Lessons from the NHS National Programme for IT

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A program of this size is bound to experience challenges

The National Health Service (NHS) in the United Kingdom is undertaking the world's largest civil information technology (IT) project,[1] committing £12.4 billion over 10 years to improve services and quality of patient care through the strategic use of IT.[1] The size of this commitment makes the NHS National Programme for IT (NPfIT), delivered by the NHS Connecting for Health (CfH) agency, of major international importance.

NPfIT covers 330 acute hospitals and mental health trusts, and primary and community care organisations across England (Scotland, Wales and Northern Ireland have opted not to participate). At the core of the program is the "Spine", a central link to a patient register, electronic prescription service, messaging service, and a summary care record. A web-based booking system, Choose and Book, which allows patients to select or change appointment times, is currently used for 12% of bookings. Radiology picture archiving, electronic prescription transfer, email, and an NHS-wide directory have been implemented, but electronic patient records, a common user interface and secondary use of data are significantly delayed.

The NHS chose to procure systems centrally and implement them locally. Procurements included NHS-wide systems (email and Choose and Book), enterprise-wide agreements (eg, with Microsoft), and five local service providers to implement the regional solutions. Local service providers are free to choose and change subcontractors.

Local systems must conform to national standards, as in Australia where all jurisdictions have agreed to use standards promulgated by the National E-Health Transition Authority. Clear differences are our federal structure that allows each state its own procurement process, financial and regulatory framework, and controls, thus hindering the unified "big bang" approach possible for England.

Once all costs of implementation and training are accounted for, the final budget for NPfIT could blow out to as much as £30 billion.[2] In June 2006, the UK's National Audit Office reported on CfH.[3] Despite the cost overruns, delays,[4] and growing clinical unrest, the report was less damning than expected. The muted response may reflect that some things have gone well, that a program of this size is bound to experience challenges, and the political cost should the program be perceived as a failure. Other nations grappling with health service reform can already learn many lessons from NPfIT.

Get the procurement model right. Procuring contracts centrally resulted in vigorous supplier competition and saved about £4.5 billion. However, the speed of procurement meant that the NHS had not prepared key policy areas (eg, information governance), standards (eg, for messaging and clinical coding), and information system architecture (neither enterprise architecture nor detailed technical architecture was ready). Further, the contracts bound suppliers to a vague specification that has cost the NHS around £30 million in legal fees to sort out.

Payment to suppliers is contingent on delivery of "working" systems (although up-front payments have occasionally been made). Consequently, the significant delays in systems roll-out have not as yet resulted in a national scandal because the public purse appears protected. Under-performing companies have not been paid, and some have suffered large, late-delivery penalties. For example, iSOFT is reported to be struggling because of its failure to deliver on time and the resulting penalties. It posted a £344 million annual loss, has taken a hammering in its share price, and is being investigated by regulators.[5] It is not clear what risk-management process can handle the worst-case scenario of one or more providers going bankrupt, leaving complex "legacy software" that cannot be maintained by other organisations.

Safety comes first. IT can be a powerful enabler, but if poorly implemented or used, it can result in patient harm.[6] Yet system safety was not written into the initial procurement specifications.[7] Somewhat late in the day, CfH developed a safety accreditation process and appointed a National Clinical Safety Officer. Failure to account for safety also brings commercial risks. A program failure, such as failing to correctly populate patient data into the allergy field of the shared records on the Spine, could easily generate widespread clinical misadventure, triggering massive legal claims and a stock market hammering.

The delayed common user interface should have additional safety benefits. Once trained on one system, clinical staff can change their employment and, regardless of the next system used, still have some consistency of user interface and information presentation, hopefully resulting in reduced training time, increased clinician effectiveness and safer practices.

Skills shortages will impede progress. CfH has been hampered by a workforce that lacks experience in large-scale IT implementation and familiarity with health services.[8] Compounding this, the severe procurement contracts paradoxically may send some health IT companies to the wall, reducing the number of organisations able to implement systems in the UK, or elsewhere. Perhaps a staged approach, with systems roll-out designed to also increase the skills base and capacity of the workforce, might have been more sustainable.

For the lifetime of CfH, there will always be questions about the capacity of CfH suppliers to deploy their best and brightest to other parts of the world. This is in part because suppliers may see success with CfH as a "loss leader" into the global market, and failure or delay there will also generate significant penalty. "Fast follower" nations hoping to capitalise on the investment of an "early adopter" nation like England may end up paying a premium on UK prices, rather than the cheaper prices some expect, as companies seek to recoup any losses incurred in the UK.

Clinical engagement comes first, not last. A significant criticism in the National Audit Office report was that procurement occurred before clinical engagement, perhaps because extensive consultation was thought to slow the process. This has resulted in significant disquiet among some clinicians and the priorities of the program not fully matching those of the clinical community.[9] How significant a failure this decision was will become clearer in time.

Picking the wrong patient consent model may be a deal breaker. Patients must give consent for their information to be stored electronically and made available to others.[10] CfH has chosen an "opt out" model in which patients by default are included within the system, and make an informed choice to leave it. For this to be fair, patients would need to be reached by an educational campaign before system implementation. Strident critics, such as the British Medical Association, counter that an informed choice to "opt in" would be a fairer model, as there is no room for doubt about a patient's intentions. Given that the shared record is not yet widely available, there is significant room for increasing disquiet in years to come, not just among clinicians, but also the public. "Opting out", while technically simpler, may end up being the Achilles heel of the new system should significant examples of breach of confidentiality hit the media. "Opting in" might eventually prove to be the cheaper model when all costs are considered, not just the technical ones.

Clinical knowledge services are an early clinical winner. Almost ignored in the CfH program hype has been the NHS National Knowledge Service which provides, among other things, the electronic National Library for Health — a vast array of evidence sources for working clinicians. With no apparent significant delays in its delivery, no dependence on other components of CfH, and a relatively small budget by the program's standards, it is likely that the IT system most clinicians see first and gain immediate benefit from will be Internet access to clinical evidence.

Political leadership is key. CfH exists because of strong political support within the government and Cabinet, and direct leadership from the Prime Minister. Without such political leadership, it seems unlikely that modernisation on this scale would ever be attempted, nor steered over the inevitable road humps encountered on the way.

Evaluation is not an afterthought. Too often, token effort is expended on measuring clinical improvements long after major decisions have been made and systems delivered. CfH has therefore established and funded an evaluation board. However, evaluation also has a major *formative* role — early versions of systems are iteratively trialled to make sure they fit into clinical workflows, are acceptable to clinicians, and don't have negative side effects. The CfH decision to consult late with clinicians has meant that there were limited opportunities for formative evaluation to shape specifications, and we may now be seeing the opportunity cost of that decision.

Perhaps history will record that the NHS was not sufficiently prepared to take on such a fast-paced, radical and extensive modernisation program, that it was compromised by workforce shortages in health informatics, and fell into the trap of leading with technology rather than clinical need. Perhaps countries like Australia will draw another, somewhat heretical, conclusion from the exercise — that IT is not like water, which can be delivered equally to all. With scarce resources, Australia should begin its IT modernisation program with just a few national clinical centres of excellence, where IT skills and efforts can be concentrated. With time, successful technologies, processes and work practices, as well as the personnel trained in them, can then migrate to the rest of the health system.

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