IBM®

The future runs on System z

Delivering Applications and Services at the Speed your Business Demands

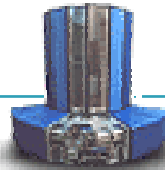*Hayden Lindsey*
VP & Distinguished Engineer

Enterprise Modernization,
Modeling, Construction & Compilers
Rational Software

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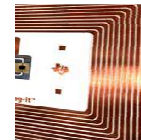
By 2010, there will be **30 billion RFID tags** in circulation

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

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

Change can be ~~very disruptive~~ an opportunity

IT skills shortage reaches highest level in 10 years

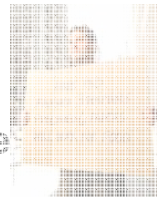All software systems crashed due to software bug when F-22 flew over international dateline

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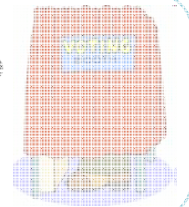— 2008 IBM CEO study

COBOL thwarts California's "Governator"

North Carolina Jobless Claims Crash State's Web Site

Ohio election web site shut down after being hacked

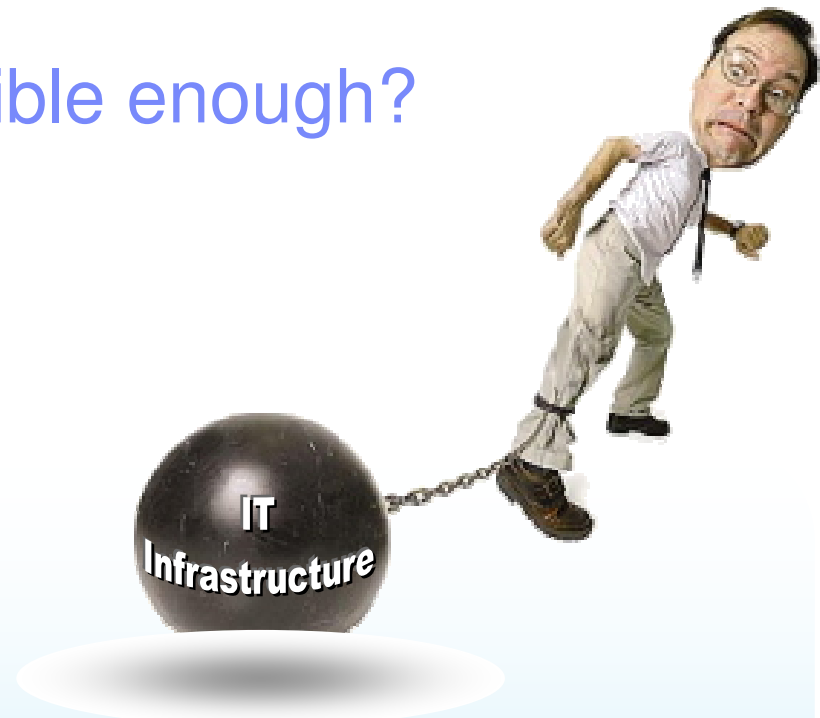**View fashion shows and collections on your iPhone**

Malta is building a 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
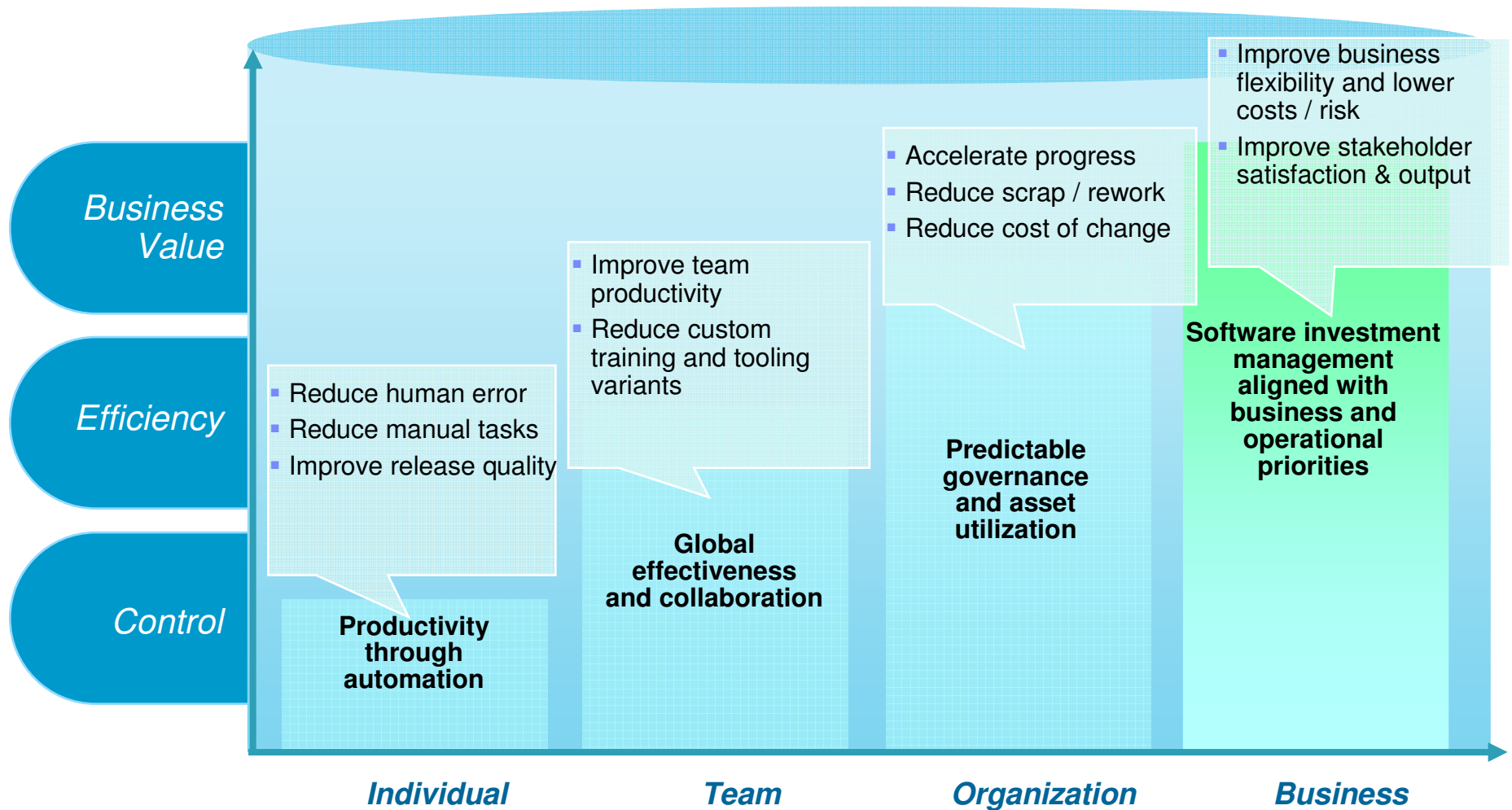
Is your IT infrastructure flexible enough?

"The message for IT is clear; business needs and expects greater agility from IT. 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

Business Value

Efficiency

Control

- Reduce human error
- Reduce manual tasks
- Improve release quality

Productivity through automation

- Improve team productivity
- Reduce custom training and tooling variants

Global effectiveness and collaboration

- Accelerate progress
- Reduce scrap / rework
- Reduce cost of change

Predictable governance and asset utilization

- Improve business flexibility and lower costs / risk
- Improve stakeholder satisfaction & output

Software investment management aligned with business and operational priorities

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

Rational solutions can help in 3 domains

Enterprise Modernization

*IT Business Transformation*

Complex / Embedded Systems

Enterprise Modernization

Harness the same power and flexibility for all types of applications, no matter the platform upon which they are deployed

IT Business Transformation

Align your IT infrastructure with your business strategy and vision to innovate new business strategies and meet long term objectives
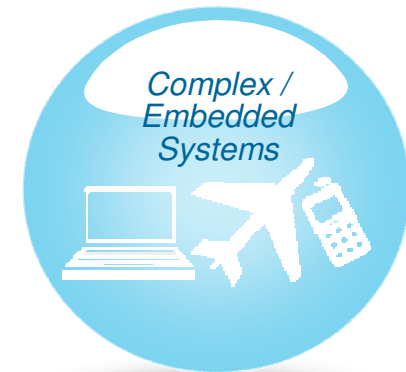
Complex/Embedded Systems

Deliver innovative software for your products while integrating across mechanical, electronic and software domains

Key modernization challenges for IT organizations

Applications

- Higher maintenance costs
- Lost application knowledge
- Architectural complexity
- Poor quality and performance

People

- Skills lock-in
- Plethora of new technologies
- Unattractive, low productivity tools
- Steep learning curve

Teams

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

Infrastructure

- Expensive hardware upgrades
- Large up front investments
- Development access on production mainframe
- Software licensing costs
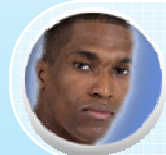
"We don't understand the effort, risk and impact of modernizing our legacy software portfolio"

"Our skills gap just seems to keep growing. How do we stay current with all the language and technology changes?"
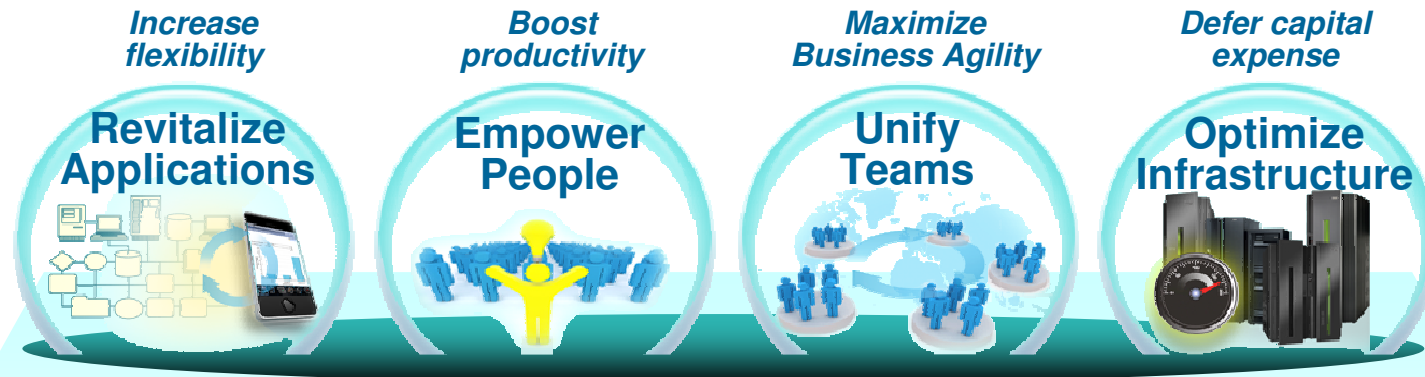
"Our architecture has evolved to be too complex and convoluted – we need to be flexible and agile."

