



IBM Rational Software Conference 2009
As Real as It Gets!



Integrated Requirements Management and Quality Management

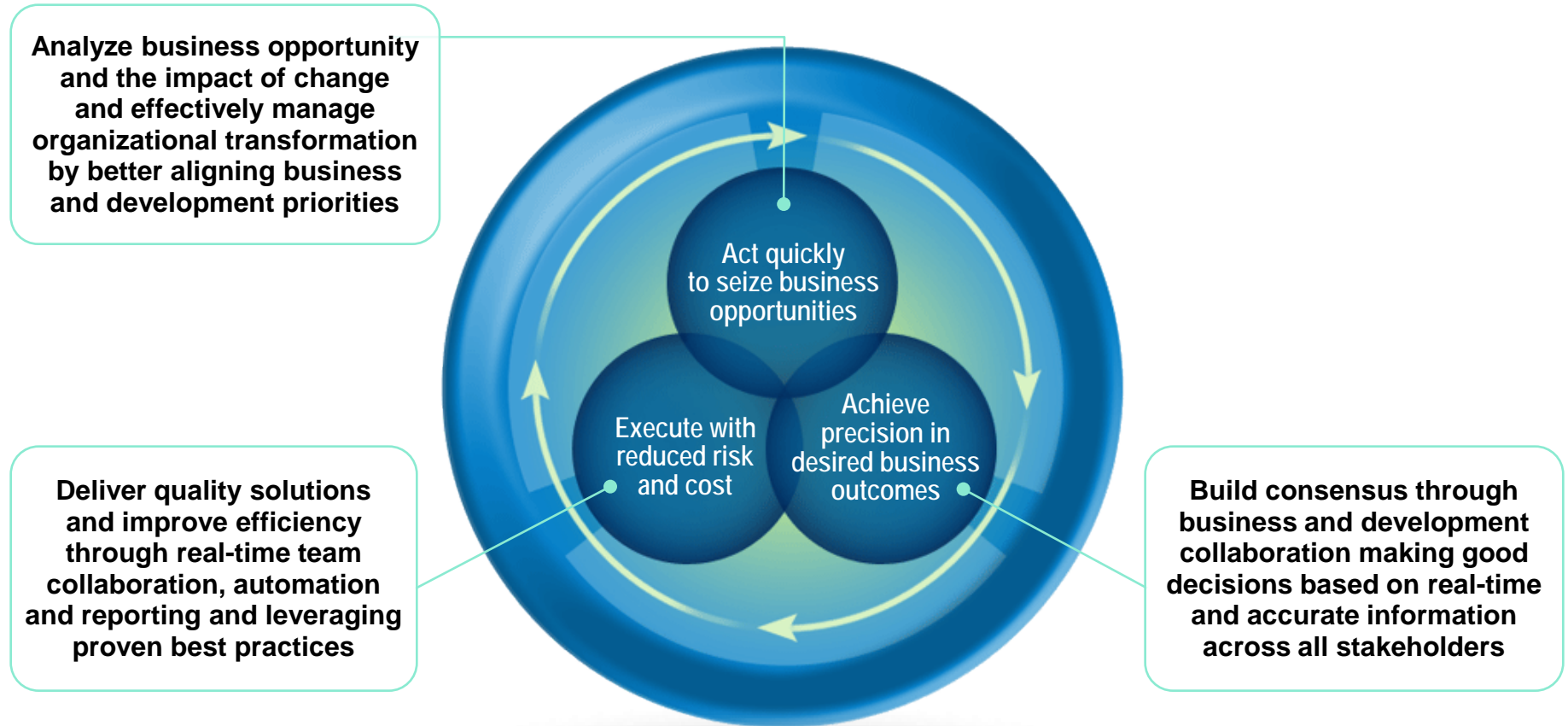
Jared Pulham
Senior Product Manager, Requirements Management Tools

Rational. software

IRE10

Part 1 – Business Presentation

Driving Business Differentiation in Challenging Economic Times with Agility and Confidence



Achieve Precision in Desired Business Outcomes

Deliver the high quality products/systems the customer needs

We struggle with complex projects meeting customers needs a timely manner

CTO



We are continuously pushed to increase quality with less resources!

Quality Manager



Execute with reduced risk and cost

Analyst



It's hard to accurately capture requirements & make sure they are implemented & tested

Act quickly to seize business opportunities

Achieve precision in desired business outcomes

Tester



It's hard to keep up with requirement changes and know what is most important to test

**The Solution:
Requirements Engineering and Quality Management**



Consensus Building and Quality Delivery Among Business, Systems and Engineering Experts

Drive greater specificity in project guidance and identify quality issues early to reduce cost and risk

Drive consensus among business and technical experts using proven visual and collaborative techniques

"We spent most of our development budget in identifying and correcting defects!"

CTO

Accelerate time to market and improve operational efficiency

Automate proven delivery processes to reduce rework and determine optimal plans

"70% of our rework is due to requirements errors. As a result our budgets get tighter and we fail to meet the release date."

Project Manager

Adapt seamlessly to changing priorities with greater visibility and effortless reporting

Make confident decisions faster to proactively address ever-changing inputs and insights

"If we don't release our products to market on time - we can't achieve our profit targets"

