Change and Configuration Management
IBM Software Development Platform

Segrate, 22 Novembre 2006

Agenda

- Defining Change and Configuration management

- Business value of Change and Configuration management solutions

- Challenges-solutions in Change and Configuration management

- Capabilities of Rational Change and Configuration management tools

- BuildForge Demo

- ECM Demo

- Closing, Q&A and Thanks

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- **Defining Change and Configuration management**

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Defining Change and Configuration Management

- The control and adaptation of the evolution of complex systems. It is the discipline of keeping evolving software products under control, and thus contributes to satisfying quality and time constraints. Software configuration management (or SCM) can be divided into two areas:

  - The first area of SCM concerns the storage of the entities produced during the software development project

  - The second area concerns the activities performed for the production and/or change of these entities

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Why Change and Configuration Management ?

Software projects are more complex than ever

- Many developers

- Complex software and content artifacts

  - source code   - documentation

  - object code   - models and designs

  - web content   - requirements

  - test scripts   - directories

  - DB tables structure   - DB tables data

- Larger and distributed teams

- Changing business needs

  - mergers, acquisitions, OEM

- Change in Internet time

- Many releases and platforms (heterogeneous environment)

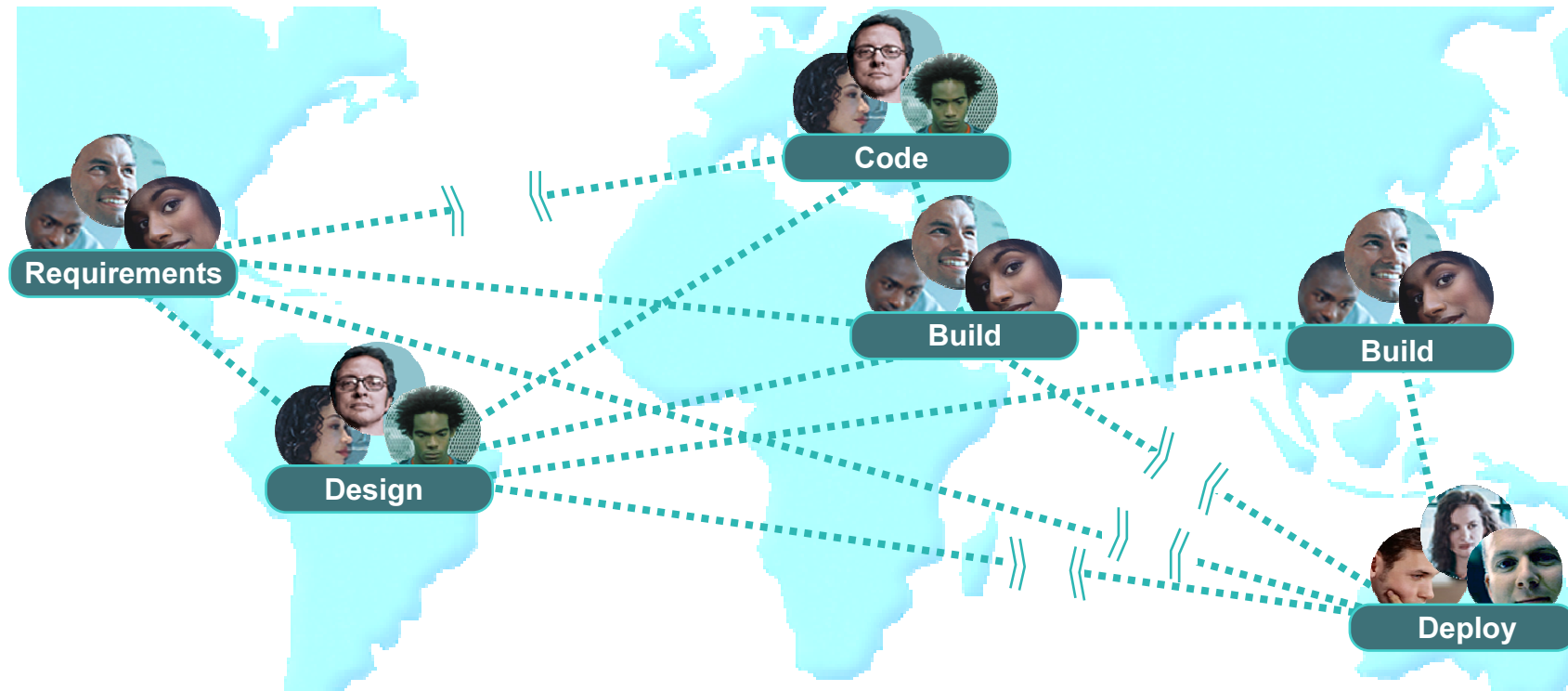- Many locations where software is developed

Quality Change and Configuration Management improves responsiveness and agility

AGILITY

Market Change **Compliance Change** **Supply Change** **Labor Change**
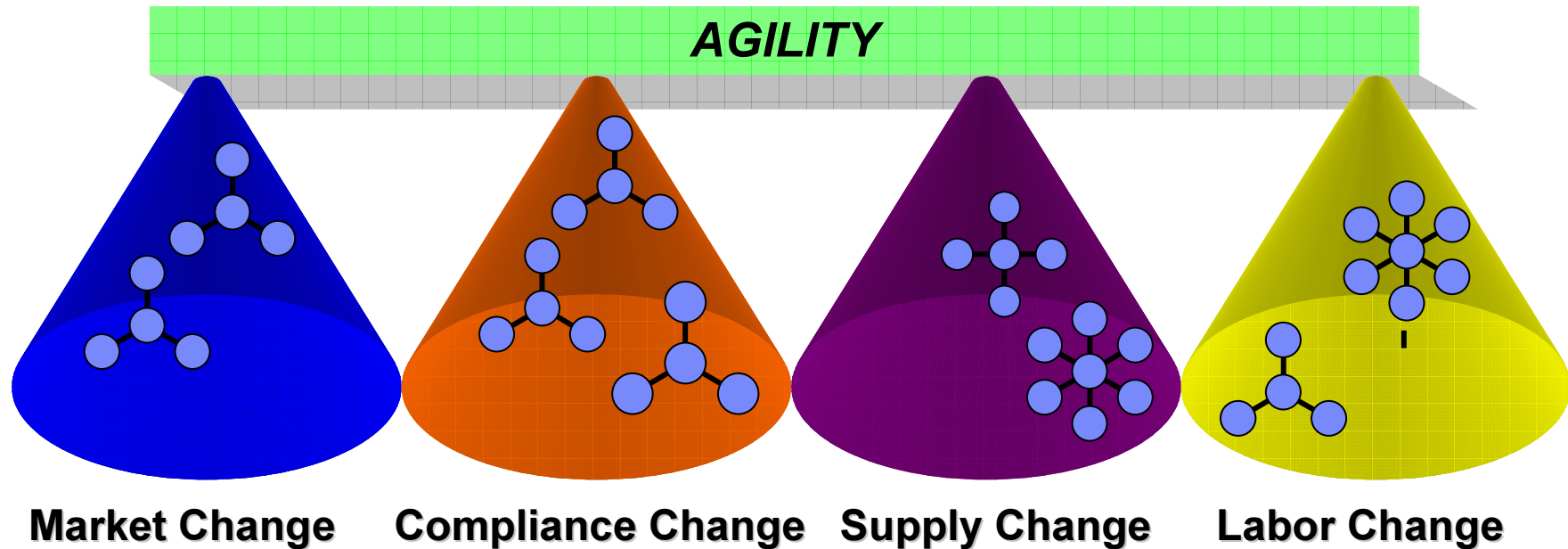
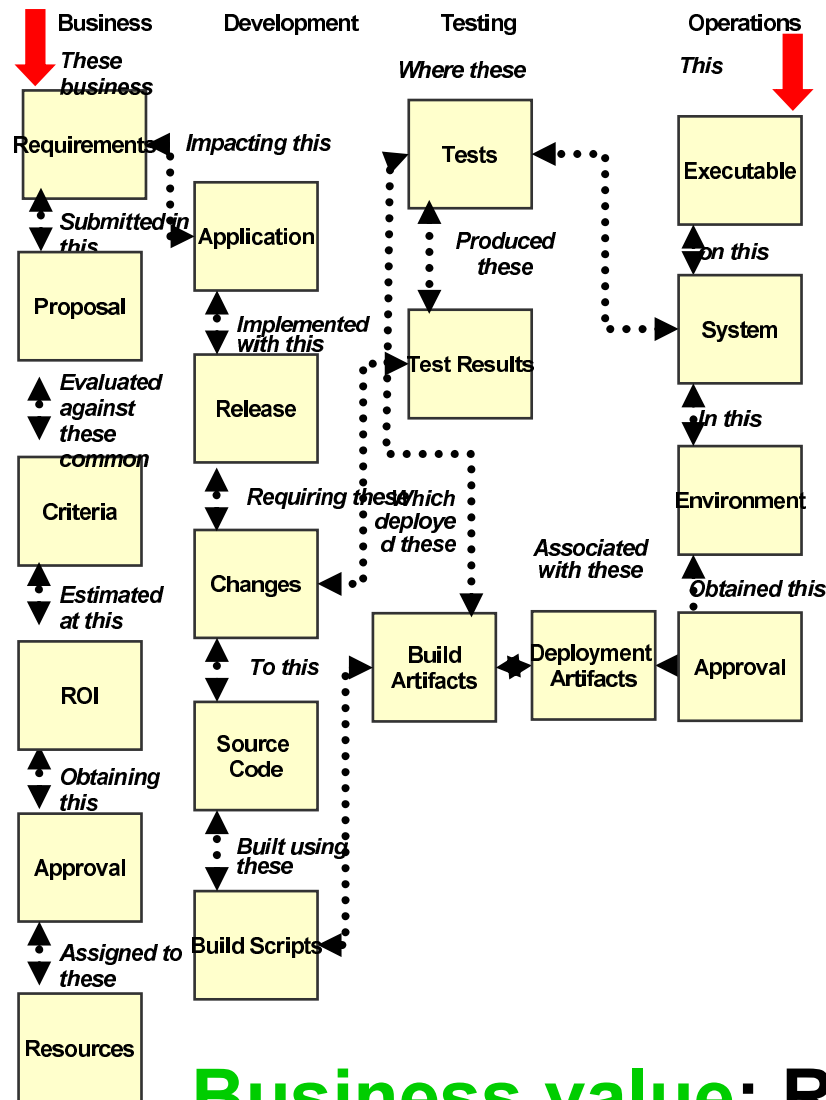**Business value: Cope with changing business needs and pressures**

