

CASE STUDY

UNIVERSITY OF CALGARY

Since its establishment in 1967, the Faculty of Medicine at the University of Calgary has become an international leader in health research, education and health care. Through its clinical work, continuing medical education programs, and close relationship with the Calgary Health Region, the Faculty of Medicine moves new treatments and diagnostic techniques from the laboratory into hospitals and clinics, continually improving patient care. Scientific breakthroughs in cancer, diabetes, stroke, joint injury and arthritis, as well as heart disease, have benefited people the world over. More than twenty international collaborations are evidence of the pivotal role the University of Calgary medical school has played.

In recognition of the growing importance of information technology and life sciences, the Dean of Medicine established MedIT five years ago to provide the Faculty with dedicated information technology support and expertise. From the "Medicine" Help Desk, building on the growing expertise in applying technology and managing networks, MedIT supports nearly 4,500 faculty, staff and students at the Faculty of Medicine.

Providing Specialized Research

Hytham Khalil is Director of MedIT, responsible for the strategic vision of the Faculty's technology direction and ensuring that MedIT supports the plans and business objectives of the medical school. His team of more than 30 individuals provides client support through its Help Desk, specialized applications, development, server administration and client computing programs. As Manager of Client Services, Tom Dumin's role is to address the specific and unique technology needs of larger user communities within the Faculty of Medicine, helping the groups learn how to use and leverage the technology resources available from the Faculty of Medicine, the University of Calgary and the Calgary Health Region.

The University's Core DNA and Protein Services facility is one such client, supported through the Core Facilities Support Program. Established in 1985, the facility's core services include DNA/RNA synthesis and DNA sequencing. Under the leadership of Dr. Richard Pon, the Labs have distinguished themselves



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Key Facts:

Industry:
Medical Research

Product:
Xythos Enterprise
Document Manager

Audience:
Scientists, lab technicians and
remote researchers

- Benefits:**
- Increased volume of DNA testing
 - Accelerated individual request processing
 - Allows lab staff to easily post sequencing results and make them available to customers

- Why Xythos?**
- Open standards-based platform increases system flexibility
 - Secure platform protects sensitive research material
 - Intuitive interface allows collaboration across DNA lab



“The Xythos Enterprise Document Manager solution proved to be technically superior, delivered significant performance improvement and the economics made it very attractive.”

- Basil Baluta,
Enterprise Architect and Project Lead, Med-IT Lab, U. of Calgary

through specialized research in nucleic acid chemistry. The DNA Sequencing Laboratory currently provides DNA sequencing to more than 600 different researchers throughout Canada and is one of the largest multi-user sequencing facilities in the country.

MedIT supports the DNA Lab and, as such, believed that a secure, web-based document and file management system would provide the environment that Dr. Pon and the DNA Services facility were seeking. According to Durnin, “We were looking for a solution that was web-based and could provide easy and secure access to files for individuals in multiple locations. We were also looking for one that offered enhanced security for the DNA clients.” In looking at the DNA Services facility’s sequencing operations, the MedIT team strived to find a new system that would be accessible by multiple platforms, easy-to-use and intuitive for the DNA Services facility – one that would help to make the DNA sequencing process more efficient.

Supporting The DNA Sequencing Lab

The process previously in place called for local scientists to drop off DNA samples in person – and for out-of-town researchers to send their samples by courier. All of them needed to receive their results back from the lab as quickly as possible. In addition, each submission could contain up to several dozen samples of DNA, each with various processing instructions. The DNA Sequencing Laboratory would process the samples using laser-induced fluorescence instrumentation to “read” the sequence information from each of the samples. The results of these sequencing analyses produced large data files containing information in graphical, text, and binary formats which needed to be inspected, verified, and formatted with various software tools. The primary responsibility of the laboratory staff was, and is, to process the samples, generate and verify the data then distribute that data to the scientists.

After the automated sequencing was performed, numerous manual file transfers and manipulations also had to take place before the information could be uploaded to an FTP server: A lab technician, for example, might have to send various emails for each sample to notify customers and fellow technicians of test results and changes. Additionally, each time results were generated, someone would have to collect all the files and move them to different workstations for processing and storage, as well as for separate invoicing and archiving. The need for greater data security was also a concern, especially with data from private biotech companies – as that data needed to be explicitly separated from any and all other lab clients. In that case, proprietary, highly confidential data had to be shipped directly to the client.

Recognizing the need for improving the Lab efficiencies and enhancing security, the Enterprise Architect team at the Lab, led by Basil Baluta, began to investigate alternatives. One of their beliefs was that a new system could also potentially automate protocol workflows – and better tie the test result sample data to the large source data files helping automate the DNA workflow process.



“The Xythos deployment was very smooth. We expected to receive calls from clients with questions about how to use the new service – but there were none!”

