A comparison of NHS CRS implementation at two London hospitals: cross-site organizational learning

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Academy Health ARM

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The settings

<table>
<thead>
<tr>
<th>Site</th>
<th>Type</th>
<th>Beds</th>
<th>Population</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site A</td>
<td>Teaching hospital and medical school. Leads in cancer care</td>
<td>900 beds $700m pa</td>
<td>700,000 population</td>
<td>5100 staff</td>
</tr>
<tr>
<td>Site B</td>
<td>General hospital, some teaching</td>
<td>520 beds $300m pa</td>
<td>320,000 population</td>
<td>2600 staff</td>
</tr>
<tr>
<td>Cerner Millennium London Configuration (LC0)</td>
<td>Cerner Millennium London Configuration (LC1)</td>
<td>Cerner Millennium London Configuration (LC2)</td>
<td></td>
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</tbody>
</table>
| • An electronic care record for every patient  
  • Patient registration, admission, discharge, transfer  
  • Patient medical record tracking  
  • Pathology / Radiology requests, results viewing and notifications  
  • Clinical assessments and documentation  
  • Scheduling (including theatres, clinics, beds, diaries)  
  • Access to management information and reporting  
  • Compatibility with Choose and Book  
  • Maternity booking of expectant mothers and recording of delivery details | • Connection to the Spine (the national database and messaging service), providing access to patient demographic information, such as name and address  
  • Increased security with the use of SmartCards and single sign on access to the system  
  • Theatre case functionality, including pre and intra operative documentation, case tracking views and mandatory reporting  
  • Clinical features include allergies, extended requests, additional clinical assessments and ability to link to scanned documents | • New functionality to support:  
  - medication management, including requesting and administration of drugs  
  - anaesthetics, including device integration  
  - critical care, including bedside medical device integration and critical care data entry  
  - advanced structured clinical documentation  
  • Enhancements to existing functionality in the following areas:  
    - theatres  
    - accident and emergency  
    - requests and results reporting  
    - clinical documentation  
    - patient administration  
    - operational, clinical and management reporting  
  • Future integration with other care settings |
Method

• One lead researcher to collect data
• Iterative two-step analysis: initially, at each individual case study level, and then a meta-synthesis from another case study and ultimately all 12 case studies
• Regular analysis workshops with the wider evaluation team and formative feedback sessions with individuals and Trusts
## Detailed dataset for Sites A & B

<table>
<thead>
<tr>
<th>Site</th>
<th>Total no. of site interviews</th>
<th>Hours of on-site observations</th>
<th>No. of site documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (December 2009-December 2010)</td>
<td>36</td>
<td>22</td>
<td>124</td>
</tr>
<tr>
<td>B (May 2009-December 2010)</td>
<td>27</td>
<td>19</td>
<td>94</td>
</tr>
</tbody>
</table>
More about context

• Both early adopters of Cerner Millennium LC1 (London configuration)
• Site A first in UK to implement many aspects of Millennium and also new for everyone else concerned (Cerner, LSP, LPfIT, other areas of CFH)
• Site A went live in June 2008 ... and announced massive problems a few weeks after; huge revenue loss, resulting in deployment being halted and a ‘90 days rescue plan’ (nearer 180 days) and further national Millennium deployment on hold
• Site B was make or break site for CFH in London; it went live in November 2009
Context (cont’d)

• Both sites saw the NHS CRS a key enabler of their long-term overarching strategy to modernize healthcare.

• Free software and maintenance up until 2014 plus incentives to be early adopter pushed them to go live: “having the National Programme fund it for us and all the complexities of integration was obviously a big financial bonus for us” [Senior Manager, Site B].

