

AUTOMATED TESTING TOOL EVALUATION

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EXECUTIVE SUMMARY:

For the first two weeks in October, one or two hours each day were spent studying the latest automated testing methodologies and searching for top of the line automated testing tools. By the 15th of October three automated testing tools were selected for evaluation. A 30 day evaluation copy of each automated testing tool was requested from the vendors. The automated testing tools selected were Compuware's QARun, Mercury Interactive's WinRunner and Rational's Team Test.

I have not worked with QARun before so we immediately down loaded a copy of Compuware's QARun from the Internet so I could start learning how to run it. Because it was not yet loaded on the CITRIX server I tested it as a stand alone tool against the SKYWARD, Legacy/Wise applications on my work station to see if QARun could run against those applications. That testing was successful for the Legacy and Wise applications but not the SKYWARD application. QARun can not see some of the objects in the SKYWARD application in the stand alone environment.

Starting on the 30th of October the automated testing tool license for WinRunner was obtained from the vendor and installed on the CITRIX server with a 30 day evaluation trial period. QARun was also installed on the CITRIX server at that time for evaluation in the CITRIX environment. On November 13th we loaded the Rational Team Test license on the CITRIX server and began the 30 day evaluation testing of that automated testing tool against our SKYWARD application. Evaluation of the automated testing tools continued full time through the 22nd of November. WinRunner and QARun do not work well with the SKYWARD application in the CITRIX environment. Tests on Rational's Team Test in the CITRIX environment against the SKYWARD application proved to be very successful. As a part of the test evaluation, modular Team Test automated test scripts were written to create a partial set of regression tests that are now available and can be run as a part of our Washington Feature Set PMP testing.

The test results of our automated testing tool evaluation show that Rational's Team Test is clearly the superior automated testing tool to use with our SKYWARD application. There are now ten days left on the 30 day evaluation period for Team Test before a permanent license will need to be installed for the Team Test automated testing tool so the script writing can be continued.

INTRODUCTION:

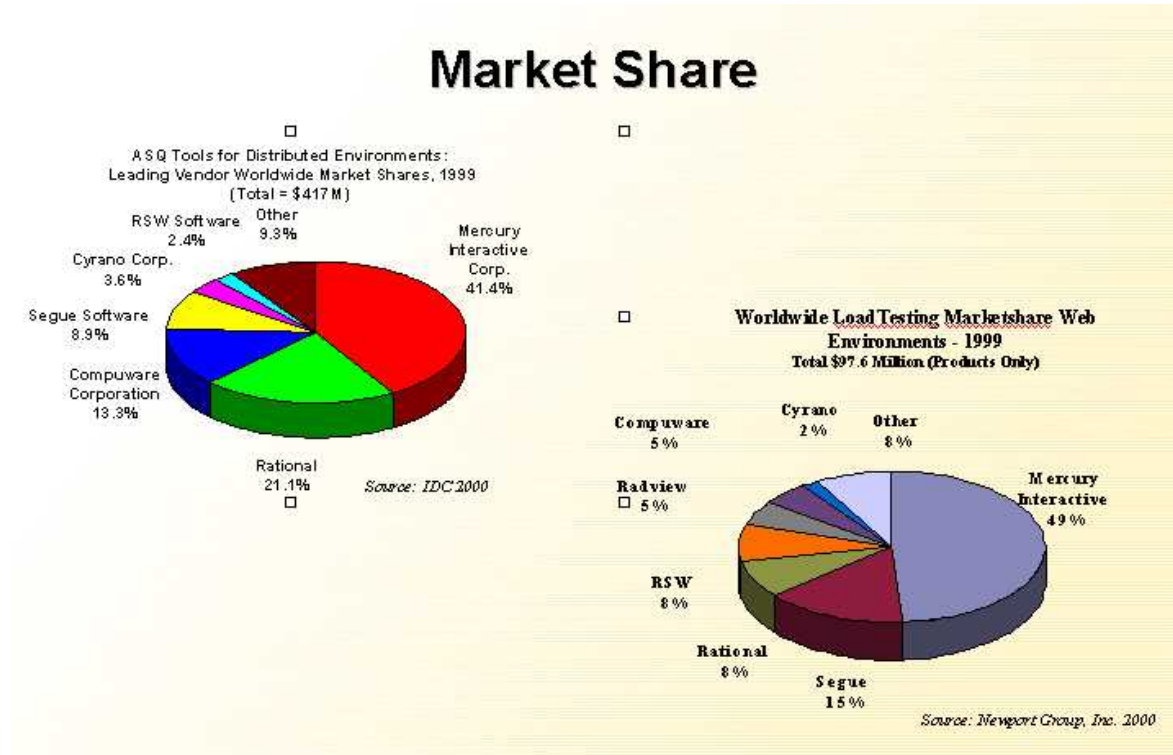
There are a number of Automated Testing tools on the market today. The following is just a representative list of the major vendor products that are most widely used. (The highlighted tools are the ones we tested)