Improves management of distributed development

**Business value**: **Collaboration and reuse reduces cost**

Makes compliance easier

Business   **Development**   **Testing**   **Operations**

These business

Where these

This

Requirements — *Impacting this* — Application — Tests — Executable

Submitted in this

Produced these

on this

Proposal — Test Results — System

Implemented with this — Release

Evaluated against these common — *In this*

Criteria — *Requiring these* — *Which deployed these* — Environment — System

Estimated at this — Changes — *Associated with these* — *Obtained this*

To this — Build Artifacts — Deployment Artifacts — Approval

ROI — Source Code

Obtaining this

Built using these

Approval — Build Scripts

Assigned to these

Resources

- Help enforce a secure and audit-ready development environment

- Establish end to end life cycle traceability

Business value: **Reduce risk of Failing Audits**

Get better visibility into projects
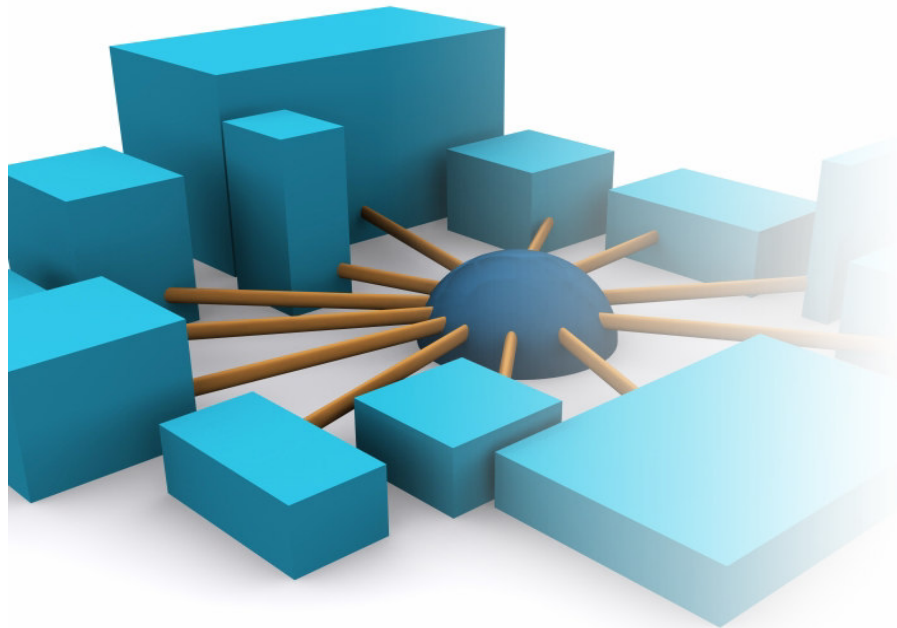
Instant Insight into Projects

Test   Change   Defects

- Single project view

- Global test project coordination

- Configurable, enforceable processes

Business value: better control and predictability

Improve Management of complex architectures, environments and processes

Workstation/PC

Server(s)

Mainframe

Browser

Business value:
Works in any
environment
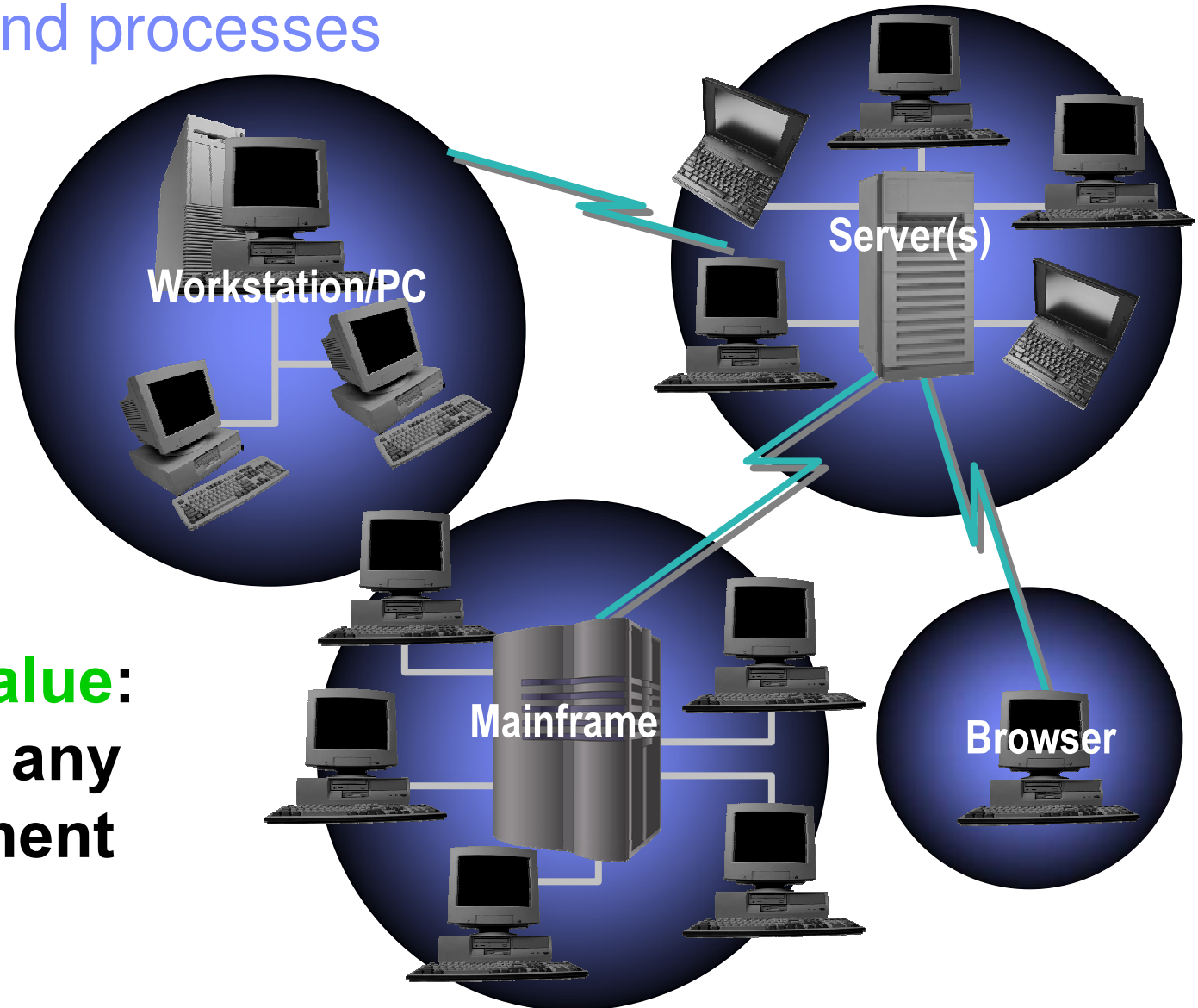
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The challenge: poor visibility, lack of cohesion across business and technology domains

