has become the blueprint by which the NHS will transform its digital landscape, commencing with the work of the GDEs.

Among other key business factors that will determine UHBristol's appointment as a GDE we must demonstrate: the level of Return on Investment that will be achieved, affordability of the match-funding required, achievability of the delivery milestones required to meet the programme objectives, and an understanding of the critical success factors involved in deploying and embedding complex digital systems into a busy front-line NHS environment.

1.1 A note on safety, security and 'doing things properly'

Matters of information governance, general and cyber-security, clinical safety, consent and other factors rightly and inevitably come to the fore whenever topics discussed in this document are raised.

It would be distracting for each functional or operational reference in this document to be qualified by associated governance constraints, so this document has a working assumption that we have and will continue to address these matters 'by the book' and that, as part of the explicit GDE responsibilities, we will strengthen and extend our capabilities in this area.

For example, when we refer below to information sharing between oganizations, access to patient information by individuals, or the use of cohort data for business intelligence or research purposes, we undertake that all necessary governance will be addressed within the Trust and with our partner organizations.

2 Executive Summary

For UHBristol, the GDE programme offers a rare opportunity to participate in a high-profile, national scheme that will make a huge and positive difference within the Trust and across BNSSG.

The invitation to bid for the GDE programme does not suggest that we are already 'excellent' at health informatics and IT. We believe, however, that it does recognize that UHBristol and BNSSG as a whole has established a reputation for successful conception and deployment of digital solutions, and that we are committed to continue on a path towards excellence.

GDE has come to us through the 'attitude' that has given us Connecting Care, an on-going digital strategy that fits well within the new national agenda, a level of digital maturity that reflects steady, sustained investment and, not least, the backing of our EPR supplier, System C.
We will need to prove that, given the right level of funding, it's possible to make digital happen in the NHS as well as anywhere in the world.

2.1 Deliverables

We must not underestimate the level of effort and commitment that will be needed to deliver the GDE programme. Although it will encompass the completion of some existing digital projects, the majority of the deliverables will be new products and functions that we would not be able to afford without this additional funding. Drawn from System C's core product set, the main functional deliverables will be:

1) **Phased introduction of a 'Clinical Workstation'** on smartphones, tablets and desktops/laptops to support Trust-wide clinical noting, alerting and task management, e-observations, assessments and ordering.
2) **Full deployment and roll-out of order communications and e-prescribing and medicines administration** across the Trust
3) **Deployment of alerting, workflow, referral, task management and care pathways** across the local care community
4) **Deployment of a Person-Held Record (PHR)** so that patients can access records from the local care community and contribute to their own records
5) **Identification and deployment of revised care pathway support** initially managing between 3 and 5 clinical conditions (e.g. congestive heart failure, frail and elderly, epilepsy)
6) **Deployment of business intelligence and dashboard** functionality to provide a population health and service activity picture across BNSSG.

All of this will be supported by a concentrated and well-staffed transformation and engagement programme that will be responsible for promoting best-practice use of the technology and an understanding of how to manage and use information properly through adaptive change. The switch from any-time paper-based recording to real-time digital capture will we welcomed by many users, but we need to be ready to assist those who cannot readily adopt the new techniques using a variety of coaching and mentoring methods.

At least half of the 'value' of our effort will be pushed across the health economy through the medium of the Connecting Care Partnership, which is composed of the health and care organizations in BNSSG. This is fundamental to the success of the programme outside of the Trust and we will do all we can to promote stronger commitment amongst the partners.

2.2 The Funding

Funding of up to £10m is available, payable by instalments linked to milestone achievements. It is not yet clear what the proportion of capital to revenue funding is available, but UHBristol is keen to engage suppliers on a service basis rather than procure capital assets. The award of capital carries a significant overhead that devalues the funding for both the Trust and the supplier.

All external funding must be matched by the Trust. The financial model submitted (Appendix B) shows that the Trust expects to match and exceed GDE funding through local capital and revenue input to the Clinical Systems Programme together with operational capital schemes for applicable digital programmes.

During the three-and-a-half years of the programme UHBristol will have to demonstrate that it has met over 30 key requirements (see Section 4) and maintain a detailed benefits realization workstream that tracks and validates the RoI – otherwise part of the funding may be at risk.

The expenditure for CSIP and GDE across the term of the programme is expected to be:

	16/17	17/18	18/19	19/20	
	Annual	Annual	Annual	Annual	Total
Funded Contribution					
(Offered as source of match funding)					
ng Clinical Systems Programme & Operating capital digital					
Capital allocation					
Software and projects					
Services					
Hardware					
Total CSIP Capital	**4451**	**3137**	**2290**	**2290**	**12168**
Programme revenue allocation					
CSIP staffing and revenue	**660**	**1319**	**1319**	**1319**	**4617**
Total CSIP Revenue	**659.5**	**1319**	**1319**	**1319**	**4616.5**
*** Total Committed Contribution**	**5110.5**	**4456**	**3609**	**6109**	**19285**
**** GDE Programme Delivery**					
UHBristol workstreams					
GDE Programme Delivery Team	**190**	**500**	**500**	**500**	**1690**
Total UHBristol Delivery	**190**	**500**	**500**	**500**	**1690**
System C functional workstreams					
Rolled-up service and stage payments	**1385**	**2770**	**2770**	**1385**	**8310**
Total System C Delivery	**1385**	**2770**	**2770**	**1385**	**8310**
**** Total GDE Programme Delivery**	**1575**	**3270**	**3270**	**1885**	**10000**
**** GDE Investment from NHSE**					
Total funding	**2500**	**2500**	**2500**	**2500**	**10000**
*** Total GDE Investment from NHSE**	**2500**	**2500**	**2500**	**2500**	**10000**
HBristol contribution *exceeding* match fundir	**2800.5**	**2456**	**1609**	**4109**	**10974.5**

The GDE programme will be conducted alongside IM&T's on-going 'business as usual' operational activities, which include improving and refreshing the underlying performance and scope of our IT estate.

2.3 Return on Investment

The GDE requirements for return on investment are onerous and we have looked hard at the remaining opportunities for efficiency savings alongside the huge but non-cashable benefits of improving the safety of our hospitals and the quality of care that we deliver.

We have identified high-level benefits and savings to be worked up into a detailed statement to be agreed within the MOU. Please see section 5.6 for further details of these schemes.

3 What will GDE mean for UHBristol?

For the last five years our Clinical Systems Strategy has had the following vision statement, borrowed from Cambridge's eHospital programme:

> ***"Our vision ... is one in which every member of our staff will have access to the information they need, when they need it, without having to look for a piece of paper, wait to use a computer or ask the patient yet again..."***

We have been working step by step towards this vision but with the sheer scale and complexity of the task and associated investment required it has remained a long-term goal.

GDE means that we can realize this vision within three years. Not just within the Trust itself but with partner organizations across BNSSG through the Connecting Care Partnership.

The opportunity for UHBristol to become a Global Digital Exemplar carries tremendous benefits for the Trust, but also significant responsibilities in terms of making sure we take our own staff with us by equipping them to be able to exploit the information and technology that will be delivered, and by learning lessons and setting an example to our neighbours and System C's other customers of how to do digital properly. This 'digital mentoring' aspect of the programme is critical and will require significant investment of time from senior UHBristol staff.

In the past five years we have successfully built the foundations we need to underpin the objectives of the GDE programme. We have a modern, mature patient administration and electronic patient record system (Medway), which forms the 'engine' driving activity within the Trust; we have a range of associated systems serving the specialist needs of departments such as the intensive care units, emergency departments and theatres; we have achieved an exceptional level of integration between systems around the Trust, with some 70 departmental system integrated with our PAS and other corporate systems in some way.

