



National Audit Office

The National Programme for IT in the NHS: Project Progress Reports

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The National Programme for IT in the NHS: Project Progress Reports

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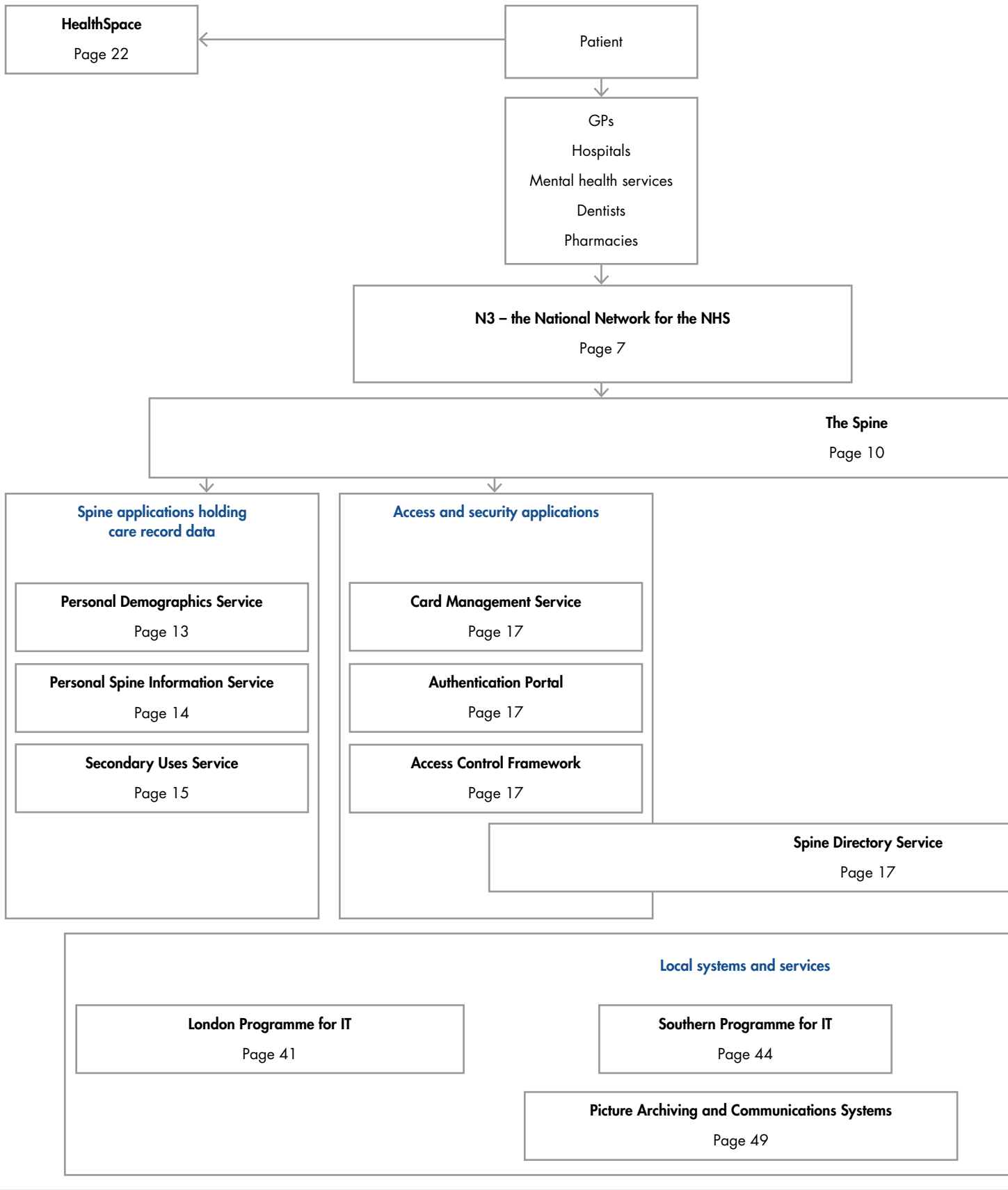
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National Programme for IT in the NHS: Main systems and services



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Introduction and commentary

1 This Volume comprises progress sheets which set out for each of the 14 main components of the Programme: background information, including what the system does and who the supplier is; details of the progress that has been made in developing and deploying the system; information on service availability and usage; and estimated cost and expenditure to date. Pages 4 and 5 indicate how the various projects fit together.

2 The first two projects – the N3 network (page 7) and the Spine (page 10), with its various applications – form the crucial underpinning infrastructure of the Programme. While they have been challenging to implement in such a large and diverse organisation as the NHS, they have been deployed on or ahead of schedule. Further development of the Spine is planned for 2008. The picture is similarly favourable on the variety of ‘other applications’, with deployments to date meeting the planned timescales, though there is further progress to be made on NHSmail (page 32) and GP to GP transfer (page 35).

3 The original scope of the Programme comprised an electronic booking service, an electronic prescription service and an electronic care record. The major challenges have been and remain with these three elements, which depend most on developing and deploying systems to support local operations, in Trusts, GP practices and pharmacies.

4 Deployment of the electronic booking service, which became Choose and Book (page 24) to support the Government’s policy to extend patient choice, is well advanced, though not all Acute Trusts have a compatible care records system, meaning that patients cannot book appointments directly with them. Usage is increasing, but has not yet reached the target level set for March 2007. Around half of first outpatient appointments are now made using Choose and Book, with considerable variations between Primary Care Trusts.

5 There remains some way to go before the Electronic Prescription Service (page 28) is fully implemented. While some 80 per cent of GPs and pharmacies are now capable of issuing electronic prescriptions, deployment of the second software release, which is designed to remove the need for paper prescriptions in most cases, is dependent on GP and pharmacy systems being accredited to connect to the Electronic Prescription Service; none has yet been accredited.

6 The biggest challenges have been on the electronic care record, which comprises two elements – the Summary Care Record (page 19) and the Detailed Care Record, which will be supported by the care records systems being deployed by the three Local Service Providers for London (page 41), the South (page 44), and the North, Midlands and East (page 46). The progress now being made in relation to the care record is extensively discussed in Volume 1 of this report.

1 N3 – the National Network for the NHS

Background

What does it do?

The N3 network provides IT infrastructure, network services and broadband connectivity, linking every NHS site in England including hospitals and GP surgeries, and non-NHS sites providing NHS care. One of the largest civil networks in the world, it is designed to enable the secure, accurate and efficient transfer of data between clinical and non-clinical IT systems within the NHS. The network can carry data, voice, video and images and provides a high bandwidth to allow large files and patient records to be transmitted. It provides back-up lines for resilience and offers opportunities for reducing the costs of telephone services and making most effective use of bandwidth.

When did it join the Programme?

Part of the Programme from the outset in 2002.

Supplier

British Telecommunications plc (BT). BT's role is to define and develop network services to meet the needs of the Programme; procure and use appropriate suppliers to deliver the services on terms and conditions which achieve value for money for the NHS; and manage the network to support the Programme.

Development

Community of Interest Networks

The introduction of N3 was through 'Standard Reference Connections' to each site to deploy the connections rapidly to meet the requirements of the Programme. Local communities or groups of NHS Trusts can now develop 'Community of Interest Networks' to support local business needs and those of the Programme. Such networks offer substantial operational flexibility, greater bandwidth and reduced costs to both the local community and the Programme. A major programme of work is underway to develop and deploy Community of Interest Networks across England where local communities choose to take part.

Voice over Internet Protocol

As each connection is reviewed three years after the original installation, from April 2007 to March 2010 there will be opportunities to introduce new services from the N3 catalogue. For example, N3 can carry telephone calls through 'Voice over Internet Protocol' technology, which presents an opportunity for Trusts to make financial savings. In July 2007 the network was made available to Trusts for this purpose and they will be able to make free phone calls between sites that have subscribed to a 'Local Gateway Service'. Trusts will also be able to place calls from their desk-based phones to mobile phones at considerably reduced prices. The addition of these services was negotiated with no additional central expenditure. BT is meeting these costs although Trusts are responsible for paying additional set-up and usage fees.

Deployment

Targets

To connect 6,000 NHS sites to N3 by 31 March 2005.	Achieved on time in March 2005.
To connect 12,000 NHS sites to N3 by 31 March 2006.	Achieved three months early in December 2005.
To connect 18,000 NHS sites to N3 by 31 March 2007.	Achieved two months early in January 2007.

Progress in connections

The deployment scope of the N3 project is to deliver connectivity to every NHS site. There is, however, a turnover of some five per cent of sites each year through closure, merger and new build activity. The target network, both in terms of size and location, is therefore variable to meet the physical configuration of the NHS at any given time.

At 31 March 2008, there were 22,804 live serviced connections, including 11,205 GP connections (including both fixed links to sites and mobility solutions). The number of fixed links to sites is expected to fall in the future as Community of Interest Networks result in fewer, larger shared connections to the network.

Progress in Community of Interest Networks

At 31 March 2008 more than 3,000 sites (approximately 15 per cent) had contracted to receive a Community of Interest Network solution. Deployment is underway and will continue throughout 2008. NHS Connecting for Health's aim is for 30 per cent of sites to be covered by a Community of Interest Network by April 2009.

Progress in Voice over Internet Protocol technology

The Voice over Internet Protocol technology has been piloted at five early adopter sites. A focus on London has led to 50 of the 72 Trusts contracting to take the N3 'Local Gateway Service'. Implementation is planned to take place by May 2008. NHS Connecting for Health expects the experience in London to drive demand across the rest of the NHS.

Service availability and usage

Target

In each month, the service to be available 99.99 per cent of the time.