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

IBM Rational Enterprise modernization solutions can help
Reduce maintenance costs while maximizing ROI of your software investments

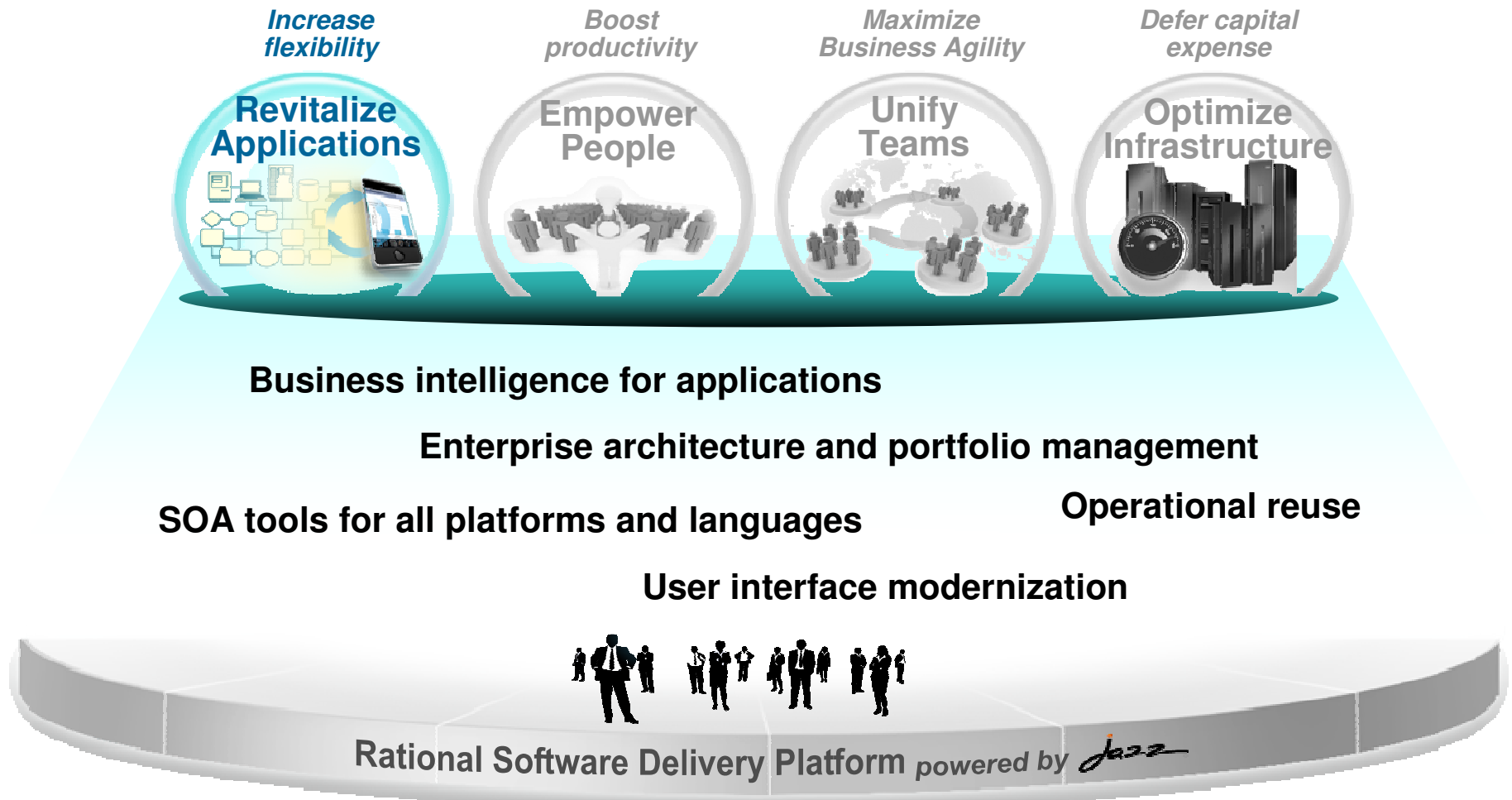| Increase flexibility	Boost productivity	Maximize Business Agility	Defer capital expense
Revitalize Applications	**Empower People**	**Unify Teams**	**Optimize Infrastructure**

- **Increase flexibility** by revitalizing existing application portfolio
- **Boost productivity** and accelerate innovation with modern skills
- **Maximize business** agility by bridging organizational silos
- **Defer capital expense** by optimizing application infrastructure

Rational Software Delivery Platform *powered by* Jazz

Increase flexibility by revitalizing existing application portfolio

Increase flexibility	*Boost productivity*	*Maximize Business Agility*	*Defer capital expense*
Revitalize Applications	**Empower People**	**Unify Teams**	**Optimize Infrastructure**

Business intelligence for applications

Enterprise architecture and portfolio management

Operational reuse

SOA tools for all platforms and languages

User interface modernization

Rational Software Delivery Platform *powered by* Jazz

Enterprises want to…

Understand the impact and cost of change to their IT systems

Revitalize Applications

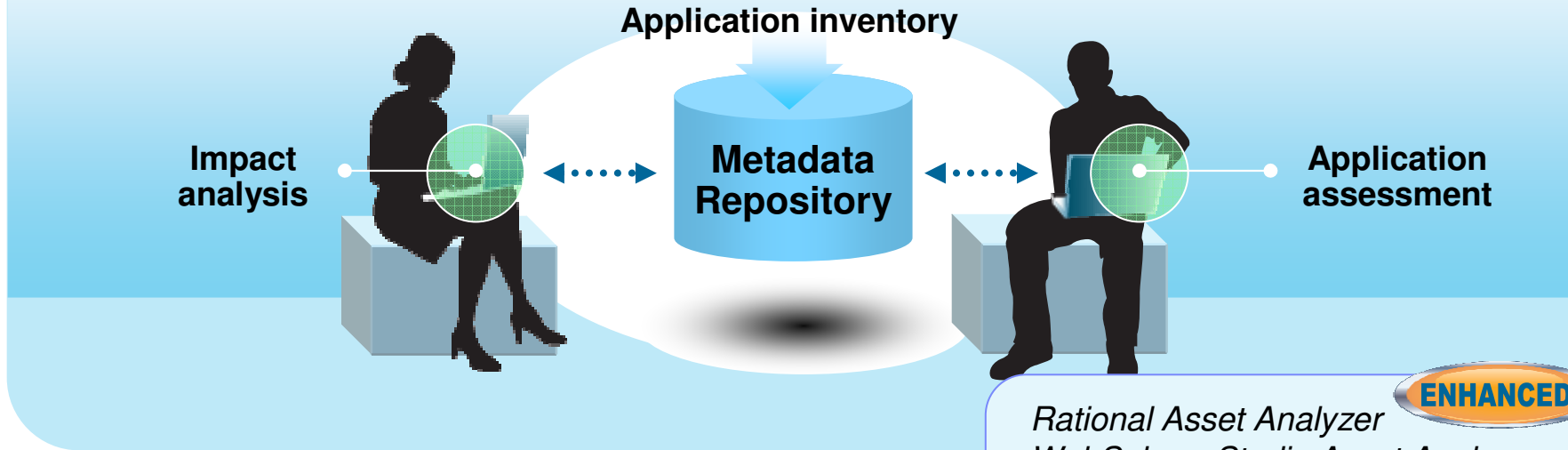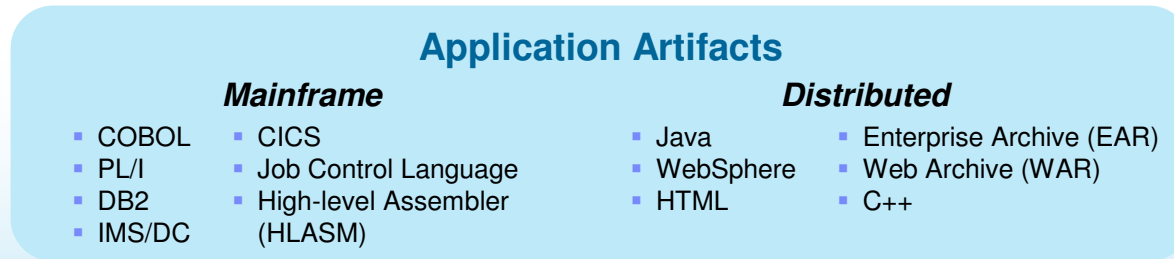What is impacted if I change this COBOL copybook?

JSF

EJB

COBOL
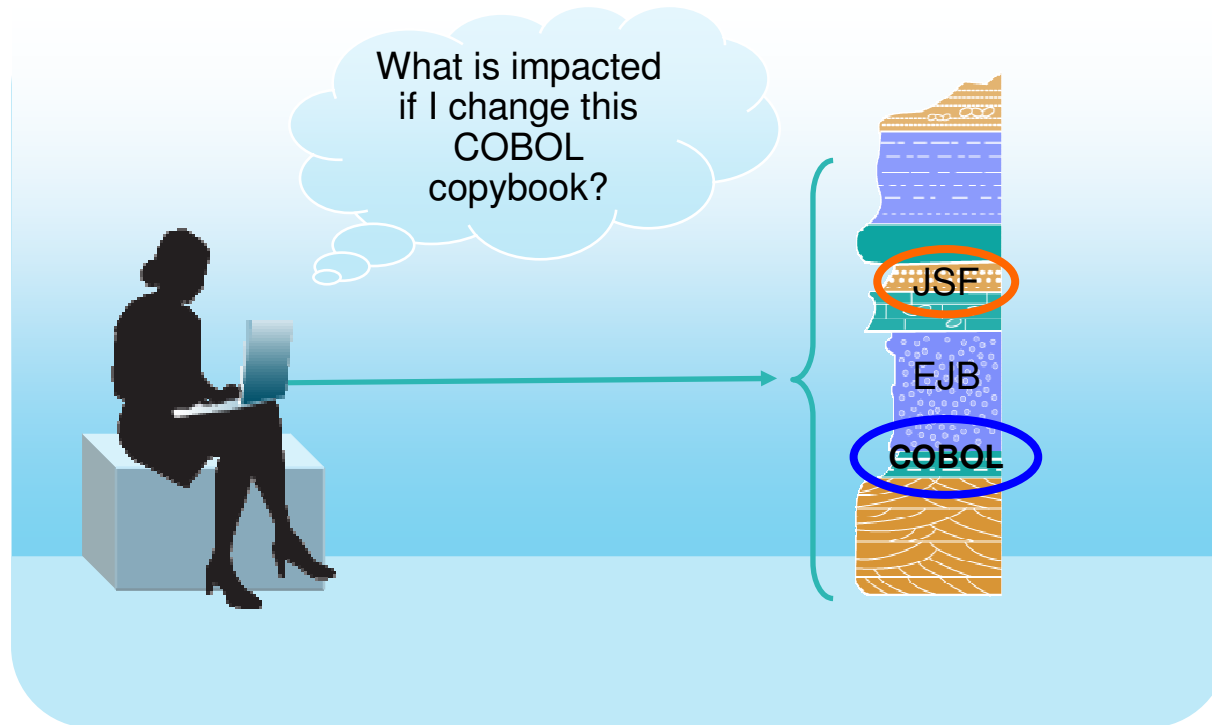
But…

They have no business intelligence inventory of their application assets, relying instead on manual and error-prone processes and incomplete knowledge.
They must compensate with more extensive planning and extra testing.

Solution: Business intelligence for applications

*Restore lost application knowledge via technical analysis*

Revitalize Applications

Application Artifacts

Mainframe

- COBOL
- PL/I
- DB2
- IMS/DC
- CICS
- Job Control Language
- High-level Assembler (HLASM)

Distributed

- Java
- WebSphere
- HTML
- Enterprise Archive (EAR)
- Web Archive (WAR)
- C++

Application inventory

Impact analysis

Metadata Repository

Application assessment

ENHANCED!

