



Case Study: Karolinska Institute



Customer Overview:

Stockholm's Karolinska Institute is part of Sweden's largest medical training and research center and is one of Europe's leading medical universities. Karolinska University accounts for 40% of academic medical research in Sweden and awards the Nobel Prize in Physiology or Medicine.

Challenges

Over the years, Karolinska Institute has treated a huge number of patients at various sites across the region. The volume of associated medical records is vast. Over time, the average size of patient files has increased to meet legislative requirements for better research documentation. For example, the average birth file contained only 8 to 10 pages in 1963, increasing to 47 pages in 2004. Complex medical records can now run to more than 100 pages.

By the 1980s, the Institute's archived, paper-based patient records filled a massive 15km of shelf storage space in a number of different locations. It was expensive to store the files and difficult to access them.

"There was no standard procedure for retrieving patient records from the different filing systems, and this approach to archiving was costly, time consuming, and inefficient," says Luciano Dani, Head of IT-Archiving at Karolinska Institute. "In addition, the system lacked security and documents were easily mislaid."

The Institute commissioned an audit of the patient record handling processes. "The Boston Consulting Group found that not only were administrative staff spending huge amounts of time in retrieving patient files, medical staff were also involved. For example, in the Internal Medicine department, a massive 12% of nurses' time was taken up in obtaining the right medical records," continues Luciano Dani.

In 1986, to save time and space, the hospital started scanning the old inactive paper medical records onto microfilm, for long-term storage and manual retrieval by an archival staff of 35. By 1996, to speed up the scanning process, the hospital had increased the number of people in the scanning team from 4 to 15, and acquired two Kodak high-volume scanners.

Solution

The Institute then decided to introduce an electronic solution. And by 1998, the IT-Archiving team had fully implemented Global 360's hybrid File360 electronic archiving system.

Since then, all newly received paper documents have been scanned into the File360 system to create an Electronic Medical Record, as well as a microfilm archive. At the same time, the old paper files are also gradually being scanned into the electronic record. Whenever a file is requested from the paper archives, these are scanned in, along with a proportion of the remaining paper files.

By 2004, the original 15km of archived paper records had successfully been reduced to only 6km, with 30% of all patient records now stored in the File360 Electronic Medical Record system.

However, 2004 brought a new challenge. To improve patient care and increase efficiency, Karolinska Institute merged with Stockholm's Huddinge Hospital, creating an even larger organization employing approximately 17,000 people. This posed the problem of how to integrate the diverse systems used by the two hospitals across 45 or so different clinics.

Challenges

Following a merger with another hospital, the Karolinska Institute needed a solution to help it integrate legacy systems and to provide enterprise-wide, web-browser access to patient records.

Solution

The Karolinska Institute deployed File360 to create a combined archiving and data exchange solution for delivering structured information. It has also allowed for the integration of legacy data and has become a significant part of the hospital's central patient administration system.

Results

The Global 360 system has provided for easy migration from legacy systems to a unified central patient administration system; allowing secure and fast electronic access to patient records to some 15,000 authorized staff, to help them in providing quality medical care.



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“As our objectives have changed over the years, from saving archiving space and time to helping health personnel carry out their work, we have been made full use of the Global 360 File360 system to meet these changing objectives.”

Luciano Dani, Head of IT-Archiving, Karolinska Institute, Sweden

Take Care system can request a patient's documents on screen. Take Care then fires a request against the File360 database, asking for all documents with that patient's Personal Identification Number. File360 returns a list of all the documents stored for that patient, regardless of where they originated. And the user can open any document from the list.

The solution has been designed so that the user interface is the same, whether the records are stored in File360 or in Take Care.

The Institute is satisfied that File360 is providing a very viable integration solution. “With Global 360's File360, integration is very easy and very flexible,” comments Luciano Dani.

File360 allows the import, export, and management of many file formats, including xml, tif, jpeg, Ascii, and printer output. It allows digital data to be stored in various ways, including DVD/CD and Computer Output to Laser Disc (COLD), as well as long-term storage on microfilm. And it is easily customized using Application Programming Interfaces (APIs).

The Institute has also implemented further File360 functionality. Firstly, to streamline the scanning and indexing process, scanned paper documents are now automatically indexed using Optical Character Recognition and Intelligent Character Recognition, in place of manual indexing.

Secondly, single documents within each paper patient file are automatically separated in the scanning process. So users can identify individual documents in a patient file, instead of having to search through the entire file, which can be more than 100 pages long.

Working with system users to identify their requirements, the newly-merged IT-Archiving team identified their Global 360 File360 system as providing the easiest and most flexible solution. The team decided to use File360 to enable them to extend Huddinge Hospital's central patient administration system, Take Care, right across the new hospital organization, by the end of 2005.

Patient data is imported into the File360 system from Karolinska Institute's legacy systems in XML format, ready for instant retrieval. Members of staff using the

And thirdly, following requests by medical staff, new Kodak color scanners have been installed, allowing documents, including X-Rays, to be scanned and stored in color.

Meanwhile, users revealed a major new requirement for the system. They were looking to enable 15,000 of the total 17,000 hospital employees to securely access the 60 million or more documents stored in File360, from wherever they happen to be in the hospital.

Karolinska Institute chose the File360 Internet Retrieval (IR) module to provide the advanced web-based solution it needed. As a result, the Institute became the first to take full advantage of the latest web features offered by File360.

The File360 Internet Retrieval module enables authorized staff to access File360 information via a single browser interface, over the Institute intranet, using thin client machines. And access can easily be extended to authorized staff in other hospitals, and possibly eventually the patients themselves.

“The web browser interface is the greatest File360 feature we've implemented so far,” says Luciano Dani. “It's easy to deploy, easy to maintain and support, and provides good security.”

Results

Global 360's File360 system has evolved significantly since it was first implemented by Karolinska Institute. Originally, it was designed to save space and time by providing a stand-alone “add-on” hybrid archiving system for paper and microfilm documents, offering unstructured information and accessible by archiving staff.

File360 now provides Karolinska Institute with a combined archiving and data exchange solution, delivering structured information. It has allowed the integration of legacy data and has now become a significant part of the hospital's central patient administration system, enabling authorized users to obtain the patient information they need, on screen, regardless of how and where it was originally stored.

Not only can the File360 solution be applied to patient records, it can be applied to other types of information, such as invoicing. This means that other systems in the Institute can be integrated in a similar way, using File360, to create a single set of systems across the organization. It is estimated that this will save up to 28 million Swedish Crowns (US\$4.1m).

Karolinska Institute's IT-Archiving team is very positive about the way that Global 360's File360 solution has evolved to provide medical staff with fast access to the right patient documents. “As our objectives have changed over the years, from saving archiving space and time to helping health personnel carry out their work, we have made full use of the Global 360 File360 system to meet these changing objectives,” concludes Luciano Dani.

