



eHealth in Theory and Practice

eHealth Case Studies

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Human Computer Interaction

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Experiences with centrally-initiated large scale national health IT projects

- Australia
- UK

'Maturing' Electronic Health Record Initiatives

From small scale – pilots & localised initiatives:

1967 Dr Lawrence Weed - PROMIS project

To large scale national agendas

- Australia: 2001 National eHealth Project -> HealthConnect
- UK: 2002 National Programme for IT -> Connecting for Health
£12-14bill
- US: Nationwide Health Information Network; recent US\$20 billion to digitize health system
- Canada: 2001 Canada Health Infoway 2001 CAD\$2.1 billion
- Denmark: Connected Digital Health program
- Austria: Elga etc



Australian experiences

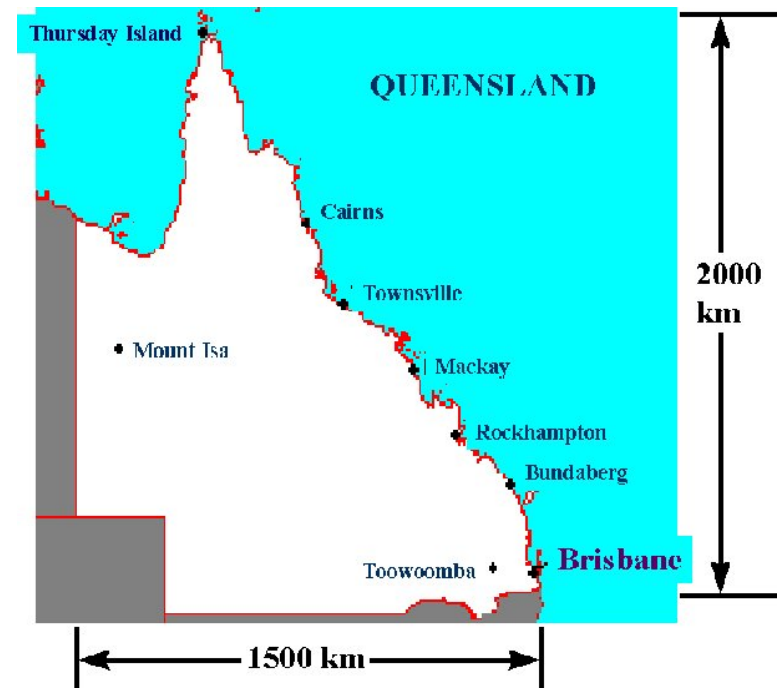




- 1928 Royal Flying Doctor Service
- Improving health care in the 'outback'

Australia (Qld): HBCIS - 1980s-1990s

- **HBCIS: Hospital Based Corporate Information System**
- State-wide – all public hospitals
- Specification/decision in early 1980s
- Delay in final contracts – ~ 1986
 - Political reasons
- McDonnell Douglas Solution
 - 8 year implementation phase



Experiences with HBCIS

- Focus: patient administration and corporate management
- Clinical add-ons:
 - Order entry-results reporting; PACS; Pharmacy
 - Expert user groups
 - Input on design & selection
- US software package
 - effort to modify for Oz grossly under-estimated
- Mixed results
 - Some successes
 - But also many issues - didn't like it when they got it!

Impacts of 'political' delays

- PICK operating system
 - Out of date before it even started!
- Changing needs
 - “aspects of [QH’s] information needs were apparently **not made explicit** prior to the selection of the system and have **changed significantly** during the 8- year implementation phase”
- Missing needs
 - “The needs of **community service agencies**, particularly long-term care facilities, have **not been considered**”

