

# Application Life Cycle Management – Implementing a Collaborative Approach to Software Development



Hayden Lindsey, Vice President & Distinguished Engineer:  
Rational Enterprise Modernization, Modeling and Construction

April 2011



# Many businesses are challenged by growing complexity

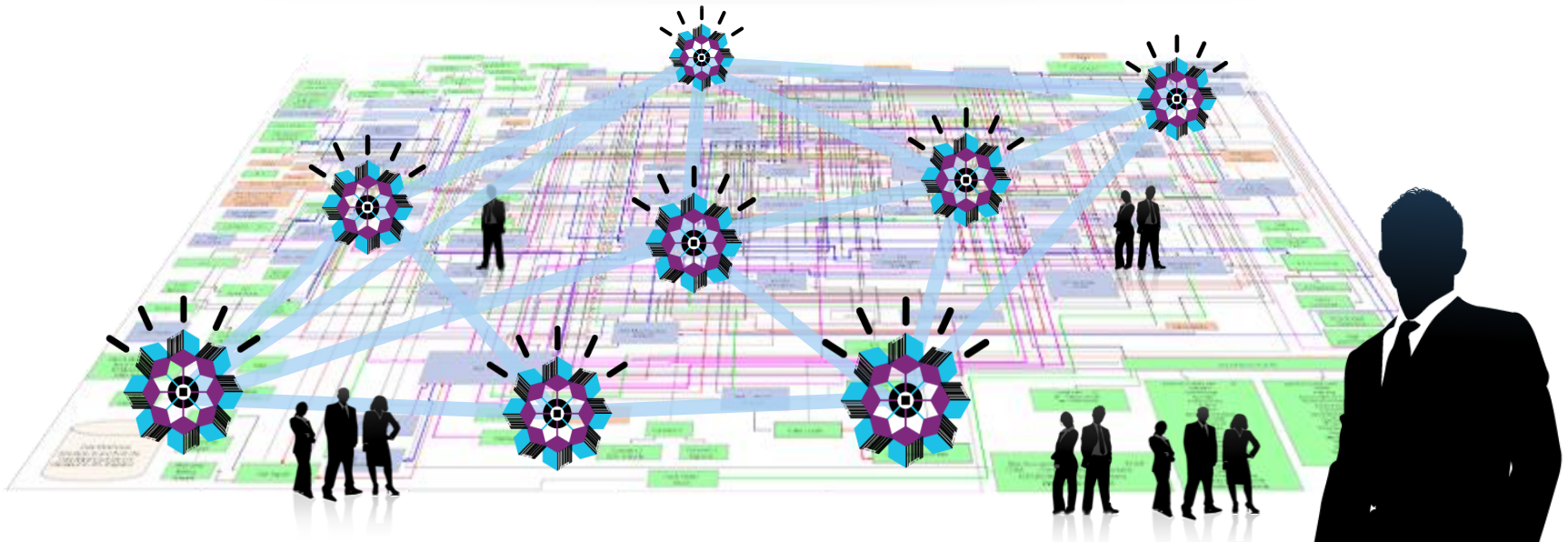
**8 in 10** CEOs anticipate significant complexity ahead.



**Half** Feel prepared to handle it.

**30%**  
complexity gap

Source: IBM Global CEO Study 2010  
"Capitalizing on complexity".

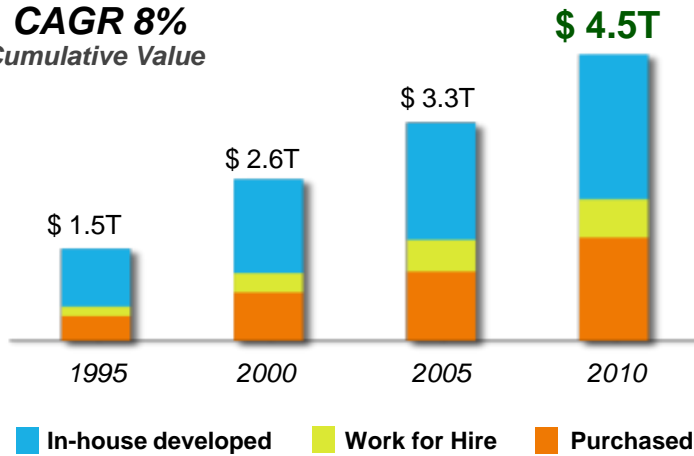


**Growing Complexity**

...and the numbers can be unpleasant

### Investment

**CAGR 8%**  
Cumulative Value



### Challenges

- **70%** budget locked in maintenance
- **80%** of Mainframers are 50+ years old
- **50%** IT projects rolled back
- **85%** of distributed computing capacity is idle



**Mainframe**



**Distributed**

...and IT is often viewed as a root cause



*"For IT to regain relevance, it must reinvent itself as an organization that moves beyond its legacy burdens and helps the business take charge of the new IT capabilities available in the market."*

Shed Your Preconceptions: Business Technology In 2020, Forrester Research, Inc., December 13, 2010

# Four key barriers preventing optimal return on IT investments

## Decades of application investments



*"We don't understand the effort, risk and impact of modernizing our legacy applications."*



## Islands of skills, languages and platforms



*"Our skills gap keeps growing. How do we stay current with all the language and technology changes?"*



## Poorly integrated teams



*"We need to enable our teams to collaborate across platforms, languages, and environments."*



## Infrastructure inefficiency



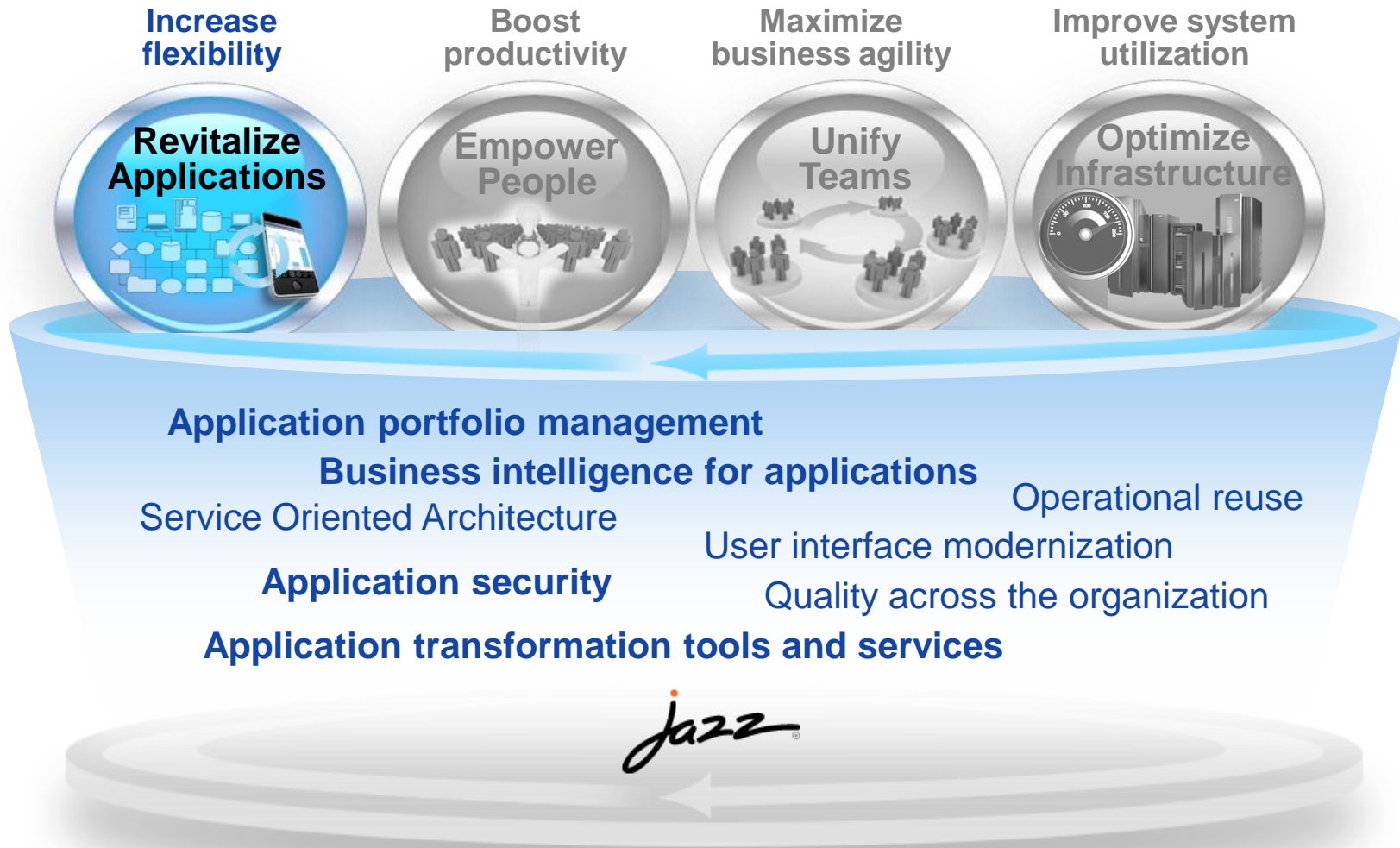
*"We need a cost effective way to improve our infrastructure efficiency and free up capacity to handle more workload."*



# Enterprise Modernization offers a low risk, high return approach



# Increase flexibility by revitalizing existing application portfolios





# Enterprises want to...

*Align their application portfolio to the business' overall strategy*

## Increasing Business Pressures

Minimize costs for maintaining and operating existing systems

Enable new business opportunities through new and innovative systems

Minimize risk exposure (Compliance, Schedules, Security, ...)

Drive business process optimization through technology



Aging population possessing key domain, business and technology knowledge

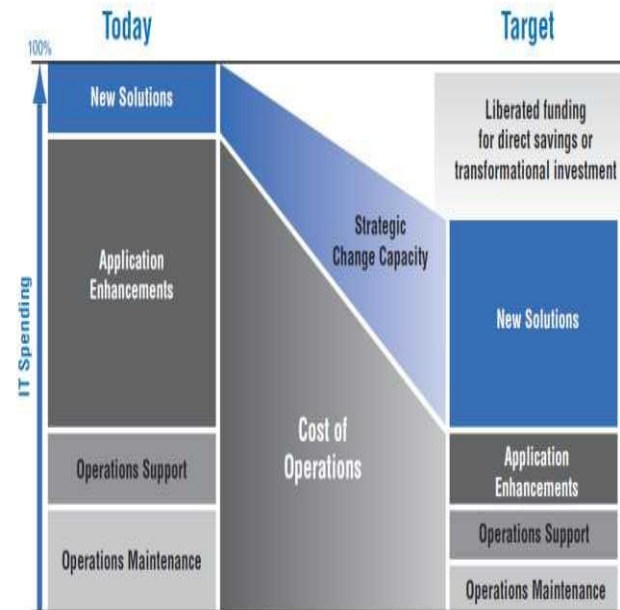
Complexity driven by continued expansion of technology options

Duplicated and competing capabilities and technologies

Degrading maintainability as a result of aging technology and brittle architectures

## Increasing IT Constraints

## Insufficient Strategic Spend



## But...

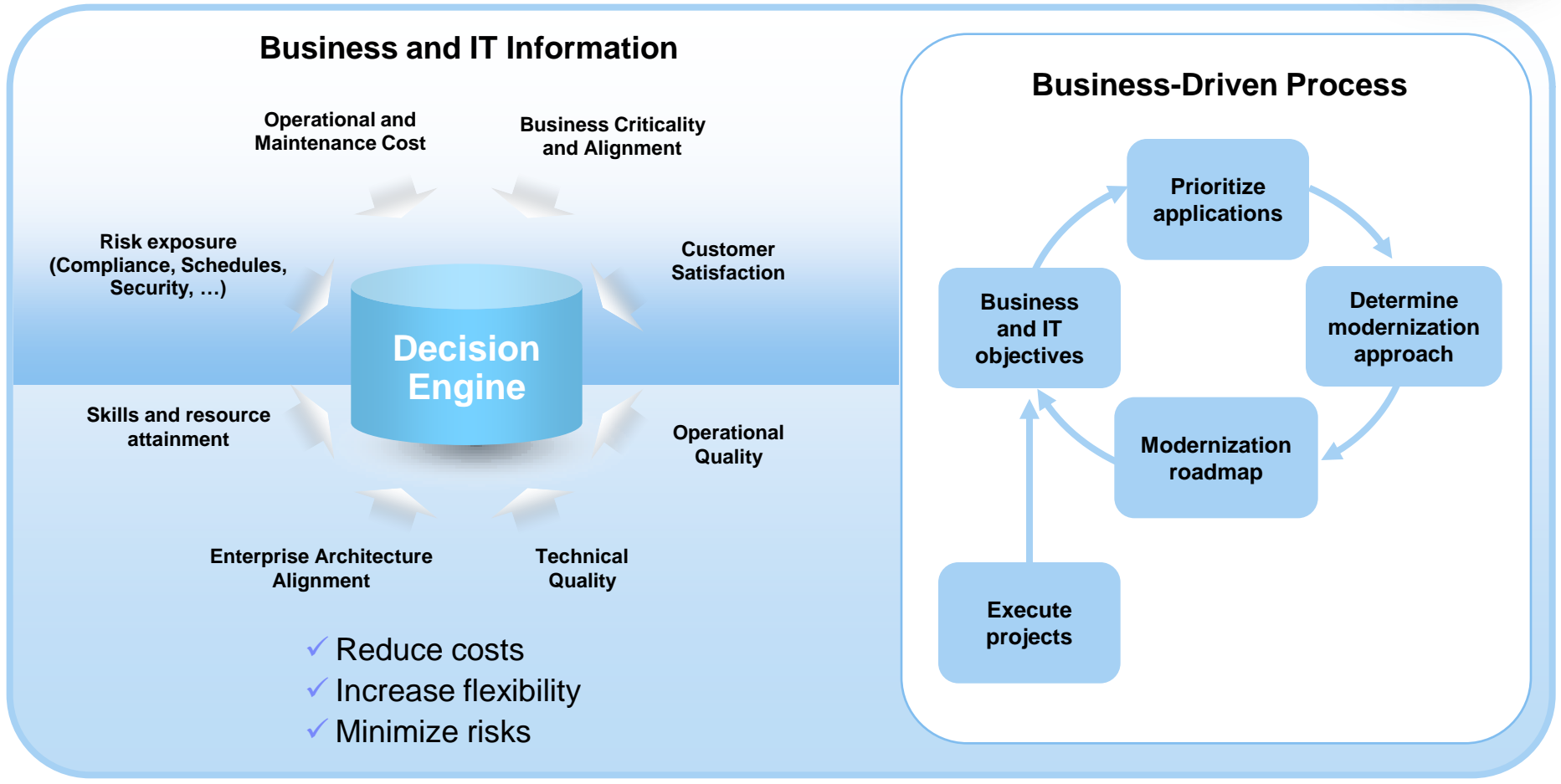
*Lack of business and IT information makes decision making ad-hoc, error prone and politically driven versus analytical and fact-based. Limited awareness of applications (usage, design, relationship to business requirements, etc.) increases cost, slows development delivery and reduces quality.*





