Industry:
Health Care

Organization :
City of Hope

Description:
City of Hope National Medical Center and Beckman Research Institute is a 212 bed facility dedicated to the prevention, treatment, and cure of cancer and other life-threatening diseases through innovative research and patient care.

Business Problem:
Needed to develop and implement a centralized Y2K-compliant fund-raising database to carry them into the 21st century. Prior to this project, they had nearly 80 separate databases running on various platforms, many of them non-Y2K compliant.

Rational Solution:
Successfully used Rational TeamTest to automate a business-critical database conversion and Y2K testing challenge.

Key Benefits:
- Automated a high-cost manual test activity
- Successfully introduced regression testing using resilient and robust test scripts, allowing QA to reduce returns due to defects from 25-30% to near zero
- Solved the communications problems between the programmers and testers — with everyone working from the same set of data, more reliable and timely decisions are being made

Programming Environment:
Platforms: Windows NT
Development Tools: Sybase PowerBuilder
Number of Developers: 3-5
Number of Testers: 3-5

Rational TeamTest Helps City of Hope Move into the Next Millennium

Early in the twentieth century, a businessman suffering from tuberculosis died on the streets of Los Angeles. Shocked into action, his fellow merchants raised enough money to start a TB clinic in Duarte, California, where the weather was hot and dry. The original hospital consisted of two tents, a nurse and a doctor.

Today, more than 85 years later, the tents have evolved into the City of Hope National Medical Center and Beckman Research Institute, a 212 bed facility dedicated to the prevention, treatment and cure of cancer and other life-threatening diseases through innovative research and patient care. Its 2600 employees include 107 full-time physicians and 180 basic research scientists. City of Hope is one of the largest providers of bone marrow transplants in the United States. In addition to the facilities in Duarte, a clinic in West Los Angeles and in Arizona, City of Hope also has a more than a dozen fund-raising offices in locations across the United States.

Throughout its history, City of Hope has been on the cutting edge in research and patient care. As an important part of its infrastructure, its information technology must also remain on the cutting edge in order for the institution to remain competitive. According to Senior Project Manager, Jan Shorter, "Under the strong leadership of Vice President and CIO, Information Technology Services, Michael Sauk, City of Hope has managed to do just that. Unfortunately, many not-for-profits are behind in technology and unprepared for the year 2000. We have an infrastructure made up of fiber optic cabling on campus, T-1 line connections to our two largest fund-raising offices, and frame relay connectivity amongst 12 outlying offices. City of Hope is testing, upgrading and replacing over 400 software products in preparation for Y2K."

According to Shorter, " The development and implementation of the fund-raising system has been one of our greatest challenges. When completed in December of this year, nearly 80 separate databases running on various platforms and all non-Y2K compliant databases will have been converted to one up-to-date, centralized repository for fund-raising information that will take us into the 21st century. The effort has not been an easy one."

Creating a New Enterprise-wide Fund-raising System

In the early 1990s, Shorter and others, including Trinh Le (president of Intelligent Software Consulting (ISC) and the City of Hope's former programming manager), began investigating the complex job of not only converting the old applications but putting together a wish list of desired new features and functionality. Their goal was to create a new, enterprise-wide fund-raising system that consolidated all the key information but still allowed the more than 300 departments to track their own donors, gifts and fund-raising activities. They settled on a distributed computing architecture that include an eight-way Sun SparcCenter2000 server with 1 GB of RAM and the Dell Pentium II workstation running on Windows NT. Sybase PowerBuilder was chosen as the development tool. Sybase also supplied the relational database management system that would become the new home for the hundreds of separate databases that had been living independent lives throughout the organization.

Shorter and Le were involved in setting up an implementation team to handle requirements, prototyping and design. A user steering committee was selected as well as a working committee of four or five users to deal with day-to-day decisions. Le assembled a five-person programming group and the challenge to prepare the City of Hope's development group information infrastructure for the 21st century began in earnest.

"TeamTest has given us a new level of confidence that each new release of the software will work in our production environment the way it's supposed to."

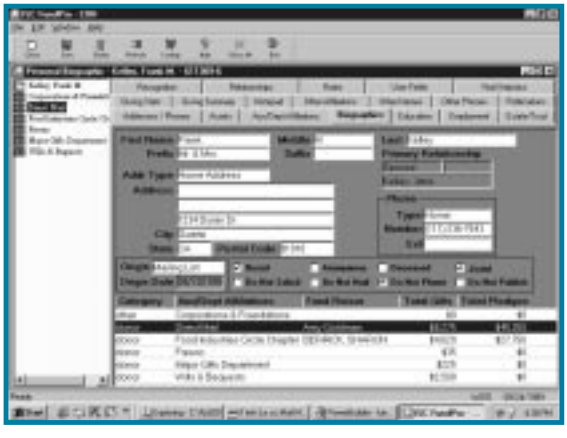
Integrating the Databases

"Integrating all those databases and applications into a new system proved to be a very complex development job," said Le. "As you would with any major software development project, we tested the code as we went along, hoping to detect and fix as many errors as possible. The problem was that we were doing all our testing manually. It was a time-consuming and not very accurate process — after each unit test, we were averaging a 25 to 30 percent return due to defects. In addition, we were unable to do any regression testing — the job was just too big. So, if the fixes we made caused problems in code that had already been tested, we didn't find out about it until much later when we put the entire system through a production test.

"We also had a communication problem," Le added. "We had no efficient way to share information about the status of each programming task between the QA team and the programmers."