We are already pushing ahead with the roll-out of our Evolve digital casenote system, which now contains over 15 million documents available to all of our clinical staff, with plans to take it into the BRI early in 2017; we have already created around 200 e-forms and 70 service orders on Medway, each of which eliminates the need to generate and store several pages of paper-based information; we are already employing the means to communicate electronically with our health and care partners, with more opportunities being identified all the time; we are already working with System C towards our first pilot of electronic prescribing.

Above all, we have established an appetite for 'doing things digitally' across our user base, but this appetite is tempered by, for example, the fragmented nature of some of our systems, and the 'friction' that users feel when they're trying to access and use the software on poorly-configured workstations. GDE means that we can rapidly eliminate the gaps and inconsistencies between these systems and deliver the software tools that our staff need into their hands, wherever they are.

4 Objectives and Impacts of the GDE Programme

The objectives of the GDE programme were communicated as part of the initial invitation from NHS England in early August for UHBristol to submit an Expression of Interest. Whilst these objectives cover a very wide range of topics there are many other aspects of our informatics business that will continue alongside this programme and we will bring other emerging projects and initiatives under the programme to ensure that we can maintain a cohesive approach to the overall delivery.

4.1 The Objectives – Key Aims of the GDE Programme

We will be required to demonstrate how we can make a step change to:

- Improve the processes of care and
- Use information to better inform decision making and care

And to achieve world-class leading performance in the following areas:

Through extended use and optimisation of the Electronic Patient Record functionality, deliver comprehensively across the organisation:

- Real-time clinical documentation in structured and unstructured formats (Records, Assessments and Plans)
- Device connectivity including e-observations (Records, Assessments and Plans)
- Patient access to their record and clinical interaction functionality (Records, Assessments and Plans)
- Order entry and results reporting (Orders and Results Management)
- PACS integration (Orders and Results Management)
- Closed-loop medicines management (Medicines management and Optimisation)
- Deployment of evidence based workflows and clinical decision support (Decision Support)
- Automated clinical alerting (Decision Support)

Within a wider, standards based approach to Information sharing and Interoperability in the local health and care system, deliver:

- Correspondence and test results available to patients via open interfaces
- Reciprocal communication with care teams for patients
- Sharing of events between EPR and local economy at points of care; e.g. requests for service, admissions, discharges, and other transfers of care reports and updates (e.g. encounters and lab results)
- Integrated workflow across care settings through notification and alerting to professionals as part of the care process
- Access to structured data about a patient from primary care and other care settings in real-time (including in-episode and post episode care) e.g. exposure of GP record in EPR or EPR record in GP systems
- Appointments management with primary care and across care settings
- Ability to locate and access care records from across localities
- Integration with key national services such as eReferrals, Summary Care Record and the Electronic Prescription Service

- Supporting information sharing through a set of structured open FHIR APIs for sharing key elements of the care record e.g. medications, allergies, problems, diagnosis, encounters
- Enabling patient access to information from across care settings – developing and trialling use of emerging standards such as SMART
- A common data sharing agreement and consent approach across the economy
- Export of full and configured sub data set to local/regional data platform for population health management to enable near-real time insight at the point of care
- Reporting and contract submissions directly from clinical systems to support service planning and quality improvement using the NHS Number as the link key

Security

- Proven Cyber Security Framework is in place
- No unsupported operating systems, software or internet browsers used within the IT estate
- A credible plan to respond to threats to data security with senior board accountability

We must also become leaders in:

- Innovative new approaches to care redesign
- Building new digital tools and integrating them into workflow
- Promoting teamwork and communication
- Promoting closer connections between patients, primary care, and secondary care
- Potentially partnering with IT companies, in the UK and elsewhere, to promote innovation
- Potentially partnering with research organizations to catalyse advances in conducting research and disseminating its findings

4.2 Impacts

GDE will have a profound and fundamental impact on the day-to-day working of UHBristol, across the whole of BNSSG through our commitment to Connecting Care, across the South West through our tertiary network, and nationally through System C's other customers.

The programme cannot be delivered with a covert or piecemeal approach, because **we will be implementing technology that will fundamentally change the way we all work, how we think about our work, and how we relate to our colleagues, our patients and our partners**. It will take a certain courage for the organization to commit to some of these changes, because to this point many of the technological solutions we have introduced are not mandated or pervasive throughout the organisation, but this will change with the nature of the technology that we will introduce through this programme.

Specifically, **the impact on our patients and our staff** will be through delivery of care within a cohesive digital framework that encompasses all administrative and clinical information, ensuring that there are no 'gaps' between the various professionals and teams involved in their care. This will eliminate delays, ensure that clinicians have the information they need, reduce variation in the delivery and outcome of care, and enable better communication and engagement between professionals.

There will be a **direct impact on delivery of our Local Digital Roadmap** (LDR), because we will achieve digital maturity earlier and with more sophisticated tools than would otherwise be affordable. Again, this will have a collateral benefit on our local partners and their own roadmap activity.

The Sustainability and Transformation Plan (STP) is underpinned by an assumption that widespread adoption of good digital practices will enhance our ability to deliver on the STP themes. **GDE in UHBristol will have a direct impact on delivery of our STP**:

- We will standardize and operate at scale.
  The standardization of complex processes and interactions between partners can only be conducted safely and reliably using proven digital methods.
- We will develop system-wide pathways of care.
  Our GDE proposal includes shared care pathway tools that can be deployed across the city.
- We will develop a new relationship with the population
  Our proposal includes a 'person held record' (PHR), sometimes referred to as a patient portal, that will give our service users access to their records and the ability to participate in development of their care pathways.
- We will develop new relationships between organisations and staff
  With Connecting Care as the nucleus of a single, cohesive information sharing and notification
- We will build on our existing digital work as a driver and enabler of cultural change
  Technologically, UHBristol is starting from a high baseline, but many enabling functions remain untapped while we address these cultural issues.

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5 Affordability and Return on Investment

GDE funding is conditional on:

- The delivery of over 30 specific requirements to agreed milestones over the three-and-a-half year term of the programme
- Match funding investment by the Trust and its partners against any funding received.

5.1 The funding requirement

We have established that we can engage System C to achieve the required milestones within the funding envelope. The GDE programme at UHBristol will therefore operate as a major strand of activity within our Clinical Systems Programme, with dedicated resource allocated where appropriate but able to work within our existing framework for greatest impact.

System C has indicated that the cost of achieving this work will be greater than the funding available from the programme and has therefore made arrangements with its main investor, Symphony Technology Group, to meet additional funding requirements until income from rolling out products from the UHBristol programme into its existing user base becomes available. The total sum payable to System C over the term will be £8.31m.

The total annual programme expenditure across the term is expected to be:

	16/17	17/18	18/19	19/20	
	Annual	Annual	Annual	Annual	Total
Funded Contribution					
(Offered as source of match funding)					
ng Clinical Systems Programme & Operating capital digital					
Capital allocation					
Software and projects					
Services					
Hardware					
Total CSIP Capital	**4451**	**3137**	**2290**	**2290**	**12168**
Programme revenue allocation					
CSIP staffing and revenue	**660**	**1319**	**1319**	**1319**	**4617**
Total CSIP Revenue	**659.5**	**1319**	**1319**	**1319**	**4616.5**
*** Total Committed Contribution**	**5110.5**	**4456**	**3609**	**6109**	**19285**
**** GDE Programme Delivery**					
UHBristol workstreams					
GDE Programme Delivery Team	**190**	**500**	**500**	**500**	**1690**
Total UHBristol Delivery	**190**	**500**	**500**	**500**	**1690**
System C functional workstreams					
Rolled-up service and stage payments	**1385**	**2770**	**2770**	**1385**	**8310**
Total System C Delivery	**1385**	**2770**	**2770**	**1385**	**8310**
**** Total GDE Programme Delivery**	**1575**	**3270**	**3270**	**1885**	**10000**
**** GDE Investment from NHSE**					
Total funding	**2500**	**2500**	**2500**	**2500**	**10000**
*** Total GDE Investment from NHSE**	**2500**	**2500**	**2500**	**2500**	**10000**
HBristol contribution *exceeding* match fundir	**2800.5**	**2456**	**1609**	**4109**	**10974.5**

The GDE programme will be conducted alongside IM&T's on-going 'business as usual' operational activities, which include improving and refreshing the underlying performance and scope of our IT estate. The on-going revenue cost of UHBristol's IM&T operations (2016/17) is £6.04m.