# Solution: Comprehensive application portfolio management

*Helps organizations proactively make faster and better-informed decisions*



*“Smarter APM and associated application revitalization has enabled IBM’s IT to cut maintenance costs by 20% and defects by 58%.”*

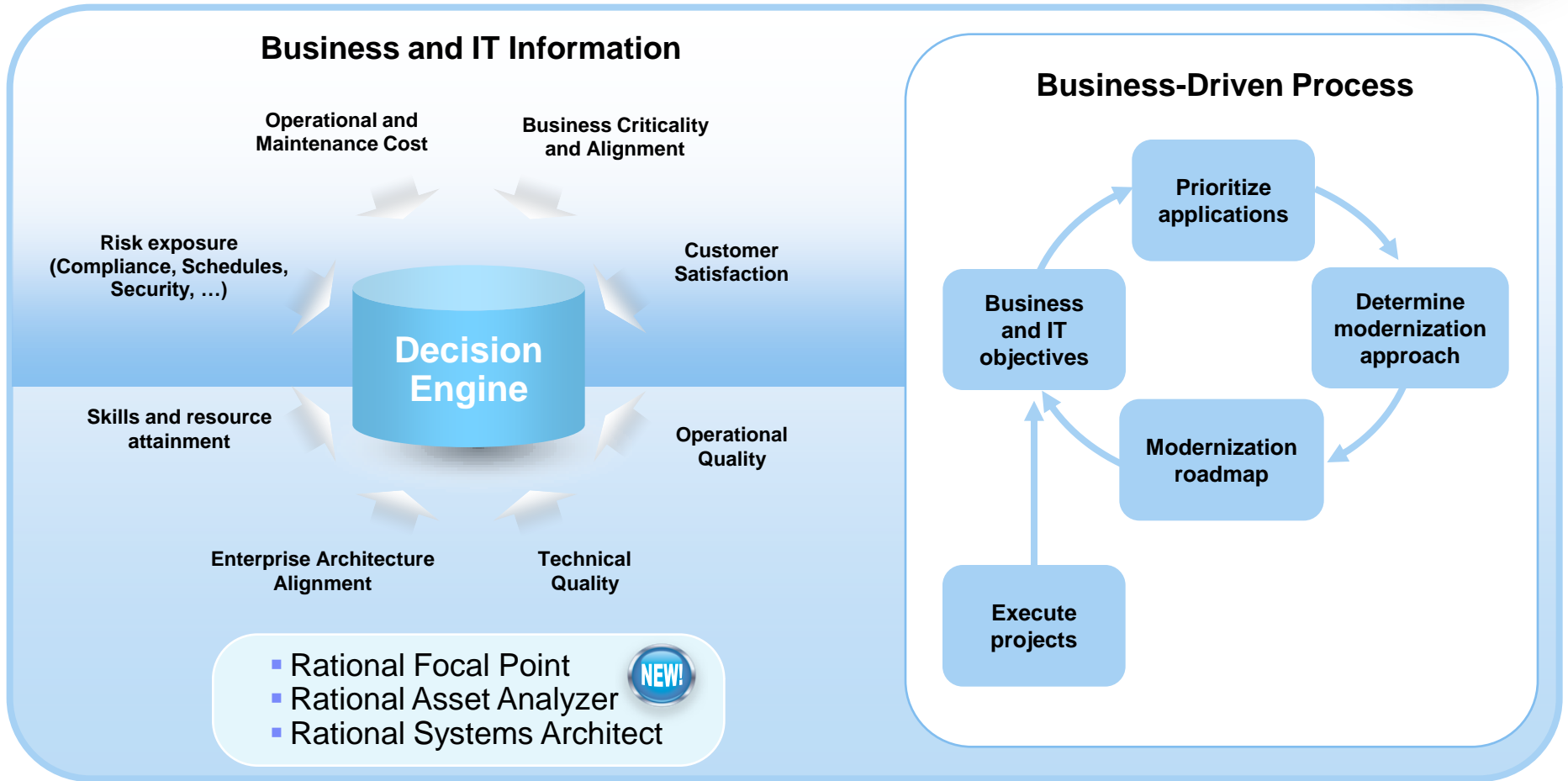
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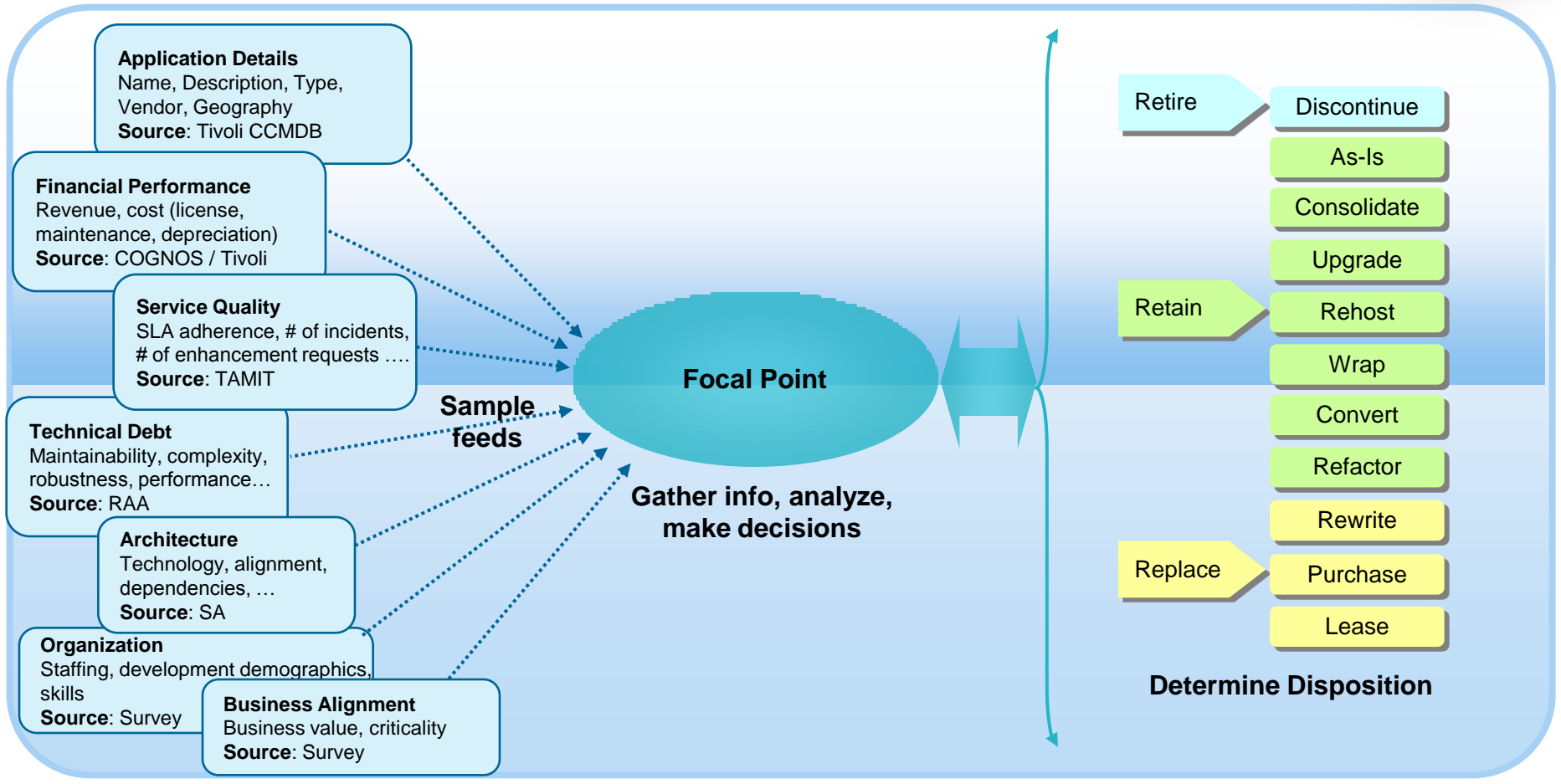
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# A well-defined process with information feeds

*Effectively translating business needs to executable roadmaps*



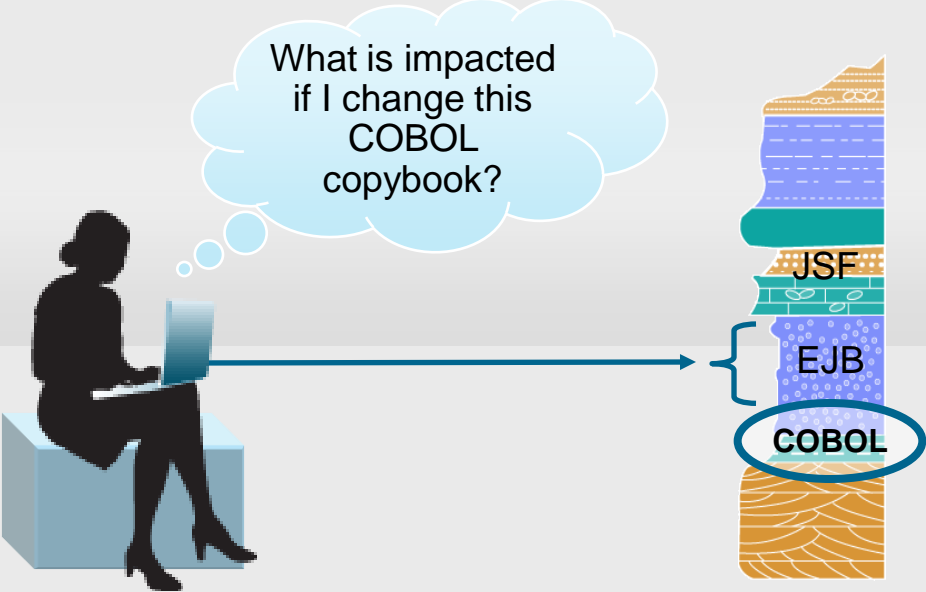
*“Making IT resource consumption transparent and understandable to business leaders enables healthy business discussions around how to shift resources to where they will do the most good for the whole business.”*



— Define “Application” Based On Your Content To Avoid False Starts In Your Rationalization Efforts, Forrester Research, Inc., January 26, 2011

## Enterprises want to...

*Understand the impact and cost of changes to their IT systems, harvest and manage business rules from existing applications, analyze these rules, and minimize rework and points of failure*



What is impacted  
if I change this  
COBOL  
copybook?

JSF  
EJB  
COBOL

Industry analysts estimate there are between **200 and 300 billion lines of mainframe legacy code**. **COBOL accounts for about 70%**, with five billion new lines of code added each year

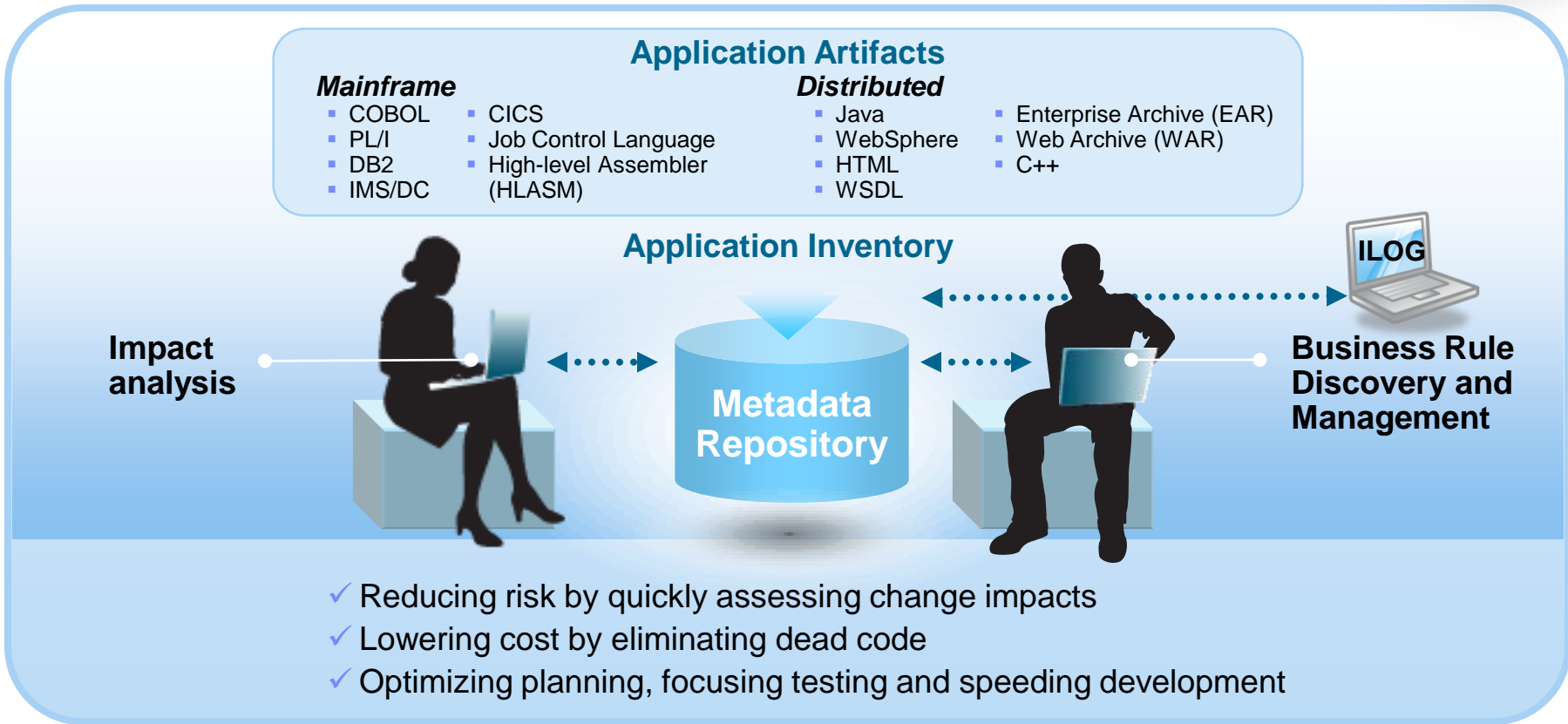
## But...

