



Delivering 21st Century IT Support for the NHS

National Strategic Programme

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1 EXECUTIVE SUMMARY

1.1 Vision (section 2)

1.1.1 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.

The programme focuses on the NHS but we also intend to take forward in parallel developments in Social Care IT so the two services are integrated as local communities are ready.

1.2 Strategy (section 3)

1.2.1 The core of our strategy is to take greater central control over the specification, procurement, resource management, performance management and delivery of the information and IT agenda. We will improve the leadership and direction given to IT, and combine it with national and local implementation that are based on ruthless standardisation.

1.2.2 A Ministerial Taskforce will be established under the chairmanship of Lord Hunt. A new NHS IT Programme Director will be appointed to ensure delivery of the national components and co-ordinated local implementation. Each Strategic Health Authority will appoint a Chief Information Officer (CIO) and have a key role in ensuring PCTs and NHS Trusts implement and use the core IT solutions determined at national level.

1.2.3 From April 2002 to April 2003, before the significant additional levels of funding are available, we will work on developing the NHS' IT management structure, capacity and capability. We will also define the data, and data interchange standards we will require in the future. We will build the essential system specifications for Phase 1, and begin to deliver the National Health Record Service. We will also begin work with OGC, PASA, Partnership UK and the eEnvoy to streamline procurement.

1.2.4 In Phase I we will quickly develop the infrastructure, including improving broadband capacity, needed to lay the basis for key applications. The key applications in this phase are electronic records, booking and

prescribing. These will be developed and implemented to national standard specifications.

- 1.2.5 The programme is based on the assumption that the SR2002 bid provides a significant level of increased funding. Our strategy to ensure funds are directed to the required IT developments will be to release them only when systems proposed by NHS organisations are compliant with national standards or called off from a list of compliant systems. In 2002/03 we will seek to accelerate the pace of development in connectivity, bandwidth and electronic records as available resources permit.
- 1.2.6 These changes will require closer working with industry partners and a greater emphasis on national procurement arrangements. For example, “development partnerships” with a consortia of suppliers will be needed, as well as agreed national standards and specifications. Each national procurement activity will be subject to Office of Government Commerce (OGC) Gateway procedures.
- 1.2.7 Finally we will work closely with the Modernisation Agency to change working practices so that IT is used effectively.

1.3 Delivery (section 4)

- 1.3.1 The delivery of the National Strategic Programme will have a number of key streams of work including, building the IT infrastructure, defining data and system IT standards nationally, creating and maintaining critical national services, managing procurement, developing the IT capacity of both the NHS and the IT industry suppliers and managing local implementation.
- 1.3.2 These streams will be co-ordinated at the national level by a new Programme Director, who will have a central programme support team. A communications strategy with the NHS and IT industry will be developed.
- 1.3.3 Our greatest challenges during the delivery process will include
 - balancing rapid progress at a national level with user acceptance and implementation capacity in the NHS and IT industry at the local level;
 - ensuring that we achieve best procurement value while accelerating the business case and procurement processes, and reducing the level of choice for the local implementations;
 - ensuring that we efficiently capture and re-use the experience and knowledge in IT design and implementation of the Strategic Programme at all levels in the NHS;
 - building and maintaining the IT capacity and capability of the NHS through a period of rapid change.

1.4 Risk analysis and management (section 5)

- 1.4.1 We have completed an initial risk analysis and management assessment, and identified actions to minimise and or manage the key risks. A major component of the risk management strategy will be through the rigorous application of the OGC Gateway process. Through applying this process, we will ensure that independent reviewers carefully assess each project stream.

2 VISION

2.1 Introduction

2.1.1 Historically, the NHS has not used or developed IT as a strategic asset in delivering and managing healthcare. While there were good, usually local, IT initiatives sponsored by enthusiastic visionaries, these were outweighed by the overall lack of funding and development priority given to IT at all levels. Good experiences were not captured, and successful implementations were not scaled from their local beginnings to NHS-wide application.

2.1.2 In 1998, the NHS recognised that IT had a major role to play in healthcare, and *Information for Health* (IFH) defined the strategic approach for the use of IT. Since the advent of IFH, there have been improvements in the level of IT funding and in the uses that are made at local, regional and national levels. However, there remain a number of critical barriers to the effective use of IT as a strategic tool in the delivery of healthcare by the NHS, including:

- small amounts of protected IT funding that has had low priority for many Trusts – leading to very low levels of investment;
- lack of a cohesive, nationally-led IT architecture for data and system standards that allow information and processes to follow the patient's journey through the NHS seamlessly;
- the need to improve coordination of IT resources and procurements to increase the pace of implementations and provide fast, better value for money IT projects;
- low levels of secure, high-bandwidth connectivity for NHS staff, backed by means of authenticating users to access sensitive patient information.

2.2 The future

2.2.1 Our vision for information and IT is to connect delivery of the NHS Plan with the capabilities of modern information technologies. In the sections below we set out some of the practical examples of key stakeholder experience in an NHS operating with modern IT at its heart.

2.2.2 **For patients**, in a modern IT-enabled NHS there will be direct and visible impacts on how they interact with the healthcare system and on their experience as consumers of health services. They will see that their health records are always readily available to staff and will have the chance to help maintain the quality of those records. Patients will be reassured to see that staff have the high quality IT systems in place, can answer any questions they have and are relying on up-to-date treatment and prescribing protocols as well as the latest medical knowledge and clinical practice. Patient friendly care protocols will be available. Citizens will be able to obtain information over the phone or via the Internet 24 hours a day, and patients can expect up to date information about their symptoms to be on line (via Internet or DiTV), or can phone a call centre

to receive advice and make appointment bookings on-line. Telecare and monitoring services will be available from the convenience of their home.

