



Case Study

**Enhancing Product
Quality for a Global ISV :
through Sustenance
Engineering, Testing and
QA services**

With Sustenance Engineering, Testing and QA services, Sonata improves the product quality of a global ISV.



The customer needed to improve its product features and quality to reclaim its reputation amid the user community. In addition, it also required a faster time to market for its products in an increasingly competitive market. They required a team of engineers to provide maintenance & testing services for their products to be made available across multiple platforms - including the Windows platforms and different flavors of Linux.

Customer Profile

The customer, a US based Independent Software Vendor (ISV), is a provider of secure Embeddable Database and 4GL RAD Visual development tools for building applications. Since the company's inception in 1984, the technology and expertise of the customer has benefited more than one million users around the globe.

Business Scenario

The IDE & RDBMS products are enhanced periodically with major and minor releases. Minor releases focus on providing fixes for critical defects that affect the users of the product whereas major releases provide enhancements in addition to defect fixes, based on the needs of their end customers. Sonata was required to provide QA/ validation services, sustenance engineering support and testing services for the IDE & RDBMS products.

Solution Delivered

Sonata delivered testing, maintenance and porting services for the customer's IDE and RDBMS products. The team delivered a comprehensive set of testing services including functional, regression, compatibility (Platform/ DB), installation and performance testing, covering over 22,000 test cases. The Sonata team was also involved in Compatibility Testing of the database product over 21 different combinations of connectivity protocols, Operating Systems (customer & server) and encryption levels.

Thus, Sonata helped the customer in the optimization of the testing activity through effective automation. The maintenance team was involved in re-engineering of the complete IDE which is about 1 million lines of code using QT tool-kit to make it compatible for both Windows and Linux. The maintenance team provided enhancements and defect fixes for IDE and RDBMS products.

SOLUTION OVERVIEW

Profile

Sonata Software, headquartered in Bangalore, India, is a leading IT consulting and services company. Sonata's customers are located across the US, Europe and the Asia-Pacific region. Its portfolio of services includes IT Consulting, Product Engineering Services, Travel Solutions, Application Development, Application Management, Managed Testing, Business Intelligence, Infrastructure Management and Packaged Applications. As per the industry rankings released by NASSCOM for FY07-08, Sonata Software ranked among the Top 20 IT Software and Service Exporters in India.

Website

www.sonata-software.com

Scenario

QA/ Validation services, sustenance engineering support and testing services for the customer's IDE and RDBMS products

Platforms /Technologies

- OS: Windows, Linux (different flavors)
- Tools: Visual Studio, Rational Robot, SilkTest, Squish, Vantive, Timbuktoo, Newsgroup, VMWare
- DB: Oracle, SQLServer, Sybase, SQLBase, Informix, DB2, MaxDB, Firebird, MySQL

Benefits

- Improved product quality
- Consistent and timely product releases
- Fully outsourced QA team, resulting in improved documentation and enhanced developers regression suite
- Access to the Indian market, through our Indian product reselling arm

The services delivered include:

- Testing
- Maintenance
- Re-engineering
- Porting
- Documentation
- Installer packaging

Since its initiation in 2002, the customer's relationship with Sonata has been immensely productive. Sonata not only helped the customer in improving the product quality, it also provided a gamut of other value-added services including Product Sustenance, Enhancements and Specialized Packaging. Sonata went as far as providing product distribution services to the customer in the Indian market. With its active participation in end-customer newsgroups for problem resolution and leveraging, and its in-depth knowledge of the customer's products, Sonata has helped the customer earn tremendous appreciation in its user community.

Delivery Model

Three key projects were executed for the customer. They are described in the table below

S. No	Project Name	Description of tasks undertaken
1.	Testing of the IDE product used for Application development	<ul style="list-style-type: none"> • Functional, installation/ sanity, regression, MATS, connectivity and performance testing • Testing across 6 Windows platforms and different flavors of Linux using Windows emulation software
2.	Sustenance Engineering of IDE product used for application development	<ul style="list-style-type: none"> • Analysis, design and incorporation new enhancements • Analysis and fixing of defects performed on multiple code lines and cloned in the defect tracking system for sustained maintenance • Re-engineering of IDE using QT toolkit for true cross platform compatibility for Windows & Linux.
3.	Testing of RDBMS product	<ul style="list-style-type: none"> • Regression, compatibility, connectivity, performance and installation testing • Defect Verification on the new builds and maintenance releases
4.	Sustenance Engineering of	<ul style="list-style-type: none"> • Analysis, design and incorporation new

S. No	Project Name	Description of tasks undertaken
	RDBMS product	enhancements <ul style="list-style-type: none"> ● Analysis and fixing of defects ● Implementation of ODBC, OLEDB, JDBC and NDP Unicode Drivers for Unicode Database. ● Migration Utility for Unicode Database.