*They have no business intelligence inventory of their application assets, relying instead on manual, error-prone processes and incomplete knowledge. They must compensate with more extensive planning and extra testing and by manually 'searching' for code affected by business decisions.*



# Solution: Business intelligence for applications

*Restore lost application knowledge via technical analysis*



*“IBM Rational Asset Analyzer software is a robust and reliable tool that supports portfolio analysis of large applications in a short period of time, delivering accurate reports that give a clear understanding of the application at the business, architecture and program levels.”*

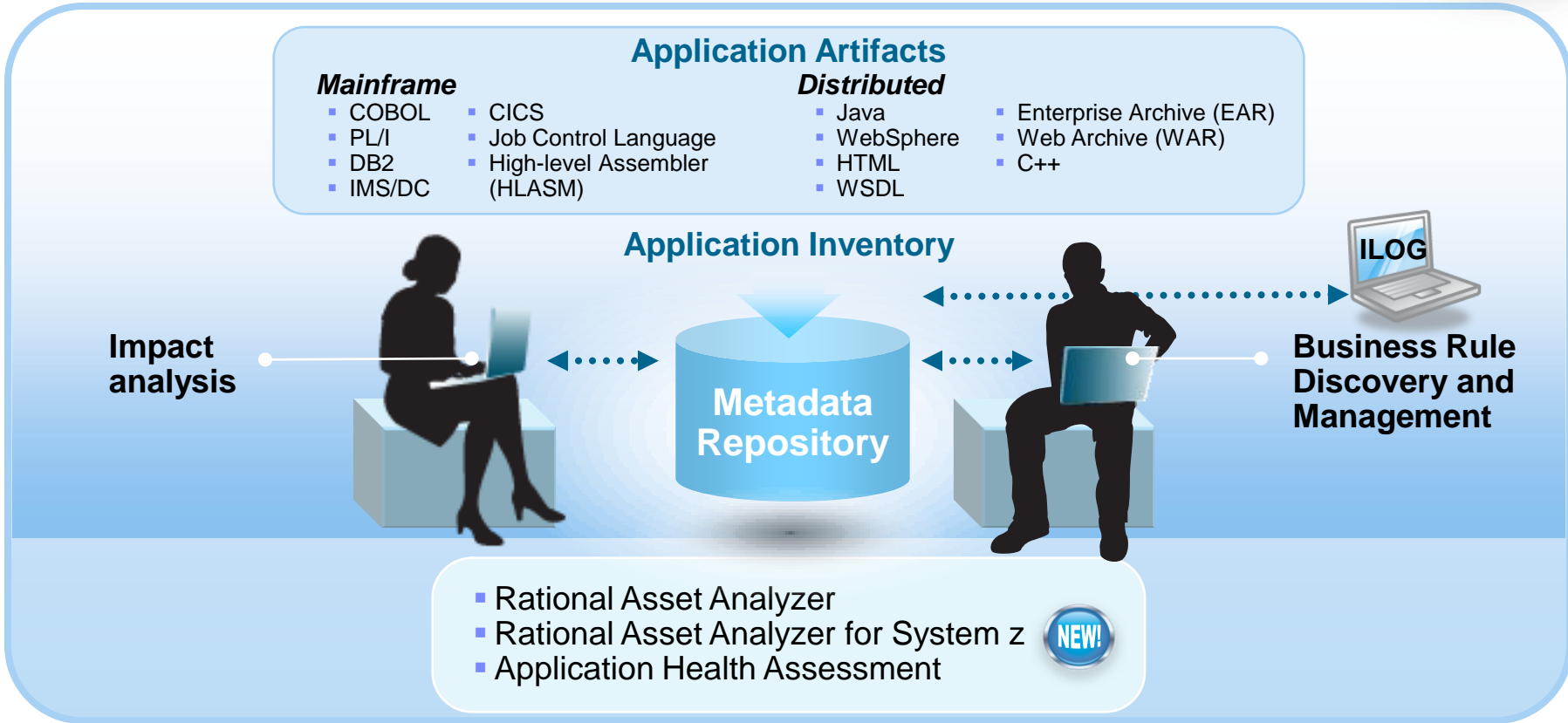
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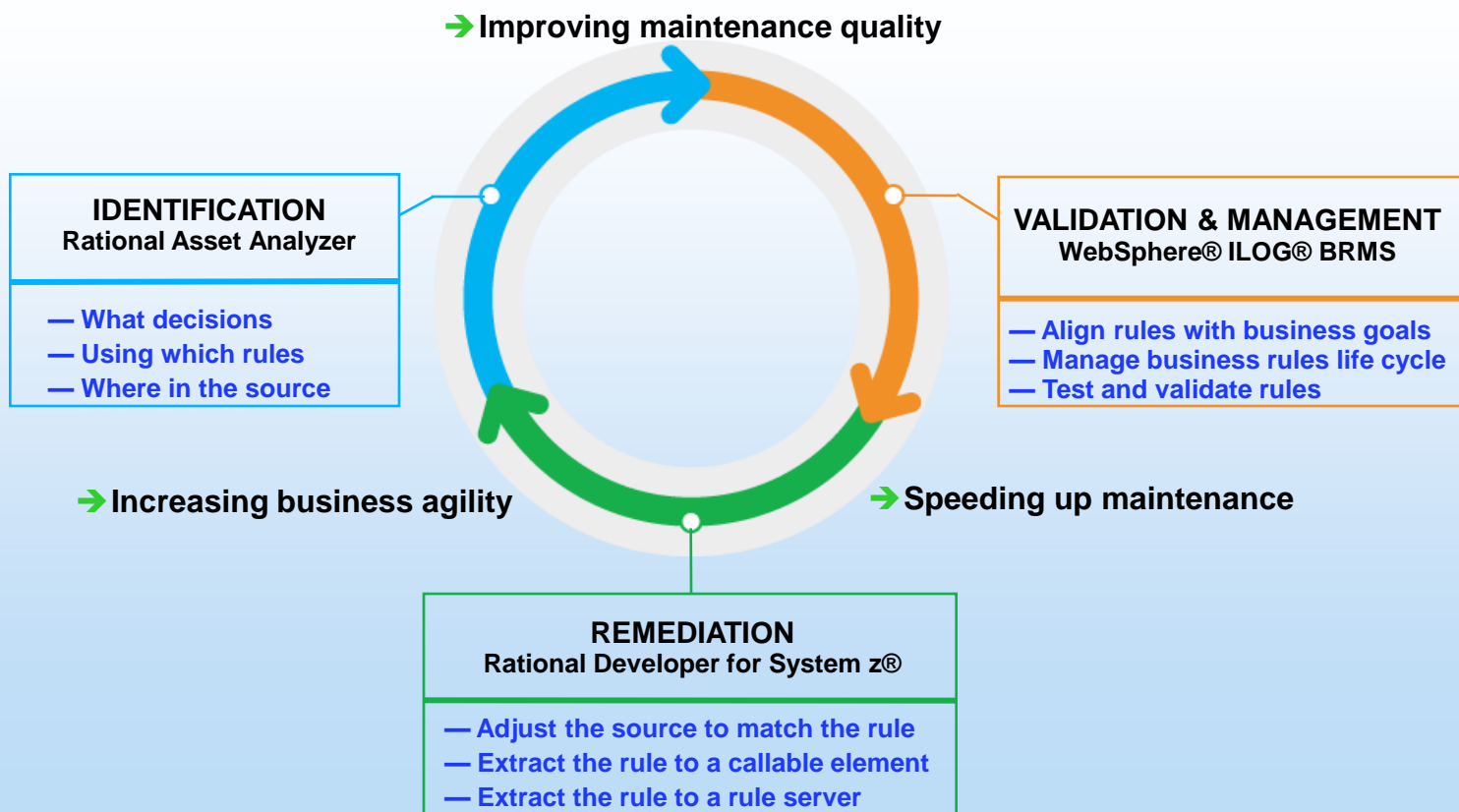
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# Mining business rules from within existing software assets

*Speed maintenance and improve quality*



Enterprises want to...

*Proactively manage and mitigate security exposures as they open their legacy applications to the Web*

## Legacy functionality exposed in web applications and services creates significant risk without security measures

- ❖ **76%** of CEO's surveyed feel reducing potential security flaws within business-critical applications is the most important aspect of their data protection program - *Business Case for Data Protection - A Study of CEOs and other C-level Executives in the United Kingdom, March 2010, Ponemon Institute*
- ❖ **55%** of all cyber vulnerabilities are Web application vulnerabilities - *IBM Xforce 2010 Mid-Year Trend Report*
- ❖ **79%** of compromised records were compromised using Web applications as the attack method - *Verizon 2010 Data Breach Investigations Report*



But...

*Developers are uninformed of the problem and not mandated to develop secure applications causing applications to be deployed that are riddled with security flaws and that are often non-compliant with industry regulations*



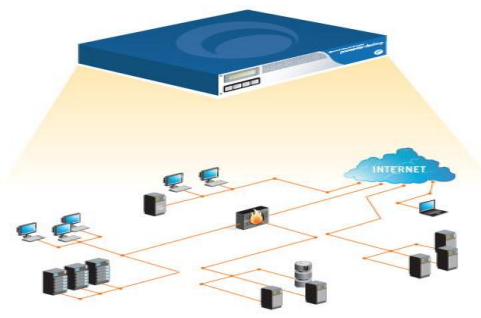


# Solution: Proactively secure your applications

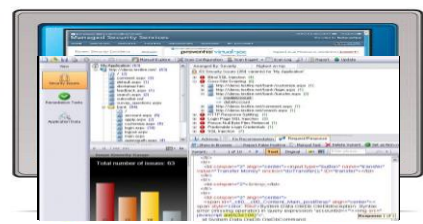
*Scan applications for security flaws before they are deployed*



**1**  
Scan applications and code



**2**  
Analyze and identify issues



**3**  
Report: Detailed, actionable



Extensive language support including: COBOL, Java, C, C++, .NET, PL/SQL and many more

- ✓ Cost effectively manage risk with proactive remediation of application vulnerabilities
- ✓ Protects legacy assets by securing applications

*“The real key is that we have the education in place and now implement security early in the application development lifecycle, so we have less overall vulnerabilities to manage.”*  
— DTCC



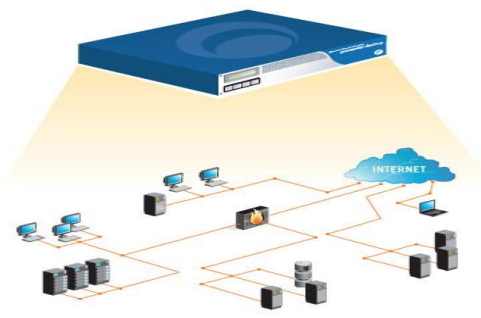


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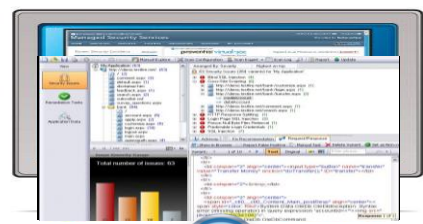
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Analyze and identify issues



NEW!

3

Report: Detailed, actionable



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- Rational AppScan Source Edition **NEW!**
- Rational AppScan Enterprise Edition
- Rational AppScan Standard Edition

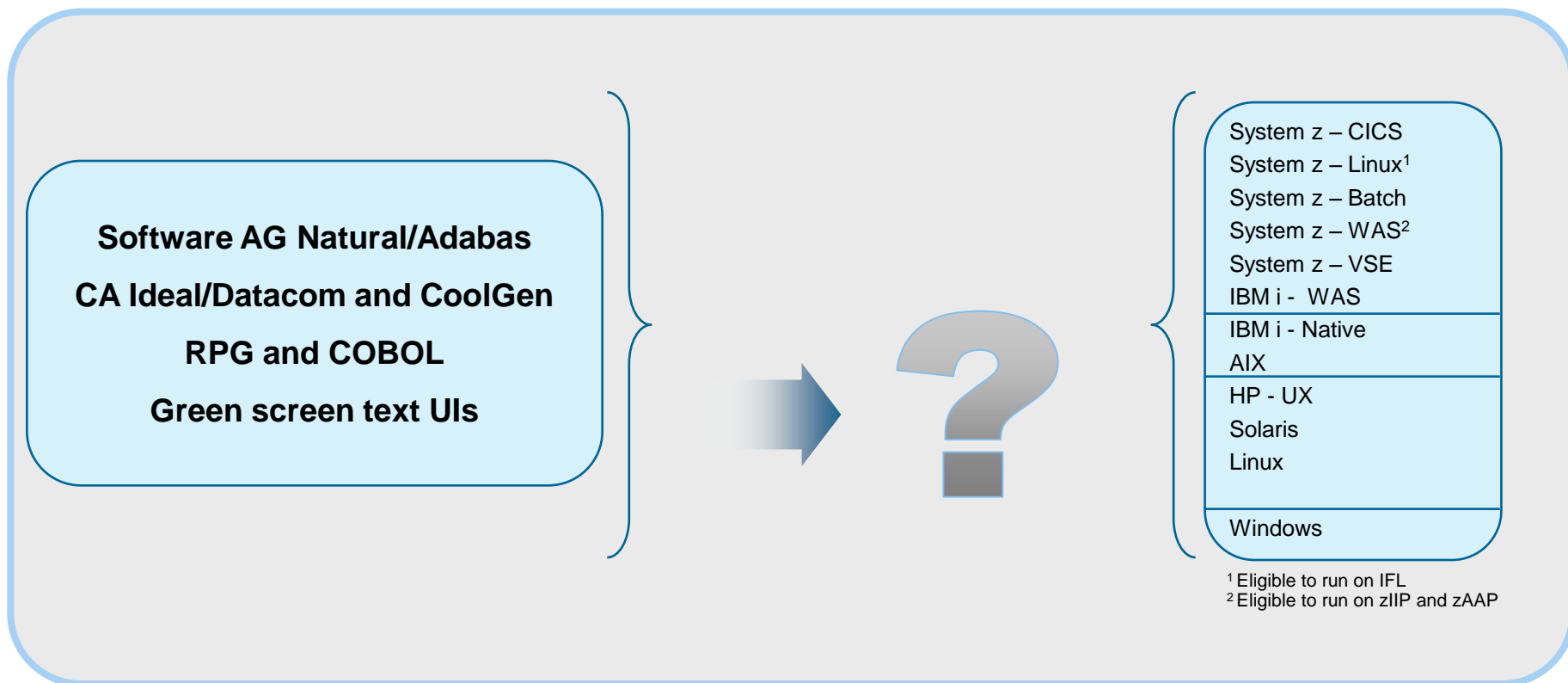
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## Enterprises want to...