See Figure 1 of the Annex, pages 56 and 57.

Usage

NHS Connecting for Health estimates that over one million NHS staff use N3 to perform their roles.

In a typical month more than 140 terabytes of data, including ten terabytes of X-ray and other PACS images, routinely cross between sites connected to the network.

N3 also transfers 100 terabytes of data through the Internet gateway each month, either coming into or leaving the NHS network, equivalent to the Encyclopaedia Britannica every four seconds or over 20,000 complete copies every day.

Cost

The estimated cost of the N3 contract is £530 million to March 2011.

Expenditure to date totalled £423.0 million at 31 March 2008.

Unlike the other Programme contracts, expenditure on N3 does not take the form of a fixed price, but an agreed catalogue of services to meet the needs of NHS organisations. Every three years, the service contract connecting a location is renewed, creating an opportunity to achieve a lower cost for future provision as a result of sharing connections in a Community of Interest Network, falling market prices, no further connection costs, or better managing the capacity requirement.

2 The National Data Spine (the Spine)

Background

What does it do?

The Spine comprises eight applications.

- Three hold care record data – the Personal Demographics Service, the Personal Spine Information Service and the Secondary Uses Service.
- Four security applications restrict access to national and local systems to accredited users – the Card Management Service, the Authentication Portal, the Access Control Framework and the Spine Directory Service.
- One is the messaging service – the Transaction Messaging Service.

There is also another service on the Spine, the Clinical Spine Application, which enables healthcare professionals who do not have access to compliant local NHS care records systems to send and receive information to and from the Spine.

The Electronic Prescription Service (page 28) is also part of the Spine.

When did it join the Programme?

Part of the Programme from the outset in 2002.

Supplier

BT.

Development from Release A1 in 2006¹

Key releases	Key feature	Target date	Date achieved
2006: Release A1	<p>Secondary Uses Service – Payment by Results:</p> <ul style="list-style-type: none"> ■ algorithm for financial year 2006-07 ■ data viewing and reporting 	May 2006	May 2006
2006: Release A2	<p>New architecture for Transaction Messaging Service</p> <p>Support for message transfers on Personal Demographics Service</p> <p>Support for Electronic Prescription Service including digital signatures and pharmacy nomination</p>	August 2006	August 2006
2006: Release B1	Secondary Uses Service – functionality to replace legacy NHS-wide clearing service and enablement of reporting and analysis features	November 2006	November 2006
2006: Release B2	Summary Care Record early adopter functionality including Clinical Spine Application	March 2007	March 2007
Secondary Uses Service 2007: Release 2	Secondary Uses Service – infrastructure upgraded to database server platform and upgraded Oracle database software	August 2007	August 2007
Oracle database server platforms	Spine upgrade of Oracle database server platforms, including improvements to cross-site resilience	November 2007	November 2007
Secondary Uses Service: Release 3L	<p>Secondary Uses Service – support for:</p> <ul style="list-style-type: none"> ■ commissioning datasets including patient pathway identifier ■ new data feed from Personal Demographics Service ■ data feed from Choose and Book to support reporting against the 18 week target 	November 2007	November 2007
Release 2008A	<p>Personal Demographics Service – a range of functions including updates from NHS legacy systems, birth notifications, civil registration, birth and death processing, batch tracing, NHS number management, and further support for patient access to HealthSpace.</p> <p>Personal Spine Information Service – augmentation of Summary Care Record with clinical messages from secondary care, discharge summaries, outpatient letters, support for patient sealed envelopes and provision of ‘consent to store’ choice.</p> <p>Further enhancements to electronic transmission of prescriptions, access control and provision of alerts.</p>	May 2008	Planned

¹ Releases prior to Release A1 2006 are described in our previous report, *The National Programme for IT in the NHS* (HC 1173, Session 2005-2006).

Key releases	Key feature	Target date	Date achieved
Secondary Uses Service: Release 3R	Secondary Uses Service – support for reporting against the 18 week target	May 2008	Planned
Secondary Uses Service: Release 4	Secondary Uses Service: <ul style="list-style-type: none"> ■ new reporting and analysis for Choose and Book data ■ population statistics ■ enhancements to reporting against the 18 week target 	Provisionally scheduled for October 2008	Planned
Release 2008B	Personal Demographics Service - major upgrade to support direct GP registration links to enable start of migration of GP registrations from NHS legacy systems Enhancements to GP to GP records transfer support	November 2008	Planned

Service availability

See Figure 1 of the Annex, pages 54 and 55.

Cost

The cost of the Spine contract is £889 million to June 2013. There are a number of other projects where the costs include an element of expenditure on the Spine. This will ultimately increase the cost of the Spine but these costs are accounted for in the individual projects to avoid double counting.

Expenditure to date totalled £585.0 million at 31 March 2008.

The Spine: Applications holding care record data

Spine application: Personal Demographics Service

What does it do?

The Personal Demographics Service is the central and authoritative source for patient demographic information, such as name, address, date of birth, and NHS number.

Progress

The Personal Demographics Service went live on time in June 2004 and has been upgraded three times since then. It now offers:

- a single source of patient demographic information, as the first step in consolidating the large number of locally held demographic databases throughout the NHS;
- search routines that allow NHS staff to identify the patient and for the patient's records to be found more easily; and
- the ability to allocate NHS numbers to patients from within a Trust, enabling the patient to participate in national services, such as Choose and Book.

The next releases are scheduled for May 2008 and November 2008. These will provide functionality to replace the demographics functions of other national IT systems, such as the NHS Strategic Tracing Service, NHS Numbers for Babies Service and the NHS Central Register, which is the current authoritative source of NHS numbers.

System usage

At 31 March 2008, 469,856 users were registered to access the Personal Demographics Service and over nine million enquiries were being made on the system each week.

Since the introduction of the Personal Demographics Service, the number of temporary NHS numbers in use has reduced from over 230,000 in January 2005 to less than 10,000 in March 2008.

Spine application: Personal Spine Information Service

What does it do?

The Personal Spine Information Service is a repository for the clinical data contained in the Summary Care Record. It gives information to, and receives it from, local systems as the patient is treated by the NHS.

Progress

The Personal Spine Information Service was introduced in March 2007, and was available in read only form to all care settings.

From May 2008, the Personal Spine Information Service will be able to receive clinical messages via discharge reports, outpatient reports, and emergency department reports. Also from May 2008, patients who have an advanced account on HealthSpace will be able to add messages to their Summary Care Record. The introduction of these services will conclude the technical implementation of the Personal Spine Information Service.

System usage

At 31 March 2008, 26 GP practices involved in the early adopter programme for the Summary Care Record had uploaded some 153,000 records to the Personal Spine Information Service.

Spine application: Secondary Uses Service

What does it do?

The Secondary Uses Service provides analysis and reporting facilities for purposes other than the direct care of patients. Such information is usually provided in aggregated, and anonymised or pseudonymised form.

Uses of the information include examining public health trends, analysing the effectiveness of treatments and planning the number of beds and staff the NHS requires. The Service supports a number of national initiatives, such as Payment by Results, the reimbursement mechanism for acute care.

Progress

The Secondary Uses Service is being developed and delivered incrementally through a number of releases, according to needs across the NHS. It has run since 2005, replacing the NHS-wide clearing service, which previously shared management information and data across the NHS.

The Secondary Uses Service is now delivering Payment by Results and other management information used for the commissioning of care including, for example, data on referrals, accident and emergency attendances, outpatient attendances, admitted patient care, elective admission waiting lists and mental health care.

Future releases will enable the loading of data such as demographic information, prescriptions and Summary Care Records, and will provide functionality to track groups of patients. The contracted releases for the Secondary Uses Service are due to be completed by the end of 2008 though there may be further releases – studies are underway looking at primary care data and the potential to support a wider range of research activities.

18 week patient pathway

IT support is required to measure whether patients have been treated within 18 weeks of making an appointment to see a consultant in secondary care, in line with the Government's target. There are two associated requirements:

- by December 2007, the ability to measure an 18 week patient pathway; and
- by April 2008, the ability to feed 18 week pathway information into the Secondary Uses Service to provide Trusts and commissioners with information to support the planning and commissioning of services.

In September 2007 roll-out of Secondary Uses Service Release 2 delivered the platform on which to build functionality to support reporting against the 18 week patient pathway. The upgrade to enable the loading of Choose and Book referrals and the updated commissioning dataset (including the data needed to support 18 week reporting) went live in December 2007. The 18 week reports have been staggered over four deliveries, two of which align to formal software releases. The formal Secondary Uses Services reporting Release is due to go live in May 2008, but there are a set of 18 week reports that are being delivered early, which are on track for delivery in April 2008. There will be a further set of 18 week reports at the end of June 2008 and then in Secondary Uses Services Release 4 provisionally scheduled for October 2008.

In addition, Trusts' care records systems require functionality to provide data for the measurement of the 18 week pathway in their Trusts, through the system deployed by the Local Service Provider or through their legacy system where Local Service Provider systems have not yet been deployed. Of the Local Service Providers, BT and CSC have developed solutions and started to deploy them, and Fujitsu's solution is currently completing testing. NHS Connecting for Health estimates that 111 care records systems had received a solution by 31 March 2008, leaving 60 to deliver the data required through workaround solutions.

System usage

The Secondary Uses Service database contains over 800 million records, with over a million new records a day being submitted by NHS Trusts. All NHS commissioned acute activity (including NHS care provided by the independent sector) can now be captured, and the NHS Operating Framework (issued by the Department of Health in December 2007) requires the NHS to use the Secondary Uses Service from April 2009.