5.2 Milestone payments

Funding of up to £10m is available, payable by instalments linked to milestone achievements with one quarter of funding up front, one quarter on achievement of each of two agreed interim milestones and one quarter on completion of the objectives. UHBristol proposes that Milestones 2, 4 and 6 should be used as payment milestones for funding drops and all six primary milestones will be used as payment triggers for System C. The final milestone will be the checkpoint confirming that all GDE requirements and RoI predictions have been met to that point.

The functional and product content of each milestone is shown in section 6. The dates of the milestones are:

Milestone 1 - January 2017
Milestone 2 - March 2017
Milestone 3 - Jul 2017
Milestone 4 - Oct 2017
Milestone 5 - Mar 2018
Milestone 6 - Mar 2019

5.3 Capital/Revenue Considerations

It is not yet clear what proportion of capital to revenue funding is available, but UHBristol is keen to engage suppliers on a service basis rather than continue to procure capital assets. The award of capital carries a significant overhead that devalues the funding for both the Trust and the supplier. Although guidance has indicated that revenue funding will be restricted UHBristol will request that the maximum proportion of the funding is allocated in this form.

5.4 Match Funding

All external funding must be matched by the Trust. The financial model submitted (Appendix B) shows that the Trust will match and exceed GDE funding through local capital and revenue input to the Clinical Systems Programme together with operational capital schemes for applicable digital programmes. Applicable capital schemes allocated in later years will be offered as further evidence of matched funding.

The total CSIP and operating capital contribution offered as match funding will exceed the award by approximately £10m.

5.5 Benefits

In addition to the required efficiency savings, UHBristol expects to gain substantial safety and quality benefits from the use of the new digital functionality. It has not been possible to assign a direct value to these benefits because they cannot be accurately quantified in terms of, for example, the reduction in serious incidents or variation requiring investigation by senior clinical and administrative staff.

We know that such savings will be achieved but we cannot commit at this stage to exactly what and where they will be, although we will commit to maintaining a detailed baseline and benefits/savings monitoring regime as part of the transformation activity that will be an integral part of the programme.

5.6 Return on Investment

The GDE requirements for ROI have been stated as 2.4:1 over the lifetime of the asset, which UHBristol has assumed to be seven years. Meeting this return in the form of cash-releasing and cost-avoiding efficiencies that are identifiable at this stage has been challenging. Although we are confident that the return is available there is inevitable uncertainty about the precision of any forecast. But no-one has done this before at any scale

The following pages, 'Finding the Return on Investment', present the case for a series of efficiency savings that UHBristol could achieve through the use of new technology and better-informed staff. These candidate areas will be worked up into a detailed statement to be agreed within the MOU and tracked for the lifetime of the programme and the asset.

Each area looks at a product that we intend to use at scale and at pace, shows how in even limited circumstances it provides measurable significant benefit, and relates how this will apply within UHBristol and BNSSG as a whole.

Finding the Return on Investment -
The changing focus of health and social care IT

Traditionally care providers have used IT for basic functionality that addresses work processes rather than clinical objectives. UHBristol's approach will be to use good digital process and practice across the community as way of helping the Trust to improve clinical performance in areas such as:

- Reducing A&E Attendances
- Safeguarding Children
- Reducing Length of Stay
- Keeping patients at home
- Removing Paper
- Improving Outcomes and Safety
- Stopping doing things that don't need doing

Quality and Safety are the main benefits that UHBristol will seek to gain from participation in the GDE programme, which will give us the opportunity to address many quality and safety issues that are not easy to fix without the routine use of well-designed, real-time digital solutions.

But the GDE programme has put a strong emphasis on the need for a financial return on investment through operational efficiencies. The following section therefore looks at evidence gathered nationally for the products and approaches that we would employ as part of our GDE programme, and suggests how such savings would apply to UHBristol. Whilst the total candidate savings are unrealistic, there is an obvious potential to derive significant, meaningful savings through the programme.

Case 1: Acute Kidney Injury at East Kent

Example Saving

East Kent Hospitals report a 20% reduction in Acute Kidney Injury from their deployment of a clinical team-messaging system (Careflow).

- 13% of admissions will have/get an acute kidney injury
- These patients will stay 4.7 days longer
- And they are more likely to develop a chronic disease

The saving at East Kent was £2.8m

Sources:

NHS England https://www.england.nhs.uk/patientsafety/wp-content/uploads/sites/32/2014/03/bg-present-keep-kidneys2.pdf

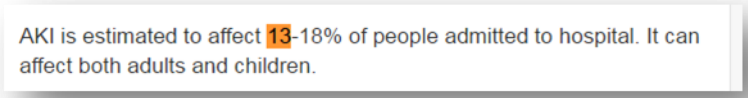
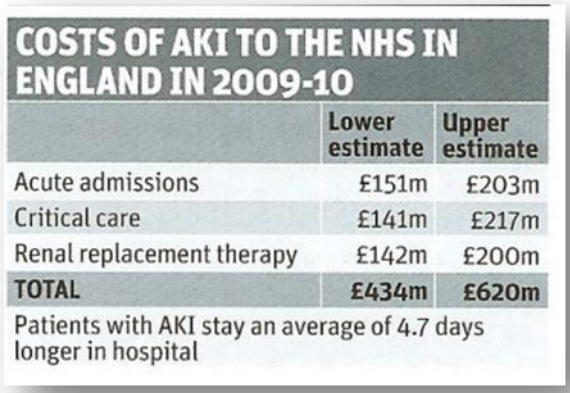

AKI is estimated to affect 13-18% of people admitted to hospital. It can affect both adults and children.

Figure 1

NHS England: https://www.england.nhs.uk/patientsafety/wp-content/uploads/sites/32/2014/04/issue-aki-pres2.pdf



COSTS OF AKI TO THE NHS IN ENGLAND IN 2009-10

	Lower estimate	Upper estimate
Acute admissions	£151m	£203m
Critical care	£141m	£217m
Renal replacement therapy	£142m	£200m
TOTAL	**£434m**	**£620m**

Patients with AKI stay an average of 4.7 days longer in hospital

Figure 2

Calculation

1 This is based on East Kent's own estimate of a £2.8m saving
2 East Kent is 1,015 beds compared to UHBristol's 1,085 beds – so the figure is left unchanged at £2.8m
3 Number of admissions at UHBristol = 72,000 (see Figure 3 below)
4 Assume 13% of these get AKI in line with East Kent 72,000 x 13% = 9,360 patients with AKI
5 Assume these patients stay 4.7 days longer in line with East Kent. 9,360 x 4.7 = 43,992 excess bed days
6 An excess bed day costs £276 (see Figure 2). So the excess bed days that could be saved at UHBristol would save 43,992 x £276 = £12,142,000
7 East Kent saw a 20% reduction so £12,142,000 x 20% = **target savings of £2,428,000**

Case 2: Reduction in Emergency Admissions Length of Stay at Dorset

Example Saving

Dorset County Hospital recorded a > 10% reduction in Emergency Admissions Length of Stay following the introduction of VitalFlo. The Trust attributes the savings to:

- Deterioration caught earlier
- Reducing outliers increases appropriate specialist care
- More likely to spot complications