Rational Asset Analyzer
WebSphere Studio Asset Analyzer
Application Health Assessment

Delivering

Reduced risk by quickly determining the full impact of proposed changes and lowered costs via dead code elimination, optimal planning, focused testing and faster development

Enterprises want to…

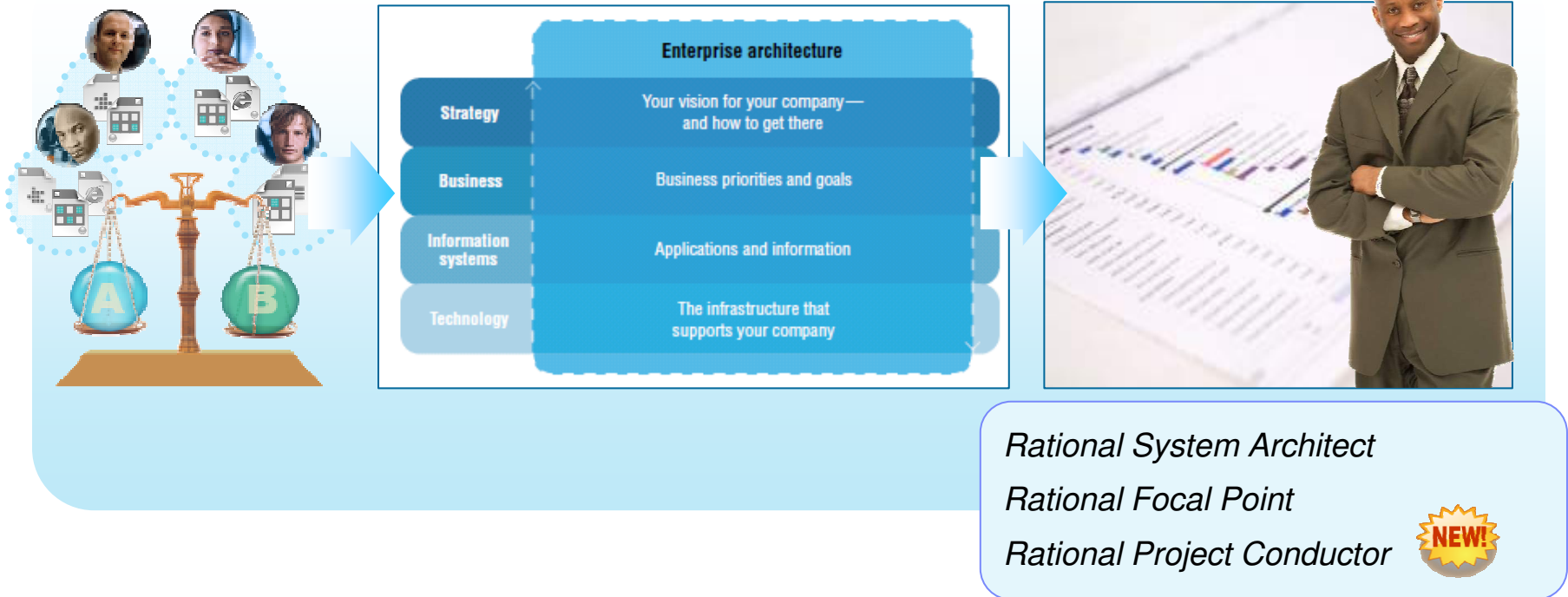*Better align IT activities and investments with their business goals and objectives*
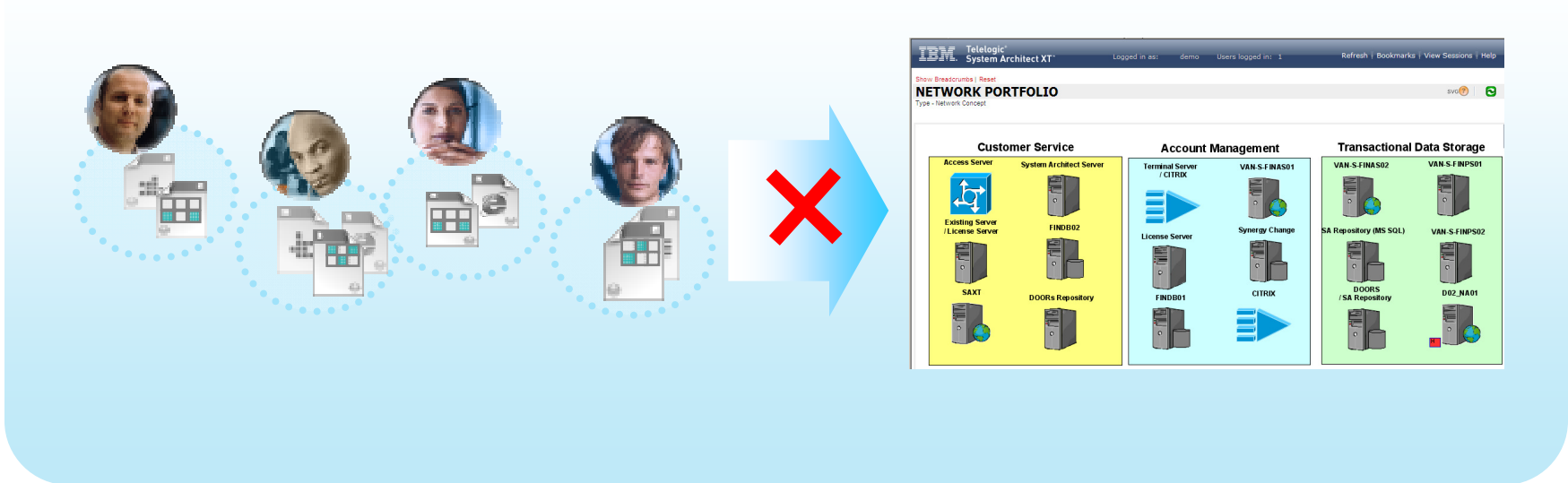
But…

They do not have a tool or process for capturing business goals or prioritizing projects, nor for linking them to the associated IT efforts. They rely instead upon less rigorous verbal discussions and difficult-to-maintain documents.

Solution: Enterprise architecture and portfolio management

Make enterprise IT planning actionable and traceable

Enterprise architecture

Strategy	Your vision for your company— and how to get there
Business	Business priorities and goals
Information systems	Applications and information
Technology	The infrastructure that supports your company

Rational System Architect

Rational Focal Point

*Rational Project Conductor* **NEW!**

Delivering

Understanding of current application infrastructure, prioritization of cost-cutting and consolidation candidates, impact analysis of portfolio decisions, and central oversight of architecture, risks, demands, and investment management

Revitalize Applications

Enterprises want to…

Have a nimble IT organization that leverages SOA to respond more quickly to the needs of the business

Revitalize Applications

Customer

Division

Shared Svc

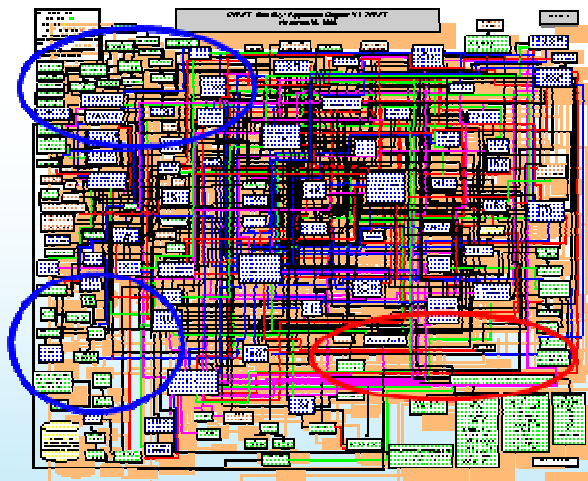**Supplier**

Outsourced
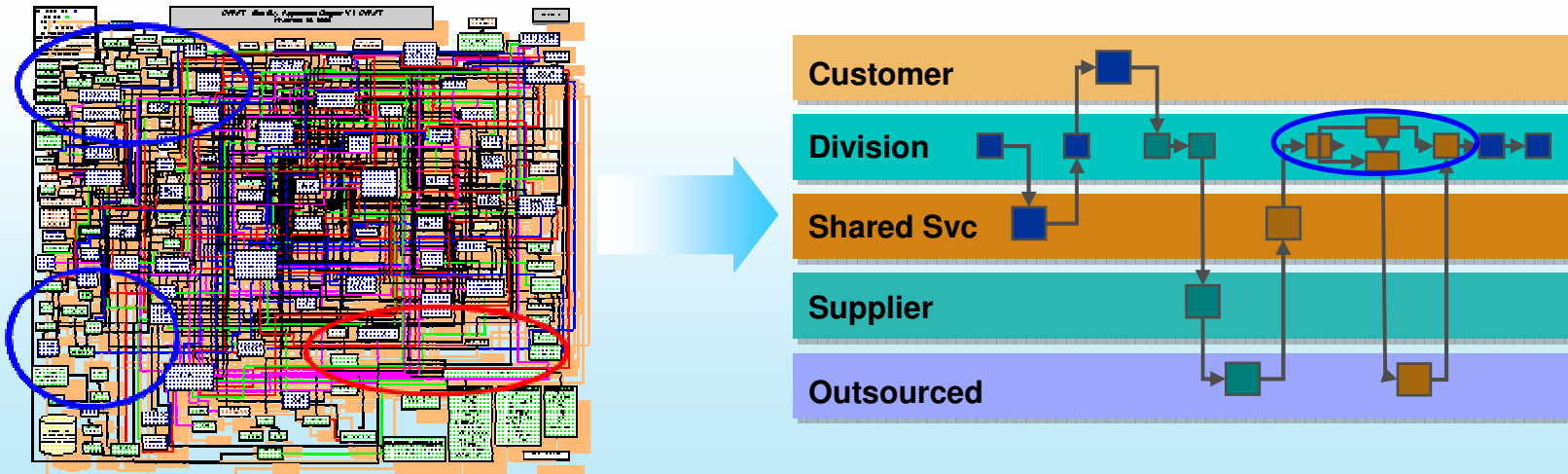
But…

They have application architectures that were built incrementally over the last 20-30 years and are no longer flexible or agile
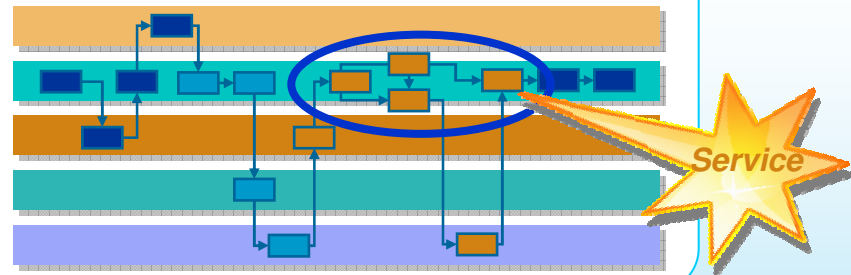
Solution: SOA tools for all platforms and languages

*Use powerful tools to quickly begin SOA evolution
by harvesting and repurposing proven assets*

