Office of Government Commerce

TITLE OF PROJECT

Delivering 21st Century IT Support for the NHS –
National Strategic Programme

Gate review: 0 – Strategic assessment
Status of report: Final

Review Date: 23rd June - 28th June 2002

Review Team:

<text redacted>

Delivering 21st Century IT Support for the NHS. Gate 0
Date held: 23rd June - 28th June 2002

Background

1. The National Strategic Programme is concerned with major developments in the deployment and use of Information Technology (IT) in the NHS. It aims to connect delivery of the NHS Plan with the capabilities of modern information technologies to:

    - support the patient and the delivery of services designed around the patient, quickly, conveniently and seamlessly;
    - support staff through effective electronic communications, better learning and knowledge management, cut the time to find essential information (notes, test results) and make specialised expertise more accessible;
    - improve management and delivery of services by providing good quality data to support NSFs, clinical audit, governance and management information.

2. The Plan focuses on the NHS but also takes forward parallel developments in Social Care IT so the two services can be integrated as local communities are ready.

3. The core of the strategy is to take greater control over the specification, procurement, resource management, performance management and delivery of the information and IT agenda. It intends to improve the leadership and direction given to IT, and combine it with national and local implementation based on 'ruthless' standardisation.

4. From April 2002 to April 2003 (Phase 0), before the significant additional levels of funding are available, the Programme will concentrate on developing the NHS IT management structure, capacity and capability. Data and data interchange standards will be defined, together with the essential system specifications for Phase 1. The key applications in Phase 1 are electronic records, booking and prescribing built onto an infrastructure that includes improving broadband capacity. All applications will be developed and implemented to national standard specifications.

5. The Plan is based on the assumption that the SR2002 bid provides a significant level of increased funding. The changes envisaged will require closer working with industry partners and a greater emphasis on national procurement arrangements. "Development partnerships" with a consortia of suppliers are likely to be needed. Each national procurement activity will be subject to Gateway procedures.

Purpose and conduct of the review

6. The purposes of the review was to consider the following areas;
    - Review the business need and identify whether it requires a project or a programme of projects.
    - Ensure that the project or programme is supported by users and stakeholders and contributes to the organisation's business strategy.
    - Review the arrangements for leading and managing the project or programme (and its individual projects).
    - Review the arrangements for identifying and managing the main project or programme risks (and in the case of a programme the individual project risks), including external risks such as changing business priorities.
    - Check that financial provision has been made for the project or programme and that plans for the work to be done through to business case justification (Gateway Review 1) for each procurement project are realistic, properly resourced and authorised. This should include the individual projects within a programme.

7. The Gateway 0 Review was carried out by:
<text redacted>
8. The review took place between 23rd and 28th June 2002.

9. The review team would like to express their thanks for all the help and co-operation they received from all those interviewed. Everyone without exception was extremely helpful and open during discussions. Their input was vital and they made the task of the review team easier. The team also thanks **<text redacted>** and **<text redacted>** for their exceptional support during the review.

Overall Conclusions

10. The time is clearly right for enhancing the IT capability of the NHS to help it deliver its challenging targets. The need for significant additional funding has been recognised. All the key stakeholders agree that a centrally managed approach is necessary as long as it is combined effectively with locally controlled implementation. A broad understanding has been established that the key building blocks of the programme are infrastructure, bookings, prescriptions and health records.

11. That these messages have been consistently, and often passionately, conveyed to the review team is a significant achievement and can be attributed to <text redacted>. The review team found widespread high regard for what <text redacted>as achieved so far and it is clear to the team that with him at the helm, the programme has a high level of credibility with the wider health service community, especially clinicians.

12. The primary issues for a Gate 0 review are funding, alignment to business strategy and senior management commitment and support. The review team found that the programme is sufficiently well covered on these issues.

13. The review team does, however, have significant concerns which will need to be addressed as the programme moves forward. These are summarised in the section below on "preconditions" and are explored in more detail in the main body of the report.

14. **The recommendations of the report are summarised in the sections that follow. They fall into three groups, as follows**:

- **Preconditions.** This section set out some broad thematic issues which recurred throughout the review and which can be identified in the more detailed recommendations.
- **High priority recommendations.** These reflect issues where, the review team believes urgent attention is needed. These issues will need to be addressed prior to any further Gateway review of the programme.
- **Other recommendations.** These reflect issues where there is scope for improvement. Where possible supporting advisory detail has been provided in annexes.

Preconditions

15. The following paragraphs set out the important cross cutting issues which could fundamentally affect the success or failure of the programme and are of primary concern to the review team.

16. Organisational Capacity and Capability. The current organisation is not capable of delivering the programme. The key issues include the capability to manage and run large scale change programmes, the ability to manage widespread IT driven change at local level and the capability to manage procurement on a scale unprecedented in DH or NHS history.

17. Business Change. There is widespread appreciation that the programme is a change programme first and foremost albeit with significant IT elements. But the implications of this are not being pulled through into the way the programme is structured, into the level of engagement with stakeholders, considered further below, and into detailed planning. The programme needs to be run, managed and resourced as a large scale complex and integrated change programme and the review team make specific recommendations about how best to do so.

18. Simplification. It almost goes without saying that this programme is huge in scale, vast in complexity and enormous in scope. The way to deal with this triple challenge is to drive for simplicity but the review team found the thinking in important areas such as procurement, design, and

implementation to be over-elaborate and confused. We make specific recommendations for tackling these and other areas including communicating the benefits, but the underlying message is that programmes of this sort get delivered by building one piece at a time, steadily, incrementally and coherently.

19. Refocusing effort. At present the various elements of the programme are at different stages of development. As a result the review team found that in some crucial areas (e.g. organisational and architectural design) development work was limited while in others significant work had taken place, perhaps going too far, too fast. The review team believes that effort should be concentrated in the short-term on getting right the essential preparations, plans and organisation for the programme which is not yet in a position to proceed to procurement stage. We highlight those areas requiring urgent attention.

20. Electronic Records. On the face of it, this is a detailed issue. However, the review team found that while the concept of electronic patient records is at the heart of one element of the programme, and connects to others, there is no uniform view about what is should be, what data it should contain, the degree to which it should be populated with historic data and so on. Getting clarity, and simplicity here is vital as it will impact on procurement, implementation, change, cost and just about all elements of the programme.

21. Costs and Benefits. Most attention in the recent past has been on funding and while the details are still awaited significant new funding now seems assured. While this is good news for the programme the review team believes that more work will be required to develop a better understanding of the costs and benefits of the programme at a high level. On the cost side we comment on and make recommendations about the control of funds, the concerns about the revenue consequences of the programme and the uncertainly and complexity over the implementation and change management costs. On the benefits side we believe that the arguments are sound but have not been developed below the broad conceptual levels. A fuller articulation of benefits will be required for a Gate 1 review but actually there would be huge benefit in being able to communicate them so as to engage with stakeholders in the field.

22. Engagement. Our final recurring theme concerns engagement, or more specifically the lack of it. As we have already noted there is widespread appreciation of the challenges facing the programme and the opportunities it presents. But below this, at the level of designs and detailed plans, there has been insufficient consideration. The people on the programme display a “head office” mind set, with “great thoughts” being developed at the centre and then disseminated. A successful programme does not work like this. It requires detailed engagement. Only staff with front line experience can ensure that an application will actually work, an implementation approach is feasible or be able to identify key staff that have special support needs. The programme’s way of working will need to

change from the current centralist, “we know best” approach to a much more dynamic, interactive and engaged approach which expedience shows is the way not only to get results but also to win the hearts and minds battle. Again we make a number of specific recommendations in this area.

High Priority Recommendations

23. This section summarises those recommendations where the review team believes urgent attention is required. The basis for, and context of, these recommendations are contained in the main body of the report. The numbers correspond to the order in which the recommendations appear in the report.

3	Key stakeholders should participate in the business design work and development of outline implementation plan
10	The Director General should select team and run the programme without constraints of existing structure and organisation
15	A core team should be established, in one location, headed by the Director General
19	Establish a "war room" approach for key project areas
21 & 22	Establish a single Business Design Authority and Technical Design Authority
26	Review the procurement approach to determine viable options to take it forward
35	Deliver early successes with particular emphasis on influential groups such as Nurses

Other Recommendations

24. This section summarises those recommendations where the review team believes there is room for improvement. Additional guidance and advice on many of these issues is contained in a series of annexes. The numbers correspond to the order in which the recommendations appear in the report.