Business View

- Poor visibility and governance over IT investments
- Lack of actionable information
- Blind decision-making

Operations View

- Inadequate service levels
- Inability to rapidly deploy applications
- Complex, multi-tier operating environments

BUSINESS

Business Analysts

Operations

OPERATIONS

Application Developers

DEVELOPMENT

Application Development View

- Overwhelming complexity
- Relentless time-to-market pressure
- Uncontrolled change

Solutions must add value across all levels of business

Executive

- Managing change effectively speeds the development lifecycle
- Metrics ensure efficient resource allocation
- Integrations streamline cross-functional team communication

Maximize
business results

Project Manager

- Instant project status updates pinpoint problem areas quickly
- Effective bug triage meetings improve quality
- Automated workflow keeps the team in synch

Ensure
predictable results

Practitioner

- Easy submission and modification of change requests saves me time
- Personal metrics tell me what I should work on first
- Automation of tedious tasks saves me time

Frees
me to focus

IT Lifecycle Management … bridging the Gap

"Major vendors are starting to integrate their application life-cycle management (ALM) and systems management tools to close the loop between development and operations and are also starting to integrate these tools with portfolio management tools to make the link with planning. The vision – a fully integrated, automated end-to-end solution – what IDC is calling IT life-cycle management (ITLM)…**"**

Melissa Webster, IDC, May 2005 - "IT Life-Cycle Management: Will a Platform Emerge?"

Challenge #1
Sluggish response to business change

- Slow response to changing requirements causing diminished development investment returns

- Poor metrics and reporting capabilities causing inefficient workload distribution

- Use of non-value-added processes

- Disjointed development and deployment efforts resulting in extra cycles and slowed delivery

Solution #1
Improving responsiveness and agility

- Allow your developers to work independently but still coordinate their work as a team

- Get better visibility into your projects status and deliverable's states

- Have developers automatically merge their changes into multiple projects running simultaneously

- Know precisely which change requests and/or defect fixes were incorporated into each build

- Easily track change requests to requirements to test results to build and release artifacts

Challenge #2
Poor individual and team effectiveness

Developer

Deployment Manager

Architect

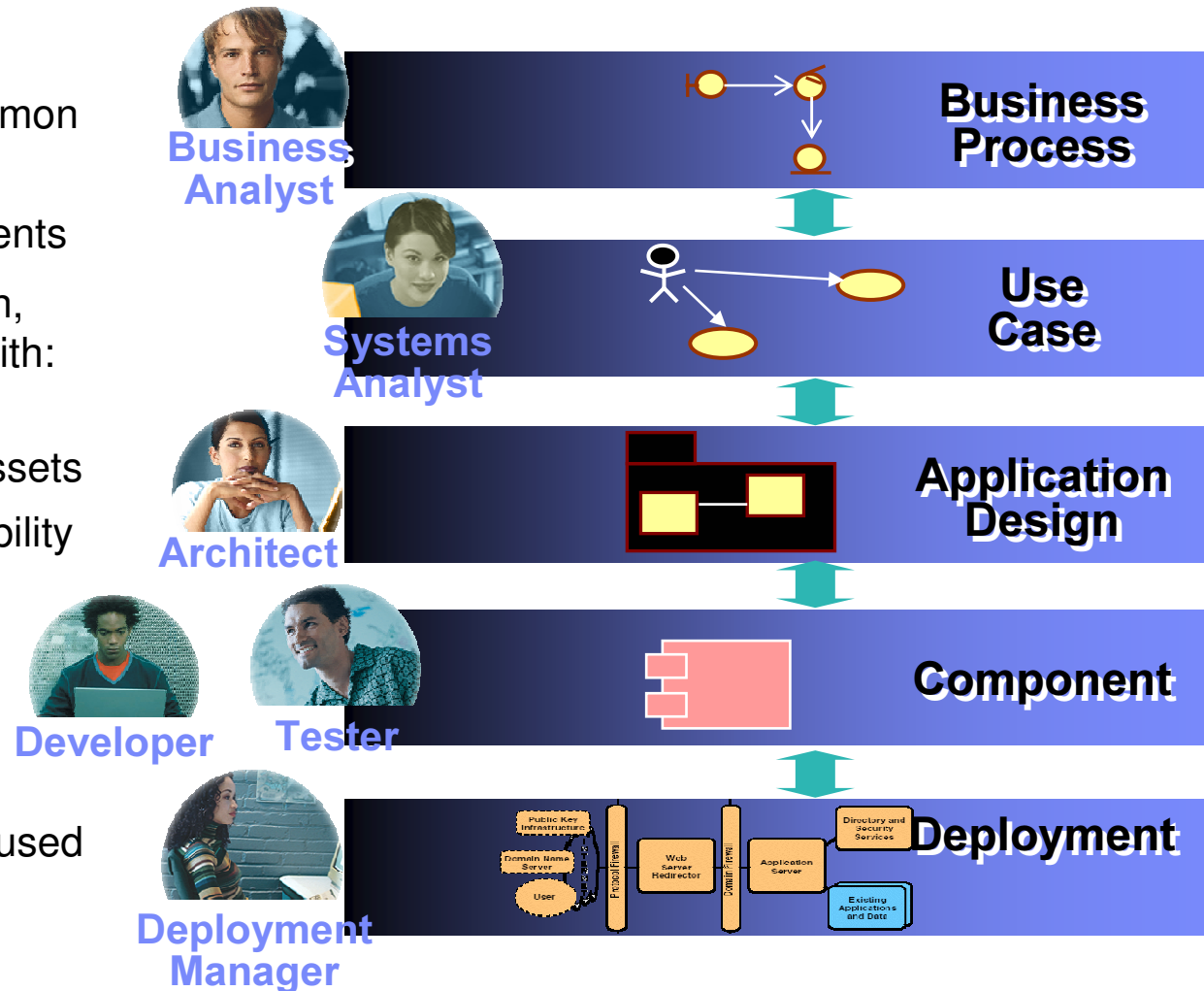**Tester**

Systems Analyst

Business Analyst

- Slow and lacking communication

- Lack of reused components

- Manual processes

- Limited of collaboration

Solution #2
# Improving individual and team effectiveness

- Multiple perspectives of common data, optimized for each role

- Remote access and Web clients

- Better project communication, collaboration, coordination with:

  - a central repository for all development and build assets

  - built in automation with ability to add custom script

- Automate and control the software life cycle

- Parallel development

- Support for most commonly used IDE's

Business Analyst

Systems Analyst

Architect

Developer   **Tester**

Deployment Manager

Business Process

Use Case

Application Design

Component

Deployment

Challenge #3
Inability to properly manage enterprise wide distributed resources
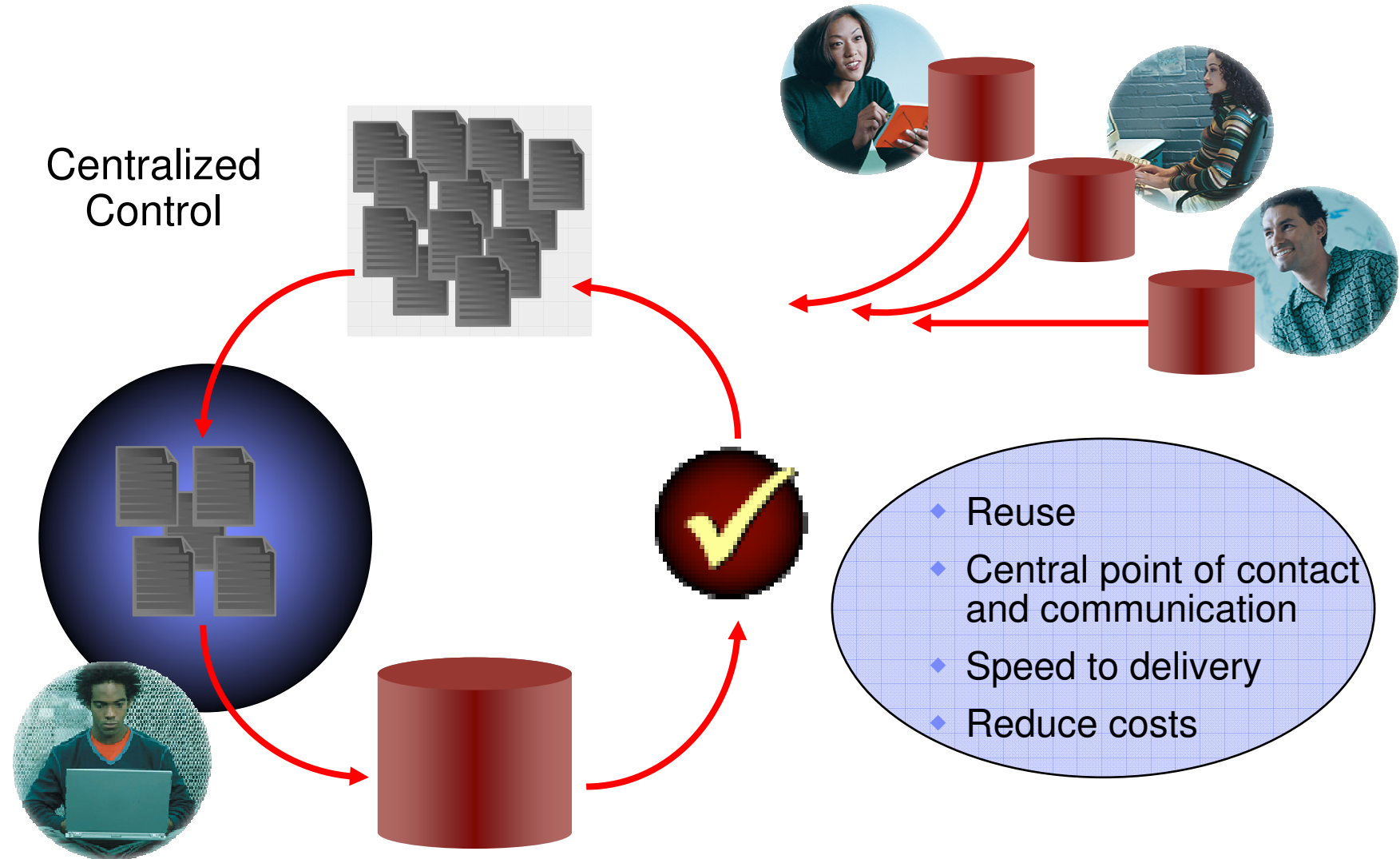
Scattered Local and Remote Resources
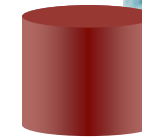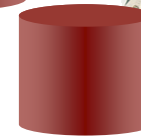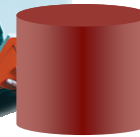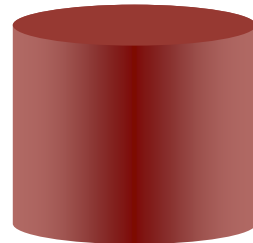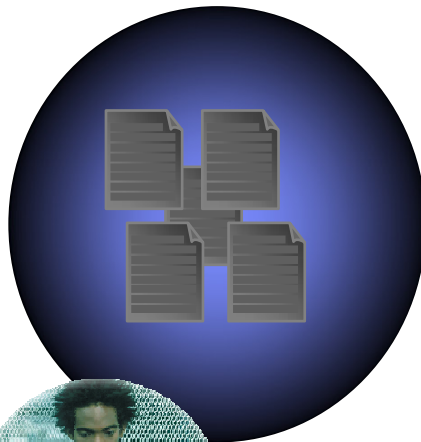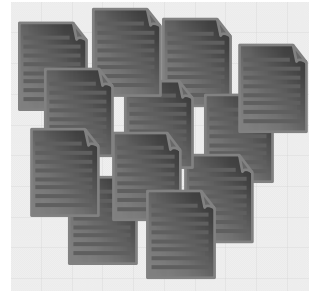
Right Sourcing of assets

- ◆ Reproduction
- ◆ Gaps in communication
- ◆ Time lost in progress

Solution # 3
Streamlined management of distributed resources

Centralized
Control

- ◆ Reuse
- ◆ Central point of contact and communication
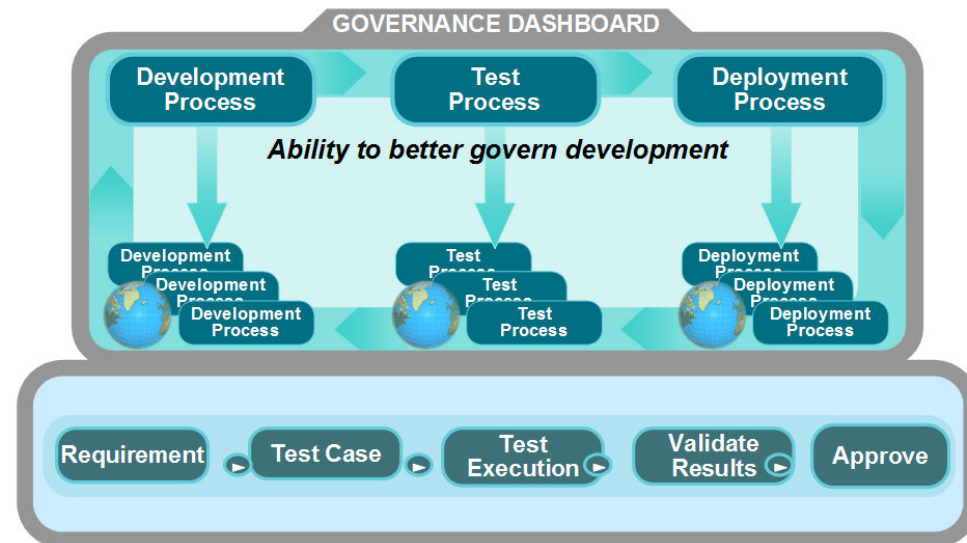- ◆ Speed to delivery
- ◆ Reduce costs

Challenge #4
Compliance

- Regulations and standards

  ▸ Government agencies need to comply with OMB A-123 (equivalent SoX 404 in the Commercial Sector) and (FISMA) Federal Information Security Management Act.

