CASE STUDY: Healthcare

University Hospitals Leuven: Improving patient care through Web-based cooperation

SOLUTION SUMMARY

Challenge	How can one of Europe's leading hospital systems help referring physicians stay informed about their patients' progress?
Solution	University Hospitals (UZ) Leuven has improved information flow through a custom, Web-based portal — BEA WebLogic® Server and running on Intel® Xeon™ processor-based servers. The system gives referring physicians convenient, secure access to patient information so they can better track their patients' treatments.
Products	**Servers:** • Dell* PowerEdge* 2650 servers with dual Intel Xeon processors **Software:** • Microsoft* Windows* 2000 Server SP2 • BEA WebLogic Server 7.0 • BEA WebLogic Portal 7 • BEA WebLogic JRockit™ JVM • Connectivity to a Sybase* database

BUSINESS CHALLENGE

Hospitals and physicians alike have been moving to exploit the efficiencies offered by information technology. Most hospitals today have some form of medical information system, and a majority of general practitioners have adopted computerized medical records. But many hospitals still lack a central patient medical record system that includes comprehensive, up-to-the-minute treatment information on admitted patients. Instead, patient data is scattered across multiple records and is accessible only within each institution or practice.

As a result, the referring physician sees only a summary report of treatment that's compiled after a patient is released. If physicians need information during the patient's stay, they have to make multiple phone calls to contact the specialists at the hospital, and receive information via faxes. All in all, it's a disjointed process — and an unfortunate one, since the GP generally remains the point of contact for both the patient and relatives during the hospital stay.

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The University Hospitals (UZ) Leuven is using BEA WebLogic Server and Intel Xeon processor-based platforms to remedy that situation. The largest hospital in Benelux, UZ Leuven has created a new, centralized system that stores all patient medical information and gives GPs timely and secure access to comprehensive information about their admitted patients.

A Blend of Old and New

UZ Leuven blends rich tradition with a reputation as one of Europe's most advanced centers for high technology medicine. The hospital is affiliated with the Catholic University in Leuven, which was founded in 1425 and is the oldest university in Belgium. Both are located in the town of Leuven, just 20 km east of Brussels. UZ Leuven integrates the four university hospitals of Gasthuisberg, Pellenberg, Sint-Rafael and Sint-Pieter, and combines research and teaching with direct delivery of medical services. With nearly 2,000 beds, it has 450,000 consultations and 550,000 hospitalization days annually, including 52,000 emergency admissions.

UZ Leuven is a leader in using information technology to enhance patient care and streamline the delivery of medical services. It is part of the Global Healthcare Exchange, a sophisticated system that enables its materials management department to send purchase orders directly to its suppliers' enterprise resource planning (ERP) systems.

Closer Communication

Determined to improve the information flow between GPs and the hospital, and between the different institutions within the hospital, UZ Leuven recently moved to expand its medical information system with the addition of Web-based access to referring physicians, including GPs and external specialists. The LISA project — Leuven Internet-Cooperating Doctors — aimed to:

- Improve medical cooperation with referring physicians
- Enhance service to patients and relatives
- Increase involvement of referring physicians as members of the multidisciplinary patient team

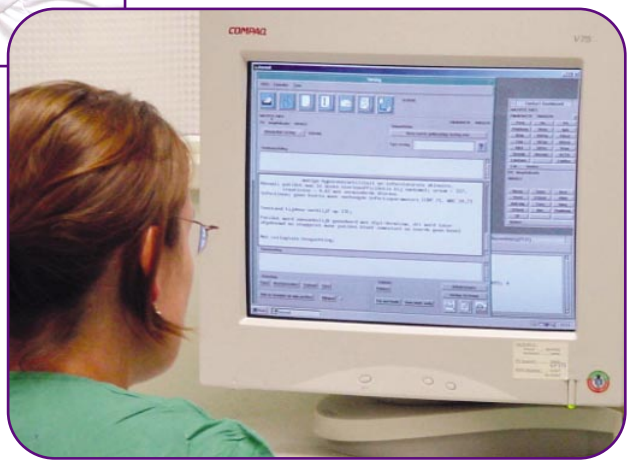
To achieve these goals, the system would need to give referring physicians a comprehensive view of the patient treatment process including internal results, information on the diagnostics, therapeutic approach, scheduled procedures, appointments, physical location and contact persons. Physicians would need to be able to add information to the files. And the system would have to support interdepartmental workflows such as requests for entry and appointments, results reporting and medical alerts.

In addition to these functional requirements, there were several key criteria for the chosen system. Protecting patient privacy would obviously be crucial, with secure authentication of authorized remote users. Ease of use was also a must, since the hospital would not be able to train system users in house. And the system needed to be universally accessible by any physician. UZ Leuven therefore decided it had to be an Internet-based system able to work via any standard browser running on the client PC.

"We get additional advantages by using BEA WebLogic Portal, including the ability to integrate and personalize services."