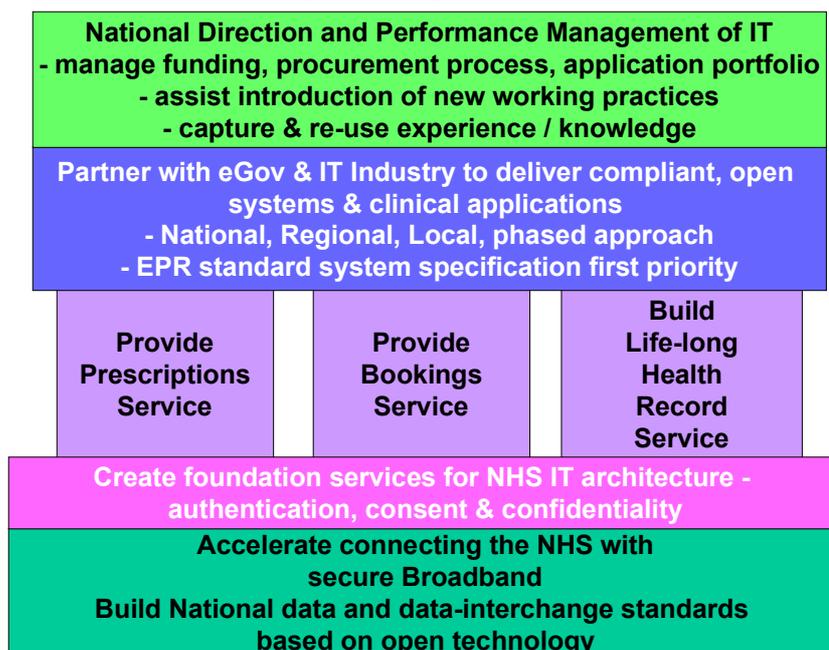
2.2.3 **Health care professionals** will have safe, fast, modern IT systems to support them routinely in their work. They will be able to review case histories, schedule care plans, prescribe drugs, commission tests and view results quickly and conveniently. Their time with patients will be spent more effectively in delivering safe, high quality care based on universally available, secure, accurate, up to date electronic records. Access to research and knowledge will be freely available and continuing personal development will be supported by a process of lifelong learning via the resources of the NHS University. Fast, secure, reliable communications links will support telemedicine services designed around patients' needs and remote monitoring of some conditions will be commonplace.

2.2.4 For **health care managers** reliable, accurate data (financial and clinical) will enable better workforce planning and management of scarce resources, will improve clinical governance and promote high quality care. Public Health, the planning of services for populations, as well as analytical and statistical services will be based on better quality data. Joined-up services will be the norm as organisational boundaries are blurred in the interests of focusing on customers' needs and information is securely shared in "real time" among appropriate professionals.

2.3 National Programme Architecture

2.3.1 The necessary programme architecture to achieve this is illustrated below –

National Strategic Programme - Architecture



2.3.2 The key elements are to:

- create an IT management capability that provides greater leadership, competence development, co-ordination and direction, allowing the NHS to capitalise on the power of IT to integrate data and processes across organisational and physical boundaries;
- manage funding to ensure IT receives the investment it requires;
- capture knowledge of best practice and drive it into the national, regional and local IT environment;
- work with clinicians and the Modernisation Agency to make sure the benefits offered by IT-supported working practices are delivered.
- work with industry to ensure they can provide the capacity and products to ensure we obtain quickly the advantages offered by compliance with national data and systems standards;
- coordinate procurement to ensure we achieve best value, rapid progress and compliance with data and systems standards;
- develop core national services that can be used throughout the NHS (eg Electronic Health Record Service, Booking Service, Prescriptions Service);
- develop a compliant choice of systems for a portfolio of critical local applications (eg Electronic Patient Record, EPR);
- build connectivity, so that all staff have the bandwidth and access devices they need;
- create national standards for data quality and data interchange between systems at local, regional and national levels.

3 STRATEGY

3.1 Strategic decisions required to deliver the Vision

3.1.1 There are a number of critical strategic elements that must be in place to deliver the IT vision for the NHS. These are:

- an increase in the level of national direction given for IT by evolving and simplifying the management structure and responsibilities within both the DH and NHS at regional and local levels;
- a phased approach to deliver change quickly – focus at any one time on quickly delivering a limited portfolio of activity, nationally, that can be built on by subsequent phases;
- management of increased levels of funding with clear central direction and control;
- a structured partnering approach with Industry to deliver new IT systems across the NHS;
- coordination, acceleration and where appropriate simplification of procurements to ensure we get value for money while moving at a fast pace, and do not add unnecessary time and cost to our industry supplier base. We will consider radical outsourcing options that add pace and value to the programme;
- changed working practices in the NHS;
- benchmark progress against best practice companies.

3.2 Create National Direction for IT

3.2.1 The full details of the Management Structure are given in Appendix 1. In summary there will be:

- a ministerial taskforce chaired by Lord Hunt
- a single DH Director (Sir John Pattison) who will be responsible for the programme and report to Lord Hunt and the Chief Executive/Permanent Secretary, Nigel Crisp
- a newly appointed National IT Programme Director working to Sir John empowered to deal directly with the Strategic Health Authorities and manage those funds held centrally for this programme. The National Director will work with the Information Policy Unit and NHS Information Authority.
- a Chief Information Officer appointed by each Strategic Health Authority to ensure there is appropriate funding and effective IT management for every PCT and NHS Trust to implement and use the core IT solutions determined at national level
- capacity in PCT and NHS Trusts to implement the local elements of the national programme
- a workstream to develop the capability in the NHS to underpin the above.

3.3 Phases of delivery

3.3.1 Set out below are the phases of the programme delivery that allow the impact of improved IT to be made early, with sustained, incremental

increases in functionality. A preparatory Phase 0 is needed from April 2002 – March 2003. Phase 1 will concentrate on some key tools and pieces of infrastructure. Successive phases will then add to the portfolio, with increasing sophistication of function built onto proven infrastructure and data quality.