  ▸ Healthcare compliance issues include FDA 21 CFR Part 11, HIPPA (Health Insurance Accountability and Portability Act), and Sarbanes Oxley.

  ▸ Standards such as CMMI are widely adopted by public and finance customers to facilitate process improvement and compliance efforts.

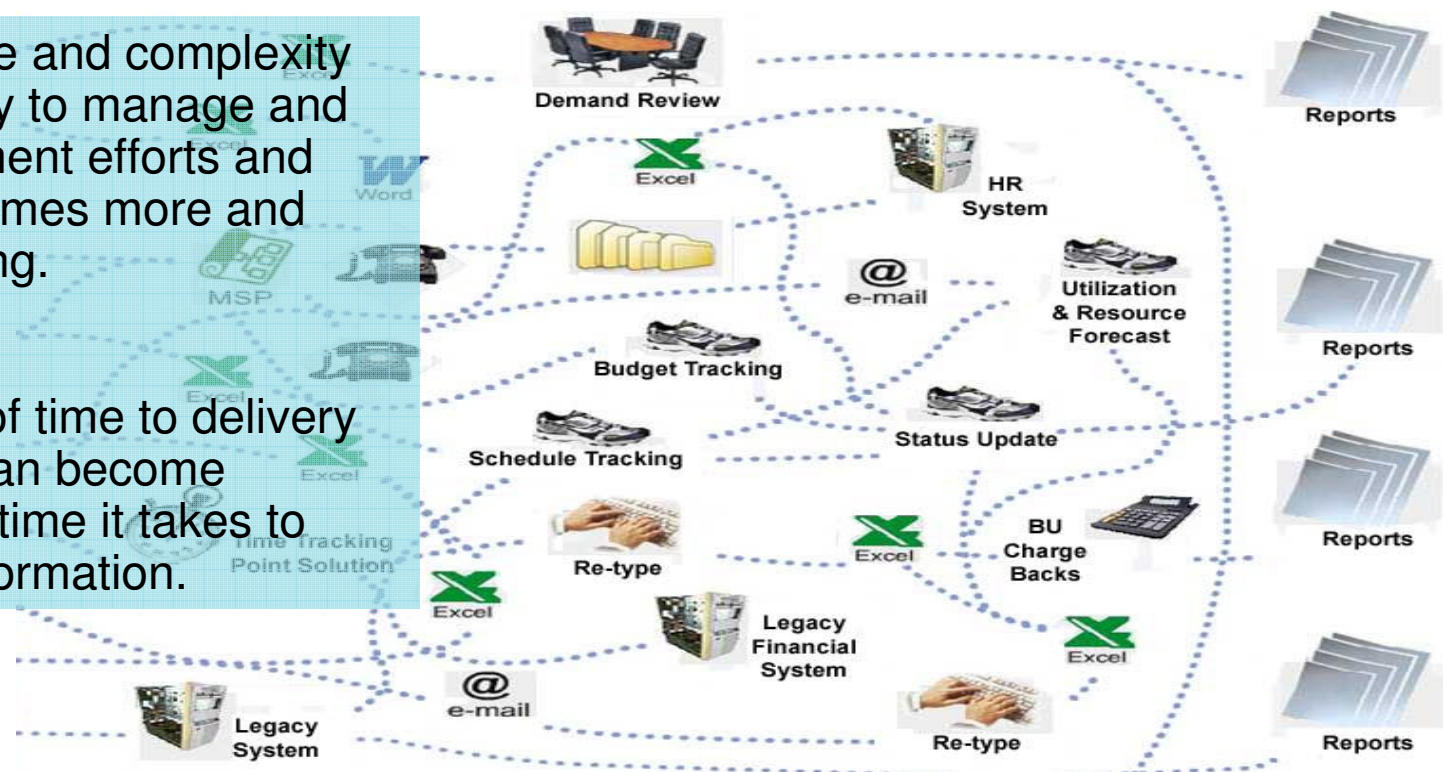# Solution #4
Improving control and traceability

- Management required change approvals

- Automatic Change Logging

- Metadata accompanied change request that assists in determining impact analysis

- Document all changes introduced into the environment from inception to delivery

- Password security

- Audit trails

- Electronic signatures

GOVERNANCE DASHBOARD

Development Process	Test Process	Deployment Process

Ability to better govern development

Development Process	Test Process	Deployment Process

Requirement	Test Case	Test Execution	Validate Results	Approve

Challenge #5
Poor visibility into project's progress and status

▪ As project size and complexity grows the ability to manage and focus development efforts and resources becomes more and more challenging.

▪ Assessment of time to delivery and progress can become obsolete in the time it takes to compile this information.
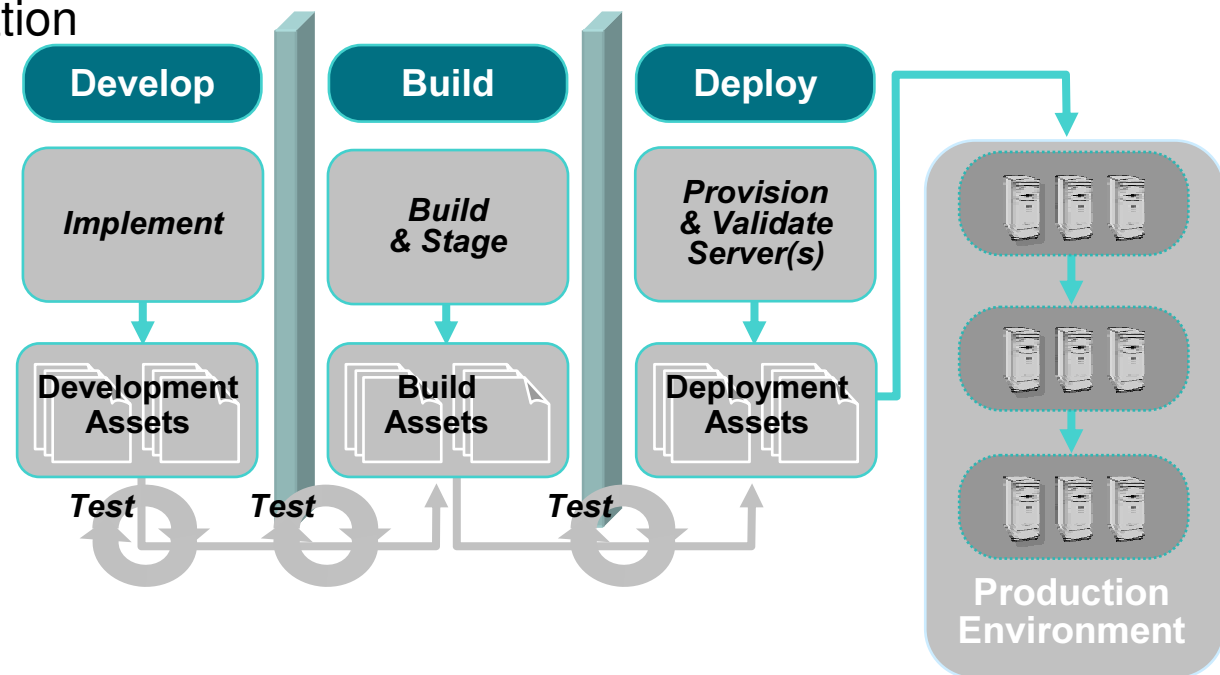
Solution #5
Real-time project status

