NHS Scotland eHealth Applications Strategy

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eHealth – Architecture and Design – Application Strategy 2  
Objective: C234 8788 5.0
Executive Summary

Introduction

1. This document sets out the eHealth Applications Strategy for NHS Scotland. It directly supports the eHealth Strategy 2011-17 and is owned by the eHealth Strategy Board. It is part of a framework of other supporting strategies and its purpose is to provide direction and support for the key decision makers and planners in NHS Scotland. This includes in particular the eHealth Programme Board, eHealth Leads, Portfolio Management Groups and their supporting senior managers.

Background

2. The current eHealth applications landscape is highly complex and is characterised by numerous and diverse local applications, a few national products for local use and a few nationally shared systems. There is a wealth of information in supporting databases which remains difficult to share outside the scope of an application. This creates challenges around maintaining data consistency and cost of holding multiple data copies.

3. Under the previous eHealth Strategy 2008-11 activity was started to reduce this complexity. Technology was acquired for Boards to enable greater integration, and appropriate governance was put in place to ensure a consistent and joined-up approach to delivering outcomes. This strategy sets out a framework, supported by some agreed principles and describes four key drivers that will deliver the aims of the eHealth Strategy 2011-17.

4. There has been three years of investment in eHealth applications directly from the eHealth Programme and also from local Board budgets. This has covered business as usual as well providing the means for developing and procuring new solutions. For the period covered by Spending Review period (2011-15) the eHealth Programme budget has been considerably reduced from previous levels, and is flat for the period. There is no capital budget for the period, so new requirements must be met from the reuse of existing assets and by the effective prioritisation of external and internal ICT services and resources.

Purpose

5. The Strategy recognises a continuously changing world where the delivery of the quality ambitions of NHS Scotland will inevitably lead to citizens being provided with new and more sophisticated ways to connect electronically to services provided by NHS Scotland. New technology solutions will need to be put in place in order to enable service reconfiguration and provide a high quality of care - and, of course, this needs to happen at the same time as there is pressure on public finance and a growing demand on NHS Scotland resources.

6. This Strategy provides a means of reducing cost and providing more flexibility to meet organisational challenges. It will enable demands from new business initiatives to be met with a timely response and avoid new expense by exploiting assets that have already been acquired. Incremental convergence around
common systems and approaches will be the means to make collaboration easier, make information more accessible, increase value for money, improve efficiency and simplify maintenance.

7. The strategy provides guidance on how to spend within existing resources and what can be done to avoid future cost. It works within the parameters set out by the Finance Strategy and within local funding capacity.

8. The Strategy is also a reflection of one of the key principles in NHS Scotland of ‘Re-use before buy’ and ‘Buy before build’. It looks at ways to avoid buying new applications, the potential transfer from in-house developments towards commercial products, and adds to procurement guidance.

**Strategic Drivers**

9. This will be achieved by Boards applying the four key drivers that underpin this Strategy, namely **Rationalising**, **Extracting More Value**, **Building Flexibility**, and **Choosing strategically**. These are not new concepts, and NHS Scotland already adopts aspects of these when taking key decisions around applications. The strategy expects Boards to define targets using these drivers and report achievement against them in their annual eHealth Delivery Plan.

10. This Strategy recognises that the existing estate provides value to the health service. This Strategy therefore is not a prescription of a rip and replace approach. Boards will continue an incremental path towards the targets in this Strategy by taking into account their local context and desired outcomes.

**Rationalising**

11. This is the main contributor towards convergence and is aimed at releasing cash savings.

12. Rationalisation means that action will be taken to reduce duplication of line-of-business applications, to reduce copies of data, to reduce the complexity of integration, and to re-engineer national applications.

13. This recognises that to achieve convergence the established eHealth governance structures around the approval of business cases will have a vital role to play. The existing standard eHealth categorisation of applications ¹ will be a key instrument of that governance.

**Extracting more value**

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¹ The eHealth Strategy 2008-2011 defined these categories as

- **A**: National – mandatory implementation across NHS Scotland - All NHS Boards will participate in a nationally defined and agreed roll-out programme
- **B**: National – choice as required - NHS Boards will adopt the software application if and when functionality is required, or when existing alternative licence expires
- **C**: Local - full choice.
14. This is the main contributor towards exploiting existing assets and is aimed at enabling new business needs in a timely way whilst avoiding buying or building new systems.

15. Extracting more value means that when there is new demand for an eHealth solution then the first thought will be how this can be delivered through various forms of reuse. What needs to be avoided is the procurement of a new product, a new code development, even developing extensions to an existing application.

**Building flexibility**

16. This supports convergence and reuse and is aimed at reducing the cost of change.

17. Building flexibility means putting in place information services that allow information sharing with third parties without needing to provide full end-to-end solutions. This also provides independence from underlying applications, increasing local ability to make changes with minimum impact.

18. It places a discipline on those developing and deploying applications to take a wider view on who might benefit from access to the information and how it might be used. Information exchange with other Boards, with partner organisations and with the people of Scotland will effectively take place on the basis of nationally agreed specifications and by avoiding the provision of new NHS software, equipment and network connections.