Phase 0 – April 2002 – March 2003 - Firm Scope
<p><i>Infrastructure</i></p> <ul style="list-style-type: none"> • Define data standards • Define interchange standards • 100% Consultants with PCs <p><i>Application services</i></p> <ul style="list-style-type: none"> • Create first stage of National Health Record Service • Agree XML based EPR System Specification, using open standards <p><i>Implementation and Support</i></p> <ul style="list-style-type: none"> • Work with OGC and e-Envoy to streamline procurement • Begin increase of NHS IT capacity and capability
Phase 1 – April 2003 to December 2005 – Firm scope
<p><i>Infrastructure</i></p> <ul style="list-style-type: none"> • Broadband access (>128kbs) to every clinician & support staff in the NHS, increased bandwidth to minimum - 2Mbps between trusts and across NHS Net Gateways • Access and authentication available for all NHS staff, implementation of National NHS Directory Service • Domain to domain encryption implemented <p><i>Application Services</i></p> <ul style="list-style-type: none"> • National Bookings Service, implemented • National Prescriptions service, 50% implemented • All PCTs, NHS Trusts actively implementing elements of EPRs • Full National Health Record Service implemented, and accessible nationally for out of hours reference • National Patient Record Analysis Service established for 100% of NHS transactions; • Provision of e-learning materials through the NHS U <p><i>Quality Management</i></p> <ul style="list-style-type: none"> • Establishment of a Faculty of Health Informatics in the NHS U. • Implementation of Gateway procedures for Information and IT projects <p><i>Implementation and Support</i></p> <ul style="list-style-type: none"> • National IT services portfolio established • StHA investment plans accepted (and funding agreed) by National Programme Director

Phase 2 – January 2006 – December 2007 (Tentative scope)

Infrastructure

- Broadband access implemented at recommended access speeds across local and wide area networks in the NHS
- Secure access mechanisms (e.g Smartcards) for all NHS staff

Application Services

- Full National Health Record Service, with core data and reference links to local EPR systems for full record access;
- National Bookings Service, all patient appointments, implemented;
- National Prescriptions Service, with full clinician and patient functionality, 100% implemented;
- EPR (compliant with new National standard, XML-based specification) systems implemented in all PCTs, all Hospitals;
- Picture Archiving and Communications Systems for all acute Trusts
- Telemedicine established in all GP surgeries for ECG, skin disease
- Patient / Citizen Portal available via Internet, Digital TV, wireless devices
- Ambulance Telemonitoring implemented in 20% of all emergency response vehicles
- Ambulance radio replacement
- Home Telemonitoring available in 20% of homes requiring it
- Common clinical terms implemented for hospital and primary care
- National Knowledge Service fully established.

Phase 3 – January 2008 – December 2010 (Tentative scope)

- Ambulance Telemonitoring implemented in 100% of all emergency response vehicles
- Home Telemonitoring available in 100% of homes requiring it
- Unified Health Record (with all appropriate Social care information)

3.3.1 Phase 2 will be firmly defined during calendar year 2003, Phase 3 during calendar year 2006.

3.4 Funding the Implementation

3.4.1 The final decisions on additional or increased funds for investment in NHS IT are tied to the 2002 Spending Review. All the funding issues will be finalised and announced in summer.

3.5 Working with Industry Partners

3.5.1 The scale and speed of change required in the use of IT in the NHS

requires close partnership working with the IT Industry. From the use of IT consultants and contractors in developing and managing the implementation plans, through to the co-operation of systems suppliers in developing systems that comply with national data standards and system specifications, industry will play a critical role in our success. Key to this relationship with Industry will be:

- demonstrating commitment to the programme through effective communication of the IT management structure and funding commitments;
- effective management of the local implementations to ensure only compliant systems are purchased;
- cohesive management of procurement at local, regional and national levels, while working within EU procurement Directives.
- communicating early the IT architecture (based on open XML standards), interchange standards, data standards and systems' specification that the industry will need to build
- sharing the capacity needs of the NHS with the IT industry so they can invest in their resources to support delivery of our systems

3.6 Procurement Strategy

3.6.1 To accelerate the impact of IT across the NHS, the traditional approach to procurement must change at both national and local levels. Five options have been considered. They are discussed in detail in Appendix 2 but in outline are as follows.

- **Option 1 - 100% Private Sector dependence:** Outsource the whole of the NHS IT strategic programme (including local implementation arrangements)
- **Option 2 - Strategic outsourcing:** Selectively outsource major components of the NHS IT Programme, e.g. networks; Deliver some components at a national level via the NHS Information Authority, e.g. National Health Authority Information System; maximise the use of national framework contracts for commodities; set national standards for local use; Strategic Health Authorities to be performance managed to ensure implementation
- **Option 3 - National NHS solutions for the NHS:** NHS to run all major components of the IT strategic programme at an national level (primarily by the NHS Information Authority), and maximise the use of national framework contracts for commodities; set national standards for local use; Strategic Health Authorities to be performance managed to ensure implementation
- **Option 4 - Strategic HAs Lead:** Decentralise the management of IT to Strategic Health Authorities; maximise use of national framework contracts for commodities; set national standards for local use
- **Option 5 - 100% Local NHS Provision:** Maximise use of national framework contracts for commodities; set national standards for local use; responsibility for implementation rests with local NHS Trusts. This "Local Implementation" option is, broadly, where the NHS is today.

3.6.2 Option 2 is the preferred route forward. Characterised as Strategic Outsourcing, this approach gives the best spread of risk, has

achievability, retains the incentives for innovation whilst insisting on ruthless standardisation of a national infrastructure. It requires robust management of the resources at Strategic Health Authority level to ensure that both new and baseline spend on IT is appropriately protected. It also needs clear and explicit mechanisms for setting and agreeing standards.

3.6.3 Procurement activities at national level will be to:

- establish “development partnerships” with consortia of suppliers, with the aim of producing a limited portfolio of compliant systems that can be called-off at regional and local levels, to avoid multiple local procurements where they are unnecessary;
- agree a phased programme of development of standards and testing to deliver the national specifications;
- work with PASA, OGC, Partnerships UK, Office of the e-Envoy, and HM Treasury to agree the formalities of the procurement processes that will be needed to achieve accreditation of (consortia of) suppliers/prime contractors, and systems.

3.6.4 Each national procurement activity will be subject to OGC Gateway procedures. Formal business cases will need to be produced, as part of a managed process within set time limits. Subject to agreement with PASA, HMT and OGC, the time limits for national procurements need to be as tight as possible, and the national IT Director and NHS Information Authority will need to ensure they are adhered to. Reporting (e.g. via OGC) to No.10 Delivery Unit on major IT procurements will be one way of keeping up the pressure to deliver to agreed timescales.

3.6.5 At the local level, our procurement approach will be characterised by:

- call-off of centrally-funded, compliant systems from a limited choice (for key functional areas like EPR);
- co-ordination at regional / sub-regional level to ensure that appropriate consistency is maintained across PCTs and hospitals.

