SUCCESS STORY

" With the HDS solution, we built the Healthcare Information Exchange Platform in less than 6 months. The HDS PACS-optimized storage solution and professional services guaranteed high performance and high reliability of the underlying data infrastructure platform of this project. "

Wan Zhen
Director of IT Center
Tianjin Haihe Hospital

Hitachi Data Systems Helps Tianjin Haihe Hospital to Build an Integrated Hospital Information Platform

As the designated hospital for public health emergency in Tianjin, China, Tianjin Haihe Hospital's strategic mission is to handle health emergency situations. Its IT system must not only support daily routine works, but also be able to accommodate explosive growth in case of the emergency. Therefore, Tianjin Haihe Hospital launched an IT system upgrade and reconstruction project and selected Hitachi Data Systems to lead the effort with its file and content solutions.

Tianjin Haihe Hospital ("Haihe Hospital"), directly under the Tianjin Bureau of Public Health, is a large-scale integrated grade-3 hospital specializing in the treatment of the respiratory system disease. The modern hospital combines healthcare, teaching and scientific research, and is the designated hospital for public health emergencies in Tianjin. Haihe Hospital is a critical member of Tianjin public health defense system and is currently home to Haihe Clinical College of Tianjin Medical University and Tianjin Respiratory Disease Research Institute.

The Challenge: Readiness for Health Emergencies and Growth

Currently, core operations of Tianjin Haihe Hospital run on distributed system silos built around some applications in a traditional model. Resources cannot be shared, and it is difficult utilize them across the hospital. With the growth of the hospital, this model could not meet the daily demand, and could not address the pressure brought by the potential performance burst required by a health emergency. Therefore, hospital IT decided it was imperative to implement hospital-wide data consolidation, systems upgrade and IT system reconstruction.

Tianjin Haihe Hospital

INDUSTRY
Healthcare

SOLUTION
File and Content

HARDWARE
Hitachi NAS Platform 3080 (cluster)
Hitachi Unified Storage 130 and 110

SERVICES
Provided by Hitachi Data Systems Global Services

Benefits at a Glance
- High performance.
- High efficiency.
- High reliability.

IT systems of Tianjin Haihe Hospital are distributed in different departments, and the data is distributed among different device silos. In the proposed project, the existing IT infrastructure of the hospital would be re-architected to meet the hospital's business demands.

A major hurdle would be completing this complex project with only 7 hospital IT staff within 6 months.

Project Tasks

In this IT system upgrade and reconstruction project, Tianjin Haihe Hospital was faced with many challenges. Transforming from traditional application silo model to sharing resources in its "Healthcare Information Exchange Platform" model was a challenge (see Figure 1). Therefore, the infrastructure and application platform had to be and redesigned completely. Specifically, the hospital had to address the following items:

- The implementation of the Healthcare Information Exchange Platform requires data sharing and resource optimization at the storage infrastructure layer.
- Each clinical information system (CIS) module on Healthcare Information Exchange Platform has different storage and performance requirements on the underlying storage infrastructure. Thus, the hospital needed to build an infrastructure platform that is capable of supporting different types of data and meeting different performance requirements.
- The picture archiving and communications system (PACS) has the largest data volume among IT systems of the hospital, and it generates massive unstructured files. The hospital needed to optimize the PACS infrastructure platform.
- Considering its important strategic position as the designated emergency hospital, Tianjin Haihe Hospital needed to ensure high availability and reliability of its business. Therefore, it was critical that the hospital build a platform with complete data protection.

Unified Resource Integration Management Platform

PACS   HIS   LIS   Anesthesia   EMR

Healthcare Information Exchange Platform (HIEP)

