FUJITSU

CASE STUDY
Paik Hospital

Improving Job efficiency and reliability
EMR introduction, IT equipment upgrade, server stability demonstration

▲ Inje Univ. Paik Hospital Haeundae

Introduction of Project

Project: Establishment of EMR · PACS · OCS
Applicable Hospitals: Inje Univ. Paik Hospital Sanggye, Pusan, Ilsan & Haeundae
Term: 2008~2010

인제대학교백병원 INJE UNIVERSITY PAIK HOSPITAL

Introduction of Paik Hospital

Inje University Paik Hospital was first opened in 1932 when Dr. Inje Paik, clinical professor of Gyeongseong Medical School (in the former Seoul National University.) took over Uemura Surgical Hospital. The management was started on commission and in 1946 it was established as a public hospital. The hospital has a long and proud history. It now operates across 5 general hospitals including Seoul, Pusan, Sanggye, Ilsan and Haeundae with a total of 3,500 beds. The Inje University Paik Hospital is a leader in medical advancement and increased reliability through actively investment in IT systems. This is both in preparation for the era of medical tourism and u-healthcare service.

Introduction of Paik Hospital

Establishment		1932 Established / 1975 Reestablished and modernized				
Size 3,567 beds	Hospital	Seoul	Pusan	Sanggye	Ilsan	Haeundae
	Open	1932	Jun. 1979	Aug. 1989	Dec. 1999	Mar. 2010
	No. of Bed	402	900	704	557	1,004

<Source : Paik Hospital>

Background to introduction

- The hospital evaluation system directed by the Ministry of Health & Welfare required the introduction of EMR, PACS and OCS
- Data was expanding due to patient increases and will expand further due to the introduction of EMR, PACS and OCS systems
- It was also time the outmoded and obsolete servers were replaced.

Systems introduced

- DB server : Fujitsu PRIMEQUEST
- General servers : Fujitsu PRIMERGY
- Storage : Fujitsu ETERNUS
- EMR : Fujitsu FK-EMR
- PACS : INFINITT Healthcare Marosis Enterprise

Benefits

- Easy to manage charts and the elimination of possibility document damage or loss
- Immediate viewing of medical information, and better facilities for medical education and research
- Reduced waiting times for information following examinations
- Improved hospital image and reliability

▲ Inje Univ. Paik Hospital Seoul

▲ Inje Univ. Paik Hospital Sanggye

▲ Inje Univ. Paik Hospital Pusan

▲ Inje Univ. Paik Hospital Ilsan

THE BENEFITS

The benefits

The implementation of Electronic Medical Records (EMR), Picture Archiving & Communication System(PACS) and Order Communication system (OCS) at Inje University Paik Hospital has made it easier to manage and maintain medical charts and has removed the possibilities of document damage and loss. In addition, medical staff are immediately aware of the results from patient examinations and are able to immediately notify patients and guardians. This has had a satificatory effect in reducing hospital lead-times. As a result Inje University Paik Hospital has increased its image and reliability.

Improvements in chart management and storage.

Hospital processes have changed. Previously it took a day or longer for out-patients or in-patients to obtain examination results. It was fastest if they could see the results in the medical office as soon as they were available; but the past process required a day for the results to be manually delivered to the medical office. However, since the OCS/EMR systems were introduced, results can be viewed instantaneously in the medical room as soon as they are available. In particular in-patients, who previously could see if the results where available, can now see as soon as the image-interpreted data is printed.

With the removal of chart delivery tasks, staff can also work more productively. Productivity is further improved by the digital nature of the chart, which now makes it possible for multiple medical professionals to conveniently view the same chart simultaneously. This also eliminates any previous wait times as well.
In addition, since EMR authenticates records by a public authentication institute, it also improves the hospital' s image and reliability.

EMR also improved job efficiency in the IT department of Inje University Sanggye Paik Hospital. "Fujitsu' s EMR functions were innovative and contained excellent functions that had been developed from an early stage, these we could not find in other vendors' products," emphasized Kim Yongok, Director of the medical information room at the hospital. Inje Univ. Sanggye Paik Hospital determined that the existing servers would probably not support the speed required by the introduction of EMR, OCS and PACS, so the introduction of new servers and storage devices was also determined. The hospital also customized the Fujitsu EMR solution to create FK-EMR, adopted .the Microsoft .MNET development methodology and selected Fujitsu PRIMEQUEST and PRIMERGY server and ETERNUS storage after competitive review of Fujitsu and other vendor products.

Uninterrupted Server Operation

Stability similar to that required by financial institutions was also important to the hospital. Otherwise a server problem might cause major damage loss in the computerized office systems. While a bank may be subject to damages of client' s property, due to system failure, A similar failure in a hospital may put patients lives in danger. Gangnam Severance Hospital introduced Fujitsu PRIMEQUEST servers in 2006, earlier than Inje Univ. Paik Hospital, and has demonstrated uninterrupted server operation ever since. In addition, the previous server used at Inje Univ. Paik Hospital often ran at close to 100% CPU capacity; but with the new server this was only 50%, which maintained a more stable process speed.

There where three major advantageous of using PRIMEQUEST: Firstly, it was structured using dual synchronous system architecture, this provided mainframe class stability. Secondly, it supports open standards. The high performing Intel processors, on which MS Windows and Linux OS can operate, support a vast range of proven ISV/IHV (Independent Software Vendor/Independent Hardware Vendor) products. Finally PRIMEQUEST supports flexible partitioning functions, multi OS operation, with a high density & cable-less design that optimizes the data center, by saving space and reducing electricity bills.

Inje Univ. Sanggye Paik Hospital maximized their entire system use by structuring EMR/OCS, the DB server and the file server using a cost-effective active/active method. In addition, uninterrupted service was secured using interactive monitoring functions that support failover to the backup server in case of failure.

As the EMR/OCS AP server embodies load-balancing using L4 switches it can operate an uninterrupted service even if a server is in trouble. This is due to the duplex system enabling of the L4 switch hardware. Inje Univ. Sanggye Paik Hospital can therefore expand their system flexibly simply by attaching a new server to the L4 switch when the number of users and traffic volumes suddenly increase. Each L4 switch is also in a duplex formation for additional failure protection.

The PRIMEQUEST based integration of the DB server locates the OS partitions required for system booting on the ETERNUS SAN Storage - instead of using an internal disk. This creates a more stable and efficient system environment.

Expansion to Pusan, Ilsan and Haeundae

Univ. Sanggye Paik Hospital first established EMR, OCR and PACS on June, 2008 as well as introducing the Fujitsu PRIMEQUEST, PRIMERGY, ETERNUS and FK-EMR products. This successful system establishment at Sanggye, was followed by Inje Univ. Pusan Paik Hospital and Ilsan Paik Hospital who also established the same system in March, 2009 and December, 2009 respectively. The Inje Univ. Haeundae Paik Hospital due to open in March, 2010 have also chosen Fujitsu to establish the most advanced medical system. In their case it will be a highly advanced ubiquitous hospital in preparation for the emerging era of medical tourism, which will consist of a fully computerized system with no manual work.

Domestic hospitals are subject to the government' s hospital evaluation system (managed by the Minister of Health & Welfare) and to keep pace with this, Inje Univ. Paik Hospital, has readily prepared the system to correspond to the changes in the external environment. One of the important items in the evaluation system is "Informization" and it is expected that introducing EMR, OCR and PACS will contribute as well as enabling new opportunities in medical tourism. How well the IT system is equipped is important but more important still is operational stability.

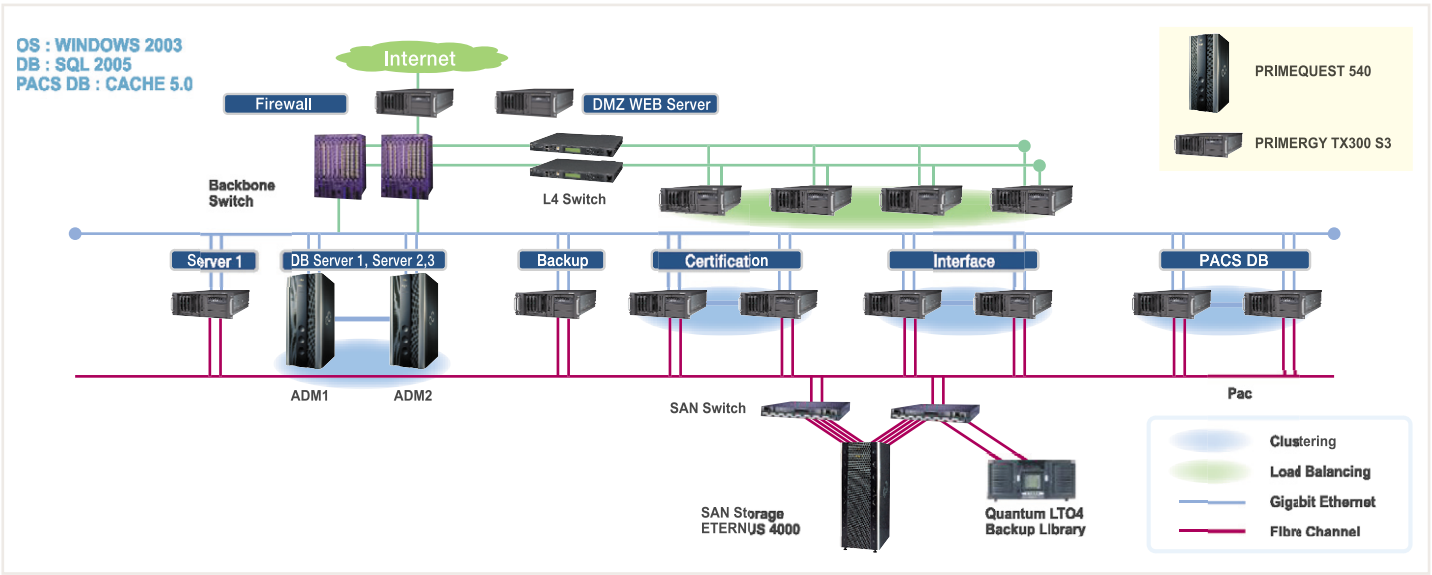
Inje Univ. Sanggye Paik Hospital is prepared against system failure as any IT systems component, subject to failure due by natural disaster or others reasons, should be able to save stored data as MS Excel files. In addition, Inje Univ. Sanggye Paik Hospital prevents system failure by supporting both backup systems and complete systems that minimize damage.

Anytime anywhere Web service

Inje Univ. Sanggye Paik Hospital is currently using Fujitsu FK-EMR developed and customized based on .NET, and intended to create an anytime and anywhere accessible web service environment. Inje univ. Sanggye Paik Hospital also uses standard web protocols for internal access. Currently, all external accesses are stopped due to security considerations, but they were properly prepared when the systems was developed.

In addition, a standard medical record module was developed, which is also scheduled to support personal medical record on web in the future. Inje Univ. Paik Hospital was established in Seoul, Gyeonggi-do and Pusan and staff work on rotation, so a system that supports hospital records from other hospitals would help support a better medical service. Inje Univ. Paik Hospital has invested in IT for the past 2 years and is also considering the establishment of a data warehouse to utilize an manage the increasing and accumulating data as EMR is introduced.

System Structure of Paik Hospital



<Source : Sanggye Paik Hospital>

CUSTOMER INTERVIEW

IT improved work productivity and customer satisfaction

Yong Ok Kim, Inje University Sanggye Paik Hospital, Medical Information Room Director

Q. What was the greatest change after Paik Hospital introduced EMR, PACS, OCS?

A.
First of all, chart management and storage are more easily controlled and the medical data can be viewed instantly. This in turn facilitates its use in medical education and for research purpose. In addition, patients don' t have to wait to see the results because the system digitalizes the results and promptly delivers them to the medical office.

Q. What was the main reason for choosing Fujitsu?

A.
As a matter of fact, we reviewed other vendors' products as well as Fujitsu' s for this project. As a result of comparative size and situation tests there was no significant difference between Fujitsu' s? and other products. But Fujitsu PRIMEQUEST had proven to have the best stability. In case of Inje Univ. Sanggye Paik Hospital, although data has hugely increased by about 30% since EMR was introduced, there has been no trouble with the data server to date. Since Inje Univ. Sanggye Paik Hospital proved the stability, the hospitals in Ilsan and Pusan also determined they should introduce Fujitsu servers and storage; while Inje Univ. Haeundae Paik Hospital, due opening in March 2010 with 1,004 beds, also chose the same products.

Q. Did you pick up on any references before finally choosing PRIMEQUEST?

A.
Inje Univ. Sanggye Paik Hospital made the decision to introduce PRIMEQUEST as its stability had been proven in the case of Gangnam Severance Hospital.
They have been using PRIMEQUEST since 2006 and have reported no server failures since then.
Stability is the most important factor in a hospital IT system, I think.

Q. Other hospitals prefer UNIX servers. Do you have any specific reasons for choosing an NT server?

A.
PRIMEQUEST is a stability-proven system even if replacing a mainframe. PRIMEQUEST is more expensive than other UNIX servers; however NT server supports OS, application and DBMC licenses with very little maintenance, which consequently save costs. In short, stability and low maintenance costs were the main reasons for the choice.

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