**Choosing strategically**

19. This is aimed at ensuring value for money over the lifetime of an application. It applies when choices need to be made in the course of rationalisation and also recognises that sometimes it is inevitable that new products will need to be introduced.

20. Choosing strategically means that more attention will be paid to non-functional requirements during procurement and other options evaluation in order to avoid applications that are barriers to information exchange and/or turn out to be expensive when they are impacted by business and technical change.

**Making it happen**

21. Implementation of this strategy requires that the NHS Scotland Health Boards will integrate it into a number of core business as usual processes and work towards a set of targets as set out below. These will be integral to local and national eHealth governance.

22. Boards created a set of eHealth Plans at the end of 2011. It is not required that these will be reworked as a result of this strategy. In fact, the review of the plans indicates that Boards already intend to move in the desired direction. It is future submissions that will need to take more detailed recognition of the strategy.

**Adding to Board eHealth Plans**
23. A Short Life Working Group will be formed and tasked to revise the list of category A and B applications and to plan the roadmap for national products and shared systems by January 2013. The goals of this plan will be to increase strategic fit of the estate and release efficiency savings from April 2014 onwards.

24. Each Board will set out plans for the implementation of any agreed national applications and for the delivery of the benefits as set out in national and local business cases. In particular, eHealth Plans will state when and how a Board will transition to category A and B applications.

25. Each Board will incorporate in their eHealth Plan an assessment of the number and diversity of applications in use in their organisation. This will be accompanied with plans for rationalisation and convergence of this position at local level.

26. Each Board will also set out plans for increasing co-operation with other Boards in relation to applications and intentions to share applications in accordance with rationalisation/convergence objectives and shared services.

27. As part of approval cycles for eHealth Plans, in addition to feedback as part of developing these Plans, the eHealth Design Authority will provide advice to the eHealth Strategy Board (or delegated bodies) such that there is an informed view of how well a given plan aligns with the four strategic drivers set out in this strategy.

   Improving business as usual

28. Each Board will incorporate an assessment of the four strategic drivers and the principles behind them into their local business case approval process by August 2012. If required, the eHealth Design Authority can work in partnership with Boards to develop specific guidelines for local approval processes.

29. The eHealth Design Authority will work with NHS Boards and NISG Procurement to reflect this strategy in procurement guidance by January 2013.

   Investing in the future

30. A Short Life Working Group tasked to specify a baseline of information exchange services has now completed its work. When approved, all Boards will implement these specifications so that from April 2014 they are in a position to consistently provide access to the priority information set for clinical portals.

31. By April 2013, all Boards will deploy an instance of the national integration and workflow tool, or agree to share an instance with another Board, as an enabler for this strategy and for the national Architecture Vision.
Introduction

This strategy as part of a framework

32. The strategy is part of an agreed strategic framework for the future direction for eHealth in NHS Scotland (see figure 1).

33. The strategic agenda for healthcare services in Scotland is set by the *Healthcare Quality Strategy for NHSScotland*\(^2\). This is the overarching strategic context for the direction, development and delivery of healthcare services for the years to come both in terms of securing quality improvements and in achieving the necessary efficiencies.

34. The *Quality Strategy* and other national initiatives such as the Patient Safety Programme\(^3\) provide the policy context for *eHealth Strategy 2011-17*\(^4\) and its focus on the strategic eHealth aims.

35. This document fully supports that strategic agenda and sets out the strategy for the applications estate of NHSScotland for the period of 2012-2017. It will support planning, provide a reference to assess business cases and to inform decisions by eHealth governance bodies at local and national level.

36. Most of the principles in this strategy are already being applied in some form and some place within NHS Scotland. Examples are provided in the discussion of the main strategy.

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\(^2\) [http://www.scotland.gov.uk/Publications/2010/05/10102307/8](http://www.scotland.gov.uk/Publications/2010/05/10102307/8)

\(^3\) [http://www.scottishpatientsafetyprogramme.scot.nhs.uk/programme](http://www.scottishpatientsafetyprogramme.scot.nhs.uk/programme)

The requirements of NHS Scotland

37. The current clinical and business environment in NHS Scotland requires eHealth to deliver applications which support core services and enable the quality ambitions of the service during austere financial times.

38. This is not only about improving how current services are provided but also includes structural changes, due to changing demographics and citizens’ expectations. There is a need to be prepared and respond well to new demand.

Progress so far

39. Under the previous eHealth Strategy 2008-11 activity was started to reduce the complexity of the eHealth estate. Technology was acquired for Boards to enable greater integration and appropriate governance was put in place to ensure a consistent and joined-up approach to delivering outcomes.

40. There has been three years of investment by the eHealth Programme and from local Board budgets in eHealth applications. This has covered business as usual as well providing the means for developing and procuring new solutions.

41. For the period covered by Spending Review period (2011-15) the eHealth Programme budget has been considerably reduced from previous levels and is flat for the period. There is no capital budget for the period, so new requirements must be met from the reuse of existing assets and the effective use of external and internal ICT services and resources.