Australia: <http://www.ehealthinfo.gov.au/>



The screenshot shows the homepage of the Australian eHealth Information website. The browser's address bar displays 'http://www.ehealthinfo.gov.au/'. The website features a navigation bar with links to Home, FAQs, eHealth links, Glossary, and Contact us. A search bar is located in the top right corner. On the left side, there is a vertical menu with links to Home, About eHealth, Healthcare Identifiers, Personally Controlled Electronic Health Records, Model Healthcare Community, The Patient Journey, eHealth Sites, and Brochures. The main content area includes a large banner titled 'What is eHealth?' with a subtitle: 'The combined use of electronic communication and information technology in the health sector' - World Health Organisation. Below the banner is a 'Find out more ...' link. To the right of the banner is a section titled 'eHealth Sites' featuring a map of Australia and a list of links to state and territory eHealth sites: New South Wales, Victoria, South Australia, Western Australia, Northern Territory, Queensland, Tasmania, Australian Capital Territory, and Private Healthcare. At the bottom, there are three smaller sections: 'Introduction to eHealth', 'eHealth for Aged Care', and 'eHealth Global'. The footer contains links to Contact us, Sitemap, Terms of use, and Privacy policy.

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eHealth

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Healthcare Identifiers

Personally Controlled Electronic Health Records

Model Healthcare Community

The Patient Journey

eHealth Sites

Brochures

What is eHealth?

"The combined use of electronic communication and information technology in the health sector" - World Health Organisation

Find out more ...

eHealth Sites

What's happening in your state?

- + New South Wales
- + Victoria
- + South Australia
- + Western Australia
- + Northern Territory
- + Queensland
- + Tasmania
- + Australian Capital Territory
- + Private Healthcare

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National eHealth Strategy

- 2000: National Electronic Health Records Taskforce recommendation to create national health information network
- HealthConnect – \$128M program
 - Goal: shareable e-records – pilot trials
 - 2003 Health Minister [[speech](#)]:
 - *“Failure to establish an electronic patient record within five years ... would be an indictment against everyone in the system, including the government.”*
- 2004 -> NEHTA: National E-Health Transition Authority
 - Define eHealth architectures, infrastructures, standards, identifiers etc
- Over \$5B spent on eHealth over 10 yrs (to 2010)!

A politician's assessment ...

“Back then [2003], my thinking was that people in the health system were at least as capable as those in the finance system. **If eftpos could link billions of bank accounts and financial institutions around the world, it should surely be possible for every Australian patient's file** to be copied, indexed, stored and securely made available to the patient and authorised treating professionals via the internet.

In retrospect, I had **underestimated the difficulty** of shepherding independent professionals and insular institutions through the thickets of patient privacy and sheer force of habit.”

Tony Abbott - 2007 Speech ['An e-Health Report Card'](#)

(prev Health Minister, current Leader of the Opposition)

Hugely controversial

Eg

‘E-health in dire straits’

Health Informatics Soc Aust (HISA)

[The Australian](#)

18 Jan 2008

‘E-health records risk patient safety’

Medical Software Industry Ass (MSIA):

- [ZDNet](#) 19 March 2012

- Ignoring global standards, what is already working – [eg](#) & private [blogs](#)

- state governments critical of consultation process [The Australian](#) 28 Nov 2011

-Etc!



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Australia's e-health in dire straits

KAREN DEARNE January 18, 2008 12:00AM

THE Rudd Government should bypass the National E-Health Transition Authority and fund a key health stakeholder group to develop an "agreed vision and plan for e-health", the Health Informatics Society of Australia says.

"Despite recognition in most other advanced countries of the need for investment in and the use of IT in the health sector, Australia sits without a plan for how it will deliver its e-health future," HISA said in a pre-Budget submission prepared for the federal Treasurer, Wayne Swan.

"There is not even a clearly articulated and shared vision of what we expect our investments in e-health to deliver."

In the past two years, NEHTA has suffered from a lack of direction and has been criticised for its inability to engage with doctors and health IT providers, and its failure to deliver on work plans, HISA said.

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"There is no doubt that the standards and infrastructure elements which NEHTA has been charged with delivering are important, but it's more important to ensure those elements will fit the requirements of patients, providers and the Government, and that they can be delivered by industry," it said.