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



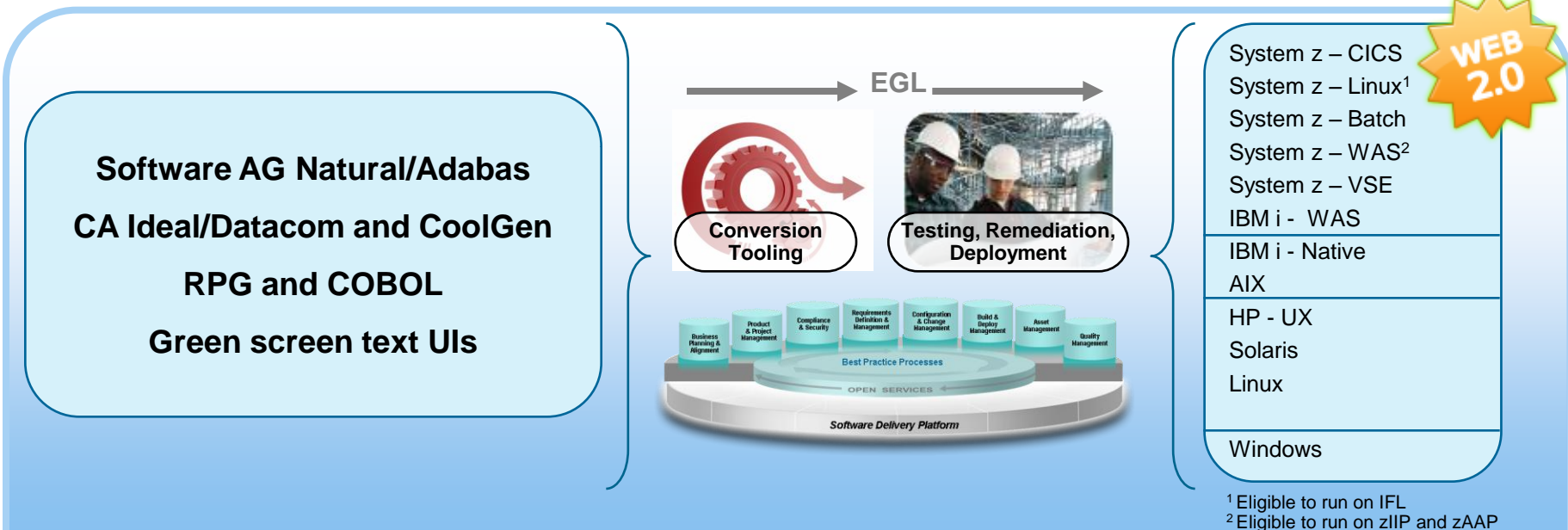
## But...

*They are using older languages and/or are stuck on poorly supported, expensive, legacy development platforms*



# Solution: Application transformation tools and services

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



- ✓ Greatly reduced development platform support costs
- ✓ More flexible, integrated development environment

Operating costs were reduced 55 percent by migrating from the VAGen legacy application to Java. *“The migration to EGL combines the best of both worlds: The stability of IBM System z and the flexibility of Java.”* Massive cost savings are also included!

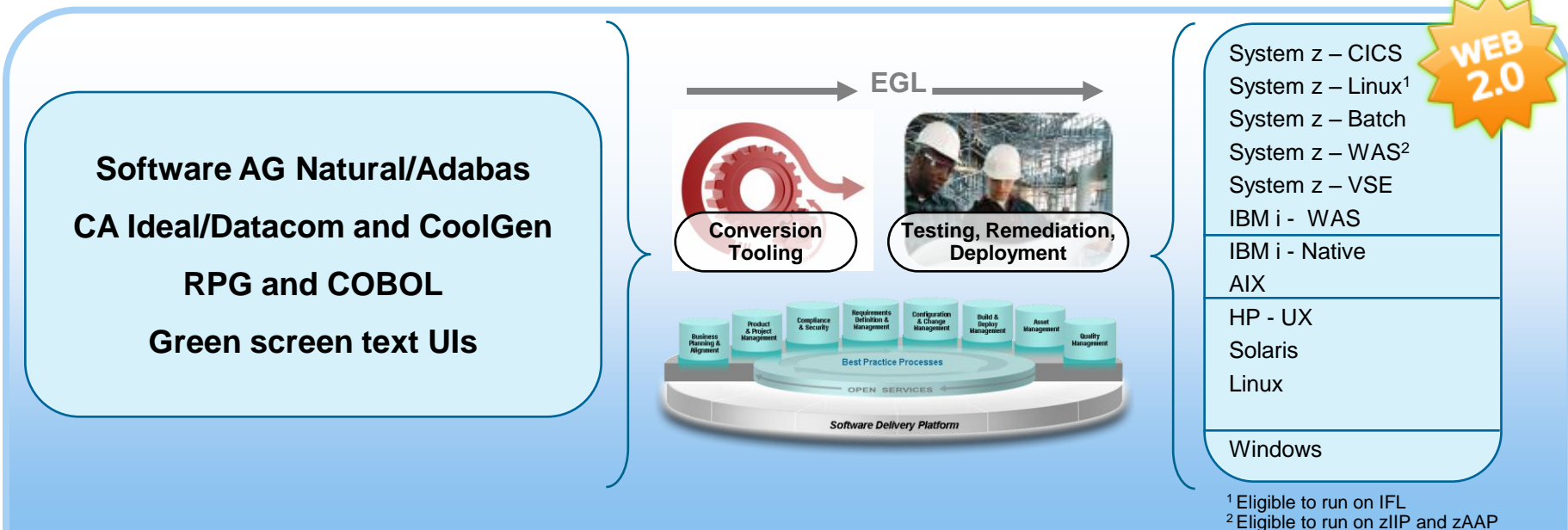
— Frank Landewee, project manager, Atos Origin GmbH, Essen





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- Rational Migration Extension for Natural
- Rational Migration Extension for CA
- Rational Migration Extension for Rich UI
- Rational Migration Extension for IBM i

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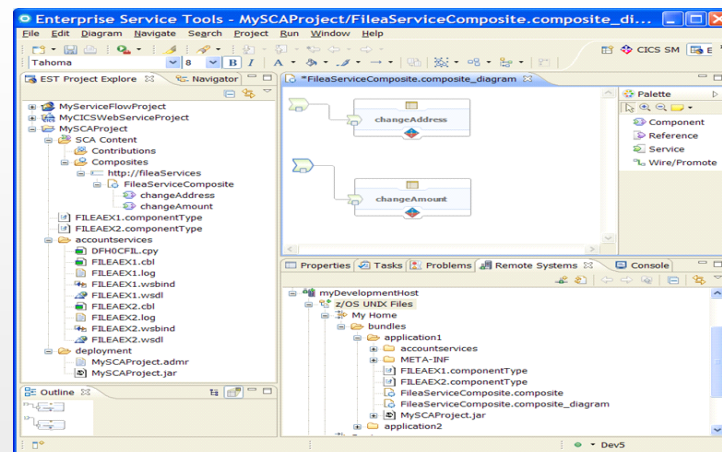
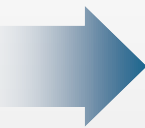
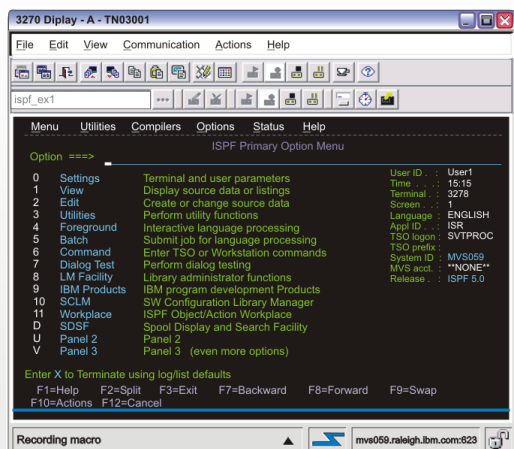


# Boost productivity and accelerate innovation with modern skills



Enterprises want to...

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



But...

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



# Solution: Comprehensive, multi-platform IDEs

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



- ✓ Modern tools with which to attract new talent
- ✓ 22-37% improvement in developer productivity<sup>1</sup>
- ✓ 50 -80%<sup>1</sup> reduction in host CPU usage

*“Our team now develops, debugs and tests with more confidence, and it is clear that more and more people here will be using Rational Developer for System z.”*  
— Almut Geiger, product specialist at HVB IS







# Rational Programming Patterns for System z v8.0.1

*Preserve and extend your VA Pacbase investments*

**NEW!** *Recently Announced*

- ✓ Experience the Power of programming patterns
- ✓ Low cost migration from VisualAge Pacbase v3.5
- ✓ Leverage traditional and new programming skills
- ✓ Comprehensive integrated development platform



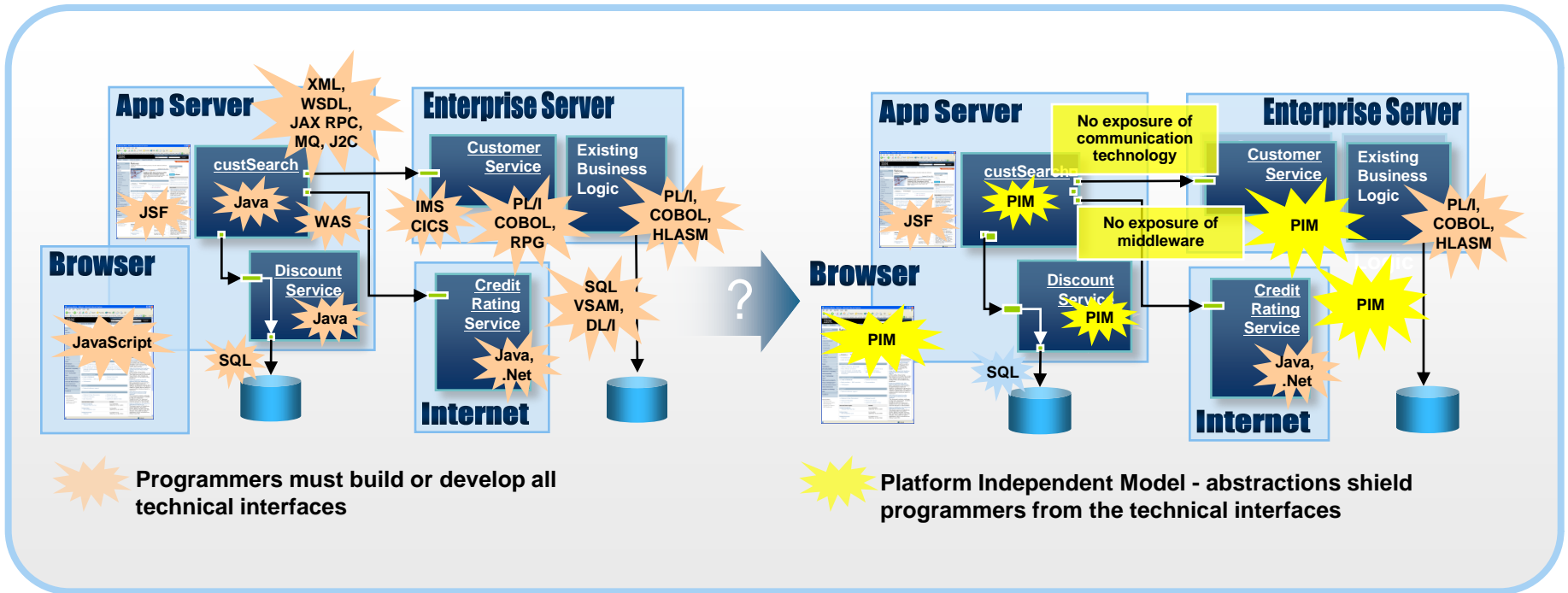
## Delivering...

- New integrated development environment for Pacbase models and programs
- Fully integrated with Rational Developer for System z and Rational Team Concert
- Ultimate platform flexibility



# Enterprises want to...

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



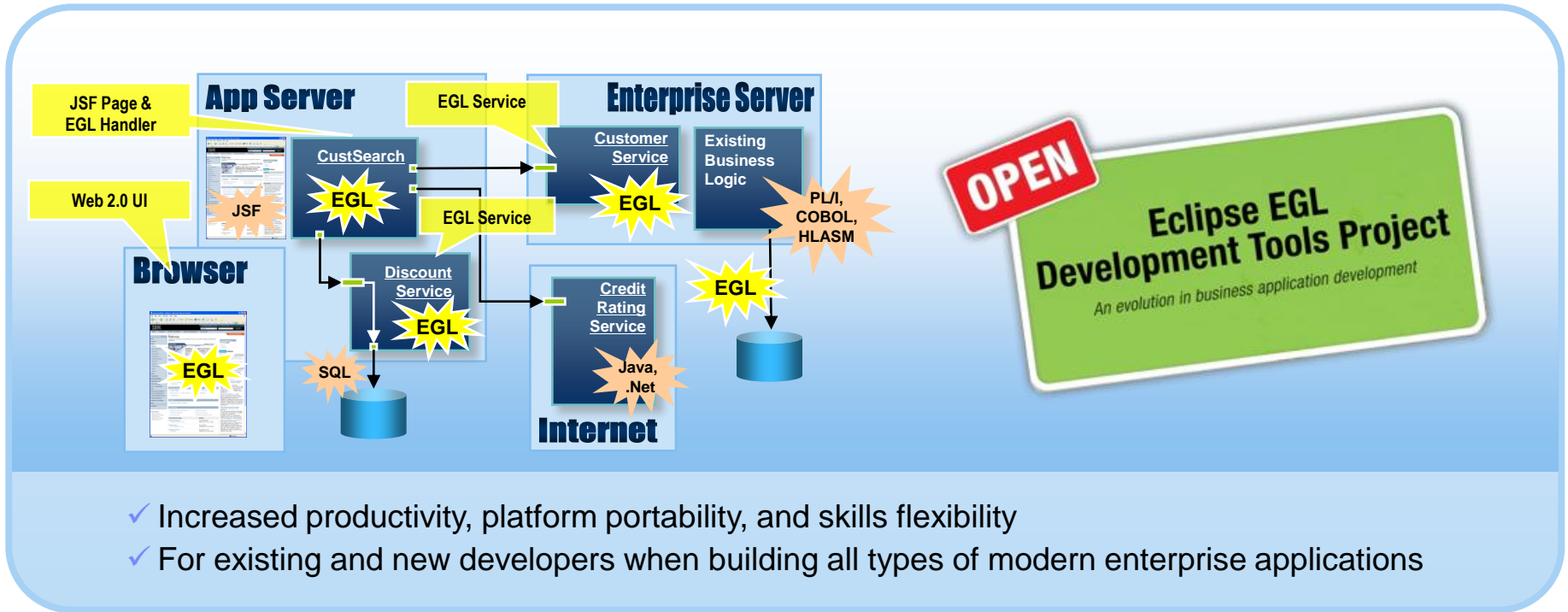
## But...