1	Financial allocations and budget arrangements should be clarified.
2	The Programme should refocus its efforts on planning, preparation and organisational development.
4	Formal user groups should be established for each of the present four major projects and an SRO appointed for each from the stakeholder community
5	There should be greater stakeholder participation in project and programme boards
6	The role of Director General should be established with clear lines of accountability

7	The Director General should attend the monthly “top team” meeting
8	The Programme should appear as a standing item on the monthly “top team” agenda
9	The Director General should be free to recruit programme staff from whatever source
11	Strategic Health Authorities should commit appropriate resources to recruit and support CIOs of the calibre necessary
12	The Director General must have tight engagement with StHA CEs
13	CIOs should be directly accountable to the Director General with dotted line accountability to the StHA CEs
14	The roles and responsibilities of, and engagement with, other organisations involved with staff development and training should be clarified
16	Creative ways of making the virtual nature of the wider programme team should be introduced
17	Current programme risk register should be reviewed by the Programme Executive Group
18	A formal risk management process should be introduced
20	The audit of the “as is” architecture across the health community should be accelerated
23	Review widely across NHS and the rest of Government for examples of best practice
24	Review and agree ownership of all components and potential components of the programme
25	Launch projects to establish the NHS number as the base identifier across all systems, and seek to rationalise systems in use in the “as is” architecture
27	Many pilots are underway across the entire NHS. A stream of work should be established to establish "start", "stop" and "continue" criteria and then review those pilots already underway against those criteria.
28	Identify appropriate “intelligent customer” resources to support the procurements across the programme
29	Engage closely with suppliers in reviewing the design and implementation approach
30	Key technology components required to deliver the programme may have been developed elsewhere in government. This should be investigated and any opportunities to exploit such work should be seized on
31	Review the procurement strategy for all interdependencies
32	Expose critical issues and deadlines within the procurement strategy and address inconsistencies
33	Engage fully with relevant stakeholder groups to develop an outline implementation strategy
34	Develop a costing model for implementation strategies
36	Explore alternative models for the programme organisation

	structure
37	Provide mentoring system for senior managers involved in the programme
38	Establish an “intelligent customer” competency in NHS
39	Review external issues that could affect the programme at regular intervals
40	Produce a simpler articulation of the component parts of the architecture
41	Promote benefits that will be realised through the application of new technology and other changes
42	Make more of existing IT successes in the NHS

Review of current phase

25. The review team has structured its review of the current phase into a number of sub-headings for each of which findings, conclusions and recommendations have been grouped together. These sub-headings are;

    a) Funding
    b) Alignment with Business Strategy
    c) Engagement with Stakeholders
    d) Programme Governance
    e) Programme Management
    f) Risk Management
    g) Design and architecture
    h) Approach to procurement
    i) Approach to implementation
    j) Capability of the organisation (DH and NHS) (resources)
    k) Lesson learned
    l) Simple articulation of the message (communications and benefits).

a) Funding

26. The whole programme cost is thought to be around £5 billion with about half of that sum allocated in the 3 years starting April 2003 (actual allocations to be determined). The programme therefore demands a high level of commitment as a long-term high priority of the Department of Health.

27. The review team found broad acceptance and evidence of the commitment required in delivering a programme of this scale. This started at the top with Ministers through to Strategic Health Authority level. Funding at primary, community and secondary care service levels was not tested but to a degree the planned central control and distribution of funds circumvent this.

28. That said, there is a lack of clarity about budget management, who will hold the budget at central level, how it will be distributed for local investment through the Primary Care Trusts (PCTs) and the role of Strategic Health Authorities in that distribution. The latter was described as

having a ‘gatekeeper’ role given that allocations are normally made direct to PCTs. At the centre, the IA is geared up to handling finance as a special health authority but the sums involved are vast in comparison to their current budgets.

29. A key issue raised by a number of interviewees was the status of new money, whether it is capital or revenue. This is exacerbated by the difficulty in assessing the costs of the change elements of the programme as opposed to IT investment. One interviewee remarked that it was an ‘early, crucial issue’. Several said that the balance should be around 75% revenue, 25% capital so that revenue consequences could be absorbed into baseline. The point being that the programme would require recruitment of specialist and support staff, training and development and so on which were revenue rather than capital issues.

30. The evidence suggests that although the programme has been broadly costed, the allocation and delegation details have not been disseminated. There is also a potential difficulty in spending the allocated budget for year one of the programme.

- **Recommendation 1** The financial allocation and budget management arrangements should be clarified and stakeholders notified.

b) Alignment with Business Strategy

31. The starting point for this programme of work is the NHS Plan which sets out the vision, role and purpose of the NHS. It is further supplemented by other key documents including, "Implementing the NHS Plan" and "Information for Health" which provide an excellent framework for the Information Management and Technology (IM&T) strategy and its implementation. The business strategy is therefore well-articulated and meets the requirements of the review.

32. The review team found widespread consistent and enthusiastic support for “Delivering 21st Century Support for the NHS, the National Strategic Programme” (the Programme). All those that the team interviewed, from Minister downwards, were of the view that the time was now right, and the approach also right, to transform the Health Service from a reactive and fragmented service into a coherent, integrated and proactively managed care system. IM&T is now consistently seen as the key to making progress and to improving performance and service delivery. We heard, in many different forms, examples of how IM&T can help to transform processes and deliver benefits to patients, clinicians, and the wider community. The team therefore concludes that at this stage in its life the Programme provides an overview and overarching strategy for deploying and using IM&T in the NHS.

33. However, the challenge is to turn this into reality and we believe that moving forward will require more emphasis to be placed on the essential

supporting material in the form of strategies for areas such as design, procurement, implementation, change management and staffing.

34. The review team found a widespread and realistic recognition that IT alone is not enough and that there are many complex and demanding change management challenges ahead. This level of complexity is a common risk in programmes of this nature.

    - **Recommendation 2** The programme should refocus its efforts, in the short term, on essential planning, preparation and organisational development work.

c) Engagement With Stakeholders

35. Stakeholder interviews conducted by the review team indicate that all groups are fully supportive of the importance of IT in the delivery of the NHS Plan and of the need for a centrally managed approach. This is a significant achievement. In addition, senior managers in DH, NHS and elsewhere in government showed a good understanding of the issues and of the high level approach.

36. Awareness by stakeholder groups of the more detailed approach set out in the 'National Strategic Programme' is patchier. Although strong in some areas, the lack of awareness from some key stakeholder groups is a cause for concern, particularly given that some elements of the programme are fairly well advanced. Indeed, the degree of stakeholder engagement with such critical elements of the programme as business design and the implementation approach is low.

37. The methods of engagement with stakeholders (long, detailed, wordy documents) are not conducive to a good understanding of the issues or to gaining support and buy-in. The teams responsible for the documentation appear to be developing the project briefs and designs in isolation from stakeholders and not to be fully aware of the consequences of this approach.

38. A key lesson from the implementation of Information for Health was that it suffered from a lack of engagement with clinicians, patients and the supplier community. It appears that these lessons have not been taken fully on board. There is already a gap appearing between the IT strategy and the stakeholder groups who will be crucially engaged in delivering and operating the solutions and services provided. The fact that the strategy is still, in many respects, at an early stage of development, means that the opportunity exists to correct this issue now.

    - **Recommendation 3** Key stakeholders should participate in the intensive business design work and development of the outline implementation plan that are recommended in the sections on Design and Architecture and Implementation

- **Recommendation 4** Formal user groups should be established for each of the current four major projects within the programme and an SRO for each project drawn from the stakeholder community (e.g. a CEO from an StHA)

- **Recommendation 5** There should be greater stakeholder participation in project and programme boards.

d) Programme Governance

39. The review team heard much evidence on governance arrangements from all levels. Broadly, the findings fall under 4 headings: the role of the new Director General, the IA and IPU interface, the role of CIOs and the role of other organisations.

Director General

40. The role and status of the Director General has been outlined, including a profile of the individual, freedom to recruit his/her own team, position near Board level and sole responsibility for the programme.

41. Currently, the programme comprises a number of work streams, the majority being managed by staff from IA and IPU at the Birmingham and Leeds sites. Three work stream leads are situated elsewhere and outside of these two organisations. Communication and liaison exists between the two organisations and ultimately the Director of Information and Research (Sir John Pattison) connects them at the top.

42. Thus accountability for the programme rests with the Director who is also responsible for a wider information, research and development directorate. Clearly, the decision to appoint a Director General is the right one.

43. However, the DG's role is not fully understood by many of those interviewed or, reportedly, senior managers in the IA and IPU. In short, there is a lack of clarity about:

    - where the DG is to be placed in the Department of Health / IA / IPU
    - whether it is a 'Chief Executive' 'Director' or 'Programme Manager' role
    - lines of accountability
    - what is the impact on IA / IPU as separate organisations
    - from where staff will be recruited; IA, IPU, external
    - if staff ('the best') are drawn from IA/IPU – how will the impact on those two organisations be absorbed?
    - financial responsibility and accountability of the DG.

44. Establishing a new team drawn at least in part from IA and IPU may undermine the viability of those organisations.

- **Recommendation 6** The role of the DG should be established with clear lines of accountability for staff, IA and IPU, financial and budget responsibilities and organisational accountability (see also section on Programme Management).

- **Recommendation 7** The DG should attend the monthly "top team" meeting

- **Recommendation 8** The programme should appear as a standing item on the "top team" agenda

- **Recommendation 9** The DG should be free to recruit from whatever source required

IA/ IPU interface

45. The review team was given a number of versions of the historical context of the establishment of the IA and IPU and how this accounted for traditionally 'frosty' relationships between the organisations. Some commented that this had improved in recent months and both were working to a joint agenda on the programme. Indeed there was evidence of collaboration and a joint approach to a number of issues. Others demonstrated that the 'traditional' relationships remained in some areas.

46. However, it remained unclear to the review team where IPU responsibilities ended and where IA's began. Loose definitions were that IPU was the policy arm, and IA operational. These were not confirmed by descriptions given of various activities or of how the accountability process worked. IPU appear to be taking on operational responsibilities.

47. Evidence suggests that the present structure is generating unnecessary problems for the programme through difficult communications; multi-site working and separate computer networks, lack of clarity about roles, muddled leadership of the programme, and most importantly, confused accountability and decision making.

48. An example was given to demonstrate how this could impact at local level. A situation was described where a decision was delayed on a PFI Full Business Case because IPU / IA had not cleared the IT elements of the scheme. It had not been easy to identify who was responsible for the final decision or who in IA/IPU had responsibility for certain issues.

- **Recommendation 10** - The Director General should establish the programme team and run the programme without constraints of existing structure and organisations.

Role of Chief Information Officers

49. So far, just over half of the 28 CIOs based in Strategic Health Authorities have been recruited. The team learned that these vary from part time to

full time posts, Director level or one level below, professionally qualified in some cases and not in others.

50. The Chief Executives of StHAs interviewed confirmed the importance of the role and priority given to it, but echoed concerns about clarity and confused lines of accountability. One was clear that accountability of the CIO should be straight to the Director General.

51. The CIOs interviewed were unclear about their role and lines of accountability, although consistent about the messages received from early meetings with the Director. They reported that a number of CIOs were concerned about the security of the post within the StHA, with a suggestion that not all StHAs are as committed to the programme as they should be.

52. But other positive signs were also reported. Some StHAs were forming groups to bolster the CIO role and ensure consistent implementation across StHA boundaries. One of the CEs interviewed was considering a joint 'Director' level post with 2 other StHAs to take the local lead (in the 'lead' of the 3 CIOs).

- **Recommendation 11** The Department should ensure StHAs commit appropriate resources to recruit and support CIOs of the calibre necessary

- **Recommendation 12** The DG must have tight engagement with StHA CEs.

- **Recommendation 13** CIOs should be directly accountable to the DG with 'dotted line' accountability to the StHA CE (see Annex F)

Other Organisations

53. The review team heard inconsistent messages about the role of other organisations particularly around implementation and the training and development of staff.

54. The Modernisation Agency is described in the Programme document as having some responsibility for training and development leading up to and during implementation.

55. Additionally, we were made aware of 28 Workforce Development Confederations who have a training and development responsibility for all NHS staff and who receive most of the substantial NHS training and development budget.

56. Finally, one of the programme's work stream leaders said that he had programme responsibility for developing staff capability.

57. There was little evidence that any joined up thinking or preparation was in hand across the three organisations to deliver the training needs for the programme.

    - **Recommendation 14** Roles and responsibilities, and engagement with other organisations, in respect of staff development and training, should be determined.

e) Programme management

58. It is clear that the National Strategic Programme at this stage in its evolution is still the sum of a number of parts, each of which is at a different stage of development. The overall programme structure is represented, not unreasonably, by a set of large building blocks but these do belie the complexity and integrated nature of what is being proposed.

59. The programme itself comprises a number of separate work streams, each of which has a work stream leader. The work stream leaders are geographically dispersed and while each is committed to the programme they are not necessarily working full time on it. In the absence of the Director General the programme team has been managed and co-ordinated by an acting programme manager on a temporary basis. The work stream leaders meet together once every six weeks, a period that the team finds to be unduly long given the scale and required pace of the programme, and the particular issues that need to be tackled at this time in the programme life cycle. The skills and experience of the work stream leaders are varied with a few being strong.

60. A set of work plans exist and a consolidated programme plan has been constructed. However, these contain relatively few defined milestone targets and no effective presentation of the main high level linkages and dependencies. An understanding of these interdependencies is essential in a programme of this scale and complexity even at this early stage. The review team was not able to gain a quick appreciation of what deliverables had been produced, and signed off, what was in production and who was responsible. The concepts of base lined plans and monitoring against milestones were not in evidence.

61. The quality management systems could be improved to avoid the situation of having documents in circulation, the status of which is unclear.

62. There is some evidence of collaborative working across work streams but the prevailing mind set is that of “Head Office”. It is centralist and corporate in nature. There seems to be a lack of awareness of the need to engage, at a detailed level, with stakeholders and indeed how to do so. In general terms this lack of widespread engagement has lead to there being no real perception in the operational areas of what the programme is actually doing. There are exceptions of course but the prevailing sense is one of the programme being in an “ivory tower”.

63. Some basic planning and preparatory work has gone into setting up a programme office but there is no clear view of how this will add value to the programme other than by improving communications between work streams.

64. From all this the review team concludes that as currently configured, and recognising the relatively early stage of development, the programme management arrangements are not yet fit for the purpose. The programme is not yet adequately resourced and does not yet have the sort of infrastructure and management processes in place that are required. The organisation of the programme team is simple but not appropriate to the demands for integration and coherence that this programme will require.

65. Many of the issues outlined above are recognised but the team encountered a rather sanguine belief among many of those interviewed that the appointment of the DG will resolve them. The review team does not support this view and is of the opinion that the DG will need to be supported by an experienced management team.

66. Resourcing this programme management team will require new approaches and these are considered elsewhere (see section on Capability of the Organisation). The team is likely to include a few people drawn from IA and IPU but more drawn from elsewhere. The programme management team should be co-located and supported by a strong programme office.

- **Recommendation 15** A core team should be established in one location. The figure below provides an illustration of the sort of senior programme management team required:

Programme Director	
System / application design, IT architecture and integation "Technical Design Authority"	Business model / organisation and process design "Business Design Authority"
Security and access	Implementation planning
Procurement and contract management	Stakeholder Engagement & communication
Data and Standards	

- **Recommendation 16** Creative ways of making the virtual nature of the wider programme team effective should be introduced. Tactics that may be appropriate include:
    - Use of web enabled Programme support tools for supporting risk and issue management, document management and diary management;

- Development of a Programme "Hub"; space that can be used for collaborative working (workshops etc), a nerve centre for the programme and a key element in a wider communications strategy (see also under Design and Architecture);
- Many such programmes use different types of structure, with a number of work streams working together (horizontally) to deliver a number of major deliverables or outcomes (the main building blocks – Prescriptions, Bookings, EPR and infrastructure).

f) Risk management

67. Appendix 5 of the 'National Strategic Programme' document identifies and categorises risks to the programme together with suggested approaches as to how these risks might be managed. The review team has found evidence that some of these risks are being actively tackled (e.g. supplier side capacity and capability).

68. However, there is no formal risk management process in operation for the programme, no risk mitigation plans and no assignment of these plans to specific owners. Some of the recorded risks (such as lack of buy into investment objectives) seem, to the review team, to have already been mitigated by the diligence of the programme team whilst other risks (such as the lack of buy in to proposed solutions or the risk of diversion of attention from the presently proposed deliverables) do not appear on the risk list.

- **Recommendation 17** The current programme risk register should be reviewed by the Programme Executive Group, particularly in the light of some of the findings in the rest of this report.

- **Recommendation 18** A formal risk management process should be introduced with defined owners and reporting mechanisms.

g) Design and Architecture

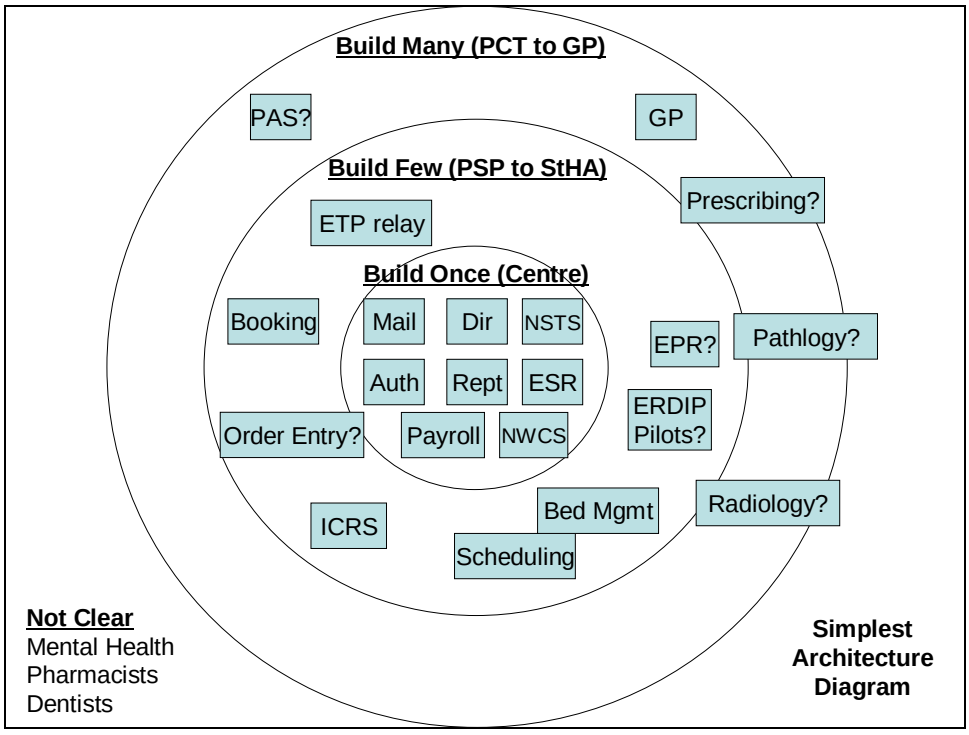
69. The potential scope of the overall programme is unquestionably huge. It requires the roll-out of a series of built-from scratch components, the ramping up of existing pilots and the integration of a wide variety of legacy systems – all with the close co-operation of a range of stakeholders throughout the Department of Health and the NHS and also externally (including suppliers, regulatory bodies and so on). The stakes are high and the need to completely address the Business and Technical Design and Architecture fully and up front is of paramount importance. The review team has identified several important issues in this key area.

70. There is no single view of the architecture outlining the boundaries of each component or the linkages and exchanges between each of them. Each of these linkages will require extensive definition of standards and then the "ruthless application" of those standards, however, many of them are not

yet ready for distribution and a wide variety of standards are already in place in the existing baseline architecture.

71. The documentation as it stands omits what ought to be important components of the architecture and the design principles behind them, notably the requirement for a single authentication system for staff with perhaps a second system to cater, in the future, for patients. Ownership of these components is unclear. A system that caters for these functions may require the roll-out of a PKI (Public Key Infrastructure) system on a scale that is unknown globally . This would be a serious stretch for the programme and for government more generally.

72. It was difficult to obtain clarity during the review on which components would be built only once, which a small number of times and which would be left open for fully local implementation. The diagram below makes some assumptions about how the overall architecture may look based on conversations had during the review but there are some areas where questions remain and even the "build once" components (notably authentication) are not always absolutely clear.



73. Design work to date has been conducted largely in a vacuum. A few, highly knowledgeable people mostly from within the policy area have developed most of the drafts to date. Limiting involvement of key stakeholders from a variety of organisations and from various levels in the organisation could result in significant omissions at this stage. One specification, for ICRS, appears to include functionality that is already catered for in other applications, such as ETP (Electronic Transfer of Prescriptions) and Booking. Formal design and specification authorities to review business and technical designs are not in place.

74. There is limited knowledge in the centre of the “baseline” IT environment across the NHS. Failing to rationalise the vast number of systems in use today, ahead of the wider implementation of the programme, will make for a significantly more complicated roll-out. Similarly, there is a broad range of pilot projects underway that need to be evaluated to common criteria, best of breed selected, lessons learnt drawn out and knowledge circulated.

75. The baseline environment contains a large number of legacy systems coupled with smaller numbers of probable “end point systems” (i.e. ones that will remain in use as the programme rolls out). The architecture needs to fully consider which systems will exist at various stages (and in which geographies), how they will be integrated, how they will be switched off and data migrated and so on.

76. A significant piece of work needs to be done to establish data requirements both in terms of data quality (the overall level of data quality is generally believed to be poor), and legacy migration. During the review a wide variety of requirements were discussed. These range from "don’t migrate any legacy data" through "migrate only the last two years data" to "migrate everything". Decisions taken here will have a significant impact on the implementation strategy, discussed further below.

77. The PSP process (detailed in the Approach to Procurement section below) requires an “accreditation process” for chosen applications. This will entail significant testing and integration environments, supporting a wide variety of components at any one time. This will put the design and implementation teams under pressure and require close co-operation between suppliers working on the key components.

78. The speed with which the programme is moving has meant that some important components have raced ahead of others. The ETP (Prescriptions) project is already at pilot stage and the project manager is looking already for ways to move ahead without going to procurement. The Booking project has recently gone out to tender from catalogues. The risk of these projects carrying on without reference to a consistent architecture may cause issues later. That said, early deliveries on a national scale would be good for the programme as a whole and the modularisation and isolation of some components should be supported.

79. A missing stream of work is the one that covers common look and feel for applications. Without a common approach and interface design there would be a risk of building in a continuous need for staff retaining. With more than 200,000 NHS workers changing jobs inside the NHS annually, the size of this risk in great. Also, work on programmes such as "ukonline" shows that failing to build “human-centred” applications at the start results in much lower levels of usability, lower productivity improvement and reduced overall usage.

80. Overall the critical assumptions and decisions regarding the architecture, although clearly thought about by members of the team, have not been exposed, reviewed and actioned. Without a solid process around these, blind assumptions will be made by different parts of the programme leading to difficulties in implementation, particularly when integrating different components. Also, the procurement process is likely to be mis-informed giving higher costs, longer lead times and huge overheads in change control.

- **Recommendation 19** A “War Room” approach needs to be urgently undertaken for each of the key project risk areas, clarifying scope, boundaries and assumptions.

- **Recommendation 20** The audit of the “as is” architecture needs to be accelerated with the CIOs in the StHAs given this task as an immediate requirement. Actions to simplify the architecture as far as possible ahead of further implementation can then be reviewed

- **Recommendation 21** A single Business Design Authority should be established with oversight of the entire programme and related projects.

- **Recommendation 22** Similarly, a single Technical Design Authority should be established across the programme.

- **Recommendation 23** Both the BDA and TDA should look across the NHS for examples of best practice. In the limited time available for this review, Walsall emerged as a potential example. Also, other government departments carrying out similar projects, such as CJIT, should become partners with cross-membership of boards.

- **Recommendation 24** Ownership of all components and potential components of the programme should be reviewed and agreed.

- **Recommendation 25** A fundamental assumption of the programme ought to be that the "NHS number" will be widely used by the time implementation commences. Also, to make implementation simpler, the wide variety of systems in existence now should begin to be rationalised. A formal project to achieve these aims needs to be fired up urgently.

These recommendations have been fleshed out in Annex C with some additional suggestions.

h) Approach to procurement

81. The procurement strategy at present calls for a variety of suppliers to be “warmed up”, i.e. assessed for overall capability, capacity and ability to work in partnership. Those suppliers that pass the initial hurdles will be identified as potential “Primary Service Providers” (PSPs) and given the

opportunity to bid for the components within the overall architecture. Once a core set of PSPs have been chosen for each component, StHAs will be able to procure the solution that they require from that subset of "accredited" suppliers.

82. The rationale behind this approach is that it will increase competition, give the Strategic Health Authorities a greater degree of choice, and increase the ability to deliver by providing more capacity and capability. Arguably this approach may also reduce implementation risk by ensuring that should any single supplier fail to deliver an adequate solution, then there are at least other suppliers who could step up to replace them. Given Government's overall success rate in delivery of IT projects, this is a laudable approach. There are, however, a series of risks that need to be addressed and the entire approach may need to be modified for certain components.

83. Managing this range of procurements simultaneously will put enormous strain on the limited skilled procurement resources available to the programme today. The NHSIA and PASA are not used to running large scale IT procurements (the NHSIA budget is perhaps an order of magnitude smaller than the annual budget that will be available for this programme). Once procurement takes place, there will be substantial work required for contract management. Other parts of government have found that this is best handled by the original procurement team who understand the contract and the scope of work. Intelligent customers will be required at various levels of all organisations involved in the programme but skilled resources are in very short supply across government generally.

84. The strategy operates at two levels at present. The first tier concerns the selection of several PSPs by the centre (the accreditation process which should be owned by the Technical Design Authority); the second tier is concerned with the selection of a single PSP by a StHA. Suppliers may increase pricing dramatically to cater for a series of uncertainties: whether they will win any business against a variety of competition, what their costs will be in integrating to a variety of unknown legacy systems, which standards they will have to include at a later date, how much bespoke work they will have to do for StHAs and so on. Determining Value for Money in this context will be extremely difficult.

85. Suppliers may choose to be selective about bidding (witness the ongoing Inland Revenue outsource programme), reducing the effective choice and, most likely, there will be more bidders than expected for the big prize, the ICRS (Integrated Care Record Service) project.

86. The specifications are not yet mature enough to formally distribute to suppliers although there is much merit in reviewing them with suppliers at this early stage, seeking comments and improvement suggestions. It is understood that some of this has already been done.

87. Typically three stages of business case are worked through for major projects. Production of the Strategic Outline Case, Outline Business Case and Final Business Case are all lengthy pieces of work, sometimes taking years. The approach for this programme will need to be dramatically streamlined to reduce the time constraints, whilst simultaneously upping the risk management activity to ensure that exposure is understood and managed at each stage. There is already a review underway of local delegated expenditure limits which should reduce the need for Strategic Health Authorities (StHAs) to produce their own business cases. They can, instead, fold underneath the National Business Case.

88. The PSPs are being encouraged to partner with many smaller suppliers, most of whom are probably already in the NHS market somewhere. Although the ability for the PSPs to partner is largely proven (with the exception perhaps of some who are likely to smother smaller suppliers), it is not clear if the small suppliers will be able to handle one partnership, let alone the multiple partnerships being suggested at present. A substantial support infrastructure will be required to ensure that this process is smoothly undertaken.

89. Overall, it is not clear that the chosen procurement approach will be successful. For instance, few suppliers may take on the risk of bidding for each of the key components without being sure of the potential return, the scope of work and the ability of the customer to provide adequate resource to support the initiatives and ensure success. The days of the supplier being responsible for delivery are long gone and that approach has consistently proven unsuccessful in even small projects. The programme will stand or fall on its ability to act as an intelligent customer throughout.