Revitalize Applications

- EGL
- C/C++
- COBOL

- PL/I
- RPG
- SQL

- CICS, IMS
- Java applications
- Stored procedures

Service

Rational Application Developer
Rational Developer for System z   **ENHANCED!**
Rational Developer for i
Rational Business Developer
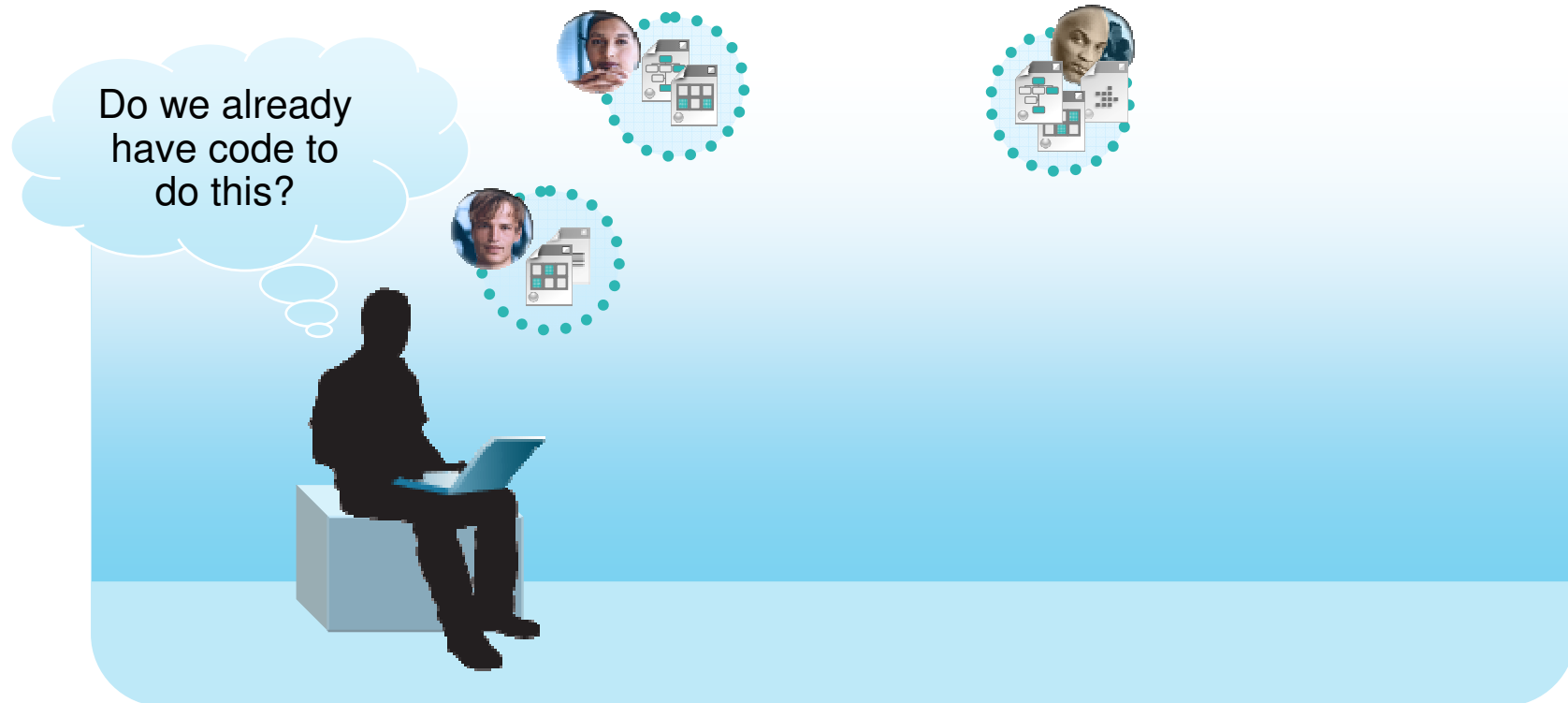*Host Access Transformation Services*

Delivering

*5x lower costs and reduced risk through reuse of existing assets, higher
productivity, and platform portability of new services*

Enterprises want to…

*Reuse existing assets to reduce duplication and speed time to market*

Revitalize
Applications

Do we already
have code to
do this?

But…

They do not have the infrastructure to implement a reuse culture

Solution: Operational reuse

Instill proactive asset management of all IT artifacts into the organization's processes and culture by deploying a reuse infrastructure

Revitalize Applications

I will look in our RAM Repository

RAM Repository

Cloud
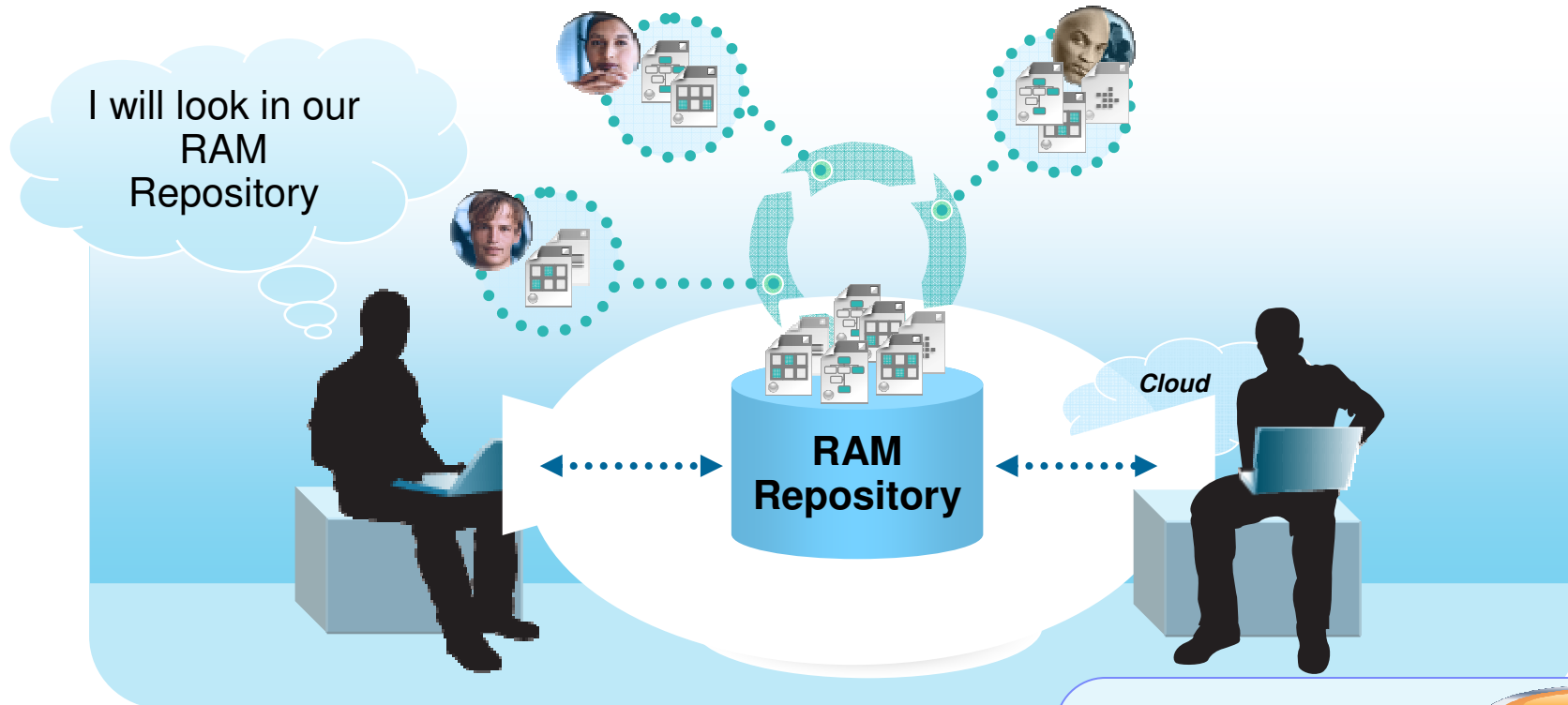
Rational Asset Manager **ENHANCED!**

WebSphere Service Registry and Repository

Delivering
Greater reuse, development efficiency, faster time-to-market, and higher quality

Enterprises want to…

Provide a range of appealing, more intuitive user interfaces
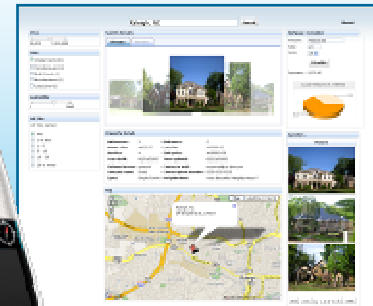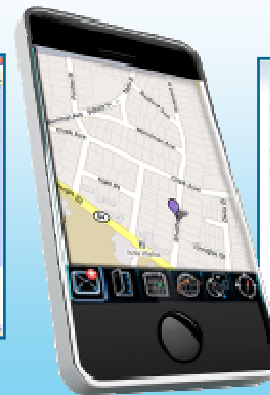*to increase employee productivity and boost customer satisfaction*

But…

The cost of replacing or re-writing these applications is prohibitive,
and they may not have the necessary web and UI technology skills

Solution: User interface modernization

Deploy the ideal UI for your application, from quickly creating a modern Web UI out of an existing green screen application to customizing a highly interactive, graphical Web 2.0 UI

Revitalize Applications
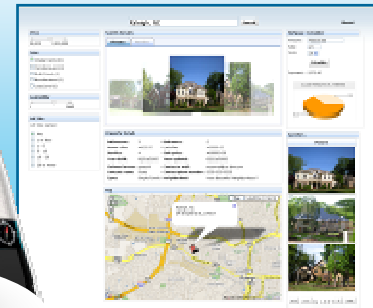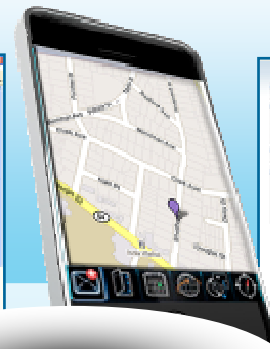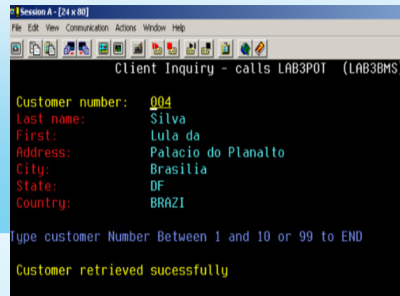
NEW!

Rational EGL Community Edition

Rational Host Access Transformation Services

Rational Developer for System z

Rational Business Developer

Delivering

Greater customer satisfaction, lower employee training costs, and fewer errors from more modern and compelling UIs

Boost productivity and accelerate innovation with modern skills

Increase flexibility	*Boost productivity*	*Maximize Business Agility*	*Defer capital expense*
Revitalize Applications	**Empower People**	**Unify Teams**	**Optimize Infrastructure**

Modern IDEs for all platforms and languages

Modern business language

Enterprise training programs, communities and resources

Rational Software Delivery Platform *powered by* *Jazz*
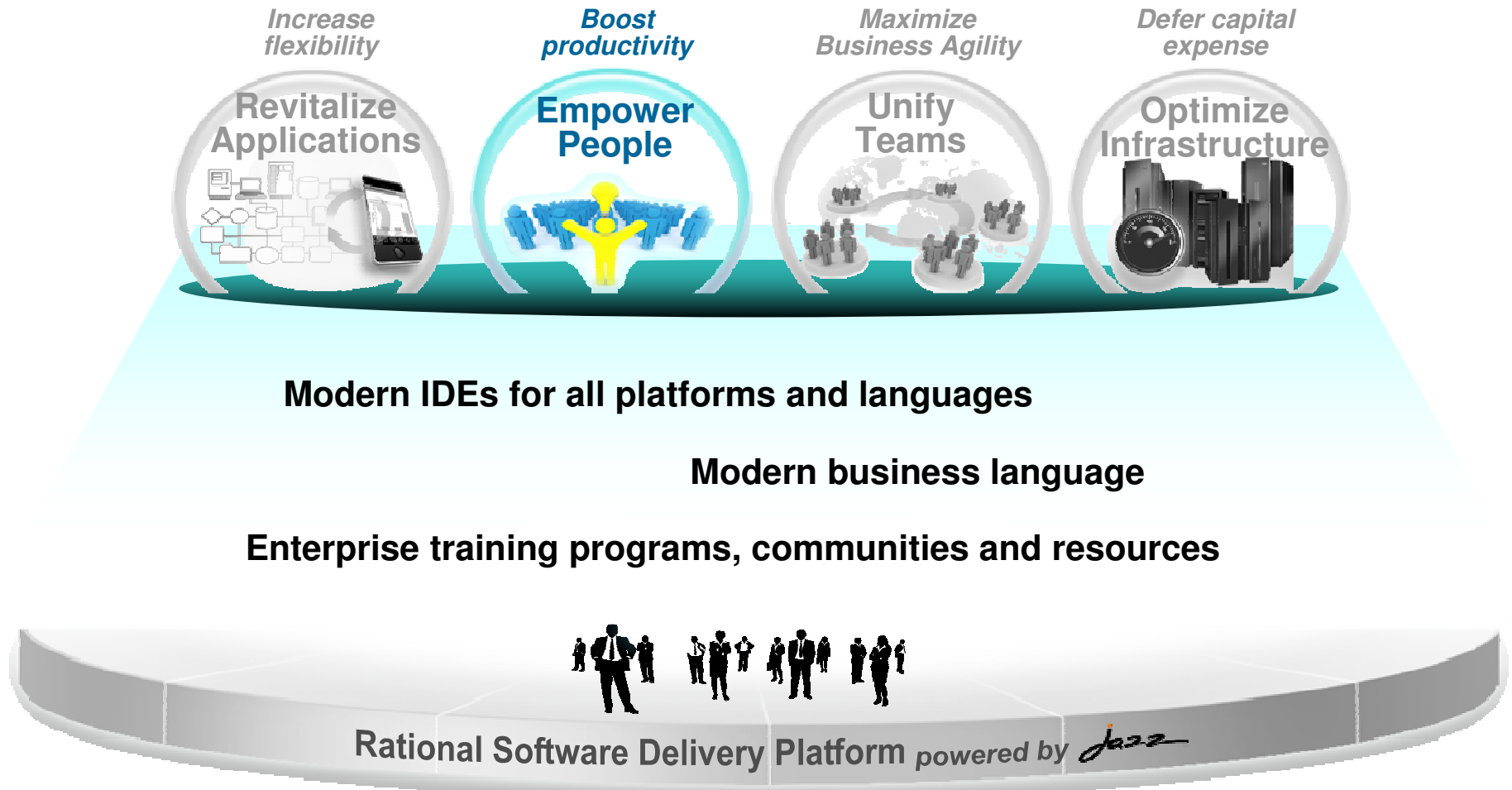
Enterprises want to…