Product Manager

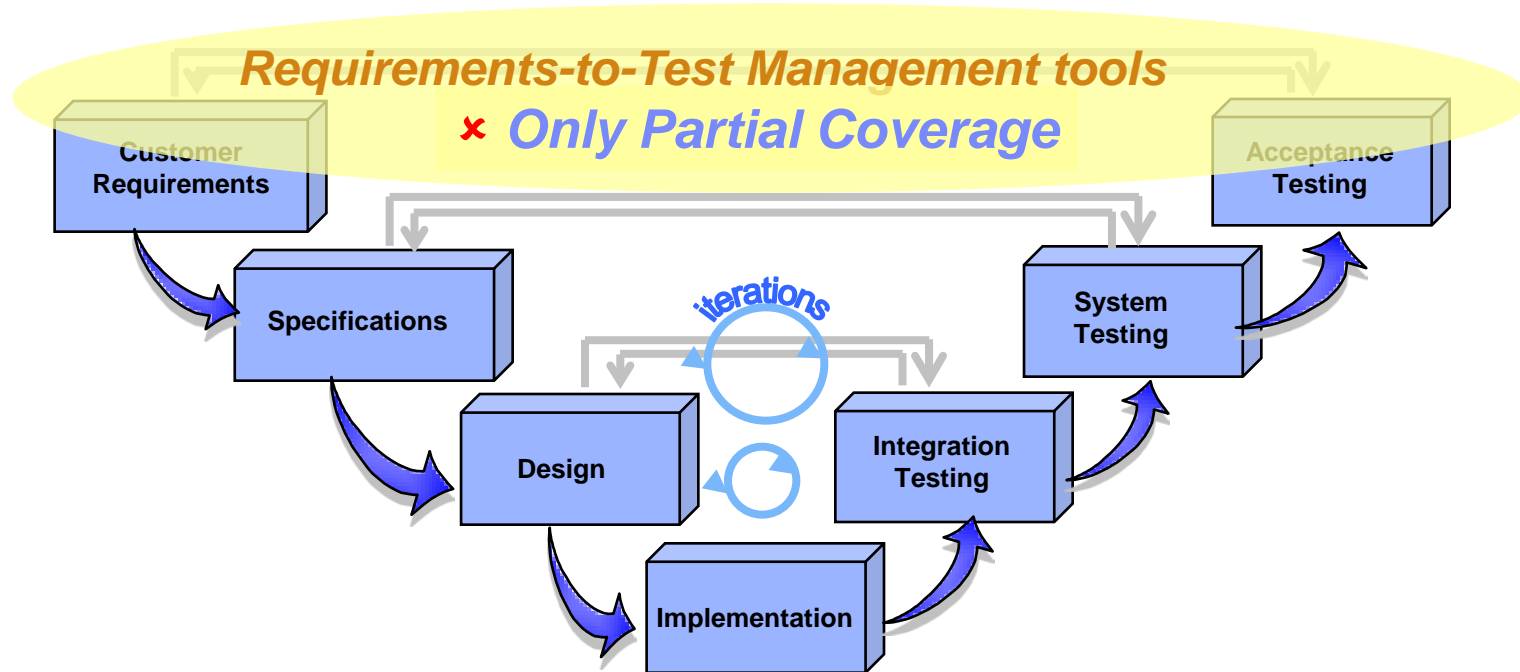
Measure for ongoing process improvement

Adopt quality trends, leading practices and successful deployment patterns to impact future outcomes

*"Process led automation ROI is real – 4,752,886 hours saved in reusing 9,696,199 test artifacts – \$1.1B in total value" ***

Other Tools Offer Partial Coverage To Pain Points

- *Approach focused on needs of test audience*



Capability Gaps

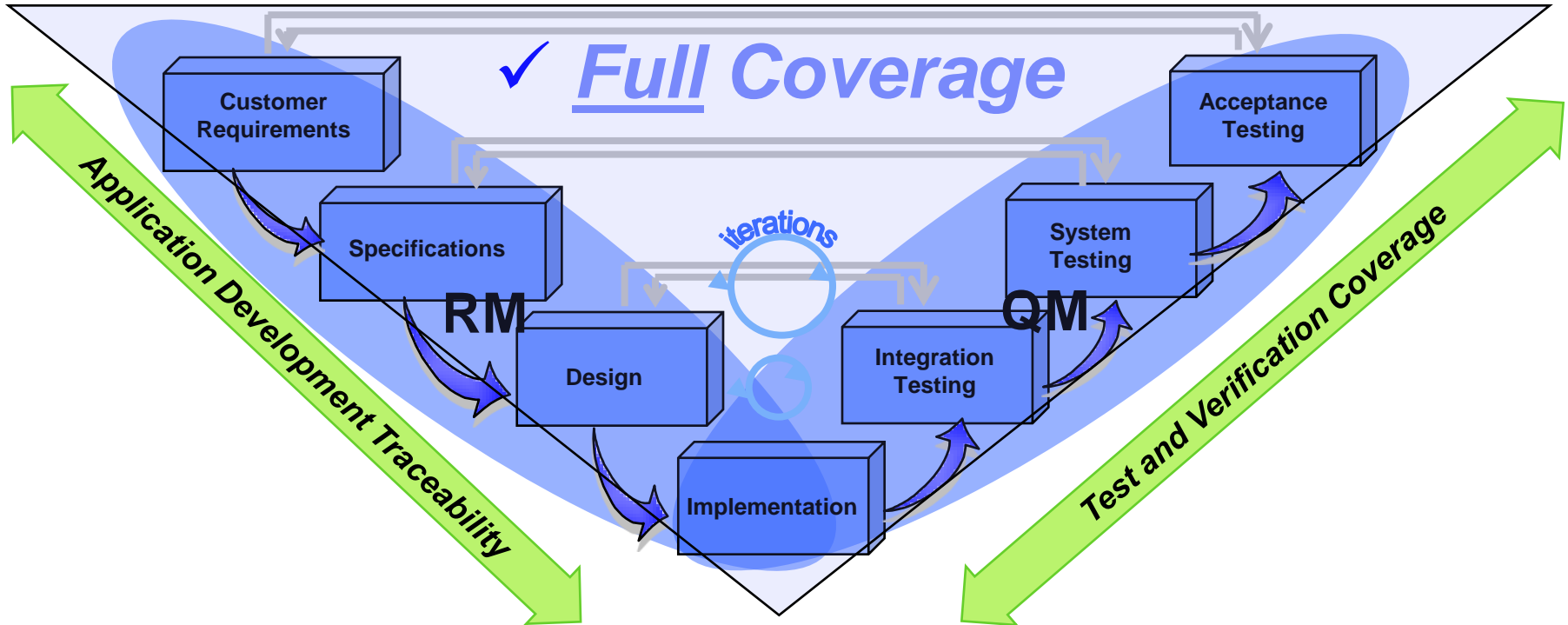
- Only support linkage of test to a single level of requirements
- Incomplete life cycle coverage (no design/build)

Implications of Gaps

- No common set of clear requirements shared by team
- Risk of missing critical requirements & serving business
- Limited ability to assess requirements change impact
- Limited ability to identify most critical requirements to test
- Difficult to prove compliance (traceability, audit-ability)

IBM Offers A Unique Solution

That Ensures Entire Lifecycle Collaboration and Traceability



IBM's full life cycle coverage and traceability solution

- ✓ Common set of clear requirements shared by team
- ✓ Don't miss out critical requirements
- ✓ Assess requirements change impact
- ✓ Identify most critical requirements to test
- ✓ Prove compliance (audit-ability)

IBM Telelogic DOORS

Worldwide market and technology leader

- ✓ Yphise award for best RM Product
- ✓ ISO 9001 Compliant development

Success from comprehensive requirements management process

- ✓ Easy-to-use document oriented views
- ✓ Lifecycle traceability to *any* information
- ✓ Web-based access and review

