

Accelerating Medical Data Processing

Intel® Core™2 Duo processor-based platform speeds up database statistical processing of GE's Centricity® Cardiology PACS solution at Samsung Medical Center



Running GE's Centricity® CARDDAS Xi²™ CVIT system on a high performance infrastructure with Intel® Core™ 2 Duo processors provided Samsung Medical Center with a highly responsive and reliable solution for accelerating medical data processing.

Samsung Medical Center (SMC) is a state-of-the-art medical facility and a firm believer of the digital hospital vision in taking advantage of the latest information and communication technologies to improve healthcare processes for clinicians and their patients' well-being. To meet its goals of providing better healthcare, SMC invested in Intel® Core™ 2 Duo processor-based systems, which together with the deployed GE Centricity® CARDDAS Xi²™ Cardiovascular Information Technologies (CVIT) system, enabled the medical center to streamline and accelerate the processing of statistical patient data that plays a vital role in SMC's medical work processes.

Challenge

- **Improve data management capability.** Speed up data processing for all patients and streamline statistical processing of the database.

Solution

- **Implement cardiovascular information system.** Set up GE's Centricity® CARDDAS Xi²™ CVIT solution that takes advantage of the high performance of Intel architecture.
- **Deploy Intel® architecture.** Utilize Intel® Core™ 2 Duo processor-based servers and workstations as an integral part of the complete cardiovascular information solution.

Assessing the Situation

SMC was preparing to open a new cancer center in 2008 and wanted to deploy a cardiovascular information system on an IT infrastructure that would provide the medical center with the robust stability and reliability it needed to ensure efficient and speedy processing of medical data. SMC also needed to boost its data storage capacity to accommodate all the data that the new center would generate, and these data would be managed by the cardiovascular information system to be shared by all medical staff.



"GE Centricity® CVIT and Intel® Core™ 2 Duo processors make it easy to keep and transport data; we can access echo data much faster, and this is very helpful in speeding up patient diagnosis."

– Professor Seung Woo Park
Samsung Medical Center



삼성서울병원

SMC, like many modern medical centers, needs to keep up with the latest advances in technology that improve not only patient care, but the facility as a whole. The medical center is made up of many departments that operate best when connected to each other. SMC has over the years, implemented technology initiatives that have connected its various departments with systems such as the Samsung Medical Information System (SMIS), and the Picture Archiving and Communications System (PACS).

Information technology is an integral part of the SMC's daily medical operations. Every day, electronic patient data is collected, processed, examined, analyzed, and stored into its database systems. The data is especially important in helping doctors diagnose patients, spot commonalities in symptoms across different patients, assess treatment effectiveness, among a myriad of other benefits. With the setting up of the new cancer center, SMC was looking toward implementing an information system for cardiology.

In a cardiac center, data is the key driver for cardiologists. The capture of information, and the subsequent action based on the resulting processed data are important. Accelerating data processing for all patients and streamlining statistical processing of the database is a top priority, as SMC believed that its data management capability was holding back cardiology technology at the medical center. To ensure proper treatment and administration for all patients on an ongoing basis, all signal data and image data generated from the patients had to be interrelated and managed as statistical values.

Towards this end, SMC chose GE's Centricity® CARDDAS Xi²™ Cardiovascular Information System (CVIS) and Cardiology PACS solution, the GE Centricity® CVIT system. CVIT is an image and information solution for cardiac care, and provides everything a cardiac center needs for digital image management, archiving, reporting and workflow management. It is a centralized Cardiology solution that links records, PACS and processes—from cardiac operating rooms (ORs), echocardiography laboratories (echo labs) and catheterization laboratories (cath labs), and other non invasive cardiology departments (such as ECG)—with other departments in the medical center.

However, SMC's existing servers and workstations were inadequate in keeping up with the demands of GE's Centricity CVIT solution. SMC was experiencing server downtime and application failures up to twice a week due to the high data processing workload imposed upon the processor. The processor on a single server peaked at 100 percent when running several of the system's applications simultaneously, resulting in severe slowdown in data processing and application failures. To resolve this situation, SMC decided to switch over to Intel® Core™2 Duo processors which were more capable of running multiple, intense software applications simultaneously.