The impact of global trends
42. Global trends\(^5\) suggest that the future applications landscape will be characterised by more variety in which information is accessed by the general public and by NHS staff. Mobile devices are becoming increasingly popular in the private life and in the workplace. Services provided over interactive TV are on the rise. There are already early signs in NHS Scotland that future applications will need to be delivered through several different types of devices and channels\(^6\) which will bring a whole new wave of mobile ‘apps’.

43. Telehealth services are recognised in the eHealth Strategy as being a likely part of the response to the current population challenge. The implementation of the required technology will see a new pattern of information exchange between the NHS and devices in people’s home and on the move.

44. There are a range of other emerging technology trends that vendors will be exploring and turn into offerings to NHS Scotland, such as Cloud computing. Guidelines will need to be developed continually in order to assess these trends, and to determine where they best fit within the overall eHealth strategy.

Doing some things differently

45. NHS Scotland invested substantially over many years in an application estate to meet its needs. Cornerstone applications such as SCI Store, ECS and SCI Gateway yield valuable services to the NHS. At the same time, NHS Scotland now has new toolsets and products available which offer alternatives to delivering information and messaging services. Potentially, existing services can be re-designed and delivered in more efficient ways.

46. In addition, NHS Scotland eHealth has to expect an increase in the number of parties who want to exchange information. This is combined with end-user assumptions that their preferred front-end technology will be supported.

47. Gartner research\(^7\) estimates that for an application that is owned over 15 years, the cost of going live is on average 8% of the lifetime total cost of ownership. Business and technical change is therefore an important fact of life for an application that needs to be anticipated and reflected in the design in order to contain the cost tail.

48. The strategic response to this is to extend the design idea behind clinical portals - joining of a complex series of products and services which work together to provide an outcome\(^8\). It is not sustainable to respond to each set of new requirements with buying or developing a new tailored application. Instead, applications will increasingly be assembled from components and re-assembled in a different way when requirements change. This means that user expectations and supplier relationships need to change.

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\(^6\) For example, the adoption of a clinical application on the iPad in NHS Dumfries and Galloway, the provision of knowledge at the point of care through mobile applications from NHS Education for Scotland, and the delivery of health information and transactions through interactive digital TV by NHS 24.


\(^8\) Plummer, D. C. and Hill, J. B. (2009) *Composition and BPM Will Change the Game for Business Systems Design*, Gartner Research, Id Number: G00173105
**Scope**

49. The strategy builds on the nationally agreed eHealth Architecture Vision and its associated Architecture Principles and Standards. It describes a way of translating the ideas in these documents into application convergence, reuse, better use of funds and delivery of eHealth Strategy aims.

50. Applications for the purpose of this strategy is software that provides end-user functionality to support clinical and business functions. In the NHS this can be a wide range of clinical software aligned to clinical disciplines and patient management as well as software that supports common business functions such as HR and Finance. The following section contains a wider discussion of different types of software.

51. The Applications Strategy is derived primarily from an analysis of key clinical applications used in NHS Scotland organisations and conclusions were generalised into an approach that covers all clinical and administrative applications.

52. The strategy covers information in the sense that it takes a view on data holdings. It re-emphasises the national architecture vision of separating data, logic and presentation into separately re-usable and exchangeable components. This is a departure from historical approaches of placing the whole application into a single unit which can inhibit flexibility and can create unnecessary duplication.

53. The areas where the strategy intends to drive change towards this layered architecture is where components can be combined to form new solutions, such as clinical portal, and where NHS Scotland owns products and therefore has the ability to reshape them, such as the intention to withdraw the built-in user front end to ECS at some stage.

54. A time horizon of 6 years (to 2017) was selected in order to be aligned with the horizon of the latest eHealth Strategy. This period also captures the length of several current national contracts and reflects the incremental development principle which means that some strategic changes will take a long time to come about.

55. During this length of time it is likely that business and technology change will occur in such a way that the strategy needs to be reviewed and updated. This will be carried out as and when such change is identified.

**Software definitions**

56. The following provides definitions for the various types of software that this strategy refers to.

57. **Applications software** provides end-user functionality to support clinical and business functions. In the NHS this can be a wide range of clinical software aligned to clinical disciplines and patient management, software that supports common business functions such as HR and Finance, and general productivity software such as office suites and collaboration tools.

58. **Middleware software** provides services for applications to communicate and to construct distributed applications. In this strategy this translates to the national
integration and workflow tool as a key enabler to increase interoperability and re-use.

59. *Infrastructure software* is a layer of generic software that provides services for end-user applications. It includes operating systems and database management software. This type of software is the domain of the Infrastructure Strategy.

60. *Individualised software* is a custom development for a single customer though a commissioned project. Usually this is referred to as bespoke or ‘built’ software.

61. Individualised software has the advantage that it can be tailored closely to requirements, but also means that the customer bears the full development cost and subsequent maintenance costs. This makes it relatively expensive and NHS Scotland has a declared intent to avoid this type of software.