Tools and Technologies Used

Operating Systems	Windows, Linux (different flavors)
Tools/ Technologies	Visual Studio, Rational Robot, SilkTest, Squish, Vantive, Timbuktoo, Newsgroup, VMWare , QT, Unicode Libraries, OLEDB, ODBC, JDBC, NDP
Databases	Oracle, SQLServer, Sybase, SQLBase, Informix, DB2, MaxDB, Firebird, MySQL

Business Benefits

- Improved product quality with resolution for critical defects
- Consistent and timely product releases
- Fully outsourced QA team, resulting in improved documentation and enhanced developers regression suite
- Access to the Indian market, through our Indian product reselling arm, a true reflection of our multi-faceted relationship with ISVs
- 50% savings in Engineering resources
- 25% reduction in Engineering cost (USD 0.6 m per annum)
- Consistent, timely releases
- Improved quality of products, resolutions for Critical/ long pending defects

Sonata Value Addition

- Active participation in end customer news groups for resolution of problems. With deep knowledge of the customer's products, it is possible to help end-users. This has earned the customer much appreciation in the user community.
- Optimization, Automation and Process orientation of products and testing.

Key Project Details

1. Testing for Application Development IDE RAD tool

IT challenge

The IDE product is enhanced periodically with Major and Minor releases. Minor release focuses on providing fixes for critical defects that affect users of the product but Major release provides enhancements in addition to defect fixes based on the needs of the customers that are elicited through customer advisory board meetings.

The customer wanted Sonata to provide the QA/Validation services for the IDE product, which is a development tool, to make sure that it fulfills all the new functionality and existing functionality work as before.

Scope of work

For QA of the IDE product

- Testing the releases and Patches; Preparation of test plans/cases for new functionality; Functional testing for new features
- Installation/Sanity testing; Regression testing of existing functionality
- MATS tests – manual and partly automated; Automated tests using Rational Robot and SilkTest; Automate testing of new features and fixed defects
- Connectivity tests; Performance testing
- Confirming defects; Verification of fixed defects
- Documentation review for new features
- Increased number of platforms to be tested from 2 to 6 Windows platforms. Earlier done on Win 2K and NT. Also done on 6 platforms Win NT, Win 2K, Win 98, Win ME, Win XP, and Win 2003. In addition to the windows platforms, the customer extended support for different flavors of Linux platform using windows emulation software such as Wine and Crossover.

Product Description - IDE RAD tool

The IDE product is an object-oriented, 4GL-tool set. It has a built-in version control, customizable coding environment, and native connectivity to a wide range of popular databases; it is used for building large-scale, enterprise-wide applications with access to variety of databases using ODBC, OLEDB or native connectivity. This tool facilitates development of COM components, use of any other COM components and has tight integration with Office 2000. It also facilitates development of web-enabled applications.

Tools/Technologies used

Operating Systems	Windows NT, 2K, XP, 2003, 98, ME, Linux (Redhat/Suse) with Wine/Crossover
Tools/ Technologies	Oracle, SQL Server, Sybase, SQLBase, Informix, DB2
Database Connectivity	Native, ODBC, OLEDB
Tools	Rational Robot, SilkTest, Vantive, Timbuktoo, Newsgroup, Visual Purify, VSS

Project Metrics

- 8400+ regression test cases/applications
- One release: 9 months, 23 builds, 1709 new test cases, 479 defects verified
- Team- 8 persons - 158 person-months so far
- Duration: 26 months
- 4 major releases and 7 patches

Business Benefits

- Reduced QA Turnaround time
- Improved Test coverage by automation and optimization
 - o Partial Automation of MATS testing resulted in reduction in execution time from 2 person-days to 1 person-day.
 - o Automation of database connectivity testing resulted in reduction of execution time from 8 person-hours to 3 person-hours
- Extended relationship to Maintenance and testing of database product
- Better Quality product release resulting in enhanced satisfaction for client's customers
- Fully outsourced QA team
- Enhancing the regression suite
- Improving the documentation
- Rationalization of database connectivity scripts resulted in reduction of number of scripts and thus enhancing maintainability.

2. Sustaining Engineering of IDE RAD product used for Application Development

IT challenge

The IDE product is enhanced periodically with Major and Minor releases. Minor release focuses on providing fixes for critical defects that affect users of the product but Major release provides enhancements in addition to defect fixes based on the needs of the customers that are elicited through customer advisory board meetings. The customer wanted Sonata to provide sustaining engineering support for the IDE product using co-development model in which Sonata team had to work closely with the customer's development team.

Scope of work

The IDE product has a code base of 1 Million lines. The maintenance required:

- Impact analysis for New enhancements
- Analyse/Design & Incorporate New Enhancements
- Defect analysis and provide fixes
- Unit Test cases and testing for modified functionality/defect fixes
- Regression testing using developers test suite
- Development of regression scripts for new functionality

Project metrics

- Team - 6 people - 99 person months
- 3 major releases and 4 patches
- Duration: 22 months
- Average turnaround time for defect fixes in days: Simple - 2, Medium - 4, Complex - 8

Defect fixes were done on multiple code lines. The defect that needed to be fixed on multiple code lines were identified and cloned (for the version/ patch that it is planned) in the defect tracking system. These defects were then assigned to the maintenance team. Maintenance team would fix the defect on that particular code line.

