

**Industry:**  
Health Care Services

**Organization:**  
Major New York City-Based  
Hospital Network

**Description:**  
Cardiac assessment and  
reporting system

**Business Problem:**  
Building a Web-based cardiac  
assessment and reporting  
system to help increase  
productivity, reduce costs and  
enhance customer satisfaction.

**Solution:**  
IBM Rational Rapid Developer,  
Microsoft SQL Server,  
Microsoft MTS

**Key Benefits:**  
Built a complete n-tier,  
enterprise-class cardiac  
assessment system that met  
and surpassed customer  
requirements.

Salvaged a stalled  
development effort started  
by another consulting firm.

Jump-started development  
efforts by reverse-engineering  
database design.

Gained customer buy-in early  
by rapidly creating prototypes,  
and refining them with an  
iterative process.

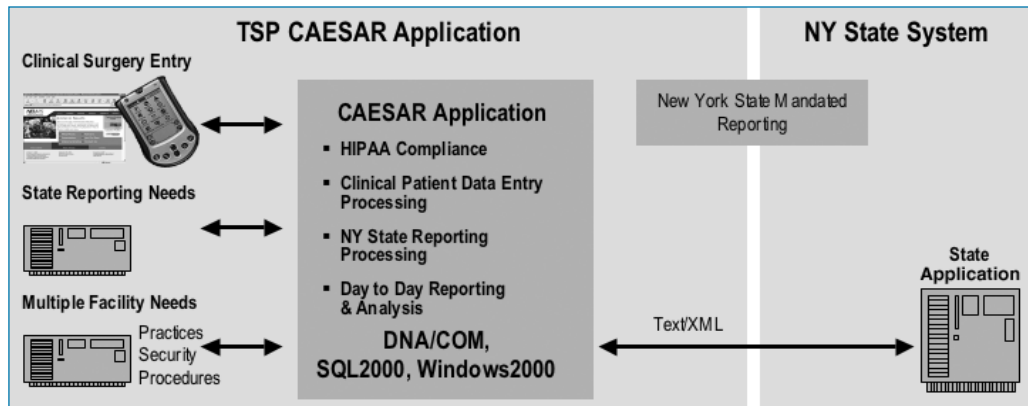
Saved time and resources by  
dramatically streamlining J2EE  
development and n-tier  
infrastructure efforts – resulting  
in ability to focus on higher  
value areas – such as  
comprehensive documenta-  
tion, on-line help and added  
functionality.

Delivered a HIPAA-compliant,  
problem-free application on a  
tight schedule.

Completed a project that  
would typically require 15  
developers with just five.

**Rational** software

## TSP Delivers Comprehensive Cardiac Assessment and Reporting System to New York City-Based Hospital Network On Time Using IBM Rational Rapid Developer



*TSP rapidly constructed a well-architected, n-tier cardiac assessment and reporting system using Rational Rapid Developer. Timesaving features like reverse-engineering and application prototyping led to early customer buy-in, streamlined development efforts, and created the ability to concentrate on real business issues.*

The developers and consultants at Technology Solution Partners LLC (TSP) start every project with the same goal—exceed customer expectations. Based in Shelton, Connecticut (about 60 miles north of New York City), TSP is an information technology consulting and services company that combines technical expertise with powerful development tools, including IBM® Rational® Rapid Developer™, to provide comprehensive and cost-effective software development, management and monitoring services.

### Architected RAD Gets Project on Track

On a recent project, TSP faced a significant challenge to help a leading New York City hospital network create and deploy a full-featured, high-quality cardiac assessment and reporting system. The project was initially attempted unsuccessfully by a large, well-known consulting firm. After watching the consulting firm spend nearly a year to deliver a system that not only failed to meet user demands, but also neglected to take into account the requirements of its partner facility network, the hospital network sought the professional help of TSP.

In addition to the professional expertise comprised by the TSP team, they also leveraged the benefits of Rational Rapid Developer — an architected rapid application development (ARAD) environment. This powerful combination enabled TSP to quickly build a complete n-tier, enterprise-class system that not only meets the hospital's requirements, but provides additional functionality that is helping doctors better assess and analyze cardiac surgeries.