3.6.6 To support consistent local procurement we will:

- implement a procurement advice service by the NHSIA to help improve business cases and encourage compliance with national standards (especially when skills shortages are being exacerbated as we shift the balance of power);
- agree the arrangements for Strategic Health Authorities (StHAs) to identify resources to manage and co-ordinate IT procurements;
- agree the delegated approval arrangements for StHAs to approve business cases.

3.7 Delivering results

3.7.1 The focus of our programme is on IT systems and services. However we have not lost sight of the fact that there are other critical elements, including using IT to change working practices and converting from

legacy systems and data records.

Changing working practices

- 3.7.2 We will work closely with the NHS Modernisation Agency to produce and implement a plan to ensure that the enhanced IT capabilities lead to the use of the new systems and data to change working practice – thereby delivering faster, higher quality, more consistent healthcare experience for the patient. A critical element in the strategy to change working practices and encourage adoption of the IT must be changes in the measures used at PCT / hospital level on the use of IT systems. We will work with the Modernisation Agency to consider a series of pragmatic measures that could be applied to identify those practices / hospitals that are grasping the IT opportunity, and those who are falling behind. We will also consider rewards and sanctions that could be applied to encourage adoption, including “Best Practice” and “Early Adopter” rewards that could have tangible financial benefit. Any developments in this area will be taken forward through ROCR. We plan to help by providing templates and best practice guidelines that are supported by the data and systems we are specifying to afford each organisation help in both implementation and use of new systems.

Converting legacy data, interfacing to legacy systems

- 3.7.3 Another critical activity, that will transform the programme from one that provides systems to one that helps the NHS to use its IT investment, will be the conversion of data from old formats into that required by the new EPR systems. In addition, interfacing remaining systems (eg in Patient Administration) to the new systems where needed will also be a major undertaking. We will work with the Strategic Health Authority Chief Information Officers to help plan and budget for this activity.

3.8 Benchmarks – internal, external

- 3.8.1 We are taking action to establish benchmarks for our planned IT systems to enable comparison of progress against best practice. They include:
- consulting best practice IT user companies across industries (eg Cisco, BP, Shell, Ford, Microsoft);
 - partnering with other Healthcare providers to exchange experience and mentor each other (Kaiser Permanente, Norway, Spain);
 - tracking international health IT strategy developments, e.g in New Zealand, Australia;
 - inviting external internationally respected experts to review progress;
 - supporting European Health Telematics standards development.;
 - working with the Office of the e-Envoy;
 - tracking the work of the WHO in developing international benchmarks;
 - sharing experience, standards etc with colleagues in Scotland, Northern Ireland and Wales.

4 DELIVERY WORK STREAMS

4.1 Building the IT Infrastructure

- 4.1.1 **NHS network facilities** will be re-procured in the next 18 months with the emphasis on the need to improve capability to support e-business in the future. It will include the provision of broadband access (greater than 128 kbs) to staff and a minimum of 2 mbps between trusts and across NHS gateways.
- 4.1.2 There is a comprehensive work programme to support **confidentiality and consent** issues. The government has made it clear that the fundamental principle governing the use of information that individuals provide in confidence to the NHS is that of informed consent. A national “model” for consent and access is being developed and needs to be agreed with the Information Commissioner. It will then be shared with suppliers to ensure it can be implemented in record systems.
- 4.1.3 One of the elements required to support the confidentiality requirements is the provision of **authentication** mechanisms. Options for this are currently being explored. These will be dependent upon the national directory service (for which the contract is due to be placed in spring 2002) and the Electronic Staff Record system, which will be fully implemented by 2004.
- 4.1.4 Interim **encryption** facilities are already being provided e.g. for the national e-mail service. Plans for the longer-term approach are currently being drawn up, with a business case for Privacy Enhancing Technologies due to be completed by September 2002.

4.2 Defining data and system standards

- 4.2.1 The development of standards is a long-term process, and the implementation of standards needs careful management. The immediate activities that are needed however are to set the strategic direction, to implement current standards for projects underway and to manage migration from old systems.
- 4.2.1 Setting the strategic direction means giving clear messages to the NHS and to suppliers about the direction of travel and to suppliers about the international standards which the NHS expects to implement. At the beginning of June 2002 we will describe the standards and specifications that can be laid down at that time whilst continuing collaborations with suppliers and the NHS to further develop these standards.
- 4.2.2 Work is currently underway on a strategy for electronic Clinical Communications and a report is due at the end of March 2002. This will guide the implementation of the electronic Pathology results to GPs and GP to GP record transfer (both due in December 2002); radiology reporting and electronic discharge summary implementation due to commence in March 2003; and the standards for electronic transfer of

prescriptions will be available later this year.

- 4.2.3 The third strand of work around standards requires management of the migration from the current, patchwork, position, to support for the strategic level of standards outlined above. For example, the pathology messaging project will initially deliver EDIFACT messages, transported over X.400. New projects will introduce the e-gif type standards such as XML and SMTP.

4.3 Maintaining and creating critical national services

Maintaining existing National Services

- 4.3.1 The NHS Information Authority is responsible for ensuring critical national services are maintained. Examples include:

- NHS Strategic Tracing Service (NSTS);
- NHS-wide Clearing Service (NWCS);
- NHS Health Authority Information Services (NHAIS);
- Clinical Terms.

- 4.3.2 In addition to on-going support and maintenance, some of these services require specific actions, e.g.:

- reprocurement when existing contracts cease (e.g. NWCS, where the current contract expires in 2004);
- development to reflect new requirements (eg NHAIS which needs to be updated to reflect the needs following Shifting the Balance of Power;
- support through implementation and further update, e.g. Clinical Terms.

Health Records

- 4.3.3 A National Health Records Infrastructure will be defined and provided **nationally**. It will provide specific products and services for use with local systems. These will include patient identification, NHS number and standards for security, confidentiality, access and consent.

- 4.3.4 The patient-oriented Electronic Health Record (EHR) will be developed both for clinical conditions and for use in providing information for emergency care anywhere anytime for use by authorised NHS staff. EHRs for clinical conditions eg cancer will be developed using national data standards and structures to provide local EHRs. These will interface with the National Health Record Infrastructure which will progressively provide access to more and more data.