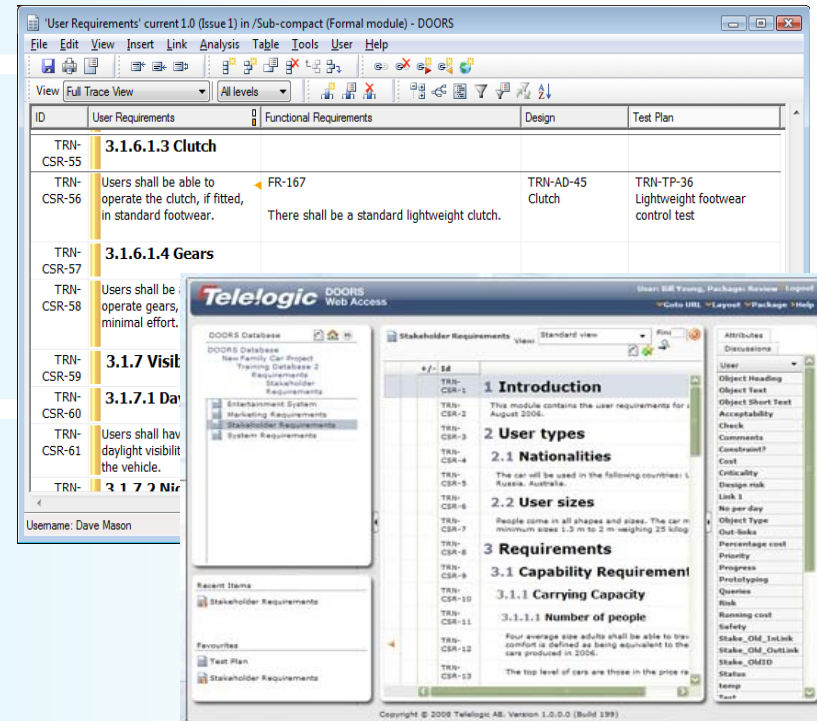
Highest compliance and audit capabilities

- ✓ Simple but powerful versioning
- ✓ FDA Compliant Electronic Signature
- ✓ Comprehensive traceability reporting



Yphise certifies Telelogic DOORS
as the best ranked software product in comparison with the competition for Agile Requirements-Driven Development (ARDD)

Yphise certifies that the product has the strengths that represent a valuable investment according to expected benefits by large companies, based on ISO 9001:2000-certified assessment.



The screenshot displays the IBM Telelogic DOORS software interface. The top window shows a requirements traceability table with columns for ID, User Requirements, Functional Requirements, Design, and Test Plan. Below this, a 'Telelogic DOORS Web Access' window is open, showing a document view of requirements. The document includes sections like 'Introduction', 'User types', 'Requirements', and '3.1.1 Carrying Capacity'. A sidebar on the right lists various attributes like 'User', 'Object Heading', 'Object Text', etc. The bottom of the screenshot shows the copyright information: 'Copyright © 2008 Telelogic AB, Version 1.0.0.0 (Build 199)'.

Rational Quality Manager

Central hub for business-driven software quality delivery

Mitigate business risk with collaboration

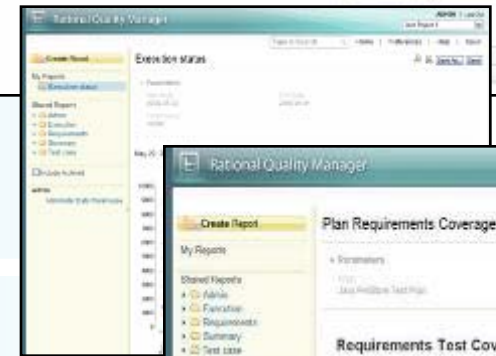
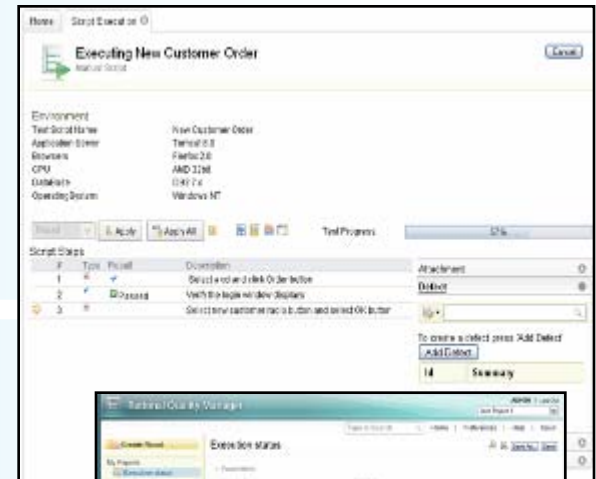
- ✓ Team coordination of test planning
- ✓ Enforceable process workflow
- ✓ Upstream and downstream quality

Improve operational efficiency with automation

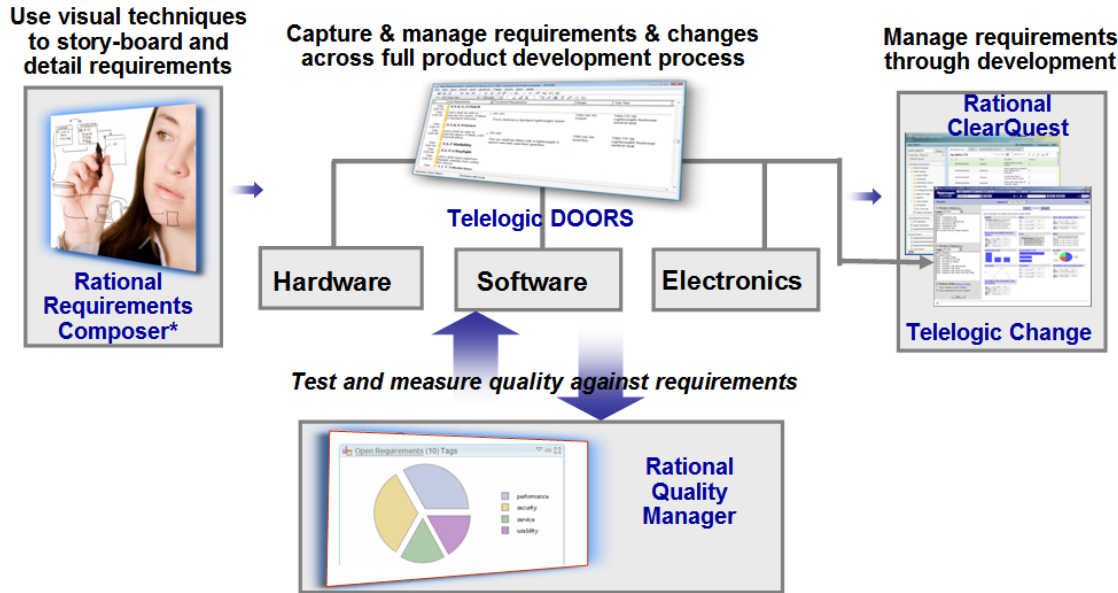
- ✓ Lab efficiency and asset utilization
- ✓ Test coverage optimization
- ✓ Environment and lifecycle coverage

Make confident decisions with effortless reporting

- ✓ Ongoing analysis & process improvement
- ✓ Proactive risk management
- ✓ Greater predictability



The Extended Rational Solution



Extended Rational Solution

IBM Requirements Engineering Solution

- Getting marketing , engineering, manufacturing, suppliers and subcontractors on the same page
- Managing scope, plus assessing and controlling the impact of change
- Ensuring end-to-end traceability
- Ensuring conformance to contractual agreements
- Demonstrating compliance to regulations

- Rational Requirements Composer
- Rational ClearCase or Telelogic Synergy

- Telelogic System Architect
- Telelogic Rhapsody

- Rational Method Composer
- Quality Management **portfolio** RQM integrates with many tools, including **Rhapsody TestConductor*** (for Model Driven testing), **Rational TestRT** (for Unit/Integration testing) and **Rational Software Analyzer** .
- MCIF

Customer comments on Rational Quality Manager

"I think that IT organisations now have more options... They are not forced to use HP if it is not good in their development environment... And with the good integration with version control system it is my opinion that they [Rational] have a better integrated testing offer than the competitors right now."

-- Peer Eland, TietoEnator

"Easy to use and comprehensive Jazz Based Tool for the Test and Integration Business. Rational has found the way to make Testing and Integration a better place to work."

-- Massimiliano Russi, Zurich Financial Services

"IBM Rational Quality Manager (RQM) represents a sea change in software quality enforcement. Customers will see an immediate return on investment not only from the administrative viewpoint, but from the insightful assimilation of process enforcement. RQM will transform quality teams by fostering greater collaboration without locality restrictions. Software development stakeholders will concur that RQM delivers the required features to deliver their own high-quality products with greater confidence."

– Russell Stanley, Trinity Software Solutions, Inc.

"IBM Rational offerings provide a business driven quality environment. By integrating and automating our process and Rational tools, Sogeti can deliver a consistent engagement approach, provide clients with process customization and transparency and accelerate the development of test plans and assets within Rational Quality Manager."

– Dan Hannigan, Sogeti

Process-led Automation yields real savings

Examples of automation capabilities

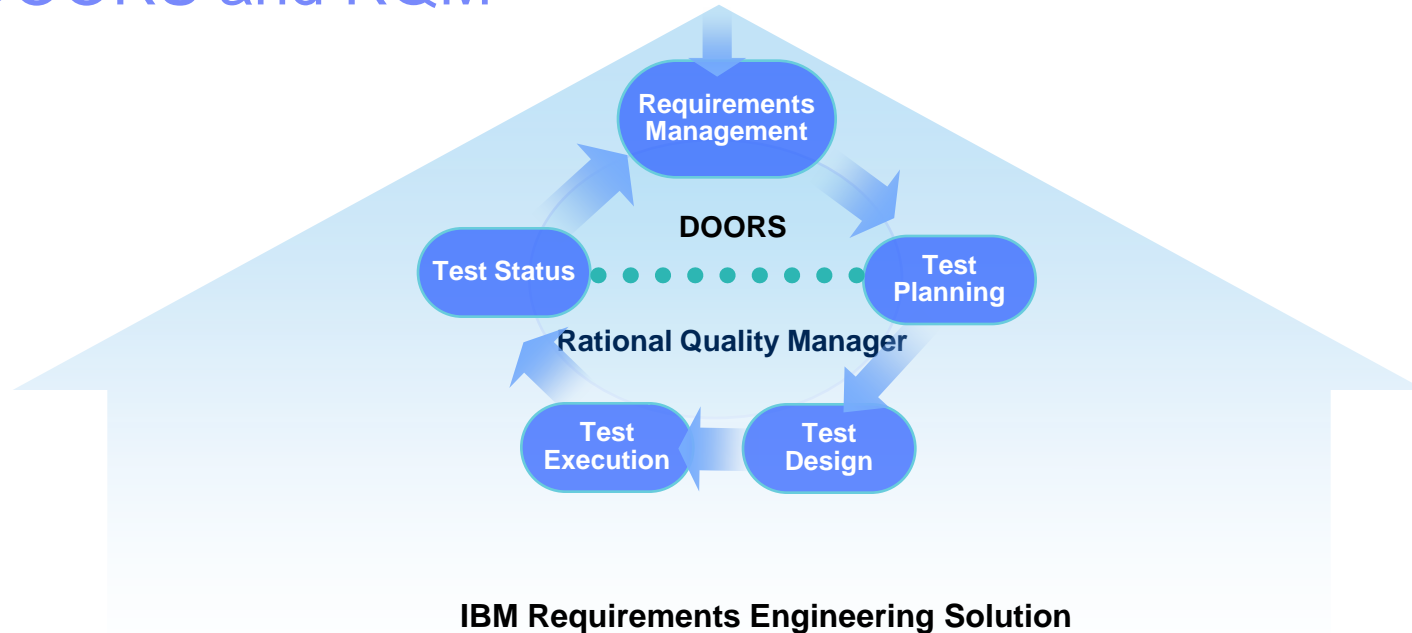
	Developing repeatable industry test solutions			Advanced Defect Analysis	Developing repeated test process models applicable to future projects		Integrating end to end processes	
Asset	Test cases copied	Manual scripts copied	Manual scripts Reuse	Prevent and Block duplicate Defects	Baseline & migrate documentation	Baseline artifacts	Leveraging component Reuse	Dynamic updates of test assets
Quantity	290	296	1,178	765	1,154	1,711	870	1,883
Hours saved	141	148	589	Discovery in 4 Hr 1,484	577	855	435	470
Value	\$11,600	\$11,850	\$47,000	\$857,000	\$46,200	\$68,000	\$34,800	\$37,700

Source: 2008 GBS Test Practices study over 855 projects

Average per project saving with automation and collaboration best practices calculated on a per asset task and process savings

Estimated hours saved per project: 4700 hours

Overall Benefits of an Integrated Approach with DOORS and RQM

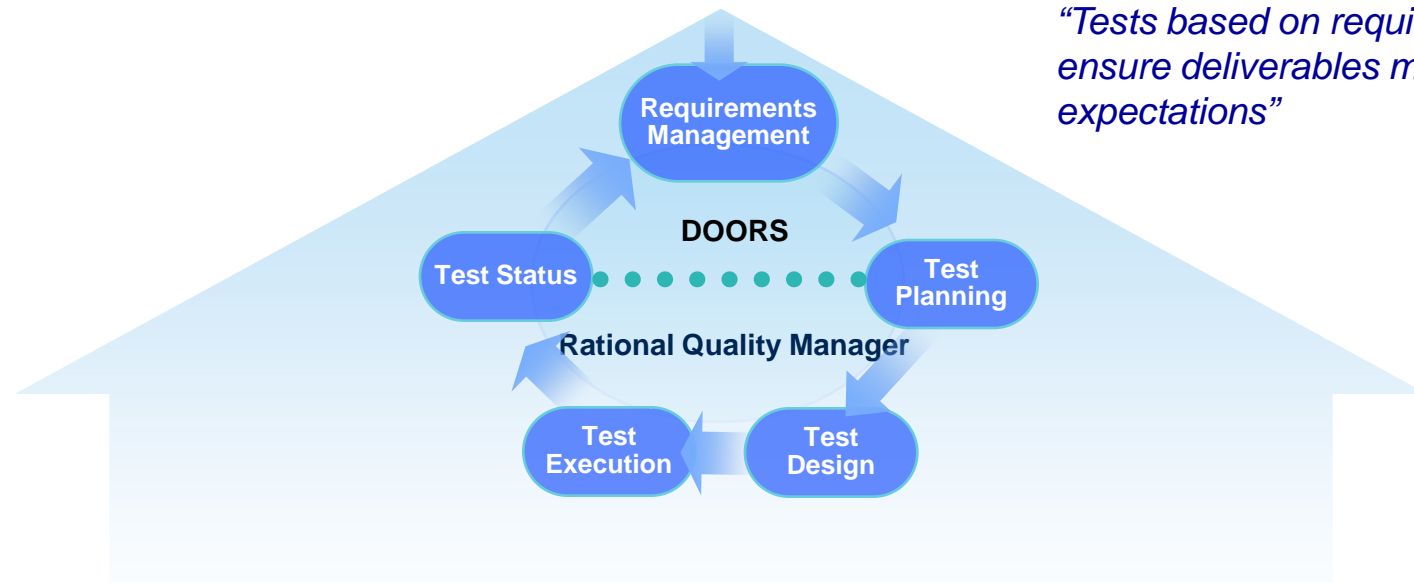


IBM Requirements Engineering Solution

- Getting everyone on the same page with minimal learning curves
- Accessing information from other disciplines without the need to move outside of a preferred working environment
- Managing scope, plus assessing and controlling the impact of change
- Ensuring end-to-end traceability
- Ensuring conformance to contractual agreements
- Increasing systems quality
- Demonstrating compliance to regulations

Part 2 - Technical Presentation

Principles of an Integrated Approach



"Tests based on requirements ensure deliverables meet customer expectations"

1. Plan Tests Early

- Plan tests for each requirement as the requirement is written.

2. Conduct Tests Early

- Perform tests as early as possible in the development process.

3. Relate Tests to Requirements

- Trace tests back to the requirements they are design to check.

4. Relate Defects to Requirements

- Trace defects back to the requirements that they show are not satisfied.

5. Measure Progress against Requirements

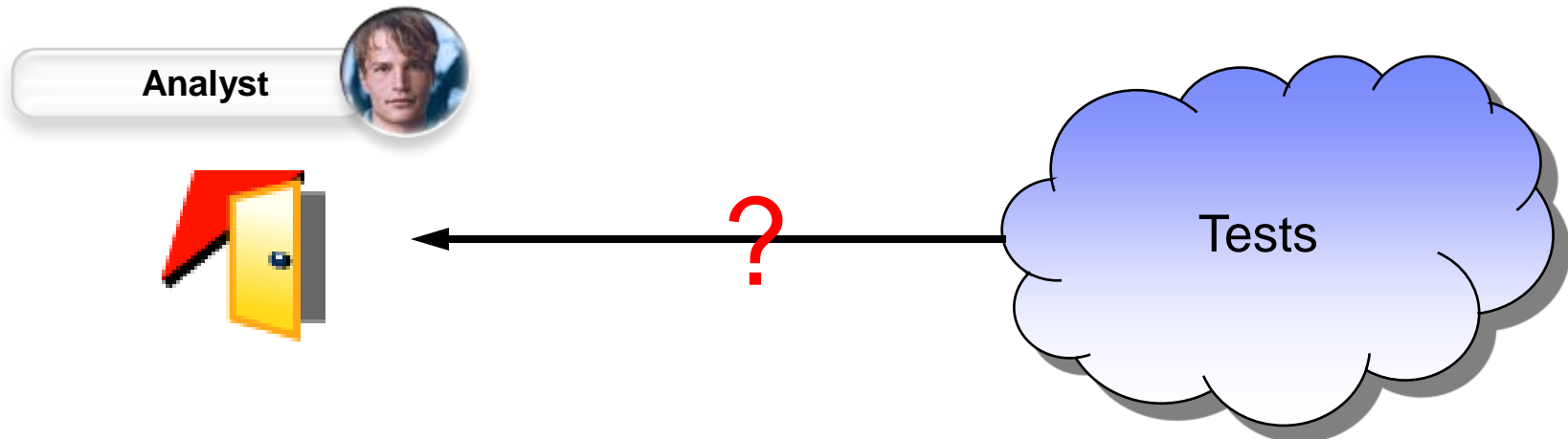
- Set targets and measure the progress of testing in terms of those requirements that are shown to be satisfied or are not satisfied.

Benefits

- Providing a requirements based integration between Requirements Management and Test Management enables:
 - ▶ The Requirements Analyst to focus on delivering testable requirements with fully defined qualification criteria
 - ▶ The QA/Tester to focus on developing tests against a known set of requirements
 - ▶ Release Management can be performed based on requirement quality measures rather than on statistics of test pass/failure

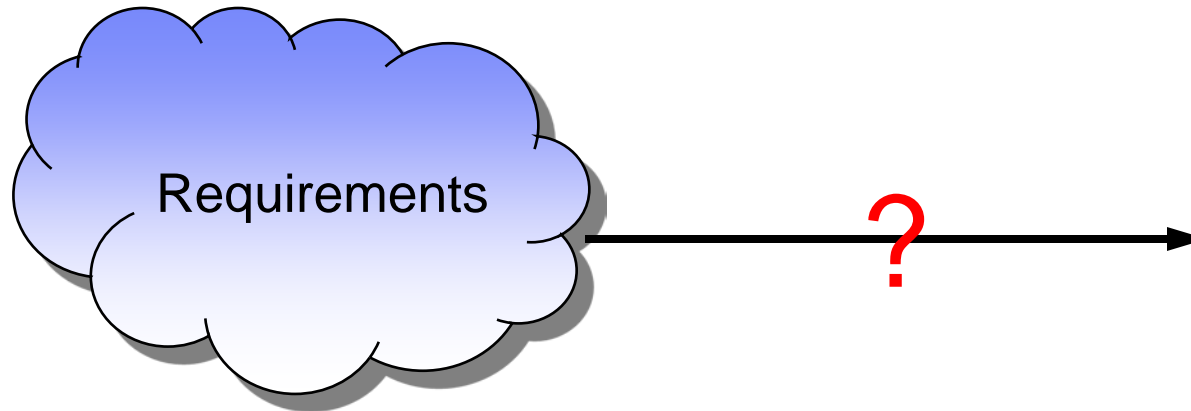
Role: Analyst

- The Analyst is a DOORS user principally interested in Requirements Management
- Specifies *Qualification Criteria* that must be met by testing
- Needs to know that requirements are tested
- Performs Impact analysis to cover requirements and test
- Wants to be involved with Release Review Boards