TSP's President Girish Gupta reports that Rational Rapid Developer was a great help to his team's success on the project. "Without Rapid Developer, we would have needed 15 people — instead of just five — and another three managers to manage those 15 people. Also, we could have never accomplished what we wanted to in the short timeframe that we had. With Rapid Developer, we are able to make everything happen on time — develop and deliver the application, deploy it, and maintain it. We could do all these things, because with Rapid Developer our focus was on the application and the business problem, not developing the framework or trying to figure out how to code something in Java™."

**IBM**®

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Girish Gupta,  
President, Technology  
Solution Partners LLC

### **Simplified N-tier Application Development Shortens Development Efforts**

The five developers from TSP used IBM Rational Rapid Developer to complete the project in just three months from the time the specifications were set — an impressive accomplishment considering the complexity of the application, and its numerous requirements.

Gupta explains, “The State of New York requires all New York hospitals that do cardiac surgery to report specific data on cardiac patients to the state every quarter. The hospital network facilities had used different systems for the three types of cardiac surgery: adult, pediatric, and percutaneous. At each hospital the data was manually collected on forms and entered into different applications. With so many systems, and the manual work involved, the reports were frequently late and required intensive effort by network administrators to manage reporting to the state and analyzing across the network.”

When we took over the project, we said ‘We want to go through the basics. Tell us what the needs are.’ We sat down with the users and went through all the requirements. We started from scratch. We were under the gun to deliver, because everyone had already been waiting for this system, and the next deadline to report results to the state was fast approaching—we knew Rational Rapid Developer would be an ideal fit.”

### **Focus on Business Value**

Initially, the basic requirements of the hospitals were simple — they needed a HIPAA-compliant system that would enable the reporting of cardiac data to New York State, on-time. TSP delivered a comprehensive solution that not only fulfilled those requirements, but also included additional functionality. Gupta notes that because Rational Rapid Developer enabled the TSP team to focus on the business logic of the application — and not the implementation details of various layers in the n-tier system — they had time to add various features that the hospital now finds indispensable. “One of the things we were able to achieve was validation of the data so that it meets the state’s requirements. When the hospitals submit data, the system checks it to ensure validity. That was very important,

because now their data is never rejected by the state. Last year was the first time they were able to send the data on-time for all four quarters — and each report was accepted. This was a big achievement, with very high business value,” Gupta says.

“We were able to provide all of those features, all those bells and whistles that the users wanted, because Rapid Developer saved us so much time in other areas. With Rapid Developer, we were able to focus on the application, not on how to make it happen. Because we were not bogged down with how to construct the Web pages, for example, we could take that proactive approach,” Gupta concludes.

### **Rapid, Iterative Prototyping Led to Customer Satisfaction**

Recognizing the shortcomings of the earlier approach, the TSP team knew they had to get buy-in from their customers as early as possible. They applied an iterative development approach and used Rational Rapid Developer to rapidly develop a set of easy-to-understand, browser-based user interfaces, which they then demonstrated for the hospital. Through a combination of visual modeling and automated code construction and deployment, Rational Rapid Developer enabled the TSP team to rapidly prototype and deploy full use cases for review by their customer. Gupta recalls, “When we started, the users were still not sure what they wanted, so we had to go through analysis iterations to determine what they wanted. In the meantime, we developed demo versions, which we standardized using guidelines from the Center for Disease Control (CDC). With Rapid Developer, we could develop different concepts quickly. We showed them three or four designs with different themes. Using the rich style repository functionality of Rational Rapid Developer, TSP professionals were able to standardize the look and feel across the entire application. Additionally, we showed them how a user would navigate the site. They picked the theme they liked, and we were set.”

### **New Design Improved Ease of Use and Performance**

Rajasekhar Gopiseti, Manager of Development at TSP and a key contributor to the project, notes. “While it took months for the

other firm to develop a system that could be demonstrated, TSP was able to demonstrate a coherent and consistent user interface with Rational Rapid Developer in just a few days. Rational Rapid Developer helped TSP develop an interface that was not only better organized – with a separate page for each section – it also performed better because only a fraction of the data was being retrieved or saved when a page was displayed or submitted.”

