Sir Charles Gairdner Hospital manages medical equipment with eMED

Sir Charles Gairdner Hospital, based in Perth, is one of Australia's leading teaching tertiary hospitals. The bio-engineers of the Medical Technology and Physics department used LANSA to develop eMED, a Windows and SQL Server based system that manages the purchasing, maintenance and quality assurance for over AU$80 million worth of medical equipment, as well as radiation safety services. eMED has proven to be such a success that, with the help of LANSA partner Lateral WA, the system is now being implemented at other facilities.

Alan Thomas, Biomedical Engineering Manager (Projects), says, "We have put our subject knowledge and empathy with Biomedical Engineering into building the eMED system. Using LANSA, we have been able to deliver a very professional solution. eMED helps us to manage the equipment from cradle to grave, provides technical support and complies with strict regulations."

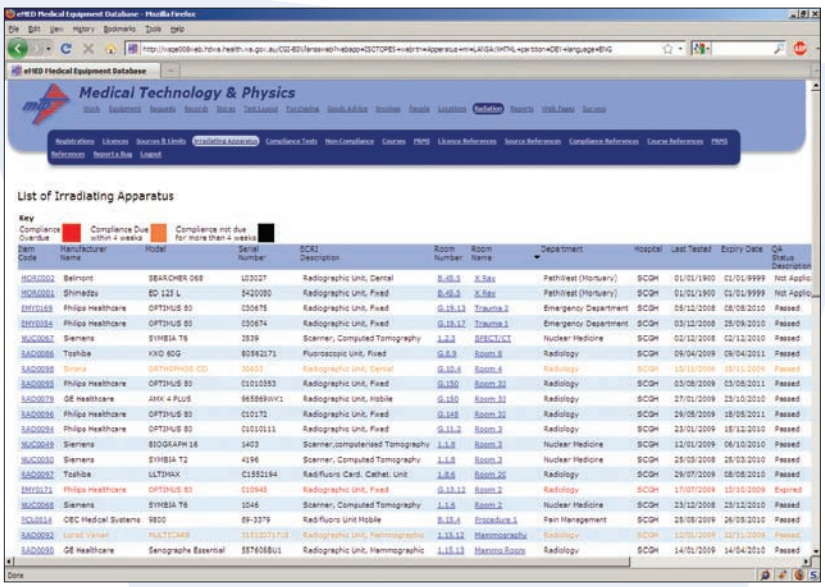
No Suitable Packaged Solution

Sir Charles Gairdner Hospital (SCGH), a major hospital within Western Australia's North Metropolitan Area Health Service, has over 600 beds and 5,000 staff who treat over 420,000 patients every year.

The Medical Technology and Physics department (MTP) of SCGH provides management and training services in medical and scientific equipment, medical physics, radiation health, radiopharmaceutical production and diagnostic services in visual electrophysiology. MTP also offers technical and scientific advice on radiation management, the purchase and operation of medical equipment, software and consumable items, and solving of problems related to their use.

MTP's customers include over 30 departments of SCGH, such as the operating theaters, intensive care and emergency departments. Various other medical and educational institutions in the Perth area also make use of MTP's services.

MTP manages sophisticated and expensive medical equipment, such as: Medical Networks, Patient Monitoring Systems, Anaesthesia Systems, Operating Theater Equipment and Instrumentation, Ultrasound, MRI, CT Scanning and Radiation Monitoring.



eMED manages all activities throughout the life of medical equipment, including the scheduling of regular performance and compliance tests.

In any modern hospital, biomedical engineering plays a vital role in positive patient outcomes. Due to the critical nature of these activities, there are very strict procedures that need to be followed, such as regular compliance and safety checks. The people who use or maintain medical equipment need to have suitable qualifications and expertise. Records need to be kept of all activities within the department, including patient records.

"We have been able to streamline the process from start to finish."

Until recently MTP was using an in-house developed Clipper based system that had been fine-tuned over a period of 25 years. "It did exactly what we wanted it to do, but it was limiting our ability to interact with customers," says Alan. "Only MTP staff could access the system and all customer inquiries were dealt with by phone or email. As both the volume of data and the number of customers were growing, that system could not continue to support us efficiently."

"Having developed the existing system ourselves, we had a deep understanding of the application and the knowledge of what works and what does not work. We did not want to lose any of the functionality that we already had."