The new group should be independent of NEHTA and the Australian Health Information Council, and focus on the "enormously complex task" of building a fully interoperable health system across state borders, which supports both private and public sectors, and is accessible by a diverse range of medical providers.

HISA also calls for a substantial increase in funding for post-graduate studies in health informatics, and an accreditation program, to help address the critical skills shortage.

"We need trained health informaticians, as the the skills are not easily transferable from other IT specialities," it said. "The required level of privacy, security and accuracy of health data reflect an information environment of unequalled complexity, where errors can readily endanger lives."

Contentious issues

- Central or distributed repositories?
- Interconnectivity or interoperability?
- Who can access? How is this controlled?
- Opt in or opt out?
- National identity card by stealth
- Differences between states
- And many more!



Current State : PCEHR

- Personally Controlled Electronic Health Records (PCEHR)
 - 2010 budget: \$466.7M for two years
 - "nationally consistent patient health summaries"
 - 'Bringing PCEHR to life' [video](#)
- Target:
 - Consumers able to register for PCEHR from 1 July 2012.
- Voluntary opt-in system as 'privacy compromise'
 - [most consider this a mistake!]



PCEHR: concerns

- Doctor organisations: RACGP, AMA [[web article](#)]
 - Control: “potentially risky as it put the patient rather than their doctor as the gatekeeper of medical records”
 - Funding for training, adoption, use, ‘additional work’ ?
- Cynical Critiques [[The Australian](#) 17 Aug 2010]:
 - *“A brilliant stroke. If consumers “control” their own e-records, problems such as **consent, data security and liability are no longer the government's concern.***
 - *Hey, it's cheap, too. Because people will have to pay commercial providers -- like Microsoft, Google and new entrants such as health insurers -- to set up and maintain their own records, government is **off the hook on cost** as well.”*

UK experiences

National Ehealth Strategies – Examples – England



NHS Connecting for Health

NHS Connecting for Health (NHS CFH) is part of the Department of Health Informatics Directorate.

Our role is to maintain and develop the NHS national IT infrastructure.

NHS staff, the media and patients can use this site to learn about our work and its benefits.



Latest news

[Hamer champions involving student nurses in IT innovation](#)

19 March 2012

[Choose and Book features in BBC TV show 'Doctors'](#)

01 March 2012

[Clarification on free NHS treatment for those with an NHS Number](#)

09 February 2012

[More news](#)

Featured services

New & upgraded sections

New content, FAQs & cases

Summary
Care
Records

[Summary Care Records \(SCR\)](#)

SCRs provide healthcare staff treating patients, in an emergency or out-of-hours.

[Electronic Prescription Service \(EPS\)](#)

[Key figures about healthcare in the United Kingdom¹¹:](#)

Total population: 61,411.69 (OECD 2008);

Life expectancy at birth: 79.9 years (OECD 2007);

Healthcare expenditure as a % of GDP: 8.4% (OECD 2007);