Android
Atesto Functional Testing Service
Autoscriptor Inferno
AutoTester for Windows
AutoTester for OS/2
CAPBAK
Certify
CitraTest
e-Monitor
e-Tester
eValid
Forecast
imbus GUI Test Case Library
Jemmy
QARun
Panorama-2
QC/Replay
QES/EZ for GUI
Monitor Master
Rational TeamTest
Segue
SET (Solution Evaluation Tool)
SilkTest
Smalltalk Test Mentor
SQA TeamTest: ERP Extension for SAP
TestBench400
SQA TestFoundation for PeopleSoft
Tasker
Test Now
TestQuest Pro Test Automation System (formerly B-Tree Systems, Inc.)
TestRunner
Unified TestPro (UTP)
Vermont High Test Plus
Visual Test
WebKing
WinRunner
xrc - X Remote Control
XRunner

For due diligence purposes, we have used the five criteria below to select and evaluate automated test tools

FIRST

The first consideration in selecting an automated testing tool was market share in the industry. The three tools holding the largest market share were as follows (Source: Stickyminds.com Ray Robinson, Automation Test Tools Comparison posted Sep 18, 2001)



The three tools that have the largest market share are then, Mercury Interactive’s WinRunner with 41.4%, Rational’s Team Test with 21.1% and Compuware’s QARun with 13.3%. Those three tools were then considered for further evaluation to see if they were the ones to be selected.

SECOND

The second consideration was company financial standing. Many of the automated testing tool vendors have created products and then have gone out of business leaving the users without recourse. The same three automated testing tool vendors were at the top of the list in company stability. (Source: Corporate Internet Web Page For Each Company)

Compuware

Founded in 1973
2 Billion per year in sales
15,000 employees
9,500 customer service reps
In 2001 Compuware announced a five-year, \$75 million dollar agreement with Detroit Public Schools to provide information technology services to the district. The agreement provides for two, two-year extensions
Home Office: Farmington Hills, MI

Rational

Founded in 1981

One of the world's largest, most profitable software development companies, with over \$689 million in revenues (FY ended 3/31/02).

3,500+ professionals in 80 locations throughout the Americas, Europe, Middle East and Asia-Pacific.

The vendor selected by 98 of the *Fortune* 100.

The leader in multiple segments of the software development lifecycle management market.

The "company that put the 'unified' in modeling languages" by creating the Unified Modeling Language.

Winner of more than 50 industry awards.

Home Office:

Rational Software Corporation

18920 Forge Drive

Cupertino, CA 95014

(1-800-728-1212)

Mercury Interactive

Founded in 1989
Subsidiaries: Freshwater Software
Offices in 25 countries
1733 employees
Revenue: 2001: \$361.0 Million, up 18% from 2000 2000: \$307.0 Million, up 64% from 1999 1999: \$187.7 Million, up 55% from 1998
Nasdaq Stock Symbol: MERQ listed in S&P 500 & Nasdaq 100 Index
Recent Awards: #1 in Software Elite Category of Forbes ASAP's Dynamic 100 for 2001 #9, Fortune Magazine's 100 Fastest Growing Companies for 2001 #37, The BusinessWeek 50 for 2001 One of the Twelve Hot Companies to Watch, Intelligent Enterprise Magazine #40, Forbes 200 Best Small Companies WebStar Service Award from the Service & Support Professionals Association
Home Office: Mercury Interactive Corporation 1325 Borregas Avenue Sunnyvale, CA 94089 USA Tel: (800) 837-8911 (US toll-free), (408) 822-5200 Fax: (408) 822-5300

THIRD

The third consideration was customer service. That is almost as critical as the tool features. If you are not able to solve a problem and can not get help the tool is useless.

Compuware:

I have never worked with Compuware before. I therefore found some problems with the automated testing tool and called the customer service help line to see what kind of service I would get. I would think that an evaluation customer would get top of the line service to try to make the sale. It took 2 days for them to call me back. The person who called me back did not even know what the syntax for the language was. He said he would have to look it up and call me back. All I was asking was if the comma went inside the quote marks or outside the quote marks. The reason for my question was that in the book it was one way and the on-line help showed it the other way. I tried it both ways and neither example would work. He spent 3 more days looking it up then sent me a solution that did not work and said he would get back to me. I am still waiting. That was 3 weeks ago. The sales person has never called me to see if we tried the tool or if we wanted to purchase it.

Mercury Interactive:

I have worked with them before on the W2K project. They have an excellent customer service department. It is top of the line. I emailed them 3 pages of questions and within one day I had answers to every question. I also got a phone call from one of the head technical customer service people. He has spent several hours with me on the phone trying to work out the problems we are having with the tool seeing the application. He has even offered to fly up here and look at our server on site to see if he can solve the problems. Their service is excellent. The sales representative has also called me several times to see how things were going. He always returned my calls when I called him.

Rational:

There is not better service available anywhere. I have worked with them for 7 years and the service gets better every year. They have spent hours with me on the phone helping me install the tool on CITIX. They have helped me write code to work around some problems. The sales representative calls me at least 2 or 3 times a week just to make sure there is nothing else that I need that she could help me with. They are the best of the best at customer service. The tool is worth buying just for their service.

FOURTH

When using an automated testing tool there will come a time when other software tools will need to be added onto the testing tool or work in a suite with it. The forth consideration in looking for an automated testing tool was the other compatible software tools available from the same vendor that could be used in conjunction with the automated testing tool. All three vendors have a full complement of add on tools available.

Compuware:

Quality Assurance Testing Tools for Distributed Systems
Reconcile Trace requirements throughout the project life cycle
QADirector Manage the test process from planning to execution
QACenter Performance Edition Execute load and performance testing
QADirector Manage the test process from planning to execution
QARun, TestPartner Perform functional test automation
TrackRecord Automate project tracking and defect management
File-AID/CS Manage test data
Application Expert Analyze pre-production performance
Application Vantage, ClientVantage, ServerVantage, NetworkVantage Troubleshoot performance problems
ClientVantage, ServerVantage, NetworkVantage Manage service levels
ServerVantage, NetworkVantage Monitor server and network performance
Application Expert, Application Vantage, ClientVantage, ServerVantage, NetworkVantage Measure and analyze response times
Application Expert Analyze
Application Expert, Predictor WAN provisioning
QACenter Performance Edition Execute load and performance testing
Quality Assurance Testing Tools for MainFrame Systems
QAHiperstation Ensure enterprise server reliability, record mainframe server activity and provide repeatable test execution
XPEDITER/Code Coverage Ensure that your testing practices are effective and excuting business logic within your applications
XPEDITER/DevEnterprise Analyze, segment, build, test and extend applications for large maintenance and

development projects
Abend-AID Maintain and ensure service level agreements
STROBE Measure and analyze OS/390 and z/OS application performance
iSTROBE Analyze application performance data via a web browser
Abend-AID Detect, analyze and resolve application faults
Abend-AID Fault Manager Obtain real-time and historical reporting information
Abend-AID for WebSphere MQ Automate problem solving for WebSphere MQ

Mercury Interactive:

Enterprise Testing
ActiveTest ActiveTest SecureCheck Astra LoadTest Astra QuickTest Astra SiteManager LoadRunner LoadRunner TestCenter QuickTest Pro TestDirector TestSuite WinRunner XRunner
Production Tuning
ActiveTune ProTune
Application Performance Management
ActiveWatch ActiveWatch SLM Topaz Topaz Business Availability Topaz Diagnostics Topaz for SLM Topaz ActiveAgent Topaz Auto RCA Topaz Console Topaz Observer Topaz Open DataSource Topaz Prism Topaz Rent-a-POP Topaz SiteScope Topaz WeatherMap Freshwater SiteScope

Rational:

Complete Solution

- [Rational Suite AnalystStudio](#)
- [Rational Suite ContentStudio](#)
- [Rational Suite DevelopmentStudio](#)
- [Rational Suite TestStudio](#)
- [Rational Suite Enterprise](#)

- [Solutions for Java](#)
- [Solutions for .NET](#)
- [Solutions for Embedded Software](#)

