IBM®

The future runs on System z

Enterprise Modernization
Lowering the cost of multi-platform application development and delivery

Hayden Lindsey
Vice President & Distinguished Engineer
IBM Rational Enterprise Tools & Compilers

Change is the new norm

There are **1 billion** camera phones in use today

IBM Sequoia Super Computer…
It would take the entire population of the earth, about six billion, each of us working a handheld calculator at the rate of one second per calculation, more than 320 years to do what Sequoia can do in one day.

"8 of 10 CEOs see significant change ahead"
- 2008 IBM CEO Survey

The **internet of people** is over one billion strong. The **internet of things** is almost one trillion.

By 2010, there will be **30 billion RFID tags** in circulation

Soon there will be over **2 billion people** on the web

China sends more text message **in a week** than the U.S. does **in 1 year**

IBM

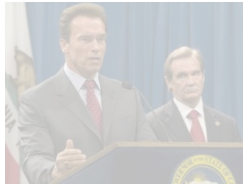# Change can be ~~very disruptive~~ an opportunity

IT skills shortage reaches **highest level** in 10 years

All software systems crashed due to software bug when F-22 flew over international dateline

50% of outsourced projects are expected to **under perform**

"The gap between expected change and the ability to manage it has almost tripled since 2006."
– 2008 IBM CEO study

COBOL thwarts California's "Governator"

North Carolina Jobless Claims **Crash** State's Web Site

Ohio election web site shut down after being **hacked**

View fashion shows and collections on your iPhone

Malta is building smart grid to link the power and water systems

Mobile phone provider "3" launches new handset to allow users to make free calls via Skype

For example, a smarter planet requires <u>lots</u> of software

- For businesses and institutions everywhere, there have never been so many *new possibilities*

- Imagine the amount of *software* necessary to:
  - Deliver a green world
  - Take advantage of information base explosion
  - Communicate with a trillion devices
  - Drive on-going product differentiation
  - To seize new global market opportunities

- Leaders everywhere are deploying *increasingly intelligent* software, systems and products

- Accelerating innovation and enabling effective change is highly dependent on our ability to *manage effective software delivery*
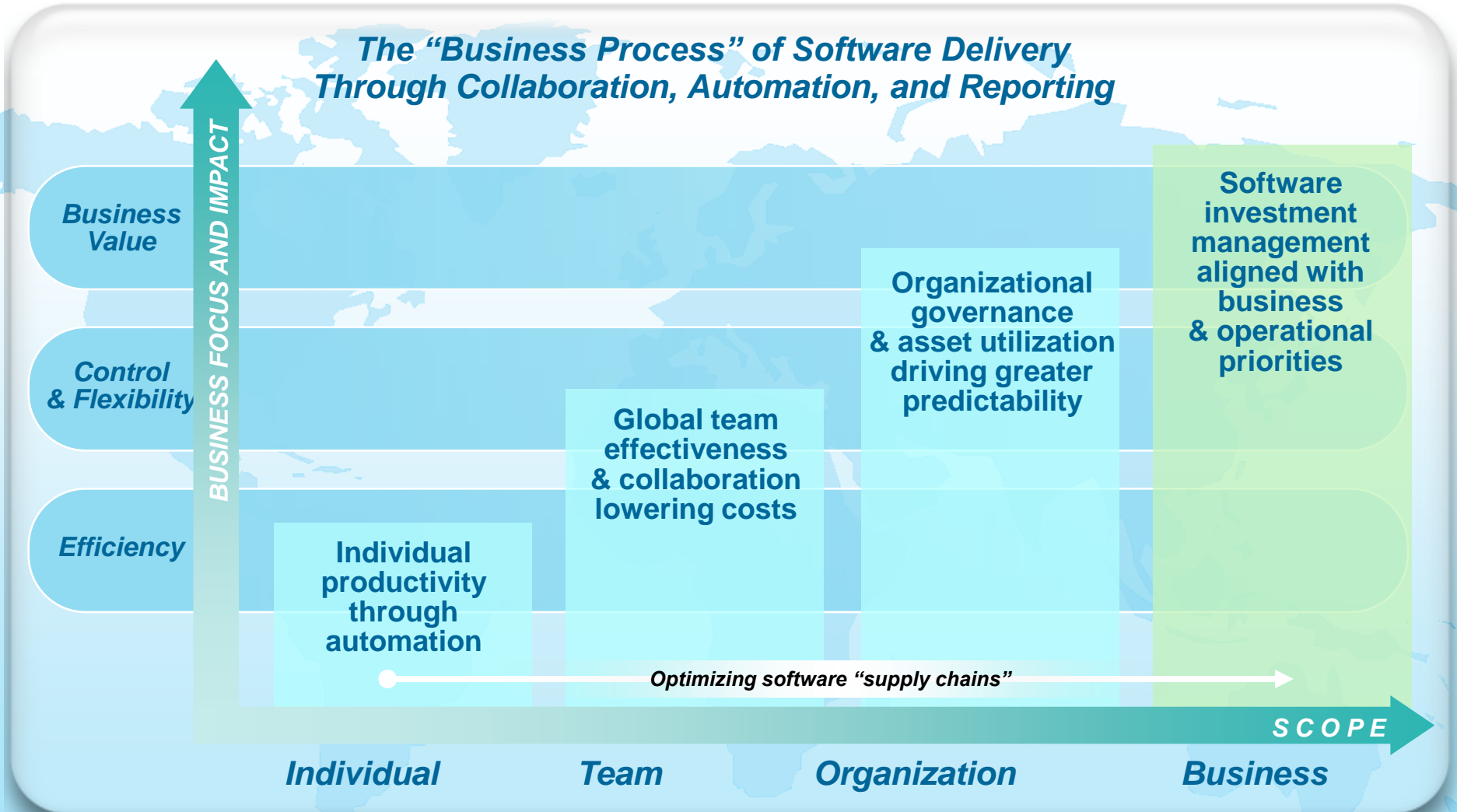
Let's build a smarter planet