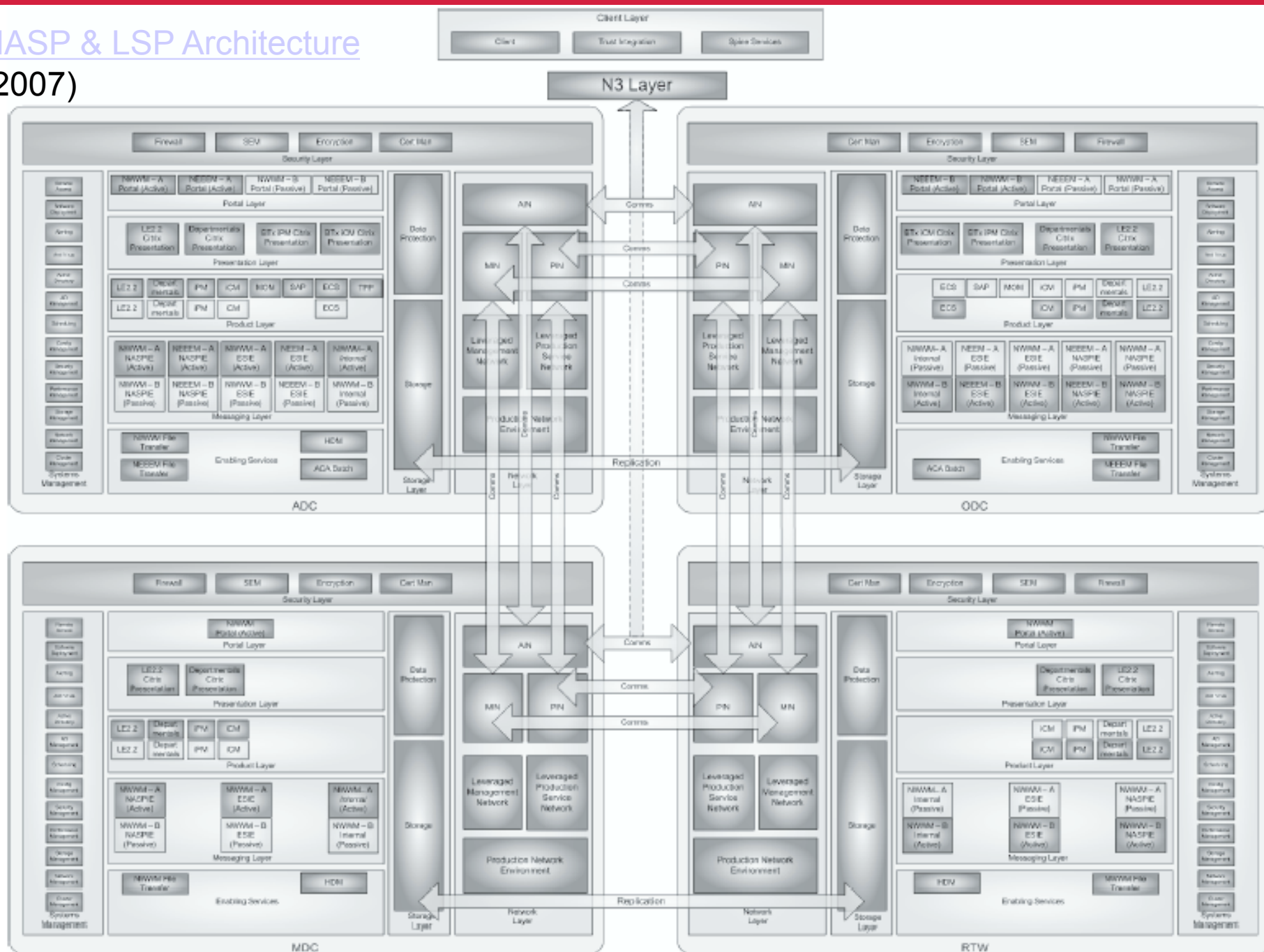
Brief history

- 1948 National Health Service (NHS)
- 1998 report: 'Information for Health: An Information Strategy for the Modern NHS 1998-2005, A National Strategy for Local Implementation '
- => National Programme for IT (NPfIT)
- NHS Information Authority (NHSIA) – closed 2005
- => NHS Connecting for Health (agency of Dept of Health)
- [Integrated Care Record Service => NHS Care Record Service]

Key strategies – NHS Care Records Service

- **Local Service Providers (LSP)**
 - England divided into 5 regions (clusters)
 - Each cluster assigned distinct IT suppliers
 - Detailed electronic care records – held locally
- **National Application Service Provider (NASP)**
 - SPINE – summary patient records (from end of 2004)
 - Also accessible by patients via ‘MyhealthSpace’
 - Other IT systems common to all NHS users
 - Eg ‘Choose and Book’, Electronic transmission of prescription, PACS etc
- National target – was it 2008? Opt-out system

NASP & LSP Architecture (2007)



2002 Consortium Response to CFP

Sapient:

Business & technology company

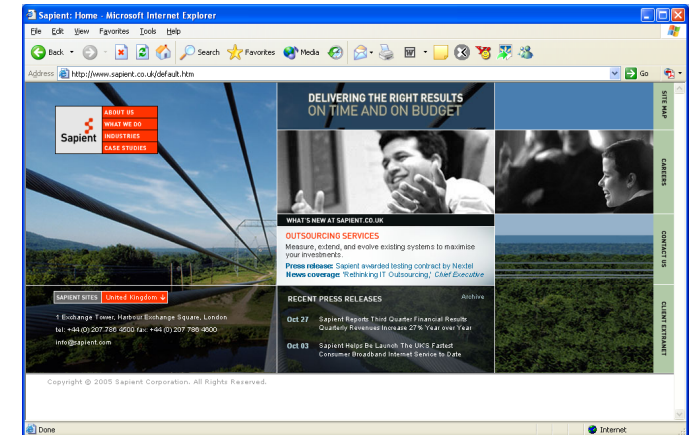
Wanted health as domain 'vertical'

On team of short listed LSP consortia

Number of diverse partners

Last ~three weeks

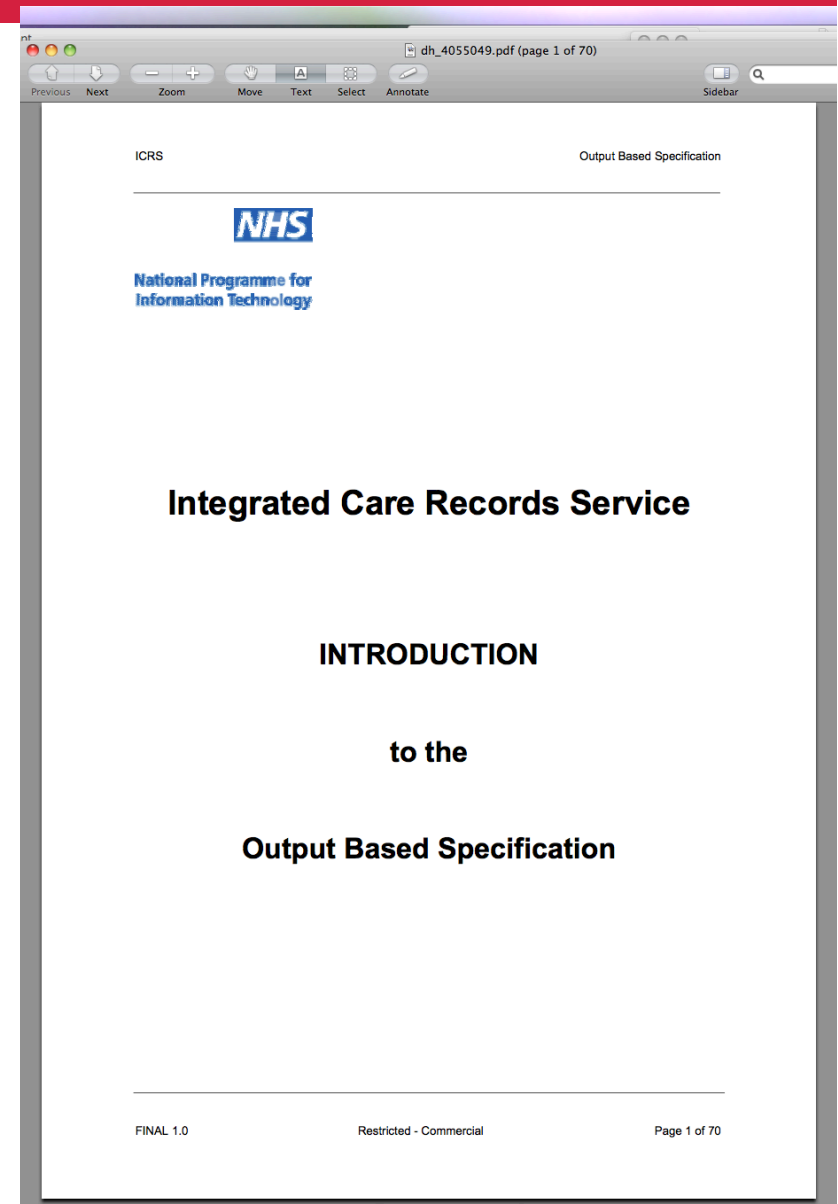
Team of approx 70 people from different companies co-located in Sapient London offices