- **Recommendation 26** The procurement strategy should be reviewed to determine options for taking it forward, including: pairing small numbers of StHAs with PSPs very early in the process, regionalising the implementation and assigning regions to PSPs, allocating “integration PSPs” who will have the job of bringing together all components from other PSPs into one StHAs environment and so on.

- **Recommendation 27** Many pilots are underway across the entire NHS. A stream of work should be established to establish "start", "stop" and "continue" criteria and then review those pilots already underway against those criteria.

- **Recommendation 28** The two tier procurement approach will place significant burden on resources in the centre and in the StHAs. An active approach to select “intelligent customers” should be undertaken now to ensure that appropriate resources, including appropriate support infrastructure, are in place. (see section on Organisational Capability).

- **Recommendation 29** Suppliers need to be brought more fully into the process even at this stage. Key documents should be exposed to a broad range of partners at multi-supplier reviews. Work here should include a support process for the smaller suppliers to ensure that they do not see the chosen approach as a threat.

- **Recommendation 30** Key technology components required to deliver the programme may have been developed elsewhere in government. This should be investigated and any opportunities to exploit such work should be seized on.

- **Recommendation 31** The interdependencies of the various elements of the procurement strategy need to be fully fleshed out. This will ensure that components come on stream at the right time, that existing procurements are stopped or allowed to continue as needed and that switch-off or extension strategies for existing contracts are managed.

- **Recommendation 32** Exposing and addressing the critical issues now and the deadline by which they should be resolved will help ensure that an urgent, but targeted, focus remains. It sounds trite, but "measure twice, cut once" seems appropriate.

These recommendations have been fleshed out with additional detail and suggestions in Annex D.

i) Approach to implementation

90. The review team found widespread recognition of the capability and capacity constraints that currently exist and that will impact on the ability to implement the strategy. In particular, the ability of industry to mobilise the resources that this programme is likely to require is seen as one of the main risks to the programme. Work is already underway to mitigate this risk and substantial high level engagement with the supplier community has taken place. However, the team found that consideration of the implementation strategy (the overall approach to rolling out the strategy) was entwined with consideration of the overall approach to procurement.

91. There is also widespread recognition of the complex and diverse existing situation with, for example, 9,000 GP practices using an indeterminate number of local applications. Some action has been taken to understand this "legacy" situation, and as already noted some CIOs have been charged with carrying out some form of local stock take.

92. Everyone the review team spoke to recognised the extremely complex nature of the change management challenges. It was acknowledged that the programme was not simply a question of implementing IT but that delivering it would require a sophisticated and multi-dimensional approach to change management. All wanted to see some sort of early delivery of tangible (palpable) change and improvement.

93. Having established that there were many disparate views on how best to do it all, the review team heard many suggestions but found no evidence of a co-ordinated, consistent and agreed view. From this the team concludes that while the scale and complexity of the challenge is recognised no significant attempt has been made to cut through the many issues to come up with even a high level view of how implementation might be achieved. Because of the complexity involved and the amount of high level planning still to do, it is not possible at this stage to put even broad estimates on the costs, or resource requirements. Accordingly, the team has no view as to whether the amount of funding apparently available (see section on Funding) is likely to be adequate.

94. The implementation plan should consider the opportunities for modular delivery of some functions early (such as, perhaps, the Prescriptions project); the range of legacy systems already deployed and the iterations that will be needed to replace them; the leveraging of existing pilots; the delivery of important standards in a timely fashion; and the ability of any given StHA to absorb change of this scale both in IT and in business practice.

95. The implementation plan will also need to address the dependencies between the various projects covering, for example, when broadband connections are required to specific geographies, when desktop upgrades will be needed etc. The plan must review the interaction between the key components and determine how they will interact with existing legacy systems, so as to produce the optimum approach to roll-out.

- **Recommendation 33** The relevant stakeholder groups should be engaged (including the supplier community) and an implementation strategy should be developed collaboratively (see also section on stakeholder engagement). The team recognises that engaging with the supplier community on this complex subject, without clarity on what is to be delivered will be difficult (see the section on Design and Architecture).

- **Recommendation 34** A costing model should be developed to build a more comprehensive picture of the costs and the likely spending profiles. Such a model will, downstream, be required for benefits cases and can be made more sophisticated as detail gets added.

- **Recommendation 35** A specific element of the implementation plans should be the delivery of early successes with particular emphasis on delivering benefits for influential groups such as Nurses.

j) Capability of the Organisation

96. DH and NHS do not have recent experience of running an IT-related programme of change of this degree of complexity or remotely

approaching this scale, though the senior management in the NHS appear able to engage fully with the complexities and challenges of the strategy. The NHSIA and IPU currently commission new in-house development of approximately £30m pa. This compares to an anticipated annual budget of over £1bn in Year 3 of the programme.

97. The NHS appears to have a sufficient number of people to form an effective "intelligent customer" function. The review team has been impressed by the quality of the thinking from within NHS on the interface between IT and the business. However, a greater degree of formalisation around this role would be beneficial.

98. The procurement approach envisaged differs markedly from current practice and will stretch the 'intelligent customer' community very thinly.

99. The current approach to the planning of the programme does not indicate the requisite understanding of the specific needs of a 'programme' as opposed to a 'project', such as the need to map dependencies between projects and achieve compatibility of architectures and approaches to implementation.

100. The perception in the NHS of the track record of centrally delivered, IT-related solutions is that it is poor.

101. The quality of some of the organisations potentially involved in the implementation (such as the Modernisation Agency) is high. There is, however, a doubt regarding their desire or ability to increase their capacity to incorporate the breadth of the IT strategy. The capability of the organisation to implement solutions has not been fully considered in the Programme and the scale must therefore remain unclear at present.

102. The current approach to implementation (as understood by the review team) relies heavily on the calibre of the CIO's in Strategic Health Authorities.

103. A programme of this scale and complexity would challenge any organisation. But the key issues appear to be:

- the relative lack of understanding and experience of the staff at a senior level of the implications and requirements of leading and managing an extremely large, IT-related change programme
- NHSIA and IPU do not have the right resources (quality or quantity) to populate the majority of the team needed to deliver a programme of this scale and complexity
- on implementation, the quality of the available resource is high. However, it is the scale of the task that will pose significant challenges

104. In short, the current organisation is not capable of delivering the programme as envisaged.

- **Recommendation 36** Alternative models (Joint Venture, CJIT) should be considered for obtaining the necessary capability to deliver the programme. This recommendation is expanded in Annex F.

- **Recommendation 37** A mentoring facility in Programme Management should be established for all senior managers in DH/NHS involved with the programme so that they are fully equipped to deliver their roles in the programme.

- **Recommendation 38** An “intelligent customer” competency should be formally established in the NHS

k) Lessons Learned

105. A number of people interviewed, emphasized the fact that history had considerable bearing on the way in which the programme was being carried forward. It was clear that some important and difficult lessons had been experienced in past IT projects in the NHS but it was equally clear that the new programme would be managed and implemented in a new and changed NHS structure.

106. It was also clear that there was a general feeling that lessons learned such as those gained from Implementing "Information for Health" seemed to point to greater central control and management. Funding was a significant issue in this case as IT expenditure was diverted to other high priorities such as waiting lists. There is no evidence on the way in which the excellent work described to the team that has been carried out in Wallsall is to be carried forward.

107. The review team were given a copy of the Protti report which contained a series of sound recommendations but the team saw no evidence of the way they were being actioned. The team heard that people were too busy doing other things to give it the attention it deserved.

108. Pilot projects are in progress in a number of areas, many covering similar ground but the measures of success for those activities do not appear to be clearly defined. Milestones for the pilot projects appear to conflict with information given as targets as part of the planning assumptions for the national programme.

- **Recommendation 39** The Programme Executive Group should review external issues that affect the programme at regular intervals to ensure that all important developments have been assessed and lessons learnt, an early example would be the experience of the Shared Services project.

l) Simple articulation of the messages

109. The review team was frequently reminded of the scale and diversity of the National Health Service. Comments such as the "largest employer in Europe" were stark reminders of the issues. It was also informed that National Strategic Programme is a very large scale, high risk venture to be implemented in a tight timescale.

110. Large IT programmes in government have been prone to failure for a variety of reasons but a common theme is that they are just too large and too complex to manage and implement effectively. To counter these obvious concerns, a key objective for this and other government programmes of this kind, is to simplify the message, process, management and control wherever possible. Nothing will remove the overall scale and complexity but there are numerous possible ways to break these elements down. There is clear evidence of many attempts to do this already through the introduction of the existing programme of successful pilots but more needs to be done.

111. At the moment, there is a high level description of the programme supplemented by a number of lengthy documents. For many presentational and comprehension reasons, there is a need to produce additional descriptive material based on a more simple, perhaps diagrammatic approach. This theme of straightforward breakdown into simple increments should be carried forward throughout the design, and implementation phases. All of this effort will also help get important messages to staff, stakeholders and suppliers.