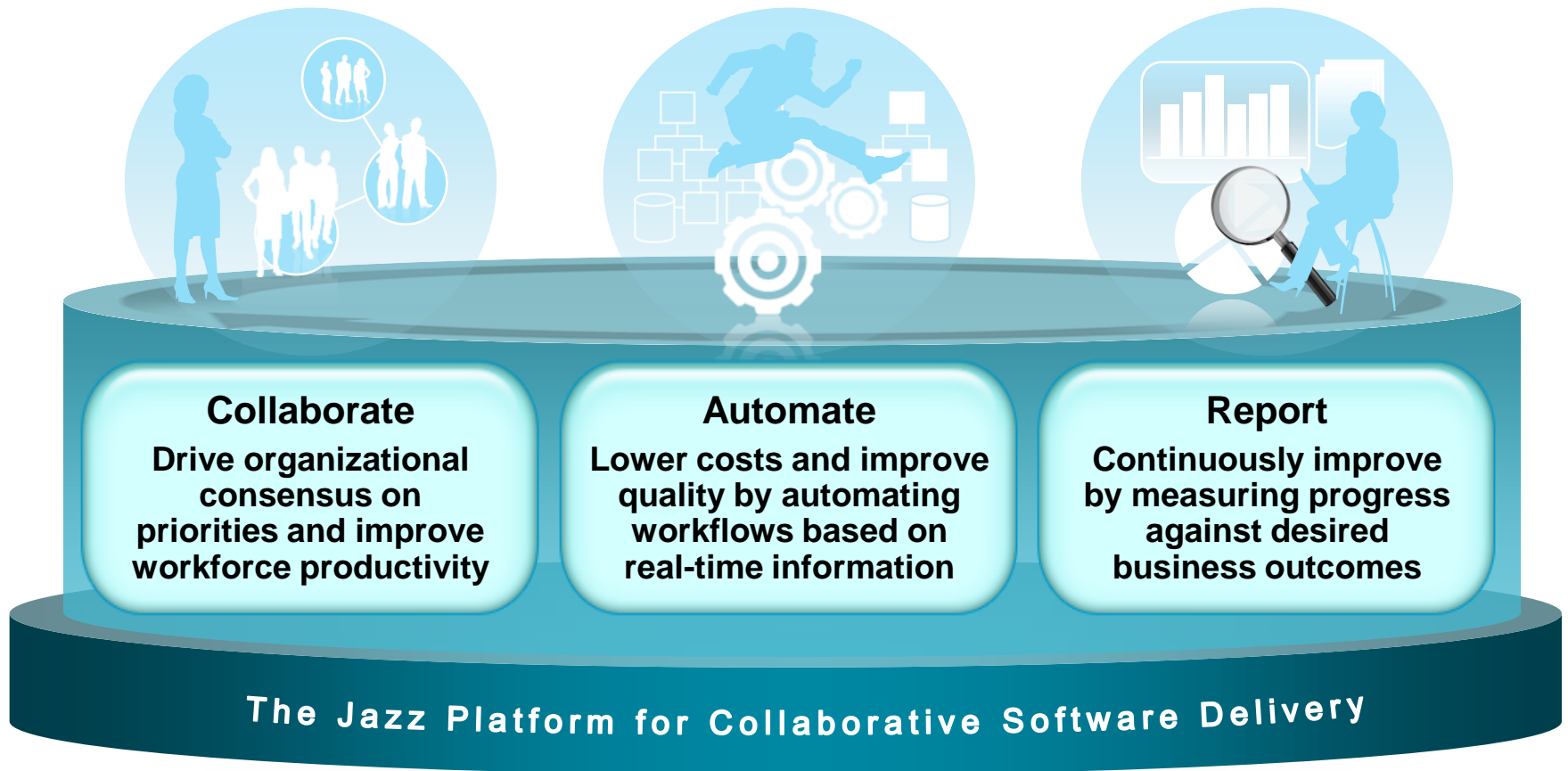# Is your IT infrastructure flexible enough?

IT Infrastructure

"The message for IT is clear; business needs and expects greater agility from IT. The current approaches to project prioritization, resourcing, agility and governance are clearly not satisfying customer needs. A new approach to IT delivery models and sourcing options is required that allows IT organizations to be more responsive to the needs of the business."

– Gartner, October 14, 2008, "Changing the Cost Structure of IT Will Become a Business Imperative for Most CIOs"

Treat your software as a strategic business process

The "Business Process" of Software Delivery Through Collaboration, Automation, and Reporting

BUSINESS FOCUS AND IMPACT

- Business Value
- Control & Flexibility
- Efficiency

Software investment management aligned with business & operational priorities

Organizational governance & asset utilization driving greater predictability

Global team effectiveness & collaboration lowering costs

Individual productivity through automation

Optimizing software "supply chains"

S C O P E

Individual **Team** **Organization** **Business**

Align your evolving business priorities and stakeholder constituencies

Collaborate

Drive organizational consensus on priorities and improve workforce productivity

Automate

Lower costs and improve quality by automating workflows based on real-time information

Report

Continuously improve by measuring progress against desired business outcomes

The Jazz Platform for Collaborative Software Delivery

Yet the wrong metrics can incent negative behavior

You need a framework to improve software delivery
The Managed Capability Improvement Framework (MCIF)

- Drive business innovation and reduce costs through measured and continuous process improvement

- A phased approach that helps teams
  - ▸ Adopt an incremental, measured approach to transformation
  - ▸ Focus on the core practices that matter most
  - ▸ Accelerate adoption through out-of-the-box assets
  - ▸ Articulate capability improvements in terms of business value
  - ▸ Support any method
    - – Optimized for Agile practices

MCIF helps software and systems delivery teams measure, manage and incrementally improve their software delivery capability.

Rational solutions can help in 3 domains

Enterprise Modernization

IT Business Transformation

| Mfg Systems | Supply Chain | Logistics | Customer Support |

Complex / Embedded Systems

- **Enterprise Modernization** – harness the same power and flexibility for all types of applications, no matter what platform they are deployed on

- **IT Business Transformation** – align your IT infrastructure with your business strategy and vision to innovate new business strategies and meet long term objectives

- **Complex/Embedded Systems** – deliver innovative software for your products, while integrating across mechanical, electronic, and software domains

Key modernization challenges for IT organizations

"We don't understand the effort, risk and impact of modernizing our legacy software portfolio"

"Our skills gap just seems to keep growing. How do we stay current with all the language and technology changes?"

"Our architecture has evolved to be too complex and convoluted– we need to be flexible and agile."

"Our development teams working on different platforms are struggling to communicate. How do we collaborate in the context of our work?"

