

# Integrated Medical Data Distribution

Integrated IT Solutions



# Hong Kong Hospital Authority implements central medical data repository with GE Centricity solution for easy access across public hospitals

**Hong Kong Hospital Authority (HKHA)** is a firm believer in utilizing IT to improve the effectiveness of healthcare practices in the territory's hospitals and among its medical professionals. Previously, Hong Kong hospitals implemented electronic patient records (ePR) to improve healthcare practices, and later added Radiology Information Systems (RIS) and Picture Archiving and Communication Systems (PACS).



As a result, the hospitals grew more efficient in their healthcare practices. But with it came additional challenges. For example, patients typically visit different hospitals for various ailments, resulting in extra work and duplication of patient data across hospitals. HKHA realized that having a central system to integrate, store, and share patient medical records would provide faster, more efficient and effective healthcare services.

*"At the click of a mouse, doctors in the Hospital Authority have the entire clinical history of a patient available to them. This enables doctors to make better decisions and provide more timely and effective treatment."*

– Dr. NT Cheung  
Chairman  
Clinical Informatics Program  
Steering Group

## Challenge

- *Localized patient data not effectively serving a mobile population.* Hong Kong's public hospitals were not effectively sharing medical data and images with data being replicated when patients visit different hospitals.
- *Duplicated data capture not efficient.* Multiple data captures of the same patients cause inefficient use of hospital resources, wastage of electronic storage space and lowers the integrity of the patients' medical records thus raising patient safety concerns.

## Solution

- *Central Image Distribution Data Center.* Develop a central data center repository, and integrate in planned phases, the public hospitals' PACS image data and patient records to the repository.
- *GE Healthcare solution.* Implement GE Centricity Enterprise Archiving and Enterprise Web Solution to effectively handle image management of the system and link into HKHA's legacy ePR software backbone.

## Assessing the Situation

HKHA manages the territory's healthcare system and is responsible to ensure that every patient is adequately provided with effective and quality healthcare. Integrating IT in healthcare is important in streamlining work practices, freeing clinicians from time-consuming paperwork and mundane tasks so that they can spend more time in diagnosing and caring for their patients.

Since 1999, the territory's hospitals have been using a proprietary clinical management system (CMS) with electronic patient records (ePR) to track a patient's medical history.

"Modern healthcare is an incredibly complicated multi-disciplinary activity and in fact is probably the most information-intensive industry in the world today," says Dr. NT Cheung, chairman of the Clinical Informatics Program Steering Group. "At HKHA, we see CMS and ePR as the being absolutely essential to providing safe, high quality care to the population of Hong Kong."

Over the next few years, the hospitals implemented Picture Archiving and Communication Systems (PACS) to manage radiological information like digital scans and filmless X-rays. However, these were implemented in individual hospitals and patients' scans were not shared among them. If a patient visited another hospital, another scan was taken. This inefficient use of hospital resources increased workloads and slowed patient diagnosis.

The solution lay in integrating the PACS systems with the ePR system across all of HKHA's hospitals and making the data available at a central repository at HKHA. Electronic patient records and scans would then be accessible by doctors at any hospital.



*"Doctors now have immediate electronic access to the images and radiological reports even if they are in different locations."*

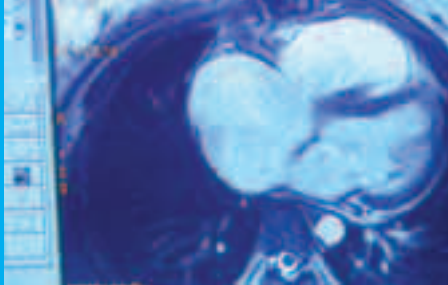
– Dr. Lilian Leong  
Chairman  
Radiology IT Steering Group

## Spotlight: Hong Kong Hospital Authority

- Established in 1990, Hong Kong Hospital Authority (HKHA) is a government organization responsible for managing all 43 public hospitals and clinics in Hong Kong.
- HKHA also provides specialist outpatient care and general patient services, managing 29,000 beds and over 50,000 staff.
- Annually, HKHA's hospitals manage more than one million inpatient episodes, over eight million specialist outpatient visits, two million emergency visits and five million general outpatient attendances.

## Key Technologies

- GE Centricity Enterprise Archiving and Enterprise Web Solution integrate the hospitals' legacy systems with the image data collected from the hospitals into the central repository.



## Integral Answers

- GE Healthcare's team worked closely with HKHA's IT team and hospital staff to design an easy-to-use system that accommodated their needs and real-world work processes.
- Choosing GE Centricity Enterprise Archiving and Enterprise Web Solution gave HKHA the flexibility and open architecture for quick development and deployment.
- Treating millions of patients a year meant the amount of data would grow exponentially; selecting the GE Centricity solution allows HKHA to meet its current needs with the scalability to expand to meet future growth.