112. Early programme successes should be demonstrated to the many communities of interest. There is already evidence that excellent work is being carried in parts of the NHS in both pilots and full scale projects.

- **Recommendation 40** More effort should be expended to produce a more simple articulation of the components parts of the architecture.

- **Recommendation 41** The benefits that will be realized through the application of new technology and other changes delivered as part of the programme should be promoted.

- **Recommendation 42** More should be made of existing IT successes in the NHS.

Annex A - List of interviewees

<Text redacted>

Annex B - List of Key Documents Reviewed

- Delivering 21st Century IT support for the NHS
- NHS Plan
- Delivering the NHS Plan
- Information for Health
- Building the Information Core
- Shifting the Balance – Next Steps
- Delivery contract for DH
- DH Departmental Report
- Programme Plan – PowerPoint version
- Sir John Pattison's PowerPoint planning day presentation
- National Specification for Integrated Core Records Service
- Modernisation Agency Business Plan 2002/3
- Implementing Information for Health: Even More Challenging Than Expected – Professor Protti, June 2002
- Managing Successful Programmes - OGC

Annex C - Design

The overall design of the programme is represented in all of the documentation seen as a “Greek Temple”. Although this is a useful schematic during the early stages of a project, the design work has not yet progressed to a more detailed level. Boundaries between each of the main vertical components are not addressed except at the highest level and interactions (data exchanges, function calls etc) are not addressed at all. Given that at least two of the components (Electronic Transfer of Prescriptions and Bookings) are either in full pilot mode or out to tender now, this is likely to result in confusion in both the supplier and implementation communities.

The interactions between various components will require extensive definition of standards, some of which are already underway (the HL7 standard set has been running for several years; e-GIF is proven; several of the minimum datasets required are defined) but others (scheduling, various components of the health record and other minimum datasets) are not yet ready for distribution or are in varying stages of implementation. As implementation progresses, the absence of these standards (usually highlighted as “to be delivered later” in the requirements documents) will cause delays and increase the risk of failure. Standards such as HL7 which are supported by some of the existing Electronic Patient Record software at v2.2 will need to move to v3 during the implementation, but these standards are not yet ready.

Some important pieces of functionality are not yet represented, notably a system for patient authentication. Staff authentication is thought to be the responsibility of the Infrastructure team who are in the process of developing the Mail/Directory service with EDS. That said, there is confusion over real ownership. Several solutions have been explored although there does not appear to be an agreed strategy – areas discussed included “domain to domain” authentication (effectively meaning if you are in a hospital and logged onto a system there, you implicitly are authenticated) to individual access levels using perhaps a PKI system. Scale roll-outs of PKI are yet to be carried out in the UK and there are limited comparisons in the rest of the world. The absence of a piece of work to review authentication methods for patients may mean that a re-architecting of important components is required later, making implementation harder and much riskier.

The architecture as it stands allow for several Primary System Providers (PSPs) to build equivalent core components to the same specification. Although this is principally a procurement issue, it will have important consequences on the architecture. There is, as yet, no single picture that identifies which systems can and should be built by several parties and which should be central and built only once. It would be hard to make a case for each PSP developing a process for pseudonimysation for instance, or for each PSP maintaining a database of reports (covering patient care statistics, waiting times etc.) that could not be aggregated at a national level. Similarly, more than one authentication system would not be appropriate. The programme has already confronted this issue in other areas by identifying and procuring a single payroll system, starting work on the single Electronic Staff

Record or building a common mail and directory service – but the same rigour has not yet been applied to the remaining components.

The design work has been concentrated around a few highly knowledgeable people (the “vital few”), mostly within the Department of Health with some reviews performed by stakeholders – the most notable example of this is the most complex system, ICRS. In many ways it seems that the designs have been completed in a vacuum. After the fact reviews of lengthy documents (the ICRS spec runs to 187 pages) are difficult and usually relatively little value is added. Those vital few are predominantly concentrated in the world of policy and there has been little injection of implementation reality and technology viability. There is no evidence of workshop reviews being used as the basis to work through the “as is” processes and then determine the “as should be” processes. It would be usual to map the National Frameworks covering each of the main care cycles both as they exist and as they will be onto the architecture to ensure that all steps have been considered and that appropriate functionality will be in place. Indeed, this process will be a key persuader in highlighting the benefits of one implementation strategy over another and will help identify overall benefits for the delivery – for instance, identifying processes that are eliminated (such as postal delays, multiple approvals, re-work etc.).

The initial specification for the Integrated Care Record System (ICRS), although only in a draft state, is a comprehensive document that details a broad range of requirements. It does, however, appear to include functionality that is the responsibility of both the ETP and the Bookings application; along with functionality for scheduling and other aspects of the programme. At this stage, it is insufficiently detailed or bounded to allow a supplier to build a system.

The requirements documents seen to date lack clarifying diagrams or flows that would aid understanding. The lack of involvement of key stakeholders from a variety of organisations and from several levels in each organisation is worrying and could result in omissions or re-work. At the same time, design and requirements work appears to be concentrated on the view from a systems standpoint, with the exception of the generic and very high level outputs statements in the requirements documents. There is little demonstration of the specific process that a patient and their care provider would go through – no charts showing the interactions, the information required, the systems touched and so on, which would presumably have to be iterated through as components were procured and deployed.

The NHS IT universe is enormously varied – the number of systems in use at GPs has been various described as “3”, “around 30”, “ around 26 with some systems having 17 flavours” all the way to “9,000 systems” – the truth appears to be nearer 30, but it is not known how much local bespoke work has been undertaken, which may be where the 9,000 count comes from (as that is the approximate number of GP practices in the country). Although some PCTs, such as Walsall, have slimmed down the number in use to two (Taurex and emis), there is not yet a plan to achieve this result more widely to reduce the

complexity of the overall design. In fact, the baseline IT infrastructure across the whole community is not fully understood – although the CIOs in the StHAs are soon to undertake a stocktake. Important assumptions about items such as browser configuration, firewall configuration, network capacity and so on could impact the implementation of the finished architecture. This complexity means that any Systems Integrator chosen as a PSP will have to carry out a series of complicated integrations, probably in several iterations as various components are added, legacy systems are replaced and so on. The architecture complexity will therefore be increased with the potential for multiple-PSPs to be interacting at the same time or close together, increasing the risk of components not working together correctly unless the standards and interchanges are rigorously defined and tied down early. Many of these systems use a variety of identifiers for patients (it is understood that the vast majority of GPs now use the NHS number, but this is not the case at other points in the care cycle). Interchange of data will be seriously compromised unless a standard reference is applied now.

The design also includes a plan to use technologies developed during pilot work (such as ERDIP and ETP), although the process for fully evaluating the pilots and determining the forward approach is not yet locked down. The ETP project will have an academic review, evaluating the three systems in use since June 1 2002, running from July through to January 2003 with a report in the spring – but, at the same time, a business case is likely to be prepared for a procurement to start later this year at a national level. There are at least 13 ERDIP pilots underway (although there are likely to be more which are not badged as pilots), each of which uses different solutions. It is not evident what scaling assumptions were built into these pilots, making it difficult to determine whether they could be rolled-out as is or whether they would require significant rearchitecting.

Ownership of some of the key components has not yet been brought fully into the remit of the programme. The ETP system is a recent transfer in but is already at a stage where two consortia (from an original three, with two members merging recently) deploying solutions in early June. The Booking system is owned by the Modernisation Agency and has separately gone out to tender recently to three suppliers selected from the NHS-cat list. It is not clear what architectural assumptions were made for this important component potentially compromising how it will inter-operate with other components. Importantly, the chair of the Booking project sits on the Programme Board (the “PEG”), but there does not appear to be technical cross-over and inter-project dependency analysis. Some of the key components of the overall architecture will need to be enhanced to achieve the aims of the programme. For instance, NSTS (the Tracing System) will need a programmatic interface developed. All of these tasks need to be identified, owned and time-boxed so that the dependencies are fully understood.

Several conversations were held during the review about data requirements – both in terms of quality of existing data and regarding the need to migrate data to the new environments. Views on this migration differed widely with some stakeholders noting that any migration would be too challenging, so it would

be best to draw a line in the sand; others wanted at least two years and still others noted that the risk, say, of missing something that had occurred long ago (such as an allergic reaction to penicillin) was such that all data available was needed. Migration of large amounts of data, certainly of varying quality, will be challenging and will dramatically impact the implementation plan, the degree of testing and the resource required.

One of the largest parts of the programme will be the testing of new components and how they interact with legacy components. Traditionally testing is carried out in a staged way culminating in a full test in a near replica of the target environment. With so many components included, building replica environments will be challenging – especially given the range of suppliers involved. Ultimately the stakes are high and the approach to testing needs to be exceptionally robust. Efforts to test across multiple suppliers and architectures in other parts of government have been highly challenging – lessons can be learnt from the Office of the e-Envoy and others.

With such a range of suppliers building applications and deploying over such a wide range of staff and stakeholders, there is a need for strong guidelines on common look and feel. There is no identified stream of work covering this. Failure to address this will mean that applications work differently from community to community or even within the same hospital. Given more than 200,000 staff transferring within the NHS each year, the potential for confusion without re-training is large. Also, failing to be rigorously prescriptive here will result in differing standards of applications catering for the partially sighted or those with reading difficulties.