Calculation

1 We are looking for a saving associated with a 10% reduction in Emergency Admissions LoS
2 In 2012-13, there were 5.3 million emergency admissions nationally to hospitals, representing around 67 per cent of hospital bed days in England, and costing approximately £12.5 billion.
   a) Source: NAO Report 2013: Emergency Admissions to Hospital: managing the demand (see Figure 3 below)
3 UHBristol with 1,000 acute beds represents 0.88% of acute beds in England
4 Ten percent of the £12.5 billion cost identified by NAO is £1.25 billion
5 So if all of England was to save 10% of its emergency admissions, then the saving across England should be £1.25 billion, and...
6 if UHBristol represents 0.88% of that potential saving then the **target saving could be £11,050,700**

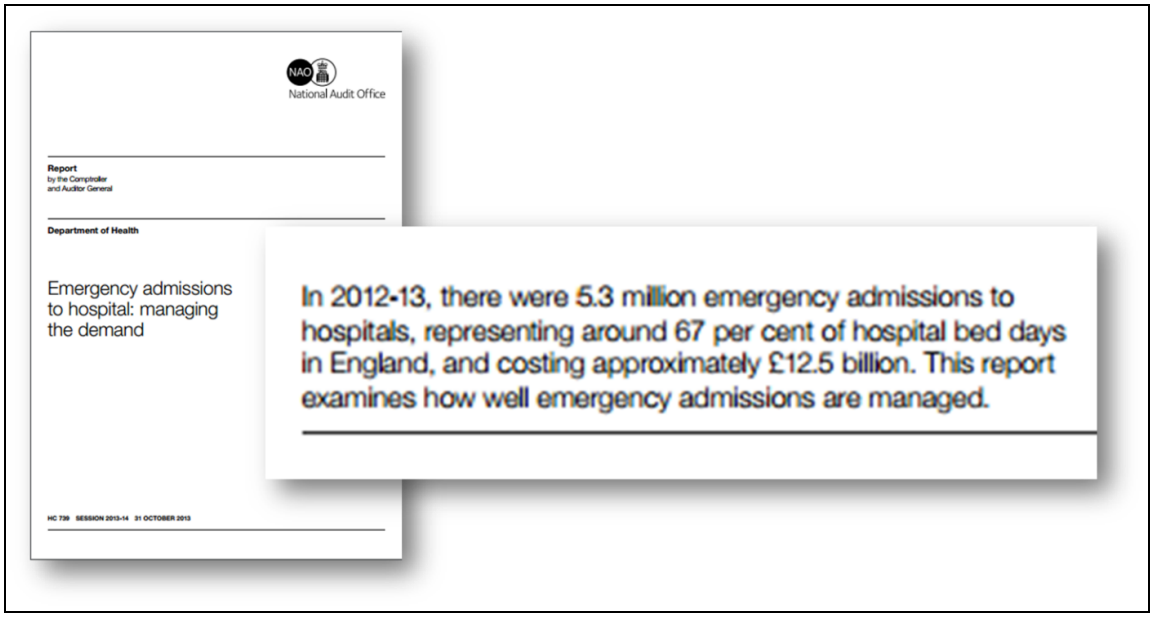


Figure 3

Case 3: Reduction in A&E Attendances in Manchester

Example Saving

Manchester saw 19% fewer A&E attendances for patients on Long Term Care plans across the city. An analysis of 2,000 + patients using electronic long term care plan on CareCentric showed:

Calculation

There are two savings calculated here:

- Reduction of 19% in A&E attendances
- Reduction in non-elective admissions of 15%

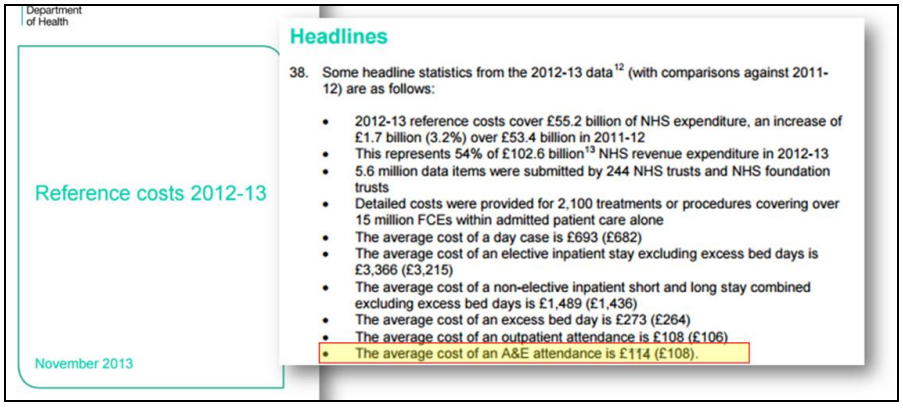
The Total value of benefits forecast by Manchester is £13.8m
The most significant area of benefit is a reduction in hospital admissions

A&E Attendances

1 The average cost (nationally) of an A&E attendance is £114.
   a) Source: Department of Health reference Costs 2013 (see Figure 4 below)
2 In 2013/14 UHB had 115,000 attendances.
   a) Source: CQC Report on UHBristol 2013/14 (see Figure 5 below)
3 We can calculate the costs of A&E attendances at UHBristol as 115,000 x £114 = £13,110,000
4 A 19% saving on these costs would be £13,110,000 * 19% = £2,490,000

Non-Elective Admissions

1 The average cost of a non-elective admission is £1,489 (excluding excess bed days)
   a. Source: Department of Health (see Figure 6 below)
2 The percentage of admissions which were non elective nationally in Q3 2013 was 52.4%
   a. Source: National Statistics (see Figure 7 below)
3 UHBristol had 72,000 Inpatient admissions in 2013/4 (see CQC report extract above)
4 If we assume that UHBristol reflects the national picture then the number of non-elective admissions would be 52.4% of this number: 52.4% x 72,000 = 37,697
5 A 15% saving on this would be 15% x 37,697 = 5,645
6 A saving of £1,489 per case would be £1,489 * 5,645 = £8,419,000
7 So total value of £2,490,000 (point 6 above) + £8,419,000 = £10,909,000
8 Calculation to this point is based on the assumption that all relevant patients have a long-term care plan but this will not be the case. We can make a reasonable assumption that say 10% of relevant patients are on a LTC Plan,which would set the **target savings at £1,090,000.**


Department of Health

Reference costs 2012-13

November 2013

Headlines

38. Some headline statistics from the 2012-13 data[12] (with comparisons against 2011-12) are as follows:

- 2012-13 reference costs cover £55.2 billion of NHS expenditure, an increase of £1.7 billion (3.2%) over £53.4 billion in 2011-12
- This represents 54% of £102.6 billion[13] NHS revenue expenditure in 2012-13
- 5.6 million data items were submitted by 244 NHS trusts and NHS foundation trusts
- Detailed costs were provided for 2,100 treatments or procedures covering over 15 million FCEs within admitted patient care alone
- The average cost of a day case is £693 (£682)
- The average cost of an elective inpatient stay excluding excess bed days is £3,366 (£3,215)
- The average cost of a non-elective inpatient short and long stay combined excluding excess bed days is £1,489 (£1,436)
- The average cost of an excess bed day is £273 (£264)
- The average cost of an outpatient attendance is £108 (£106)
- The average cost of an A&E attendance is £114 (£108).

