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Ireland's National PACS Project

Ireland's National Integrated Medical Imaging System (NIMIS) project will make radiology in the nation's public hospitals filmless and paperless by introducing PACS/RIS with Voice Recognition (VR) and electronic Order Communications (OCM) to all public hospitals, and enable electronic image sharing between them. Some Irish public hospitals have already implemented PACS/RIS. Those with end-of-life PACS/RIS will have their systems replaced; otherwise, legacy systems will be left in place and integrated with NIMIS. This is the first large central procurement of a clinical system in Ireland and we hope this will provide a basis for future public procurements in Irish healthcare IT.

Healthcare in Ireland

The Health Service Executive (HSE) came into operation in 2005 and replaced 11 regional health boards, which left a legacy of a large number of relatively small hospitals with poor integration of information management structures. Fifty public hospitals of Ireland perform radiologic imaging ranging from large academic hospitals to small district hospitals.

The HSE is driving a radical transformation of medical care. This includes rationalising the delivery of hospital care. Radiology departments, which had previously been working in isolation, are being amalgamated into regional teams, involving radical changes in work process. There are private hospitals in Ireland that operate outside of the HSE. Patients frequently access both public and private services. Irish patients may also access health services from Northern Ireland. NIMIS will require the ability to integrate with private hospitals.

Current Status: PACS/RIS & Healthcare IT

The first PACS installation in Ireland was in 1998. Since then, a further 15 hospitals have introduced PACS. About 3.5 million radiology exams are performed in Ireland per annum and 1.4 million of these are currently performed in hospitals with PACS. There is a wide variety of RIS from multiple vendors. A few hospitals have OCM but most, including many of the hospitals with PACS installations use paper ordering. All hospitals have their own Patient Administration Systems (PAS) from a wide variety of vendors.

Family doctors or general practitioners (GPs) use a messaging system known as Healthlink to receive reports. Healthlink will be used by NIMIS to send reports from hospitals to GPs and will eventually allow GPs to order radiology investigations from hospitals.

Electronic transfer of image data occurs in a limited form via stand-alone teleradiology systems, mainly facilitating review of neurosurgical cases. The majority of image transfer is done manually with transport of films or CDs. Radiology reports are, with few exceptions, provided by the site that produced the images and there is currently no significant off-site reporting. There is an increasing demand for subspecialty off-site reporting from the clinical and radiological community and for off-site cover on-call.

There is no unique health identifier in Ireland. NIMIS will need a central 'Source-of-Truth' for patient identification across multiple sites. This would permit Patient Identity Crossmatch (PIX) and Patient Demographic Query (PDQ). A system with this functionality is currently being used to reconcile outpatient pharmacy and medical card payments but is not integrated with hospital PACS. The NIMIS tender suggested the use of this system as the central PIX/PDQ server, although vendors were allowed to submit alternative proposals.

Procurement Process

Based on analysis of other national and regional models, it was decided to do the procurement as a single entity, rather than have several small 'best-of-breed' procurements for subsets of the system. After approval of the initial business case, a central project team was established within the HSE to perform the procurement and act as the nucleus of the rollout team after the procurement had finished. The team consisted of representatives of all relevant stakeholders and had input from the Irish government's department of finance.

There is a local project team in each hospital that carries out accurate surveys assessing the current status of local workflow, and relevant infrastructure. This team also initiated a process of consultation with future users of the system, which was fed back into the tender specification. This form of central procurement for a clinical system had never been performed before. Integration of the local and central team is of crucial importance in gaining the trust of the ultimate end-users. The project will be funded centrally from the capital budget of the HSE. The budget will include not only funding for the vendor but also funding to augment HSE infrastructure where needed, to facilitate the project. There was a two-step procurement process.

Step One: A Pre-Qualification Questionnaire (PQQ) set minimum selection criteria for inclusion in the next phase, including financial capacity and standing, sufficient support teams to facilitate installation of the system in the timeframes set, and evidence of previous experience at multiple large-scale PACS/RIS installations.

Step Two: Full detailed technical and functional system specification was distributed to successful vendors from phase one, along with a draft contract and other required details. No specific design was mandated. The project team envisioned a number of scenarios where image sharing would be used and these were included in the tender documentation along with various timing goals. Vendors were to design a system to account for each scenario within the specified timeframes, based on the current status of the HSE networks.

There was review and initial scoring of technical and functional specification responses. Then, detailed system demonstrations and tender clarification meetings took place. These involved the project team and a wide variety of clinical users and IT personnel. The decision was based on scoring the initial tender documentation and verified by the system demonstrations and site visits. McKesson Imaging Group was identified as the preferred vendor and the contract was signed on 23 February 2010.

Proposed Design of NIMIS

The overall design of NIMIS is quite simple. There will be one PACS/RIS shared by all hospitals. It will be based in a central data centre with full disaster recovery where all images will be archived and stored. Individual hospitals will have a local store of two years of images and a backup system that can provide PACS/RIS and VR in the event of network failure. Hospitals with existing PACS/RIS will send copies of images and RIS messages to the national PACS/RIS. The archive will have an XDS archive and registry to allow for future integration of a full electronic health record and to allow for potential sharing of information with healthcare IT systems in Ireland and potentially in other jurisdictions such as in Northern Ireland.

McKesson are the prime contractors, and will provide their own Horizon PACS/RIS solution. Hospitals with preexisting OCM will have that interfaced with NIMIS. A number of hospitals are implementing OCM projects concurrently with NIMIS and these will also be integrated. McKesson, as prime contractor, will integrate a number of third party solutions, which will be available to all users of the system. These will include Nuance RadWhere for voice dictation, TeraRecon for advanced 3D image manipulation, Segami Oasis for molecular imaging, and Magview for mammography reporting.

The national image archive will create opportunities for medical research and education. NIMIS will include McKesson's Horizon Study Share, which counts amongst other features, the ability to enable the creation of a national teaching archive. There will also be integration with McKesson Research Share to provide a central server for research projects and facilitate multi-site projects.

NIMIS Rollout and Challenges

The rollout schedule is 30 months. It is aimed to have the first hospitals going live by Q4 2010/Q1 2011. The process will clearly involve having multiple hospitals interacting with the vendor and the HSE central design team at one time with hospitals at different stages of the process at any given time. Delivery within this timeframe faces several key challenges including:

- Integration with multiple existing hospital IT systems;
- Developing a system of clear communication between McKesson, the HSE central project team and the project teams in the individual hospitals;
- Mapping existing workflow across multiple hospitals and integrating and adapting this with NIMIS;
- Integration with the central PIX/PDQ process will involve considerable effort for local hospitals in changing their workflow for more accurate patient registration, and
- Maintenance of data security and patient confidentiality. This will be a key element in both system design and in working through the new workflows for the system.

Conclusions

Thus far, NIMIS is regarded as a success within Irish medicine. The central procurement process has clearly delivered a high-specification system. It is acknowledged that this would not have been possible based on the previous models of individual hospital procurement. However, the final success or failure of the system will now hinge on both the HSE's and the vendors' ability to roll out the system within the specified timeframe.

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