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Documentation Computerisation

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The Mater Misericordiae University Hospital is a charitable voluntary hospital which has been delivering healthcare

services to the residents of Dublin and Ireland for almost 150 years. As well as a full range of tertiary services for its

local catchment area, the hospital is a national centre of excellence for cardiothoracic surgery and spinal injuries, and

a teaching hospital affiliated with University College Dublin and the Royal College of Surgeons in Ireland.

With 570 beds and almost 3000 employees, the management of information across clinical, administrative and clerical areas can be a challenge. Although the hospital has been an early adopter in the use of technology to manage information

– a hospital wide Patient Administration System (PAS) including Computerised Physician Order Entry (CPOE) in all inpatient and outpatient departments began in 1984 – a huge amount of information remains on paper. While reduction of the paper load is the ultimate target, it is recognised that it may take some time. In the meantime, retention, storage and retrieval of paper-based information...

Þ .... creates risk not only to the Hospital in administrative and financial terms, but also in a clinical sense with the potential unavailability or illegibility of clinical information.

Þ .... comprises a 'low hanging fruit' opportunity for business process improvement in many areas of the hospital.

In that context, the Mater Hospital decided to implement a pilot project to scan paper documentation in the Emergency Department (ED) to determine:

Þ Whether the technology available in the form of hardware and software can support the ultimate aspirations of risk mitigation and process improvement.

Þ Whether the process change involved in an implementation is acceptable within the culture ambient within the hospital.

The ED was chosen to spearhead the project for a number of reasons, primarily:

Þ From previous and ongoing projects, there existed a strong working relationship between the ED clinical and administrative staff, and the Information Management Services (IT) department.

Þ The pressure on space and staff conditions meant that success in either of the primary objectives would have an immediate beneficial effect on the department.

A solution based on mid-range scanners, proprietary scanning and quality control software, and a bespoke development to integrate with the PAS was selected for the scanning operations, configured in such a way that quality control is always a primary concern. While visual checks are performed at 3 distinct points in the process, this is done in an unobtrusive way as part of an organic process through the system. As scanned documentation is treated as secondary evidence in court of law, it is seen as crucial that every possible mechanism is employed to ensure the veracity and authority of the soft-copy.

A double-blind ID verification is employed with an interface to the PAS.

Automatic barcode recognition is employed in the scanning software to detect both patient ID and episode ID. The PAS interface is queried to ensure that that episode ID does in fact belong to that patient ID. This rules out identification error due to accidental mis-positioning of the barcode and is virtually foolproof. The same interface to PAS also records, on PAS, the fact that documentation for that episode is in the scanning process and may be available online. Having gone through independent quality control, the scanned documentation is uploaded to the main PAS and made available to any suitable privileged location in the hospital within 10-15 seconds. The data is stored on a highly available storage area network (SAN), with independent copies kept in two different physical locations. A digest is made of the data as it is stored so that it can be demonstrated at a later stage that the document has not been altered since it was scanned.

When the system introduced into the administrative area of ED, no additional staff were deployed full-time. This resulted in a transition period or 4-8 weeks when emergency relief was 'parachuted in' on occasion as existing staff were becoming familiar with procedures, to a point where quiet moments in the department could be effectively used to catch up with the scanning workload. Those staff, however, quickly came up to speed and barring bursts of unforeseen pressure, can keep the scanning process up to date within 1 to 2 days.

The department has reaped the benefits, however, as local storage space is substantially reduced – creating more space to work in, and clinical staff do not need to occupy the administrative areas searching for past documentation – the administration area is a quieter and calmer place. The clinical staff are able to save time and effort having documentation easily to hand on the PAS.

Other departments in the hospital, such as Patient Services, Accounts and Community Services as well as clinical wards, are able to access records immediately and non-exclusively. The documentation itself is secure from damage or loss, so we feel that goals as set out have been met, and plans are in development to extend the concept into other clinical areas of the hospital.

But lessons have been learned. Despite a wide and intensive consultation process to document where, when, and how the paper documentation was used in the old system, a handful of boundary use-cases were discovered only when the paper system was no longer available. That should not come as a surprise given the complex nature of healthcare generally, and in particular around the ED process. The most significant boundary case was the discovery that documentation could, in some circumstances, be returned from community liaison units with additional annotation after scanning, requiring re-scanning. The flexibility of the software and the scanning process made it trivial to introduce a new document ‘class’ which indicates clearly to end-users that the rescanned document supersedes a previous version, although the previous version remains accessible.

Also, in the course of the lifetime of documentation, individual pages can become detached, and discovered only after the main body of documents have been scanned. Again, the flexibility of the scanning process offered an easy solution to re-insert the page into the body subsequent to scanning, with an audited explanation of the offending circumstances.

While these situations are to some extent inevitable, the recognition that boundary cases will occur and building adequate flexibility in contingency has proved successful in this instance.

Hospital staff of all dispositions have risen to the challenge. The fact that painful changes in the early days, before benefits from process improvement were seen, did not sink the boat, serves as testament to the commitment of the staff involved. It is a large part of the success of this project, but also means, that in hindsight, this was never a truly 'pilot' project because the prospect of returning to a manual, paperonly work practice is unthinkable.

In terms of future applications, we are happy that efforts were made in the early stages of development to ensure the system would have the ability to scale to a hospital-wide system. We have estimated that up to 50 scanning locations around the hospital would be required to maximise benefit. But each of these can attach directly to the existing infrastructure with no significant re-engineering.

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