Multiple access, minimal risks: How single sign-on and patient context management can streamline access to patient data

Few, if any, NHS hospitals have an integrated electronic patient record (EPR) system that gives clinicians all the patient information they need in one place. Typically, nurses and doctors will have to flick between several computer systems (laboratory, radiology, patient letters, departmental databases, PAS, PACS, and so on) as well as leaf through paper notes to get a complete picture of a patient's history, status and future care plans. Because there are so many usernames and passwords to remember, security is often compromised by shared logons and passwords written on sticky notes - or even notice boards!

How can we fix it?

One way to simplify this is to implement some kind of EPR 'portal' that aggregates key information from multiple systems into a single patient-centric view. This often leads to a strategy where the portal is the recommended first source for general clinicians, while particular specialties will use the specialized capabilities of their departmental systems. However, not all systems are capable of providing the HL7 interfaces normally needed to feed an EPR portal. Also some 'niche' systems have rich functionality that is needed by general clinicians not just one department (PACS, for example).

An alternative method is to use single sign-on and patient context management. Single sign-on means that the user only has to enter one username and password (usually the main network logon); the user authentication software stores their credentials for other applications and passes them through as the systems are invoked. Patient context management is also known as 'single patient selection'. This means that whatever patient is selected in one application will automatically also be selected in all the other applications with the patient context environment. This can be programmed to follow very specific rules – for example, if I open a radiology report then PACS could 'tune' to the relevant set of diagnostic images. Or patient context can just work at a high level, so that each application only goes as far as selecting the given patient but does not go into any specific screen after that.

Business case

Portsmouth Hospitals NHS Trust adopted a programme to implement both a portal and single sign-on with patient context management. The EPR portal aggregated data from PAS, pathology, radiology and patient letters. The business case for the investment in single sign-on and patient context management was based on efficiency improvements. The Trust recognized that there was huge demand from clinicians to use electronic systems to support and improve patient care and operational efficiency, but computer systems were slow and cumbersome to access. We argued that the Trust was at risk due to clinicians sharing passwords to applications and systems, with the consequence that there could be no reliable audit of data and system usage while that practice continued. We believed that attempting to enforce network security without single sign-on would cause massive disruption, clinician resistance, time wastage and consequent reduction in activity and risks to patient safety.

Although we did not anticipate any cash-releasing savings, we estimated that the saving in clinician time amounted to about £250,000 a year.

Procurement

The Trust ran a competitive procurement exercise, using a framework contract provided by the UK Office of Government Commerce to simplify the process and obviate the need for a full OJEU exercise. Although there were numerous products offering single sign-on, there were very few vendors offering patient context management, so we needed to find suppliers in the framework contract who could partner with the patient context management vendors. The Trust was looking for a vendor with a convincing track record in healthcare, robust technology, experience of our main clinical applications and a credible, proven deployment approach.

At the time there was very little deployment of patient context management in the NHS, so the Trust made a site visit to a major hospital in Kentucky, USA, and made phone and email contact with several other vendor reference sites in the US. We also worked closely with another NHS Trust that had recently procured a patient context management solution. The contract was eventually awarded to Sentillion to provide their Vergence product suite for identity and context management. This was in large part due to their singular focus on healthcare systems and their expertise with a broad range of hospital software and operational issues. Sentillion was acquired in 2010 by Microsoft, who perceived an important complementary alignment with other Microsoft products such as Amalga and HealthVault. Microsoft now has contracts with seventeen NHS Trusts for various identity and access management products.

Deployment

Initial deployment was in the Critical Care unit, where clinicians were used to a high degree of IT system dependence and enjoyed very high levels of operational support. The main applications in the patient context environment were the departmental clinical information system (CIS), the EPR portal and a laboratory test-requesting system. The installation in this unit was rather bespoke to address particular configuration issues and this did not lend itself to a wider standard rollout. Nonetheless, clinicians were generally very positive about the new capability and quickly wanted it fixed when problems occurred. One troublesome workaround was that user network profiles were not downloaded to speed logon times, but this led to drive mappings, email and printer settings not being available without complex scripting. A major lesson learned from the initial deployment was the need to reduce user profile sizes as a precondition of deploying single sign-on, so a sub-project was set up to address this issue.

As user profiles were brought under control, general deployment proceeded across the Trust. Four applications were in the standard patient context package: PACS, the EPR portal, the laboratory test-requesting system and a document management system. The main deployment issue was the instability of some of the applications we wanted to implement in the patient context environment. When application upgrades were installed, navigational behaviour would sometimes change and thus not respond as expected to the programmed events and triggers in the patient context environment. The Trust's change control mechanism did not immediately realize that application upgrades would now impact on a wider community of users. Whereas system vendors previously operated relatively independently when introducing software changes, impact assessment would now be needed to see what if any effect there would be on patient context management.

Training to use single sign-on with patient context management was minimal. Generally speaking, the reaction was 'Why hasn't it always worked like this?' The one downside to single sign-on was if a clinician had to use a PC that did not have single sign-on configured and they had forgotten their various system passwords due to not needing them for so long.

An additional form of deployment is the provision of dedicated clinical workstations in ward areas that do not operate as general purpose PCs. For these workstations, there is a rapid network logon that completely by-passes user profiles and only provides access to applications within the patient context environment. (However, the workstation does allow a secondary logon to terminal services that then gives access to email and other personal applications if necessary.) The advantage of these workstations is fast user switching – there is not the usual delay of logging off and on.

The Trust now has approximately 1400 regular users of the single sign-on and patient context management system.

Clinician reaction

Many clinicians have offered enthusiastic support for the project:

'It will significantly improve my life!!'

'It is a very useful tool. It saves time for each patient seen. I use it in all my clinics. In fact I use it almost every day. I would definitely recommend to other colleagues.'

'I have been using it in my clinics and I have been impressed (high praise from me). I demonstrated it at our department meeting last week and was asked how others could get it?'

'I was surprised how smoothly the system worked and it shows that you've done a grand job at ironing out most of the bugs and glitches that can so easily overshadow and distract from the benefits of a genuine advance... I feel much more confident about recommending it to my colleagues.'