Figure 4

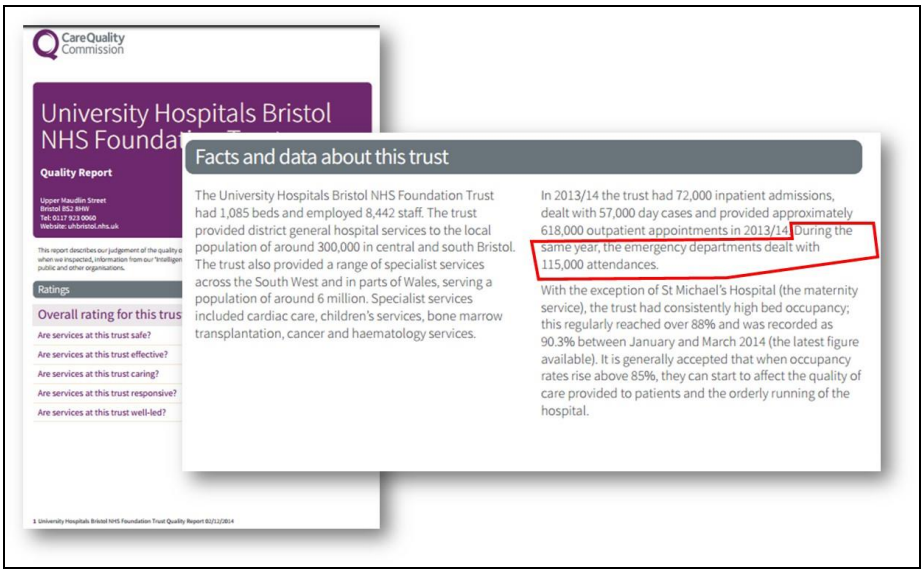


Figure 5

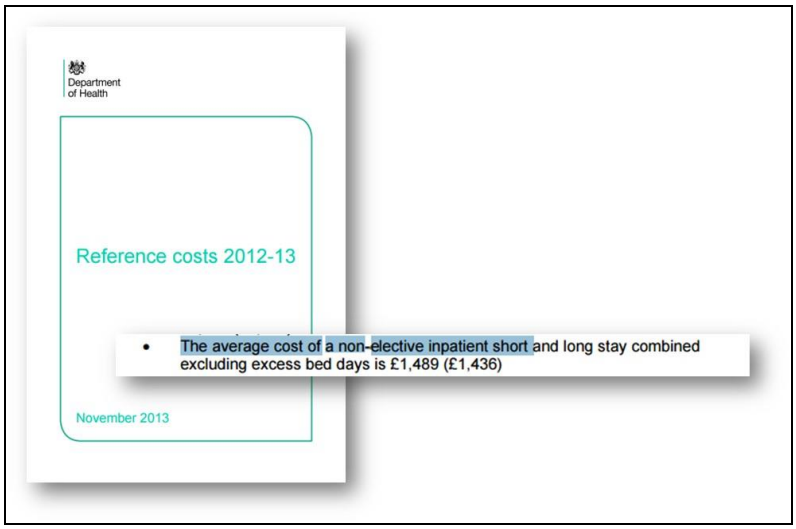


Figure 6

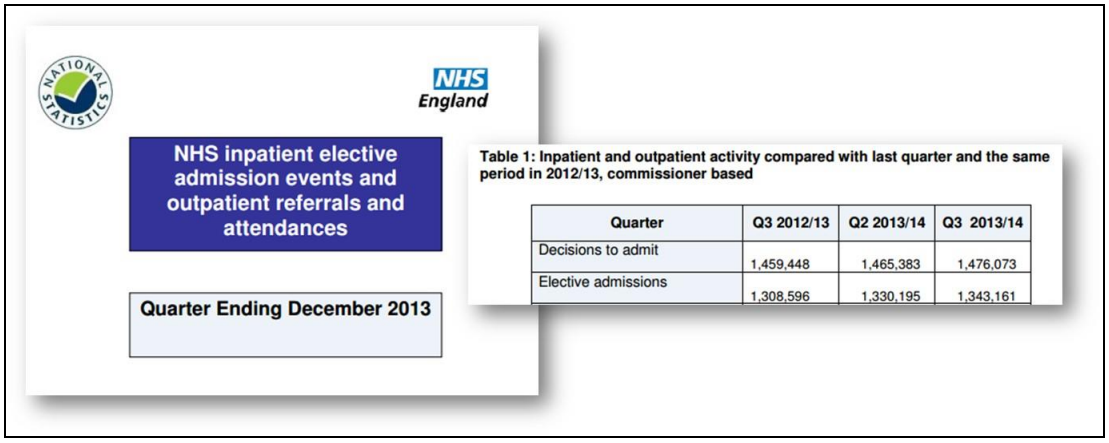


Figure 7

Case 4: Reduction in Length of Stay Seen Nationally at Vitalpac Sites

5.6.1.1 Example Saving

In a study of VitalPac users, a 15% reduction in lengths of stay was seen in nationally in units that used eObservations

5.6.1.2 Calculations

1 The average cost of an excess bed day is £276
   a) Source: DoH Reference Costs (Figure 4 above)
2 The bed occupancy at UHBristol is around 88% (This may not be the average but the CQC report suggests that it is regularly exceeded)
   a) Source: CQC Report (Figure 8 below)
3 The Number of Inpatient cases at UHBristol is 72,000
   a) Source: CQC Report (Figure 5 below)
4 The number of beds at UHBristol in 2013/14 was 1,085
   a) Source: CQC Report (Figure 5 below)
5 So the approximate number of occupied bed days will be 88% * 1,085 * 365 = 396,000 bed days
6 A 15% reduction in this would be 396,000 x 15% = 59,400 bed days saved
7 If we assume that all of these are excess bed days the saving will be 59,400 x £276 = £16,395,000 saving
8 If we assume that just 8% of beds are impacted by eObservations – this would be £16.4m x 8% = **target savings of £1.3 million**.

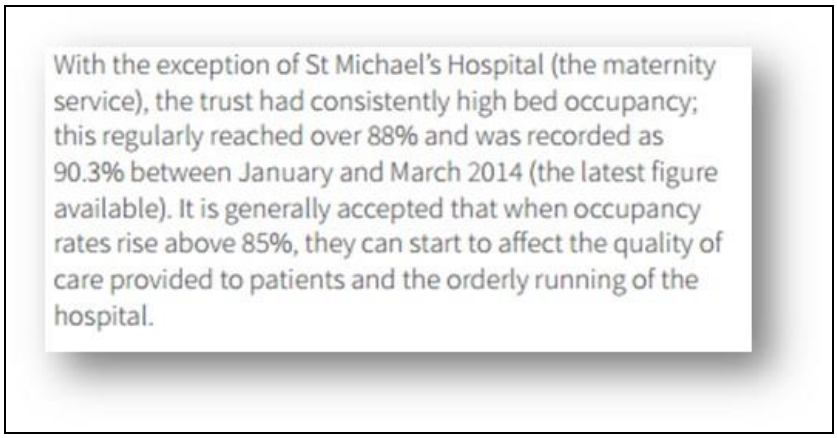


Figure 8

Case 5: Impact of Careflow and New Models of Care (NMoC) On Epilepsy

Careflow: Epilepsy Business Case

Over a quarter of the population in England (15.4 million people) have a long-term condition (LTC), many of whom have more than one LTC.
People with LTCs use a significant proportion of health care services (50% of all GP appointments and 70% of inpatient stays).