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



# Solution: EGL – An open, modern business language

*Build new or extend existing multi-platform enterprise applications in EGL with its middleware abstractions, high productivity language, modern IDE, and extensible architecture*



- ✓ Increased productivity, platform portability, and skills flexibility
- ✓ For existing and new developers when building all types of modern enterprise applications

*“... We want to avoid the ‘skill silos.’ What we really need is a large group of general developers who should not worry about target platforms and focus on developing business components, and only a small number of technology specialists, so that we can swiftly allocate general developers to upcoming business needs... EGL is helping us achieve this goal...”*

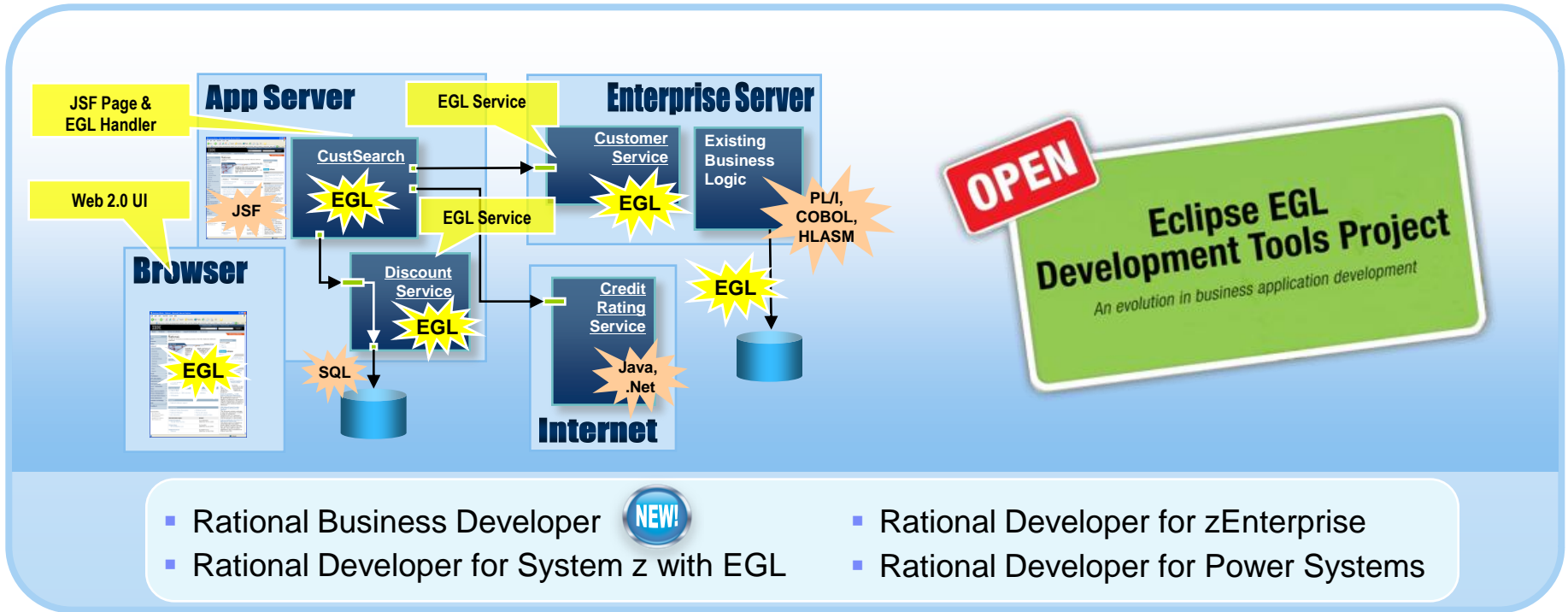
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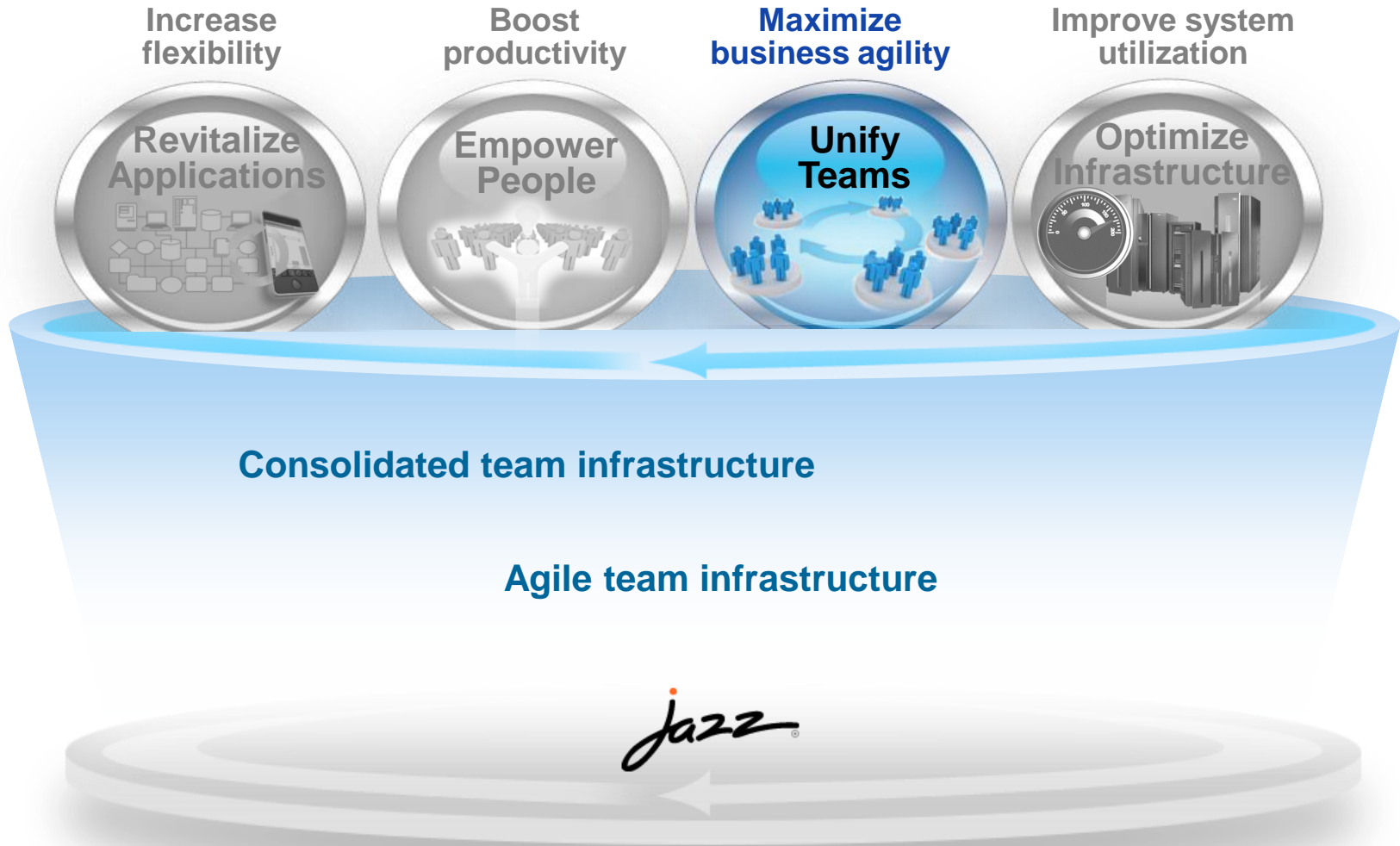


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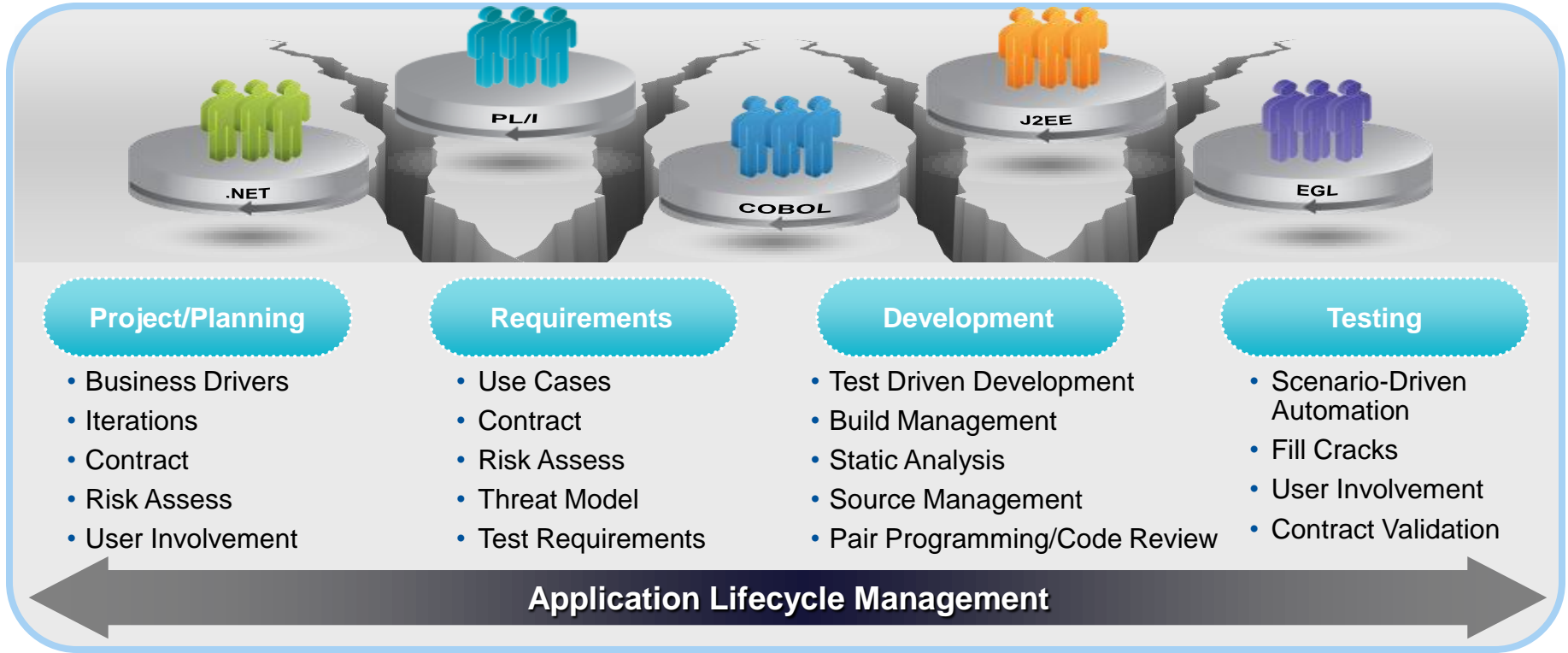
# Maximize organizational agility by unifying development teams





# Enterprises want to...

*Deliver to market faster and cheaper by exploiting agile and test-driven development practices, effectively tracking end-to-end requirements, reducing team infrastructure costs and increasing cross-geo collaboration and governance*



## But...

*They have “islands” of development, each with different tools and processes that do not support real-time collaboration, integration, comprehensive oversight, or lifecycle traceability, all of which results in reduced quality and slower time to market*



# Solution: Collaborative application lifecycle management

*Deploy new, common team infrastructure for source control, change management and build that empowers your team with integrated collaboration, process automation, and reporting*



*“Building an agile development team requires a multiplatform approach, and Sodifrance uses Rational Developer for System z and Rational Team Concert for System z to help application teams synchronize their efforts and improve collaboration.*

*Rational on System z offers a powerful and valuable combination for any company that wants to boost its development team’s productivity.”*

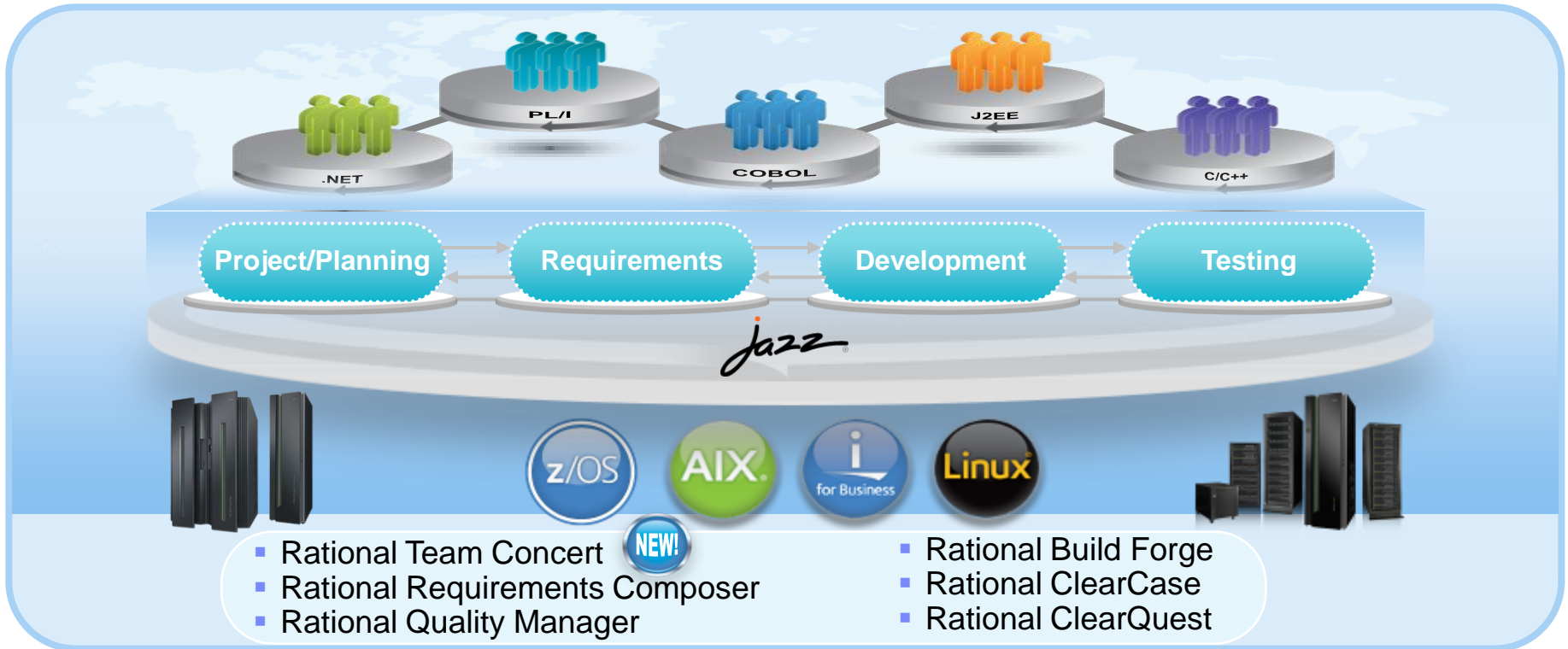
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# Improve application performance by fully exploiting latest hardware