Alan looked at what other hospitals have implemented and at several packaged solutions, but did not find anything suitable. He stated, "Most packaged solutions are huge and have tons of fields and options that we do not need, but at the same time they lack in some of the precise functionality that we do require. Other packages are too thin, just database recorders with hardly any intelligence built into their programs."

"Our enquiries led us to seek advice from Lateral WA. They suggested that LANSA would be an ideal solution to our management upgrade. We evaluated LANSA and liked its high definition language and data definition Repository. With training and support from Lateral WA we felt confident to embark on the project and develop the new version of eMED ourselves," said Alan. ➔

By Bio-Engineers for Bio-Engineers

The eMED system is designed and developed by MTP's biomedical engineers – Zeljko Maurac and Jonathan Stafford – and Steve Crossley, a radiation physicist. All learnt programming in university, but none of them were trained as software developers.

After a four day Visual LANSA training course by Lateral WA, the engineers set out to develop the system, planning for a rich-client user interface, but very soon realized that a browser interface would be more suitable, as it would not require any other software than a browser on the users' desktop. They attended a few more days training in LANSA Web Application Modules (WAMs) and after that they worked on the system by themselves.

Jonathan Stafford, Biomedical Engineer at MTP, says, "Lateral WA provided the initial training and was available in case we needed assistance. They also assisted us, along with our IT department, to setup the Windows Application server and SQL Database server."

eMED is now available to customers on the SCGH Intranet, allowing them to view details of their medical equipment and request services. eMED's functionality includes Medical Equipment Inventory and Management, Radiation Physics, Statistical Information, Purchasing and Invoicing, Business Contacts and Staff information including training and qualifications.

eMED manages all activities throughout the life of medical equipment. Any repairs or testing of equipment is logged through a work order. Regular performance and compliance tests are scheduled, flagging users when equipment is due to be tested. Spare parts purchase requests are triggered when minimum quantities are reached. LANSA Integrator's email functionality is used to keep all users up-to-date with relevant information.

SCGH will soon implement a wireless real-time patient equipment tracking system which will integrate with eMED, possibly using LANSA Integrator. Future plans also include integration with a Theater Instrument Maintenance system.

ISO Accredited

"We are a technical support facility for the hospital. We have put our subject knowledge and empathy with biomedical engineering into building the eMED system. eMED is not just a generic asset management system. It is a purpose built management system and is tailor-made for medical equipment and radiation physics activities, built by medical engineers," continues Alan.

In any modern hospital, biomedical engineering plays a vital role in positive patient outcomes.

"Using LANSA we have been able to deliver a very professional solution."

"We are an AS/NZS ISO 9001:2008 accredited department, which guides all functions within the department. eMED integrates with and enhances our documentation system, simplifying document control and indexes, while also providing easy access to relevant documents. eMED enables us to keep our records paperless and produce reports only when required."

"By giving customers online inquiry and work order access, they are now far better informed. Of course we are still involved in reviewing their requests and giving advice, but because orders are now remotely recorded and the workflow is automated, we have been able to streamline the process from start to finish and record all the steps as requests go through."

"LANSA was easy to learn and we are fortunate that we have people with development skills in our engineering team. If we find something in the system that can be improved, we can do that ourselves immediately. We do not have to wait and budget for the services of a third party."

"Being in control of the solution also allows us to meet special requests from our customers. We have very fine control of all the records of medical equipment, current and archived. We imported the data from the old system and we can now use LANSA-built dashboard facilities in eMED to graphically analyze historical information going back over 25 years, which is very valuable," says Alan.

Still Evolving

With the help of Lateral WA, eMED is currently being implemented at the Biomedical Engineering Department of the Western Australia Country Health Service, the largest country health system in Australia.

"We want to be the leading biomedical and physics organization in Australia. To that end we are always looking for a better way of doing things. The eMED system is the evolution of all that," said Alan.

"The eMED system is a sophisticated management system that has gone far beyond our original scope and it is still continuously evolving. LANSA gives us the flexibility to let eMED do what we want it to do and to give authorized users secure access to the information. Using LANSA we have been able to deliver a very professional solution," concludes Alan. ■

Company and System Information

- Sir Charles Gairdner Hospital is one of Australia's leading teaching tertiary hospitals and has an international reputation for ground breaking medical research. For more information visit **www.scgh.health.wa.gov.au**
- Lateral WA, a LANSA partner located in Perth, Western Australia, delivers a flexible and cost-effective range of IT and business services. For more information visit **www.lateralwa.com.au**