Proposed technology

Careflow is an event-driven, care coordination system that draws on multiple sources of clinical and workflow information to ensure that all clinicians involved in the management of a patient have access to relevant timely information. Clinical objectives are pre-defined and compared against alert thresholds. Alerts are sent out using direct messaging to a smartphone or tablet. There are two specific areas where this may enhance the current standard of care:

1 The optimised management of a patient suffering a first fit.
2 The ongoing management of patients with established epilepsy. Health Economics

Management of first fit

1 There are around 32,000 people per year presenting with a first epileptic fit in the UK [Joint Epilepsy Council].
2 These patients may or may not be admitted. Generally, all will attend out-patients for evaluation, with many being followed up subsequently, although only around 15% will ever have a second fit.
3 Assuming that currently:
   a) 90% of patients will attend a first out-patients appointment
   b) 75% of these will attend at least one follow-up appointment
4 Based on the current NHS Tariff, expected annual UK expenditure on out-patients appointments (excluding investigations) will be:
   a) 32,000 x 90% x £222 = £6.394 million
   b) 32,000 x 90% x 75% x £135 = £2.916 million
   c) Total = £9.310 million
5 For NHS Bristol CCG with a population of 451,280 expenditure would be: £66,774

Second Fit

6 If we assume that Careflow allows 90% of patients to be monitored remotely and only recalled for follow-up if they have a second fit:
7 Of the 32,000 having a first fit, 28,800 (90%) will attend a first appointment, of which 25,920 (90%) will be monitored remotely, the remaining 2,880 attending for follow-up regardless
8 Of the 25,920 being monitored remotely, 3,888 (15%) will have a second fit and will be recalled to the clinic
9 The remaining 22,032 will be discharged to the GPs care, with no further planned follow-up
10 Costs incurred will be:
11 28,900 x £222 = £6.394 million
   a) (2,880 + 3,888) x £135 = £0.914 million
   b) Total = £7.308 million
12 This represents a reduction in expenditure of £2.002 million (21%) nationally, or £14,429 in Bristol CCG

If UHBristol were to extend this model to surgical, orthopaedic and gynaecological patients followed up after procedures, in Bristol CCG one would expect to see around 148,000 follow-up appointments per year, of which perhaps 75% are unnecessary. **The potential for savings on this scale is in the range £7-10 million in Bristol CCG** – more than enough to justify the investment.

Ongoing management of epilepsy

13 Only 52% of patients are seizure free, although with medication, it should be possible to increase this figure to 70% [Joint Epilepsy Council]

14 The financial consequences of an epileptic fit are considerable.

15 We will therefore look at what may be considered a 'typical' patient who could be helped by Careflow. If we assume that:

a) The patient has 10 fits per year
b) 5 are managed at home
c) 5 require A&E attendance but no onward admission
d) 2 require admission to hospital

16 Acute costs incurred annually:

a) 7 x urgent ambulance transfers to A&E @ £221 = £1,547
b) 7 x A&E attendance @ £150 (VB05Z) = £1,050
c) 2 x overnight ward admissions @ £590 (AA26B) = £1,180
d) TOTAL annual cost = £3,777

17 If we assume that this is a good estimate of mean expenditure and that Careflow could achieve the following:

a) Achieve fit-free status for 15% of patients
b) Reduce fit frequency by 60% in 20% of patients
c) Reduce fit frequency by 30% in 20% of patients
d) Have no effect in 45% of patients

18 Then we can estimate the following savings in the 108,000 patients in the shortfall:

a) Saving of £3,777 in 16,200 patients = £ 61.187 million
b) Saving of 60% x £3,777 in 21,600 patients = £ 48.950 million
c) Saving of 30% x £3,777 in 21,600 patients = £ 24.475 million
d) No saving in 48,600 patients
e) TOTAL annual saving = £ 134.612 million

19 In Bristol CCG with 451,000 population, this would amount to an **annual saving of £963,000**

Impact Of NMoC On Coronary Heart Failure

Background: Heart Failure

Heart Failure has a poor prognosis with 30–40% of patients with heart failure dying within a year of initial diagnosis, and subsequent mortality of 10% per year.
In the UK, heart failure accounts for a total of 1 million inpatient bed-days, approximately 2% of all NHS inpatient bed-days, and 5% of all emergency medical admissions to hospital.
The financial cost of treating patients with heart failure is significant – approximately 2% of the total NHS budget is spent on treating patients with heart failure, with 60-70% of that cost spent on treatment in secondary care.
Heart failure is the most common reason for hospital admission in the UK and patients are at high risk of readmission. Preventable factors that contribute to readmission and poor outcomes include:

1 Inadequate knowledge of the condition by the patient
2 Poor compliance with pharmacotherapy
3 Adverse effects of treatment
4 Failure to recognise early symptoms of deterioration and to seek advice
5 Poor social support

Heart Failure in Bristol

6 It is estimated that Bristol CCG supports over 3,000 people living with chronic heart failure.
   a) Source: We have no published source for this. We used the percentage of patients in Chiltern (0.67%) and looked at the equivalent percentage in Bristol (451,000 patients in Bristol CCG) 451,000 x .67% = 3,000
7 Chiltern look to save:
   a) For CCG: savings of between £577k and £1,126k pa.
   b) For Hospital: increase revenue of £300k and £661k pa
8 If we take the lower figures £577,000 and £300,000 (£877,000)
9 Chiltern has 511,545 population. Bristol has 451,000. Bristol is 88% the size of Chiltern so an equivalent low figure would be £877,000 * 88% = **target savings of £773,000** and the equivalent high figure would be £1,572,000

6 The GDE Programme Plan

UHBristol and System C have drafted a plan to deliver the GDE (and EoI) requirements well within the term of the programme.

Our plan is bold and ambitious, in keeping with the intention of the programme, but it is based around the phased delivery of existing products and techniques, reducing the risks associated with the development of complex products from scratch. Software and integration development will be required in some areas, of course, and the sequencing of milestones recognizes this by leading with existing products while development continues on the later components.

Appendix B illustrates the rationale behind our plan by mapping the programme milestone outcomes to product components and GDE objectives. The milestone outcomes are shown below to illustrate the depth and pace of delivery.

We have set particularly ambitious goals for the first six to eight months after commencement. Based on existing products and technology, the first two milestones are intended to kick-start the programme by deploying useful, in-the-moment technology solutions to the basic problems of clinical communication and patient observations. These alone will derive immediate benefit and whet the appetite of our user base for what comes next.

But successfully delivering the technology components of the solution alone would miss the whole point of the exercise, which is to engage and equip all of our staff to understand how to make the best use of the technology and the information that it can make available to them when they need it.

6.1 The Milestones

Six achievement-based milestones have been identified as the basis for measurable progress and payment purposes. These milestones are outcome-based, so each line represents significant effort and the delivery of underlying products and technology components to make it work.

Appendix B (tab D) shows these milestones across the functional themes to illustrate the progression in each area. The next stage of planning will relate specific, measurable benefits to these outcomes. The Milestones and outcomes are:

Milestone 1 - January 2017

- Careflow platform deployed and integration commenced providing platform for alerting, clinical collaboration, handover, task management, referrals
- Community alerting and collaboration scope in draft and data sharing agreements reviewed and updated
- Patient engagement strategy agreed and commenced to recruit initial users
- Clinical engagement strategy agreed and commenced
- Structured and unstructured Clinical noting scope agreed and configuration commenced
- New Models of Care/Pathways candidate conditions identified and first 2 LTC's selected
- Order Communications Gap analysis for full roll-out including mobile development complete

Milestone 2 - April 2017

- Roll-out of Careflow alerting integration supporting selection from, AKI, low/high K+, low Hb, Neutropenia, TNT, D-Dimer, availability of radiology reports, admissions, discharges and A&E attendances plus key admissions including COPD, Oncology, Congenital Heart Patients, Haemophiliacs and patients with learning disabilities
- Roll-out of Careflow alerting, clinical collaboration, Hospital at Night and Handover to 24 teams - information pushed to acute clinicians when they need it
- Bristol care community integration layer deployed alongside Connecting Care - content assembled from providers across the care community at the point of care

Milestone 2 – cont...