### Delivering the Solution

Teams from GE Healthcare and HKHA worked closely to integrate the images into the existing ePR system, consulting with HKHA doctors and clinicians for feedback on their on-the-job experience and real-life needs for the system.

The team began integrating the PACS systems of four hospitals, archiving the image data to the newly built Image Distribution Data Center, holding 10 TB of storage for over one million patient examinations. Later, more hospitals were integrated into the system. Currently, nine major public hospitals (10 by the end of the year) are connected and sharing over 30 TB of centralized storage for over two million patient examinations.

GE provided the Centricity Enterprise Archiving and Enterprise Web Solution for effective digital image management with simple tier-storage architecture. The team also developed the interfaces that seamlessly integrated the new Centralized Imaging Distribution System with HKHA's legacy ePR software backbone.

At the hospitals, radiological images are captured and converted into digital files based on DICOM (Digital Imaging and Communications in Medicine) standards. These are compressed and transmitted to the HKHA central image repository and integrated with the patients' ePR records that are stored on multi-terabyte network attached storage systems. An icon on the patient's ePR shows that medical images are available on the patient and can be easily referenced at the click of a mouse.

To deliver images and patient data speedily to the hospitals, HKHA deployed high performance multiple processor-based servers at its data center, linked to high-speed leased data lines connecting to the hospitals. Bandwidth varies from 4 Mbps to 1000 Mbps, and the hospitals' LAN backbones range from 100 MB to one gigabit.

A survey of over 300 users of the system revealed that over 70 percent found the system easy to use, and needed little training. Significantly, 80 percent believed it helps in patient management.

## Return on Investment

- Dr. Lillian Leong estimates that “a single hospital can typically save up to 2.5 million Hong Kong dollars a year, in film processing cost.”
- Duplication of electronic patient data has been eliminated among the hospitals that have been integrated into the HKHA central data repository.
- Scalability and flexibility of the GE Centricity Enterprise Archiving and Enterprise Web Solution ensures that future expansion can be integrated easily into the existing platform, thus maximizing the investment value of its implementation.



*“Filmless radiology reduces the waiting time for diagnosis, and allows me to have faster access to my patients’ records and images. The benefit is that it lets me spend more time with my patients.”*

– Dr. CC Yau  
Consultant in Oncology,  
Chief of Service  
Princess Margaret Hospital

“The system is an excellent example of how IT can greatly improve collaboration of patient care,” says Dr. Lillian Leong, chairman of the Radiology IT Steering Group.

The success of the initial phases of the integration project has led HKHA to expand the system to cover all 43 public hospitals under its care. To provide safe high quality care to all its citizens, HKHA has future plans to extend the central image depository system to the private medical sector, such as clinics, to access through the Internet.

### **GE Healthcare Technologies—Transforming Healthcare Delivery**

The Centricity® portfolio builds on GE’s rich clinical heritage and history of innovation, and also leverages numerous best practices to ensure that the care enterprise is on a path of continuous advancement. So whether it is during an afternoon visit to a clinic or a midnight trip to Emergency, care providers can make smarter decisions for every patient.

For more than 100 years, scientists and industry leaders have relied on General Electric for technology, services and productivity solutions. So no matter what challenges your healthcare system faces, you can always count on GE to help deliver the highest quality services and support. For details, please contact your GE Healthcare representative today.

© 2008 General Electric Company - All rights reserved.  
GE and GE Monogram are trademarks of General Electric Company.

GE Medical Systems, a General Electric company,  
going to market as GE Healthcare.

## GE Healthcare—Integrated Information Technology Solutions

To learn more about what Centricity® can do for you,  
Visit us at [www.gehealthcare.com](http://www.gehealthcare.com) or write to us at  
[updates@gehealthcare-asia.com](mailto:updates@gehealthcare-asia.com)

### Japan Main office

Tel: +(81-42) 5853633  
Fax: +(81-42) 5826858

### Korea Main office

Tel: +(82-2) 30166114  
Fax: +(82-2)-5636974

### China Main office

Tel: +(8621) 5257 4650  
Fax: +(8621) 5208 2008

### Oceania Main office

Tel: +(61-2) 98464000  
Fax: +(61-2) 98464001

### Taiwan Main office

Tel: +(886)-2-2516-5280  
Fax: +(886)-2-2516-5290

### South Asia office

Tel: +(91-80) 28452923  
Fax: +(91-80) 28452924

### Hong Kong office

Tel: +(852) 21006300  
Fax: +(852) 21006292

### SE Asia office

Tel: +(65) 96534766  
Fax: +(65) 62777688



imagination at work