There are nearly 2,000 registered users of the Secondary Uses Service, and around 7,000 extracts are being taken each month. The users include providers of care (mainly NHS Trusts but also independent sector providers) and purchasers of care (mainly Primary Care Trusts but including some health informatics services and users at Strategic Health Authorities). No more than three people at any organisation can have access to the Secondary Uses Service.

The Spine: Access and security applications

Card Management Service

- Manages the creation and deletion of Smartcards.
- Implementation was completed in June 2004.

Authentication Portal

- Manages and controls the authentication and authorisation of registered Spine users to Spine services. Once users authenticate successfully using their Smartcard, provided from the Card Management Service, they can access the services which their registered role allows, through role-based access settings.
- Implementation was completed in June 2004.

Access Control Framework

- Controls access to NHS Care Records Service data, held by the Personal Spine Information Service. The Framework registers and authenticates all users, and provides a single log-on and a record of each healthcare professional accessing a patient's record. All information is provided on a need-to-know basis, based on a user's role and 'legitimate relationship' with the patient. It stores details of these relationships between healthcare professionals and patients, and of information to which patients have chosen to restrict access.
- The Framework was implemented in December 2005 and will be extended through the introduction of the Access Control Service from May 2008. This will provide the following capabilities.
 - 'Sealed envelopes' – the ability to restrict access to clinical information (individual documents) in a patient's Summary Care Record.
 - Dissent to the Summary Care Record – if a patient chooses not to have a Summary Care Record at all, one will not be created and there will be no record to be viewed.
 - Dissent to sharing a record – a patient can have a Summary Care Record but choose not to share it, and any attempt to view the record will be denied.
- The Access Control Framework holds records of around 50 million 'legitimate relationships'.

Spine Directory Service

- The Service spans both the security and messaging services of the Spine. It comprises the Spine User Directory and Spine Accredited Systems and Services, a master source of information about accredited users and systems. Every transaction or message processed by the Spine is checked against the information held in the Service to ensure it is from an authorised user and system. The Service also provides information on the NHS's organisational structure and organisation codes.
- Implementation was completed in June 2004 and a number of enhancements have been made or are in progress, for example to support NHS restructuring.
- The Service contains details of around 500,000 user role profiles, 75,000 organisations and sites, and 11,000 work groups.

The Spine: Messaging application

Transaction Messaging Service

What will it do?

The Service is the message handling element of the Spine, providing the interfaces between Spine data and other registered systems and users. It allows clinical messages from users of the NHS Care Records Service to be routed securely to the service they are requesting and manages the response to that request.

Progress

The Service was implemented in July 2004.

The Service currently supports the following message types: Choose and Book, GP to GP transfer, Medication Management, Personal Demographics Service, Legitimate Relationship Service and enquiries on the Personal Spine Information Service. The number of message types to be supported is to be extended to include, for example, discharge, accident and emergency reporting, HealthSpace, outpatients, sealed envelopes and alerts.

Usage

The Service handles around 108 million messages a month.

3 NHS Care Records Service: Summary Care Record

Background

What does it do?

The Summary Care Record is intended to contain those elements of a patient's Detailed Care Record that are important in supporting care in unscheduled events and/or the transfer of care between providers, subject to the patient's agreement. In the first instance the Summary Care Record will contain a patient's demographic details and information on current medication, allergies, and adverse reactions. Over time, more detailed information may be added, with the patient's consent, but retaining the principle of a summary record.

A patient's Summary Care Record will be available (subject to the appropriate security controls, for example authentication of accredited users through the Spine Access and Security controls) to any clinician who has a 'legitimate relationship' with the patient from any healthcare location in England connected to the secure N3 network.

The Summary Care Record will support care in the following settings:

- out-of-hours primary care
- emergency department care
- ambulance services
- acute medical and surgical admissions
- walk-in centres
- minor injury units
- treatment of temporary residents by GPs
- NHS Direct
- care delivered in community care settings
- mental health treatment in the community

When did it join the Programme?

Part of the Programme from the outset in 2002.

Suppliers

- The NHS Care Records Service, including the Summary Care Record, is to be delivered through the Programme's national systems, the care records systems provided by Local Service Providers, the systems of existing suppliers to the NHS, and through the Clinical Spine Application.
- The Personal Spine Information Service (page 14) is the national application that will hold the Summary Care Record data.

Plans for the introduction of the Summary Care Record

Progress

In 2005 the implementation of the Summary Care Record was deferred by two years from the original plan on the grounds of complexity and the need for wider consultation, for example on patient confidentiality issues. In the meantime, work continued on:

- the Care Record Guarantee, which sets out the principles to be applied in handling electronic care records. The Guarantee was first published in May 2005. It is reviewed annually by the Care Record Development Board and revised versions were published in April 2006 and August 2007; and
- the supporting infrastructure, including the Spine, incorporating the Personal Demographics Service, both of which were implemented in 2004.

In terms of implementing the Summary Care Record, the revised plans are as follows.

March 2007 onwards	Early adopter programme	<ul style="list-style-type: none"> ■ GP contribution to the Summary Care Record (demographic details, and information on current medication, allergies and adverse reactions). ■ Roll-out of the Clinical Spine Application (where each early adopter can demonstrate clinical benefit will be derived). ■ Advanced accounts on HealthSpace (page 22) available in the early adopter areas.
To be determined	National roll-out	<ul style="list-style-type: none"> ■ Plans for the roll-out of the Summary Care Record will be determined in the light of the evaluation of the early adopter programme, which is expected in May 2008. ■ Full roll-out of the Clinical Spine Application where systems to access the record are not in place. ■ Advanced accounts on HealthSpace (page 22) available across England. ■ Additional functionality, including information flows to and from other systems (discharge summaries, referrals, emergency department reports, outpatient letters), and sealed envelopes.

Adoption of the Summary Care Record

The early adopter programme, which began in March 2007, consists of two waves covering five areas.

- Wave 1: Bolton and Bury Primary Care Trusts
- Wave 2: Bradford and Airedale, Dorset, and South Birmingham Primary Care Trusts.

The position at 31 March 2008 was as follows.

Early adopter area	GP practices where data has achieved accreditation standard	GP practices which have achieved 'business go live'	Summary Care Records created	
			Number	Percentage of mailed population
Bolton	14	10	59,641	25.1
Bury	24	16	93,547	78.8
South Birmingham	38	0	0	0
Dorset	21	0	0	0
Bradford and Airedale	9	0	0	0

NHS Connecting for Health commissioned University College London to carry out a year-long independent evaluation of the early adopter programme. The evaluation report was published on 6 May 2008. NHS Connecting for Health is considering the findings, which will inform the national roll-out of the Summary Care Record. The NHS has been asked to start planning for the implementation but firm timescales will not be set until lessons from the evaluation have been confirmed.

Usage

Total clinical records uploaded to the NHS Care Records Service at 31 March 2008	153,188
Patients choosing not to have a Summary Care Record at 31 March 2008	4,649 (0.76 per cent of the mailed population)

4 HealthSpace

Background

What does it do?

HealthSpace is a secure online personal health organiser, where patients can store and access their personal health information such as height, weight and blood pressure. As the NHS Care Records Service is rolled out across England, patients will also be able to register to use HealthSpace to view their Summary Care Record.

When did it join the Programme?

October 2005.

Supplier

NHS Connecting for Health.

Development

Target

To deliver HealthSpace Release 2.2 in time for the first early adopter Primary Care Trust.

Achieved on time, on 13 June 2007.

Progress

HealthSpace was launched in December 2003 and is available to all people in England over the age of 16.

HealthSpace Release 2.2, implemented in June 2007, subject to the necessary identity checks:

- allows people in the five early adopter areas to view their Summary Care Record via advanced HealthSpace accounts;
- provides a dedicated news service for advanced account applicants;
- provides a new log-in process with an increased level of security; and
- provides error messages and help-text throughout the log-in and registration process.

Deployment

Target

To roll out Summary Care Record access via HealthSpace to at least 50 per cent of the five early adopters by 31 March 2008.

Achieved by 24 October 2007, some five months early.

Progress

Bury Primary Care Trust

Registrations for advanced HealthSpace accounts giving access to the Summary Care Record started on 13 June 2007.

Dorset Primary Care Trust

Registrations for advanced HealthSpace accounts started on 12 July 2007.

Bolton Primary Care Trust

Registrations for advanced HealthSpace accounts started on 24 October 2007.

Bradford and Airedale Primary Care Trust

Registrations for advanced HealthSpace accounts started on 17 March 2008.

South Birmingham Primary Care Trust

Planning is underway.

Service availability and usage

Target

In each month, the service to be available 99.8 per cent of the time.

See Figure 1 of the Annex, pages 56 and 57.

Usage

At 31 March 2008, there were 32,793 registered basic HealthSpace account holders, and 2,393 registered advanced HealthSpace account holders with access through HealthSpace to their Summary Care Record.

Cost

The development of HealthSpace is closely linked to the Summary Care Record. NHS Connecting for Health is currently considering the future use and cost of HealthSpace.

Expenditure to date totalled £2.4 million at 31 March 2008.

5 Choose and Book

Background

What does it do?

The original aim of the Programme was to introduce an electronic booking service to make it easier and faster to book hospital appointments for patients. In support of the Government's policy to extend patient choice, the service's aims were expanded to provide patients with a choice of time and place for their appointments, and it was renamed 'Choose and Book' in May 2004. Choose and Book has also been expanded to include private healthcare providers.

Choose and Book provides a common means of booking appointments for NHS services using the Internet, a telephone booking service or a GP IT system. GPs and other primary care providers can register a request for a secondary care service for a patient, either booking an appointment there and then or allowing the patient to book an appointment themselves at a later date.

When did it join the Programme?