- 4.3.5 Electronic Patient Records (EPRs) supporting care in different settings (eg acute, primary and community) will be provided locally by selection from the centrally-funded, nationally compliant EPR solutions. The basic components to be procured support a functional model that includes modules such as:

- Patient Administration

- Order communications and results reporting
- Integrated care pathways
- Electronic Prescribing
- Picture Archiving and Communications Systems (PACS)
- Telemedicine and Telecare.

4.3.6 Experience of implementation of the EPRs across the NHS shows that, whilst modules for Integrated Care Pathways and Electronic Prescribing are proving difficult to deliver, there are some quicker benefits to be derived from investment in Picture Archiving and Communication Systems and telemedicine (given the necessary bandwidth). Given the resources, capability and greater central control and direction in this national programme, the NHS will be able to deliver elements of the above to all trusts in 2005 with all features being available in 2006.

Bookings

4.3.7 The Booked Appointments programme will shortly commence procurement activities to provide a national specification for information brokering, and to provide local sites with a list of accredited suppliers from whom to choose solutions. These suppliers will have been selected on the basis of meeting both the functional requirements and conformance with NHS standards. A small number of "Enterprise Communities" are about to commence electronic booking to provide experience to support rapid implementation of the proposed framework for Electronic Booking. An accredited list of suppliers will be available by the end of 2002, with implementation and roll-out to follow in 2003 and 2004.

Prescriptions

4.3.8 In developing a National Prescriptions Service, the Electronic Transfer of Prescriptions project has created partnerships from the private sector through three consortia who have agreed to deliver pilots trials. One has started and two are due to commence in June 2002. The pilots are due to run until the end of 2002. The pilots are supported by a formative evaluation programme. Designed to run in parallel with the pilots it will recommend changes as they proceed to minimise any delay between the conclusion of the pilots and delivery of the evaluation in March 2003.

4.3.9 It is anticipated that the trials will continue to grow and involve a sizeable number of GPs and Pharmacists with a natural migration into rollout. This project will create greater connectivity to NHSnet for Pharmacists allowing the access to the benefits that this service provides. In parallel the Prescription Pricing Authority will have re-engineered their systems to ensure that they prescribe electronically. The National Prescriptions Service will be 50% implemented by 2005 and fully implemented by 2006/7.

4.4 Managing Procurement

4.4.1 There will be national-level procurements for national services, and for a limited range of developmental projects. Major national procurements underway or soon to be started include:

Area to be procured	Contract award due
e-mail and directory services	April 2002
Privacy-enhancing technologies	March 2003
Networking services	March 2003
National electronic Library for Health	March 2003
NHS Wide Clearing Service	March 2004
Ambulance radio procurement	March 2004

4.4.2 Each national procurement activity will be subject to OGC Gateway procedures. Formal business cases will need to be produced. We will agree with HMT and OGC target times for the completion of each stage of procurements.

4.4.3 Even where local procurement activity is required, there will be national projects to reduce bureaucracy and duplication of effort. In particular, nationally we will:

- Establish some “development partnerships” with consortia of suppliers
- Agree a phased programme of development of standards and testing to deliver the national specifications
- Work with PASA, OGC, Partnerships UK, Office of the e-Envoy, and HMT to agree the formalities of the procurement processes that will be needed to achieve accreditation of (consortia of) suppliers/prime contractors, and systems
- Arrange call-off mechanisms at national, regional and local levels of demand.

4.4.4 In order to streamline the business case approval process we will:

- work with Finance Department to add capacity and eliminate backlog
- implement a procurement advice (but not approvals) service by the NHS IA to help reduce poor business cases (especially when skills shortages are being exacerbated as we shift the balance of power)
- agree the arrangements for StHAs to identify resources to manage IT procurements
- agree the delegated approvals arrangements for StHAs to approve business cases.

4.5 Developing Capacity

4.5.1 Our surveys suggest that the majority of NHS professional staff require some level of education, training and development in almost all Health Informatics topics. The lack of capacity of sufficient skilled staff in the NHS reinforces the need to work with industry to ensure that the necessary services are provided. The costs of paying industry (directly or indirectly) for these services will be recognised in assessing the priorities for developing in-house capacities. The NHS IA is ensuring that basic PC

skills will be provided for all staff using a national procurement and roll out of the European Computer Driving Licence Scheme.

- 4.5.2 To encourage the increase in capacity and competency in IT within the NHS at both national and local levels, we will work to create and manage IT career paths for both systems and Informatics professionals. For informatics staff, the education sector provides learning content and academic awards on Informatics, but the NHS Information Authority will award professional recognition (in a Register of Professional Competence in IT) to those who meet both practice and qualification requirements. We plan to hold an NHS IT & Informatics Professionals Conference in late 2002, an event that should start to cement the feeling of community, structure and progression in the IT workers throughout the Service. Discussions to make the establishment of a Faculty of Health Informatics an early component of the NHS University are underway.

5 RISK ANALYSIS AND MANAGEMENT

5.1 Background

- 5.1.1 This programme of work is very substantial, and it is quite clear that significant risk will be involved. This section addresses the mechanisms that will be used to manage risks, using the OGC Gateway process, provides an initial risk assessment for the programme, and then identifies a number of dependencies with known on-going projects.
- 5.1.2 The Office of Government Commerce has introduced a system of gateway reviews for major public sector projects. The first step is for the Senior Responsible Owner to use the Project Profile Model to determine the overall level of risk for a given project. An assessment of the Strategic Programme against the PMDU Project Guidance for ensuring successful delivery has been undertaken.
- 5.1.3 As soon as possible after completion of this draft of the National Strategic Programme, it will be necessary to conduct a Gateway 0 study on the overall programme.
- 5.1.4 Risk management is critical to this delivery area. We are implementing a national risk analysis, monitoring and feedback system, which will:
- Undertake sensitivity analysis of all the key risk variables in our model;
 - Produce monthly monitoring and analysis of changes in these key risk variables;
 - Develop immediate response strategies for specific problems such as capacity issues at a Strategic Health Authority or local level.
- 5.1.5 The key risks identified to date are shown in Appendix 3, together with proposed management actions. At this stage the risk assessment is high level, and has not yet considered the probability and impact of individual risks. Detailed risk registers will be completed for each project, and further analysis will be carried out at this level. These registers will be actively managed seeking, where appropriate to share risks with private sector partners.