Application Challenges

- Lost application knowledge
- Architectural complexity
- Poor quality and performance
- Regulatory and compliance risks

People Challenges

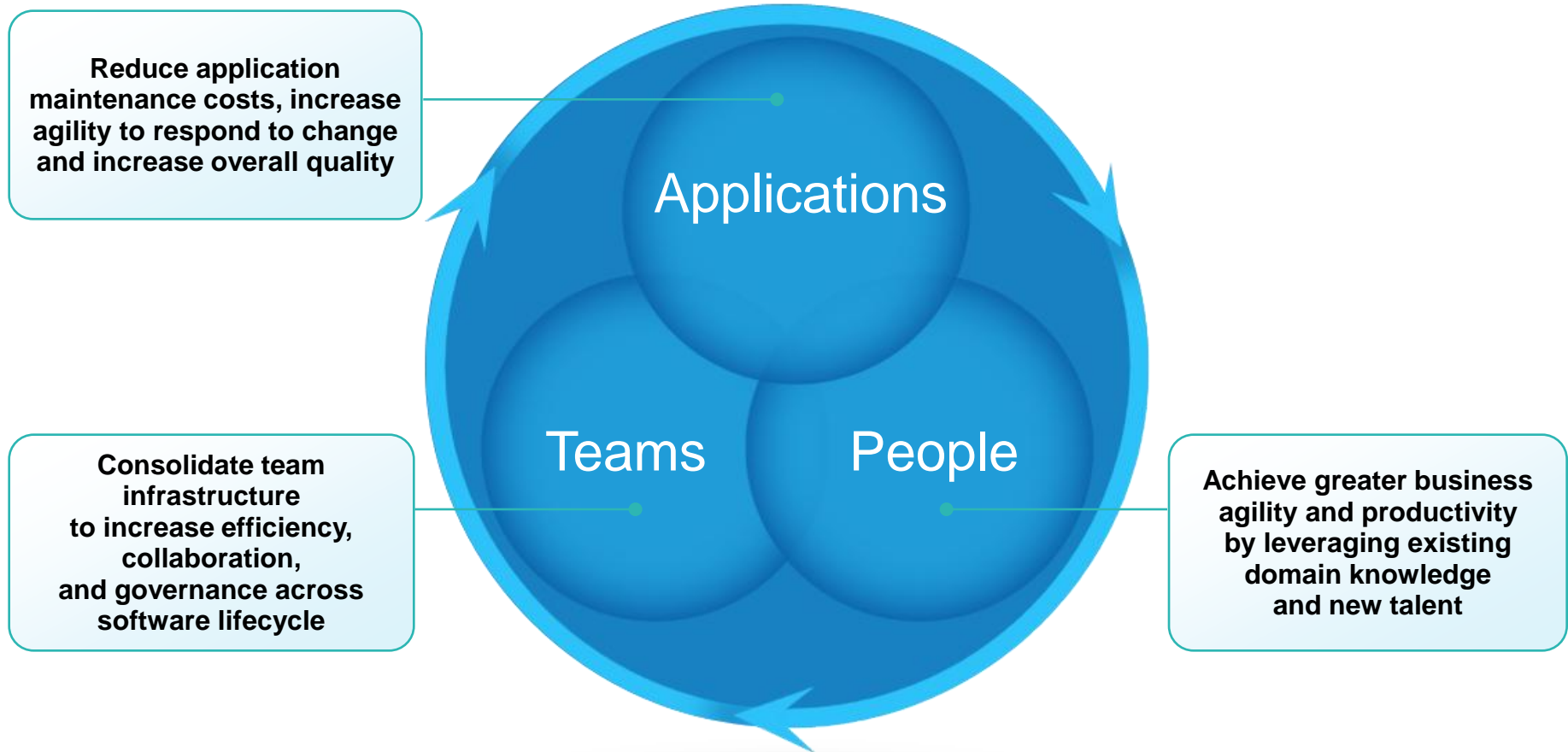- Skills lock-in
- Plethora of new technologies
- Unattractive, low productivity IDEs
- Steep learning curve due to platform/language-unique tools

Team Challenges

- Poor communication
- Incompatible tools & processes across platforms
- Weak project oversight
- Lack of traceability across lifecycle

Enterprise Modernization solutions

A smarter way to maximize the value of your applications, people and teams

Reduce application maintenance costs, increase agility to respond to change and increase overall quality

Applications

Teams

People

Consolidate team infrastructure to increase efficiency, collaboration, and governance across software lifecycle

Achieve greater business agility and productivity by leveraging existing domain knowledge and new talent

For more information, visit:
www.ibm.com/rational/modernization

Application challenges

CIO

"I need to reduce my annual IT budget by 10 percent. Which applications can I sunset?"

Architect

"Our architecture has evolved to be too complex and convoluted – Can SOA help us build apps that are flexible and agile?"

Development Lead

"Our distributed applications increasingly rely on access to mainframe data and applications. How can we determine the impact of all the changes we need to make?"

Developer

"We're using XML to define shared data across multiple applications. Can I use XML with my older COBOL and PL/I applications?"

Tester

"Changes to applications have been patched together for so many years that we now have many challenges with the quality and performance of our legacy applications."

Manage the applications that run your business

Applications

Teams · People

- **Restore lost application knowledge**
  - ▶ Quickly determine full impact of proposed changes
  - ▶ Identify and eliminate dead code
  - ▶ See code complexity and opportunities for simplification

- **Manage the evolution of your application portfolio**
  - ▶ Understand entire application portfolio, any dependencies, and map them to your business processes
  - ▶ Speed the efficiency of decision-making with up to date dashboards
  - ▶ Understand your enterprise architecture - link applications, deployed systems, organizations, business processes
  - ▶ Make decisions to sunset applications based on business value

✓ **Align IT investments with business goals**
  - ▶ Telelogic System Architect
  - ▶ Telelogic Focal Point

✓ **Discover, analyze and manage application portfolio**
  - ▶ Rational Asset Analyzer
  - ▶ WebSphere Studio Asset Analyzer

Enterprise Application Knowledgebase

✓ **Manage reusable assets, business rules and services**
  - ▶ Rational Asset Manager
  - ▶ ILOG Business Rules Management Systems (BRMS)
  - ▶ WebSphere Service Registry and Repository
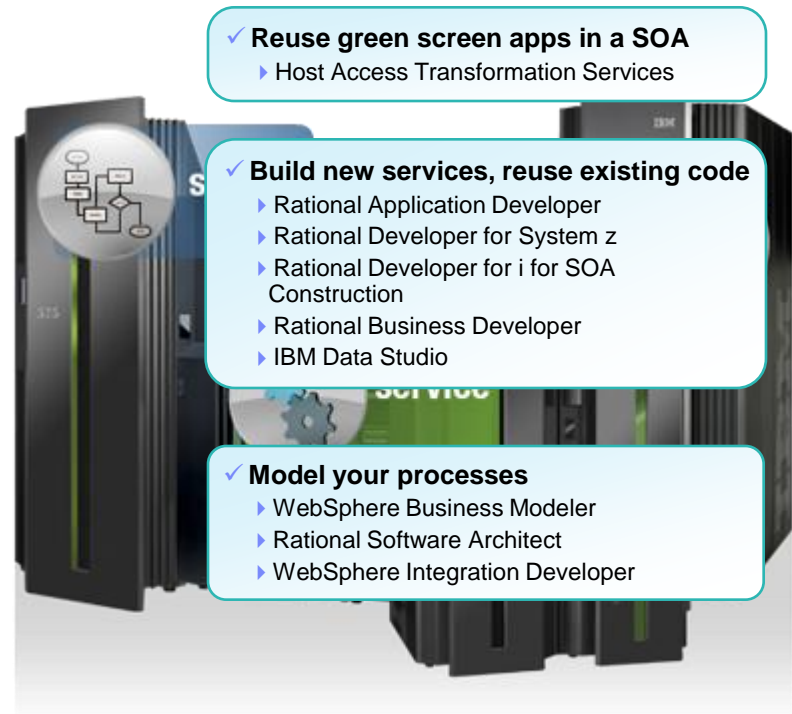
Transform complexity into usable information

Auto manufacturer used WSAA and RTW to automate identifying changes required to permit ordering cars with more than 16 options. Used Rational solutions to create automated test environment charges. Saved $12M on first project.

Build flexible applications with SOA and Web 2.0
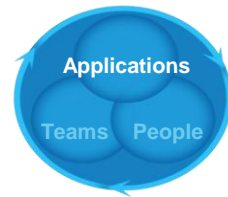
Applications

Teams   People

- **Reuse proven assets**
  - Re-factor existing assets for reuse
  - Achieve fast ROI by enabling your green screen applications
  - Quickly create web services from existing EGL, C/C++, COBOL, PL/I, RPG and Java applications

- **Accelerate deployment of new services, processes and user interfaces**
  - Create new platform independent services
  - Quickly model, architect and assemble new business processes
  - Rapidly build modern Web 2.0 interfaces

✓ **Reuse green screen apps in a SOA**
  ▸ Host Access Transformation Services

✓ **Build new services, reuse existing code**
  ▸ Rational Application Developer
  ▸ Rational Developer for System z
  ▸ Rational Developer for i for SOA Construction
  ▸ Rational Business Developer
  ▸ IBM Data Studio

✓ **Model your processes**
  ▸ WebSphere Business Modeler
  ▸ Rational Software Architect
  ▸ WebSphere Integration Developer

"HVB IS adopted IBM Rational® Developer for System z software to accelerate mainframe development, improve the efficiency of its COBOL development teams, and move to a similar environment for mainframe and Web development." - Almut Geiger, Product Specialist at HVB IS

HVB Information Services
UniCredit Group

Deliver high quality applications

Applications

Teams   People

- **Coordinate end-to-end quality across all tools and platforms**
  - Elicit, capture, elaborate, discuss, manage, and review requirements
  - Identify and resolve coding errors automatically, early in the development cycle
  - Consolidate and monitor test plans, test progress

- **Automate your testing**
  - Automate functional tests
  - Find performance bottlenecks
  - Expose vulnerabilities, privacy issues, and accessibility problems in web applications
  - Generate timely audit and compliance reports

✓ **Quality begins with good requirements**
  ▸ Rational Requirements Composer
  ▸ Rational RequisitePro
  ▸ Telelogic DOORS

✓ **Manage quality throughout the lifecycle**
  ▸ Rational Quality Manager
  ▸ Rational Test Lab Manager

✓ **Inject quality during the coding phase**
  ▸ Rational Software Analyzer
  ▸ Rational PurifyPlus
  ▸ z/OS Problem Determination Tools

✓ **Automate testing to improve quality**
  ▸ Rational Functional Tester
  ▸ Rational Performance Tester
  ▸ Rational Service Tester for SOA Quality

✓ **Eliminate quality exposures for your web apps**
  ▸ Rational AppScan

"AppScan has increased our team's productivity by enabling us to automate very complex and time-consuming activities as well as help substantially increase our level of quality, security and regulatory assurance."
- Technical Security Officer

Improve application performance & scalability

Applications

Teams People
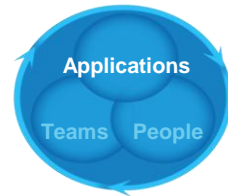
- **Increase capacity and performance without hardware upgrades**
  - Boost performance with new advanced optimization technology in C/C++, COBOL and PL/I compilers
  - Reduce cost of COBOL and PL/I XML parsing by offloading to zAAP specialty engine

- **Maximize application performance on new z10 and Power6 servers**
  - Exploit new hardware architectures without code change

- **Modernize legacy applications**
  - Leverage XML and Java interfaces in COBOL and PL/I applications

✓ **IBM Compilers on System z**
  ▸ IBM Enterprise COBOL
  ▸ IBM Enterprise PL/I
  ▸ z/OS IBM XL C/C++

✓ **IBM Compilers on POWER systems**
  ▸ IBM COBOL
  ▸ IBM PL/I
  ▸ IBM XL C/C++
  ▸ IBM XL Fortran
  ▸ IBM WebSphere Development Studio
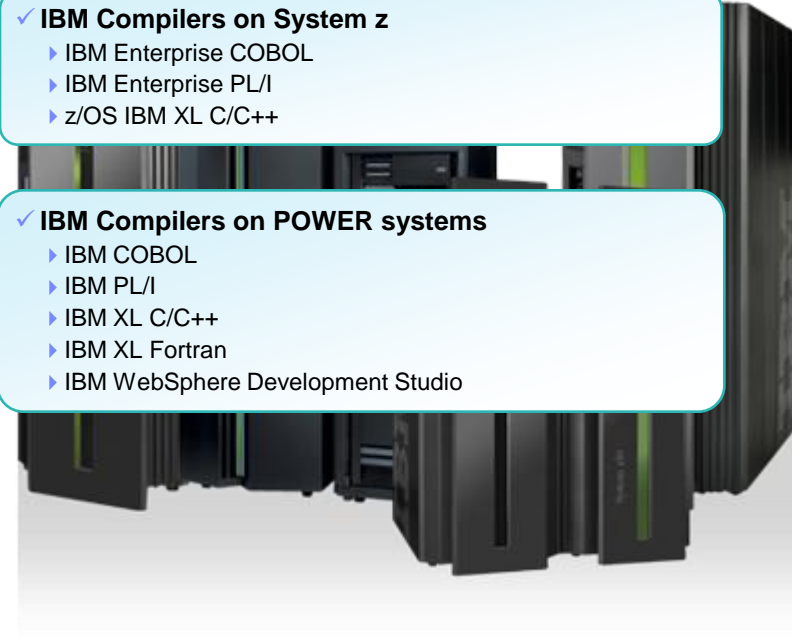
"Metal C optimization levels are just incredible. We're really impressed, there is no way that any of us assembler programmers can write code as efficient, keep it readable, and do it in a reasonable amount of time."
- Gregg Willhoit, Senior Assembler Architect, DataDirect
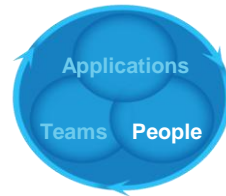
People challenges