The electronic booking service was part of the Programme from the outset in 2002, with the choice element added in May 2004.

Suppliers

- Core software is supplied by Atos Origin.
- GP and hospital systems are supplied by the Programme's Local Service Providers or by existing system providers.

Development

Progress

The core requirement of the contract (for first outpatient appointments) was delivered on time in June 2004.

GP IT systems need to be compliant with Choose and Book software. There are currently eight GP systems which are compliant, provided by six GP system suppliers that between them cover over 99 per cent of the market.

Enhancements

As well as the addition of the choice element described above, there have been a number of other additions or enhancements, including the following.

- Booking into Primary Care – enabling GPs to book appointments for their patients to see specialist GPs, for example with specialised knowledge of audiology.
- Clinical Assessment Services – a service often based at a Primary Care Trust whereby a clinical expert assesses the GP's referral and decides the most appropriate option, which may be a hospital outpatient clinic, a community clinic, or referral to a specialist GP.
- Indirectly Bookable Services – enabling a patient to telephone the hospital directly for an appointment, where the hospital's system is not yet integrated with the Choose and Book software.
- Named Consultant Referrals – enabling a GP to refer a patient directly to a specified consultant.
- Extended Choice Network – enabling a GP to see a wider selection of services than those commissioned locally. The list includes Independent Sector Treatment Centres and Foundation Trusts across England.
- Transport Booking – enabling a GP to indicate that a patient requires some form of transport such as an ambulance.
- Enhancements to the Choose and Book Patient Web Application to improve the experience for patients booking appointments over the Internet.

Two further releases of the Choose and Book software are planned for 2008, the first in April 2008. A further release is planned for 2009. These releases will include functionality to support the 'Free Choice' policy introduced in April 2008 whereby a patient will be able to choose to be treated anywhere in England.

Deployment

Targets

First booking to be made by the end of June 2004.

Not achieved – the first booking made was on 2 July 2004.

90 per cent of Acute Trusts to have access to a hospital system compatible with Choose and Book by 31 December 2006.

Not achieved – at 31 December 2006, 63 per cent of Acute Trusts (109 of the planned 171) had a compatible hospital system.

The target was reset as for 90 per cent of Acute Trusts to have access to a hospital system compatible with Choose and Book by 31 March 2008.

Not achieved – at 31 March 2008, 84 per cent of Acute Trusts had access to a compatible hospital system.

Progress

All 169 Acute Trusts and all 152 Primary Care Trusts have Choose and Book. Of the Acute Trusts, 142 (84 per cent) use a care records system that is compatible with Choose and Book. The remainder can utilise the 'Indirectly Bookable Services', developed in 2005 to enable uptake of Choose and Book by hospitals whose systems were not yet ready or able to be upgraded.

At 31 March 2008, of all 8,444 GP practices, 8,061 (95 per cent) had Choose and Book.

Service availability and usage

Targets

In each month, the service to be available 99.5 per cent of the time.

See Figure 1 of the Annex, pages 56 and 57.

NHS target to deliver 90 per cent utilisation of Choose and Book (the percentage of GP referrals to first consultant outpatient services) by the end of March 2007.

Not achieved – by 31 March 2007, 38 per cent of first outpatient referrals were made through Choose and Book.

The target has not been reset. In March 2008, 51 per cent of first outpatient appointments were made through Choose and Book. Three Primary Care Trusts achieved 90 per cent and a further 23 achieved 70 per cent, but four achieved less than 20 per cent.

Utilisation

Average weekly bookings

By March 2008, 90,104 of the 176,556 average weekly first outpatient appointments were made through Choose and Book (51 per cent).

Percentage of GP practices that made at least one booking in the current or previous month

91 per cent

Methods of booking

In March 2008, 66 per cent of the 361,082 bookings made using Choose and Book were made through the three direct methods.

By the appointments line	105,496	29 per cent
By the Internet	21,473	6 per cent
At a GP practice – by the GP	34,116	9 per cent
– by GP staff	77,725	22 per cent
Total by direct methods	238,810	66 per cent
Indirectly Bookable Services	122,272	34 per cent

Cost

The cost of the Choose and Book contract is £144 million to December 2009.

Expenditure to date totalled £103.0 million at 31 March 2008.

6 Electronic Prescription Service

Background

What does it do?

The Electronic Prescription Service allows GPs and other prescribers working in primary care to generate and transmit electronic prescriptions. The electronic prescription is sent to the Electronic Prescription Service, from where it can be downloaded by the dispensing pharmacy. Following the supply of medication to the patient, the dispensing pharmacy is able to submit details electronically to the reimbursement agency for payment.

The aim of the system is to improve efficiency, convenience and dispensing accuracy through:

- nominated pharmacies;
- electronic repeat dispensing;
- a common drug dictionary; and
- reducing the volume of re-keying of prescription data.

In time, the Electronic Prescription Service will update the medication information recorded in a patient's Summary Care Record.

When did it join the Programme?

Part of the Programme from the outset in 2002.

Suppliers

- The Electronic Prescription Service is a central component of the Spine supplied by BT (page 10).
- GP and pharmacy systems are provided by a range of suppliers and require NHS Connecting for Health accreditation for connection to the Electronic Prescription Service.

Development

The Electronic Prescription Service is being introduced in two releases. BT delivered the core functionality for Release 1 in February 2005 and for Release 2 in August 2006.

Release 1

When the prescriber issues a prescription, an electronic copy of the information is sent to the Electronic Prescription Service. The patient continues to receive a paper prescription, which is similar to the existing paper prescription but has a barcode, identifying the prescription.

When a pharmacy, which has also implemented Release 1 of the system, receives a paper prescription with a barcode, scanning the barcode retrieves an electronic copy of the information onto the pharmacy's computer, thereby removing the need for re-keying. The pharmacy dispenses the medicine or appliance, and a message is sent back to the Electronic Prescription Service to confirm what has been dispensed. Barcoded prescription forms are then posted to the reimbursement agency so that the pharmacy can be paid.

Release 2

The additional functionality of Release 2 will allow:

- the prescriber to apply an electronic signature to the electronic prescription message – making the electronic prescription a legal document. This will remove the need for paper prescriptions in most cases, though paper will continue to be used in some circumstances, particularly in the early deployment phase, when a patient has not nominated a pharmacy;
- patients to nominate a pharmacy;
- electronic cancellation of prescriptions;
- electronic repeat dispensing; and
- submission of electronic reimbursement endorsements to the reimbursing agency.

The interface with the reimbursement agency is already operational. The table below shows the progress that has been made to accredit GP and pharmacy systems to link to the Electronic Prescription Service.

Accreditation of suppliers' systems		Number to be accredited	Number with technical accreditation	Number where implementation achieved	Number where roll-out authority granted
GP systems	Release 1	10	9	9	8
	Release 2	10	0	0	0
Pharmacy systems	Release 1	13	13	12	12
	Release 2	12 ²	0	0	0

2 One existing system in the Release 1 schedule will not be upgraded.

Deployment

Targets

First deployment of Release 1 by February 2005.

Achieved on time, on 6 February 2005.

50 per cent of GPs and community pharmacies to be capable of issuing electronic prescriptions by December 2005.

Not achieved – by December 2005, 6.9 per cent of GPs and less than one per cent of pharmacies had the capability to issue electronic prescriptions. By 31 March 2008, this had increased to 79 per cent of GPs and 80 per cent of pharmacies.

All GPs and community pharmacies to have access to the Electronic Prescription Service by December 2007.

Not achieved.

- GP system deployment: at December 2007, 80 per cent of GP practices were 'technically live' (ready to switch on) with 59 per cent 'business live' (using the system). By 31 March 2008, the position was 79 per cent and 65 per cent respectively.
- Pharmacy system deployment: at December 2007, 75 per cent of pharmacies were 'technically live' (ready to switch on) with 57 per cent 'business live' (using the system). By 31 March 2008, the position was 80 per cent and 66 per cent respectively.

To maximise deployment of Electronic Prescription Service Release 2 during 2007-08.

Not achieved – Release 2 is to be piloted at initial implementation sites within a number of selected Primary Care Trusts. The pilots are due to begin in summer 2008 but are dependent upon the delivery of Release 2 compliant systems from suppliers. Decisions on full implementation will depend on the outcome of the pilots.

Service availability and usage

Target

In each month, the Spine (for the Electronic Prescription Service) to be available for 99.9 per cent of the time.

See Figure 1 of the Annex, pages 56 and 57.

Usage

Number of pharmacists registered for Smartcards at 31 March 2008

24,426

Number of prescription messages transmitted in March 2008

6,457,700

Number of prescription messages dispensed in March 2008

432,332³

Cumulative number of prescription messages transmitted by 31 March 2008

77,427,445

Cumulative number of prescription messages dispensed by 31 March 2008

3,093,141³

Cost

For Release 1, the system costs are included in those for the Spine and there was central programme expenditure of £8.0 million to 31 March 2008. The estimated cost of Release 2 is £45 million, including payments to pharmacies to adopt the Release and to system suppliers for GP practice training.

³ The number of prescriptions dispensed is lower than the number transmitted for a number of reasons, including that the pharmacy system may not yet be live.

7 NHSmail

Background

What does it do?

NHSmail is an e-mail and national directory service for NHS staff, across all NHS organisations in England and Scotland. It is designed to be secure for the transmission of patient and clinical data. NHS staff can have a single e-mail address for the duration of their employment. NHSmail works anywhere in the NHS, for example:

- nurses in the community can access e-mail on the move, at home or in any NHS organisation;
- consultants no longer need multiple e-mail accounts and addresses (i.e. one per organisation they work for) and can share their diaries and patient information across all their organisations; and
- GPs can send patient data to hospitals and exchange clinical information with colleagues in both their own practice and other practices. They can also use e-mail from home without compromising security.