ICRS Specification Document

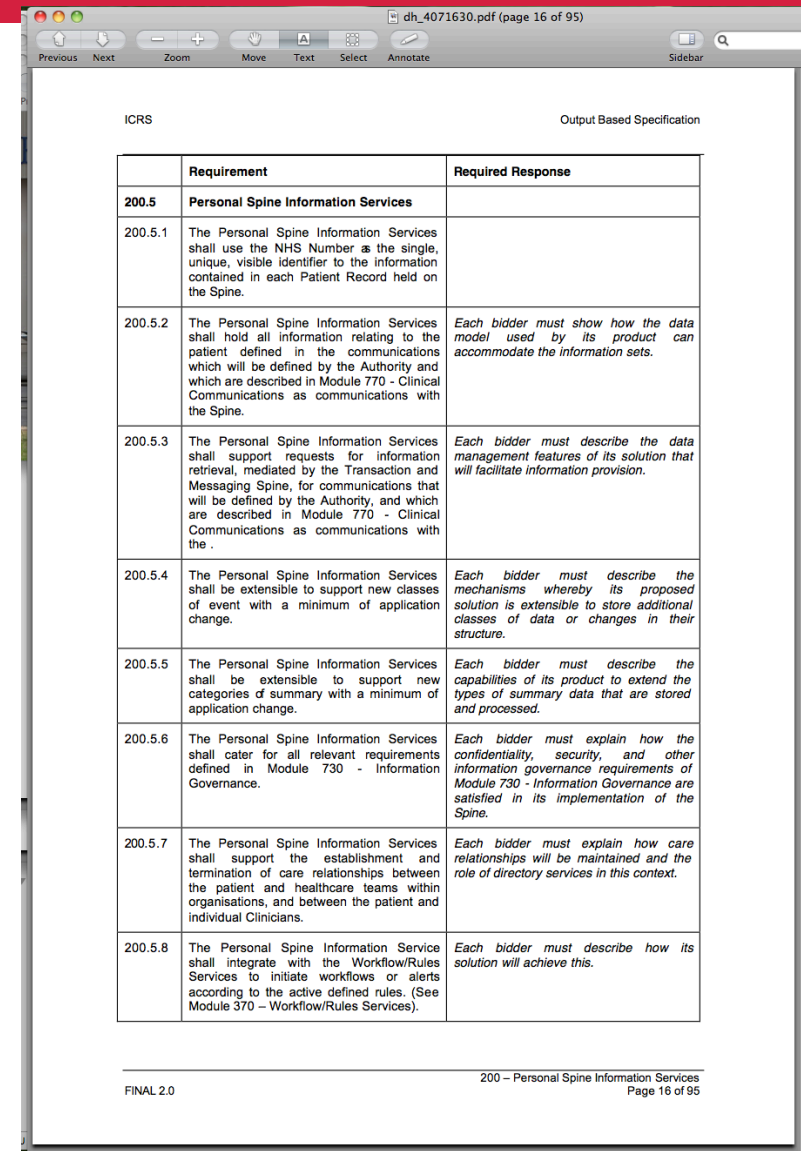
- 70 page Intro to Specification Doc
- *“Bidders are required to respond to this OBS by providing two main documents:*
 - 1. an Outline Proposal of their **proposed solutions** for the requirements that are stated;*
 - 2. a **response to each** of the numbered requirements.*

*The Outline Proposal **must cover the full scope of the requirements**”*



Specification Document

- 95 page Document !
- Nothing about:
 - Finding out what already exists
 - Involving stakeholders in design/ testing, etc
 - Change Management
- 'Users' present under 'Training Plan'
- Consortium partners pushing their own products
 - Many with no health relevance!