- Community-wide alerting and clinical collaboration scope agreed, DSA's approved, configuration complete
- Patient-Held Record requirements agreed (Patient Access), initial pilot group (250 - 500) recruited and pilot commenced
- Requirements for acute appointment self-management agreed and build commenced
- e-Observations deployed and roll-out commenced
- New Models of Care/Pathways scope agreed and build in progress
- New Models of Care pilot patients identified and recruited
- ePMA Pilot functionality deployed

Milestone 3 - Jul 2017

- Community Collaboration rollout in progress to defined teams, agreed alerting (e.g. GP notified of admission / discharge), clinical collaboration, single assessment, referrals and task management
- Admissions and Transfers electronically communicated to social care application worktray to enable seamless workflow and speed up the discharge process
- Patient Held-Record/Patient Access pilot complete and lessons learnt under review - built collaboratively with patient engagement group, scope to view their own records from across the acute
- Patient acute appointment self-management deployed and in pilot - for patient participation in their own care planning
- Clinical Collaboration/reciprocal communication with Patients - scope agreed and configured ready for QA
- Care Community Patient Access requirements agreed and DSA's reviewed - built collaboratively with patient engagement group, scope to extending access to view their own records from across the community
- Structured Clinical Noting configuration complete ready for pilot
- E-observations trust-wide rollout complete - improved visibility of inpatients and provide early alerting of deteriorating patients and identification of risk such as sepsis, AKI and infection
- Integrated observations devices - pilot commenced
- New Models of Care pilots commenced for 2 LTCs
- Community Clinical and Business Intelligence data store deployed
- Medway Order Comms software deployed and ready for rollout to replace ICE (desktop)
- Anaesthetic monitoring and paperless charting in place across all departments
- ePMA Pilot completed, lessons learnt and rollout ready to commence

Milestone 4 - Oct 2017

- Community Collaboration rollout complete to agreed teams supporting agreed alerting (e.g. GP notified of admission / discharge), clinical collaboration, single assessment, referrals and task management
- Acute Clinical Collaboration with Patients pilot complete, lessons learnt and rollout commenced
- Care Community Patient Access pilot complete, care community clinical collaboration scope agreed and configured ready for roll-out
- New Models of Care/Pathways pilots completed, lessons learnt
- Community BI Dashboards agreed, configured and deployed
- Mobile Order Comms software deployed and ready for roll-out
- Roll-out of mobile OCS in progress, mobile results reporting delivered and mobile requesting for pathology deployed
- Structured clinical noting rollout commenced
- ePMA mobile scope agreed

Milestone 5 - Mar 2018

- Roll-out of Careflow alerting complete to all acute teams to support AKI, low/high K+, low Hb, Neutropenia, TNT, D-Dimer, availability of radiology reports, admissions, discharges and A&E attendances plus key admissions including COPD, Oncology, Congenital Heart Patients, Haemophiliacs and patients with learning disabilities
- Roll-out of Careflow clinical collaboration, Hospital at Night and Handover to all teams complete
- Roll-out patient access, including collaboration, to acute (250-500 patients)
- Design and agree patient access to clinical collaboration discussions (care community)
- Configure patient access to clinical collaboration discussions (care community)
- Inclusion of patients in clinical collaboration discussions (care community) with 50 patients
- NMC/Pathways roll-out for two selected pathways in progress
- Roll-out of mobile OCS in progress, mobile results reporting delivered and mobile requesting for radiology deployed
- ePMA rollout complete to all Adult General wards

Milestone 6 - Mar 2019

- NMC/Pathways roll-out for two selected pathways complete
- Mobile OCS deployment now complete with Service Orders supported
- Simple mobile ePMA deployment complete
- Care community patient access now matured with clinical collaboration discussions available for 250-500 patients.
- Patient-Held Record/Patient Access including collaboration is available to all relevant patients
- Structured and unstructured clinical noting roll-out is complete
- All components for 'paperless' operation are in place with the majority of paper processes fully digitized

6.2 Resources

We will need a skilled, dedicated team of hands-on, can-do informatics and clinical professionals to make this programme work. Resourcing for this will be provided in three ways:

The existing CSIP team will continue its work of deploying new solutions and transforming care, with the current team structure being remodelled to take advantage of the rapid-deployment opportunities that the new products offer. This team will also be given an opportunity to up-skill in new techniques and, for some, greater responsibility that recognizes the great work they have done to date.

We will recruit new staff into new positions across the CSIP team. In addition to clinical systems specialists who will be configuring and rolling out the new products, this will include increasing the seniority of our project management team to provide better authority, additional senior programme management skills, and a substantial increase in practical change/transformation skills that can drive adaptive change, which has typically been provided from outside the Clinical Systems programme. We rarely recruit from the contracting community, preferring to take on people who will stay with us for the long term where possible, and have generally been able to find people who want to come to Bristol.

Apart from a lot of people who will be working on our programme based in their own offices, System C will station a deployment team on site in Bristol for the duration of the programme. We have worked in this way with System C previously and know that it's the best way to build a strong, fruitful working relationship that can get things done. System C has shown that it has the capability and capacity to deliver given the right environment and a willing customer—UHBristol has similarly proven that it can provide those conditions. System C has a Bristol development office that will allow close interactions between development and deployment teams.

The programme will be lead from Exec level and managed by the Trust's CIO/Programme Director, with programme support an assurance through the CSIP PMO

The cost of this resource will be shared between UHBristol's CSIP and the GDE programme funding for the term of the programme, but embedding and exploiting the new technology will require on-going resource.

7 Partnerships and relationships

The GDE programme is based on the principle of collaboration. The diversity of this collaboration far exceeds anything that we have previously undertaken in the health informatics space at UHBristol yet pulls together strands and relationships that we already have in place. We must collaborate effectively within the programme to build and embed the digital capabilities that will, in turn, help us to collaborate and share at scale in our real line of business: the delivery of health and care to the population of Bristol.

Within UHBristol we will work with our strategic supplier, System C, to deliver the new functional components of the solution. As a long-term partner, System C is committed to this programme we have worked closely at a senior executive level to pull together much of the vision and plan behind our bid.

We will harness our CCIO team and their clinical networks to engage and collaborate widely across the clinical user base, promoting clinical champions and offering colleagues the opportunity for formal accreditation if required. This group will provide the 'power-house' for adoption and change across the Trust; exemplars within their own clinical communities and networks.

We will establish a patient and public involvement workstream that will be intimately involved in the design, development and piloting of the patient-held record and collaborative care components listed in the milestones. We will call on this group to recruit individuals to work with us on the patient-facing elements of the new models of care to ensure that they will be fit for purpose and of direct benefit to our community.

Through the Connecting Care Partnership we will continue to collaborate with the other health and care organizations within BNSSG, now with the added motivation of a significant step-change in functionality that has been on our roadmap for some time. Connecting Care is the key to making the UHBristol Exemplar come to life outside of the Trust and also serves the same STP and LDR community, thereby ensuring that we can have maximum impact across BNSSG. Our partners eagerly await news of how they will benefit from this programme.

Through System C, we will establish the role of 'digital mentor' and work with other Medway customers to share our experience, our techniques and our tools to help them make the very best use of the products emerging from the programme.

We will work with other GDEs who work and think in similar ways to make the most of the GDE opportunity and establish ways to share learning and experience.

We will seek international partners to help us understand and adopt approaches and ideas that are outside of NHS mainstream thinking. We are currently looking toward European partners in this but would welcome advice from NHSE/D on identifying other candidates.

8 Governance

Governance of the GDE programme will fit within the existing framework that manages all information management and technology and the Clinical Systems Programme.

The IM&T Board and CSIP Programme Board report into the IT Management Group which, in turn reports to the Trust Board. The Exec responsible for digital delivery is the Trust's Director of Finance and IM&T, Paul Mapson. GDE will be operated by the Clinical Systems Programme under the leadership of the Programme Director and CIO, Steve Gray, alongside the Head of IM&T, Andrew Hooper.

UHBristol's CEO, Robert Woolley, is Chair of the Connecting Care Partnership Board, with Steve Gray as a member alongside senior business and technology representatives from the 17 active members of the Partnership. The GDE programme will therefore have 'a seat at the table' of the Partnership Board.

Clinical engagement and governance leadership is provided through the CCIO team which consists of two CCIOs (Chris Bourdeaux and Adam Dangoor), a CNIO (Becca May) and a CTIO (for Therapies/AHPs, Julie Packman). This group is on the terms of reference for the CSIP Board and IT Management Group, and also promotes the wider involvement and participation of clinical colleagues in matters digital. The appetite for better technological solutions amongst clinicians has increased markedly since the appointment of the CCIO team, with several clinical champions active in specialist areas—all of who are keen to start work

The Clinical Systems Programme (CSIP) has been in place for five years and is generally accepted as the 'face' of digital within UHBristol. This relationship will be leveraged for GDE, so we will add a supplier, NHSE/D and Connecting Care representative to the CSIP Board to ensure broad governance.