Tools/Technologies used (architecture)

Operating Systems	Windows 2000, Linux (Redhat/ Suse)
Tools/ Technologies	Oracle, SQL Server, Sybase, SQLBase, Informix, DB2
Database Connectivity	Native, ODBC, OLEDB
Tools	Rational Robot, SilkTest, Vantive, Timbuktoo, Newsgroup, Visual Purify, VSS

Business Benefits

- Team was productive in 3 weeks inspite of limited documentation
- Offshore code maintenance/enhancements
- Improving documentation
- Structured approach to analysis and maintenance
- Enhancements to the developers regression suite
- Resolutions for Critical/long pending defects resulted in better response and satisfaction to the client's customers.
- Extension of Web Stub to Linux/Apache web server

3. Testing of RDBMS product

IT challenge

To test the new version of the RDBMS product, to make sure that it fulfills all the new functionality and existing functionality of older version.

Scope of Work

- Functionality/Regression testing to determine whether the functional requirements are fulfilled and maintained
- Testing of database connectivity using different protocols, namely, APIPE (Local), TCP, SPX and MPIPE
- Compatibility testing to validate the application with different operating systems using different modes of connectivity and also with different levels of encryption
- Performance testing in scenarios of Concurrent users, transactions (one million), and different cache settings (upto 1 GB), etc.
- Testing with ANSI joins and non-ANSI joins.

- Connectivity testing for the driver pack using ODBC, JDBC, OLEDB and Dot Net Data Provider
- Testing for Third Party tool integration with tools like Crystal Reports, Office XP, etc.
- Installation testing; Preparing test cases and scripts for new features;
- Defect Verification on the new builds and maintenance releases
- Enhancement of Regression suite; Testing documentation and online help.

Product Description : RDBMS product

The product is a fully relational, zero-administration, embeddable database that allows companies to manage data closer to the customer, where capturing and organizing information is becoming increasingly critical.

Project Metrics

- Team- 5 people - 97 person months so far
- Duration: 22 months so far
- One release: 8 months, 36 builds, 1344 new test cases/scripts, 467 defects verified
- 3 major releases and 5 patches

Tools/Technologies used

Operating Systems	Win NT, Win 2000, WinXP, Win 2003, Win ME, Win 98, Netware 5.1/6.0, Linux (Redhat/Suse)
Database Connectivity/ Protocols	CAPI, ODBC, OLEDB, JDBC, NDP APipe, MPipe, TCP, SPX-Netware, SPX-MS
Tools	Vantive, Timbuktoo, Newsgroup

Business Benefits

- Outsourced QA Lab
- Independent Verification of the fulfillment of requirements
- Validation of new and enhanced functionality
- Status of quality of the product

Highlights

- Regression testing with 647 test applications
- Regression testing involving 26 cycles covering 11 operating systems, 4 modes of connectivity, 4 types of protocol, 4 levels of encryption and 2 versions of product.
- Improved test coverage by automation and optimization
- Development of multi-user tests to establish Benchmark
- Active participation in public news groups for resolutions to the problems faced by end users of the product
- Clarifications of technical issues through newsgroups.

Project Metrics:

Module	TDMaint	TDQA	SQLBaseDev	SQLBaseQA	GWebMaint	TDInstaller	Total
Effort	496.91	580.07	144.66	404.13	43.4	3.5	1672.67
Peak Team Size	15	15	11		1	3	45
Duration	12/8/2002 to 31/07/2007	25/03/2002 to 27/02/2007 Bottom of Form	3/1/2005 to 31/01/2007	5/8/2002 to 31/01/2007	1/12/2003 to 31/01/2007 Bottom of Form	21/11/2003 to 25/12/2003 Bottom of Form	25th March 2002 to 31st July 2007
Onsite effort	9	1	0	1	0	0	11
Offshore effort	487.91	579.07	144.66	403.13	43.4	3.5	1661.67
% cost benefit		0.25					
No. of Test Cases		Test cases: 11300; Test apps: 5200		6200			
(Any more parameters)		58 months, 5 major releases and 13 patches					

Customer Testimonials:

“Yet another milestone achieved! My sincere thank you and congratulations to each of you. Although this relatively a small step towards the final release goal, it is a significant achievement. It allows our customers to touch and feel (and almost do lot of things that they do today with our product) the product and helps build confidence in the upcoming release. I am proud of your achievements and I am sure you will be too!”

“Hearty congratulations and our sincere thanks to each and everyone for your direct and indirect contribution towards making this Team Developer 5.0 release a reality! As the email below states and many to follow, this release is one of the most important releases in our product release history. Team Developer 5.0 provides our customers and partners with many benefits in developing and promoting their applications. This release also helps us unify with customer/revenue retention and growth potential.

Thanks again for everything you have provided to the success of this project. Be proud of this achievement.”

For more information, contact info@sonata-software.com

Click here to know more about our [Testing Services](#)