ICRS

Output Based Specification

| | Requirement | Required Response |
|---------|---|---|
| 200.5 | Personal Spine Information Services | |
| 200.5.1 | The Personal Spine Information Services shall use the NHS Number as the single, unique, visible identifier to the information contained in each Patient Record held on the Spine. | |
| 200.5.2 | The Personal Spine Information Services shall hold all information relating to the patient defined in the communications which will be defined by the Authority and which are described in Module 770 - Clinical Communications as communications with the Spine. | <i>Each bidder must show how the data model used by its product can accommodate the information sets.</i> |
| 200.5.3 | The Personal Spine Information Services shall support requests for information retrieval, mediated by the Transaction and Messaging Spine, for communications that will be defined by the Authority, and which are described in Module 770 - Clinical Communications as communications with the . | <i>Each bidder must describe the data management features of its solution that will facilitate information provision.</i> |
| 200.5.4 | The Personal Spine Information Services shall be extensible to support new classes of event with a minimum of application change. | <i>Each bidder must describe the mechanisms whereby its proposed solution is extensible to store additional classes of data or changes in their structure.</i> |
| 200.5.5 | The Personal Spine Information Services shall be extensible to support new categories of summary with a minimum of application change. | <i>Each bidder must describe the capabilities of its product to extend the types of summary data that are stored and processed.</i> |
| 200.5.6 | The Personal Spine Information Services shall cater for all relevant requirements defined in Module 730 - Information Governance. | <i>Each bidder must explain how the confidentiality, security, and other information governance requirements of Module 730 - Information Governance are satisfied in its implementation of the Spine.</i> |
| 200.5.7 | The Personal Spine Information Services shall support the establishment and termination of care relationships between the patient and healthcare teams within organisations, and between the patient and individual Clinicians. | <i>Each bidder must explain how care relationships will be maintained and the role of directory services in this context.</i> |
| 200.5.8 | The Personal Spine Information Service shall integrate with the Workflow/Rules Services to initiate workflows or alerts according to the active defined rules. (See Module 370 - Workflow/Rules Services). | <i>Each bidder must describe how its solution will achieve this.</i> |

FINAL 2.0

200 - Personal Spine Information Services
Page 16 of 95

Also controversial and problematic!

Numerous delays, specification changes and NHSfIT re-incarnations (see '[NHS23](#)' - 'Bibliography of Published Concerns')

- Supplier / contract problems
- Relationships with local NHS trusts/ Strategic Authorities
- Problems with 'end user' / 'stakeholder' engagement
- Lack of buy-in by key professional groups e.g., British Medical Association
- Lack of basic infrastructure as foundations for NASP
 - *“Without a fundamental shift in strategy away from national dreaming to local electronic record building, another eight years could drift by and ..NHS ..still be deluged with paper.” [Brooks, [ComputerWeekly](#), 2006]*

Example: Choose and Book experiences

2007 Healthcare Commission [Report](#) on Choose and Book:

- "Choose and Book has **failed to win over GPs** and is 'struggling to deliver' on patient choice, a damning report from the Healthcare Commission warns.
- The commission's annual health check found **only 2% of PCTs hit targets** on convenience and choice - a result described as 'by far the worst level of performance for any of the existing national targets'.
- 'The **challenge of persuading independent practitioners to adopt the new system has been far harder than anticipated.**'

Example: Summary Care Record – Pilot experiences

16 April 2008 report [cited NHS23]:

“When .. the Summary Care Record launched in March 2007, the **plan** was for a rapid early adopter rollout ... **predicted** that within three months 'the majority of patients in Bolton will have a Summary Record'.

More than a year later, the project is stuck in the mire... The first flagship pilot has been beset by **technical glitches, confidentiality concerns and a series of crippling delays.**

Just **one in four** patients have had their records uploaded and records have been **used just 167 times**...

...has also been struck by **severe software compatibility problems** with the major suppliers.”