- Queries & Charts
  - Easily create and modify with Wizards
  - Charts: Aging, Trend, Distribution
- Reports
  - Crystal Reports-based run-time engine
  - Export to many common formats (Excel, Word, HTML)
- E-mail notification rules
  - Automatic notification of events and state changes
  - Configurable through GUI interface
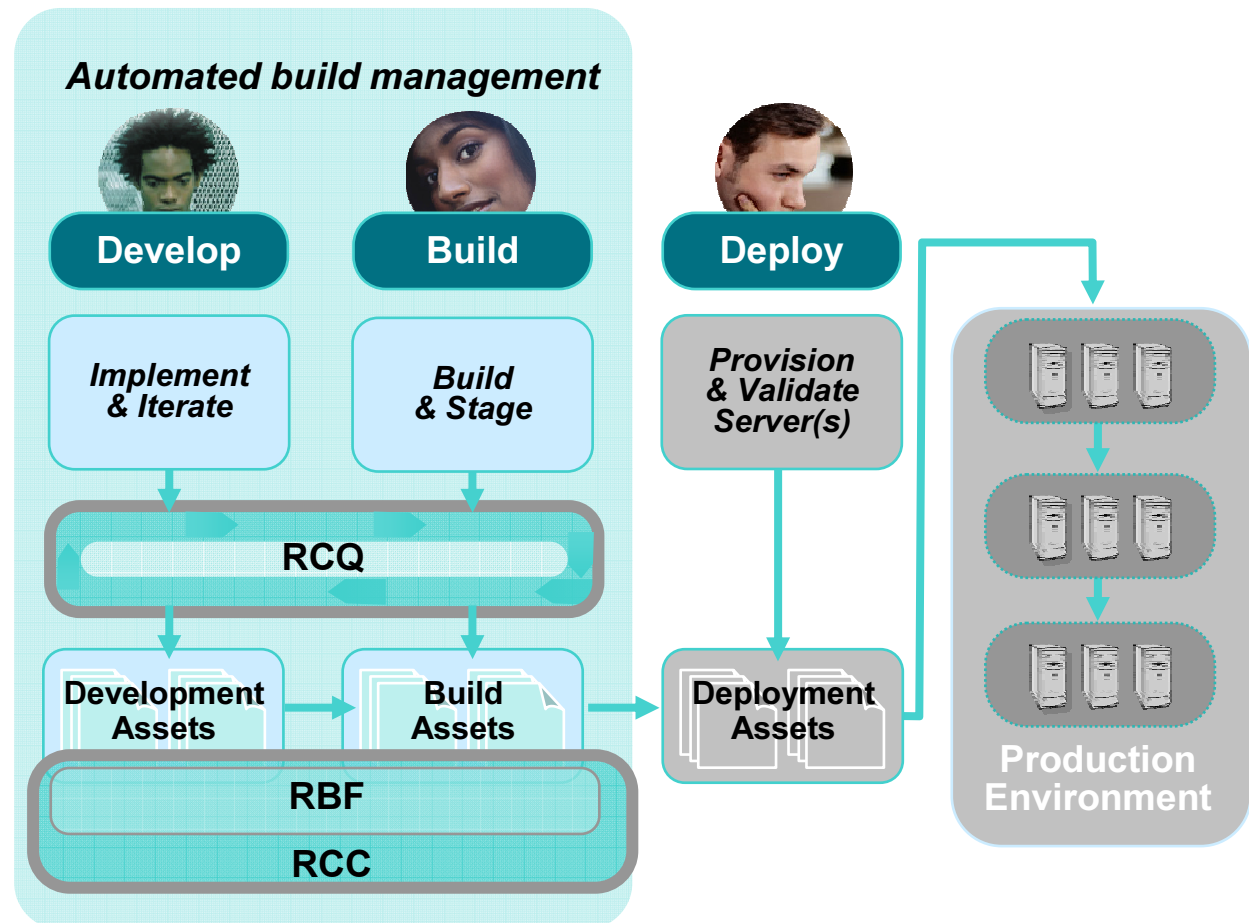 - Out of the box configuration

Challenge #6:
Complex development, test, build and deployment architectures

- Difficulty tracking testing status of multiple builds

- No shared processes, artifacts or controls

- "Over the wall" communication

- Minimal reuse

- Labor intensive

- Error prone handoffs

Develop	Build	Deploy
Implement	*Build & Stage*	*Provision & Validate Server(s)*
Development Assets	Build Assets	Deployment Assets

Test   Test   Test

Production Environment

Solution #6:
Automated build management

- Automated build management

- Detailed record of build content

- Support for continuous builds

- Build records for tracking and reporting

Automated build management

Develop	Build	Deploy
Implement & Iterate	*Build & Stage*	*Provision & Validate Server(s)*

RCQ

| Development Assets | Build Assets | Deployment Assets |

RBF

RCC

Production Environment

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All Part of the IBM Rational Software Development Platform

GOVERNANCE DASHBOARD

Solutions for geographically distributed development, compliance, SOA

Process & portfolio management

- IBM Rational® Portfolio Manager
- IBM Rational Method Composer
- Best practices content (IBM Rational Unified Process® IBM Tivoli Unified Process®, Portfolio Management)

Requirements & analysis

- IBM WebSphere® Business Modeler
- IBM Rational RequisitePro®
- IBM Rational Software Architect
- IBM Rational Software Modeler
- IBM Rational Data Architect

Design & construction

- IBM Rational Software Architect
- IBM Rational Software Modeler
- IBM Rational Application Developer
- IBM Rational Systems Developer
- IBM WebSphere Integration Developer

Software quality

- IBM Rational Performance Tester
- IBM Rational Functional Tester
- IBM Rational Manual Tester
- IBM Rational PurifyPlus

Change & configuration management

- IBM Rational ClearCase®
- IBM Rational ClearQuest®
- IBM Rational BuildForge®

- IBM Rational Team Unifying Platform™
- IBM Tivoli Provisioning Manager
- IBM Tivoli Intelligent Orchestrator

Partner ecosystem & open computing
Eclipse™, Linux®, Microsoft® Windows®, UNIX®, IBM z/OS® , IBM iSeries®

IBM Software Configuration management offerings

Benefits	Capabilities
▪ Quickly respond to change ▪ Develop anytime, anywhere ▪ Ensure predictable results ▪ Promote and support reuse	▪ Change and asset management ▪ Build and release management ▪ Flexible workflow support ▪ Traceability across the lifecycle

Key Products	Project Manager	Developer	Tester	Analyst
IBM Rational ClearCase	✓	✓	✓	
IBM Rational ClearQuest	✓	✓	✓	✓
IBM Rational BuildForge	✓	✓	✓	
IBM Rational Team Unifying Platform	✓	✓	✓	✓
IBM z/OS SCLM Suite		✓		

IBM Rational Change Management
From Workgroup to Enterprise Teams

IBM Rational ClearCase MultiSite IBM Rational ClearQuest MultiSite

Add-on

IBM Rational ClearCase IBM Rational ClearQuest

Upgrade

Distributed Team Development

Dynamic Views

IBM Rational ClearCase LT IBM Rational ClearQuest

Advanced Build Management with Rational BuildForge – zOS Extentions

Snapshot Views

Activity-Based Change Management – Unified Change Management

Single Server

Distributed Servers

Replicated Servers

Individual Workgroups

Medium-Large Teams

Remote Teams

IBM Rational **ClearQuest**
Primary benefits

- Single project view with end to end lifecycle record request tracking
  - Defects
  - Enhancement Requests
  - Customer defined records

- Test management Asset Management
  - Create and configure test plans and test cases
  - Create and run suites or individual test cases
  - Extensive query and reporting facilities to measure test progress

- Activity management
  - Built-in work flow management
  - Integrated asset management with Rational and 3rd party tools
  - Definable, repeatable and auditable processes

Rational ClearQuest provides better visibility into enterprise wide management with a Single project view abilities

- Resource allocation
  - "Are change requests distributed evenly across the team?"
  - "Who is available to take on a mission-critical bug fix?"

- Project status
  - "How many Priority 1 defects are still outstanding?"

- Trends
  - "How long is it taking to fix the average bug?"
  - "How long is taking to implement enhancement requests?"

- Testing
  - "How many defects are in the verifying state?"