*Increase productivity of their "backend" development staff,
as well as attract new employees to this work*

Empower
People
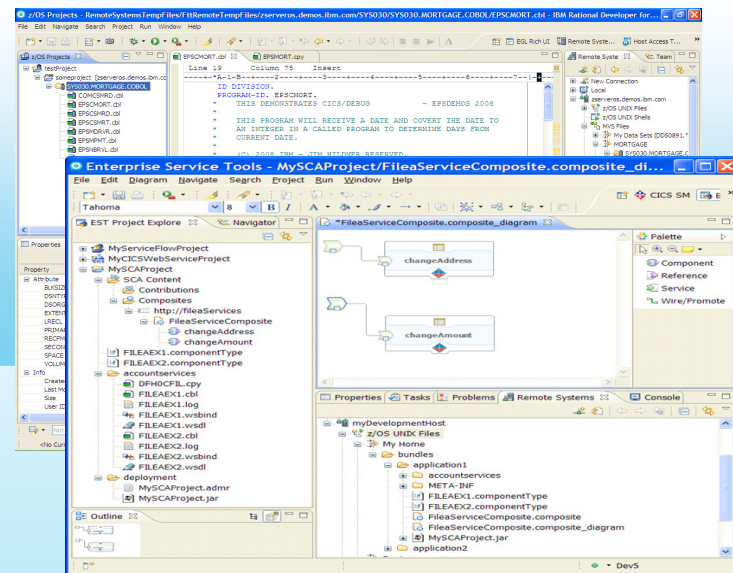
But…

*They have antiquated development tools which deliver low productivity
and are repulsive to younger staff*

Solution: Modern IDEs for all platforms and languages

Upgrade to modern Eclipse-based tools to develop and maintain enterprise applications spanning multiple platforms and languages

Empower People
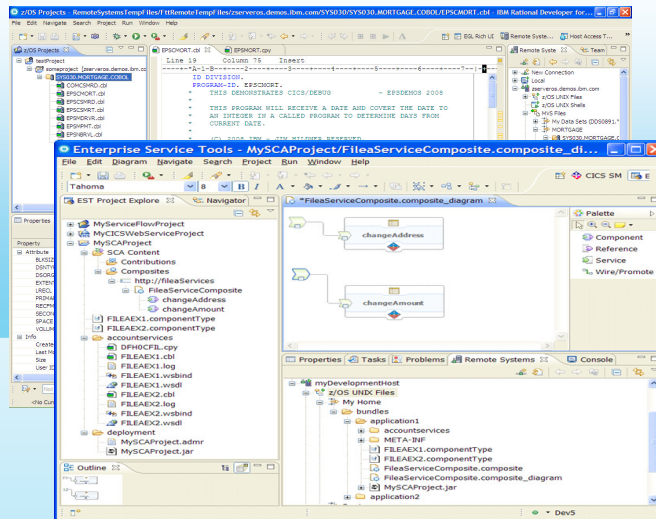
ENHANCED!

Rational Developer for System z
Rational Developer for System i
Rational Application Developer
Rational Business Developer

Delivering

50%-80%[1] reduction in host CPU usage with workstation syntax checking, ~15% improvement in developer productivity[1], and tools with which to attract new talent

[1] Aggregation of results from a productivity study conducted by IBM System z customers

Enterprises want to…

Build modern, multi-platform applications with existing and new staff

Empower People

PIM = Platform Independent Model

But…
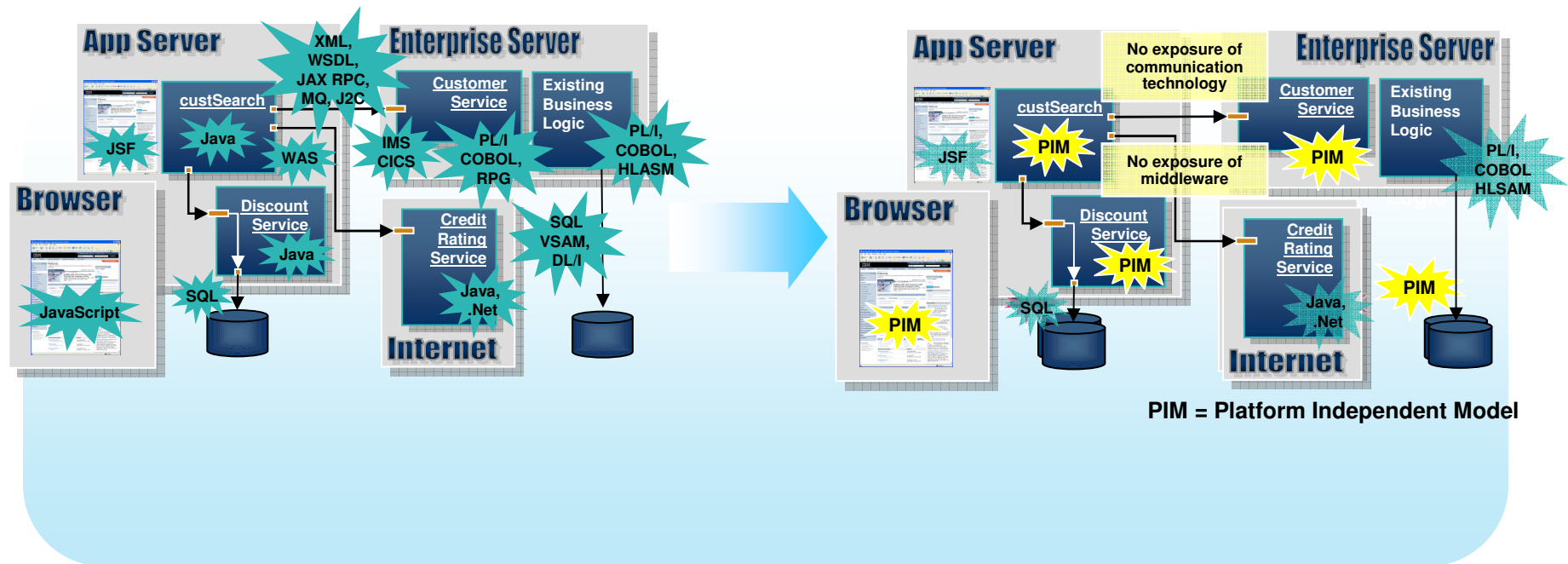
They have different teams of developers for each platform, and re-training them to all the new technologies would be costly, time consuming, and often impractical

Solution: EGL – next gen business language

Build new or extend existing multi-platform enterprise applications leveraging EGL with its middleware abstractions and high productivity language and development environment

Empower People

App Server

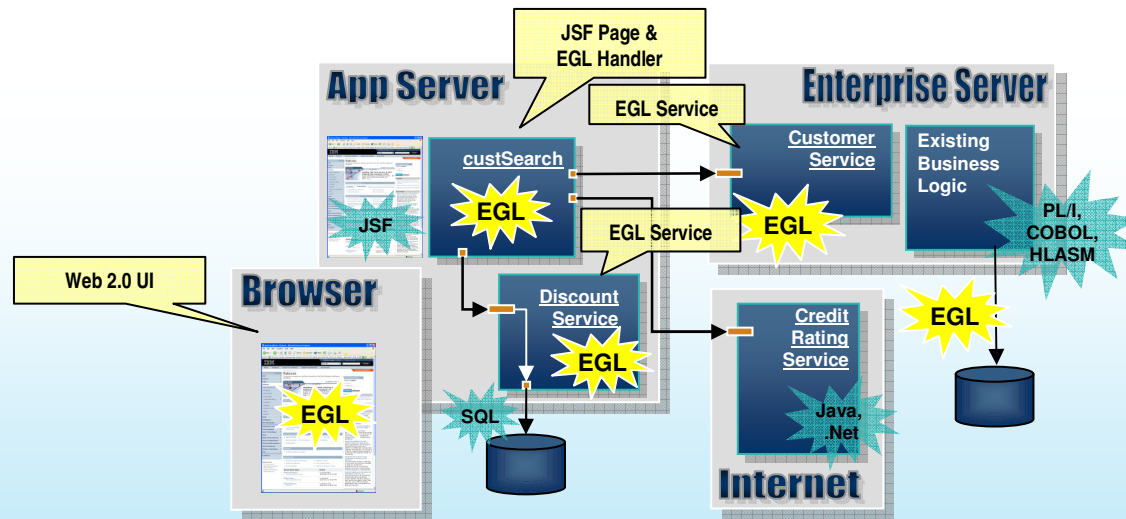JSF Page & EGL Handler

EGL Service

custSearch

EGL

JSF

Enterprise Server

Customer Service

EGL

Existing Business Logic

PL/I, COBOL, HLASM

EGL Service

EGL

Web 2.0 UI

Browser

EGL

Discount Service

EGL

SQL

Credit Rating Service

Java, .Net

Internet

EGL

ENHANCED!

Rational Business Developer

Rational Developer for System z with EGL
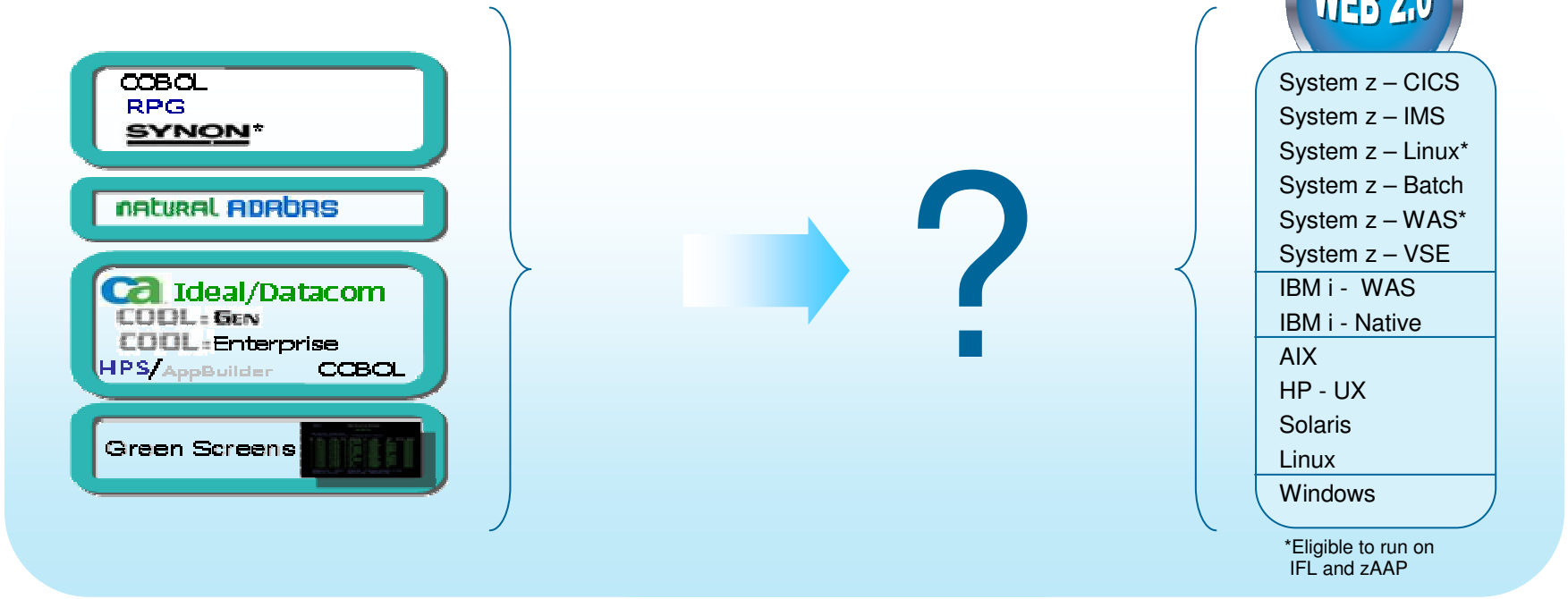
Rational Developer for System i

Delivering

Skills flexibility, high productivity and platform portability for existing and new developers when building all types of modern enterprise applications

Enterprises want to…

Reduce tool support costs and move to modern platforms, languages, and tools for their multi-platform application development

Empower People

WEB 2.0

COBOL
RPG
SYNON*

natural ADABAS

Ca Ideal/Datacom
COOL:Gen
COOL:Enterprise
HPS/AppBuilder   COBOL

Green Screens

?