When did it join the Programme?

June 2003.

Supplier

Cable and Wireless.

Development

Target

Service available for use by October 2004. Achieved on time in October 2004.

Enhancements

A new version of the Outlook Calendar connector completed testing successfully in February 2008, and deployment to user groups started by the end of that month.

Planning is underway to refresh the technology using a Microsoft Exchange 2007 operating platform to be implemented in summer 2008. This will give users more functionality and enable the platform to deliver additional services more quickly and cheaply than on the current technology platform – for example, mobile access to e-mail.

Deployment

Number of users

Number of staff with NHSmail addresses	At 31 March 2008, 341,332 staff across more than 600 NHS organisations had NHSmail addresses, comprising approximately 43 per cent of all NHS staff with e-mail addresses
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Number of active users in latest month (defined as a user who has accessed either their mailbox or calendar on at least one occasion in a three month period including the current month)	158,405 in March 2008
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NHS Connecting for Health estimate of number of clinical users, based on responses to an annual user survey	60,000 in March 2008
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Progress

NHS organisations do not have to take NHSmail. Take-up has been slow, though a further 44 NHS organisations, covering some 125,000 staff, are at various stages of the migration process to NHSmail.

NHS Connecting for Health expects all remaining NHS organisations to switch to NHSmail once the transition to Microsoft Exchange 2007 has been completed. Earlier versions of Microsoft Exchange 2007 are used by 80 per cent of local e-mail services in the NHS, so transition will be simpler and staff will have prior knowledge of how the system works.

Service availability and usage

Target

In each month, the service to be available 99.9 per cent of the time. See Figure 1 of the Annex, pages 56 and 57.

Usage

Number of e-mails sent and received in March 2008 26 million (an increase of approximately 62 per cent compared with March 2007)

Proportion of e-mails containing clinical data 55 per cent of the total, based on responses to an annual user survey

Cost

The cost of the NHSmail contract for England is £117 million over nine years from July 2004.

Expenditure to date totalled £74.0 million at 31 March 2008.

8 GP to GP transfer

Background

What does it do?

Around four million people change their GP every year. GP to GP transfer enables patient records to be transferred electronically and securely between GP practices, so GPs will usually have full and detailed medical records available to them for a new patient's first consultation.

When did it join the Programme?

March 2005.

Suppliers

Existing GP system suppliers.

Development

The GP system suppliers are developing the software to deliver GP to GP transfer. NHS Connecting for Health accreditation is required before deployment of the suppliers' solutions can begin.

Supplier	Position at March 2008
EMIS LV	Fully inter-operable solution accredited.
Vision (In Practice Systems)	Fully inter-operable solution accredited.
EMIS PCS	Accreditation is expected in the third quarter of 2008.
Synergy/Premier (iSOFT)	Accreditation is expected in the fourth quarter of 2008.
SystemOne (The Phoenix Partnership)	Accreditation is expected in the fourth quarter of 2008.
Practice Manager (Microtest)	Accreditation is expected in the first quarter of 2009.
GP Enterprise (SeeTec)	These suppliers cover one per cent of the market and accreditation will be delayed until the other suppliers have successfully delivered GP to GP transfer.
Crosscare (Healthy)	
Waveform software	

Deployment

Targets

500 GP practices to be live by the end of March 2007.	Achieved in February 2007, one month early.
3,500 GP practices to be live by the end March 2008.	Achieved in February 2008, five weeks early.
Full national rollout of the three main suppliers' systems (EMIS, In Practice Systems and iSOFT) is planned to be completed by the end of March 2009, subject to iSOFT achieving accreditation as planned in the fourth quarter of 2008.	Planned.

Progress

The first inter-operable transfers took place between In Practice Systems and EMIS systems in March 2007. As a result of these successful trials, full national roll-out was approved and the deployments began in July 2007.

Usage

Number of GP to GP transactions in latest week of March 2008	3,511 (of an estimated total of 55,000 patient transfers)
Total cumulative transactions at 31 March 2007	108,334

Cost

The estimated cost of GP to GP is £7.1 million.

Expenditure to date totalled £4.2 million at 31 March 2008.

9 Quality Management and Analysis System

Background

What does it do?

The Quality Management and Analysis System gives GP practices and Primary Care Trusts evidence and feedback on the quality of care delivered to patients. It shows the performance of each GP practice measured against national 'Quality and Outcomes Framework' achievement targets detailed in the revisions to the GP contract.

As GP practices are rewarded financially according to the quality of care provided, it is essential that the payment rules that underpin the GP contract are implemented consistently. The Quality Management and Analysis System collects national achievement data, computes national disease prevalence rates, and calculates the points and payment values earned by GP practices. It also allows GP practices and Primary Care Trusts to analyse the data collected on the services and quality of care they have delivered.

When did it join the Programme?

2004.

Suppliers

- BT supplies the core system although data is collected through GP systems, which NHS Connecting for Health certifies as compliant with the business rules of the Quality and Outcomes Framework.
- Payments are made to GP practices through NHS legacy IT systems, which receive the data electronically from the Quality Management and Analysis System.

Development

The Quality Management and Analysis System was developed to allow the first payments to be made in April 2005. Since then, the system has been enhanced in response to policy developments, including changes necessary because of NHS reorganisation which were implemented in November 2006.

Deployment

Target

Full deployment by January 2005.

Achieved, on time in January 2005, with the first payments made as planned in April 2005.

Service availability and usage

Target

In each month, the service to be available 99.86 per cent of the scheduled hours (0700 to 2200, Monday to Friday).

See Figure 1 of the Annex, pages 56 and 57.

Usage

At 31 March 2008 the system was used by 37,164 users in 8,298 GP practices (based on the number of GP practices that submitted electronic data) and 152 Primary Care Trusts.

Cost

The development costs were included in those for the Spine. As the service has been extended for two years to July 2009, there are also additional costs of £9.0 million; expenditure to date totalled £1.8 million at 31 March 2008.

10 NHS Connecting for Health Service Desk

Background

What does it do?

The NHS Connecting for Health Service Desk provides support to users of the IT systems which comprise the National Programme for IT. Users report incidents to the Service Desk, which logs the incidents and manages them to resolution. The service covers applications and services provided by both National and Local Service Providers.

Supplier

Fujitsu Services.

Development

Progress

The Service Desk was established on 15 December 2006, providing support to the North, Midlands and East Programme for IT. The service was extended to the London Programme for IT and the Southern Programme for IT on 15 January 2007.

Targets

To implement the Service Desk into the North West and West Midlands, the North East, and the East and East Midlands on 15 December 2006.

Achieved on time, on 15 December 2006.

To implement the Service Desk into London and the South on 15 January 2007.

Achieved on time, on 15 January 2007.

Service availability

Target

In each month, the service to be available 99.89 per cent of the time.

See Figure 1 of the Annex, pages 56 and 57.

Cost

The cost of the contract for the Service Desk is £47 million over seven years from April 2006.

Expenditure to date totalled £15.0 million at 31 March 2008.

11 London Programme for IT

Background

Local Service Provider

The Local Service Provider for the London Programme for IT is British Telecommunications plc (BT). It is responsible for the delivery of IT services within the area to the requirements and standards in terms of system performance, security and information governance, among other things, set out in its contract with the Secretary of State for Health. It is responsible for the work of its sub-contractors and for managing them.

In April 2007, following the introduction of the Local Ownership Programme, responsibility for developing IT system requirements and managing the design, build and testing of systems transferred from NHS Connecting for Health to the local NHS in London.

Main systems being supplied

BT contracted originally with IDX to supply its Carecast product to Trusts. In July 2006, however, BT put forward plans to move away from GE Healthcare (who had acquired IDX in January 2006) to adopt a 'best of breed' approach.

In May 2007, the necessary contractual changes were made and BT is now supplying Cerner's Millennium product to Acute Trusts and CSE Servelec's RiO product to Mental Health Trusts and Primary Care Trusts. The systems are being developed incrementally through a series of releases.

Prior to the change to Millennium, one Carecast system had been deployed, at Queen Mary's Hospital NHS Trust, Sidcup. The Trust has now migrated to Millennium.

BT also contracted originally with IDX to supply a GP system to all GP practices in London but changed to the Vision products developed by InPractice Systems (INPS) at the same time as the changes described above. BT was already deploying INPS Vision 3 as an interim solution. However, it was recognised at the time that, as the GP market in London was dominated by another supplier (EMIS), an alternative strategic GP solution might be required.

In December 2007, the Department and BT signed a Memorandum of Understanding to allow negotiations to begin aimed at improving delivery and strengthening local ownership. This is expected to lead to contractual changes by June 2008 to provide flexibility to respond to changes to the delivery of healthcare in light of the outcome of the Healthcare for London consultation and enable improved delivery that better meets the needs of the local NHS. As part of this process, the GP solution for London will also be reviewed.

Population

7.2 million.

Number of NHS staff

206,000.