Spotlight: Samsung Medical Center

- Samsung Medical Center (SMC) opened on November 9, 1994 and is composed of Samsung Seoul Hospital, Kangbuk Samsung Hospital, Masan Samsung Hospital—and Samsung Biomedical Research Institute.
- SMC operates in an intelligent building with a total floor space of over 2.1 million square feet in 20 stories about the ground, and 5 stories underground.
- SMC has 1,278 beds and is home to 4,000 employees including 900 doctors and 1,100 nurses working in 40 departments, 8 specialty care centers and 100 specialized clinics.
- SMC has a world class medical infrastructure offering state-of-the-art facilities that include the Samsung Medical Information System (SMIS), Picture Archiving and Communications System (PACS), patient referral services Web sites, telemedicine, and mobile hospital services.
- SMC is the practice and teaching center for the medical school of Sungkyunkwan University since 1997.

Key Technologies

- Intel® Core™2 Duo processor-based servers and workstations that Centricity® CARDDAS Xi²™ CVIT relies on to distribute images and medical data to clinicians.
- GE Centricity® CARDDAS Xi²™ CVIT, an integrated image and information system for cardiac care.
- One of the technology pillars of Intel® Core™ microarchitecture is energy- efficient performance, including hardware features that provide unique information sensing and capture. Processor performance and energy efficiency is increased by operating at lower frequencies that require less power to run. Intel® Intelligent Power Capability, a feature that optimizes energy usage of the processor cores, turns on computing functions only when needed. These more energy-efficient processors support smaller, more capable, and quieter PCs to conserve critical power resources. These unique features can be harnessed to reduce the likelihood of firmware failures and improve the reliability of IT systems.

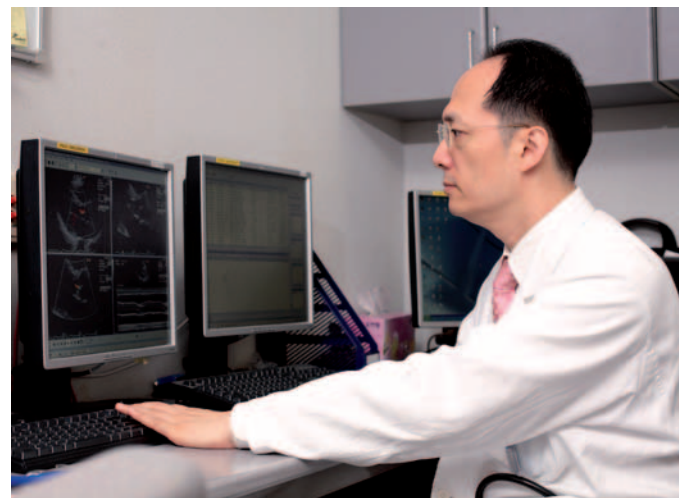
Integral Answers

- In deploying the various technological components that comprised the cardiovascular information solution, SMC evaluated several criteria that included features and functionality, pricing, system design, performance, reliability and service support.
- The Intel® Core™2 Duo processor provided a high performance, open architecture platform for the GE Centricity CARDDAS Xi²™ CVIT solution that also provides headroom for further processor utilization and scalability for future growth.

Delivering the Solution

Utilizing an IT infrastructure based on Intel® Core™ 2 Duo processors, SMC established a more reliable server and workstation environment for GE's Centricity CARDDAS Xi²™ CVIT than what previous processors could deliver. The Intel Core 2 Duo processors managed the load-bearing tasks in the multitasking environment with ease, improving performance by lowering the processor usage ratio to around 32 percent, as reported by SMC's IT staff.