Operational liaison between the overall Trust CSIP projects is conducted at the level of the Trust's Service Delivery Group (SDG), which advises and takes communication responsibility for all matters relating to the day-to-day running of the Trust. So, for example, SDG is consulted with regard to system go-live dates, planned downtime and fundamental changes to systems and software, ensuring that the business is kept up to date with

8.1 Programme Assurance

Under the leadership of the Programme Director, the Clinical Systems PMO will take primary responsibility for GDE programme assurance, detailed tracking, progress reporting and liaison with other partners. The PMO has successfully managed this process for five years and has a reputation for ensuring that process is followed correctly. For GDE, we expect to engage an external party to provide stand-off, independent assurance and will seek assistance from NHSE in appointing to this function.

8.2 Procurement

As a strategic partner, System C's contract with UHBristol was constructed to include requirements and contract options that encompass the objectives of GDE and will allow us to procure appropriate services from their existing portfolio. System C understands the financial constraints and delivery requirements of the programme and has undertaken to agree a contract to that effect. Similar arrangements exist for other supplier partners who have responsibility for specialist modules e.g. anaesthetic charting, although technology-only components will be sourced be mini-competition via framework agreements.

9 Risk Management

There are risks associated with participation in the GDE programme. A draft risk plan has been prepared (Appendix C) which will be the subject of a detailed risk workshop at the outset of the programme to examine areas of risk in greater detail, define containment options and assign risk owners and escalation points.

It is noted that the majority of these risks relate to failures in stakeholder management, highlighting the importance of strong resourcing from the outset. The Trust will be required to increase its programme staffing level and up-skill existing staff to cope with the significantly increased and broadened workload. Whilst we will benefit from the presence of a standing deployment team from System C, the primary risk is still that of not progressing quickly enough and therefore failing to achieve the objectives within the agreed timescales. This could even lead to loss of the final milestone payment.

Containment of all risk will be agreed by the programme board at the outset and reviewed regularly. The ambitious pace of the programme indicates that some risks may be realized more quickly than usual, so a more frequent review cycle may be required.

At the time of writing there are no issues associated with the programme other than the tight timescales for preparation and agreement of materials for due diligence.

10 Technical matters

10.1 Servers and storage – the infrastructure

This programme features a key departure from UHBristol's previous approach to the procurement of information systems by deploying all core product functionality from a fully-managed cloud service such as Microsoft's Azure. This approach involves a switch from the usual capital-based spend to a service revenue-based spend, so there may be constraints on our rate of cloud uptake as we refresh existing infrastructure. However, many cloud services are now amenable to the stringent NHS connection requirements and it is inevitable that the trend towards outsourcing computer servers and storage infrastructure will continue, progressively reducing the need for in-house resource.

10.2 Interoperability and security

System C is a member of TechUK, the representative professional body for health informatics suppliers, and has signed up to TechUK's Charter, which includes a commitment to open up appropriate parts of their systems to access by structured APIs to allow flexible interchange of information between systems. This is an increasingly important factor in the marketability of commercially available systems and System C will recognize this as they seek to roll out the new products and functions across their existing user base.

Similarly, System C has committed to make all user-provided data elements within its solution available for analysis, near-real-time insight at the point of care, and export to other systems where appropriate.

Through the Connecting Care Partnership, UHBristol has established a clear governance pathway for managing information-sharing across its partner organizations. This enables us to respond rapidly and positively to the changing sharing and consent needs of the health and care landscape. UHBristol and the Connecting Care Partnership have committed to implementation of the data security standards emerging from the latest National Data Guardian Review. UHBristol's Information Risk Management Group is a key part of the governance structure around our existing Clinical Systems Programme and will continue to perform this role for GDE.

10.3 Software licensing and Browser Technology

A requirement of GDE is that the Trust will have "no unsupported operating systems, software or internet browsers used within the IT estate". The IM&T department has made particular effort in this regard over the last year and we are confident that by the end of 2016 we will be compliant in terms of internet browsers with, literally, only isolated instances of obsolete operating systems, which are being progressively phased out as quickly as possible.

With the failure of the NHS to address the problem of Microsoft's hold over our licensing position, we intend to conclude an Enterprise-Wide Agreement with Microsoft early in 2017. One significant exception to our relatively clean record of using only supported software to reduce the risk of cyber attacks or mishaps is the Trust-wide SharePoint farm, Connect. This is now operating on obsolete versions of software and it is our intention to address this during mid-2017.

10.4 Cyber-security

UHBristol has a small but active cyber-security team comprised of the Information Systems Security Manager and an assistant. They are responsible for advising the Trust on cyber-security issues, risks and mitigation; both have completed CISSP training and are in the process of studying for the CISSP qualification. In addition, both are certified ethical hackers so are in a good position to prevent threats affecting UHBristol's systems.

The Information Systems Security Manager, on behalf of the trust, is a participant in the CERT UK – Cyber-security Information Sharing Partnership (CiSP) which is managed by the National Cyber Security Centre and allows members from different sectors and organisations to exchange cyber threat intelligence.

Through its cyber security team the trust has registered to participate in the early adopters' scheme for CareCert. In addition to receiving and disseminating regular bulletins, the programme will shape new services; assure, knowledge and react, which will enhance our defence and response to ensure cyber-readiness. The cyber team has already invited neighbouring organisations including SWCSU, Bristol City Council and North Bristol NHS Trust to convene a local intelligence-sharing group to assist and support each other in the event of an attack.

Internally, the Information Systems Security Manager is a member of the Trust's Information Risk Management Group (IRMG); the group has at least two board level executives as members, one of whom chairs the group. Participation in the IRMG maintains the boards' engagement with cyber risk.

The cyber security team is working to adopt the Ten Steps to Cyber Security, which is an all-round approach to cyber-security as recommended by the Communications Electronic Security Group (CESG) and the Cabinet Office. A User-awareness campaign is underway and additional training is planned. A number of documents have been submitted through the IRMG targeting ransomware and cyber-crime specifically. Infographic posters are being designed for distribution around the trust to make potential threats more visible and raise staff level of alert.
We have registered with the South West Regional Cyber Crime Unit, who are also members of CiSP, to receive weekly briefings on local threat intelligence. The briefing Information is distributed to Trust users so they become aware of actual incidents that have occurred within the region.

Internal devices on the trust network (servers, PC builds, network equipment and medical devices, etc.) are subjected to vulnerability testing to evaluate potential threats against the Common Vulnerabilities and Exposures (CVE) reference data. We then work with system owners to eradicate or contain the risk.

The cyber security team has created a group which is made up of IT staff and engineers from MEMO, which is responsible for the maintenance of medical devices. The focus is to identify vulnerabilities with networked medical devices and mitigate against threats. The group liaises with medical device manufactures to encourage them to take cyber-threats more seriously.

A cyber incident and response plan is being developed to complement the existing disaster recovery capability. The Information Systems Security Manager is also a certified member of the Business Continuity Institute.

11 Supplementary information

Supplied as accompanying attachment to email.

Appendix A – The Financial Model (UHBristol GDE Financial Model 1.0.xls)
Appendix B – The Delivery Plan (UHBristol GDE Outline Plan V0.1.xls)
- Tab A – Requirements Map
- Tab B – Tech Deployment Plan
- Tab C – Primary Milestones
- Tab D – Milestones by functional theme

Appendix C – GDE Risk Plan (UHBristol GDE Risk Plan 1.0.pdf)
Appendix D – GDE Expression of Interest (UHBristol EOI Final.pdf)