Infrastructure Platform

PACS = picture archiving and communications system, HIS = hospital information system, LIS = laboratory information system, EMR = electronic medical records
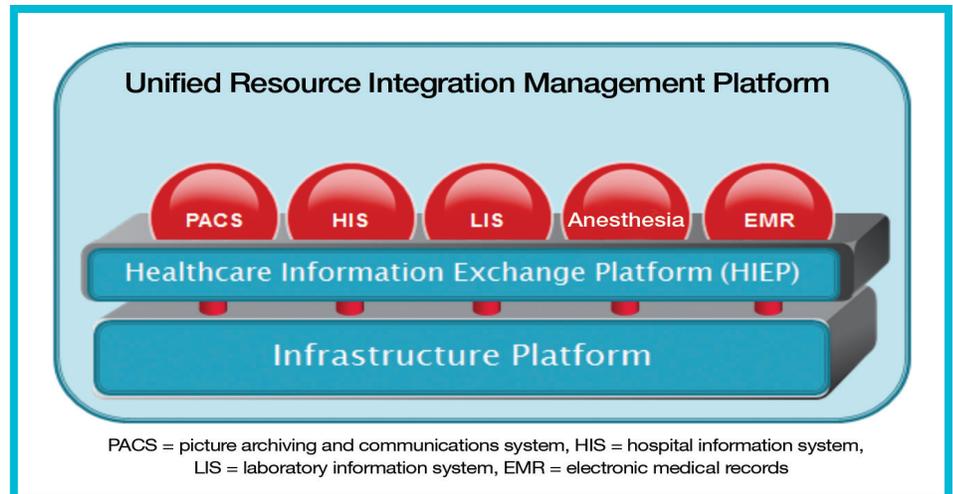
Figure 1. Healthcare Information Exchange Platform

Within the Healthcare Information Exchange Platform, data previously stored in resource silos is decoupled into application-specific data and generic data components. In this way, a truly modular, storage-based, advanced healthcare infrastructure was built. The platform exchanges generic data at the platform level and processes application-specific data in different CIS modules.

HDS Delivers the Solution

In this project, the hospital recognized it would be able to leverage HDS experience within the healthcare industry. HDS would provide a healthcare-optimized storage infrastructure platform solution according to the needs of Tianjin Haihe Hospital. Specifically, HDS tasks would include:

- Build a unified storage infrastructure platform, and provide unified storage space for structured and unstructured data.
- Optimize the PACS of Haihe Hospital, addressing traditional PACS in terms of massive number of files and performance, and simplifying PACS management significantly.
- Provide protection for the business data with a unified storage platform, and address the issue of data protection associated with the traditional PACS.

Based on the fact that different types of data have different performance requirements, HDS provided a NAS and SAN unified platform. A unified storage space was provided through Hitachi Unified Storage 100 series systems. HUS 100 series provides highly available, high-performing, symmetric active-active controller service for structured data (such as a hospital information system or HIS database).

A Hitachi NAS Platform (HNAS) 3080 cluster is used to provide service for PACS (see Figure 2). PACS has 2 distinct characteristics: a large number of files and a large amount of data, which present 2 unique problems for traditional PACS:

- **Performance.** In the case of concurrent access, traditional PACS often experiences random I/O performance bottlenecks of the file system. How to eliminate the bottleneck and improve I/O performance for concurrent access is one of the critical concerns for optimization.
- **File system capacity and file management issues.** Due to the size limitation of the traditional PACS file system, the file directory must be replaced and maintained frequently after the file system is full, and the system cannot manage large numbers of files.

HNAS uses patented FPGA-based concurrent processing technology to provide leading I/O access performance. This approach optimizes PACS performance and solves concurrent access issues of multiple doctor workstations.

HDS met all defined objectives of the IT system reconstruction project in Tianjin Haihe Hospital in less than 6 months.

HNAS can provide large-scale file sharing and simplified management. For example, a single file system can support 256TB and a single directory can support 16 million files, which simplifies the management and maintenance of PACS significantly. In this project, with the HNAS solution, Tianjin Haihe Hospital improves the management efficiency and performance of PACS significantly.

Finally, in this project, HDS implemented incremental backup of the business data across all systems to another HUS 100 series system, providing efficient data protection for structured and unstructured data. If the primary storage platform fails, the backup data can be enabled quickly to provide local recovery service for the hospital. This avoids a lengthy process of "data recovery" associated with traditional backup. In addition, as the data protection is implemented at the optimized storage infrastructure layer, it also solves the problem of traditional PACS data backup.