Cardiologists require rapid and reliable access to current and historical data that is complete and accurate. The information contains data in various forms, including text, charts, and images such as current echo images, digital scans stored on the PACS system, reports, statistical analysis data, and other essential information for cardiologists. Running GE's Centricity CARDDAS Xi²™ CVIT on the Intel Core 2 Duo processor enabled SMC to meet all the demands placed on the system. Built on the innovative Intel Core microarchitecture, the Intel Core 2 duo processor delivers revolutionary dual-core performance and breakthrough processor energy efficiency. The design changes in the Intel Core 2 Duo processors that improve performance also increase processor energy efficiency by operating at lower frequencies that require less power to run. This enables the processor to efficiently run GE's Centricity CARDDAS Xi²™ CVIT at a much lower processor utilization ratio, which means the processor has more than enough capacity to handle higher data processing workloads or more multitasking jobs whenever the system requires it.



With GE's Centricity CARDDAS Xi²™ CVIT system running on the Intel Core 2 Duo processor-based platform, SMC is experiencing the benefits of improved data processing and workflow for its doctors. SMC also transferred data captured by cardiology into electronic medical records (EMR), including echo images, reports, measurement values, and analyzed readings so that doctors have access to them at any time. The system processes the data in real-time and makes it available. Sharing the data in real-time enables doctors to discuss their patients' medical condition with colleagues and research their cases by cross-examining their findings against historical data in order to enhance the quality of medical treatment for patients.

Return on Investment

- Accelerating the data processing of clinical information captured through GE's Centricity CARDDAS Xi²™ CVIT system enabled SMC to examine 10 percent more patients in shorter time, leading to shorter waiting times and giving patients faster access to proper treatment.
- Reduced system downtime and application failures from up to twice a week to none, improving work-related efficiency and reliability.
- Intel® Core™2 Duo processors efficient processor utilization ratio provides SMC with headroom to accommodate extra usage demands, including scalability for future growth.

"Intel® Core™2 Duo processors are the key technology that enhances the performance of GE's Centricity® CARDDAS Xi²™ CVIT because it provides such powerful computing capabilities."

– Jungsu Kim
Cardiac PACS Team
GE Healthcare

"GE Centricity* CARDDAS Xi²™ CVIT and Intel® Core™2 Duo processors make it easy to keep and transport data; we can access echo data much faster, and this is very helpful in speeding up patient diagnosis," says Professor Seung Woo Park, SMC.

With the accelerated data processing provided by the Intel Core 2 Duo processors, SMC is able to examine and diagnose patients faster, and more accurately. Workflow has improved, and so has productivity. The system has enabled SMC to examine more patients in a shorter time, effectively cutting down patient queues, leading to patients getting proper treatment faster. According to Chung Hwa Heo of the department of echocardiography, "Improved work flow has led to the number of examination cases to increase by 10 percent."

The Intel Core 2 Duo processor platform and GE's Centricity CARDDAS Xi²™ CVIT also form the basis for the management of all clinical data at SMC. As SMC is also an educational hospital for the medical school of Sungkyunkwan University, and runs Samsung Biomedical Research Institute which comprises six research centers, it wanted to consolidate all the clinical data and manage it within the system. The system is now utilized in medical research by the school and the research centers, reinforcing SMC's leading role in research and development, and fulfilling its role in the Asian research medical hub.

To further the use of technology in healthcare, SMC is also working with Intel to implement a solution for the remote management of all workstations in the hospital. This will help SMC complement its cardiovascular information system and enable the medical center to promote better healthcare for its patients through the judicious use of technology.

Find a business solution that is right for your hospital or healthcare system. Contact your local GE or Intel representative, or visit the GE or Intel Web sites at:

- www.gehealthcare.com
- www.intel.com/healthcare



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Healthcare Re-imagined

GE is dedicated to helping you transform healthcare delivery by driving critical breakthroughs in biology and technology. Our expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, and biopharmaceutical manufacturing technologies is enabling healthcare professionals around the world discover new ways to predict, diagnose and treat disease earlier. We call this model of care "Early Health." The goal: to help clinicians detect disease earlier, access more information and intervene earlier with more targeted treatments, so they can help their patients live their lives to the fullest. Re-think, Re-discover, Re-invent, Re-imagine.

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