# Enterprises want to...

*Reduce application development MIPs usage and increase development autonomy*

## Application Development



## Operations



## Cost

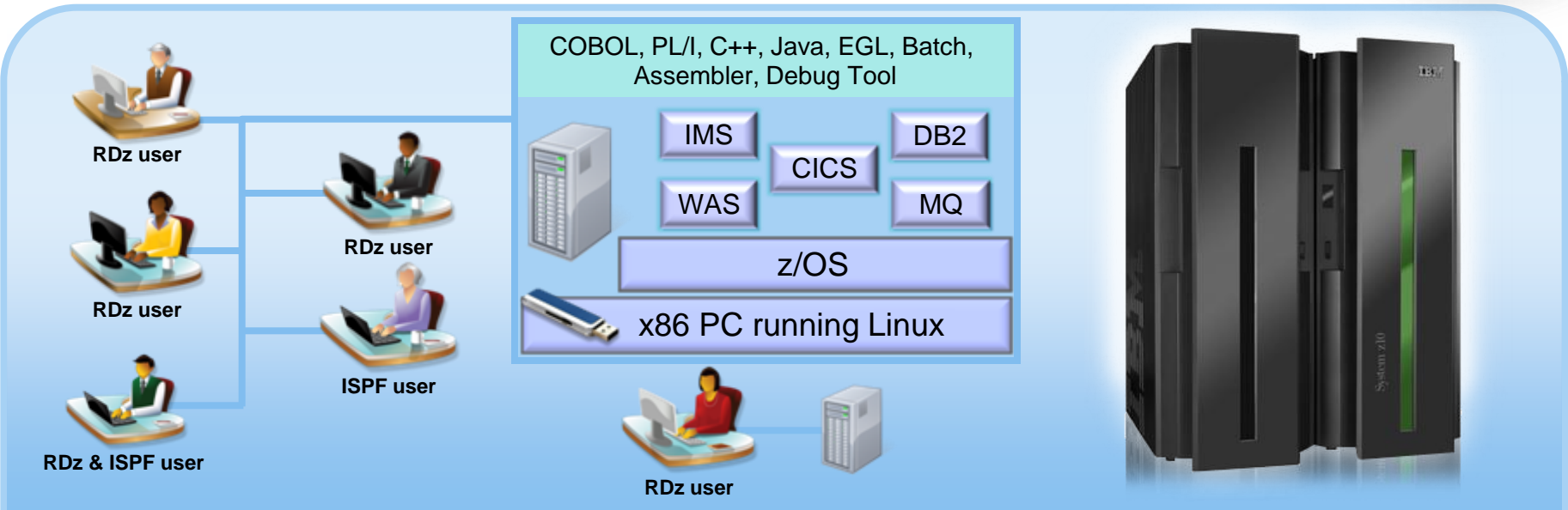


But...

*Testing requires System z MIPs and negotiation for time with the production team*



# Solution: Test mainframe applications on x86 Linux server



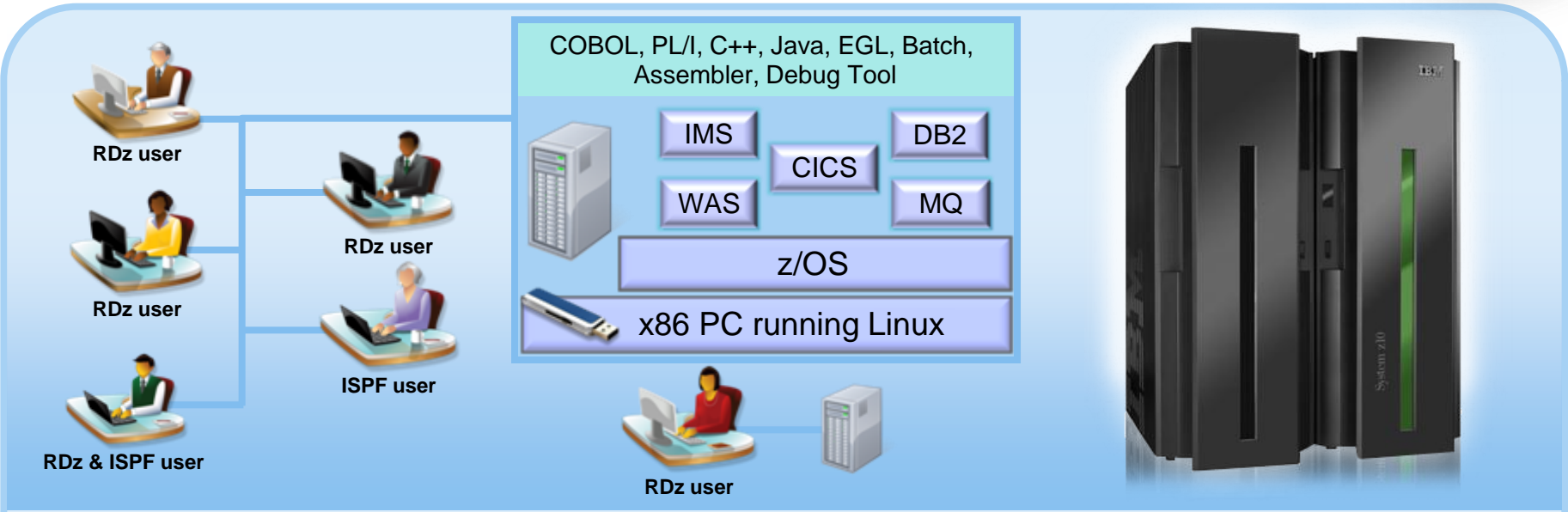
- ✓ Liberate developers to rapidly prototype new applications
- ✓ Free up mainframe development MIPS for production capacity
- ✓ Reduce costs by improving new and existing developer productivity

*“RDz Unit Test gives our developers the ability to have their own z/OS environment to prototype, compile, debug and test while our customers make the necessary changes to their test, QA and production environments... This shortens our time to delivery, shortens our project cycles, makes our customers happy and increases our margins... At the price...it’s a no brainer.”*  
— Eric Simone, CEO, ClearBlade





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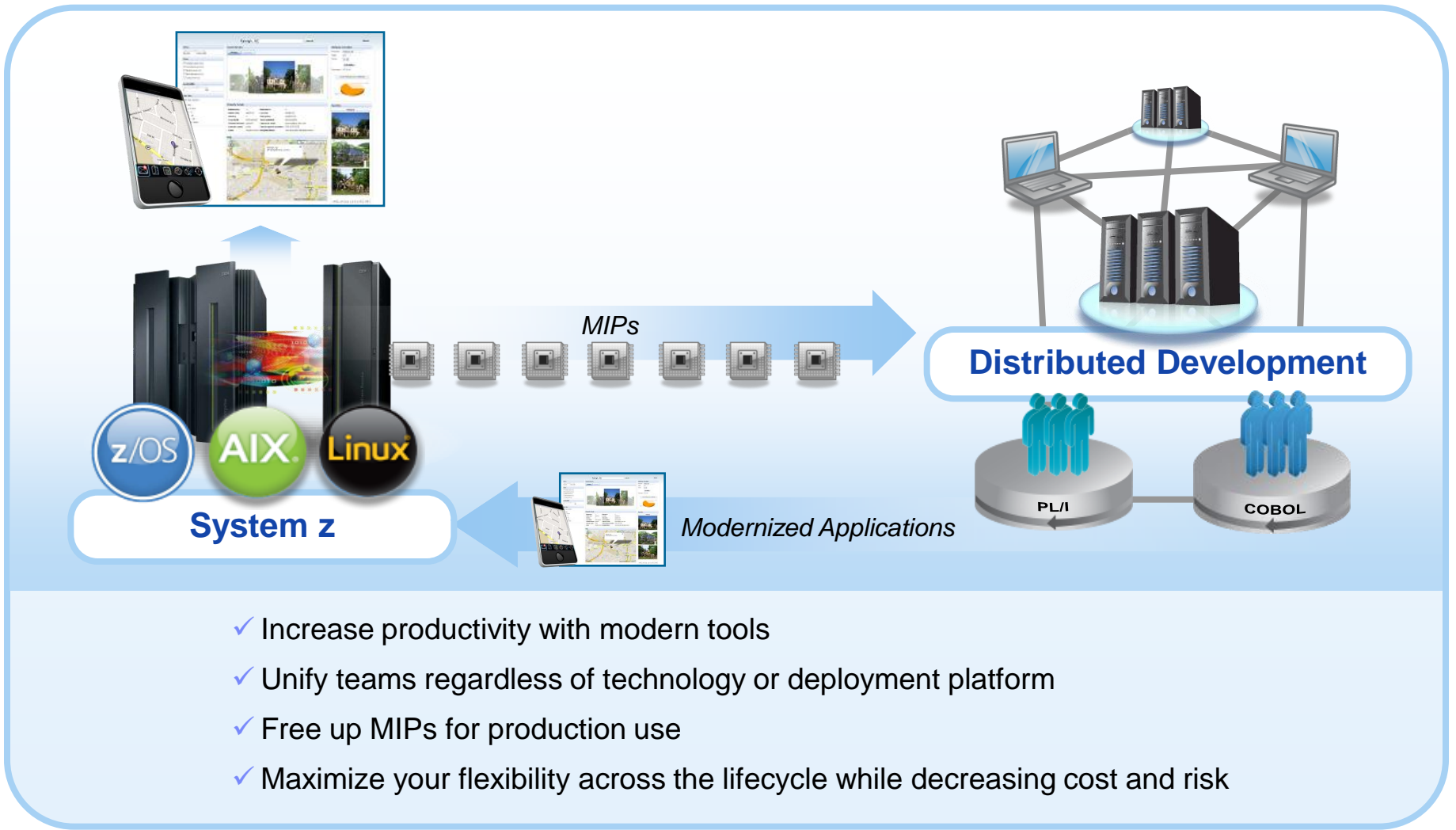
- Rational Developer for System z Unit Test Feature



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# Breaking down the barriers



- ✓ Increase productivity with modern tools
- ✓ Unify teams regardless of technology or deployment platform
- ✓ Free up MIPs for production use
- ✓ Maximize your flexibility across the lifecycle while decreasing cost and risk

# Getting started

*Next steps to modernize your enterprise applications*



To learn more visit: [ibm.com/software/rational/announce/modernization/](http://ibm.com/software/rational/announce/modernization/)



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# Customers are adopting Rational solutions for Enterprise Modernization

**Improved productivity by 15%**

**UniCredit modernizes mainframe development and testing with IBM Rational Developer for System z software**

More than 200 developers at HVB IS began using IBM Rational Developer for System z software to develop mainframe applications for IBM System z servers.

**Increased developer productivity by 15%**

**Wipro and its customer chose IBM Rational Business Developer and EGL technology to transform the application**

The new system accesses the customer's existing IBM DB2 information management system running on an IBM System i platform, and now includes IBM WebSphere Application Server software to support a modern, three-tier architecture.

**Reduced development time by 15-20%**

**SoforTe improves productivity with IBM Rational software on System z and Rational Team Concert for System z**

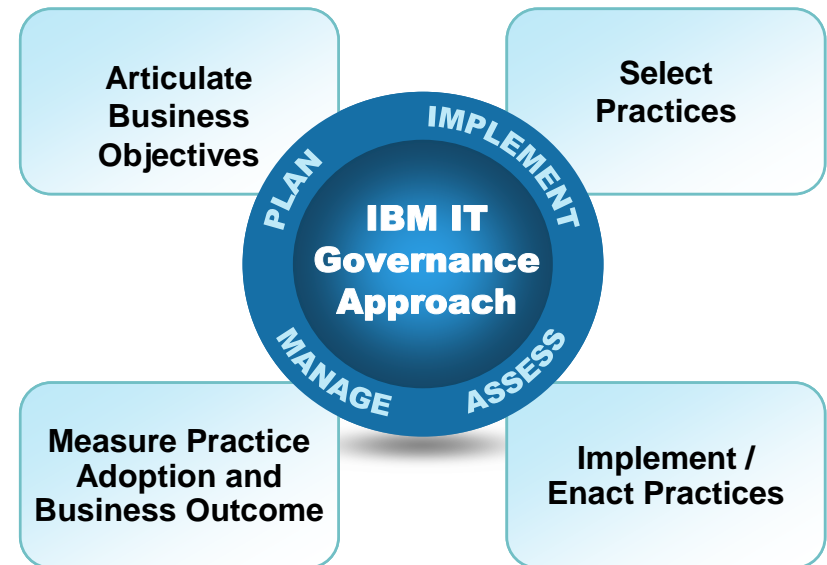
SoforTe chose to implement RDz and RTCz on an IBM System z10 Business Class server running z/OS and clients running Microsoft® Windows® clients to provide a modern powerful development environment for its customers.



# 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 and 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

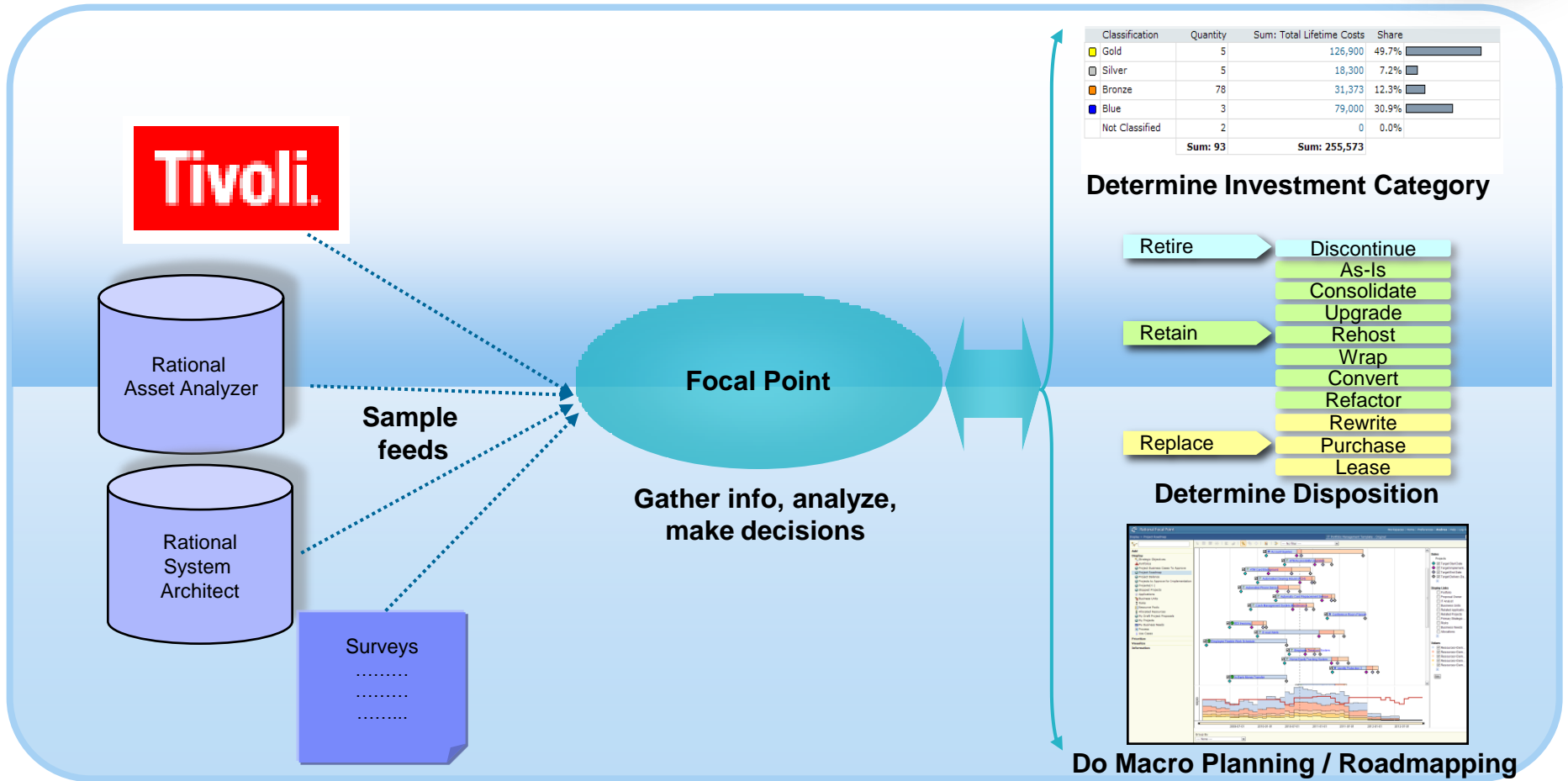
## Rational Professional Services





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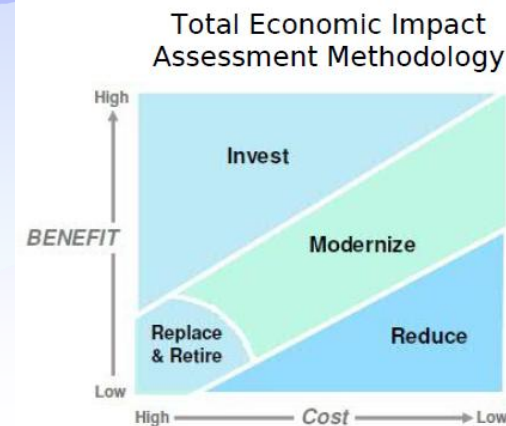


# Rational Focal Point 6.5

*Balance business value with cost and risk*

**NEW!**

*Recently Announced*



Source: Phil Murphy, Principal Analyst, Forrester Research, March 2009.

Which applications are

- ✓ the most valuable to the business?
- ✓ the most costly to maintain and operate?
- ✓ misaligned with target enterprise architecture?
- ✓ causing the most incidents?

*Rational Focal Point*

## Delivering...

- Centralized information key to decision-making, status reporting and portfolio reviews
- Collaborative information gathering, visualization, prioritization, road mapping, and planning capabilities to determine strategy and linking to execution
- Open interfaces, including integration with EA and project execution environments

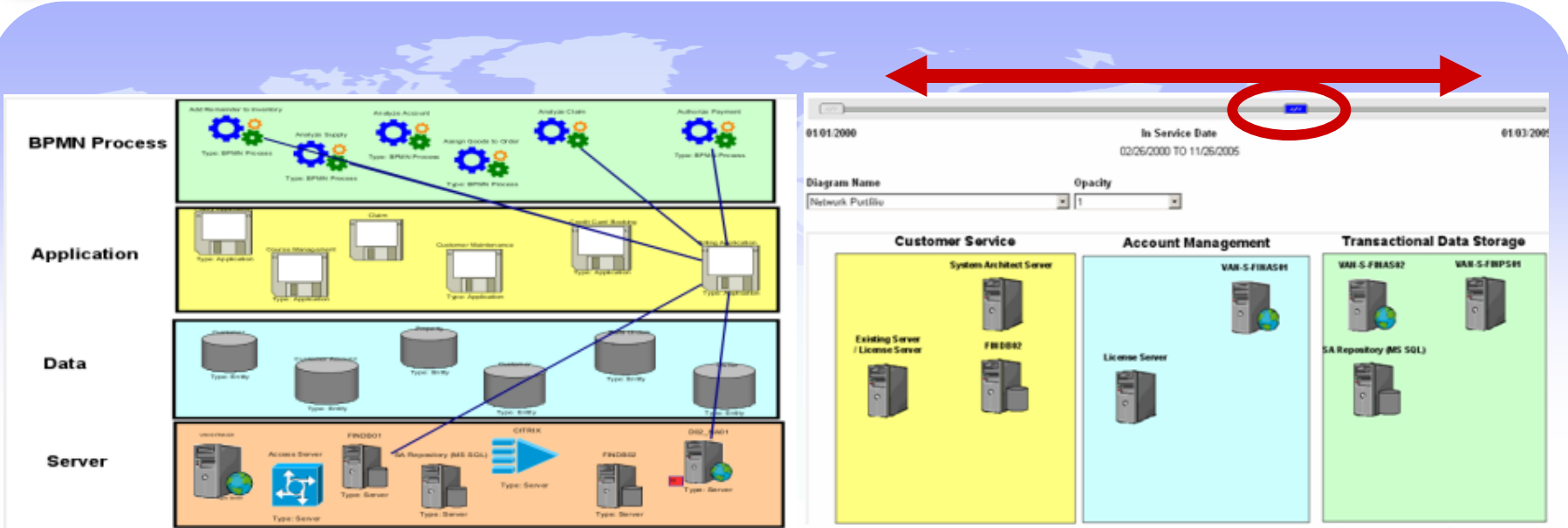


# Rational Systems Architect 11.4

## Do impact analysis and future state visioning



Recently Announced



**Model dependences across business processes to enable impact analysis**

**Slide the scale to see how your enterprise architecture evolves from as-is to future state visioning**

## Delivering...

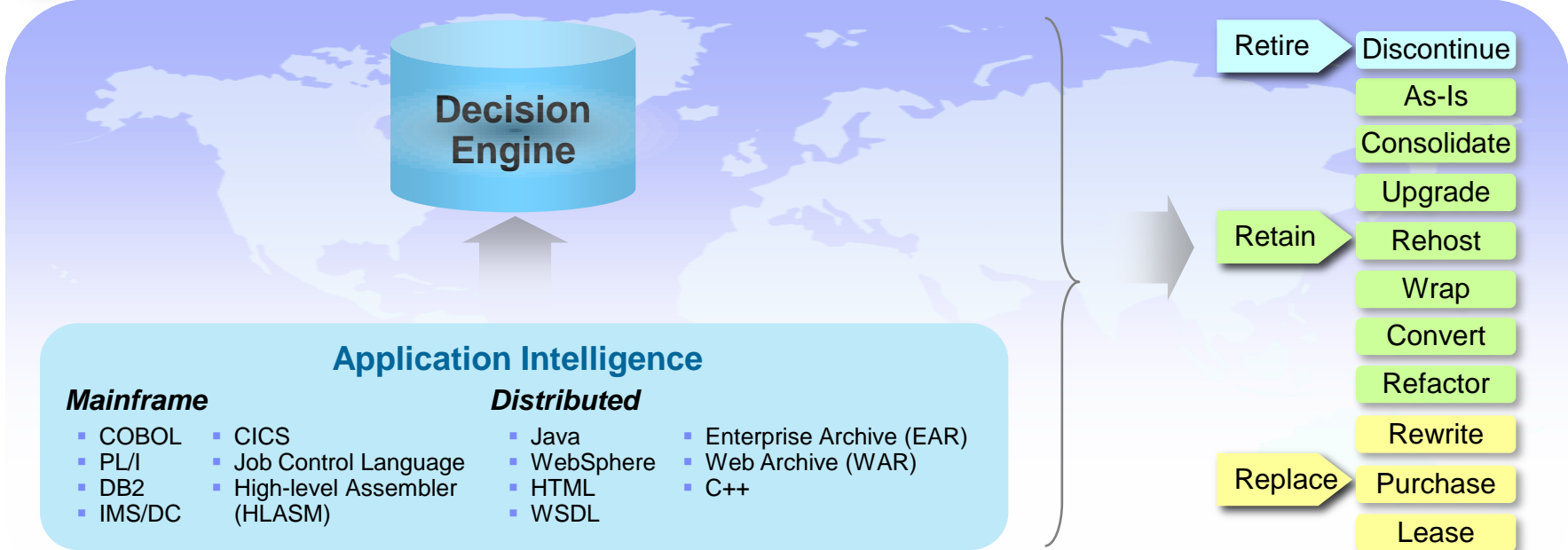
- Understanding of current state and impact analysis
- Visualization of architectural roadmaps and options for future state
- Actionable architecture through integration with delivery management, application lifecycle environments, and enterprise modernization environments



# Rational Asset Analyzer v6

Determine modernization strategy through application intelligence

**NEW!** *Recently Announced*



*“We ought to look at these things the way we look at a city—a city is a living, breathing thing, and you don't literally rebuild New York every year: you add to it. And more often than not, you're innovating what's already there.”*

— Steve Mills: Global CIO interview, 2010.

## Delivering...

- Insight into relationships within & among mainframe and composite applications
- Analytics showcasing impact of potential changes, reducing risk and improving predictability in change efforts

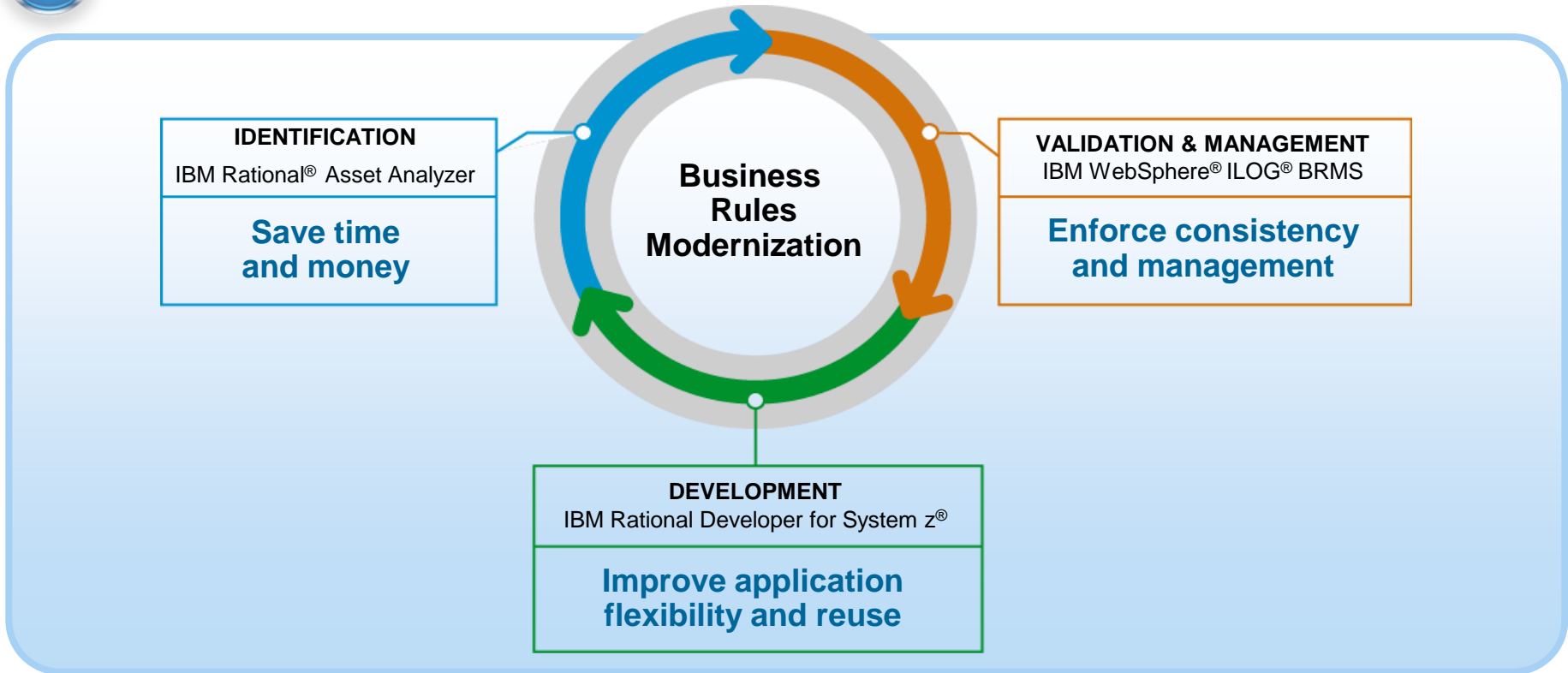


# Announcing: Rational Asset Analyzer v6

*Reduce the risk and cost of your application modernization projects*



*Recently Announced*



## Delivering...

- New integration with WebSphere ILOG for business rule mining
- Centralized management, validation and testing of business rules
- Integrated development, maintenance and modernization of business rules

# Enterprises want to...

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

*I need a way to reuse our existing assets from all our disparate environments*

## Business Logic



## Databases



## Screen Logic



# But...

*They have application architectures that were built incrementally over the last 20-30 years and are no longer flexible or agile.*

# Solution: Modernize, extend and reuse existing assets

*5x lower costs and reduced risk through SOA*



- ✓ Speeding development and delivery of applications
- ✓ Reducing risk and ensuring high quality

*“The Service Flow modeling in Rational Developer for System z enabled us to convert our CICS screens to the web without any reprogramming. This reduced our risk, lowered cost, saved months of work and allowed us to complete the project on time.”*

— Paul Williams, Director of IT, Trustmark National Bank





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- Rational Application Developer
- Rational Developer for System z
- Rational Developer for zEnterprise
- Rational Developer for Power Systems
- Rational Business Developer
- Host Access Transformation Services