### **Jump-started Development**

With the user interface modeled and developed in IBM Rational Rapid Developer, the TSP developers had a running start when they began implementing the business logic for the application. To further accelerate the early phases of development, the team used Rational Rapid Developer to leverage some of the work started by the other consulting firm. Using Rapid Developer, TSP reverse-engineered the existing database into a database model. They then made changes to the model in Rapid Developer, created a new database schema, and persisted the new database for Microsoft SQL Server. “The reverse-engineering really gave us a healthy jumpstart,” Gupta notes.

### **Reduced Maintenance and Testing Costs**

Rational Rapid Developer provided the TSP team with significant advantages in the testing and maintenance phases of the development lifecycle as well. Gopiseti states, “With Rational Rapid Developer, maintenance is very easy. The developer is only dealing with the business logic, and nothing else — not the database construction, or how he is going to update it. Rapid Developer handles all that for you. Developers are most focused on writing the business logic — the true value. That is a real advantage in the maintenance of the application. We don’t have to mandate a particular style or development framework; it is all taken care of by Rapid Developer. Since it is all automatically constructed code, we spend a lot less time in maintenance, debugging, testing and deployment.”

Gupta agrees, “With Rapid Developer we don’t even need a person to maintain the code after deployment. In the past we would need somebody who knew the code intimately. Now, you go into the object model and update it directly.

It is that simple. And our testers can focus on application-oriented tests rather than technology-oriented tests. We are not testing to see why a page wasn’t working because it was coded wrong in Java; we are testing to make sure the application’s business logic was correct.”

### **Exploring New Opportunities**

Rational Rapid Developer helps TSP manage the complexity of multiple technology platforms by constructing complete applications across all tiers of a system, for a wide range of deployment environments. This provides TSP customers with technology vendor independence and insulates their development teams not only from the complexity of n-tier development, but also from rapidly changing technologies. The ability of Rapid Developer to construct these multi-tier applications for a wide range of Web servers, application servers, relational and mainframe databases, and message transport technologies is helping TSP pursue new opportunities.

“On this project, we are using Microsoft SQL Server 2000, the Windows 2000 platform, and COM/DNA technology,” Gupta explains.

“Recently, we started working with a prospective customer, and they wanted to see what we could do in the [IBM] WebSphere® and [BEA] WebLogic areas. Using Rapid Developer, we quickly generated the cardiac application for those environments. The application worked perfectly and we were able to demonstrate it on-line. With Rapid Developer, we can quickly bring the application to any technology we need to.”

### **More Productive Developers, Substantial Cost Savings**

One of the key benefits that TSP realized as a result of using Rational Rapid Developer is the increased productivity of new Java programmers on complex projects, such as the one they completed for the New York hospitals. Gupta explains, “We don’t have to commit to a large team of highly efficient Java programmers — we need good application developers. The five people on this project were not experienced, four-year programmers. They were able to handle it because they understood the requirements and how to code the business logic. Developers coming from Visual Basic, or JavaScript — it is easy for them.”

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Rajasekhar Gopiseti,  
Manager of Development,  
Technology Solution Partners  
LLC

As president of TSP, Gupta reports that Rational Rapid Developer has provided exceptional benefits from a business perspective, by helping shorten development times, reduce costs, and deliver complete, highly reliable solutions. "Rapid Developer enforces a standard way of developing the application. This reduces the cost of maintaining the application. And since everything is modeled right in Rapid Developer, and the model explains the majority of the application, you don't need to create intensive documentation. The documentation effort is reduced significantly, so that on a regular project we can finish everything, including documentation and help, on schedule. After the analysis is done, we can complete a project using Rapid Developer in 30 percent of the time it would take without Rapid Developer. And, the benefit to the hospital is that they have gained a powerful solution to meet their business needs. What's more is that the application works exactly the way the user wants it to. The combination of our exceptional team of professionals, coupled with the power of Rapid Developer, enabled us to deliver this problem-free and feature-rich application well within the required timeframe."

"We can complete a project using [IBM Rational] Rapid Developer in 35 percent of the time it would take without [IBM Rational] Rapid Developer."

Girish Gupta,  
President, Technology  
Solution Partners LLC

## About Rational

Rational provides a software development platform that improves the speed, quality, and predictability of software projects. This integrated, full life-cycle solution combines software engineering best practices, market-leading tools, and professional services. Ninety-six of the Fortune 100 rely on Rational tools and services to build better software, faster. This open platform is extended by partners who provide more than 500 complementary products and services.

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