IBM Rational ClearQuest

IBM Rational ClearQuest-- Single Project View
Single solution to manage tests, defects and project change

Benefits:

- Consolidated, real-time view of the entire project status

- Traceable, auditable relationships between development, test and project artifacts

  - Manages test planning, test results, quality metrics, and defects

  - Central repository with integrated version control

  - Comprehensive quality metrics in project dashboards and reports
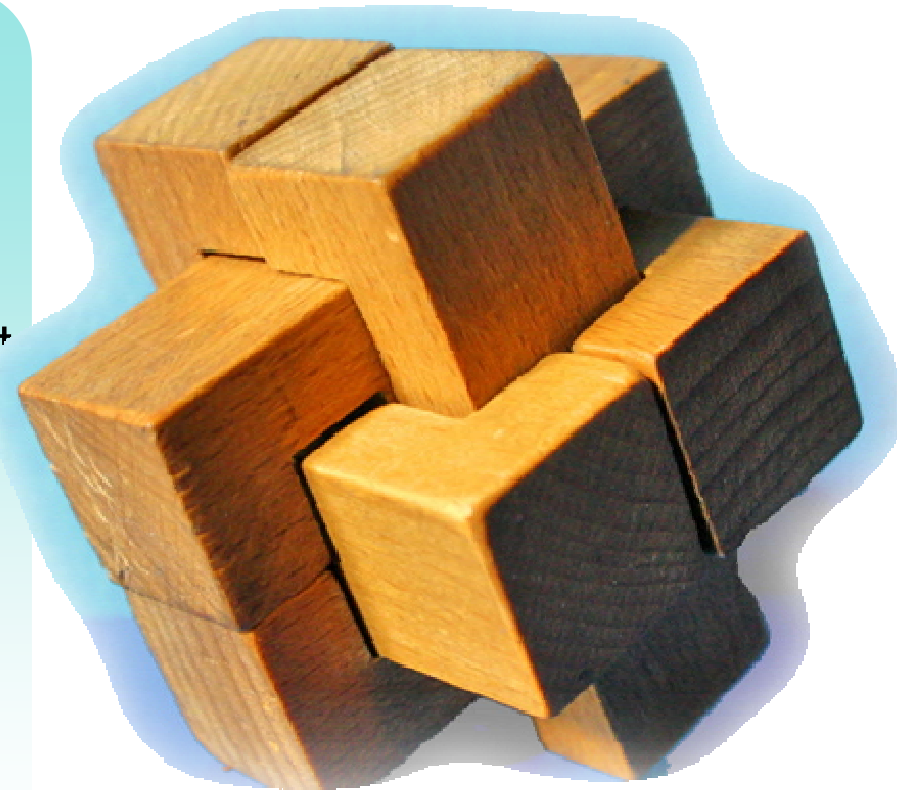
IBM Rational ClearQuest

Communicate real-time project status

- Queries & Charts
  - Easily create and modify with Wizards
  - Charts: Aging, Trend, Distribution
- Reports
  - Crystal Reports-based run-time engine
  - Export to many common formats (Excel, Word, HTML)
- E-mail notification rules
  - Automatic notification of events and state changes
  - Configurable through GUI interface
  - No programming required!

IBM Rational ClearQuest
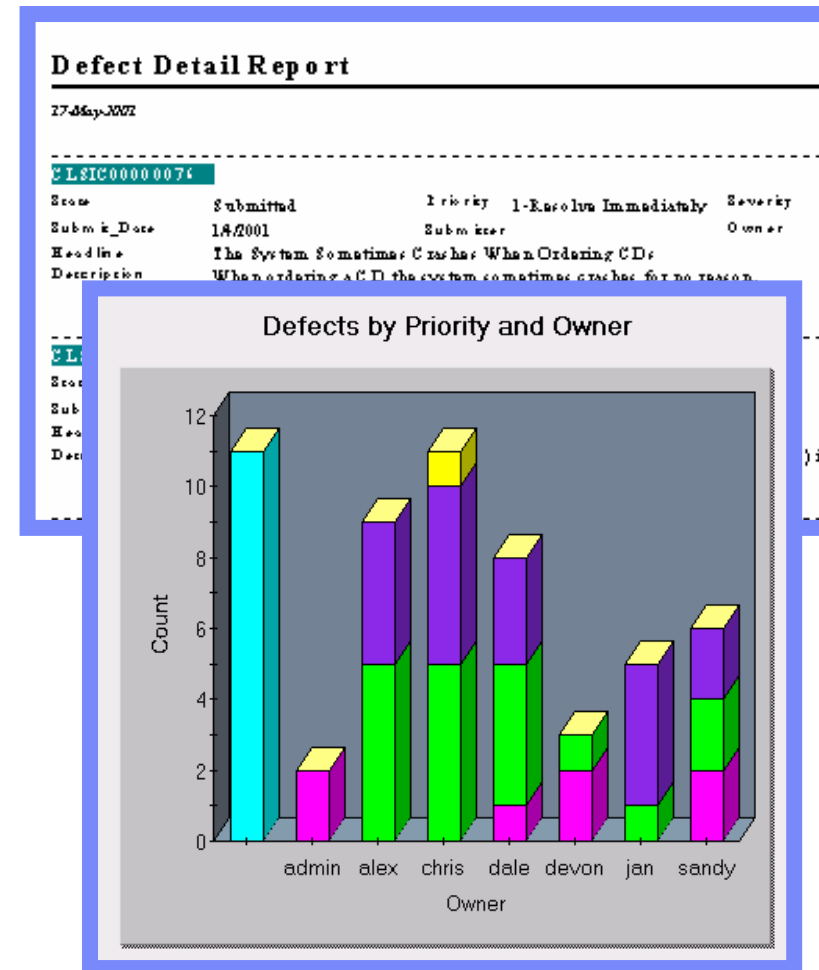
IBM Rational ClearQuest and Functional Testing

- Enterprise scalable, distributed test management

- Test process enforcement and customization

- Quality metrics

- Integrated test management and test automation tools

- Support for testing J2EE/Java, Web, .NET, Visual Basic, C/C++ and many other client-server software applications

IBM Rational ClearQuest

Hub for test and lifecycle management

Test Management	Change Management	Defect Management

Test Automation	Manual Testing

Functional testing of modern and legacy applications

Business process manual testing

IBM Rational Testing Solutions
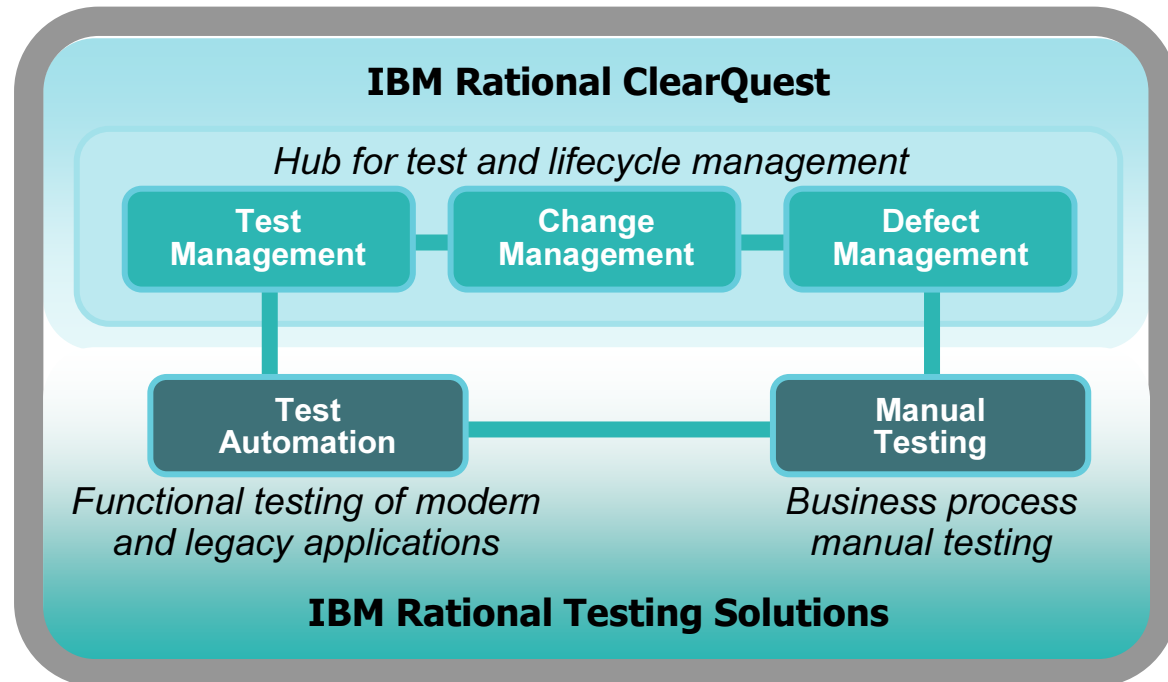
IBM Rational ClearQuest
IBM Rational Functional Tester
IBM Rational Manual Tester
IBM Rational Robot