Role: QA Manager/Tester

- The QA Manager/Tester is a RQM user principally interested in Test Management and execution
- Uses the *Qualification Criteria as test requirements*
- Needs to be involved with requirements review
- Establishes traceability to requirements
- Test failure investigation



Role: CTO (Change Control Board)

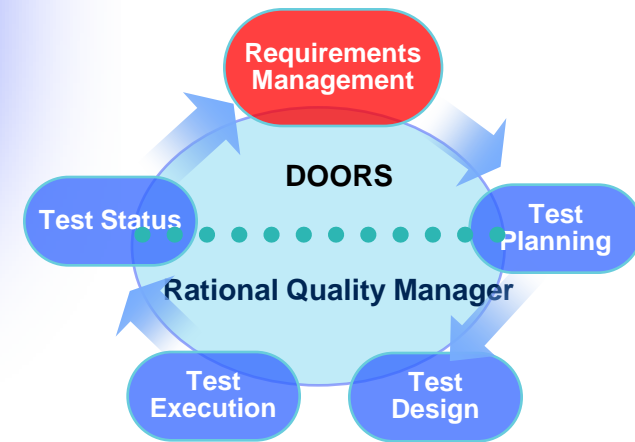
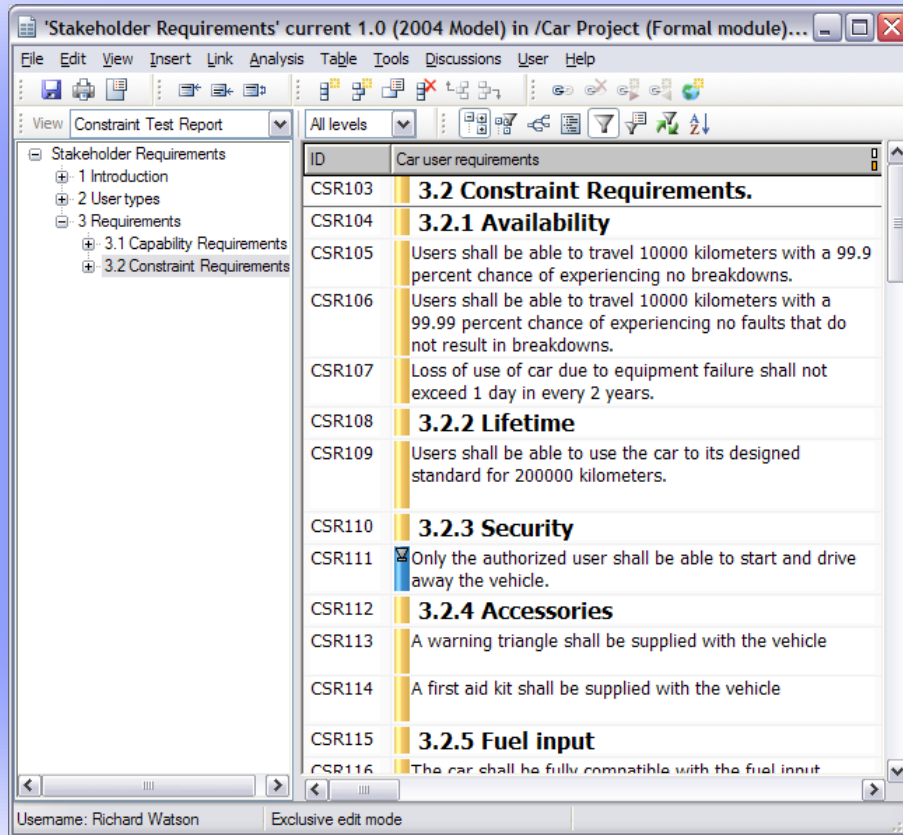


- The Change Control Board (CCB)
 - ▶ Analyze impact of defects (priority, severity)
 - ▶ Have the final say regarding release decision
- Test managers
 - ▶ influence the CCB in the confidence that they have an efficient test process working against the requirements
- Development managers
 - ▶ influence the CCB based on the latest test information against their development efforts
- Analyst manager
 - ▶ influence the CCB with the full business impact of making a release based on requirements met or not.

A walkthrough a Requirements-Based Testing scenario using DOORS and RQM

Note: RQM is generally available now. The DOORS – RQM integration is planned for availability in June 2009.

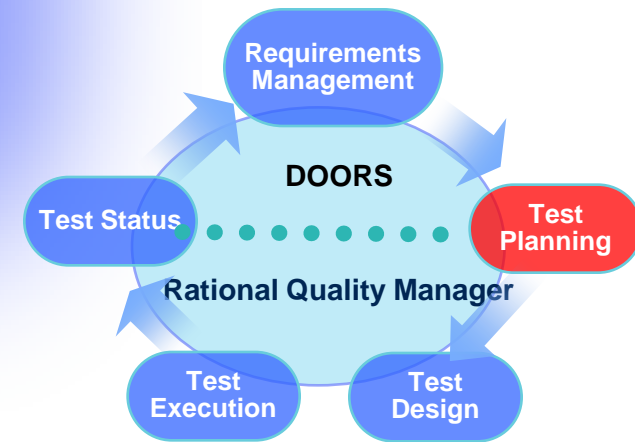
The Analyst Captures Requirements in DOORS



The QA Manager/Tester Sees Requirements in RQM

The screenshot shows the Rational Quality Manager (RQM) interface. The main window displays the 'Overall Car Test Plan' with a 'Requirements' section. The requirements are listed in a table with columns for Status, ID, Tag, Name, Description, and Owner.