6 CONCLUSION

6.1.1 This national programme will deliver the following:

- connectivity, so that all staff have the bandwidth they need
- core national services that can be used throughout the NHS
- national standards for data quality and data interchange
- a choice of compliant systems for critical local applications
- sharing knowledge of best practice in delivering change through use of IT
- management of funding.

All of the above aim to ensure that the benefits offered by IT-supported working practices are delivered across the NHS and in support of patient centred services.

Appendix 1 – The Management Structure

1. The IT management structure required to make rapid changes in the adoption and use of IT in the NHS must have the following characteristics:
 - national management of funding priorities, data and data interchange standards definition, critical systems specification and development, programme management, major procurement execution, call-off procurement co-ordination, overall IT performance management;
 - regional (Strategic Health Authorities) management of funding flows to PCTs and performance management of IT in their region
 - local (PCT level) selection and implementation of IT complying with national data standards, system specifications and infrastructure requirements.

In the sub-sections below we lay out the IT management structure for programme delivery.

National Level

2. Ministerial accountability: Endorsement and sponsorship by the Secretary of State, day to day oversight by Lord Hunt, who will chair a Ministerial Taskforce on Information and IT.
3. DH / NHS National Management structure: The Director of Research, Analysis and Information, Professor Sir John Pattison reports to Lord Hunt and Nigel Crisp, the Permanent Secretary of DH. Sir John will retain overall responsibility for the coordination, and direction of the programme to modernise IT in the NHS. Working alongside Sir John will be a newly created National NHS IT Programme Director.
4. To develop the national capacity for delivery and implementation of IT solutions, the Programme Director will need to be a robust achiever. Working with the direct support of the Ministerial Taskforce, the Director will be empowered to deal directly with StHA Chief Executives, and also to help Ministers assess when StHA performance in delivering on Implementation Plans needs Ministerial attention. Other responsibilities will include:
 - overall programme delivery to agreed milestones and performance targets;
 - delivery of infrastructure & broadband connectivity targets by direction / funding to the Strategic Health Authorities;
 - ensuring Local Implementation Strategies are specified, costed and that Strategic Health Authorities manage the allocations of funds once these plans are agreed;
 - ensuring full use is made of national call-off contracts for systems and services;
 - managing those funds held centrally to direct the local implementation of systems selected from a limited, national agreed, list;

- working with the Modernisation Agency to facilitate that the opportunities offered by the implementation of modern IT systems are grasped at local level by making changes in working practices in clinical care and healthcare management;
 - ensuring local implementation of data quality and information aspects of business continuity.
 - to capture experience and share best practice knowledge around the Strategic Implementation Team
 - with the NHS Information Authority, developing an effective communications strategy with the IT supplier community
5. To accomplish these tasks, the National Director will have resources transferred or on secondment from the current Regional Heads of Information, the IPU and NHS IA. These will include the necessary programme heads to take responsibility for the delivery of key elements of the overall programme, including liaison with other Government Departments and the OeE to ensure cohesive approaches are adopted.
 6. The National Director will work with the Information Policy Unit and the NHS Information Authority as they discharge their responsibilities, which to date have not been directly concerned with local implementation of the national strategy.

IPU responsibility: Update information policy to reflect DH and Government objectives, ensure engagement of DH policy leads with information and IT issues, give the strategic direction for national information and IT standards, and with advice from the National Director commission the development and/or procurement of national specifications, standards and systems, manage “out of critical scope” and longer term investment or technical investigation IT projects.

NHS IA responsibility: Delivery of commissioned national core IT services, eg a Health Record Service, project management for the National Director of national and local pilot system developments to be used as national standard systems specifications. In addition, the IA will continue to maintain the legacy systems in the NHS that it currently supports and be responsible for:

- definition of data and data interchange standards, core national systems specifications (Health Record Service, Electronic Prescriptions Service, Booking Service, EPR systems);
- management of those centrally held IT funds used for data and data interchange standards creation, core national systems specifications, procurement of national systems from industry, seed funding for critical systems development, infrastructure investment;
- creation of limited portfolios of compliant local systems vendors for call-off by either Strategic Health Authorities or PCTs.

Regional Level

7. At the “Regional level”, a Chief Information Officer (CIO) will be appointed by each Strategic Health Authority. The CIO will ensure that there is funding and effective IT management for every PCT and NHS Trust to implement and use the core IT solutions determined at national level. This requires:
- an evaluation of each PCT and NHS Trusts’ costed implementation plans;
 - the control of “investment funds” against satisfactory progress with PCT and NHS Trust implementation plans;
 - the management of the collaboration of PCTs of the delivery specific healthcare services to NHS Trusts and GPs who share responsibility for the same or overlapping populations. (Care networks);
 - business case approval between £5m and £20m;
 - liaison with the DoH and local health communities on the interpretation and implementation of national IM&T initiatives within a local context;
 - monitoring annual performance targets at an appropriate level of detail across the patch allowing for specific local issues such as Trust Mergers;
 - the CIO will need to ensure that the StHA can respond robustly to the strong performance management challenges for information and IT set by the National IT Programme Director.

Local Level

8. At the local level, each PCT and NHS Trust will:
- maintain business continuity of information flows and quality during the decentralisation of the NHS
 - call-off and implement national standard data, data interchange and standard specification systems (eg EPR) from a limited portfolio of choices defined at the National level;
 - meet short term targets for infrastructure improvement (e.g. broadband connectivity)
 - access and use National IT Services (Health Record Service, Bookings Service etc.)
 - collaborate with other organisations within the local community (e.g. Acute Trusts and Social Services)
 - provide a map of their relationship to care-networks
 - make arrangements for using services based on a federation of PCTs (e.g. Primary Care Agencies for Exeter Systems)
 - change working practices to gain the benefits offered by the new IT services and software;
 - guarantee executive commitment to their full implementation and availability of associated resources
 - ensure that the Trust can respond robustly to the strong performance management challenges for information and IT set by the CIO and CE of the StHA.