• However, top-down and central view of NPfIT left no room to investigate alternatives: “The reason why we implemented (NHS CRS) was because of tremendous government pressure for us to ‘go live’” (Doctor, Site B).
‘working out’ the NHS CRS

• A more or less common rationale for adoption
• Distinct experience of ‘working out’ EHR between two settings because of differences in
  – Time (A preceded B) and political context of go live
  – Vision and leadership
  – Implementation strategy
Vision and leadership Site A

• A data-centric vision; IT implementation as an end rather than a means.
• Underestimated complexity of task, raised expectations of benefits.
• Business case written with little firm information to go on
• Inadequate clinical engagement
• No ‘manual’/specific training available for staff
Vision and leadership Site A

- “I think the biggest problem with the programme is the expectation that it’s a little bit like going round installing three thousand copies of Microsoft Word and the following day everybody has got a word processor. It just is not that simple”  (Manager, Site A).

- So….. “when the system didn’t fit the way they worked, then they had to start layering workarounds on top of workarounds and they just got into more and more trouble” [LSP 1].
Vision and Leadership Site B

- IT a means to an end of improved business and clinical processes
- Fully understood complexity of the task. First target was to get business back to normal, would only consider benefits after that.
- Informed by CEOs experience and that of Site A
- Good clinical engagement
- Strong training including 100’s of workflow simulations
Vision and Leadership Site B

• NHS CRS as “not the implementation of the technology but about the changes to the way in which thousands of staff in the trust undertake their daily clinical and support work” (IT Manager).
  – Board’s vision of IT as “an enabler of improvement” [Doctor].
  – “I don’t think we are deploying Cerner here. We are reviewing and improving our services.”. [Senior Manager].
• “...no point in talking about benefits. You’ve just got to talk about doing it [NHS CRS] and being able to manage through it” [Senior Manager].
• It was viewed as a change management process which “is 20% system and 80% user change issues” [IT Manager]
Implementation Site A

- They did not “make sure the processes work and that the build is robust and that people understand their individual roles” [Doctor] prior to ‘go-live’.

- Used a generic training database that looked very different from the real environment of Millennium software. There was neither training material nor were user guides provided: “people were always crying out for a training domain to look and feel like the live system” [LSP 2].

- The structure of the implementation team not sufficiently grounded on operational users: “you need people who are getting their hands dirty every day. We probably needed to devolve it down to a lower level and actually get operated input earlier on” [Manager].

- As a result, the Trust “spent a massive time trying to fix all sorts of problems arising during the deployment” [Nurse]
Implementation Site B

- Visiting Site A let users to “see the Millennium product in actual working live as it were” [Nurse], to gain more insights about the scope of the task.
- Prepared user guides in advance and “embedded the procedures into the organization in advance of deployment” [NPfIT 2].
- “applied their own build changes and their own boards, clinics, beds, bays, so it had that look and feel of what their life system would be” [LSP 1].
- Several delays to ‘go-live’ date because of problems at Site A brought more time for planning, testing and preparation.
- NDM (New Delivery Model) after Site A problems resulted in a more collaborative and ‘in-site’ common work between the Trust, BT, LPfIT and Cerner at Site B.
Local consequences

• In contrast to Site A that faced long delays in outpatient clinics and attributed those to “incompetent end users” [Manager, Site B], Site B did not face such a problem beyond two days after go-live.

• Compared to Site A that went back to business as usual after 10 months of ‘go-live’, Site B claimed to had gone back to ‘business as usual’ after four months.

• Site B “lost some money, but it’s trivial in comparison to (Site A) and it’s thousands not millions” [Manager, Site B].
Learning

• Site B learned a great deal from Site A. For instance, as a result, Site B minimized remote and bureaucratic relationship with BT and Cerner by locating them on site.

• Interviewees at Site B and external stakeholders including LPfIT, Cerner and BT all agreed the better experience of NHS CRS at Site B was to a large degree a result of learning from Site A, which led to a new contract.

• Regional (LPfIT & BT) and national (NPfIT & DH) bodies also learned from site A, this was crucial in making a more effective, sharing environment happen.
Summary

- The national CRS rollout is very delayed, but there are signs of learnings which should speed up adoption in other sites
- A sociotechnical world view is important for success
- Our research methods can feed into successful adoption
- Report: google: chep birmingham winding road
- BMJ 2010; 341, 2nd Sept Robertson et al
- And …