HDS Transforms IT, Hospital Reaps Benefits

The proven HDS solution and professional services for the healthcare industry have met the needs of and gained recognition from many customers, and the solution for Tianjin Haihe Hospital is no exception. HDS met all defined objectives of the IT system reconstruction project in Tianjin Haihe Hospital in less than 6 months. Benefits include:

- **High efficiency.** The solution provides a stable and reliable infrastructure platform for the Healthcare Information Exchange Platform.
- **High performance.** Built on the new HDS healthcare-optimized storage platform, PACS provides industry-leading performance. The information access speed in PACS is significantly higher than that of the previous-generation PACS, which improves the diagnosis efficiency of the hospital greatly. As a result, Haihe Hospital can meet all its business demands, in its position as the designated hospital for public health emergencies in Tianjin.

- **High reliability.** This platform provides multiple layers of protection for all PACS data according to different archiving and data protection requirements, which solves data protection issue of the previous PACS. All systems are built on redundant architecture. Compared with traditional architecture, the business continuity is improved dramatically, meeting the defined business demands.

HDS solution design is based on customer objectives to ensue reliability and stability of the core business platform. The PACS-optimized solution from HDS ensures high performance and reduced maintenance, and the data protection capability provides complete data protection for core data of the hospital. Specifically, HDS Global Services is highly praised by Tianjin Haihe Hospital.

Professional and efficient Global Services team members ensured that all systems were implemented in an optimized way, and provided suggestions for the optimization of other, related systems.
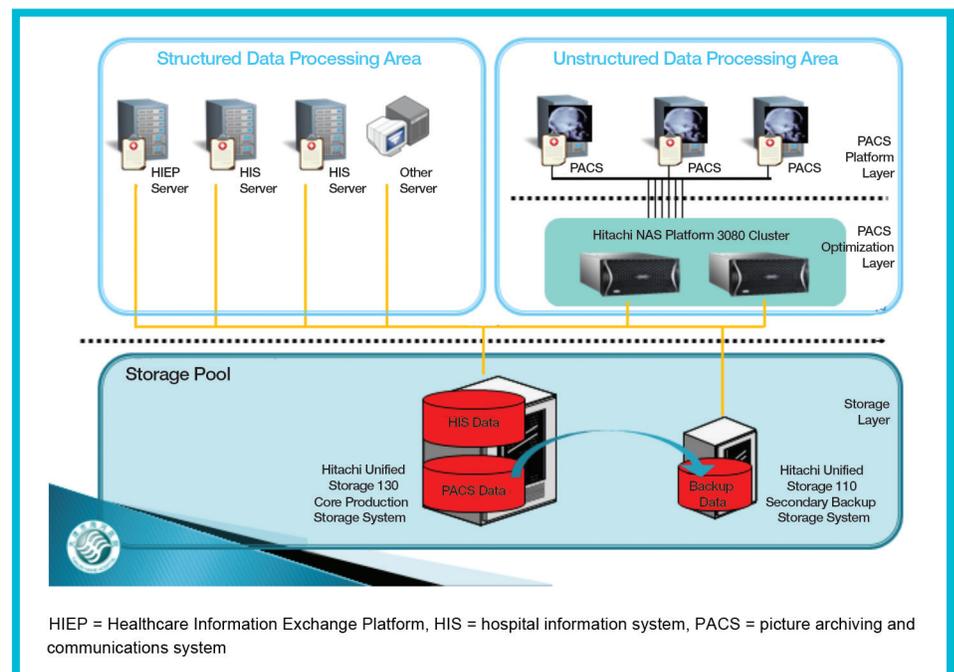

Figure 2. Tianjin Haihe Hospital PACS Platform Architecture

Tianjin Haihe Hospital Innovates With Information

Haihe Hospital selected Hitachi Data Systems to deliver its IT upgrade based on the record of success HDS has achieved within the healthcare industry. When HDS upgraded the hospital's IT environment to handle health emergencies and growth, one of the immediate benefits was increased efficiency of the PACS. Improved PACS performance ensures that medical information is more readily available to doctors. Armed with better and more timely information access, practitioners have improved diagnosis efficiency for patients.

⊚ Hitachi Data Systems

Corporate Headquarters
2845 Lafayette Street
Santa Clara, CA 96050-2639 USA
www.HDS.com   community.HDS.com

Regional Contact Information
Americas: +1 408 970 1000 or info@hds.com
Europe, Middle East and Africa: +44 (0) 1753 618000 or info.emea@hds.com
Asia Pacific: +852 3189 7900 or hds.marketing.apac@hds.com

SS-471-A DG October 2013