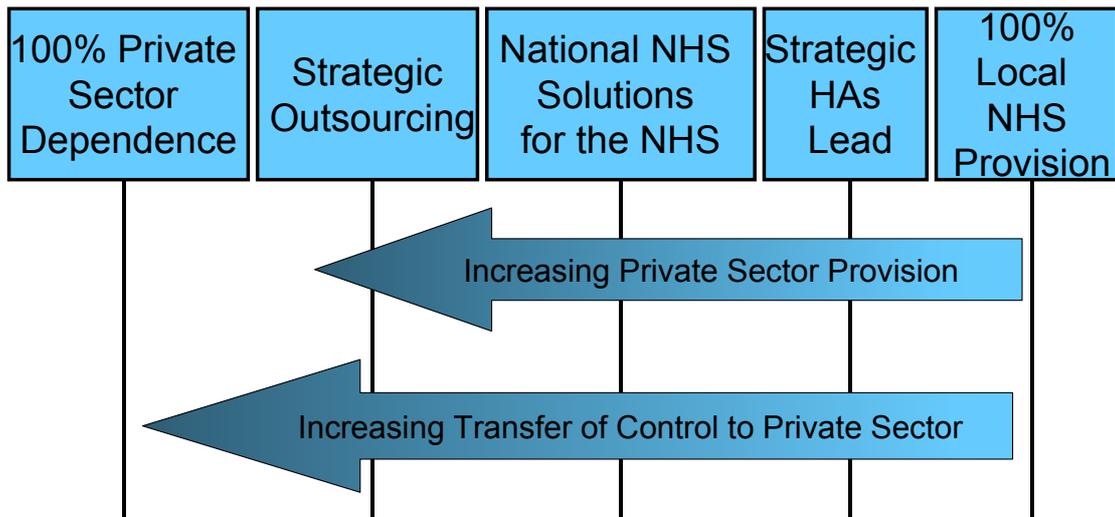
9. Part of our management structure will be to have a career and capacity development programme for IT in the NHS (see also paragraph 4.5.2) This will include:

- Annual surveys of Informatics staff (so as to inform staff retention policies)
- Supporting local and virtual teams (e.g. via learning networks)
- Development of a Faculty of Health Informatics within the NHS University to help provide a focus for e.g. increased training (in the new architecture) or IT career pathway management.

Appendix 2 - Procurement Strategy

- Five options are presented below that show a range of procurement options from national to local level. The diagram below also illustrates how the degree of private sector provision and transfer of control increase within these options.

Range of Procurement Options



2. Options

- **Option 1 - 100% Private Sector dependence:** Outsource the whole of the NHS IT strategic programme (including local implementation arrangements)
- **Option 2 - Strategic outsourcing:** Selectively outsource major components of the NHS IT Programme, e.g. networks; Deliver some components at a national level via the NHS Information Authority, e.g. National Health Authority Information System; maximise the use of national framework contracts for commodities; set national standards for local use; Strategic Health Authorities to be performance managed to ensure implementation
- **Option 3 - National NHS solutions for the NHS:** NHS to run all major components of the IT strategic programme at a national level (primarily by the NHS Information Authority), and maximise the use of national framework contracts for commodities; set national standards for local use; Strategic Health Authorities to be performance managed to ensure implementation
- **Option 4 - Strategic HAs Lead:** Decentralise the management of IT to Strategic Health Authorities; maximise use of national framework contracts for commodities; set national standards for local use

- **Option 5 - 100% Local NHS Provision:** Maximise use of national framework contracts for commodities; set national standards for local use; responsibility for implementation rests with local NHS Trusts. This “Local Implementation” option is, broadly, where the NHS is today.
3. In assessing these options there are a number of criteria to be considered: these include

Strategic issues

- *Strategic Fit.* how well the option provides fit with other key elements of the national strategy, including other Government policies;
- *Supply-side capacity and capability* - the ability of service providers to deliver the required functionality and levels of service;
- *Innovation.* How likely is that the option will lead to innovative solutions to business requirements?

Operational issues

- *Achievability* - the ability to assimilate, adapt and respond to the required level of change, including skills capability, project management and acceptance by users;
- *Risk management* - the extent to which the risks can be managed.
- *Quality.* How well will the different options deliver high quality IT services?
- *Legacy systems.* How well will options deal with the ongoing management of old IT systems (known as ‘legacy systems’ and will it assist with the replacement of these legacy systems?

Value for money

- *Benefits Optimisation* - how well the option optimises the return on benefits and improves VFM (economy, efficiency and effectiveness) against potential costs;
- *Affordability* - the required level of funding;
- *Definition and measurability of services.* Unless services are clearly defined, and able to be measured, it is unlikely that they will be delivered efficiently and effectively;
- *Transfer of operational risk.* How much do the different options transfer the risk of poor delivery of products and services to the supplier?
- *Incentive to improve.* How strong is this for the supplier, e.g. on unit price, time of delivery and service levels?
- *Cost.* Which options will lead to the lowest lifetime costs for products and services?

4. A summary of the option appraisal is:

Option	1- 100% Private Sector	2 - Strategic outsourcing	3 – National NHS solutions for the NHS	4 – Strategic Health Authorities Lead	5 – 100% Local NHS Provision
Strategic issues					
Strategic Fit	x	✓	✓	✓	x
Supply-side capacity	x	✓	x	✓	✓
Innovation	x	✓	✓	✓	✓
Operational issues					
Achievability	x	✓	x	x	x
Risk management	x	✓	x	✓	✓
Quality	✓	✓	x	x	x
Legacy systems	x	✓	✓	x	x
Value for Money					
Benefits Optimisation	x	✓	✓	x	x
Affordability	✓	✓	✓	x	x
Definition	✓	✓	✓	x	x
Transfer of operational risk	✓	x	x	x	x
Incentive to improve	x	x	x	✓	x
Cost	✓	x	x	x	x
Summary	x	✓	x	x	x

5. Option 5, whilst consistent with a decentralised NHS, has proved to be ineffective on securing delivery of information and IT on a consistent national basis. The direction of travel is away from this option. However, Option 4, is also too high a risk insofar as Strategic Health Authorities – whilst being sizeable large organisations in terms of information and IT

requirements – are not yet established. They do, however, have a key role to play in performance managing IT implementation in NHS organisations. Option 3 places far too much risk on the NHS IA in terms of its capability to run all the major components of the national programme.