62. *Standard software* is produced for a larger market and usually referred to as ‘commercial off the shelf’ or “COTS”. This software could be bought by paying a licence fee. Economies of scale for the provider mean that this tends to be less expensive than individualised software. In the case of open source the license is in fact free. However, the approach also means that the software can contain features that are not required or miss features that are desirable.

63. Where no reuse alternative exists, NHS Scotland seeks to move towards deploying standard software because of the expected cost advantage.

64. Projects can contain a mix of re-use and buy as well as configuration and bespoke coding to extend on the features that are readily available. In such cases the overall balance of these elements needs to be carefully evaluated so that the advantages of re-use and buy are not diluted too much by introducing the characteristics of individualised software again. Even in the case of configuration from within product options, consistency of business practice can avoid significant cost where different parties adopt the same underlying product.
Strategy

Vision
65. The vision of this strategy is to arrive at an application estate that shows minimal duplication and an application delivery approach that is quick, flexible and cost-effective.

66. There will be fewer products overall in NHS Scotland due to a rationalisation effort. Those products that are retained or adopted will be better suited to support technical and business change at affordable cost.

67. There will be even more emphasis on reuse in order to meet business needs. Future applications will increasingly be delivered by combining existing applications in new ways.

68. Increased interaction between the NHS and external parties will be addressed by dividing responsibilities. NHS Scotland will focus on delivering information rather than a multitude of user front-end applications.

Delivering outcomes in eHealth Plans and business as usual
69. An outcomes framework was developed with the NHS Scotland Boards that reflects how the aims of the eHealth Strategy 2011-2017 will be achieved to deliver outcomes. This resulted in a template for NHS Board eHealth Delivery Plans.

70. Each Board will create a plan that reflects its local starting point, priorities and financial situation.

71. In addition to delivering the aims of the eHealth Strategy, the Boards have an ongoing need to make efficiency savings, arrive at sustainable revenue consequences and simplify day-to-day operational management. There will also be a need for timely delivery of solutions and good supporting relationships with suppliers, either to achieve strategic aims or simply to provide continuity for existing business.

72. The strategy provides guidance on how to spend within existing resources and what can be done to avoid future cost. It works within the parameters set out by the Finance Strategy and within local funding capacity.

73. Implementation of this strategy as part of delivering overall outcomes requires Boards to integrate it into a number of business as usual processes and work towards a set of targets. Some of these will require collaboration through consortia as well as through established regional and national groups.

74. Appendix B shows a summary of how this strategy maps to the strategic aims and the overall business as usual need, as well as a summary of touch-points with business as usual processes. Specific targets were added into the following sections and highlighted in bold.

75. Each Board will incorporate an assessment of the four strategic drivers and the principles behind them into their local business case approval process by
August 2012. If required, the eHealth Design Authority can work in partnership with Boards to develop specific guidelines for local approval processes.

76. As part of approval cycles for eHealth Plans, in addition to feedback as part of developing these Plans, the eHealth Design Authority will provide advice to the eHealth Strategy Board (or delegated bodies) such that there is an informed view of how well a given plan aligns with the four strategic drivers set out in this strategy.
Rationalising

77. This is the main contributor towards convergence and is aimed at releasing cash savings.

78. Primarily this will address the significant degree of duplication that NHS Scotland still has in its line-of-business applications whereby different solutions are in use in different Boards to meet the same objective.

79. Maintaining copies of data and a complex web of integration is another challenge that some Health Boards want to address by simplifying their estate.

80. There is also a noticeable overlap of functionality across some national applications which are currently maintained as separate products. This suggests an opportunity for re-engineering in order to realise efficiency savings and to create a means to deliver new business initiatives in a quicker and more cost effective manner.

81. Rationalisation means that action will be taken to reduce duplication of line-of-business applications, to reduce copies of data, to reduce the complexity of integration, and to re-engineer national applications.

82. The ‘Choosing strategically’ driver in this strategy will have a bearing on rationalisation where it involves choosing amongst competing options.

83. In order to achieve convergence the established eHealth governance structures around the approval of business cases will have a vital role to play. The existing standard eHealth categorisation of applications will be a key instrument of that governance.

84. There are three long standing categories of eHealth service or system in NHS Scotland:

- **A. National – mandatory implementation across NHS Scotland** - All NHS Boards will participate in a nationally defined and agreed roll-out programme.
- **B. National – choice as required** - NHS Boards will adopt the software application if and when functionality is required, or when existing alternative licence expires.
- **C. Local - full choice.**

85. Examples from the current list of applications are set out below.

<table>
<thead>
<tr>
<th>Category A</th>
<th>For example: GP IT framework, Emergency Care Summary, SCI Store, SCI Gateway, National CHI, Picture Archiving and Communications System framework, Payroll</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category B</td>
<td>For example: Patient Management System framework, Accident &amp; Emergency framework, Theatres framework</td>
</tr>
</tbody>
</table>

86. This list, along with the annual IT planning framework and the architecture and applications strategies is the framework within which Boards choose and participate in the choosing of new IT solutions. It is used by eHealth governance, the eHealth Division, eHealth Leads, eHealth Clinical Leads, the eHealth Programme Board,
87. This list has not been reviewed for some time nor have future roadmaps been created to deal with the development of new solutions and the retirement of others.

88. **A Short Life Working Group will be formed and tasked to revise the list of category A and B applications and to plan the roadmap for national products and shared systems by January 2013. The goals of this plan will be to increase strategic fit of the estate and release efficiency savings from April 2014 onwards.**

89. **Each Board will set out plans for the implementation of any agreed national applications and for the delivery of the benefits as set out in national and local business cases. In particular, eHealth Plans will state when and how a Board will transition to category A and B applications.**

90. **Each Board will incorporate in their eHealth Plan an assessment of the number and diversity of applications in use in their organisation. This will be accompanied with plans for rationalisation and convergence of this position at local level.**

91. **Each Board will also set out plans for increasing co-operation with other Boards in relation to applications and intentions to share applications in accordance with rationalisation/convergence objectives and shared services.**

Examples:

The initial implementation of a recently procured patient management system will rationalise the diversity of such systems from 11 different products across the 14 Health Boards down to 7. There is potential for further convergence through additional Boards adopting the same category B product.

NHS Ayrshire & Arran seeks in future to source information directly from their patient management system where currently a copy of data from SCI Store is used.
**Extracting more value**

92. This is the main contributor towards exploiting existing assets and is aimed at enabling new business needs in a timely way whilst avoiding to buy or build new systems.

93. Historically it was often the case that a new set of requirements was matched with a new application silo. Even when existing assets are reused, there is usually some dilution of the idea by adding bespoke developments (‘build’) or by effectively taking a code copy to create a new standalone product. In the current financial environment it is becoming increasingly difficult to continue with those practices. Using revenue funds to pay for a service that is already in place instead of using capital to own a new asset is now more attractive.

94. Extracting more value means that when there is new demand for an eHealth solution then the first thought will be how this can be delivered through various forms of reuse. What needs to be avoided is the procurement of a new product, a new code development, even developing extensions to an existing application.

95. Reuse includes taking solutions from existing contracts or taking services that are shared by other Health Boards. It also includes breaking the mould on how we think about applications.

96. Modern technology and design approaches mean that new applications can be assembled by connecting existing components in a new way. NHS Scotland started on this road with clinical portal deployments. There is an opportunity to go much further by thinking about the workflows behind a set of requirements. A co-ordinating engine could move information and tasks between applications that people already use. NHS Scotland made an investment in such an engine when it adopted its national integration and workflow tool.

**Examples:**

If a Patient Administration System requires replacement then there will already be a preferred (Category B) national contract for that. This contract also contains a wide range of module options. Some of these are part of the main suite. Some are standalone products.

Clinical portals are simple examples of delivering new applications by connecting relevant parts of existing systems.
Building flexibility

97. This area of activity supports convergence and reuse and is aimed at reducing the cost of change.

98. There is currently significant variation in the systems that are chosen by Boards to hold patient information. This makes it difficult to share information with external parties. At the same time the demand for information sharing is set to increase given the eHealth strategic aims of care integration and more electronic access to the NHS for the people of Scotland.

99. Building flexibility means putting in place information services that allow information sharing with third parties without needing to provide full end-to-end solutions. This also provides independence from underlying applications, increasing local ability to make changes with minimum impact.

100. Information exchange with other Boards, with partner organisations and with the people of Scotland will effectively take place on the basis of nationally agreed specifications and by avoiding the provision of new NHS software, equipment and network connections.

101. These specifications effectively form contracts of interaction between parties and need to cover technical interoperability as well as semantic interoperability (preserving the clinical meaning of information).

102. This approach will, for example, enable the cost-effective delivery of:

- Cross-border information sharing through clinical portals
- Integration of social care and health care providers external to the NHS through web forms or their own preferred applications
- People being able to access the NHS electronically through PCs, portable devices and interactive TV
- Mobile ‘apps’
- Improved management information

103. Boards will use the national integration tool to place the complexity of their estate behind this common set of familiar interfaces which means that they can enable the delivery of new solutions independently from local plans for their estate.

104. A Short Life Working Group tasked to specify a baseline of information exchange services has now completed its work. When approved, all Boards will implement these specifications so that from April 2014 they are in a position to consistently provide access to the priority information set for clinical portals.
By April 2013, all Boards will deploy an instance of the national integration and workflow tool, or agree to share an instance with another Board, as an enabler for this strategy and for the national Architecture Vision.

Examples:

The NHS Ayrshire & Arran patient portal demonstrator was built with a layered architecture that included information exchange services. Using these services it was straightforward to add a mobile version of the portal interface to the demonstrator later on.

NHS Greater Glasgow & Clyde, NHS Tayside and NHS Ayrshire & Arran are working on mechanisms to deliver electronic discharge letters. The national integration tool is used to obtain discharge letter information from a variety of local systems. This is then converted to a standard format for use in SCI Store web services and/or EDT (Electronic Document Transfer).