- Survey: Half of GPs refuse to share records with SCR

[17 Nov 2008]

Report on English NHS Summary Care Record (SCR)

Requires integration & standardisation across Institutions however...

“Successful introduction of SCRs depended on interaction between **multiple stakeholders from different worlds** (clinical, political, technical, commercial) with different values, priorities, and ways of working.

...

Benefits of centrally stored electronic summary records seem **more subtle and contingent** than many stakeholders anticipated, and clinicians may not access them. **Complex interdependencies, inherent tensions, and high implementation workload** should be expected when they are introduced on a national scale.“

[BMJ - Greenhalgh et al 2010]

Government plans for new model of SCR - PHECR

2010 Department of Health review:

- “a centralised, national approach is no longer required, and a more locally-led plural system of procurement should operate”.

News article take on this [cited NHS23 21 June 2010]

- “The Government is planning to **switch to a scaled back, 'patient-held' electronic care record**, severing central control over the controversial programme, but stopping short of scrapping it altogether.
- A senior Government source told Pulse of moves to substantially reform the Summary Care Record after researchers found it had **spectacularly failed to deliver a raft of promised benefits to patients and doctors.**”

2011 National Audit Office report:

“The 70bn pound system ... is falling further behind schedule and in places where it has been introduced it is not working as it should.”

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£7bn NHS electronic records 'achieving little' for patients

By Nick Triggle
Health correspondent, BBC News

Patients are getting "precious little" from the NHS electronic care records system in England, a watchdog says.


The £7bn system to replace paper files is falling further behind schedule and in places where it has been introduced it is not working as it should.

The National Audit Office also said some patients would not even get one as large chunks of the NHS had pulled out.

In conclusion, the NAO said the system was not providing value for money - something the government rejected.

Electronic care records are the key part of the overall £11.4bn NHS IT project.

The scheme was launched in 2002 with the aim of revolutionising the way the health service uses technology and also includes developments such as digital x-rays and fast internet connections.



Paper records will be uploaded

Related Stories

- [GP warning over database access](#)
- [Fresh debate over medical records](#)
- [Temporary halt to NHS care record roll-out](#)

In Specification doc – the answer was training!



Change management = system training



http://www.tech-army.org/forum/forum_posts.asp?TID=142&PID=5775&title=best-classroom-idea-training-software-preinstalled

In practice, introducing EHRs is much more complicated!

As archival data



designing records ...
information focus ...

As dynamic socio-technical practice



designing practice ...
practice focus ...



In summary

“Findings raise questions about how eHealth programs [in England] are developed and approved at policy level.” [Greenhalgh et al 2010]

Complex socio-political landscape!

- Political climate
- Central agencies
- National health delivery structures
 - States, regions, authorities etc
- Industry landscape
- Professional lobby groups
- etc

Complex socio-technical issues!

- Challenges with top-down centrally initiated systems
 - Shifted from central to distributed (PCEHRs)
- Impacts of 'silly' targets & push to fulfill politician promises!
- Grand vision vs reality
 - Under-funded, over-ambitious
 - Reductions in scale / compromises
 - Removed from existing infrastructures
 - Getting foundations right, agreeing standards
 - Removed from the everyday work of healthcare
 - Disruptive to practice and care
- Critical 'stakeholders' have to be on board
- Issues of control, access, privacy, cost, opt in or out, etc
 - Many requiring legislative changes

Sample References

Note: papers can be accessed via TU library (direct or VPN network connection)

Jalal-Karim, A.; Balachandran, W.

[The national strategies for Electronic Health Record in three developed countries: General status](#), *Multitopic Conference, 2008. INMIC 2008. IEEE International* , vol., no., pp.132-138

Greenhalgh, T. et al.

[Adoption and non-adoption of a shared electronic summary record in England: a mixed-method case study.](#)
BMJ 2010;340:c3111

Greenhalgh T, et al.

[Adoption, non-adoption, and abandonment of a personal electronic health record: case study of HealthSpace.](#) *BMJ* 2010;341:c5814