- Tom Durnin
Manager of Client Services,
U. of Calgary

Establishing The Criteria

The MedIT Enterprise Architecture team established its initial criteria for the new system. That system needed to: 1) Provide secure web delivery, 2) Demonstrate a functional fit relative to the IT department’s objectives, 3) Allow access by Macs, PCs and various other operating systems for both on and off-campus researchers and clients and 4) Require little training for 600+ end users. Concluding their research, the team short-listed a group of web-based collaborative technologies including Microsoft IIS WebDAV, Enterprise Document Manager from Xythos Software and several open source applications.

One of the goals of the team is to provide technology that is more flexible and accessible than what is currently used – as well as technology that improves collaboration. These goals translate into solution requirements such as providing a reliable API, supporting a high level of scalability and being able to manage separate and secure client directories within the same server environment (features that extend beyond individual users across the enterprise.) Finding a solution with a well documented and tested rich feature set was also important to the team. According to Durnin, “We needed a system that was easy to use, had a low learning curve and would be intuitive for our own staff as well as for the wide-spread client base of the DNA lab.”

The team initiated a proof of concept test - and quickly appreciated the capabilities of Xythos Enterprise Document Manager – particularly after trying to rely on FTP for users to transfer files. “Once our group discovered that Xythos was one of a very few products that supported the Internet standards we wanted, we made a recommendation to purchase the Xythos system. While what we did was an investigation, rather than an evaluation, the features and benefits of Xythos were readily apparent. The Xythos Enterprise Document Manager solution proved to be technically superior; delivered significant performance improvement and the economics made it very attractive,” Baluta recalled. The team also thought that the Xythos system would provide a more secure and efficient system for handling the results of the DNA Sequencing Lab. In addition, Xythos could be used to globalize collaboration among researchers and simplify how they shared information across and between organizations, helping to match Xythos capabilities with MedIT’s overall objectives.

Dr. Pon agreed that there was a need to automate the data stream within the lab. He wanted a system that would: 1) Save time, 2) Improve security both in terms of physical security as well as assigning rights and permissions to each file, 3) Enable automated uploading and 4) Eliminate saving data to CDs then sending data, by courier, to the Lab’s private bio-tech clients.

A Successful Deployment

As the team thought about the DNA Services Lab, it began to consider how the DNA sequencing process (particularly the one involving researchers and their data files) might also benefit from using Xythos. Laboratory staff were



System Requirements

Servers

Any platform supporting J2SE or J2EE including: Windows NT®, 2000, 2003, Linux, Solaris®, IBM AIX®, HP/UX® and Mac OS X®

Web/Application Servers

Apache Web Server, Microsoft IIS®, BEA Weblogic®, IBM WebSphere® and Tomcat

Client Systems

HTTP-enabled devices, including those running Windows®, Mac OS® and Linux

Database

IBM DB2®, Oracle®, Microsoft SQL Server®, PostgreSQL

processing an average of 200 DNA samples each day and, once the tests were completed, lab technicians needed to perform multiple file manipulations and notifications per job request. Using the Xythos system, the Lab established a new procedure, giving each person a unique and secure login id. Customer folders were moved from the FTP server to the Xythos WebDAV-enabled server. With the new Xythos-based system, once sequencing analyses are complete, researchers are immediately notified that results are available and provided with a hyperlink to the results.

In August, 2004 with the implementation of Xythos Enterprise Document Manager, MedIT introduced its Secure Web File service for the University's DNA Services Lab. As a result of the implementation, the DNA Lab has been able to handle increased testing demand – and is now producing over two hundred client samples per day for more than 600 national and international DNA research clients. At the same time, the Lab has been able to accelerate individual request processing. The MedIT solution, based on Xythos web technology, allows Lab staff to easily post sequencing results and make them available to customers immediately after the sequencing has been completed.

With the advent of this new service, the DNA Lab and MedIT have provided an innovative approach to addressing client needs, both internally and externally. Secure and easy data access for users, immediate notification of results, ease of retrieving files and the ability to access background information through web folders have all contributed to the early and on-going success of this project.

MedIT is providing a cost effective data delivery method that responds to customer demands while also laying the foundation for a fully-automated data collection and distribution system. Over 40 gigabytes of research data is already stored on the WebFile Server. "The Xythos deployment was very smooth. We expected to receive calls from clients with questions about how to use the new service – but there were none! Even with more than 600 users, there were no issues with clients accessing their data – and our 'training' consisted of sending an email outlining the new process along with a 'quick sheet' regarding how to access files. Our Help Desk calls now are limited to password re-sets and creating new accounts," Dumin concluded.

**For more information please call 1.888.4XYTHOS
or visit www.xythos.com**

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