In the case of management information the integration applications would tap into a collection of disparate systems and translate information into a common format before it is consumed in management information tools. The data definitions should be nationally agreed so that information is consistent and comparable across NHS Boards.
Choosing strategically

106. This area of activity is aimed at ensuring value for money over the lifetime of an application. It applies when choices need to be made in the course of rationalisation and also recognises that sometimes it is inevitable that new products will need to be introduced.

107. Current mechanisms for choosing an application place most weight on functional requirements and relatively little on non-functional requirements. This can lead to a number of situations at a later time where Boards find applications that are closed to information exchange and/or turn out to be expensive when they are impacted by business and technical change.

108. Choosing strategically means that more attention will be paid to non-functional requirements during procurement and other options evaluation in order to avoid such difficulties. Particular emphasis will be given to requirements generated by related strategies such as the Infrastructure Strategy and Information Assurance Strategy, openness for reuse and a flexible design that avoids cost of change.

109. The eHealth Design Authority will work with NHS Boards and NISG Procurement to reflect this strategy in procurement guidance by January 2013.

Examples:

In 2011, the National Infrastructure Group issued guidance about the roadmap for browsers on NHS Scotland desktops. A strategic product choice will ensure that these browsers are supported by the vendor roadmap in order to avoid future incompatibilities or bespoke development cost.

The Information Assurance Strategy refers to a software package that NHS Scotland introduced to assist with system audit of staff activity. This generates a requirement for applications to be able to provide their audit logs for analysis.

The procurement of a national Patient Management System in 2009 included requirements for the system to provide an ‘open access’ approach to interfacing. As a result it was then possible to make information available in the clinical portal of the Southern Boards Consortium relatively easily.
Conclusions

110. This Applications Strategy for NHS Scotland is provided as a contributing part of an overall strategic framework for eHealth to support the delivery of person centred, effective and safe care for the people of Scotland.

111. It is aligned to its parent strategy, the eHealth Strategy for 2011/17, the principles of the McClelland review⁹, and also reflects the current Finance Strategy.

112. The strategy covers software that provides end-user functionality to support clinical and common business functions such as patient management and HR.

113. It recognises a very challenging situation for eHealth which is affected by external trends and the quality ambitions of the wider service whilst at the same time having to work under increasing pressure on public finance.

114. It translates familiar principles such as convergence and reuse and the eHealth Architecture Vision that was agreed previously into a framework for how to deal with the acquisition, development and support applications.

115. Four drivers are defined as the essence of this strategy: Rationalising, Extracting more value, Building flexibility, and Choosing strategically. A set of actions are defined to provide specifics on measuring progress.

116. All of these activities and actions are already being taken forward in some form and some place within NHS Scotland.

117. What is needed now is for Boards to move more comprehensively in that direction and integrate the strategy into business as usual through their local eHealth Plans and collaboratively in consortia as well as established regional and national groups.

⁹ Appendix C summarises this strategy’s alignment with the McClelland strategic principles.
### A. Appendix – Mapping to eHealth Strategy

<table>
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<th>eHealth Strategic aims</th>
<th>Outcome measure</th>
<th>eHealth Strategic targets</th>
<th>Applications Strategy contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>To maximise efficient working practices, minimise wasteful variation, bring about measurable savings and ensure value for money</td>
<td>Working practices are more efficient</td>
<td>By 2014 NHS Boards will have well established programmes to replace paper with digital equivalents, along with digital dictation, voice recognition, scanning and video conferencing.</td>
<td>Programmes to replace paper and increase the electronic transfer of information will probably require some new solutions and a flexible way to retrieve documents. <strong>Extracting more value</strong> from existing components should be considered. For any new products the guidelines from <strong>Choosing strategically</strong> apply. <strong>Building flexibility</strong> in form of information services should provide the means to access electronic documentation that used to be on paper.</td>
</tr>
<tr>
<td>To support people to communicate with the NHSS, manage their own health and wellbeing, and to become more active participants in the care and services they receive</td>
<td>People have the option to communicate electronically with NHS Scotland People are better able to manage their own health and well being and are more active participants in the care and services they receive</td>
<td>By 2014, the eHealth Programme will have developed a national strategy covering the range of electronic contact that individuals have with NHSS. This will provide a coherent and citizen centred framework for these Developments. By 2014, a national strategy to guide further work in this area will have been developed and agreed.</td>
<td>In its national strategy NHS Scotland should consider building an access gateway to the NHS through the approach explained under <strong>Building flexibility</strong>. This would provide a foundation for a variety of channels and applications which will probably be required to serve the diverse needs and preferences of the public. Early solutions ahead of an overall strategic framework should rely on <strong>Choosing strategically</strong> and the reuse ideas from <strong>Extracting more value.</strong></td>
</tr>
<tr>
<td>To contribute to care</td>
<td>Care is better integrated</td>
<td>By 2014 a new health and social care IT strategy should</td>
<td>The health and social care IT strategy should</td>
</tr>
</tbody>
</table>
integrate, and to support people with long term conditions

| People with long term conditions are better supported | care IT strategy will have been developed in partnership with local authorities. This will have paved the way for improvements in information sharing between health and social care workers and greater integration of health and social care services, for people of all ages, across Scotland. By 2014 the ePCS and KIS will have been rolled out nationally across Scotland for those who need it. |
| | take into account how it will adopt the approaches described in **Extracting more value** and **Building flexibility** as a means to develop the solutions that share information. |