Status	ID	Tag	Name	Description	Owner
<input type="checkbox"/>	478	12:Stakeh...	12:Stakeh...	Four average size adult...	Unass...
<input type="checkbox"/>	479	314:Stake...	314:Stake...	The top level of cars a...	Unass...
<input type="checkbox"/>	480	315:Stake...	315:Stake...	Five average size adu...	Unass...
<input type="checkbox"/>	481	316:Stake...	316:Stake...	Two average size adu...	Unass...
<input type="checkbox"/>	482	318:Stake...	318:Stake...	Users shall have easy...	Unass...
<input type="checkbox"/>	483	19:Stakeh...	19:Stakeh...	Users shall be able to ...	Unass...
<input type="checkbox"/>	484	20:Stakeh...	20:Stakeh...	Users shall be able to ...	Unass...
<input type="checkbox"/>	485	321:Stake...	321:Stake...	Users shall be able to ...	Unass...
<input type="checkbox"/>	486	319:Stake...	319:Stake...	Users shall be able to ...	Unass...
<input type="checkbox"/>	487	320:Stake...	320:Stake...	Users shall be able to ...	Unass...



The QA Manager/Tester Develops Test Cases to Test the Requirements

Manage Sections

Table Of Contents

- Summary
- Business Objectives
- Test Objectives
- Formal Review
- Requirements
- Test Schedules
- Test Estimation
- Test Environments
- Application Security
- Test Team
- Quality Objectives
- Entry Criteria
- Exit Criteria
- Test Cases
- Resources
- Attachments
- Show All Sections

Classics Java Test Plan Overview | [View Snapshots](#)

Originator: ADMIN

State: Draft

Action: Select Action

Requirements

This section lists all of the content and requirements associated with a given test plan. You can select existing requirements or define new items to cover in the test plan.

Group by: Ungrouped

10 Items per page Previous | 1 - 10 of 11 | Next

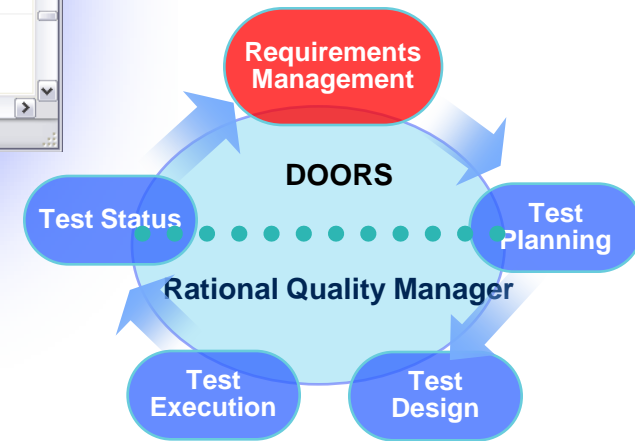
<input type="checkbox"/> Status	ID	Tag	Name	Description
<input type="checkbox"/> !	5		Login	User shall have the ability to log into the application or proceed as a guest
<input type="checkbox"/> !	9		Order single CD	Must be able to order a single CD.
<input type="checkbox"/> !	8		Order Multiple CDs	Must be able to order multiple CDs through the web client.
<input type="checkbox"/> !	6		Logout	Logout of the system.

IRE10 Collaborating across the Supply Chain with RIF

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The Analyst Checks Test Coverage in DOORS

ID	Car user requirements	Test Plan and Test Cases
CSR103	3.2 Constraint Requirements.	
CSR104	3.2.1 Availability	
CSR105	Users shall be able to travel 10000 kilometers with a 99.9 percent chance of experiencing no breakdowns.	<ul style="list-style-type: none"> Quality Manager <ul style="list-style-type: none"> Car Constraints Test Plan <ul style="list-style-type: none"> 1: 10K Reliability Quality Manager <ul style="list-style-type: none"> Overall Car Test Plan <ul style="list-style-type: none"> 1: 10K Reliability
CSR106	Users shall be able to travel 10000 kilometers with a 99.99 percent chance of experiencing no faults that do not result in breakdowns.	<ul style="list-style-type: none"> Quality Manager <ul style="list-style-type: none"> Car Constraints Test Plan <ul style="list-style-type: none"> 1: 10K Reliability Quality Manager <ul style="list-style-type: none"> Overall Car Test Plan <ul style="list-style-type: none"> 1: 10K Reliability
CSR107	Loss of use of car due to equipment failure shall not exceed 1 day in every 2 years.	<ul style="list-style-type: none"> Quality Manager <ul style="list-style-type: none"> Car Constraints Test Plan <ul style="list-style-type: none"> 2: Stress Test Quality Manager <ul style="list-style-type: none"> Overall Car Test Plan <ul style="list-style-type: none"> 2: Stress Test
CSR108	3.2.2 Lifetime	
CSR109	Users shall be able to use the car to its designed standard for 200000 kilometers.	<ul style="list-style-type: none"> Quality Manager <ul style="list-style-type: none"> Car Constraints Test Plan <ul style="list-style-type: none"> 2: Stress Test 3: Security Check



The QA Manager/Tester Executes Test Cases

Home | Script Execution

Executing New Customer Order Manual Script Cancel

Environment

Test Script Name: New Customer Order
 Application Server: Tomcat 6.0
 Browsers: Firefox 2.0
 CPU: AMD 32bit
 DataBase: DB2 7.x
 OperatingSystem: Windows NT

Passed | Apply | Apply All | Test Progress: 67%

#	Type	Result	Description
1		✓	Select a cd and click Order button
2		✓ Passed	Verify the login window displays
3			Select new customer radio button and select OK button

Attachment

Defect

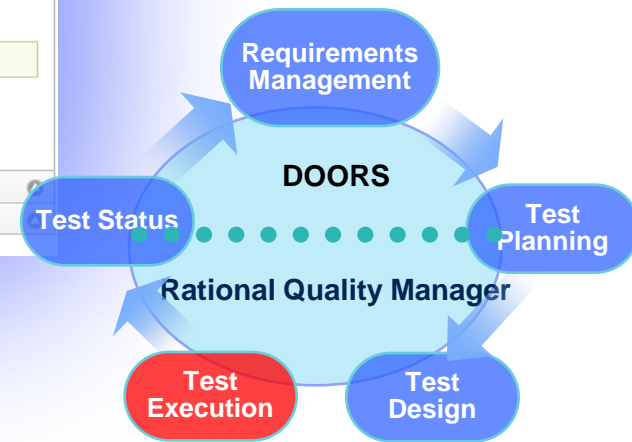
To create a defect press 'Add Defect'