IBM Rational ClearQuest— Components

ClearQuest Maintenance Tool

Set up and connect to the schema repository during installation and when you upgrade to a new ClearQuest version.

Allows finer control over what databases are available to different groups

Secure login

ClearQuest Designer

Customize schemas; manage user databases; and administer users and user groups.

Choose from several "out of the box" schema implementations

Extend functionality using pre-defined Packages

Add fields and control behavior

Modify forms

Configure the State Transition Matrix

Extend your system with triggers, including automated email notifications

IBM Rational ClearQuest

IBM Rational ClearQuest— Platforms

ClearQuest supported client platforms

Windows® client

Submit, modify, and track change requests, and analyze project progress by creating queries, reports, and charts

Web client

Access IBM® Rational ClearQuest across multiple platforms by using a Web browser to submit, modify, and track change requests, and analyze project progress by creating queries and reports.

Eclipse Client

Submit, modify, and track change requests, and analyze project progress by creating queries, reports, and charts.

ClearQuest supported database vendors

DB2®

Oracle®

Microsoft SQL Server®

Microsoft Access®

IBM Rational ClearQuest Designer

- Create new fields of any type

  - Integer, date/time, short string, multi-line string, attachment list, reference, reference list

- Easily set a field's behavior

- Built-in visual form editor

- A state machine controls the flow of records through your system

IBM Rational ClearQuest
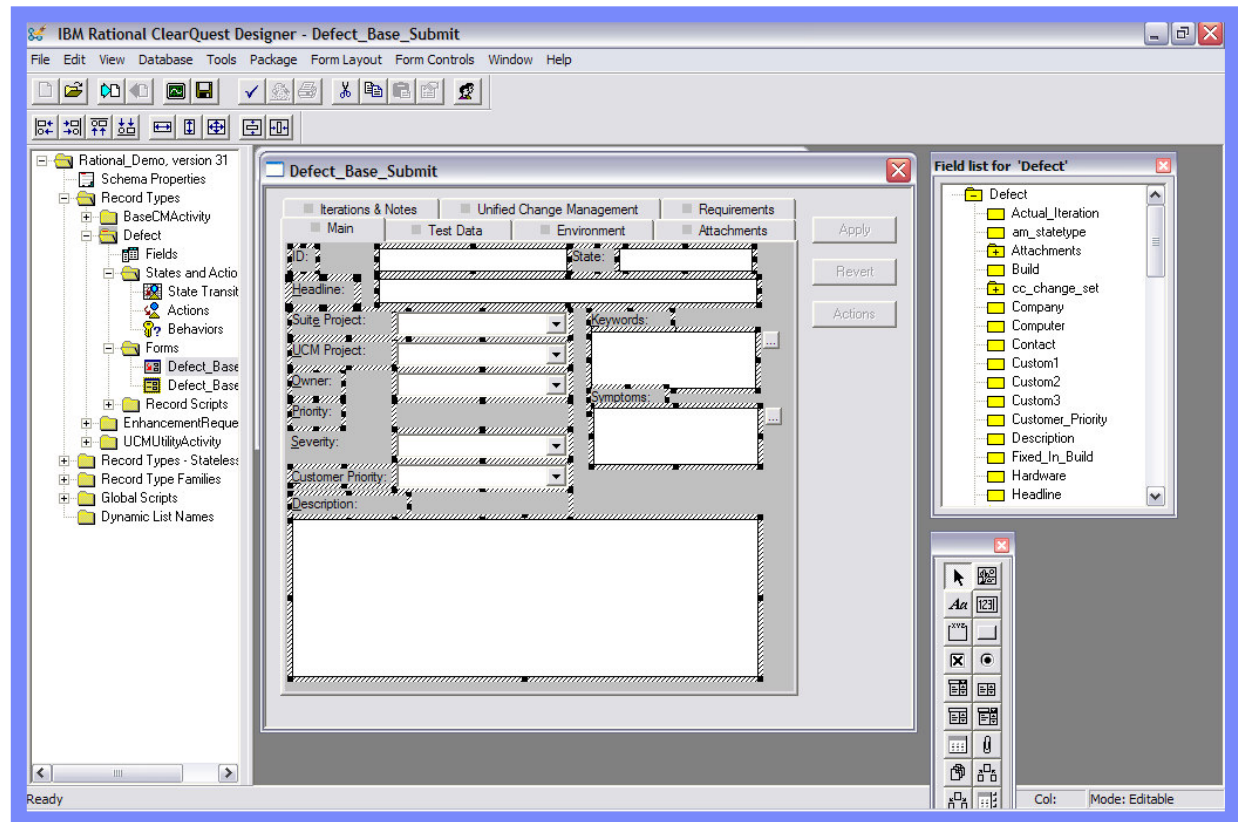
Improving individual and team effectiveness

- **To-do list**
  - "What change requests have been assigned to me?"
  - "What should **I** work on first"

IBM Rational ClearQuest Eclipse Client

IBM Rational ClearQuest Web Client

Security and Compliance made easier

- Decide what records and states require Electronic Signature Tracking

- ClearCase and ClearQuest secured entry with LDAP authentication

- Secure Repository for managed assets

ClearQuest Electronic Signatures

ClearQuest Field change logging

New Tab

Field History:

START Fields Changed by admin, Close->Closed, 24 February

Record was Electronically Signed by : Sig#2
Old value of Resolution: <NULL>
New value of Resolution: Enhancement Request
Old value of State: Submitted
New value of State: Closed

END Fields Changed by admin, Close->Closed, 24 February 20

START Fields Changed by admin, Submit->Submitted, 24 Feb

Old value of Headline: <NULL>
New value of Headline: Project # 2 Defect
Old value of Owner: <NULL>
New value of Owner: admin

Entry for each action.

ID : 00000006

IBM Rational ClearQuest Integrations:

- Rational ClearCase

- Rational BuildForge

- Rational RequisitePro

- IBM Tivoli Provisioning Manager

- Rational Portfolio Manager

- Microsoft MS Project®

- DOORS

IBM Rational ClearQuest

IBM Rational **ClearCase**
Primary functions

- ClearCase

  - Sophisticated version control, automated workspace management, parallel development support, baseline management, build and release management improves productivity and operational efficiency

  - Heterogeneous, cross-platform support for distributed, mainframe (IBM z/OS®) and midrange (IBM i5/OS®) development enables platform flexibility and enterprise-wide application development

  - Accessible through local, remote and Web interfaces, and leading IDEs including IBM Rational Application Developer, IBM WebSphere Studio, Microsoft® Visual Studio 2005 and the Eclipse framework

  - Deep integration with requirements, development, build, test and deployment tools provides a complete end-to-end solution to meet current and future needs

  - Operating systems supported: Linux, UNIX, Windows, Linux s/390