To improve the availability of appropriate information for healthcare workers and the tools to use and communicate that information effectively to improve quality

<p>| Healthcare workers have better access to the information they need | By 2014 we will have established an eHealth research and innovation advisory group. By 2014, the local use of information for quality improvements will be enhanced by the eHealth Programme developing a strategy for real time and near time performance data. By 2014 all territorial Health Boards will be using clinical portals (or electronic windows to information) and the priority information items agreed by clinicians will be available at the point of care. By 2014 work to implement an agreed Information Assurance Strategy |
| | The delivery of clinical portals in a strategic manner needs to rely on an information access layer that is introduced through <strong>Building flexibility</strong>. The same approach can support the gathering of management information and making it available in a consistent way. The Information Assurance Strategy includes the adoption of single sign on technology and privacy breach detection tools. These form key national infrastructure components that affects the choices made in <strong>Choosing strategically</strong> which also ensures that information is not locked into applications. |</p>
<table>
<thead>
<tr>
<th>To improve the safety of people taking medicines and their effective use</th>
<th>Medicines reconciliation is supported across all transitions of care. There is reduced variability in prescribing patterns and greater compliance with best practice guidelines. People are supported to take their medication appropriately.</th>
<th>By 2014 we will have enabled an accurate and up-to-date electronic medication summary to be available to the appropriate healthcare workers involved in a patient’s journey through the healthcare system.</th>
<th>An electronic medication summary will rely on the aggregation of data from multiple sources and perhaps a degree of Rationalising of existing data stores. In those cases where a Board wants to adopt a specialist prescribing application there are now reuse options under a national contract which allow Extracting more value.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To use information and technology in a co-ordinated way to provide clinical and other local managers across the health and social care spectrum with the timely management information they need to inform their decisions on service quality, performance and delivery.</td>
<td>As per eHealth Planning template</td>
<td>As per eHealth Strategy</td>
<td>Rationalising of existing data stores and an information access layer that is introduced through Building flexibility will support the gathering of management information and making it available in a consistent way.</td>
</tr>
</tbody>
</table>

Table 1: Achieving overall outcomes with the help of this strategy
<table>
<thead>
<tr>
<th>Outcome measure</th>
<th>Applications Strategy contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release of cash savings from local eHealth budgets</td>
<td>Some potential for Rationalising by reducing duplication of applications, reducing data copies and reducing the complexity of integration. Some of this could be achieved through a shared services approach amongst collaborating Boards.</td>
</tr>
<tr>
<td>Release of cash savings from national eHealth budgets</td>
<td>Rationalising by re-engineering some national applications and reducing data copies.</td>
</tr>
<tr>
<td>Shorter timescales to deliver new solutions</td>
<td>Extracting more value in various ways from what is already in place, avoiding procurement and time to deploy.</td>
</tr>
<tr>
<td>Sustainable revenue consequences</td>
<td>Rationalising and Choosing strategically in new procurements in order to arrive at affordable options.</td>
</tr>
<tr>
<td>Simpler operational maintenance</td>
<td>Convergence efforts through Rationalising and Building flexibility mean that there are fewer components to deal with overall.</td>
</tr>
<tr>
<td>Good relationships with suppliers</td>
<td>Choosing strategically selects products from forward-looking suppliers. Use of integration technology to manage lines of responsibility.</td>
</tr>
<tr>
<td>Improved clinical safety</td>
<td>Rationalising and consistency of information sharing as part of Building flexibility mean that there is less variation to be managed by clinicians.</td>
</tr>
</tbody>
</table>

Table 2: Achieving business as usual outcomes with the help of this strategy
B. Appendix – Touch-points with business as usual processes

<table>
<thead>
<tr>
<th>Process</th>
<th>Group/Organisation</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application portfolio management</td>
<td>Local Health Boards (via eHealth Leads), Portfolio Management Groups</td>
<td>To translate the strategy into more specific roadmaps</td>
</tr>
<tr>
<td>Business case development</td>
<td>Local Health Boards (via eHealth Leads), eHealth Programme Board, eHealth Strategy Board</td>
<td>Check business cases for compliance - supported with Design Authority reviews</td>
</tr>
<tr>
<td>Application procurement</td>
<td>Local Health Boards (via eHealth Leads) National procurement teams</td>
<td>To ensure that the scoring scheme adequately reflects requirements for a strategic choice and the impact of divergence is understood</td>
</tr>
<tr>
<td>Application development</td>
<td>Local Health Boards (via eHealth Leads) Portfolio Management Groups</td>
<td>Ensure maximisation of reuse, flexible design approaches and strategic choices – supported with Design Authority reviews</td>
</tr>
<tr>
<td>Supplier management</td>
<td>eHealth Leads</td>
<td>To communicate the strategy and influence product roadmaps – supported by Scottish Government Architecture &amp; Design</td>
</tr>
</tbody>
</table>

