

Bayer Diagnostics

CGI helps increase testing productivity by 25 percent

Bayer Diagnostics' goal was to improve production testing processes and to custom develop a software system that would automate the test data management process for its manufacturing facilities in Walpole, Massachusetts. Bayer hired CGI in April 1999 to assist in the design, development and implementation of the new system.

THE CHALLENGE

The product test data management process is useful in important ways, such as the following:

- It serves as a quality control check before a product is released for customer shipments.
- It provides data for assigning master curves and calibrator values for product insert cards enclosed with reagents sent to customers. The reagents and associated data are equally important product components.
- It provides data used throughout the organization for product-performance trending.

The project's main objectives were to reduce headcount associated with test data management, reduce overall expenses, reduce lead times, and improve the dissemination and use of test data throughout the organization.

The major compelling reasons for this project were that Bayer's test data management process was inefficient and was supported by an outdated Compaq (formerly Digital Equipment Corporation) VAX system. The VAX system was designed and implemented in 1982 to support the manual radioimmunoassay product line.

As technology grew into the Magic Lite, ACS:180, and Centaur products, the VAX system was modified to retrofit the new data reduction needs for these products. After 17 years of service, the VAX had become the major bottleneck in the data reduction and analysis process performed by Quality Control (QC) and many other departments.

Data analysis needed to meet current requirements had become a series of VAX workarounds to manipulate data into the correct format, coupled with repeated manual entry of data into Microsoft Excel templates. Test data within the VAX database was inaccessible to departments other than QC; even within QC, data could be only obtained through very cumbersome methods.

The inefficiencies created by working with the VAX required college-educated data analysts, technicians and supervisors to spend too much of their time performing data entry and reprocessing data, and not enough

CASE STUDY

MANUFACTURING

Bayer Diagnostics

Bayer Diagnostics designs, manufactures and markets clinical diagnostics systems for major industry markets, including self-testing, near patient testing (point-of-care and critical care), laboratory testing, and nucleic acid diagnostics. The company's facility in Walpole, MA manufactures immunoassays and other chemical products for the Laboratory Testing segment of Bayer Diagnostics.

time using data to challenge the production process and focus on product quality.

Additionally, aging hardware and software versions used to support the VAX/LAN environment resulted in incompatibilities that increased VAX and related application downtime over the past several years. The aging technology also increased the risk of insufficient resources to support and update the system.

The CGI team set to work on gathering information for the functionality and feature design of a customized test data management system (TDMS). Among other attribute requirements, the system had to perform 32 data reduction and analysis calculations within 30 seconds (the completed solution performs this operation in less than 5 seconds). Once the design was finalized and a blueprint developed, the team proceeded to construct the TDMS. Over the course of 18 months, a combined Bayer and CGI team of 20 people built the TDMS from scratch—a full lifecycle of information system development.

CGI developed the TDMS with the active participation of QC supervisors and managers who had intimate knowledge of the testing protocols and firsthand experience with technician workflow. Their participation ensured that the new system harmonized the legacy system with emerging business requirements.

CGI programmers developed the TDMS code in one environment before moving it to a test environment for user validation. Software testing scripts were based on system usage scenarios, and system defects were mitigated as they were identified. This iterative testing and design approach allowed the TDMS to evolve as a truly complex system, one that will develop as Bayer Diagnostics' business rules do.

THE TECHNOLOGY

The architecture of TDMS is multitiered and web-based. It has many interface points built on a foundation of Internet servers, browsers and databases, all of which allow for limitless expansion of the system's data storage and processing capabilities.

The system uses and was built with the following technologies:

- Oracle database
- Microsoft Information Server/Transaction Server
- Visual C++, Visual Fortran, Java Script, Active Server Pages, Visual Studio
- Actuate Reporting Server

THE RESULTS

The migration from the legacy system to the TDMS, a more scalable computing infrastructure, was successful and is currently in production. CGI succeeded in developing a solid relationship with Bayer Diagnostics, one that has earned it subsequent contracts. By providing mentoring for the Bayer team as well as long-term application maintenance, CGI ensured that productivity gains would be maintained and increased over time.

"We were able to increase our testing productivity by 25 percent, while at the same time reduce our costs by 30 percent through the implementation of the TDMS system custom-developed by CGI style."

Jim Hughes, vice president, Bayer Diagnostics