Dr. Bart Van den Bosch

CIO, UZ Leuven



Physicians can view the patient treatment process including internal results, information on the diagnostics, therapeutic approach, scheduled procedures, appointments, physical location and contact persons.

E-BUSINESS SOLUTION

UZ Leuven explored a variety of alternatives, and deployed a robust system based on BEA WebLogic Portal, with the solution's middle tier running on Dell PowerEdge servers powered by dual Intel Xeon processors. The internal system, or middle tier, behind the hospital firewall, uses BEA WebLogic Server to handle all business logic. Enterprise Java Beans (EJBs) in BEA WebLogic Server perform a variety of complex tasks. These pieces of reusable application logic call the databases that store information including ECGs, patient appointments, laboratory results and radiological images. Using this architecture, the hospital ensured a clean separation of the content on the site, the presentation styles and the logic running on the server.

To ensure highly encrypted and authorized access to the system, UZ Leuven provides remote users with a personal "Digipass." The Digipass builds a Secure Shell (SSH) through which all communication is encrypted with advanced algorithms. Personalization features in the system ensure that users have access only to specific patients. After the user specifies the patient, the system gathers all available data in real time from the hospital systems' numerous production databases.

On the client side, Java applets allow users to manipulate data as needed. Along with accessing patient information, users can make appointments and add notes to the system. Clinical information is also stored in the system and is accessible to specialists via any computer in the hospital.

User Enthusiasm

The LISA system launched as a project with only 10 GPs, quickly growing to 22 GPs within the year. Deployment improvements were made and users were added, and a year later over 110 GPs were using the system.

The enthusiasm within the hospital has been greater than expected. Physicians have commented on how improved anytime access to vital information has enhanced communication with patients and families, and patient feedback has been equally positive.

The most recent figures report that the system is accessed over 1,600 times a month, and the average user requests 12 patient reports each week.

An Infrastructure to Grow On

UZ Leuven continues to grow the system, expanding it to include additional users, including users within other hospitals and external specialists. A planned new release of the portal site will add features such as bulletin boards and chat rooms to further enhance information sharing. These extra features are expected to drastically increase the number of transactions.

Luckily, in choosing BEA WebLogic Portal, WebLogic Server and Intel® architecture, UZ Leuven has deployed a robust cost-effective infrastructure that meets users needs today and can easily scale to keep pace with expanding requirements.

WebLogic Portal simplifies, personalizes and lowers the cost of access to information, applications and business processes by offering a unified, simplified portal framework that includes portal foundation services, personalization and interaction management, intelligent administration, and integration services. WebLogic Server is the world's most widely deployed application server. The latest version, BEA WebLogic Server 7.0, delivers new features that improve developer and administrator productivity, tighten application security and simplify integration

The hardware platform for WebLogic Portal is the Dell PowerEdge 2650, which delivers a combination of performance, availability and configuration flexibility that makes it ideal for a variety of departmental and Internet infrastructure server workloads. The server features a compact, rack-dense 2U form factor, comes with up to 6GB ECC DDR SDRAM for expandable performance, and supports 5 PCI buses (including three PCI-X capable) for uncompromising I/O throughput. Driving the servers are dual Intel Xeon processors, which combine clock speeds of up to 2.80 GHz, a large, 512 KB Level 2 cache memory and the new Intel NetBurst™ microarchitecture with Hyper-Threading** Technology to produce a powerful and versatile platform for a broad range of computing needs.

UZ Leuven is also using BEA's JRockit Java Virtual Machine (JVM), which turbocharges Intel architecture-based WebLogic deployments to provide outstanding performance and price/performance for Java enterprise computing. Together, the BEA and Intel technologies will support UZ Leuven as it continues its successful efforts to deliver timely, secure information that saves time for physicians and enhances patient care.

"The combination of BEA WebLogic Platform running on Intel® architecture with the BEA JRockit Java Virtual Machine (JVM) provides a powerful and reliable environment with the high transaction capability needed for a critical system like LISA."

Dr. Bart Van den Bosch

CIO, UZ Leuven

BEA Systems, Inc.
2315 North First Street
San Jose, CA 95131
U.S.A.
General Information:
408-570-8000

www.intel.com/ad/bea

Intel Corporation
2200 Mission College Blvd.
P.O. Box 58119
Santa Clara, CA 95052-8119
U.S.A.
General Information:
408-765-8080
Customer Support:
800-628-8686

**Hyper-Threading Technology requires a computer system with an Intel® Pentium® 4 processor at 3.06 GHz or higher, a chipset and BIOS that utilize this technology, and an operating system that includes optimizations for this technology. Look for systems with the Intel® Pentium® 4 Processor with HT Technology logo which your system vendor has verified utilize Hyper-Threading Technology. Performance will vary depending on the specific hardware and software you use. See http://www.intel.com/info/hyperthreading for information.

BEA part number: PSS0524E0303-1A Intel part number: 252246-001

Visit **www.intel.com/ad/bea** today to find out more about the BEA WebLogic Enterprise Platform running on Intel-based servers. And discover how your IT investments can add up to more.

Solution provided by: