



IBM Software Group

# Software Quality Management with IBM

## *A Closed-Loop Fitness Program*



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**Rational.** software



→ Go to **IBM**

# Agenda

- **Business-driven Software Quality Management Direction**
- **Balancing Competing Factors / Breaking the Iron Triangle**
- **Strategy for Software Quality Management**
  - ▶ Continuous / Automated / Governed
- **QM in Action – what does it mean & how is it done**
- **Security & Compliance – a new kind of software testing**
- **Case Study**



# The business reality of effective software and systems delivery

## *Software is becoming the force behind Innovation*

*Business process & product innovations represents majority of new requirements levied on IT*

- **NASA** Wavefront Sensing and Control software (WFSC), will allow the Webb telescope to adjust its 18 hexagonal mirrors
- **DaimlerChrysler**  
“Innovation drives our company and is the key to the worldwide success of DaimlerChrysler.”
- **USA FDA**  
Medical technology innovations will transform the health care and revolutionize the way treatments are administered

## *Software project failures impact the bottom line*

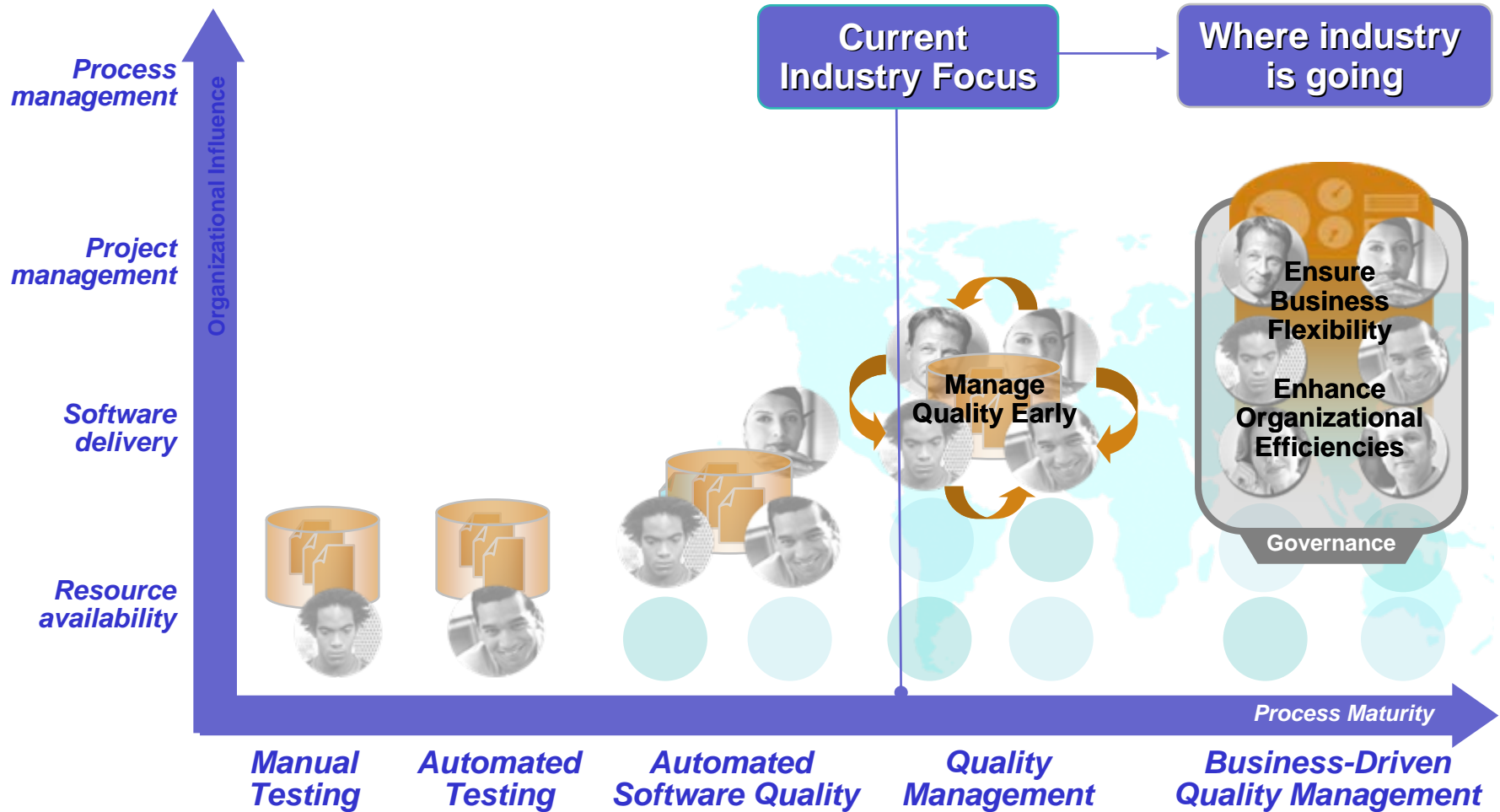
*Software related downtime costs industry almost **\$300 billion** annually. Only 34% of software project succeed*

- **Large aerospace company**  
Non-compatible software at different factories resulted in a \$6.1 billion profit hit
- **Large automotive manufacturer**  
Software defects causing cars to stall at highway speeds effected 75,000 cars
- **Medical device company**  
A serious software problem leads manufacturer to recall 42,000 defibrillator devices distributed worldwide

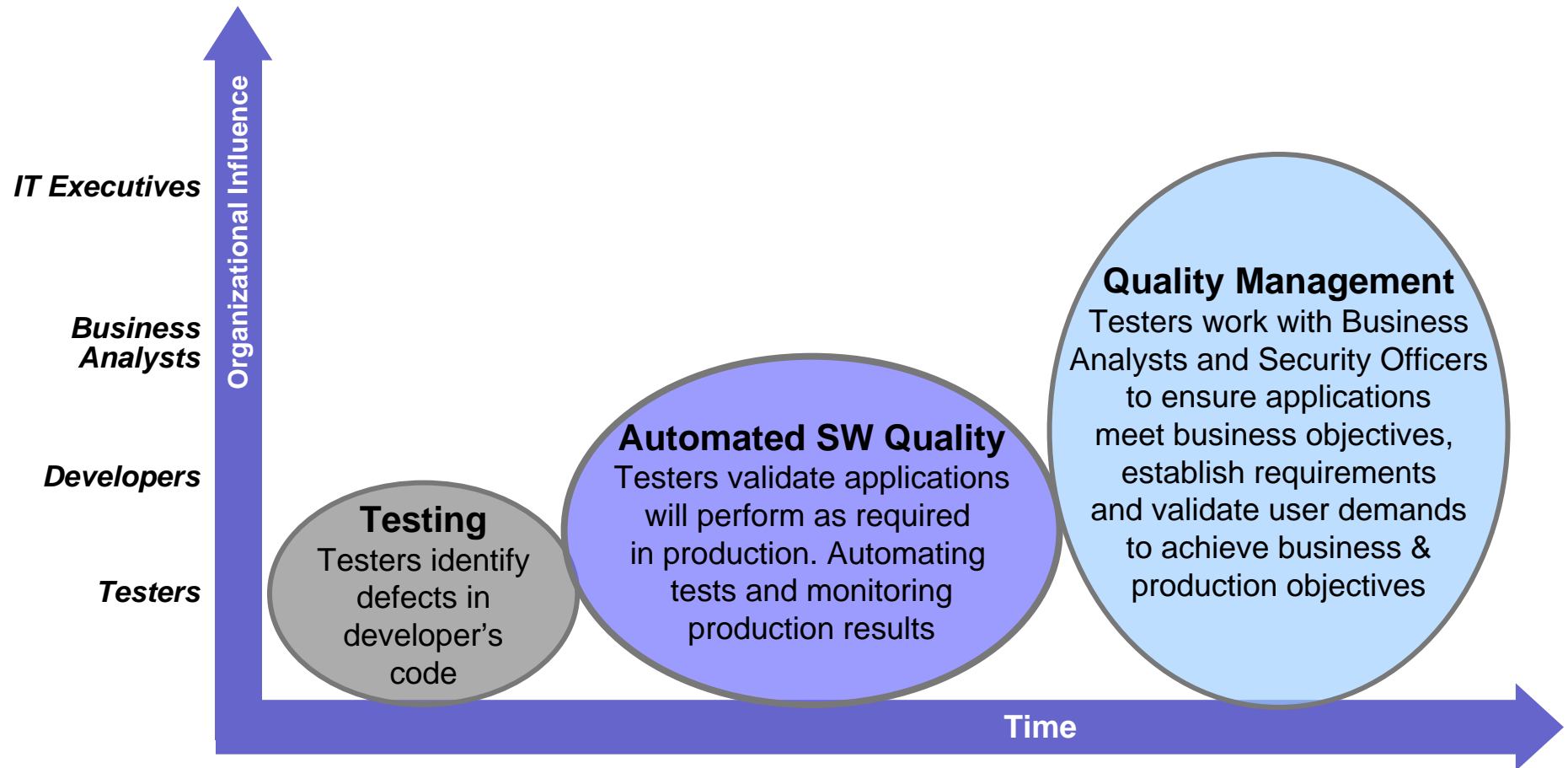


# The test market is changing...

*Test is evolving into quality management*

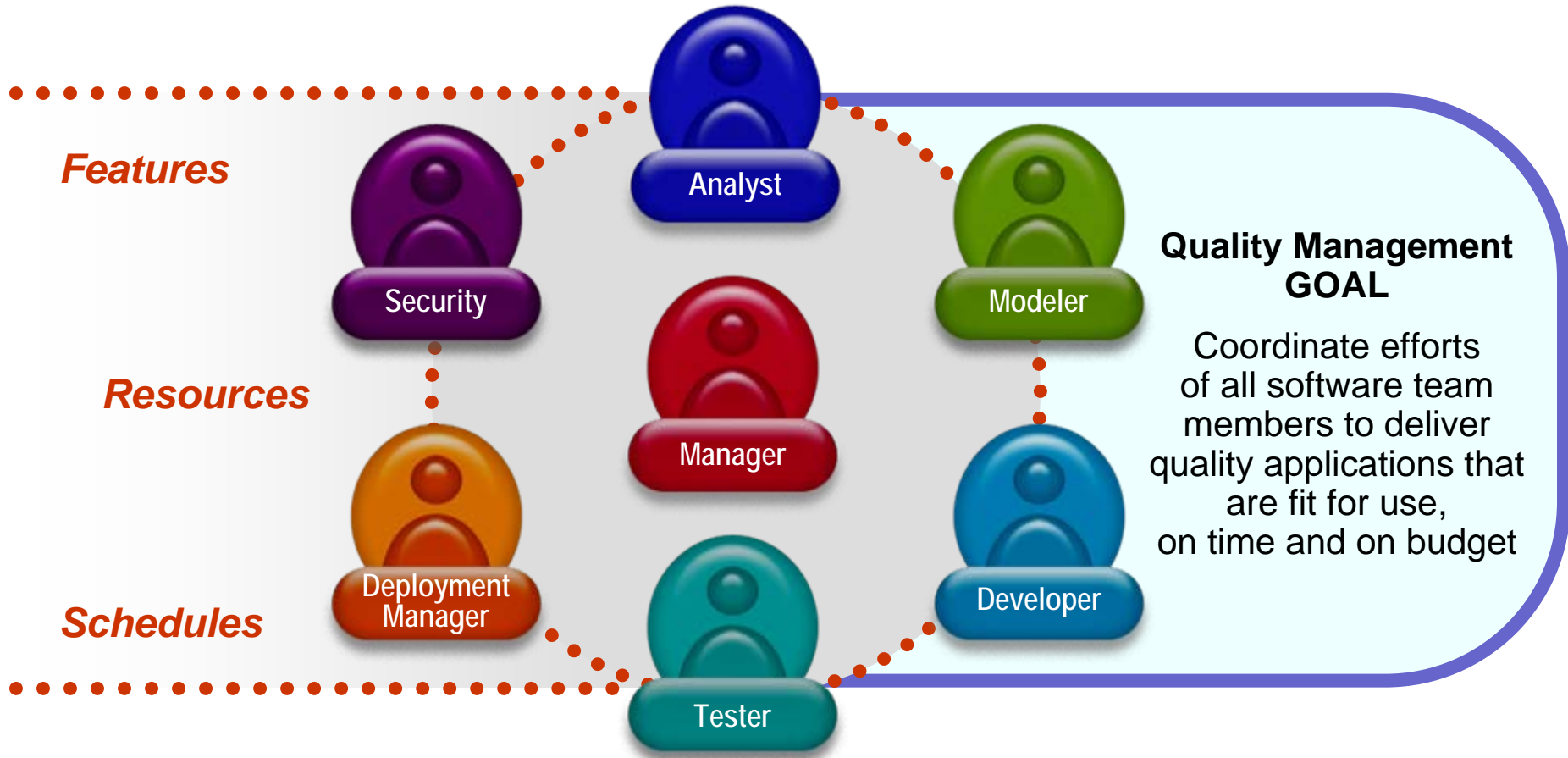


# Organizational, Environmental & Cultural Impacts in the SDLC



# Quality management drivers

*Balancing competing factors in software delivery*



*Quality management focuses on three strategies to achieve process predictability; Continuous, automated, and governed*



# Quality management strategy

*Continuous process, powered by automation to govern software delivery*



## Continuous

Continuous, comprehensive, and collaborative quality management throughout the lifecycle reduces costs and improves credibility



## Automated

Automating workflows across business processes by streamlining and eliminating redundancies to improve return on investment



## Governed

Moment-by-moment grasp of software quality and project metrics for immediate corrective action

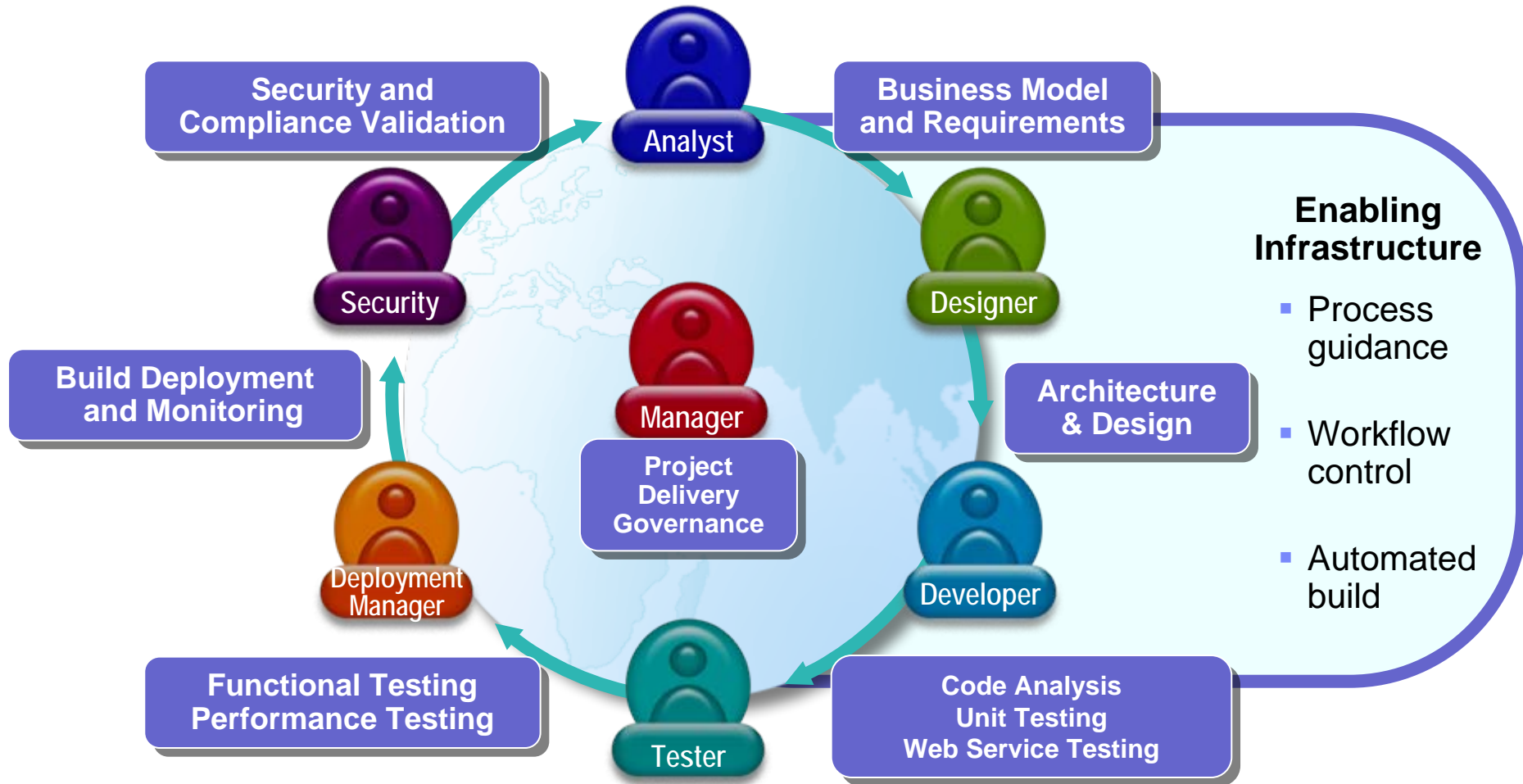
*Extending the reach  
of quality management*





# Quality management in action

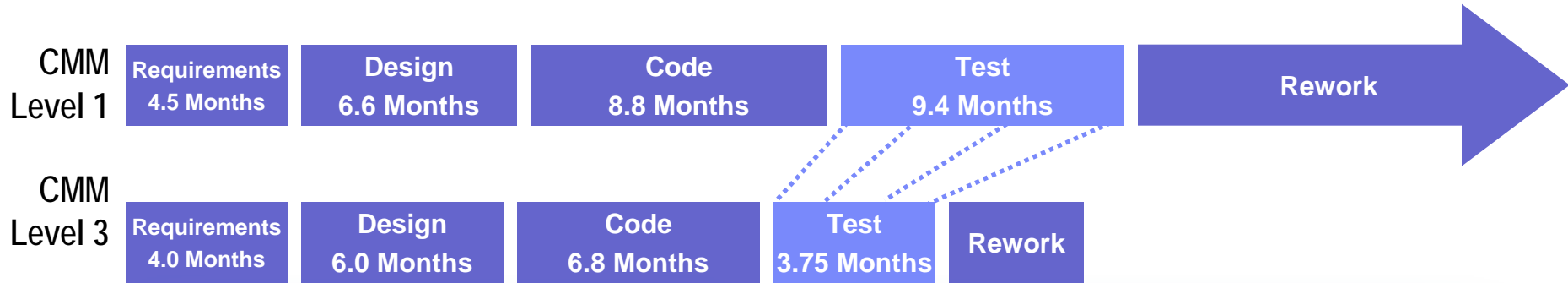
*Continuous process, powered by automation to govern software delivery*





# Impact of Continuous Lifecycle Quality Approach

*Automated and Integrated processes improve time-to-delivery*



A clear testing strategy & efficient testing processes can result in spending **50% less on testing costs** and **20% improvement in development productivity!**

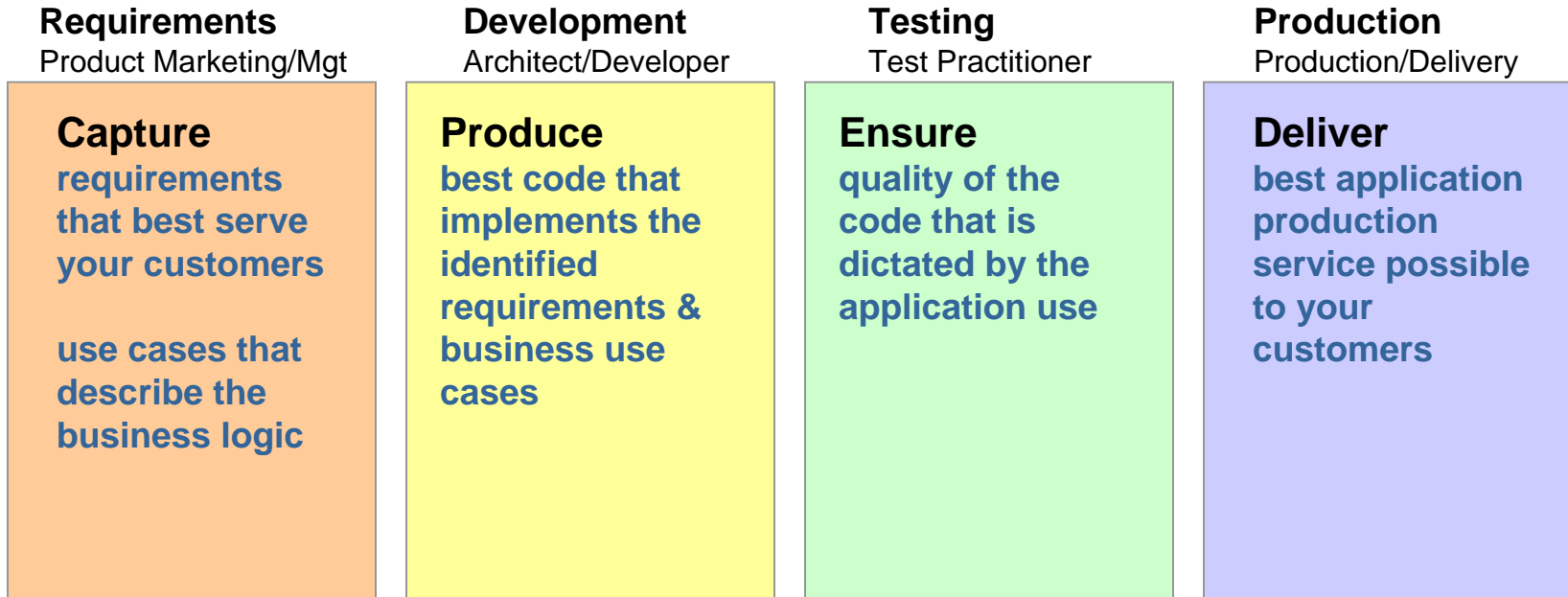
Early, iterative testing delivers **80% less defects to production**, resulting in significantly less rework and **45% more overall productivity!**

Note: CMM Level 1 organizations spend 30%+ of project dollars on testing.  
CMM Level 3 organizations spend 15%.



# The Application Development Lifecycle

## *The role that Quality Management plays in the lifecycle*

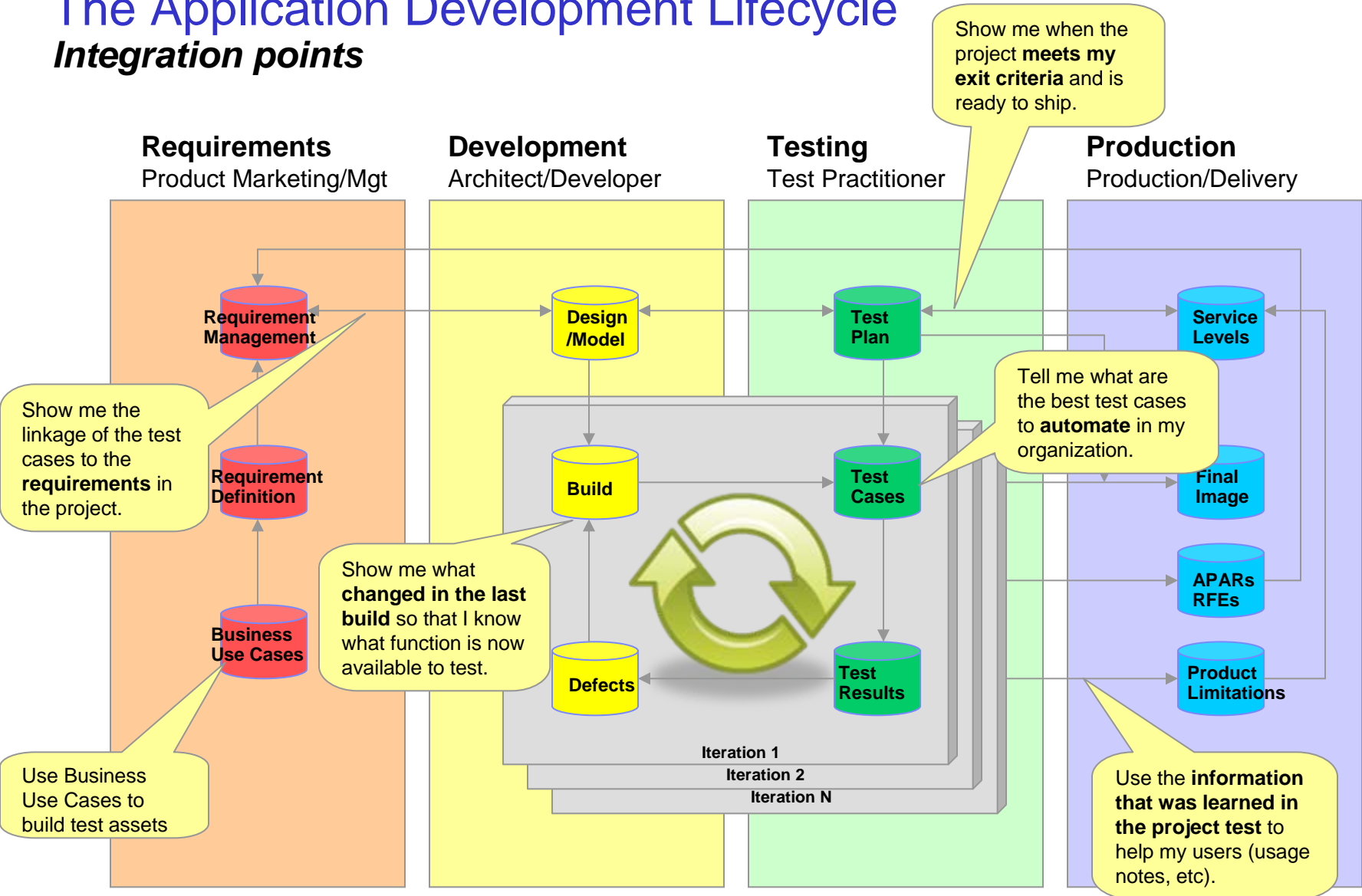


- Key QM Considerations**
- Market pressures to decrease the time to verify quality.
  - Cost pressures to move test to lower cost countries.
  - Acquisitions of code that is not created in house with unknown level of quality.
  - Expanded view of quality well beyond traditional defects to security, legal, perf, etc.
  - Increase popularity in Agile and Virtualized environments.
  - Desire for overall better Quality.



# The Application Development Lifecycle

## Integration points



# Quality Management

*Processes and products to ensure quality throughout the delivery lifecycle*

## Governed

Moment-by-moment grasp of software quality & project metrics for immediate corrective action



- Consolidated, real-time project view to manage tests, defects & project change throughout project lifecycle
- Global project coordination
- Configurable, enforceable process workflows to ensure compliance
- Traceable, auditable relationships between development, test and project artifacts
- Data collection and analysis to provide information for decision making

# Governing the Project with Unified Metrics



Budget Status  
from RPM

Defect Glide Path  
from ClearQuest

Testing Status  
from CQTM

Requirements Volatility  
from RequisitePro

Code Churn  
from ClearCase

## Assurant Health

*First Rational powered project completed on time and 30% under budget*

### Problem

- Scope management problems from uncontrolled requirements
- Lack of project metrics visibility
- Reliant on inefficient manual process

### Solution

**600 IT professionals across 3 states implemented:**

- Requirements management
- Visual modeling
- Test automation
- Workflow automation

### Benefit

- Clear communication between all team members throughout at every stage of the lifecycle
- Clear view of project status
- On time and under budget project delivery

*“Information is one of the biggest benefits I see. With IBM Rational tools, we have more information about the projects we are being asked to develop.”*

*David Steingart, IT Manager Assurant Health*



## Application Security is a Serious Quality Threat

- **Web applications are the #1 focus of hackers:**
  - ▶ 75% of attacks at Application layer (Gartner)
  - ▶ XSS and SQL Injection are #1 and #2 reported vulnerabilities (Mitre)
- **Most sites are vulnerable:**
  - ▶ 90% of sites are vulnerable to application attacks (Watchfire)
  - ▶ 78% percent of easily exploitable vulnerabilities affected Web applications (Symantec)
  - ▶ 80% of organizations will experience an application security incident by 2010 (Gartner)
- **Web applications are high value targets for hackers:**
  - ▶ Customer data, credit cards, ID theft, fraud, site defacement, etc
- **Compliance requirements:**
  - ▶ Payment Card Industry (PCI) Standards, GLBA, HIPPA, FISMA,