Add Defect

Id	Summary

Result Attachment

Comment



The Analyst Checks QA Status in DOORS

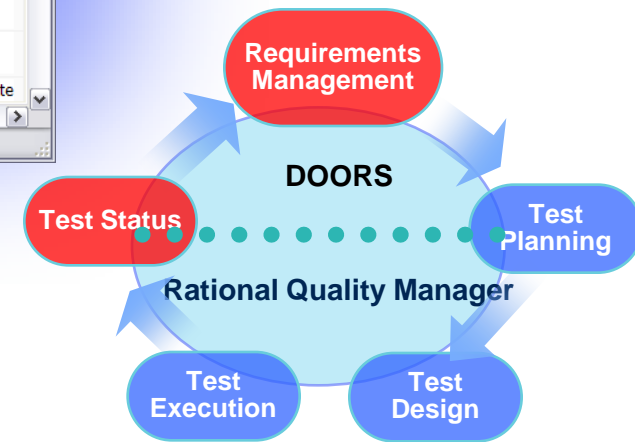
'Stakeholder Requirements' current 1.0 (2004 Model) in /Car Project (Formal module) - DOORS

File Edit View Insert Link Analysis Table Tools Discussions User Help

View Constraint Test Report All levels

ID	Car user requirements	Test Cases	Test Status	Verdict
CSR103	3.2 Constraint Requirements.		Mixed Status	Failed
CSR104	3.2.1 Availability		Mixed Status	Failed
CSR105	Users shall be able to travel 10000 kilometers with a 99.9 percent chance of experiencing no breakdowns.	(1) 10K Reliability: Failed	Approved	Failed
CSR106	Users shall be able to travel 10000 kilometers with a 99.99 percent chance of experiencing no faults that do not result in breakdowns.	(1) 10K Reliability: Failed	Approved	Failed
CSR107	Loss of use of car due to equipment failure shall not exceed 1 day in every 2 years.	(2) Stress Test: Error	Not Approved	Error
CSR108	3.2.2 Lifetime		Not Approved	Error
CSR109	Users shall be able to use the car to its designed standard for 200000 kilometers.	(2) Stress Test: Error (3) Security Check: Passed	Not Approved	Error
CSR110	3.2.3 Security			
CSR111	Only the authorized user shall be able to start and drive away the vehicle.			
CSR112	3.2.4 Accessories		Approved	Passed
CSR113	A warning triangle shall be supplied with the vehicle	(4) Accessory Audit: Passed	Approved	Passed
CSR114	A first aid kit shall be supplied with the vehicle	(4) Accessory Audit: Passed	Approved	Passed
CSR115	3.2.5 Fuel input		Approved	Incomplete

Username: Richard Watson Exclusive edit mode



Analyst Benefits

- Better visibility of test plan increases systems quality
 - ▶ Review construction of the audit trail to ensure that requirements have been planned to be tested
 - ▶ Monitor test status against requirements to identify business impact
- Fully role based integration within DOORS
 - ▶ Traceability columns on requirements and test
 - ▶ Reporting facilities
 - ▶ Suspect Links

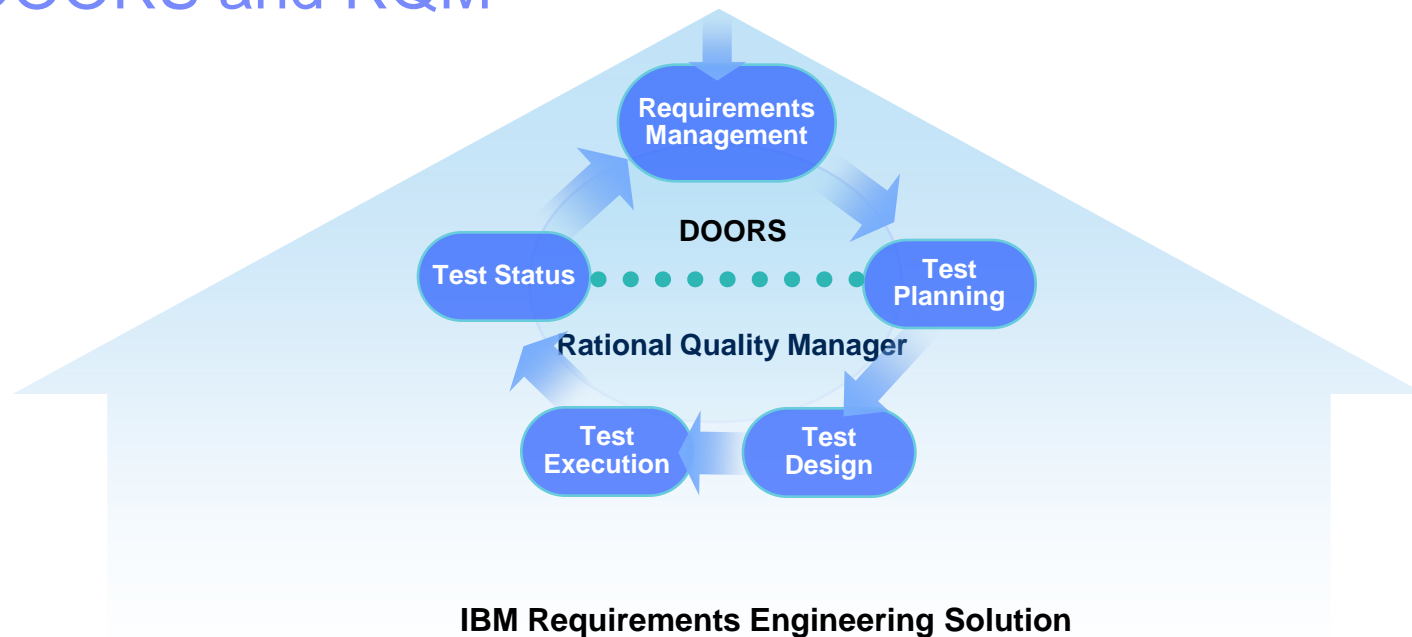
QA Manager/Tester Benefits

- Work against a defined set of requirements
 - ▶ Maximize system quality while controlling an efficient test process
 - ▶ How much testing is enough?
- Efficient test autopsy
 - ▶ is a defect in the test, implementation or requirement?
 - ▶ Traverse audit trails back to original requirements analysis
- Fully role based integration
 - ▶ Combined reports from within RQM
 - ▶ Traceability alerts so requirements changes are never lost

CTO Benefits

- Quality Assurance statistics alongside requirements ensure that:
 - ▶ Full business criticality understood and traced back to user need
 - ▶ Overall development process prioritized commercially rather than technically
- Statistics aggregated up through the requirements hierarchy
 - ▶ Fast identification of overall systems quality
 - ▶ Easier to communicate quality assurance to the end customer

Overall Benefits of an Integrated Approach with DOORS and RQM



IBM Requirements Engineering Solution

- Getting everyone on the same page with minimal learning curves
- Accessing information from other disciplines without the need to move outside of a preferred working environment
- Managing scope, plus assessing and controlling the impact of change
- Ensuring end-to-end traceability
- Ensuring conformance to contractual agreements
- Increasing systems quality
- Demonstrating compliance to regulations

QUESTIONS

Thank You



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