Development

Supplier: product	Release	Contractual target date	Achieved or forecast date	Current status
Cerner: Millennium (being deployed in Acute Trusts)	Millennium Release 0 (R0)	27 June 2007	29 June 2007	Complete
	Millennium Release 1 (now known as London Configuration 1)	November 2007	14 March 2008	Complete
	Millennium Release 2 (London Configuration 2)	May 2009	May 2009	In design
	Millennium Release 3 (London Configuration 3)	May 2010	To be determined	Being re-planned
CSE Servelec: RiO (being deployed in Mental Health Trusts and Primary Care Trusts)	RiO Version 4	28 February 2007	28 February 2007	Complete
	RiO Version 5	February 2008	To be determined	Being re-planned
	RiO Version 6	May 2009	May 2009	In design
	RiO Version 7	May 2010	To be determined	Being re-planned
In Practice Systems (INPS): Vision (being deployed in GP practices)	Vision 3	Already available	Not applicable	Complete
	Vision 4 RC1 (Release Candidate 1)	May 2008	To be determined	Being re-planned
	Vision 4 RC2 (Release Candidate 2)	May 2009	To be determined	Being re-planned
	Vision 4 RC3 (Release Candidate 3)	May 2010	To be determined	Being re-planned
Integration of the final two releases of the three products above across all the care settings	Integrated Release 1 (comprising London Configuration Release 2, RiO version 6 and Vision 4 RC2)	May 2009	May 2009	In design
	Integrated Release 2 (comprising London Configuration Release 3, RiO version 7 and Vision 4 RC3)	May 2010	To be determined	Being re-planned

Deployment: Strategic solutions

The initial approach of planning deployments over the life of the Programme proved to be impracticable. Since April 2007, responsibility for the development of implementation plans has rested with the local NHS, working with the Local Service Providers. In London the Strategic Health Authority and BT are developing a rolling 'slot plan' for future deployments. The current planning period covers 1 April 2008 to 31 March 2009.

Type	System	Number deployed at 31 March 2008	Further deployments scheduled to 31 March 2009	Estimated deployments still to be scheduled
Acute Trusts	Millennium	4	6	21
Mental Health Trusts	RiO	6	1 (plus 6 upgrades to achieve Spine connectivity)	3
Primary Care Trusts	RiO	20	9 (plus 20 upgrades to achieve Spine connectivity)	2
GP practices	Vision	82	To be determined	To be determined
Ambulance Trusts	To be determined	0	0	1
Child Health	RiO	15	10	6

NOTE

BT is also deploying a number of interim systems that will be replaced by Millennium, RiO or another yet to be determined system.

Service availability

See Figure 2 of the Annex, pages 58 and 59.

Cost

The cost of the Local Service Provider contract with BT is £1,021 million to October 2015.

Expenditure to date totalled £191.0 million at 31 March 2008.

12 Southern Programme for IT

Background

Local Service Provider

The Local Service Provider for the Southern Programme for IT is Fujitsu Services. It is responsible for the delivery of IT services within the area to the requirements and standards in terms of system performance, security and information governance, among other things, set out in its contract with the Secretary of State for Health. It is responsible for the work of its sub-contractors and for managing them.

At May 2008, Fujitsu's contract with NHS Connecting for Health was in the process of being reset.

In April 2007, following the introduction of the Local Ownership Programme, responsibility for developing IT system requirements and managing the design, build and test functions transferred from NHS Connecting for Health to the local NHS in the South.

Population

13.0 million.

Number of NHS staff

249,000.

Main systems being supplied

Fujitsu contracted originally with IDX to supply its Carecast product to Trusts. Subsequently, in September 2005, Fujitsu changed its main sub-contractor to Cerner.

Fujitsu is now supplying Cerner's Millennium product as the care records system to Acute Trusts, Mental Health Trusts and Primary Care Trusts. Millennium is being developed incrementally through a series of releases.

Fujitsu is not contracted to supply a GP system.

Development

Cerner: Millennium (being deployed in Acute Trusts, Mental Health Trusts and Primary Care Trusts)

Release	Contractual target date	Achieved or forecast date	Current status
Release 0	20 December 2005	25 May 2006	Complete
Release 0 Maintenance Release 7.03	20 August 2007	13 August 2007	Complete
Release 0 Maintenance Release 7.04	5 December 2007	10 September 2007	Complete
Release 0 Maintenance Release 7.05	15 December 2007	26 November 2007	Complete
Release 0 Maintenance Release 7.07	31 March 2008	9 May 2008	Complete
Release 0 Maintenance Release 7.08	25 May 2008	To be determined	In planning
Release 1	June 2007	These dates reflect plans that were in place before negotiations to reset the contract started.	Being re-planned
Release 2	August 2007		
Release 3	To be determined		

Deployment: Strategic solutions

The initial approach of planning deployments over the life of the Programme proved to be impracticable. Since April 2007, responsibility for the development of implementation plans has rested with the local NHS, working with the Local Service Providers. In the South, the three Strategic Health Authorities and Fujitsu are developing a rolling 'slot plan' for future deployments. The current planning period covers 1 April 2008 to 31 March 2009.

Type	System	Number deployed at 31 March 2008	Further deployments scheduled to 31 March 2009	Estimated deployments still to be scheduled
Acute Trusts	Millennium	9	To be confirmed pending the contract reset; there are 32 further deployments to be scheduled	
Mental Health Trusts	Millennium	1	To be confirmed pending the contract reset; there are 13 further deployments to be scheduled	
Primary Care Trusts	Millennium	7	To be confirmed pending the contract reset; there are 24 further deployments to be scheduled	
Ambulance Trusts	Millennium	0	To be confirmed pending the contract reset; there are 4 deployments to be scheduled	
Child Health	Millennium (Release 2)	0	To be confirmed pending the contract reset; there are 31 deployments to be scheduled	

Service availability

See Figure 2 of the Annex, pages 58 and 59.

Cost

The cost of the Local Service Provider contract with Fujitsu is £1,104 million to December 2014.

Expenditure to date totalled £81.0 million at 31 March 2008.

13 North, Midlands and East Programme for IT

Background

Local Service Provider

The Local Service Provider for the North, Midlands and East Programme for IT is Computer Sciences Corporation (CSC). It is responsible for the delivery of IT services within the area to the requirements and standards in terms of system performance, security and information governance, among other things, set out in its contract with the Secretary of State for Health. It is responsible for the work of its sub-contractors and for managing them.

The North, Midlands and East Programme comprises three of the former 'clusters' on which the original Local Service Provider contracts were based. In two clusters (the North East, and the East and East Midlands), Accenture was the Local Service Provider, and in the third (the North West and West Midlands) the Local Service Provider was CSC. On 8 January 2007 Accenture's contracts were novated to CSC.

Unlike London and the South, the North, Midlands and East Programme asked NHS Connecting for Health to continue to develop requirements and manage the design, build and test functions on behalf of the NHS in the North, Midlands and East using representatives from the NHS.

Population

29.9 million.

Number of NHS staff

794,000.

Main systems being supplied

CSC is supplying the following systems.

- iSOFT's Lorenzo product, which is currently in development and will be the strategic solution for Acute Trusts, Mental Health Trusts and Primary Care Trusts.
- TPP SystemOne for Community Care, Child Health and General Practice.
- As interim solutions, iSOFT's iPM and iCM systems to Acute Trusts, Mental Health Trusts and Primary Care Trusts, where they need to replace existing systems prior to Lorenzo becoming available.

Development

Lorenzo is being developed incrementally through a series of releases. CSC plans to deploy the first release of Lorenzo in three early adopters – South Birmingham, Bradford and Morecambe Bay Acute Trusts – in summer 2008. Full roll-out of the first release is planned to begin in autumn 2008 for those organisations that request it once lessons from the early adopters have been captured and issues resolved. The same approach is planned for the later releases.

Release	Ready for early adopters	Ready for full roll-out	Status
Release 1	Summer 2008	Autumn 2008	In development
Release 2	Autumn 2008	Spring 2009	Planned
Release 3	Summer 2009	Winter 2009	Planned
Release 4	Spring 2010	Summer 2010	Planned

Deployment: Interim solutions

Type	System	Number deployed at 31 March 2008				System that will supersede the interim solution
		North West and West Midlands	North East	East	Total	
Acute Trusts	iPM	13	3	5	21	Lorenzo
Mental Health Trusts	iPM	6	3	4	13	Lorenzo
Primary Care Trusts	iPM	42	0	5	47	Lorenzo
Community Health	SystemOne	0	24	25	49	SystemOne/ Lorenzo
Child Health	SystemOne (may become the strategic solution)	0	10	21	31	SystemOne/ Lorenzo
GP practices	Torex	0	0	4	4	SystemOne/ Lorenzo
GP practices – alternative system	SystemOne	0	357	346	703	Lorenzo

NOTE

1 CSC is also deploying a number of other interim systems that will be replaced by Lorenzo or SystemOne.

Deployment: Strategic solutions

As Lorenzo is not yet available, no deployments of the strategic solution have been made. The estimated number of deployments that will need to be scheduled in due course is set out below.

Type	System	Deployments scheduled to 31 March 2009	Estimated number of deployments still to be scheduled
Acute Trusts	Lorenzo	10	87
Mental Health Trusts	Lorenzo	1	34
Primary Care Trusts	Lorenzo	12	78
GP practices	Lorenzo/ SystemOne	204	4,052
Ambulance vehicles	Medusa	549	2,127
Child Health	Lorenzo/ SystemOne	0	59

Service availability

See Figure 2 of the Annex, pages 58 to 61.

Cost

The cost of the Local Service Provider contracts with CSC is £3,007 million to December 2015 (£1,035 million for the North East, £930 million for the East, and £1,042 million for the North West and West Midlands).

Expenditure to date totalled £599.0 million at 31 March 2008 (£214.0 million for the North East, £200.0 million for the East, and £185.0 million for the North West and West Midlands).

The expenditure to date includes the amount of £110 million retained by Accenture for the work it completed during its time as the Local Service Provider for the North East and the East.

14 Picture Archiving and Communications Systems

Background

What does it do?