Other parts of Government that have similar goals to the NHS, although perhaps not of the same scale, have confronted many of these issues. There is great value to be obtained, for instance, from reviewing the architectures that are to be deployed across Criminal Justice and, especially, the lessons learnt where they have failed in the past.

Detailed Suggestions to Couple With The Recommendations

- A generic “War Room” approach needs to be urgently undertaken for each of the key project risk areas.
    - The first session could identify, across the entire programme, the assumptions that are being made by the various owners and customers.
    - From this should be drawn a single architecture picture that clearly defines the scope of the programme (the components that are in and out), the ownership of each piece and the interactions between each.
    - Critical issues and decisions that need to be resolved such as data migration issues, standards required, readiness tasks and so on can then be exposed and assigned to owners.
- The audit of the “as is” architecture needs to be accelerated with the CIOs in the StHAs given this task as an immediate requirement. Actions to simplify it as far as possible ahead of further implementation

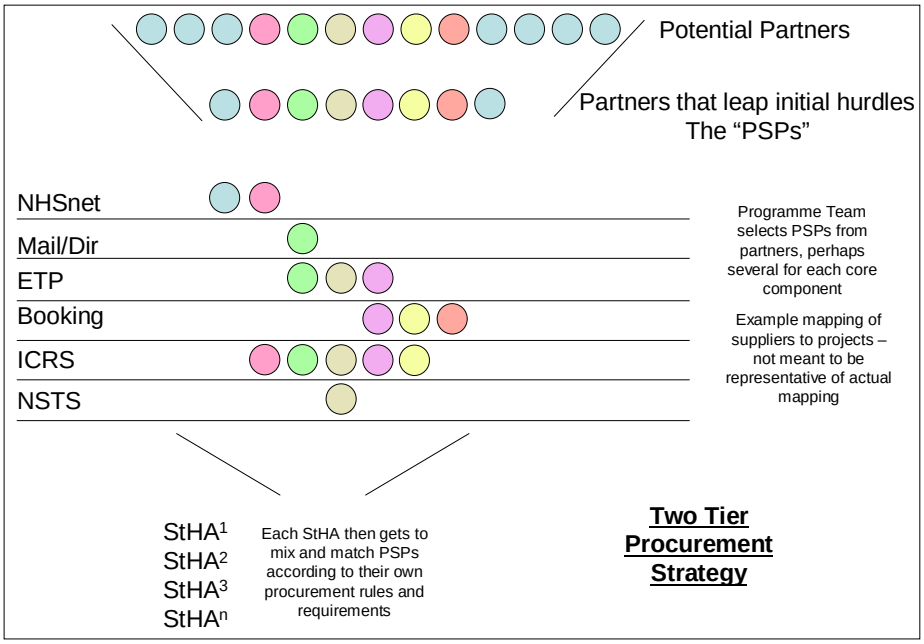
can then be reviewed. Important decisions will have to be taken at this stage whether to write-off existing initiatives, allow them to proceed (perhaps under tight constraints) or perhaps to give free rein to some areas. It is clear that PCTs, such as Walsall, that have reduced choice in, e.g. GP applications, will have an easier implementation task than those who have been more laissez-faire.

- A single Business Design Authority should be established with oversight of the entire programme and related projects. The BDA's role will be to fully map the "as is" processes and design the "as should be" processes, taking into consideration the extensive work already performed on NSFs and any other relevant work. Membership of the BDA will necessarily wide, but should be reduced by co-opting, for instance, a single representative from groups of related colleges, single representation from natural groups of StHA etc.
    - The BDA should resolve the aspects of functionality required and which component they fall into. This will remove the uncertainty created by the ICRS specification including functionality that would appear to be the responsibility of the ETP and Bookings components.
    - This authority should then be given change control responsibility for any updates to the maps, decisions on requirements (scope of individual projects) and be the escalation point for conflicts.
    - An immediate decision for the BDA should be on existing data – whether it should be migrated to the new components (and if so, how far back) or whether it should not be. It is likely that differing streams of work and different stakeholders will have different requirements here and these should be reconciled and resolved by the BDA.
    - The BDA should also consider the potential for early delivery of some components to key stakeholder groups – so as to create a sense of real change in the community and to allow the programme team to focus on some near term milestones, whilst guarding the overall vision. Delivering tangible new capability to Nurses would be an obvious starting point given that they make up the majority of the staff and have the most contact with patients.
- A single Technical Design Authority should be established across the programme. The TDA's role will be to map and understand fully the existing architecture and how the new architecture will overlay – including which components will need to be replaced and when, how the legacy systems and the new systems will interact (including how differing data standards will be inter-changed). The TDA can also inform the implementation strategy by highlighting dependencies between systems and the constraints that may exist within individual StHAs and PCTs. Membership of the TDA should be managed as for the BDA.
    - The TDA should also assume responsibility for developing the standards, ensuring appropriate versions and version control and for highlighting gaps in the existing standards.

  - The TDA also needs to kick off work on the common components of the architecture that should be built only once – authentication (both patient and staff), reporting and so on. This work should take into account other examples in government, including the government gateway, the exchange demonstrator within CJIT and so on. These components will be fundamental to the overall success of the programme and need to be given the necessary prominence, with appropriate stream leads.
  - A stream of work should be started within the TDA team to cover common look and feel principles, with the output being mandatory rules on how components should be designed.
  - The TDA needs also to own the test programme – as they will have the single overview of the architecture at each stage. Close relationships with each of the suppliers of both new and legacy components will be needed – with the creation of lab environments allowing integration testing to be carried out and, later, near live environments built. Some degree of independence of the suppliers delivering the components will also be needed and it is worth contracting the test programme to an outside agency or supplier.
- Both the BDA and TDA should look across the NHS for examples of best practice. In the limited time available for this review, Walsall emerged as a potential example. Opportunities to leverage work already completed in these sites and mark them as "beacons" – perhaps for early implementation of new components or as demonstrators for PCTs further behind should be aggressively explored.
- Ownership of all components and potential components of the programme should be reviewed. The review team particularly considered ownership of NWCS, NSTS and Authentication needed to be made clear. Also, it may be appropriate for certain components to remain where they are – the Modernisation Agency have already made good progress on the Booking project, but may be unaware of necessary technical dependencies within the wider programme for instance. Interdependencies need to highlighted and clearly owned by appropriate project managers.
- A fundamental assumption of the programme ought to be that the NHS number will be widely used by the time implementation commences. The chances of a successful implementation will be palpably increased if the existing legacy systems are rationalised starting now – fewer systems to switch off, migrate or integrate with will make for a simpler job. A formal project to address these needs to be fired up urgently.

Annex D - Approach To Procurement

The approach to procurement is outlined in the picture below:



Procurement within the government environment is notoriously complicated, lengthy and subject to enormous scrutiny. Tradition has it that, as quickly as possible, the procurement team get down to a small number of bidders to reduce the work required in evaluating bids. The chosen approach will run counter to this strategy in places by purposely maintaining a series of suppliers all the way to contract negotiation and finalisation stages. This will put enormous strain on the existing procurement resources and their expertise.

The chosen procurement approach effectively has two layers – the first at the programme level to determine the PSPs for, say, ETP (Prescriptions) and the second at StHA level to choose a PSP for local implementation. Given that an application cannot be built, tested and proven until it has customers these two layers are going to overlap dramatically – causing confusion and overhead. Suppliers, in response, are likely to increase pricing (through assumption of increased risk) wherever there is more than one PSP for a given component. At the same time, suppliers are going to be told that they will have to respond to a series of "to be defined" standards and integration processes (to a wide variety of legacy systems and new components), increasing their overhead again, the resource that they will have to provide and the risk that they take on. There is already wide discomfort in the supplier community about what this will mean, despite the best efforts of the Industry Capability stream to discuss the process with them. Some of this uncertainty is also because of the lack of clarity over business and technical architecture and the lack of appropriate documentation that can be exposed to suppliers.

Given the series of components to be procured and the desire to have several bidders on each, there is the likelihood that certain suppliers could win more than one component, increasing the risk of failure to deliver because of capacity and capability issues. There is also the possibility that suppliers will respond by bidding for the single component that they think they are most likely to win, or that they most want to win (almost certainly the ICRS project), resulting in a distortion of the competition ideal.

Having several suppliers operating in the same space for potentially long periods will increase the requirement in both the programme and at the StHA and PCT level for "intelligent customers" – people with detailed knowledge of the issues at both a business and technical level, who can make decisions in isolation known the big picture and who can provide assurance to the centre that the projects are proceeding appropriately. There is already a shortage of people to fill this role in government and this will only increase with this programme.

The NHS is clearly familiar with large scale procurements with several projects for up to £500 million underway now. Whilst this demonstrates the ability to manage complex projects, the bulk of the interdependencies and the bulk of the risk is managed by the supplier (through a PFI structure). This programme will require a change in thinking – management of the interdependencies will lie with the programme team, as will integration risk and, often, risk overall. The NHSIA and PASA are not used to running large scale IT procurements (the NHSIA budget is perhaps an order of magnitude smaller than the annual budget that will be available for this programme).