6. Option 1 has the attractions of providing clear accountability for delivery to an agreed timetable, and transfers risk. Other Government Departments' experience has shown that this is a high risk/high reward strategy and that there are significant risks, particularly where the enterprise is a complex one – as the NHS undoubtedly is. There are a number of limitations. These include:
 - Giving the chosen supplier (or consortia of suppliers) the benefits of a monopoly position
 - No convincing evidence that there is an organisation capable of scaling up its operations to take on an organisation the size and complexity of the NHS
 - To enable the NHS to retain control over performance would require detailed definition of all the services to be provided. This would take a great deal of time.
 - Given the size of the NHS suppliers would be looking for at least a 10 year deal. The incentives for the suppliers to keep pace with the innovations and changes in IT are weak
 - The transfer of staff from the NHS to the outsourcing company would be on a very large scale, and inevitably there would be many redundancies as the company (and the costs of these would be built into the deal)
7. Option 2 is the preferred route forward. Characterised as Strategic Outsourcing, this approach gives the best spread of risk, has achievability, retains the incentives for innovation whilst insisting on ruthless standardisation of a national infrastructure. It requires robust management of the resources at Strategic Health Authority level to ensure that both new and baseline spend on IT is appropriately protected. It also needs clear and explicit mechanisms for setting and agreeing standards.
8. The implementation of this procurement strategy will require a series of activities at national levels most notably the setting of specifications and standards. National specifications are being assembled for PCT information systems, Electronic Patient Records (Acute, Primary), Community and Mental Health, Electronic Health Records, a national Health Records Infrastructure and minimum clinical data sets.
9. The National Information Standards Board is now established and has three sub-boards looking at technical, clinical and management standards. Its role is to:
 - agree the process for developing national standards, building on R&D work and demonstrator projects;
 - ensure that standards are developed in the context of agreeing mechanisms for product development and testing;

- review standards regularly to ensure their on-going applicability.
10. The development of standards is a long-term process, and the implementation of standards needs careful management. Where possible, the aim is to adopt international standards. The following table illustrates some of the areas involved and the relevant standards:

Technical (building on e-gif)	XML SMTP
Information Governance	ISO17799 X.509
Terminology and Classifications	SNOMED CT UKCPRS HRGs
Schema	HL7 Version 3 DICOM
Datasets	Condition-specific datasets, eg for Cancer, CHD

11. A National Accreditation and Procurement Process Service (NAPPS) has been established by the NHS Information Authority. NAPPS ensures that relevant NHS approved information standards, as agreed by the Information Standards Board, are implemented through the use of information systems certified to agreed national system requirements. This will be achieved by:
- the development of national system requirements
 - the provision of testing services for the certification of products and the accreditation of associated services
 - the provision of IT procurement process advice and guidance through a web-enabled Information Service.

Appendix 3 – Key Risks

Key Risks	Main approach to risk management
<i>Business Risks</i>	
Future changes to National Targets and priorities	<ul style="list-style-type: none"> • Obtaining clear commitment from Ministers to the Programme definition • Ensure regular meetings with Ministers to ensure objectives and priorities are in line with requirements • Ensure membership of lead official on the DoH Board
Lack of co-operation and buy-in by NHS stakeholders to investment objectives	<ul style="list-style-type: none"> • Full involvement of interested parties • Clear leadership from Department of Health
Inadequate Scoping of Project	<ul style="list-style-type: none"> • Assessment of relevant documentation (<i>NHS Plan, DoH PSA targets, Information for Health, and updated LISs etc</i>); • Preparation of business cases • Consultation with the programme board • Manage in deliverable chunks
Infrastructure not future proof	<ul style="list-style-type: none"> • Minimise the risk through private partnership • Align with international standards
Services are not affordable	<ul style="list-style-type: none"> • Need to scope the programme accordingly
<i>Implementation Risks</i>	
Lack of commitment to project by key user groups	<ul style="list-style-type: none"> • NHS Modernisation Agency to provide implementation leadership and support • Strategic Health Authorities to provide clear leadership • Collect evidence from local delivery mechanisms to ensure consistency with national strategy • Ensure involvement of interested parties in national programmes
Individual organisations in the NHS act unilaterally	<ul style="list-style-type: none"> • Strategic Health Authorities to provide clear leadership • Set targets through Performance Management
Shortage of required	<ul style="list-style-type: none"> • Minimise at national level by transferring risk

local skills etc.	<p>to the private sector partners</p> <ul style="list-style-type: none"> • Strategic Health Authorities to be responsible for identifying staff of sufficient calibre • Allocation and ring fencing of required staff and skills
Difficulties of migrating from current arrangements	<ul style="list-style-type: none"> • Adopt a clear communications strategy to facilitate local planning • Proper transition planning
Slow or non-realisation of benefit	<ul style="list-style-type: none"> • Benefit Realisation Plan and Study to be incorporated within each detailed programme plan • Performance Management of targets
<i>Service Risks (Design, Build, Finance and Operate)</i>	
Technical incompatibilities	<ul style="list-style-type: none"> • Liase with appropriate technical bodies to ensure compatibility • Align with international standards
Supplier side capacity and capability	<ul style="list-style-type: none"> • Establish resource and commitment targets from suppliers and monitor as part of the contract process
Poor service levels	<ul style="list-style-type: none"> • Setting of key performance and availability targets • Set up effective management board with user involvement
Supplier(s) does not deliver	<ul style="list-style-type: none"> • Put appropriate project management and reporting arrangements in place
<i>Other Project Management Risks</i>	
Cost escalation	<ul style="list-style-type: none"> • Budgetary Control – fixed investment ceiling • Clearly defined review points • Regular monitoring and exception reporting
Costs cannot be predicted	<ul style="list-style-type: none"> • Develop cost model as part of contract negotiation
Lack of skills to develop supporting standards and products	<ul style="list-style-type: none"> • Include training requirements in scope
Lack of training support	<ul style="list-style-type: none"> • Include training requirements in scope
NHS unable to manage the contract	<ul style="list-style-type: none"> • Build appropriate skills during contract negotiation phase