Rational TeamTest to the Rescue

In order to meet their deadlines and be ready for the millennium, the development and test teams had to automate the testing process and improve communications between the developers and the testing team members. After evaluating several testing tools, City of Hope settled on Rational TeamTest from Rational® Software, Inc.



Donor biographic information screen from the City of Hope fundraising system, a collection of what was once 80 disparate databases running on various platforms – all consolidated and tested with Rational TeamTest.

Rational TeamTest, built on a scalable, server-based test repository, includes an integrated product suite for testing Windows-based client/server, ERP and Web applications. Rational TeamTest provided City of Hope with a single solution for defect management as well as functional and multi-user testing. The Quality Assurance team made full use of Rational Robot, a major component of Rational TeamTest, to create, modify and run automated tests — including testing PowerBuilder applications at the object level. During Object-Oriented Recording®, Rational Robot queries PowerBuilder to identify the name of each PowerBuilder object. The object name was then used for Object-Oriented Playback of scripts across the applications that City of Hope development team created on the Windows platform. Rational Robot uses object testing to inspect and verify all of the hundreds of attributes, OLE Controls, and PowerBuilder objects. All test results were logged to the central repository and reported in a test log.

"We have been using Rational TeamTest for several years to test, validate, report and manage the programming activities in our fund raising development project," Le said. "TeamTest has given us a new level of confidence that each new release of the software will work in our production environment the way it's supposed to — an assurance that was impossible to achieve manually."

A Complex Environment

"Today's software environment is a lot more complex," he continued. "Most of our older programs, which lead users down a structured tree, have been replaced by event-driven programming. When a user calls up a screen, clicks on a button or performs any other action, that event triggers a whole series of related events. For example, based on the user's action, the program may call up multiple screens, retrieve data, display default information, or highlight specific fields on the screen."

"Also, as our users have become more computer literate, their expectations have risen," Le added. "For example, now, when they exit a screen or change data, they expect the software to perform an automatic save and update the values on the screen and across the relevant databases. This is a much more powerful way of working, but it also creates a very complex testing situation that would be impossible without Rational's automated testing capabilities. And, of course, all the scripts are reusable which saves us time and money in future tests."

Le said that the QA team used Rational Robot to test individual screens and to create a "super script" which tested all the screens at once, an automatic program that ran continuously for three hours. This extensive test would not have been possible using manual methods. In addition, Rational TeamTest allowed QA to perform regression testing after every build, rooting out defects that may have been introduced when previously identified errors were corrected. At one point, new builds were introduced weekly. Complete testing within this rapid timeframe would have been impossible without good automated tools.

Le said that Rational TeamTest solved the communications problems between the programmers and the test team members. "When a defect is found, the QA team member saves the screen into the repository, Rational ClearQuest™/TT Edition, and attaches it to a defect which is automatically sent to the programmer responsible for that screen. Once the fix is made, the status of that defect is updated in the repository and QA team manager is notified. After additional testing, QA either changes the module's status to closed, indicating the problems have been fixed, or sends the defect back for additional rework. Rational TeamTest tracks the status of every defect and provides a common repository that everyone can access. It's a highly efficient process that has kept the project moving on target from build to build."

Today, after years of work, most of the City of Hope's centralized fund-raising database, with its many customized bells and whistles, is up and running. A large production database, in operation for queries since 1997, the system is now fully functional and contains some 1.8 million gift records, 390,000 demographic records and more than 3,000 fields. This system is mission critical for City of Hope and contains key information that not only allows City of Hope to keep its doors open, but to provide new health services and further its cancer research.

Event analysis screen from City of Hope fundraising campaign database system – the lifeline of the medical center's financial activities – tested by Rational TeamTest.

"Even though we're not quite finished, we are already seeing major benefits from the development," said Shorter. Now everyone is looking at the same set of data and more reliable decisions can be made more quickly. Turnaround time on ad hoc reports has been significantly reduced. We can now gather timely decision support information for the organization as a whole and still provide various departments with access to separate reporting databases that reflect their own areas of interest. Without a doubt, the work we've done over the better part of the past decade will make for a fundamental shift in the way City of Hope conducts its business."

Adds Le, "Without the capabilities of Rational TeamTest, we would have never been able to meet our deadlines and satisfy the growing needs of our users. At this point we are ready to move into the 21st century with the confidence that our fund-raising systems will be working at peak efficiency."

For more information about City of Hope visit its web site at http://www.cityofhope.org. ISC's web address is http://www.iscfundpro.com.

"Rational TeamTest solved the communications problems between the programmers and the test team members."

"Now everyone is looking at the same set of data and more reliable decisions can be made more quickly. "

About Rational Software Corporation:

Rational Software Corporation (NASDAQ: RATL), the e-development company, helps organizations develop and deploy software for e-business, e-infrastructure, and e-devices through a combination of tools, services, and software engineering best practices. Rational's e-development solution helps organizations overcome the e-software paradox by accelerating time to market while improving quality. Rational's integrated solution simplifies the process of acquiring, deploying, and supporting a comprehensive e-software development platform, reducing total cost of ownership. Founded in 1981, Rational, one of the world's largest Internet software companies, had revenues of $411.8 million for its fiscal year that ended in March 1999, and employs more than 2,000 people around the world.

Rational
unifying **software** teams

Corporate Headquarters:
Rational Software
18880 Homestead Rd.
Cupertino, CA 95014

Toll-free: (800) 728-1212
Tel: (408) 863-9900
Fax: (408) 863-4120
E-mail: info@rational.com
Web: www.rational.com

International Locations:
www.rational.com/corpinfo/worldwide/locations.jtmpl

CS-309; 10/99. Subject to change without notice.