A series of pilots are already underway and, in several cases, the suppliers have expectations of what they will get from these pilots. The ETP project is, for instance, being railroaded from three suppliers to a single supplier with a view to launching the project without further competition. One of the suppliers has already invested more than £1 million in the project, without any formal contract, and will certainly be seeking remuneration for that investment over the medium term.

There are likely to be several procurements underway across the NHS today. The programme will bring a series of new initiatives on board – some of which will duplicate or overlap with existing work. The stocktake referred to in the Business Design section will be key to understanding the present IT configuration and what changes are planned locally – and in supporting decisions on whether to start, stop or continue individual projects locally.

Detailed Suggestions To Couple With The Recommendations

- The procurement strategy as it stands is unlikely to work successfully. A review should be undertaken to determine options for taking it forward, including: pairing small numbers of StHAs with PSPs very early in the process, regionalising the implementation and assigning regions to PSPs, allocating "integration PSPs" who will have the job of bringing together all components from other PSPs into one StHAs

environment and so on. This way suppliers will have a known market to build for (and can therefore set a price) and it will reduce the risk of suppliers not bidding because of unknown market size or reward profile. A stronger approach of this form will reduce implementation time (by de-layering the procurement approach) and will help address the issue of proving Value for Money.

- A huge number of pilots are underway across the entire NHS. Some of these are being watched by the centre, others perhaps not. A stream of work to review those underway now, evaluate successful (and necessary ones) and rationalise them should be kicked off. This will reduce the wasted effort across the organisation, free up resource within both the NHS and the supplier community and ensure that effort is focused on the strategic initiatives.
- The two tier procurement approach will place significant burden on resources in the centre and in the StHAs. An active approach to select "intelligent customers" from across the service, wider government and externally should be undertaken now to ensure that appropriate resource is in place. Also, a support infrastructure should be setup so that lessons learnt, best practice, issues and risks are shared widely and actively managed.
- The programme will need to understand the range of procurements already going on across the IT domain to ensure that dependencies are understood and, more importantly, to highlight areas of overlap and duplication. A rapid process to review these should be kicked off quickly.
- Suppliers need to be brought more fully into the process even at this stage – key documents should be exposed to a broad range, multi-supplier review meetings held and actions captured. Suppliers are very likely to show up at such meetings provided that they are well structured – the rules must be clear; "no product placement" and "no promises of business" to name two obvious ones. Other parts of government have found that involving supplier architects and commercial people in developing solutions to complex problems is a fast way to address the relative lack of skilled resource without paying anything. Smaller suppliers should be protected at this stage lest they see the overall programme as a threat – there will need to be a support infrastructure around them to ensure that they are not smothered by larger suppliers or overwhelmed by the need to interact with more than one large supplier at a time.
- Key components required may have been developed elsewhere – the Inland Revenue, for instance, have vast experience of XML-validation systems, the Office of the e-Envoy understands transaction routing, Criminal Justice understand Secure e-Mail and interfacing legacy systems. Much procurement work could be avoided through leveraging products and experience from elsewhere.

- The timetable of the programme is extremely ambitious and we have heard the procurement timetable referred to as “hyper-ambitious”. It is that and more. Time spent up front ensuring that the specifications are sound, the approach well thought through, the suppliers fully involved, the stakeholder involvement widespread and so on will reap dividends later. Exposing and addressing the critical issues now and the deadline by which they must be resolved will help ensure that an urgent, but targeted, focus remains. It sounds trite, but “measure twice, cut once” seems appropriate.

Annex E - Guidance On Implementation Planning

To illustrate the problem with, Implementation Planning the review team was able, in discussions with several interviewees, to articulate a number of alternative implementation strategies (models for programme roll-out). In generic terms, these alternatives might be summarised as;

- Big bang;
- Pilots followed by big bang;
- Phased introduction;
- Incremental functionality;
- Functional;
- Combinations of the above.

When applied to the NHS environment these generic approaches might look like:

- Big Bang – it would be a very big bang indeed;
- Small bang – do a group of StHAs;
- Pilots – some examples already out there;
- Phased - One StHA at a time;
- Incremental – do one pillar at a time;
- Functional – e.g. install a cancer network.

Determining what strategy is appropriate is both important and difficult. It will depend on:

- The capacity of suppliers as already acknowledged;
- The capacity of the business;
- The specifics of what is actually being delivered (see comments in Design and Architecture);
- An appreciation of the current position both in terms of IT and business processes;
- The need to deliver some early successes;
- Costs;
- Intelligent customer capability.

The review team cannot make specific recommendations as to the precise nature of the implementation strategy, although best practice would indicate some form of progressive incremental approach, akin to the roll out of a major ERP system in a large international organisation. In the following paragraphs, we attempt to provide some additional guidance by explaining:

- Why an implementation strategy is important
- Explaining potential broad principles that can be applied

In the team's experience an implementation strategy is important because:

- It will secure a common view of the ground rules to be deployed throughout the implementation;
- It will assist the resolution of some difficult trade-offs implied at a general level without getting sidetracked by the detail at every implementation;
- It will set out the key principles for organising local implementations.

The following examples of the sort of broad principles that could be agreed with stakeholders and then applied:

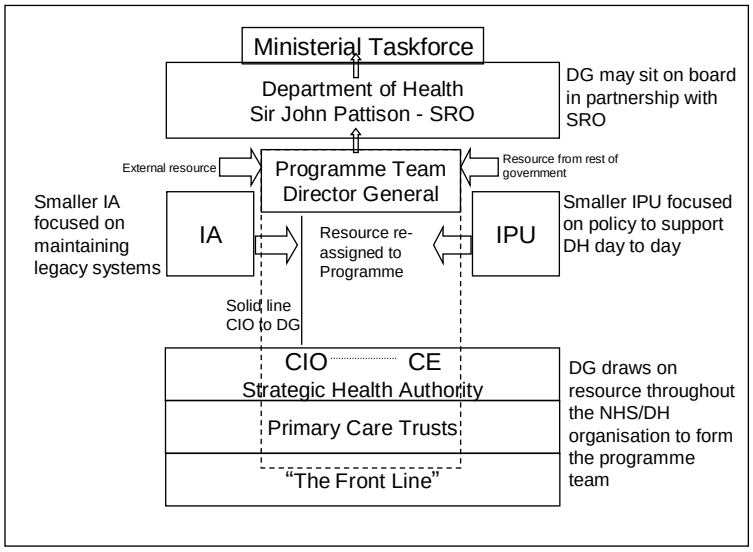
- Deliver palpable benefits, often on a small scale, but quickly;
- Use an approach that fosters learning and the ability to leverage skills and experience;
- Use an approach that tackles both IT and organisational change, cuts across some organisational boundaries and requires at least some degree of process change;
- Adopt an approach that is at least easy to explain.

An implementation strategy should cover the following:

- It should paint a picture of the type and extent of the changes likely to be undertaken at StHA, PCT and other front line locations;
- It should "join the dots" between business needs and IT and process changes;
- It should show how the work will be broken down into manageable increments and how that work will be organised and delivered;
- It should show, in general terms which roles will be responsible for what for in local implementations. This is particularly important information for the Chief Executives of StHA's and their CIOs;
- It should show how transition will be handled in broad terms including data migration, data quality, and retraining;
- It should describe the style with which the implementation wil be carried out. This is very importan because there are likely to be issues when a top down centralised solution meets a devolved and self-determining environment, notwithstanding the apparent desire to embrace the new corporate approach that the strategy embodies;
- It should also describe how local buy-in will be secured.

Annex F - Guidance on Programme Organisation

Possible Programme Governance Structure:



Organisational Benchmarks In Government

The Department of Health's internal spending caps place limits on the size of the organisation that can be supported directly. In the past this has been overcome by "hosting" resource in the wider NHS. Such a strategy may not be appropriate for this programme and other options should be considered – if only to ensure that the programme team has adequate flexibility to bring in external resource as needed, pay market rates for key players and grow in size without restriction (provided budget exists within the programme). Two models warrant immediate review:

Criminal Justice Information Technology (CJIT) – This is a very recent organisation, set-up in the Criminal Justice community to address similar issues to those faced in DH/NHS– a wide variety of stakeholders, fragmented organisations, diverse reporting lines and lack of clear ministerial accountability. The Head of CJIT <text redacted>, has been brought in from outside government (not unlike the awaited Director General for this programme) and has been given responsibility and, vitally, budget across the organisation. CJIT is just beginning to ramp up to its target size, review its domain for the projects that are essential and those that must be culled. As such, it is too early to say whether the model will be ultimately successful, but some consistency of approach between CJIT and the programme may be beneficial in ensuring that problems and issues are confronted once and once only. The report above has already noted that, at a minimum, cross-membership of programme boards is warranted.

Partnership UK – This organisation was setup to facilitate investment by the private sector in government projects. It is effectively a Joint Venture, with a portion owned by HM Treasury and the rest by external organisations. This gives PUK the flexibility of the private sector but ensures that its principles are grounded in the public sector. PUK are presently advising on procurement strategies and are therefore close enough to the programme to determine whether there is benefit in considering a similar structure.