Ada Development	Business Modeling	Component Testing
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| <ul style="list-style-type: none"> • Rational Apex Family • Rational Test RealTime | <ul style="list-style-type: none"> • Rational Rose | <ul style="list-style-type: none"> • Rational Test RealTime • Rational Rose |
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Configurable Process	Data Modeling	Defect & Change Tracking
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| <ul style="list-style-type: none"> • Rational Process Workbench • Rational Unified Process | <ul style="list-style-type: none"> • Rational Rose • Rational XDE | <ul style="list-style-type: none"> • Rational ClearQuest |
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Functional Testing	Performance Testing	Real-Time Development
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| <ul style="list-style-type: none"> • Rational Robot • Rational Team Test | <ul style="list-style-type: none"> • Rational TeamTest | <ul style="list-style-type: none"> • Rational Suite DevelopmentStudio • Rational Rose RealTime • Rational Test RealTime • Rational PurifyPlus RealTime |
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Reliability Testing	Reporting & Progress Measurement	Requirements and Use Case Development
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| <ul style="list-style-type: none"> • Rational PurifyPlus | <ul style="list-style-type: none"> • Rational ProjectConsole • Rational SoDA • Rational TestManager | <ul style="list-style-type: none"> • Rational Requisite Pro |
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Runtime Analysis	Test Management	Version Control
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|---|--|--|
| <ul style="list-style-type: none"> • Rational PurifyPlus • Rational Test RealTime | <ul style="list-style-type: none"> • Rational TestManager | <ul style="list-style-type: none"> • Rational ClearCase |
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Visual Modeling, Design & Development

- [Rational Rose](#)
- [Rational XDE](#)

FIFTH

The fifth and most important consideration for purchase of the automated testing tool is compatibility with our SKYWARD application.

Compuware:

Works quite well when running against the SKYWARD application. The automated testing tool can see most of our window objects. However there is one object that it simply can not see. Even with recording by coordinates it can not click on the SkyPrint window close button. I have spent several hours trying to find a solution to that problem. I simply can not find one. That is a

show stopper right there. There are other problems with writing the code, but I could never get help from the service people to know how to solve those problems. Getting around that one problem prevented me from writing even one script in the several days I worked with the tool and because of the poor customer service I am still waiting for them to call me back to see if they can help me find a solution. That alone would make the tool an unacceptable choice. Customer service is a must and they don't have it.

Mercury Interactive:

This is by far the best of the three automated testing tools. It has better features and more of them. It is a much more powerful testing tool. The file compare tool built in is just perfect for what we want to do. It will take any two files or series of files and compare the text in them to any other files that you want to compare them to. However all of the recording of the SKYWARD application is done by Object Index Pointer numbers. Every time you close a screen in SKYWARD and open it again the index pointer numbers change. I have worked for several days with their technical people and with Joe Towns but we can not find any solution to that problem. The index pointer numbers changing makes the tool unusable with SKYWARD.

RATIONAL:

I have used Rational Team Test's ROBOT automated testing tool for 7 years so I had an unfair advantage in making that tool work. But it really did not take much to make it work. It fits almost seamlessly with our SKYWARD application. It does not look at Object Index Pointer Numbers in recording. The actual recording of Object Index Numbers has only come up one time in writing numerous test scripts and that Object Index Number does not change when the windows are opened and closed. That was a major problem with the other two tools being evaluated. Those Object Index Numbers may change when the code is recompiled but that would be very seldom and with that few Object Index Numbers in the code it would be easy to maintain.

I found one place that the tool could not see the object on the window. That is the tabs on the main student window. However to click on those tabs, I was able to record the mouse click by using coordinate recording and it worked just fine. I was able to write 75 scripts in two days with ROBOT and they will all run repeatedly without failing. I was not able to write even one script with the other two tools in two weeks because we could never get either of them to work well enough to even run one script.

In Conclusion:

There really is no contest between the three tools when running against the SKYWARD application and our Washington Feature Set modifications. Rational Team Test has shown itself to be far superior and we therefore make the following recommendation concerning the purchase of an automated testing tool:

1. Purchase a single floating license for Rational's Team Test which includes SQA Robot and Test Manager. Approximate Cost \$6990
2. Purchase the Rational annual maintenance contract for the software. Approximate Cost \$1398 per year.
3. Schedule me for a local 3 day training course on Rational Team Test. Cost \$1795.00.
4. Purchase a single shareware license for the ExamDiff File Compare tool from <http://www.prestosoft.com/examdiff/examdiff.htm>. Cost \$25
5. Purchase a license for Visual Basic 6.0 to be loaded on my work station for development of enhanced ROBOT scripts. Cost \$109