A Picture Archiving and Communications System enables:

- images such as X-rays, computerised tomography (CT) scans and magnetic resonance (MR) scans to be stored electronically and viewed on screens;
- doctors and other health professionals to access, assess and compare images taken at different times; and
- viewing of electronic images around a hospital – in radiology departments, wards, outpatient clinics, and multi-disciplinary meetings – and remotely, for example by consultants at home.

The system comprises:

- a Picture Archiving and Communications System (PACS) whereby digital images can be viewed and reviewed, and a data store from where they can be retrieved; and
- a Radiology Information System (RIS) that manages data and work flow within the imaging department. It holds patient demographic details, examination requests, appointment information, and associated clinical reports. It can also support more efficient reporting through digital dictation and voice recognition.

Picture Archiving and Communications Systems had previously been procured piecemeal across the NHS. PACS was added to the Programme to enable centralised storage of images, and full inter-operability and compatibility with the Programme's other services.

When did it join the Programme?

2004.

Suppliers

London

BT is the Local Service Provider with Philips providing PACS and iSOFT providing RIS. The contract runs until July 2015.

South

Fujitsu is the Local Service Provider with General Electric providing PACS and Healthcare Software Systems providing RIS. The contract runs until June 2013.

North, Midlands and East

■ North West and West Midlands

CSC is the Local Service Provider with General Electric providing PACS and Healthcare Software Systems providing RIS. The contract runs until June 2013.

■ North East and East

Accenture is the provider with AGFA providing PACS and Healthcare Software Systems providing RIS. The contract runs until June 2013.

Development

Picture Archiving and Communications Systems and Radiology Information Systems were commercially available products so did not require specific development for the NHS, although some development of interfaces was required where Trusts had an existing Radiology Information System.

Deployment

Targets

The original target was for full deployment of 130 PACS across the country by March 2007. This was reduced to 127 due to organisational and other changes.

The target was not met. In the North East and the East, the signature of contracts was delayed (with consequential delays to implementations) due to an unsuccessful judicial review application. In the North West and West Midlands, CSC replaced its original PACS supplier with General Electric in March 2006.

Following the judicial review and the change of supplier in the North West and West Midlands, the target was replaced by two new targets:

1 Complete installation in London and the South by 31 March 2007.

Achieved on time, by 31 March 2007, with:

- 21 deployments in London;
- 35 deployments in the South.

2 Full deployment across 127 groups of hospitals by 31 March 2008.

Achieved over three months early, by 10 December 2007. In addition to the above deployments in London and the South, there were:

- 40 deployments in the North West and West Midlands, by 10 December 2007;
- 14 deployments in the North East, by 10 December 2007;
- 17 deployments in the East, by 1 October 2007.

By March 2008, to have systems available to begin sharing images between different NHS organisations in an effective and efficient way.

Achieved in February 2008, one month early. A number of solutions for sharing images are in place in the South and in the North West and West Midlands. Solutions are expected to be delivered in London, the North East and the East by May 2008 for initial adopters.

Progress

In the decade prior to the Programme, 50 Trusts had installed PACS. Under the Programme the rate of deployment has accelerated, with 127 systems implemented since 2004, including the replacement of seven existing PACS systems.

Service availability and usage

Target

In each month, the service to be available 99.87 per cent of the time. See Figure 2 of the Annex, pages 60 and 61.

Usage

At 31 March 2008, some 641 million images were stored centrally, with a further 10 million images being added each week.

Cost

The cost of the Picture Archiving and Communications Systems contracts is £884.9 million. This comprises the local costs of deploying the systems borne by NHS Trusts and the costs of the central data stores borne by NHS Connecting for Health.

Expenditure to date totalled £434.0 million at 31 March 2008 (although this may also cover additional services which NHS Trusts chose to purchase from the PACS suppliers).

Annex

Availability of live services

The Department's contracts with suppliers specify minimum levels of service availability, and the performance of suppliers against these targets is monitored on a monthly basis. Suppliers face performance deductions where they fail to meet the targets.

A target for a system to be available for 99.9 per cent of the time equates to the system being available for all but 45 minutes in a 31 day month. A target for a system to be available for 99.99 per cent of the time equates to the system being available for all but four minutes in a 31 day month.

Figures 1 and 2 show the performance achieved for national and local systems and services respectively, over the 18 month period to March 2008 (or less where the system concerned has been introduced during the period). Performance is shown throughout against the targets currently in place.

NOTES

- 1 The service availability levels are based on a period of 24 hours, 365 days in all cases except SystemOne for GPs (which is reported for agreed core hours of 06:59 – 21:59 on weekdays, 08:00 – 12:00 on Saturdays and 0 core hours on Sundays from 7 January 2008) and the Quality Management and Analysis System (which is measured over 07:00 to 22:00, Monday to Friday).
- 2 The service availability levels are based on a simple mean average for all component systems. Therefore, although the aggregated figure may show that a target has been met, there may be instances where the target has not been met by a component system and where, therefore, the supplier will face a performance deduction.
- 3 A component system is available when users are able to access and utilise its functions. A component system is the set of applications used by the contractor to provide the services. For acute services there will be a number of component systems; for example, the Millennium care records system contains Enterprise Master Patient Index, Powerchart, Enterprise Scheduling Management and other applications. There are multiple Picture Archiving and Communications Systems deployments and the availability figures are an average of the availability of all component systems.
- 4 The data on service availability does not reflect 'planned downtime' which suppliers use to maintain or upgrade their systems. NHS Connecting for Health told us that planned downtime for maintenance is typically between two and four hours each quarter for each system, though very occasionally a longer period of downtime is required to upgrade a system. For example, the data for the Spine applications excludes the planned 48 hour downtime to upgrade the Spine in November 2007. If the planned downtime is exceeded, the excess is taken into account in calculating performance.

1 Availability of live services – national systems and services

System	2006 Oct	Nov	Dec	2007 Jan	Feb	March	April	May
Spine Services								
Personal Spine Information Service								
Target						99.90	99.90	99.90
Performance						● 100	● 100	● 100
Clinical Spine Application								
Target						99.90	99.90	99.90
Performance						● 100	● 100	● 100
Secondary Uses Service								
Target		98.50	98.50	98.50	98.50	98.50	98.50	98.50
Performance		● 100	● 100	● 99.99	● 99.93	● 99.99	● 100	● 99.20
Spine Directory Service								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100
Transaction Messaging Service								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 100	● 99.97	● 99.93	● 99.96	● 99.98	● 99.96	● 99.99	● 100
Personal Demographics Service								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 100	● 99.99	● 100	● 99.98	● 99.98	● 99.98	● 100	● 99.93
Access Control Framework								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100
Card Management System								
Target	98.50	98.50	98.50	98.50	98.50	98.50	98.50	98.50
Performance	● 100	● 100	● 99.91	● 100	● 100	● 100	● 99.72	● 100
Authentication Portal								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 100	● 100	● 100	● 100	● 100	● 100	● 99.31	● 100
Demographic Spine Application								
Target						99.90	99.90	99.90
Performance						● 100	● 100	● 100

	June	July	August	Sept	Oct	Nov	Dec	2008 Jan	Feb	March
	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
●	99.97	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 99.98
	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
●	100	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100
	98.50	98.50	98.50	98.50	98.50	98.50	98.50	98.50	98.50	98.50
●	99.78	● 100	● 100	● 98.98	● 100	● 100	● 99.18	● 99.46	● 99.57	● 99.08
	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
●	100	● 99.97	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100
	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
●	100	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 99.78	● 100
	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
●	100	● 100	● 99.46	● 100	● 99.92	● 99.94	● 99.37	● 100	● 100	● 100
	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
●	100	● 100	● 99.81	● 100	● 100	● 100	● 100	● 100	● 100	● 100
	98.50	98.50	98.50	98.50	98.50	98.50	98.50	98.50	98.50	98.50
●	99.88	● 99.97	● 99.95	● 100	● 99.63	● 99.90	● 99.76	● 99.52	● 99.08	● 100
	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
●	100	● 100	● 100	● 100	● 100	● 99.89	● 100	● 100	● 100	● 100
	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
●	100	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100

1 Availability of live services – national systems and services *continued*

System	2006 Oct	Nov	Dec	2007 Jan	Feb	March	April	May
N3 network								
Target	99.99	99.99	99.99	99.99	99.99	99.99	99.99	99.99
Performance	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100
HealthSpace								
Target			99.80	99.80	99.80	99.80	99.80	99.80
Performance			● 100	● 100	● 100	● 100	● 100	● 99.91
Choose and Book								
Target	99.50	99.50	99.50	99.50	99.50	99.50	99.50	99.50
Performance	● 100	● 99.23	● 99.64	● 98.90	● 100	● 99.76	● 99.54	● 100
Electronic Prescription Service								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 100	● 100	● 100	● 100	● 100	● 100	● 99.87	● 100
NHSmail								
Target	99.99	99.99	99.99	99.99	99.99	99.99	99.99	99.99
Performance	● 99.95	● 99.99	● 100	● 99.92	● 99.91	● 100	● 100	● 99.96
Quality Monitoring and Analysis Service								
Target	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86
Performance	● 100	● 100	● 100	● 100	● 100	● 100	● 99.98	● 100
NHS Connecting for Health Service Desk								
Target				99.89	99.89	99.89	99.89	99.89
Performance				● 100	● 100	● 100	● 100	● 99.87