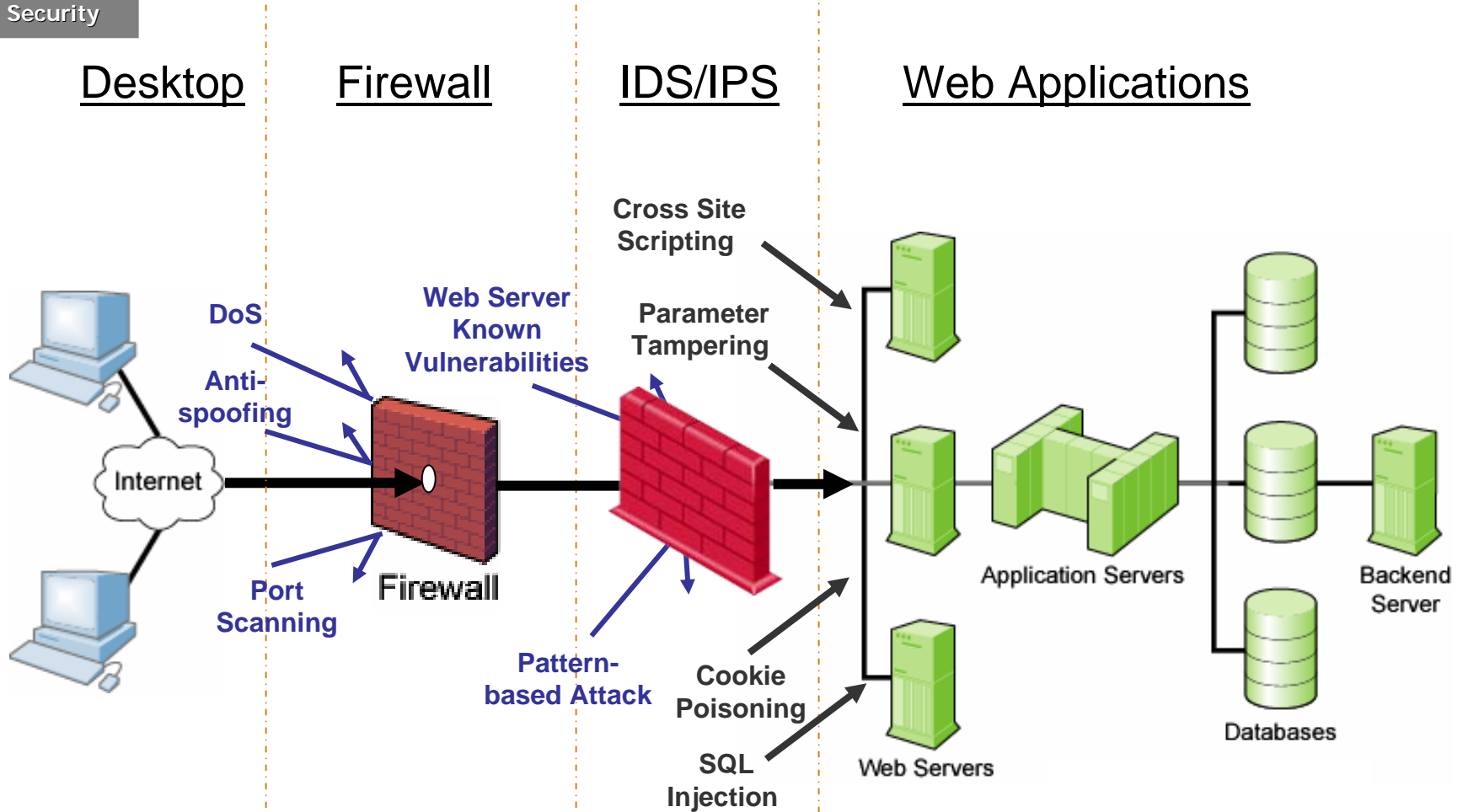






Security

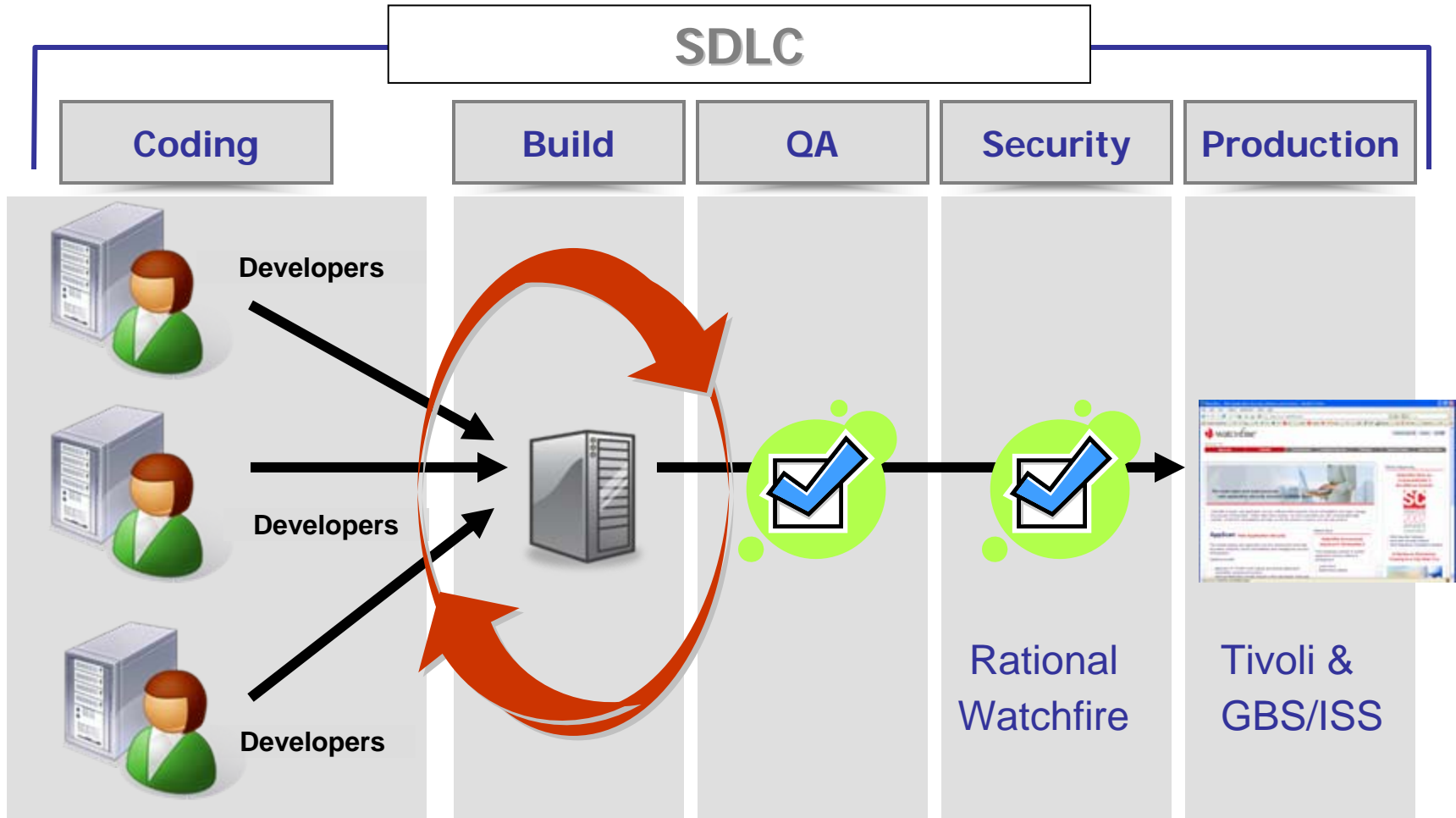
# The WEAKEST Link: *Web Application – last layer of defense*



**Manual Patching  
and Code Review**



# Security Testing Within the Software Lifecycle



# IBM Rational AppScan

*Assess and remediate security vulnerabilities*

- Automates security testing and execution as part of the normal QA run
- Integration with IBM Rational ClearQuest for defect entry
- Delivers real-time training on secure testing and coding techniques

53 Security Issues (368 variants) for 'My Application'

- [-] ! Blind SQL Injection (4)
  - [+] http://demo.testfire.net/bank/account.aspx (1)
  - [+] http://demo.testfire.net/bank/login.aspx (2)
  - [+] http://demo.testfire.net/bank/transaction.aspx (1)
- [+] ! Cross-Site Scripting (5)
- [+] ! Format String Remote Command Execution (1)
- [+] ! HTTP Response Splitting (1)
- [+] ! SQL Injection (6)
- [+] ! XPath Injection (1)
- [+] ! Cookie Poisoning SQL Injection

