

Transforming and Simplifying Software Development

Continuously ensuring quality

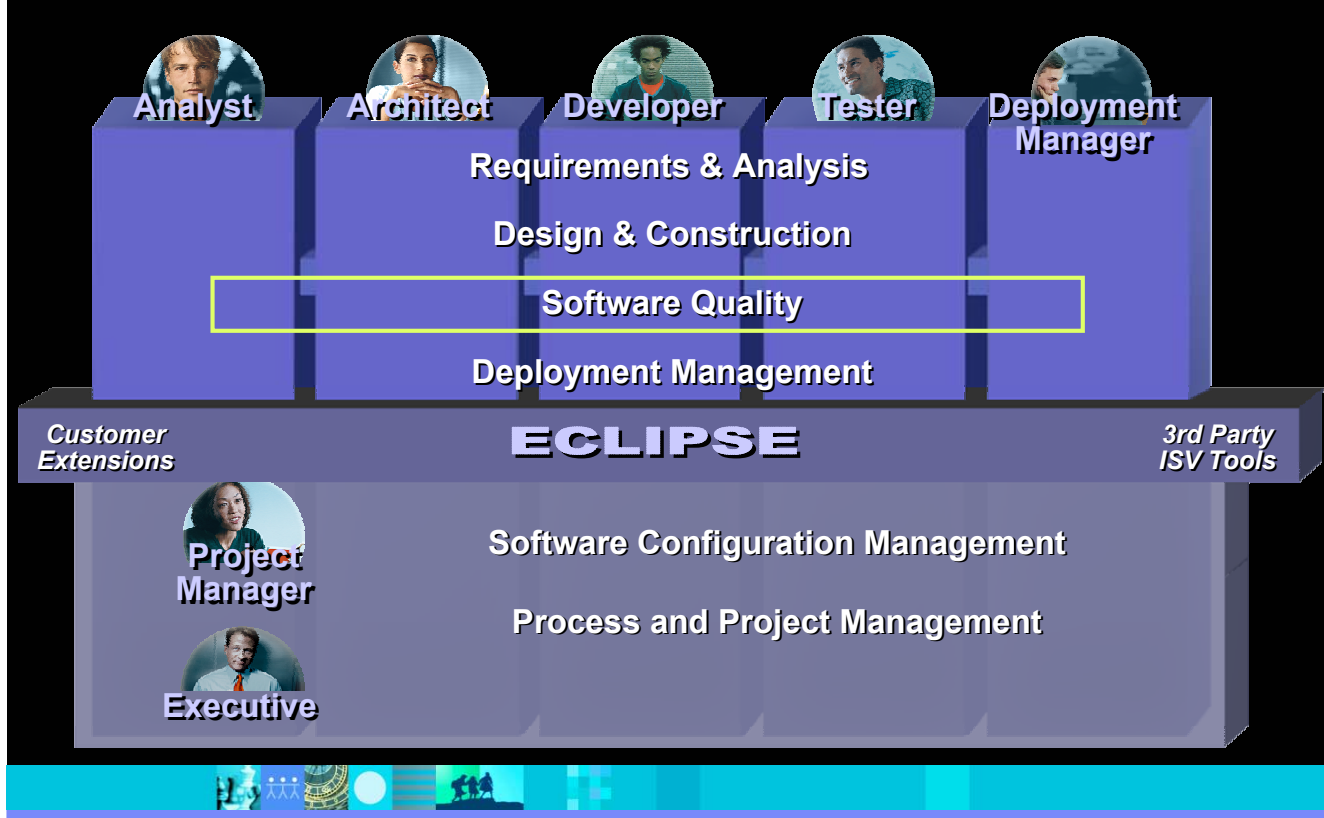
Rational software

ON DEMAND BUSINESS

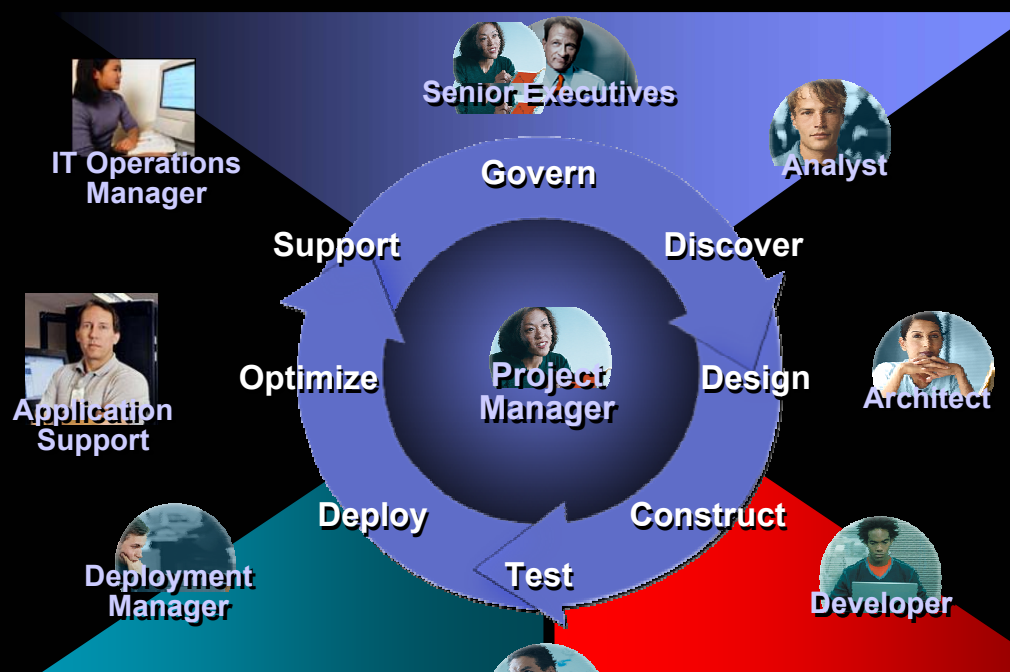
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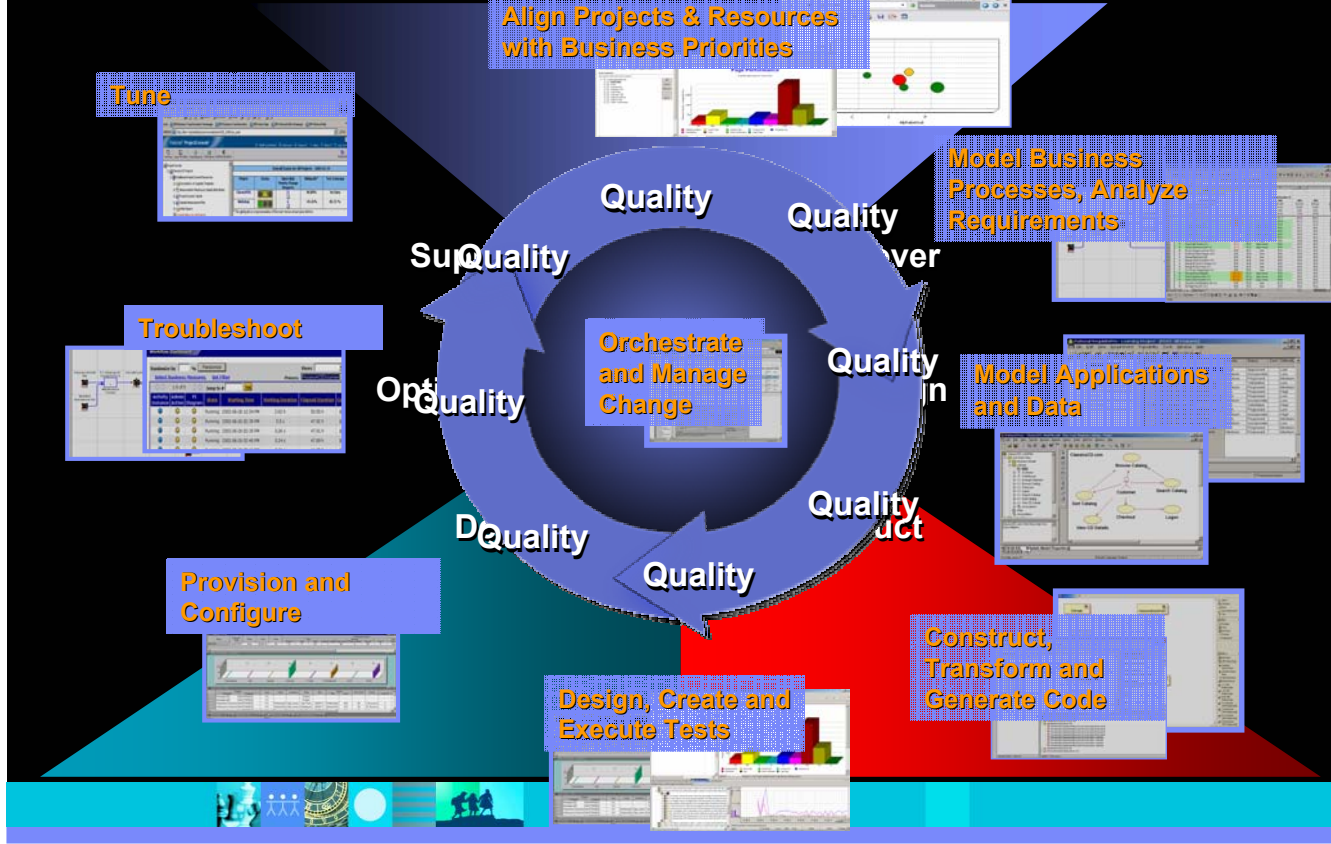
Agenda

- Introduction to the IBM Software Development Platform
- New release announcements
- Application design and construction
- **Continuously ensuring quality**
- Managing change and assets
- Project portfolio management
- Conclusion



Sources of input for application development





Cost of non-quality

Software bugs cost the US economy an estimated \$59.5 billion in 2002.

On average, professional coders make 100 to 150 errors in every thousand lines of code they write.

Software testing is said to account for 30 to 50 percent of total software development costs

In 2002, canceled projects cost firms \$67 billion; overruns on other projects racked up

It's the other person's fault!

Gartner

“...we estimate that 40 percent of unplanned application downtime is caused by application failures; 40 percent by application errors; and only 20 percent by hardware (server and network), environmental factors (heating, cooling and power failures) and disasters”

 **METAGROUP**

“70%-80% of project failures are tied to poor analysis”



What is “quality”?

Fitness for Use

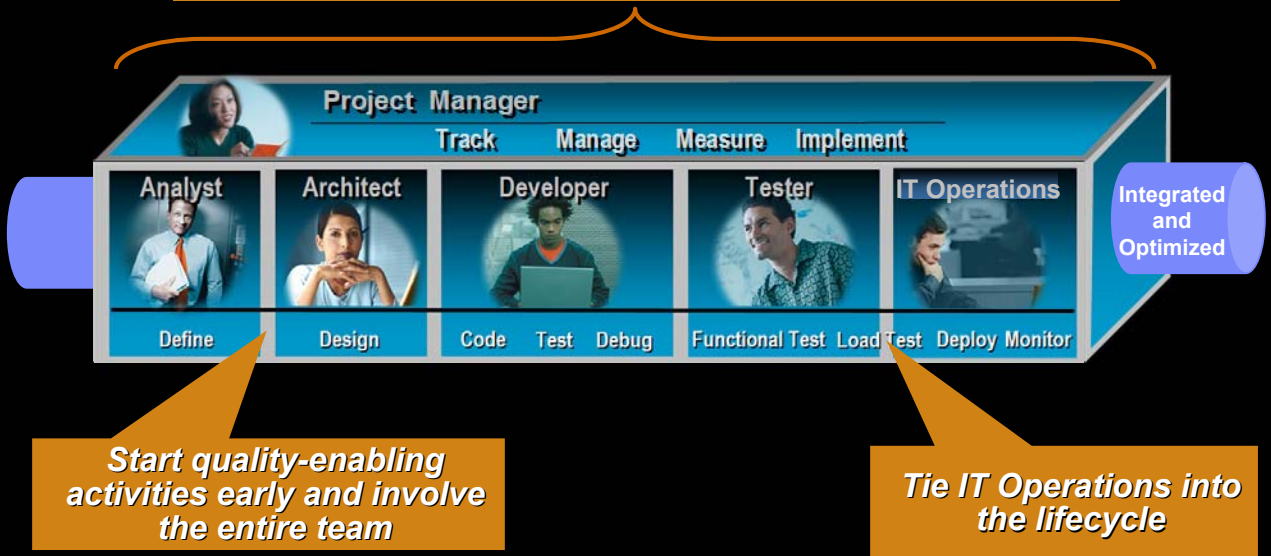
Acceptable

FURPS+
Functionality
Usability
Reliability
Performance
Supportability
+ others



Uniting innovative solutions and best practices to prevent, detect, diagnose and remove defects all across an iterative software application development and deployment lifecycle

Open, accessible, traceable data and metrics



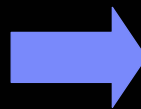
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IBM Rational - Defining and implementing standards

OMG UML2 Testing Profile

- Extends UML 2.0 to accommodate static and dynamic test specification
- Enables sharing of profiling and testing information between tools, vendors
- Establishes same test abstraction benefits as UML provides to developers

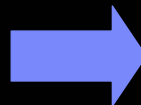


Consortium lead

1st implementation!



Founding member
and primary
contributor



Eclipse/Hyades/EMF

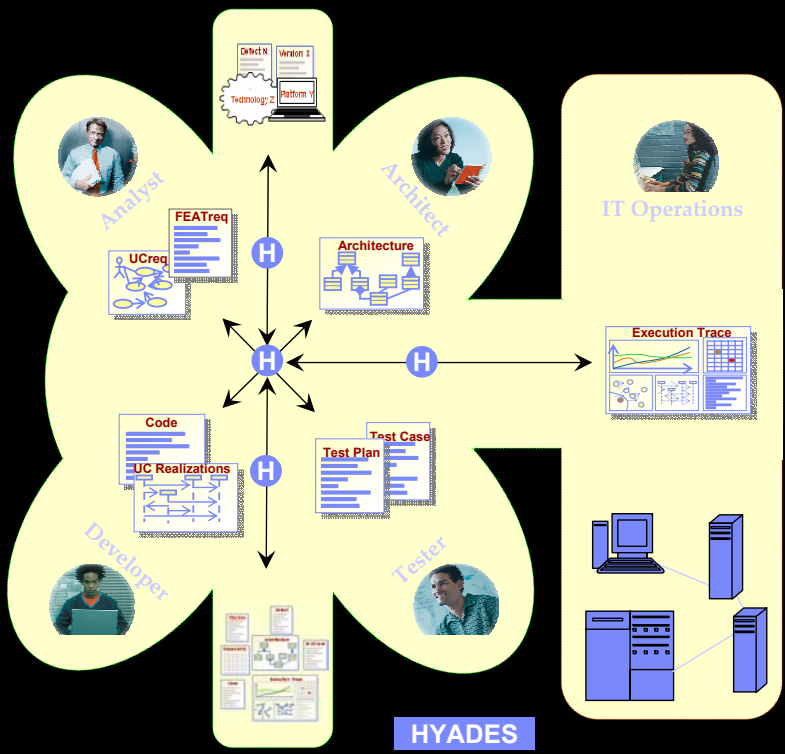
- Open source, integrated test, trace and monitoring infrastructure
- Promotes testing across lifecycle by opening door for innovation
- Avoids lock-in forced by vendors
- www.eclipse.org/hyades
- Already shipping in WSAD



Verify and validate from the beginning
Role-customized software quality tools and processes

Incorporate post-deployment analysis
Global deployment awareness

Maintain traceable, actionable cross-lifecycle linkages
Seamless asset unification
Open, extensible, technology/platform-independent infrastructure



What Hyades means for you

RECOMMENDATIONS

USERS SHOULD EXPECT — AND DEMAND — THAT THEIR TOOLS USE HYADES

- **IBM customers should migrate to IBM's new testing tools.** The benefits of using tools based on Hyades are significant, and customers should consider migrating to such tools sooner than they ordinarily would. Of course, customers will still need to determine that the release works properly with their other tools.
- **Non-IBM customers should ask their vendors about Hyades.** Firms that use tools from vendors other than IBM should begin looking for statement of policy around Hyades. The more tools that are based on Hyades, the more useful Hyades will be, and the more powerful tools that use Hyades will be. This is true for all development tools — not just for testing tools. Vendors currently backing Hyades include Computer Associates International, Compuware, IBM, Intel, SAP, and Scapa Technologies.

Carey Schwaber - Forrester Research - October 8,



Analyst

Define



Architect

Design



Developer

Code Test Debug



Tester

Functional Test Load Test



Deployment Manager

Deploy Monitor

Communication - Integration - Investigation

Business process and requirements validation
Manual testing

Anti-pattern detection
Architectural control

Programming rule inspection
Component testing
Reliability analysis

Manual testing
Functional and regression testing
Scalability and performance validation

Monitoring



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Ensuring quality with IBM software



Analyst

Define



Architect

Design



Developer

Code Test Debug



Tester

Functional Test Load Test



Deployment Manager

Deploy Monitor

RUP – ClearCase – ClearQuest – RequisitePro – TestManager – ProjectConsole

Rational RequisitePro
Websphere Business Integration Family

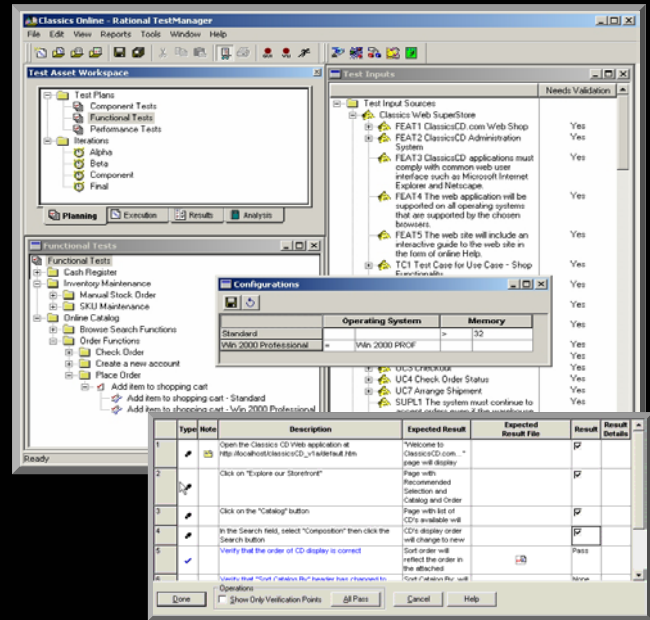
Rational Software Architect

Rational Application Developer for WebSphere Software
Rational PurifyPlus
Rational Test RealTime

Rational Manual Tester
Rational Functional Tester
Rational Robot
Rational

Tivoli TMTP
Tivoli Monitoring Family

- What
 - Test Planning and Execution
 - Test Asset Management and Reporting
- For
 - QA Team
 - Project Manager
- Why
 - Single, fact-based source for evaluation of application readiness

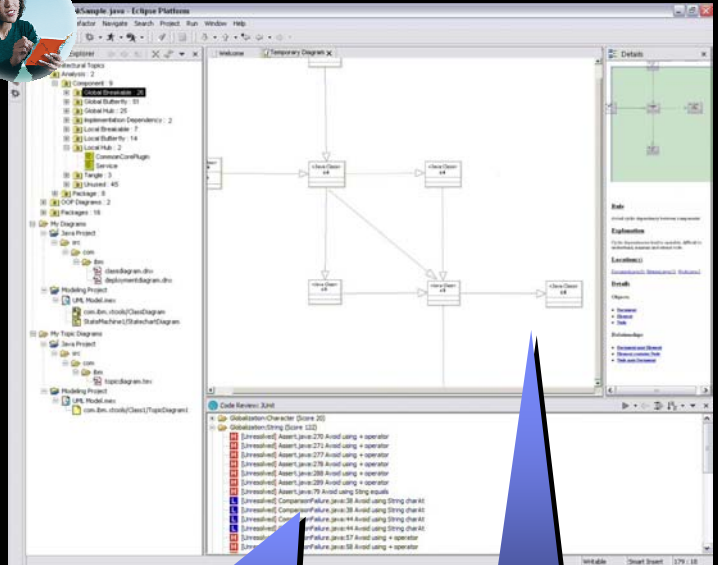


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Design: Architecture Discovery, Analysis and Control

- What
 - Architecture discovery
 - Anti-pattern detection
 - Anti-pattern control
- For
 - Architects using Rational Software Architect
- Why
 - Assurance of structural integrity before evolution of complex, fragile interdependencies



Anti-pattern detection by

Pattern

- What
 - Validation of code rule compliance
 - J2SE/J2EE Best Practices
 - Coding style
 - Naming conventions
 - Design Principles
 - Quick fixes and repair guidance

- For
 - Developers using Rational Software Architect or Rational Application Developer for WebSphere Software
- Why
 - Painless reduction of developer errors before integration efforts
 - cloud defect sources

underlined in the code editor

Rule violations by category/files/severity

Why / Example / How to fix



Component Test: Verify component functionality

- What
 - Automated unit and API testing with automated data generation
 - Statistic-based test prioritization guidance
 - Automated stub generation

- For
 - Developers using Rational Software Architect or Rational Application Developer for WebSphere Software

- Why
 - Early detection and removal of functional deficiencies

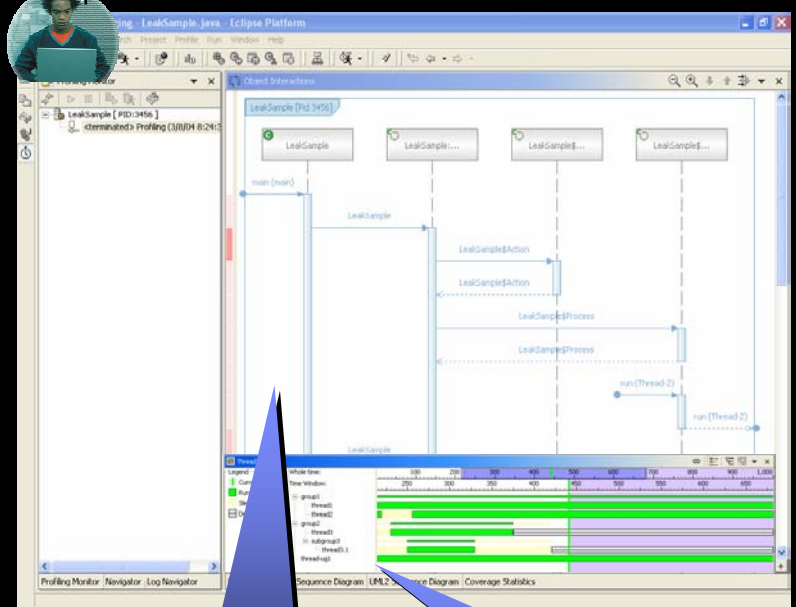
Test driven and

Action	Type	IN	default	OUT
oneBidHelperLocal_1 = oneBid...				
oneBidHelperLocal_1.bidItem...				
itemTypeID	Integer		100546	
bidAmount	Long		100	
bidIncrement	Integer	[1]	1000	10
userId	Integer		83201	
currency	int		3	
ExpectedException	Throwable			

utilization

- What
 - Runtime analysis
 - Memory leak detection
 - Performance profiling
 - Code coverage measurement
 - Thread analysis
 - Execution flow visualization
 - RSA/RAD-based support for Java
- For
 - Developers
- Why
 - Optimized reliability independent of deployment-related concerns

Developer



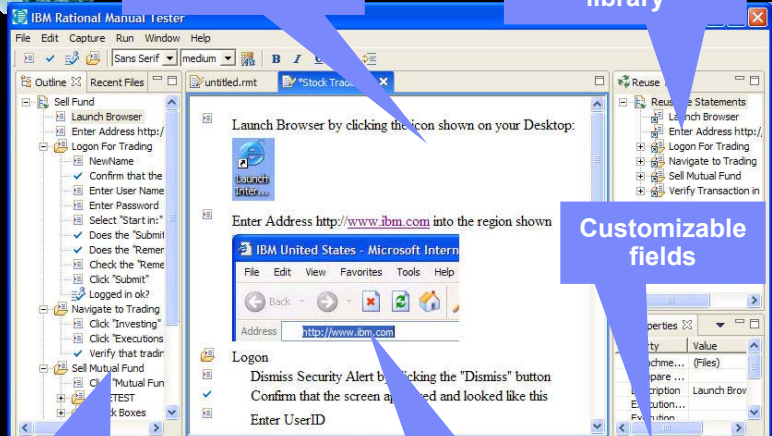
Live UML2 sequence diagram generation

Thread Analysis



Manual Testing: Rational Manual Tester

- What
 - Manual test authoring, organization and execution
- For
 - Business analysts
 - Testers
- Why
 - Reduce impact of software change and human error on manual testing efforts



Rich test editor

Test step reuse library

Customizable fields

Attached images and files

Central repository for distributed team access

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- **What**
 - ▶ Functional and regression test automation
 - ▶ Activity automation
- **For**
 - ▶ Project specific QA teams
 - ▶ Experienced testers
 - ▶ GUI developers
- **Why**
 - ▶ Ensure proper use case implementation before deployment
 - ▶ Support fact-based evaluations of project readiness and application quality

Tester

Eclipse or VS.NET-based editor and debugger

ScriptAssure™ for test script resiliency

Version control ready

Java, VS.NET, Web and terminal-based application support

Data-driven test assistance

Java in Eclipse or VB.NET in VS.NET

CardNumberInc...	creditCombo	Expirat...	NameText	StreetText	CityStateZipText
0	444444444444	0505	Trent Culpito	75 Wall St 22nd Fl	NY, NY 12212
	123412341234	0206	Brian Fred	1212 Foo Ln	[NY, NY 12214]

Performance Testing: Rational Performance Tester

- **What**
 - ▶ Load and performance testing
- **For**
 - ▶ Testers
 - ▶ Deployment Managers
- **Why**
 - ▶ Validation of Web-application scalability under variable multi-user loads prior to deployment

Tester

Deployment Manager

Workload monitor

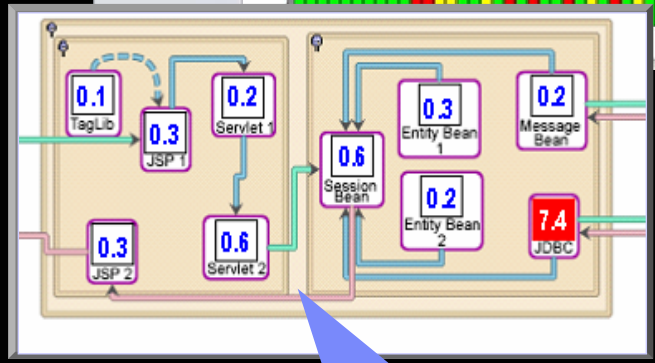
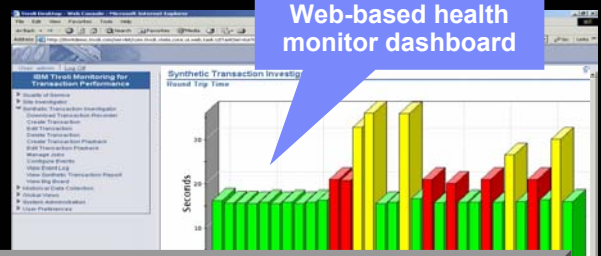
Real-time reporting

User View

Name	Capacity	Time	Users	System	Use	CPU	Total	System Limit	Pages View	Pages Used	Conn. Used	Conn. Limit
MASTER	MASTREP01	0:00:31	20	13	10	22			10	10	10	10

Steps	Script	Command	Status	Time	System	State	Def Count	Result	Last Step		
1	Manager[1]	MASTREP[1]	VU	Entered							
2	Manager[2]	MASTREP[2]	VU	Entered							
3	PrdMasterCustomer	MASTREP[3]	VU	PrdMasterCD_Web_memo	Get Test	00:00:17	PrdMasterCD	423	50	2 Success	3
4	PrdMasterCustomer	MASTREP[4]	VU	SearchCD_Web_memo	WebPage Test	00:00:17	SearchACD	313	42	41 Success	3

- **What**
 - ▶ Cross-tier post-deployment performance monitor
 - ▶ Performance degradation detection
 - ▶ Transaction decomposition
- **For**
 - ▶ Deployment Managers
 - ▶ IT Operations
- **Why**
 - ▶ Early capture and analysis of performance problems post-deployment



Quality is FREE

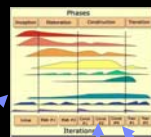
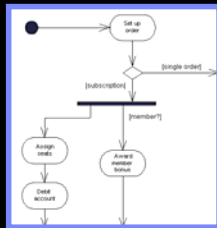
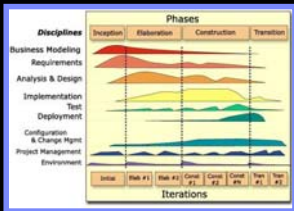
Perfect Project

- A well-defined process with unanimous buy-in from team members
- Focused attention to value-add, detail and quality across the lifecycle
- Constant evaluation of end-user feedback to ensure reinvigoration of the product line and satisfied, repeat customers

Not-so-Perfect Project

- Poorly defined process with inconsistent buy-in
- Front-loaded requirements gathering without reassessment or validation
- Absent or limited architectural and code quality assurance
- Late cycle system testing
- Limited post-deployment monitoring and

Through 2006, 80 percent of development organizations will not follow strict software engineering practices and will fail in 70 percent of their application delivery efforts



Plug-In for J2EE

Plug-In for XP

Plug-In for .NET

Large J2EE Project

Small Team Project

.NET Project