CIO *"My budgets keep getting reduced. How can we do more work with fewer people?"*

IT Manager *"College graduates aren't interested in my green screen development tools. Is there something more appealing I can offer them?"*

Project Manager *"My host programmers don't seem to communicate with my web developers when building multi-platform applications. It's like they speak different languages."*

Architect *"How can I architect solutions that shield developers from technical interfaces of platform and middleware technologies?"*

Developer *"How can I keep pace with technology changes and keep my skills relevant to the industry?"*

Improve developer productivity with modern IDEs

- **Use common Eclipse-based tooling across multiple platforms and languages**
  - Achieve ~15% improvement in mainframe developer productivity[1]
  - Reduce host CPU usage 50%-80%[1] with workstation syntax checking
  - Reduce training costs, more attractive IDE for younger developers

- **Speed development with specialized editors and code generation wizards**
  - Code assist for COBOL, PL/I, C/C++, Visual editors for BMS and MFS maps
  - Generate code from UML

System z and IBM i Green Screen Editors

✓ **Produce code faster, save MIPS**
  ▸ Rational Developer for System z
  ▸ Rational Developer for i
  ▸ Rational Developer for i for SOA Construction
  ▸ Rational Business Developer

Target Platform:
System z, IBM i, and distributed

[1] Aggregation of results from a productivity study conducted by IBM mainframe customers.

"RDz offers a uniform, open programming environment for both J2EE and PL/I developers. RDz accelerates PL/I development with its local syntax checker and debugging tool."

- Dr. Axel Lömker, KfW Bankengruppe

Build multiplatform apps with existing/new staff

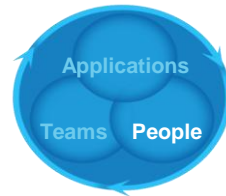Applications

Teams People
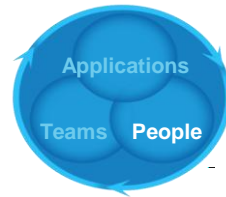
- **Deliver multiplatform solutions quickly**
  - Leverage abstractions to hide middleware & platform complexity
  - Deploy to any platform, including J2EE™, System z and IBM i, Linux

- **Build modern Web 2.0 user interfaces without being a technology expert**
  - Empower existing developers to build Rich Internet Applications (RIA)
  - Eliminate need to have skills in JavaScript, Ajax, JSON, HTML and CSS, etc.

Skills

CLAIMS CENTER

Assemble
Model Deploy

EGL
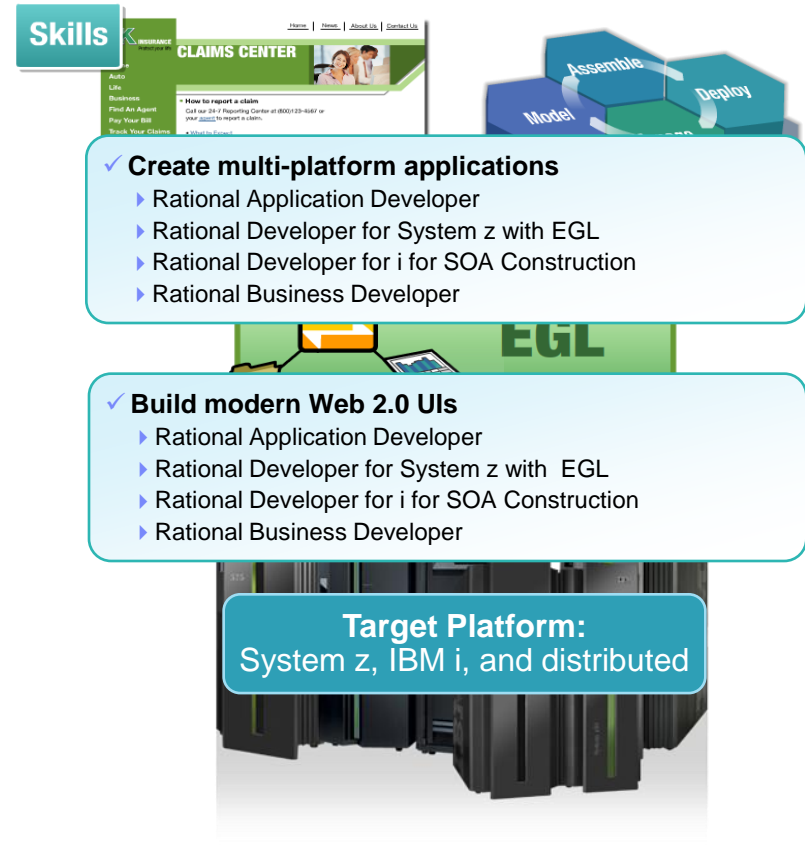
✓ **Create multi-platform applications**
- ▶ Rational Application Developer
- ▶ Rational Developer for System z with EGL
- ▶ Rational Developer for i for SOA Construction
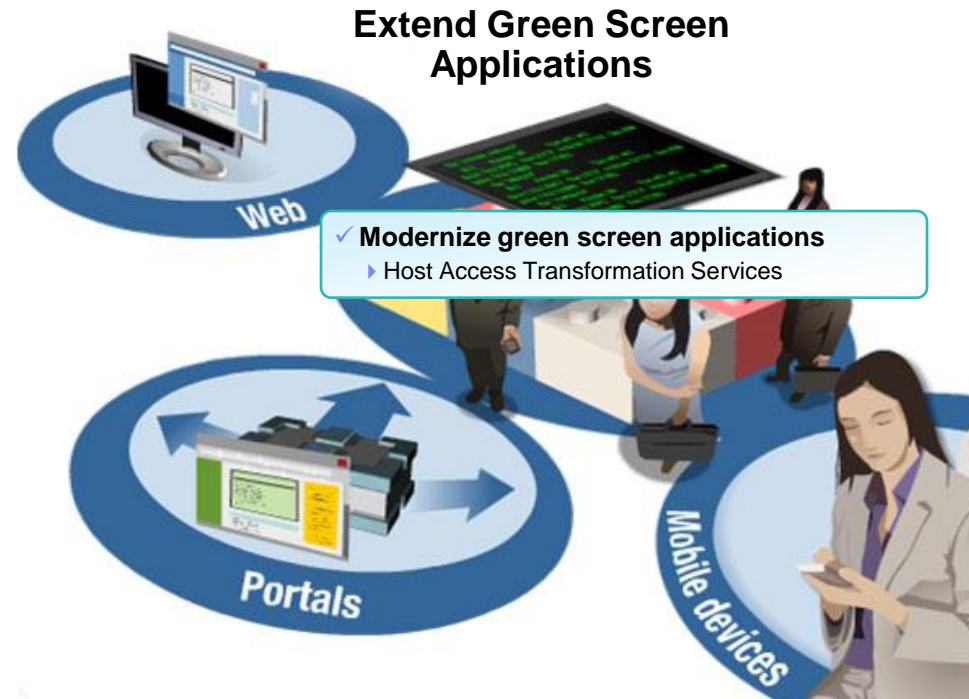- ▶ Rational Business Developer

✓ **Build modern Web 2.0 UIs**
- ▶ Rational Application Developer
- ▶ Rational Developer for System z with EGL
- ▶ Rational Developer for i for SOA Construction
- ▶ Rational Business Developer

Target Platform:
System z, IBM i, and distributed

"Currently we have one set of developers for web applications, and another for batch systems. With EGL, the same developers can do both, and we can offer our clients a choice of deployment platforms."
- Mauricio Alvarenga, IT Manager at Montreal Informática

M.I.
MONTREAL
INFORMÁTICA
Integrando tecnologia aos negócios

Extend green screen apps for new uses without web skills

Applications
Teams   People

- **Use your existing staff to provide Web, portal, mobile or rich client UIs for your green-screen applications**

  – Provide your end users with flexible, secure Web access to business applications

  – Dramatically reduce end user training and improve IT staff productivity

  – Deploy with no source code modification or application downtime

- **Expose host business processes as Web Services**

Extend Green Screen Applications

✓ **Modernize green screen applications**
  ▸ Host Access Transformation Services

Web

Portals

Mobile devices

"Rational Host Access Transformation Services (HATS) makes legacy modernization a relatively easy and fast process. I estimate that HATS cut 75% of the man-hour requirements from other approaches we have used"
- Alan Jack, Director of Technology, Oxford International
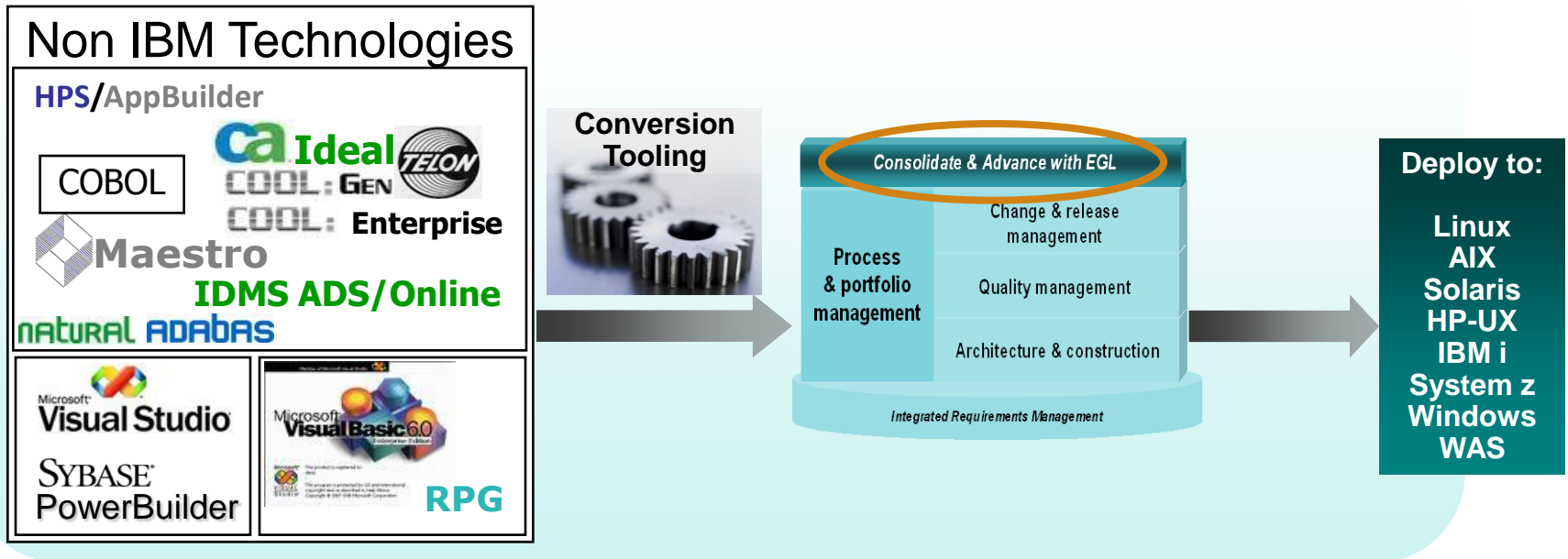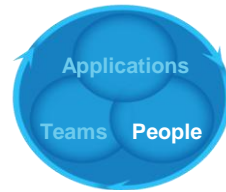
Oxford
INTERNATIONAL
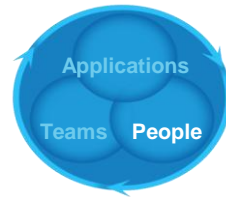
Move to a modern development platform

- Get huge savings by migrating from old, stagnant languages to modern development platforms, languages & tools
  - Solutions for Natural/ADABAS and Cool:Gen

✓ **Migrate from old languages**
  ▸ Rational Migration Extension for Natural

Non IBM Technologies

HPS/**AppBuilder**

COBOL

ca **Ideal** **TELON**
COOL: GEN
COOL: Enterprise

Maestro

IDMS ADS/Online

natural **ADABAS**

Microsoft **Visual Studio**

SYBASE PowerBuilder

Microsoft **VisualBasic 60** Enterprise Edition

RPG

Conversion Tooling

Consolidate & Advance with EGL

Process & portfolio management

Change & release management

Quality management

Architecture & construction

Integrated Requirements Management

Deploy to:

**Linux
AIX
Solaris
HP-UX
IBM i
System z
Windows
WAS**

Get the enterprise skills you need

Applications
Teams   People

- Hire university students with System z, IBM i, and Rational skills

- Leverage a growing community of business partners, customers, and IBM employees on our community cafés

- Take advantage of free education sessions , product demos, tutorials, white papers, and case studies

- Play in the System z and IBM i sandboxes
  - "Try online" hosted System z and IBM i environments
  - See best practices, hands-on exercises using full version software trials

✓ **Partner with universities worldwide**
  ▸ 537 schools, over 50000 students educated on System z
  ▸ Schools in 41 countries teaching POWER systems
  ▸ 2400 universities teaching IBM technologies

✓ **Stop by a Community Café**
  ▸ C/C++ Café
  ▸ EGL Café
  ▸ RPG Café
  ▸ COBOL Café

✓ **Take a class**
  ▸ Modern Application Architecture for COBOL Developers – build composite COBOL apps with CICS and WebSphere
 ▸ EGL Distance Learning – 8 days of free lectures, labs, electronic support

Learn more about
- The IBM Academic Initiative at: http://www-304.ibm.com/jct01005c/university/scholars/academicinitiative
- Enterprise Modernization solutions at: http://www.ibm.com/software/rational/solutions/em/

" 'Master the Mainframe Contest' helped me get a job at Bank of Montreal."

Elizabeth Bell, Georgian College

Team challenges
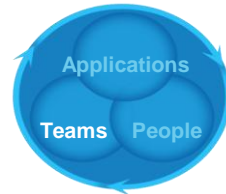
CIO — *"Our global software teams working on different platforms are struggling to communicate. How do we collaborate in the context of our work?"*

IT Manager — *"My line of business needs better access to information about the ongoing projects."*

Project Manager — *"I need a dashboard that lets me easily see if my project is on track and identify any bottlenecks."*
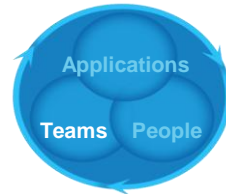
Team Leader — *"Why are some developers not following the agreed upon processes?"*

Developer — *"Why and when was this changed? Is this the latest version that I should be using?"*

Unify disparate IT infrastructures across teams

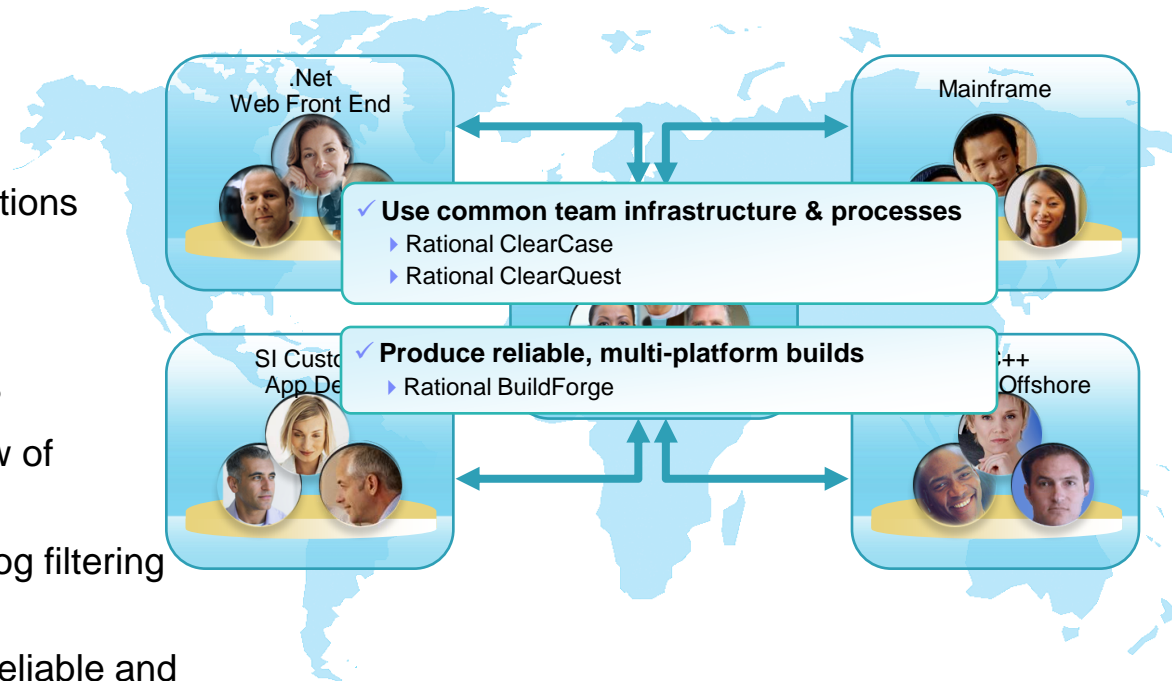Applications
Teams People

- **Consolidate your team infrastructure**
  - Eliminate redundant and duplicate tools and processes
  - Unify change management for all platforms, languages, roles, and locations
  - Ensure accurate global software delivery with a single point of control

- **Automate multi-platform builds**
  - Access a consolidated, real-time view of software assembly processes
  - Detect and resolve errors with error log filtering and automated email notifications
  - Reproduce problems quicker with a reliable and automated 'Bill of Records'

.Net
Web Front End

Mainframe

✓ **Use common team infrastructure & processes**
  ▸ Rational ClearCase
  ▸ Rational ClearQuest

SI Custo
App De

++
Offshore

✓ **Produce reliable, multi-platform builds**
  ▸ Rational BuildForge

"By providing our development teams with a common platform from which to analyze, design, develop, and test, IBM Rational solutions have created opportunities to improve the quality of our software as well as our organization"

Improve cross-team collaboration

- **Collaborate in context across all platforms and geographies**
  - Make software development more automated, transparent and predictable
  - Think and work in unison with integrated source control, work item and build management

- **Assess real-time project health**
  - Capture data automatically and unobtrusively
  - Use the web for a global view of project status

- **Automate best practices**
  - Accelerate team workflow with dynamic processes
  - Leverage out-of-the-box or customized processes

Applications
Teams People

✓ **Collaborate across the entire team**
  ▸ Rational Team Concert for System z
  ▸ Rational Team Concert for i

Future IBM Offerings

Managing Evolving Requirements

Party Jazz Offerings

Best Practice Processes

Team Awareness

✓ **Do it the best way**
  ▸ Rational Method Composer

Dashb

context oration

Jazz Platform

Jazz Integration Architecture

Jazz

The Rational Software Delivery Platform
Accelerating software innovation for the entire enterprise

Enterprise Modernization

IT Business Transformation

Mfg Systems | Supply Chain | Logistics | Customer Support

Complex / Embedded Systems

✓ Difficult times present opportunities to companies that can adapt quickly

✓ IT frequently inhibits flexibility due to fragile and poorly understood applications, limited staff productivity, poor collaboration and traceability across teams

✓ Rational Enterprise Modernization solutions deliver flexibility by:
  ▸ Improving how you build, maintain, and manage your Applications
  ▸ Helping your People be more productive
  ▸ Consolidating Teams across locations, roles, and platforms

✓ Get started today. We can help!

Learn more at: www.ibm.com/rational/modernization

Leverage IBM Services to get started today

- **Executive Services**
  - Schedule an *Enterprise Modernization Executive Planning Session* to define modernization strategies

- **Application Modernization Services**
  - Application Assessments to:
    - Develop Modernization roadmaps to resolve specific business issues
    - Improve Application Quality & Performance
    - Identify opportunities for business software delivery improvements

- **People and Team Modernization Services**
  - Provide Implementation Services for Rational Enterprise Modernization tools
  - Provide SCM migration assistance
  - SDLC Assessments to:
    - Improve Software Delivery performance
    - Implement Software Delivery Metrics to more effectively manage the software development environment

Rational Professional Services

Articulate Business Objectives

Select Practices

Measure Practice Adoption and Business Outcome

Implement / Enact Practices

IBM IT Governance Approach

PLAN   IMPLEMENT   ASSESS   MANAGE
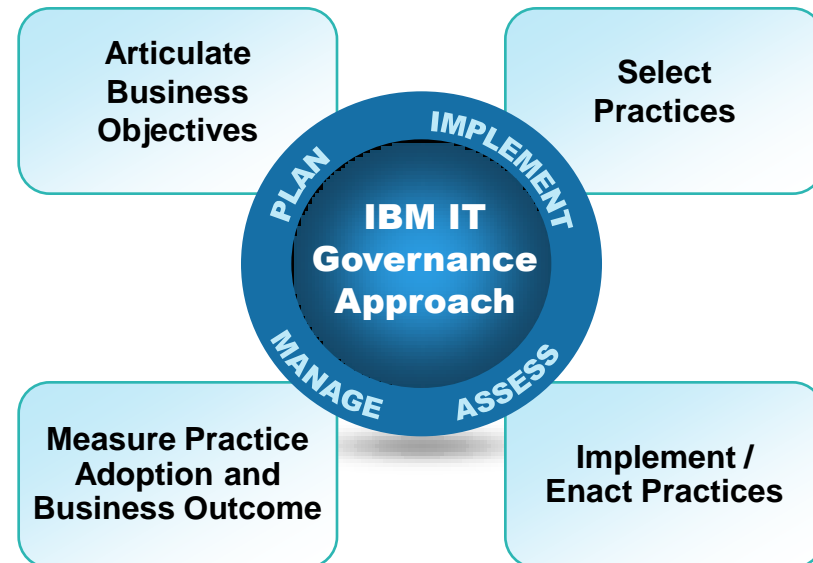
Rational Software Conference Series 2009

Helping our clients achieve the optimal **business outcomes** from their investments in software & systems, especially in today's   fast-paced economic environment.

As **REAL** As It Gets!

Real Teams.
Real Insights.
Real Results.
● REC

May 31st – June 4th Orlando, Florida

Rational. software
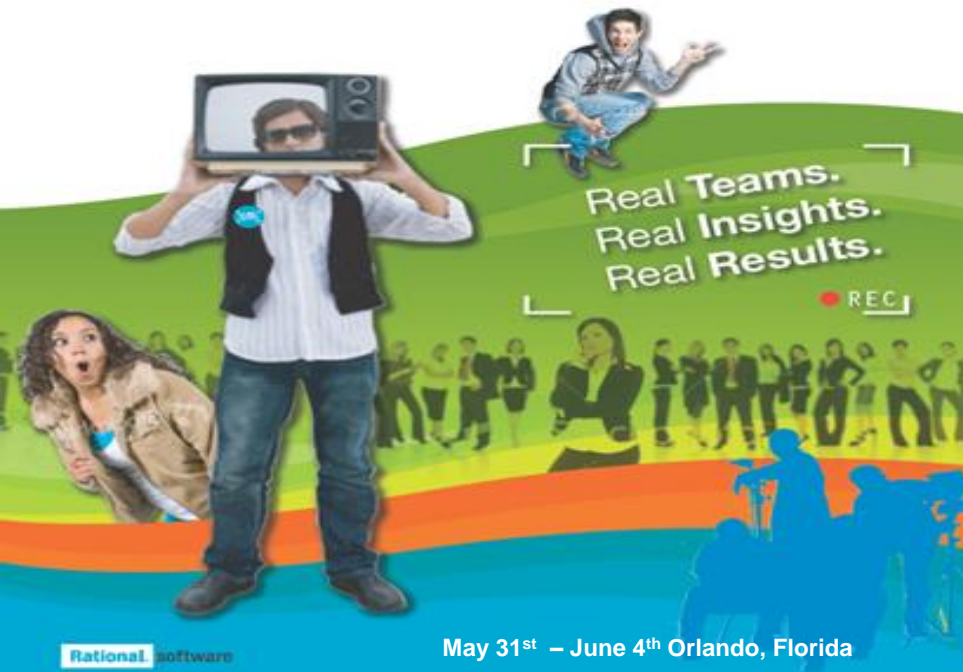
Highlights

- Over **500** sessions across 20 tracks including Executive & Business Partner forums

- *New* embedded systems / PLM track integrating the **Innovation2009** TELELOGIC USER GROUP CONFERENCE

- *New* application security & compliance track

- *New* enterprise architecture and SOA rich content

- *New* IBM Innovation Center (ICC) satellite events

- *1st Ever -* Software Reality TV show …

4 global teams!   4 software challenges!   1 place to watch it all go down!

Real Customers,
Real Challenges
Real Solutions in
Real Time!

Learn more at:

- IBM Rational software
- Rational launch announcements
- Rational Software Delivery Platform
- Accelerate change & delivery
- Deliver enduring quality
- Enable enterprise modernization

- Ensure Web security & compliance
- Improve project success
- Manage architecture
- Manage evolving requirements
- Small & midsized business
- Targeted solutions

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- IBM Rational TV
- IBM Business Partners
- IBM Rational Case Studies