Source: NHS Connecting for Health

June	July	August	Sept	Oct	Nov	Dec	2008 Jan	Feb	March
99.99 ● 99.99	99.99 ● 99.99	99.99 ● 99.99	99.99 ● 100	99.99 ● 100	99.99 ● 100	99.99 ● 100	99.99 ● 100	99.99 ● 99.78	99.99 ● 100
99.80 ● 100	99.80 ● 100	99.80 ● 99.89	99.80 ● 100	99.80 ● 99.99	99.80 ● 99.85	99.80 ● 100	99.80 ● 100	99.80 ● 100	99.80 ● 100
99.50 ● 99.43	99.50 ● 100	99.50 ● 99.62	99.50 ● 96.82	99.50 ● 98.47	99.50 ● 99.91	99.50 ● 100	99.50 ● 100	99.50 ● 99.78	99.50 ● 100
99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 99.96	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100
99.99 ● 100	99.99 ● 99.98	99.99 ● 100	99.99 ● 99.97	99.99 ● 99.96	99.99 ● 100	99.99 ● 100	99.99 ● 99.96	99.99 ● 100	99.99 ● 100
99.86 ● 100	99.86 ● 100	99.86 ● 100	99.86 ● 100	99.86 ● 99.32	99.86 ● 100	99.86 ● 100	99.86 ● 100	99.86 ● 100	99.86 ● 100
99.89 ● 99.95	99.89 ● 99.98	99.89 ● 100	99.89 ● 99.94	99.89 ● 99.93	99.89 ● 99.59	99.89 ● 99.76	99.89 ● 100	99.89 ● 100	99.89 ● 99.99

2 Availability of live services – key local systems and services

System	2006 Oct	Nov	Dec	2007 Jan	Feb	March	April	May
London Programme for IT (Local Service Provider – BT)								
Millennium care records system								
Target								
Performance								
Carecast care records system								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 100	● 100	● 99.85	● 99.57	● 99.47	● 100	● 100	● 99.65
RiO care records system								
Target	99.70	99.70	99.70	99.70	99.70	99.70	99.70	99.70
Performance	● 100	● 100	● 100	● 99.93	● 99.99	● 100	● 100	● 99.98
GP system								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 99.99
Southern Programme for IT (Local Service Provider – Fujitsu)								
Millennium care records system								
Target	98.80	98.80	98.80	98.80	98.80	98.80	98.80	98.80
Performance	● 100	● 100	● 99.97	● 99.89	● 99.68	● 99.96	● 99.58	● 99.98
North, Midlands and East Programme for IT								
North West and West Midlands (Local Service Provider – CSC)								
iPM care records system								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 99.76	● 99.87	● 99.90	● 99.84	● 99.92	● 99.96	● 99.91	● 99.86
Theatre system								
Target	99.80	99.80	99.80	99.80	99.80	99.80	99.80	99.80
Performance	● 99.93	● 100	● 100	● 100	● 100	● 100	● 99.99	● 100
North East (Local Service Provider – Accenture to December 2006, CSC from January 2007)								
iPM care records system – Acute Trusts								
Target	99.80	99.80	99.80	99.80	99.80	99.80	99.80	99.80
Performance	● 100	● 99.85	● 99.95	● 100	● 100	● 100	● 100	● 100
iPM care records system – non-Acute Trusts								
Target	99.80	99.80	99.80	99.80	99.80	99.80	99.80	99.80
Performance	● 100	● 100	● 99.95	● 99.82	● 100	● 100	● 100	● 100

June	July	August	Sept	Oct	Nov	Dec	2008 Jan	Feb	March
98.80 ● 99.57	98.80 ● 99.61	98.80 ● 99.87	98.80 ● 100	98.80 ● 99.96	98.80 ● 99.79	98.80 ● 99.94	98.80 ● 99.97	98.80 ● 99.08	98.80 ● 100
99.90 ● 100	99.90 ● 99.85	99.90 ● 99.69	99.90 ● 100	99.90 ● 99.66	99.90 ● 100	99.90 ● 100	99.90 ● 100	- -	- -
99.70 ● 100	99.70 ● 99.99	99.70 ● 99.99	99.70 ● 99.99	99.70 ● 100	99.70 ● 99.98	99.70 ● 99.99	99.70 ● 100	99.70 ● 99.57	99.70 ● 100
99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 99.78	99.90 ● 100
98.80 ● 100	98.80 ● 99.86	98.80 ● 99.83	98.80 ● 99.72	98.80 ● 99.94	98.80 ● 99.93	98.80 ● 99.78	98.80 ● 99.83	98.80 ● 100	98.80 ● 99.99
99.90 ● 99.87	99.90 ● 99.92	99.90 ● 99.76	99.90 ● 99.82	99.90 ● 99.75	99.90 ● 99.54	99.90 ● 99.42	99.90 ● 99.82	99.90 ● 100	99.90 ● 99.90
99.80 ● 100	99.80 ● 100	99.80 ● 100	99.80 ● 99.97	99.80 ● 99.88	99.80 ● 99.99	99.80 ● 99.81	99.80 ● 99.95	99.80 ● 99.78	99.80 ● 99.94
99.80 ● 99.59	99.80 ● 99.29	99.80 ● 98.75	99.80 ● 99.27	99.80 ● 100	99.80 ● 99.41	99.80 ● 100	99.80 ● 99.87	99.80 ● 100	99.80 ● 100
99.80 ● 100	99.80 ● 99.94	99.80 ● 99.99	99.80 ● 99.95	99.80 ● 99.98	99.80 ● 99.88	99.80 ● 100	99.80 ● 99.97	99.80 ● 100	99.80 ● 100

2 Availability of live services – key local systems and services *continued*

System	2006 Oct	Nov	Dec	2007 Jan	Feb	March	April	May
Ambulance system								
Target	99.30	99.30	99.30	99.30	99.30	99.30	99.30	99.30
Performance	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100
GP system – SystemOne								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 100	● 100	● 100	● 100	● 100	● 99.99	● 100	● 99.99
GP system – Synergy								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 99.99	● 100	● 100	● 100	● 99.98	● 100	● 100	● 100
East and East Midlands (Local Service Provider – Accenture to December 2006, CSC from January 2007)								
iPM care records system – Acute Trusts								
Target		99.80	99.80	99.80	99.80	99.80	99.80	99.80
Performance		● 99.68	● 99.89	● 100	● 100	● 100	● 99.92	● 99.52
iPM care records system – Non-Acute Trusts								
Target	99.80	99.80	99.80	99.80	99.80	99.80	99.80	99.80
Performance	● 99.96	● 99.95	● 99.76	● 99.98	● 99.99	● 100	● 100	● 100
Ambulance system								
Target	99.30	99.30	99.30	99.30	99.30	99.30	99.30	99.30
Performance	● 100	● 100	● 100	● 100	● 100	● 100	● 100	● 100
GP system – SystemOne								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 100	● 100	● 100	● 100	● 100	● 99.99	● 100	● 99.99
GP system – Synergy								
Target	99.90	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Performance	● 99.97	● 99.99	● 100	● 100	● 99.98	● 100	● 100	● 100
Picture Archiving and Communications Systems								
Target	99.87	99.87	99.87	99.87	99.87	99.87	99.87	99.87
Performance								
London	● 99.96	● 99.92	● 99.94	● 99.95	● 99.96	● 99.94	● 99.91	● 99.95
South	● 99.97	● 99.97	● 99.99	● 99.98	● 99.99	● 99.98	● 99.99	● 99.97
North West and West Midlands	● 99.48	● 99.86	● 100	● 99.79	● 99.85	● 100	● 99.99	● 100
East	● 99.92	● 99.97	● 100	● 99.98	● 99.90	● 100	● 99.98	● 99.81
North East	● 99.93	● 98.92	● 99.84	● 100	● 100	● 100	● 99.90	● 99.99

Source: NHS Connecting for Health

June	July	August	Sept	Oct	Nov	Dec	2008 Jan	Feb	March
99.30 ● 100	99.30 ● 100	99.30 ● 100	99.30 ● 100	99.30 ● 100	99.30 ● 100	99.30 ● 100	99.30 ● 100	99.30 ● 100	99.30 ● 100
99.90 ● 99.87	99.90 ● 100	99.90 ● 100	99.90 ● 99.80	99.90 ● 99.94	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100
99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	- -	- -	- -
99.80 ● 99.80	99.80 ● 99.65	99.80 ● 99.61	99.80 ● 99.87	99.80 ● 99.46	99.80 ● 98.70	99.80 ● 94.55	99.80 ● 99.89	99.80 ● 99.98	99.80 ● 100
99.80 ● 100	99.80 ● 99.95	99.80 ● 99.86	99.80 ● 99.72	99.80 ● 99.96	99.80 ● 99.68	99.80 ● 100	99.80 ● 99.90	99.80 ● 99.96	99.80 ● 99.75
99.30 ● 100	99.30 ● 99.64	99.30 ● 99.91	99.30 ● 100	99.30 ● 100	99.30 ● 100	99.30 ● 99.61	99.30 ● 100	99.30 ● 100	99.30 ● 100
99.90 ● 99.87	99.90 ● 100	99.90 ● 100	99.90 ● 99.80	99.90 ● 99.94	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100
99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	99.90 ● 100	- -	- -	- -
99.87 ● 99.96	99.87 ● 99.96	99.87 ● 100	99.87 ● 99.99	99.87 ● 99.99	99.87 ● 99.56	99.87 ● 99.97	99.87 ● 99.88	99.87 ● 100	99.87 ● 100
● 99.99	● 100	● 99.99	● 100	● 99.97	● 100	● 99.99	● 99.99	● 99.78	● 100
● 99.98	● 100	● 99.99	● 99.84	● 100	● 99.82	● 99.98	● 99.98	● 100	● 100
● 99.97	● 99.94	● 99.89	● 99.64	● 99.99	● 99.99	● 99.83	● 99.85	● 99.60	● 99.91
● 99.70	● 99.99	● 99.90	● 99.95	● 99.99	● 99.92	● 99.72	● 99.62	● 99.72	● 99.73

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