System z – CICS
System z – IMS
System z – Linux*
System z – Batch
System z – WAS*
System z – VSE

IBM i - WAS

IBM i - Native

AIX

HP - UX

Solaris
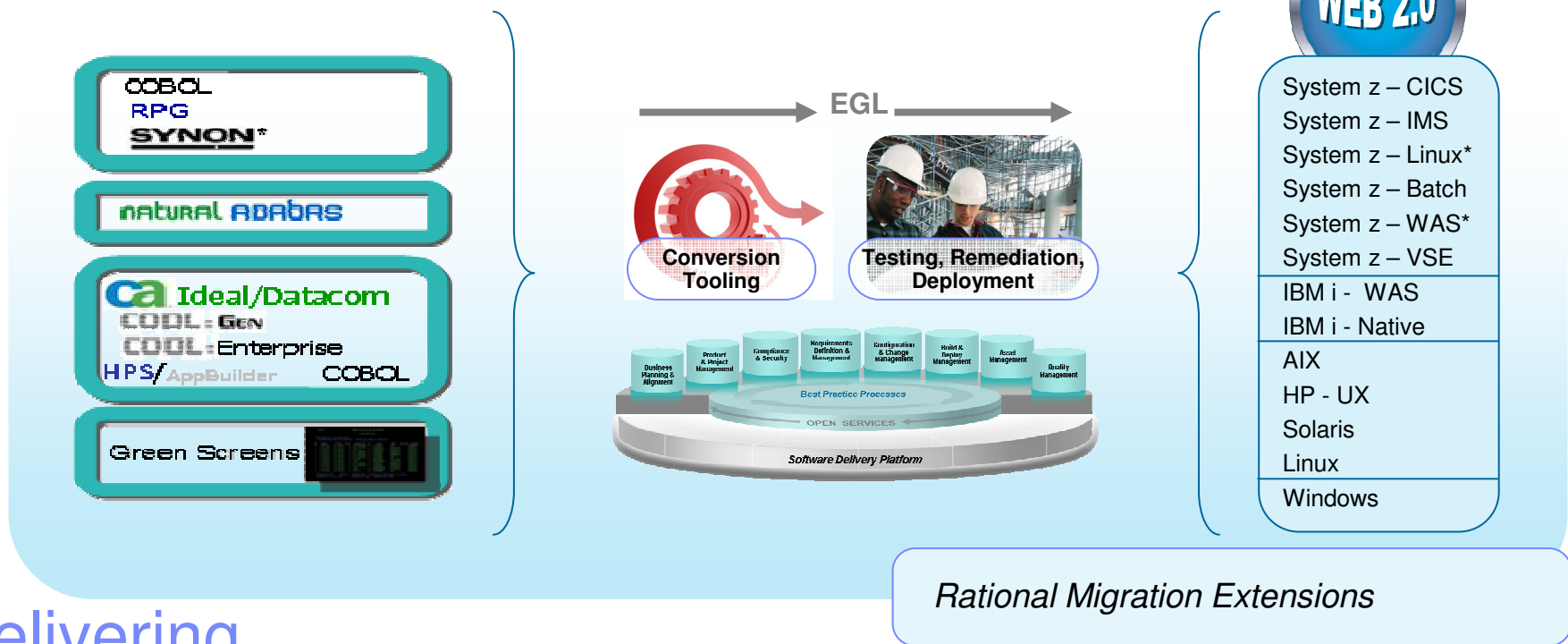
Linux

Windows

*Eligible to run on
IFL and zAAP

But…

They are stuck on poorly supported, expensive, legacy development platforms

Solution: Application transformation tools and services

*Migrate from older languages and stagnant platforms
to modern development platforms, languages and tools*

Empower People

WEB 2.0

COBOL
RPG
SYNON*

natural ADABAS

Ca Ideal/Datacom
COOL:Gen
COOL:Enterprise
HPS/AppBuilder   COBOL

Green Screens

EGL

Conversion Tooling

Testing, Remediation, Deployment

Best Practice Processes

OPEN SERVICES

Software Delivery Platform

| System z – CICS |
| System z – IMS |
| System z – Linux* |
| System z – Batch |
| System z – WAS* |
| System z – VSE |
| IBM i - WAS |
| IBM i - Native |
| AIX |
| HP - UX |
| Solaris |
| Linux |
| Windows |

Rational Migration Extensions

Delivering

*Greatly reduced development platform support costs, and more flexible, integrated
SDLC environment for making future application enhancements
(e.g. SOA and web 2.0)*

Enterprises want to…

Maintain the necessary skills within their IT workforce
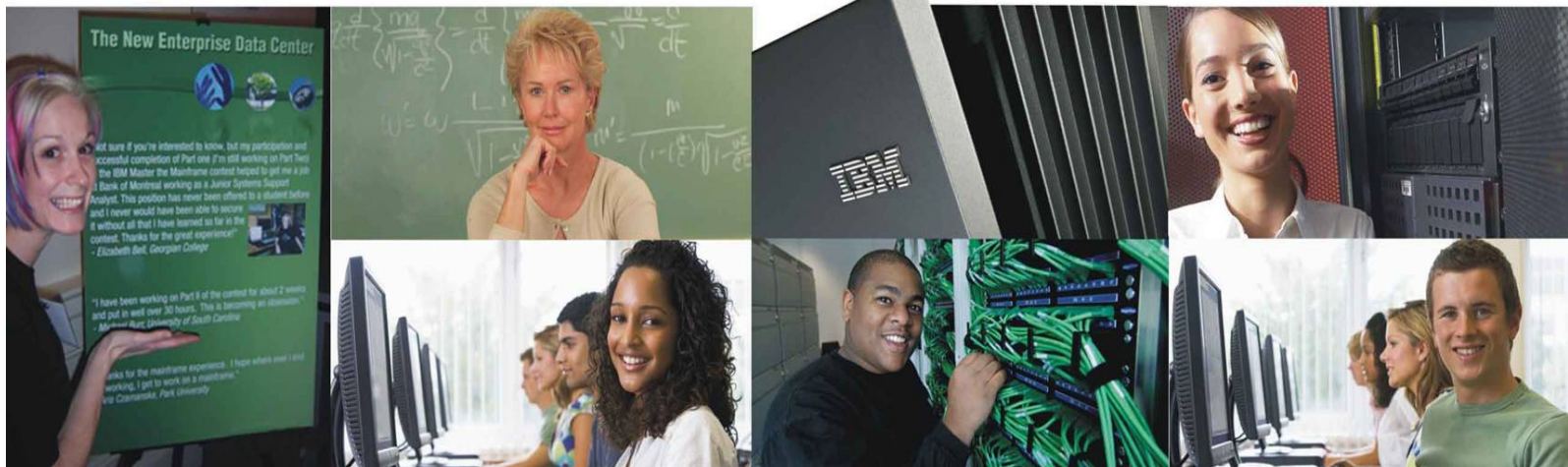
But…

They are concerned about replacing experienced enterprise developers when they retire

Solution: Enterprise training programs

Hire skilled employees from universities in the IBM Academic Initiative, and leverage IBM on-line resources to train existing staff
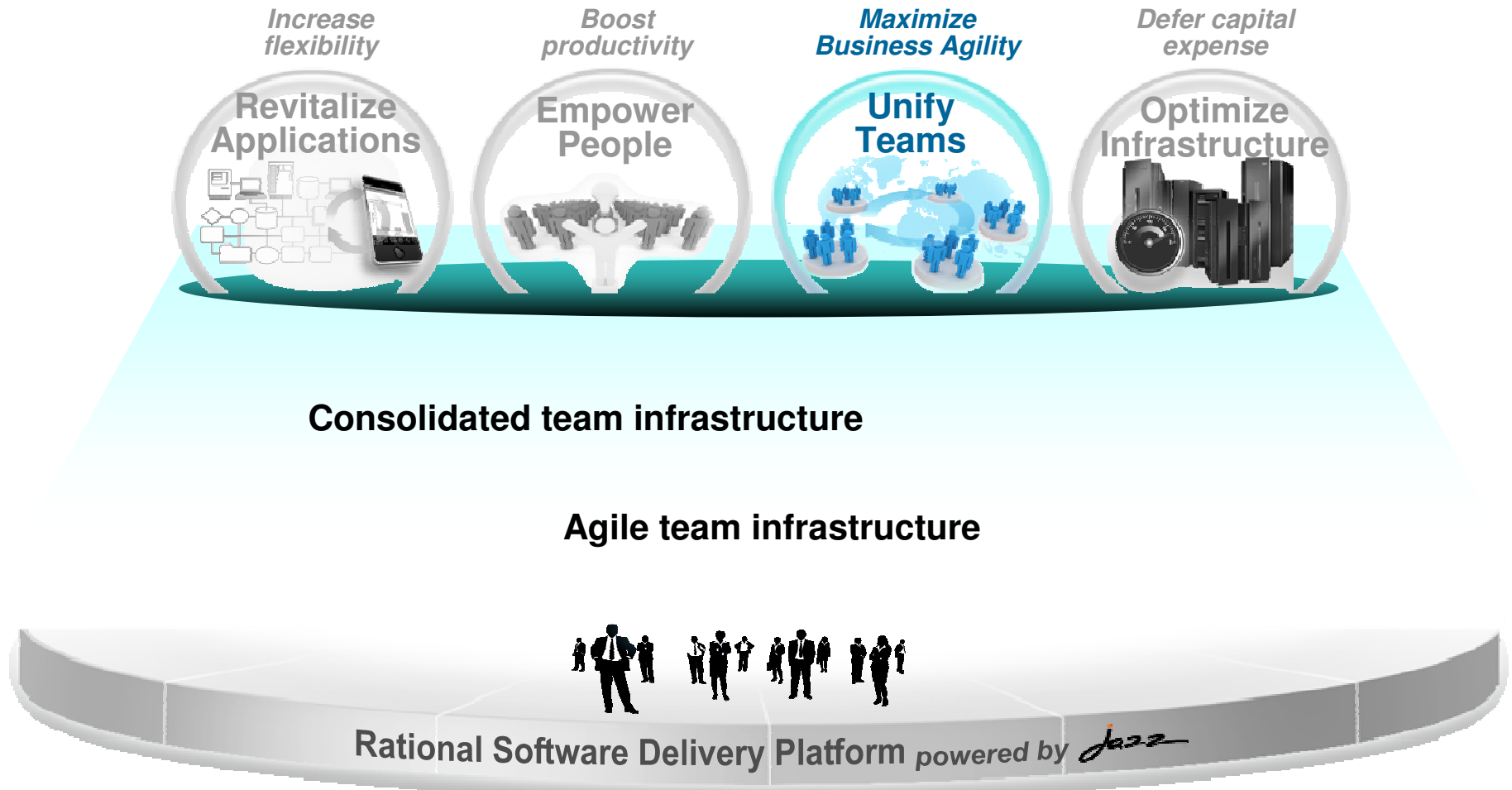

IBM Academic Initiative
Rational Community Cafés for:
  COBOL, EGL, RPG and C/C++
IBM Enterprise Modernization Sandbox
Rational and IMS Workshops
Rational Developer for System z distance
 *learning*

Delivering

New talent with enterprise skills, convenient training for existing employees, and a growing community of skilled business partners, customers, students and IBM employees

Maximize organizational agility by bridging development silos

Increase flexibility	*Boost productivity*	*Maximize Business Agility*	*Defer capital expense*
Revitalize Applications	**Empower People**	**Unify Teams**	**Optimize Infrastructure**

Consolidated team infrastructure

Agile team infrastructure

Rational Software Delivery Platform *powered by* *Jazz*

Enterprises want to…

Quickly build and deploy composite applications and reduce their team infrastructure costs

Unify Teams
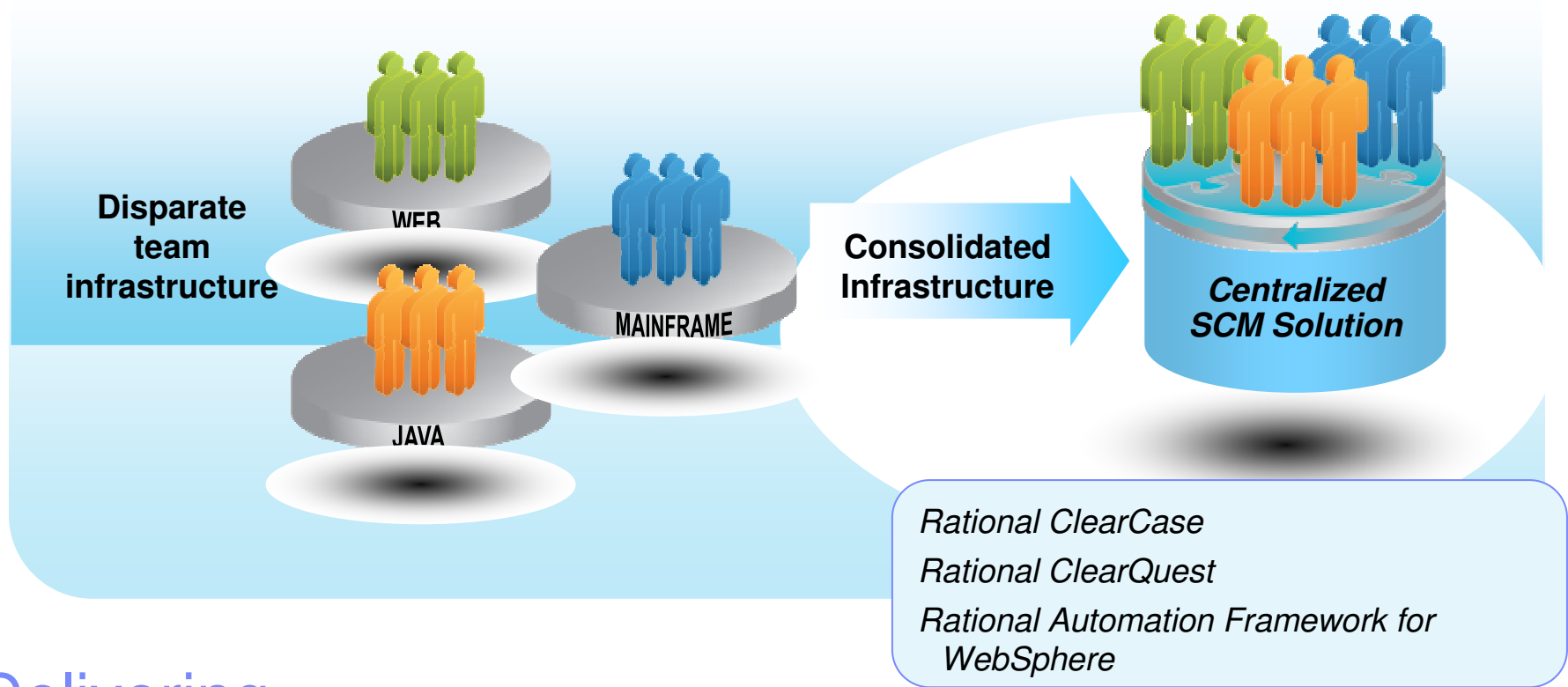
Disparate team infrastructure

WEB

MAINFRAME

JAVA

But…
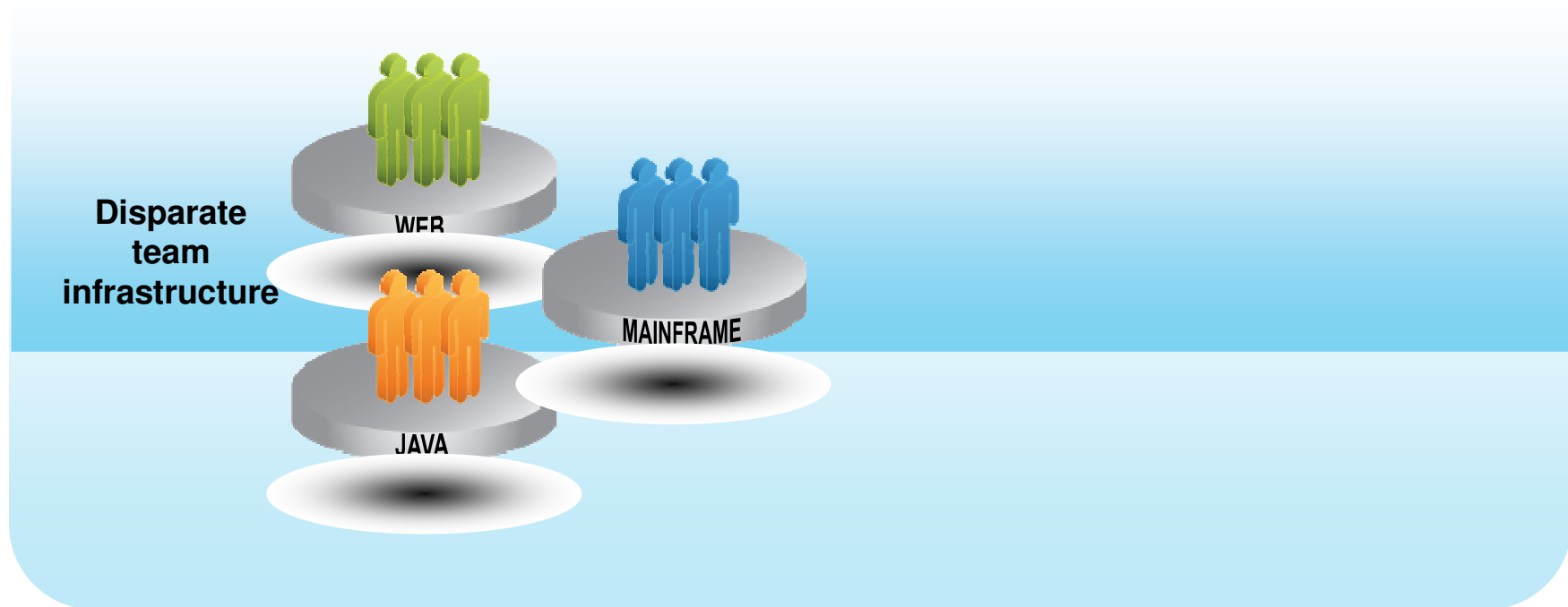
They have different tools, processes and team infrastructure for each deployment platform, greatly complicating development of composite apps, and they are using expensive, legacy SCM tools

Solution: Consolidated team infrastructure

Standardize, consolidate and simplify the team infrastructure for multi-platform projects including source code management, problem tracking, and build
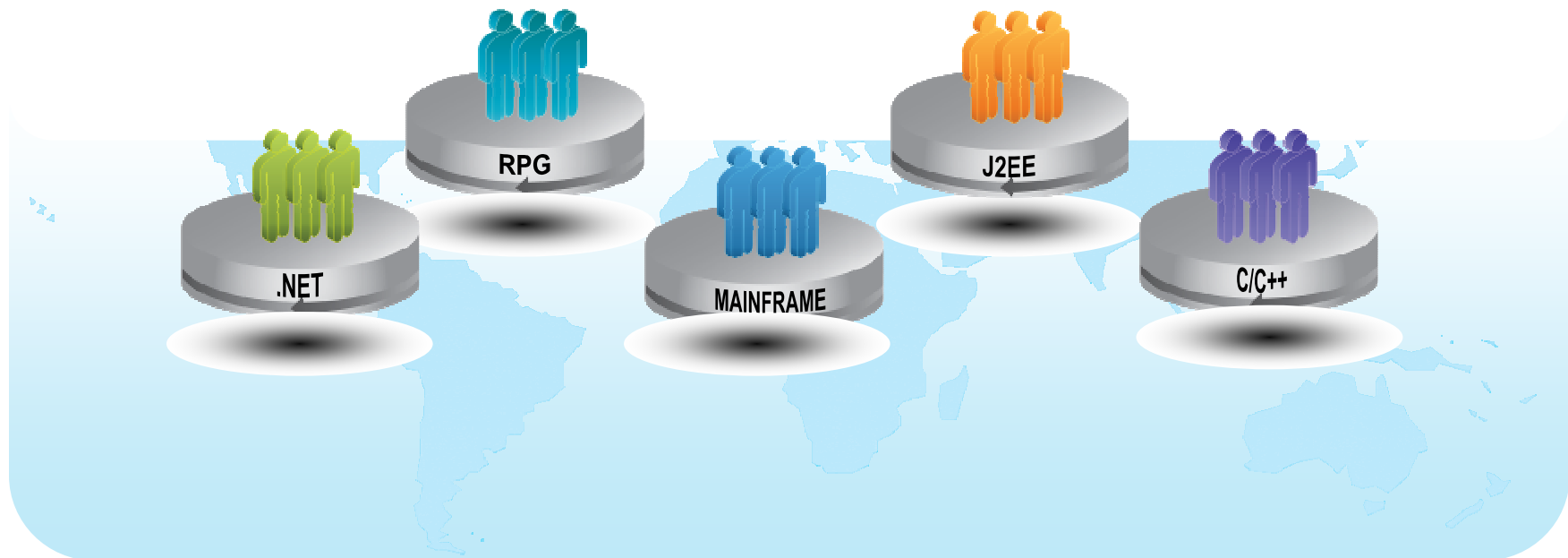
Disparate team infrastructure

WEB

JAVA

MAINFRAME

Consolidated Infrastructure

Centralized SCM Solution

Rational ClearCase

Rational ClearQuest

Rational Automation Framework for WebSphere

Delivering

Reduced costs, improved quality, greater team efficiency, and a comprehensive, holistic view of the entire multi-platform development effort

Enterprises want to…

Enable agile, multi-platform and cross-geo collaboration and governance

Unify Teams

But…

They have "islands" of development, each with different tools, processes and team infrastructure, and they do not support real-time collaboration or integrated, comprehensive oversight