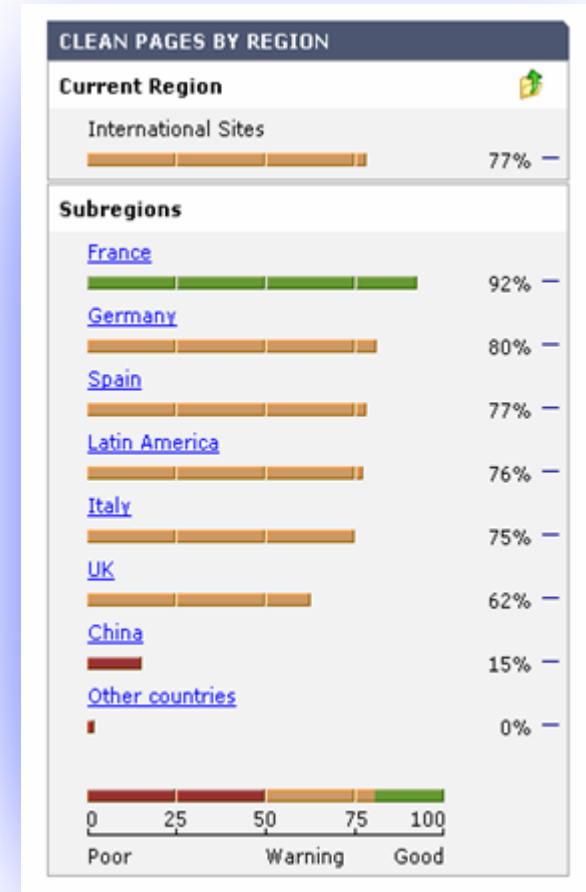
Context Menu:

- Severity
- Re-test
- Manual Test
- Delete
- Set as Non-vulnerable
- Report False Positive
- Log Defect to ClearQuest

# IBM Rational Policy Tester

*Compliance capabilities to proactively reduce risk and improve accuracy*

- **Improves the speed and accuracy of your privacy audits by automating manual processes**
- **Faster remediation of privacy issues to maintain compliance and foster customer confidence**
- **Consumer Data Privacy**
  - ▶ Improve the accuracy and reliability of online privacy assessments
- **eGov Compliance**
  - ▶ Identify Office of Management and Budget compliance risks and increase the efficiency of agency governance procedures for compliance
- **Banking Compliance**
  - ▶ Verify that website language and images comply with federal consumer protection requirements



# Quality management

*Processes and products to ensure quality throughout the delivery lifecycle*



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**Analyst**

*Analyze business needs*



**Modeler**

*Model architecture*



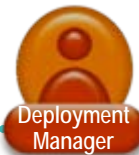
**Developer**

*Write code*



**Tester**

*Function and system test*



**Deployment Manager**

*Deploy*



**Security**

*Security and Compliance*



**Manager**

*Manage*



## Case Study – Ingenuity & Commercial Union & IBM = Success

### ■ IBM Business Partner Ingenuity

- ▶ Experienced Quality Management business partner
- ▶ Excellent Track Record of Delivering IBM Rational Quality Management Solutions
- ▶ Follow the Continuous, Automated & Governed Best Practices

### ■ IBM Customer Commercial Union

- ▶ High Profile Insurance Company
- ▶ Aggressively Short Time to Market
- ▶ Need to Comply with Governance Issues
- ▶ Historically Suffering from Quality Problems
- ▶ Having to Meet a Very Challenging Release Cycle

### ■ Quality Management Solution

- ▶ Look to begin testing as early as possible
- ▶ Continue to Test Throughout the Product Life Cycle
- ▶ Employ Test Automation to ensure Repeatable, Effective & Efficient Testing
- ▶ Collect, Analyse and Leverage Project Metrics



# Overview of Quality Management Solution

- **Worked Closely with Customer to Understand Testing Requirements**
  - ▶ Reviewed development process and influenced iterative process adoption
- **Proposed The Use of IBM Rational Quality Management Tools**
- **Designed and Implemented a Comprehensive Performance Testing Suite**
- **Identified Defects Quickly Communicated and Resolved**
- **Test Suite Maintained and Updated as Needed in parallel with the Development Lifecycle**
- **Extensive Metrics Collected and Used for:**
  - ▶ Assessment of Improvements to Quality of Software Under Test
  - ▶ To Focus Test Effort for Future Test Phases
  - ▶ Implementing Test Process Improvement
  - ▶ Supporting Customer ROI Reporting







## Summary

- **In a Very Challenging Commercial & Regulatory Environment, Companies can Succeed or Fail on their Ability to Deliver New Value to Their Customers, While Meeting Compliancy Requirements**
- **The IBM Rational Quality Management approach promotes a Continuous, Automated and Governed Approach to Ensuring Business Success**
- **Using these Best Practices, IBM BP Ingenuity works with their Customers to Improve their Development & Testing Approach – driving Customer Success**
- **The Continuous, Automated and Governed Approach to Quality Management is not an Abstract Concept, but a Proven Best Practice that Delivers Tangible Benefits**



# IBM Rational Software Development Conference 2008

June 1 – 5, 2008; Orlando, Florida

IBM Rational Software Development Conference 2008

WHERE TEAMS ARE **R-HEROES**

June 1-5, 2008 • Orlando, FL

RU READY TO SAVE THE DAY?

SAVE THE DATE!

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- Over 300 sessions – 14 tracks
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