Table 3: Ensuring successful implementation
<table>
<thead>
<tr>
<th>Principle from the McClelland review</th>
<th>View from the Applications Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Although “information management” is a core activity it is not essential to operate totally self-</td>
<td>Out of scope as a principle about organising resources for the information management processes</td>
</tr>
<tr>
<td>sufficient local information processing, support and development.</td>
<td></td>
</tr>
<tr>
<td>The number of data centres and associated support should be minimised.</td>
<td>Out of scope as a questions of infrastructure</td>
</tr>
<tr>
<td>The shared hosting of common applications delivers ICT savings and central and regional plans open up</td>
<td>The overall principle is covered through a combination of Rationalising and Extracting more value</td>
</tr>
<tr>
<td>ICT and other shared business process service opportunities. The existing clusters of nearly common</td>
<td></td>
</tr>
<tr>
<td>applications should be built upon by selecting the best single application implementation and</td>
<td></td>
</tr>
<tr>
<td>associated business processes and then from there achieve a reconciling of and agreement on common</td>
<td></td>
</tr>
<tr>
<td>business processes so that the number of separately hosted instances can be rationalised and reduced.</td>
<td></td>
</tr>
<tr>
<td>A framework of oversight and governance for each part of the public sector and at an overarching</td>
<td>Recognised by suggesting that implementation will be integrated into existing planning and decision</td>
</tr>
<tr>
<td>national level is critical.</td>
<td>making mechanisms in eHealth.</td>
</tr>
<tr>
<td>Co-ordination of interaction with the ICT industry within each sector and at a national level is</td>
<td>Recognised by suggesting that implementation will be integrated into existing planning and decision</td>
</tr>
<tr>
<td>essential and will be beneficial.</td>
<td>making mechanisms in eHealth, including additional attention to supplier management.</td>
</tr>
<tr>
<td>Relationships with suppliers should have a stronger partnership element</td>
<td>Recognised by suggesting that implementation will be integrated into existing planning and decision</td>
</tr>
<tr>
<td></td>
<td>making mechanisms in eHealth, including additional attention to supplier management.</td>
</tr>
<tr>
<td>It should not be a given that investment in and ownership of ICT assets and capability such as</td>
<td>Supported in Extracting more value which seeks to avoid additional spend through smart reuse and</td>
</tr>
<tr>
<td>systems development is the norm and all avenues including investment avoidance and transaction/ usage</td>
<td>includes the option to adopt shared services.</td>
</tr>
<tr>
<td>based charging should be pursued.</td>
<td></td>
</tr>
<tr>
<td>Citizen services and data should be seamless and integrated across public sector and should specially</td>
<td>Supported in Building flexibility which has a mechanism to facilitate the sharing of information.</td>
</tr>
<tr>
<td>address the needs of the elderly, sick and other vulnerable groups which cross organisational</td>
<td></td>
</tr>
<tr>
<td>boundaries.</td>
<td></td>
</tr>
<tr>
<td>Most of the required ICT capability is specialised by sector yet there are vital national dimensions</td>
<td>Choosing strategically takes account of requirements that can be related to a wider picture than the</td>
</tr>
<tr>
<td>and cross-sector imperatives.</td>
<td>health sector. For example, future</td>
</tr>
<tr>
<td></td>
<td>desktop infrastructure and openness for integration.</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Order of merit should be</td>
<td>A principle that is reflected in Extracting more</td>
</tr>
<tr>
<td>to first reuse, then buy</td>
<td>value.</td>
</tr>
<tr>
<td>and build only as a last</td>
<td></td>
</tr>
<tr>
<td>resort. Existing initiatives and exemplars should be built upon and have their capabilities extended through free sharing with others.</td>
<td></td>
</tr>
<tr>
<td>New technologies and concepts be pursued especially where they can reduce investment and support other efficiency and sustainability goals.</td>
<td>Addressed in Extracting more value with a new approach to designing solutions.</td>
</tr>
<tr>
<td>The negative impacts of and positive opportunities from effective ICT on the environment should be addressed and pursued.</td>
<td>Out of scope as a question of data centre and network design as well as desktop infrastructure.</td>
</tr>
</tbody>
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Table 4: Mapping to the strategic principles proposed in the McClelland review
Configuration Management

Document Control

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<tr>
<td>Author:</td>
<td>Enterprise Architect – Applications: Thomas Buchendorfer Scottish Government eHealth Directorate, Architecture &amp; Design</td>
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eHealth Programme Approval

The issue of this document requires the approval of the signatories below on behalf of the Project Board.

Approved by: eHealth PET

<table>
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<tr>
<th>Name</th>
<th>Title</th>
<th>Signature</th>
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Approved by: eHealth Programme Board

Document History

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<td>26- June- 2012</td>
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Distribution

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