Solution: Collaborative application lifecycle management

Deploy new team infrastructure that supports collaboration in context across all platforms and geographies, real-time, automated monitoring of project health, and built-in development workflows
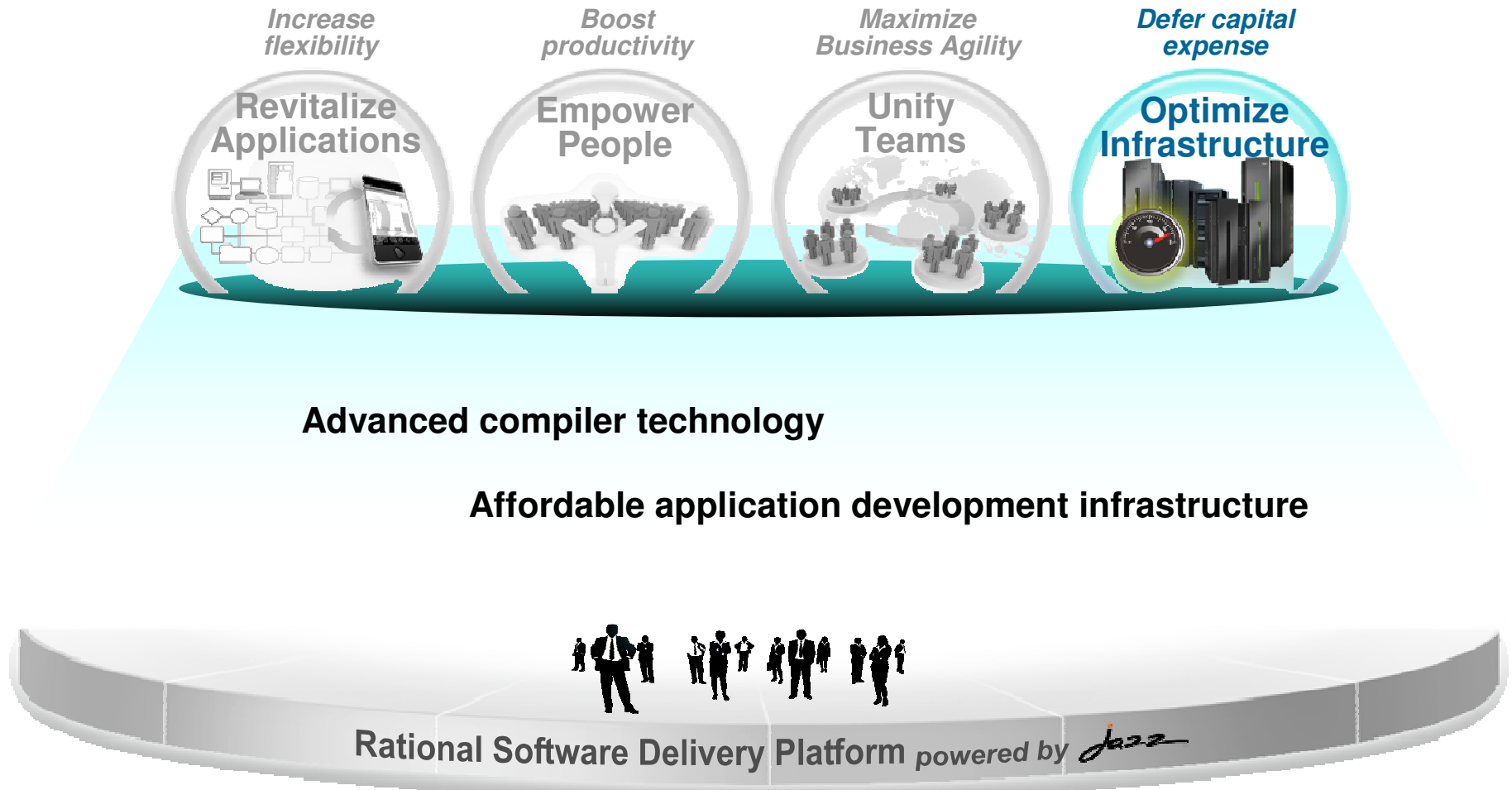
Unify Teams

Rational Software Delivery Platform powered by *Jazz*

ENHANCED!

Rational Team Concert for System z

Rational Team Concert for IBM i

Rational Team Concert

Delivering

Improved communication, higher quality, informed decision-making, and more automated, transparent and predictable software development

Defer capital expense by optimizing application infrastructure

Increase flexibility	Boost productivity	Maximize Business Agility	Defer capital expense

Revitalize Applications   **Empower People**   **Unify Teams**   **Optimize Infrastructure**

Advanced compiler technology

Affordable application development infrastructure

Rational Software Delivery Platform *powered by* Jazz

Enterprises want to…

*Maximize application performance on existing hardware
to reduce capital expenses*

But…

They have back-level compilers or are not fully using optimization

Solution: Advanced compiler technology

Exploit new advanced optimization technology in C/C++, Java, COBOL, PL/I and Fortran compilers

Optimize Infrastructure

Performance

Enterprise COBOL

Enterprise PL/I

z/OS XL C/C++

ENHANCED!

Delivering

Lower capital outlays by increasing capacity on existing hardware, and improved performance of application suite

Enterprises want to…

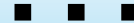*Make the mainframe an affordable, simple and accessible platform for new application development*

Optimize Infrastructure

IT   **Banking**   **Retail**

. . .
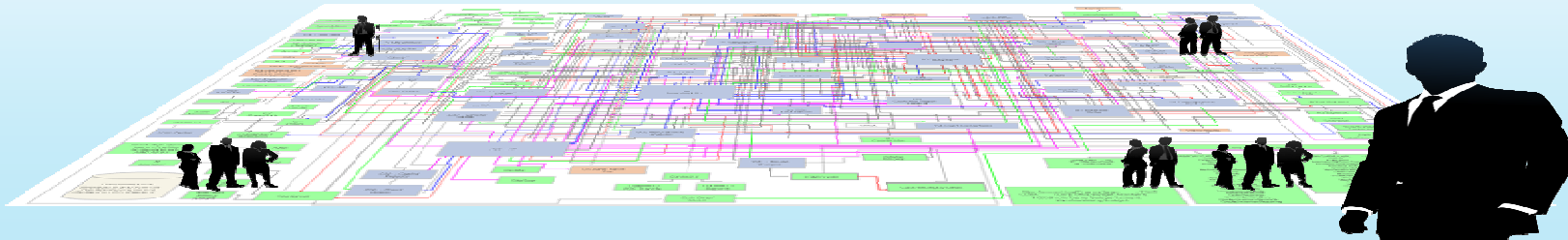
But…

Processing capacity used on the mainframe is considered production processing and as a result is not viewed as price competitive with x86 and UNIX development environments

Solution: Affordable System z development environment

Integrated System z hardware, software and maintenance designed to help customers build and deploy new enterprise applications on the mainframe

NEW!

System z Solution Edition for Application Development

Other Solution Editions:
- Data Warehousing
- SAP
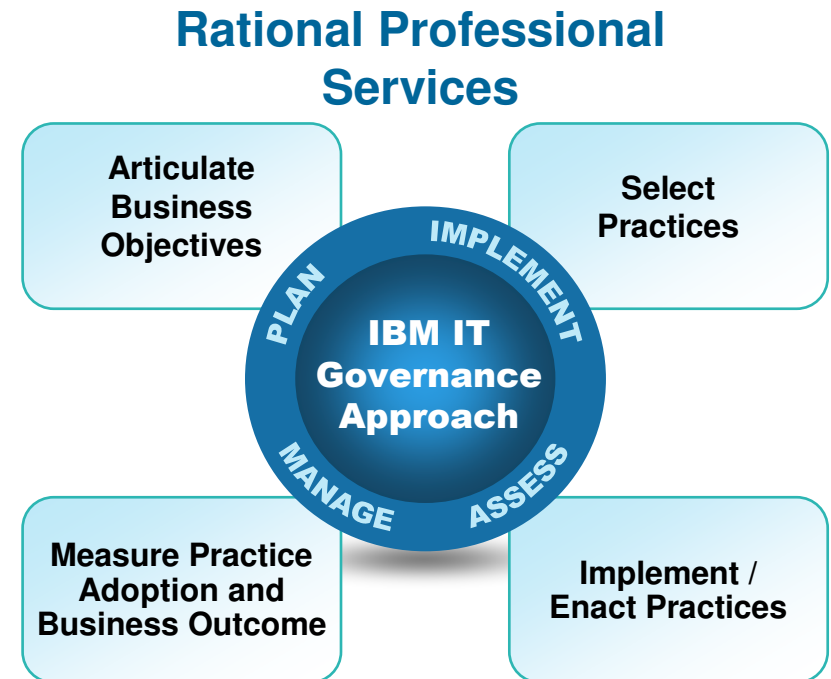- ACI
- WebSphere®
- Security
- GDPS®
- Cloud Computing

z/Solution Editions

ENHANCED! *Rational Software Delivery Platform for System z*

Legendary mainframe quality at new competitive prices!

Delivering

Tangible savings in hardware, software, and services to cut application development time and costs by making mainframe assets readily available and simply consumable in a secure private cloud environment

Optimize Infrastructure
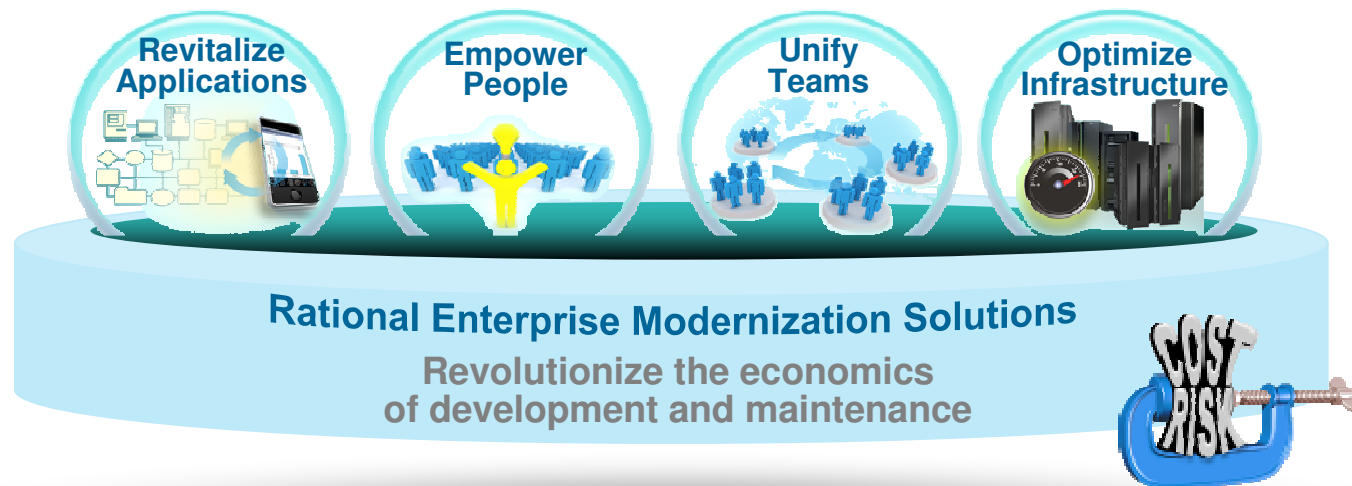
Leverage IBM Services to get started today

- **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

IMPLEMENT

PLAN

IBM IT Governance Approach

MANAGE

ASSESS

Measure Practice Adoption and Business Outcome

Implement / Enact Practices

IBM Rational Enterprise modernization solutions

Revolutionizing the economics of development and maintenance

- **Difficult times present opportunities for businesses to gain efficiencies in the short term while making strategic IT investments for future growth**

- **But application complexity, limited staff productivity, poor team collaboration, and constrained infrastructure limits IT flexibility**

- **Rational Enterprise modernization solutions can help:**
  - ✓ **Increase flexibility** by revitalizing existing application portfolio
  - ✓ **Boost productivity** and accelerate innovation with modern skills
  - ✓ **Maximize organizational agility** by bridging development silos
  - ✓ **Defer capital expense** by optimizing application infrastructure

Revitalize Applications   **Empower People**   **Unify Teams**   **Optimize Infrastructure**

Rational Enterprise Modernization Solutions

Revolutionize the economics of development and maintenance

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