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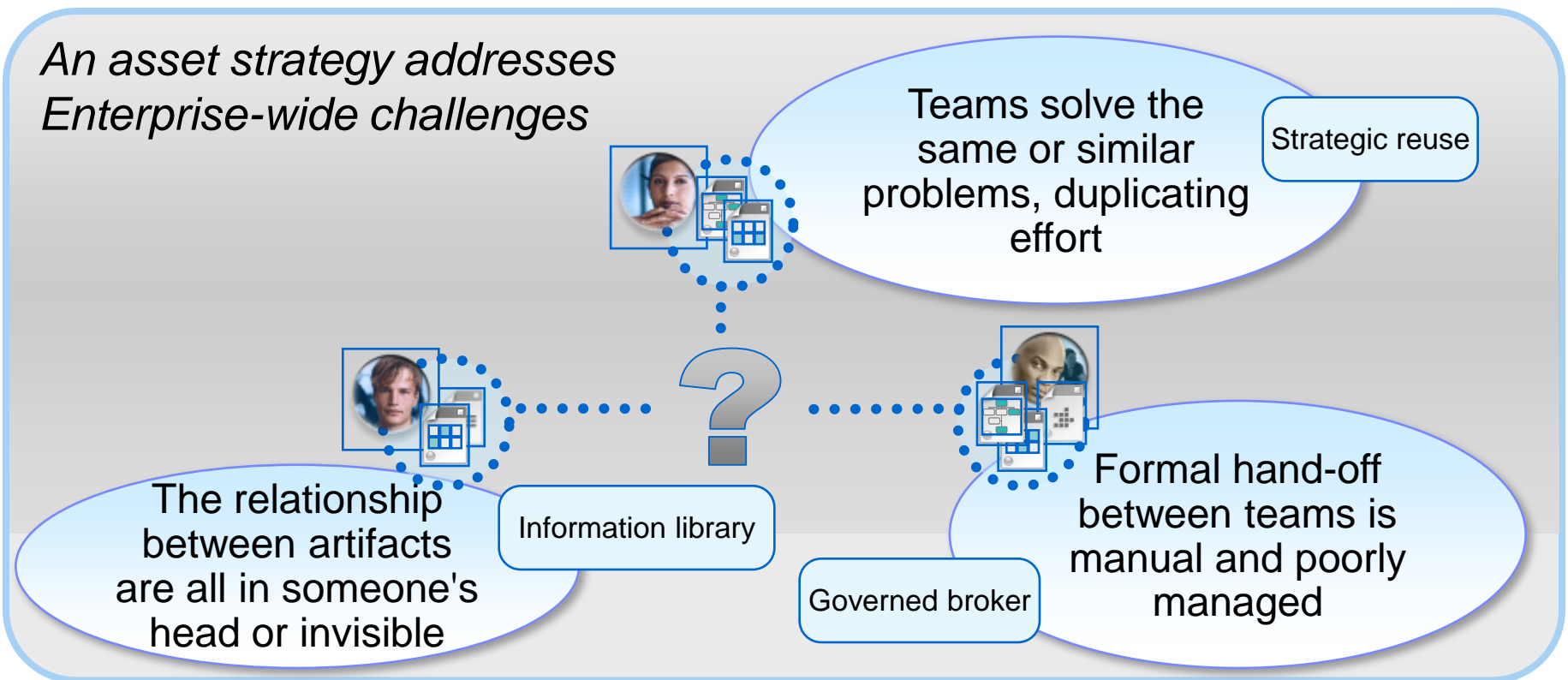


# Enterprises want to...

*Get more value from the assets created by each team*



*An asset strategy addresses Enterprise-wide challenges*



## But...

*They do not have the infrastructure or culture to implement a software asset strategy*

# Solution: Re-usable, high value assets

*Transform software artifacts into meaningful software assets to be shared or referenced throughout the organization*



## Catalog

*Quickly find the assets you need*



## Govern

*Automate reviews and policy enforcement*



## Share

*Easily publish and consume assets*

High Availability clustering plus *jazz* integration and workflows

- ✓ Greater reuse, development efficiency, faster time-to-market, and higher quality
- ✓ Track dependencies and notify users of changes and upgrades

*“In the past, our personnel were forced to use a multitude of interfaces to find the information they required. With Rational Asset Manager, they now have a single point of entry. As a result, they have faster access to information.”*

— Edwin Freekenhorst, IT Architect, Shell



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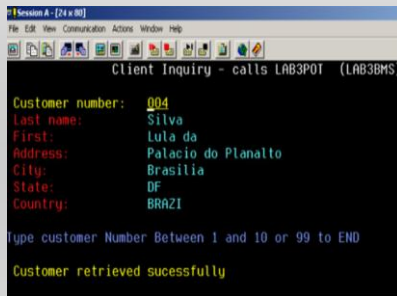
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## Enterprises want to...

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

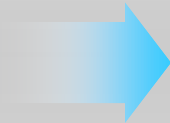


```
Session A - (24 x 80)
File Edit View Communication Actions Window Help
Client Inquiry - calls LAB3POT (LAB3BMS)

Customer number: 004
Last name: Silva
First: Lula da
Address: Palacio do Planalto
City: Brasilia
State: DF
Country: BRAZI

Type customer Number Between 1 and 10 or 99 to END

Customer retrieved sucessfully
```

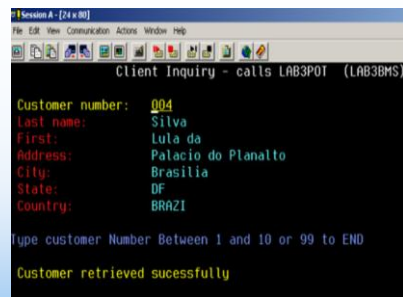


## But...

*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*



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

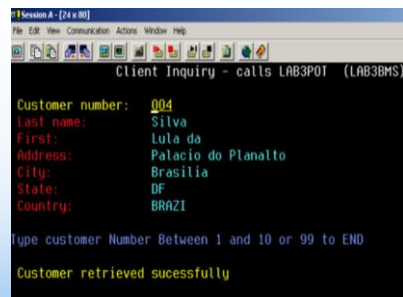
*“IBM Rational HATS enables us to create a one-stop shop online where our dealers can find anything they need, print any reports they need, and submit warranty registrations much more quickly and easily than they could before.”*

— Sonja Muhm, Programmer Analyst, Winnebago Industries



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- Rational EGL
- Host Access Transformation Services
- Rational Developer for System z
- Rational Developer for zEnterprise
- Rational Developer for Power Systems
- Rational Business Developer
- Rational Application Developer

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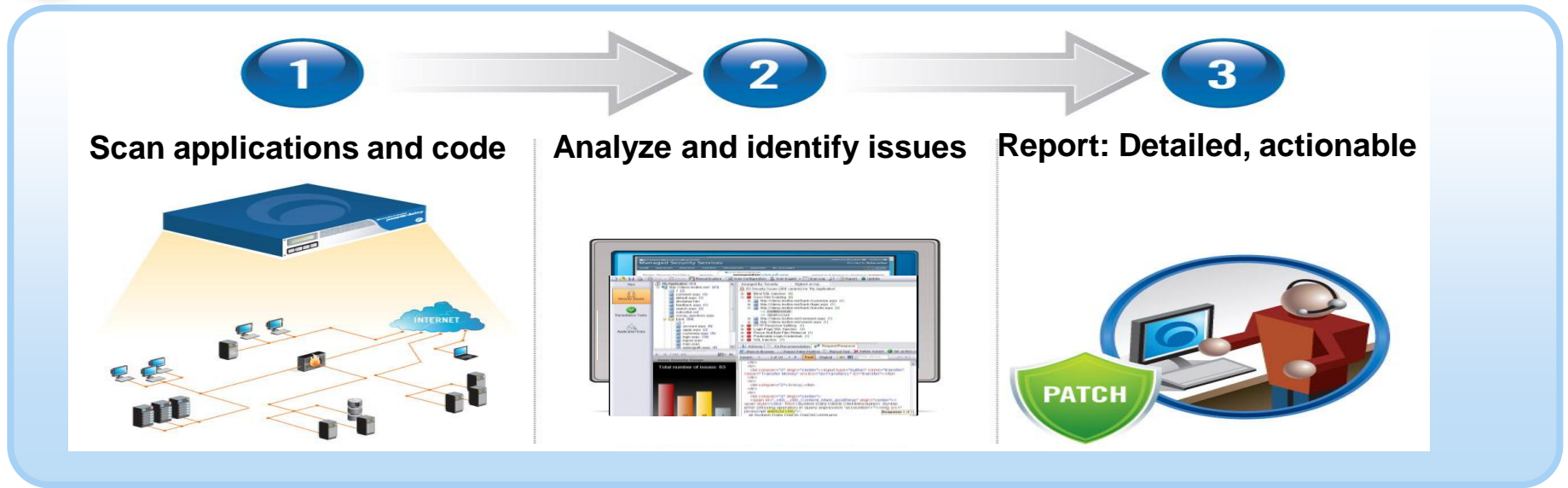




# Announcing: Rational AppScan Source Edition v8.0.0.1

*Expanded language and platform support, extensible framework support and hybrid analysis strengthen security*

**NEW!** Recently Announced



## Delivering...

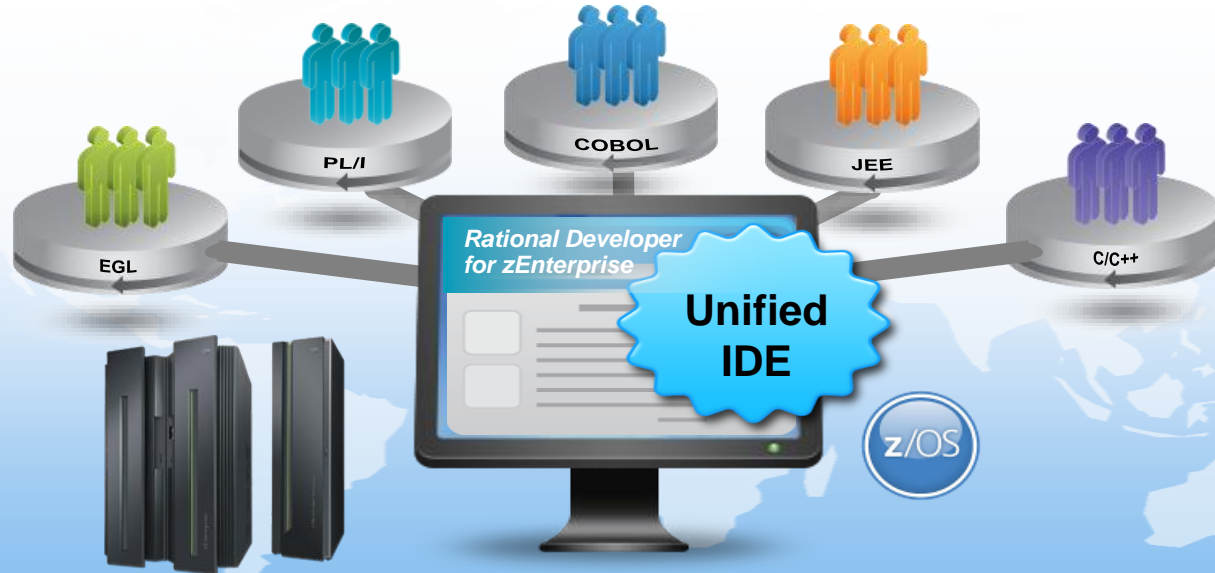
- Protection of legacy assets by securing applications
- Extensive language support including: COBOL, Java, C, C++, .NET, PL/SQL and many more
- Robust integration with IDEs including: RAD, Eclipse and others
- Dynamic results correlated with Static results
- Over 40 out-of-the box compliance reports





# Solution: Comprehensive, multi-platform IDEs

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



- Rational Developer for System z **NEW!**
- Rational Developer for zEnterprise
- Rational Developer for Power Systems
- Rational Application Developer
- Rational Business Developer
- Rational Programming Patterns for System z **NEW!**

*“Our team now develops, debugs and tests with more confidence, and it is clear that more and more people here will be using Rational Developer for System z.”*  
— Almut Geiger, product specialist at HVB IS

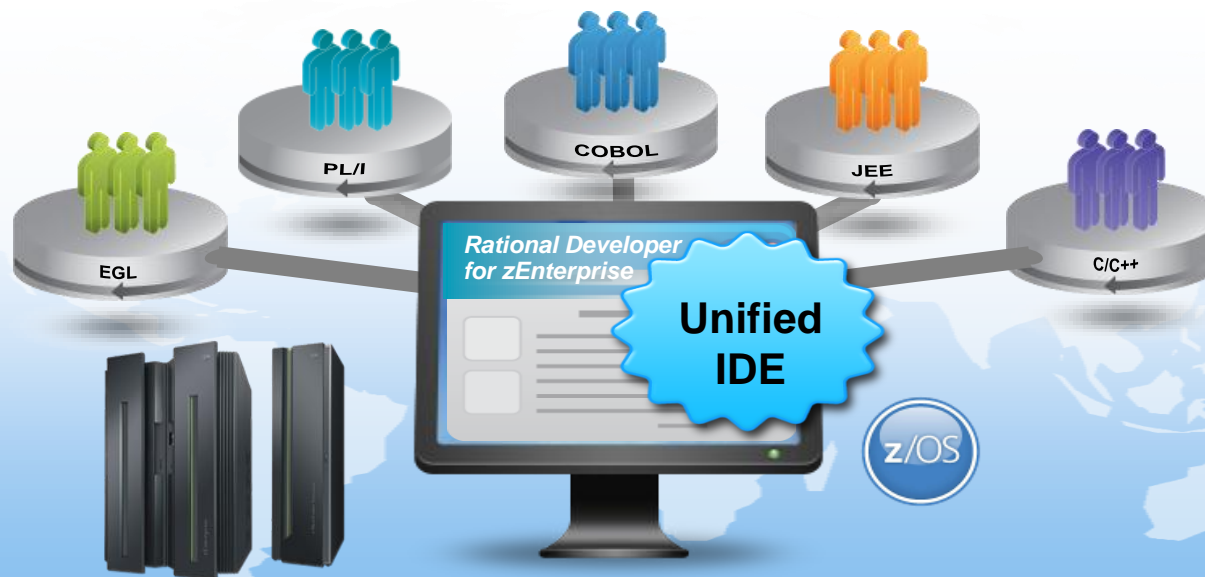


# Announcing: Rational Developer for zEnterprise v8.0.1

*Gain productivity and efficiency through a multiplatform IDE*

NEW!

Recently Announced



- ✓ Lower your enterprise development and maintenance costs
- ✓ Enhance your developer productivity and flexibility

## Delivering...

- Cross-platform debugging including z/OS, Linux for System z, Power Systems, WAS, etc
- Multiplatform development across Java, COBOL, PL/I, HLASM, C/C++, EGL, etc.
- Increased usability for typical development operations cuts development time



# Announcing: Rational Developer for System z v8.0.1

*Improve mainframe skills and attract new development and support staff*

**NEW!** *Recently Announced*

- ✓ Lower development cost
- ✓ Faster time-to-market
- ✓ Enhanced productivity
- ✓ Increased application quality



## Delivering...

- Enhanced productivity for code restructuring, refactoring and batch modernization
- Enhanced performance and robustness for real-time source code validation
- Centralized IDE customization to reduce administration costs and ensure consistency

# Announcing: Rational Business Developer v8.0.1

## *Multiplatform business language for modern application development*

NEW!

Recently Announced

- ✓ Faster time to market
- ✓ Improved productivity
- ✓ Leverage traditional programming skills
- ✓ Ultimate platform flexibility



## Delivering...

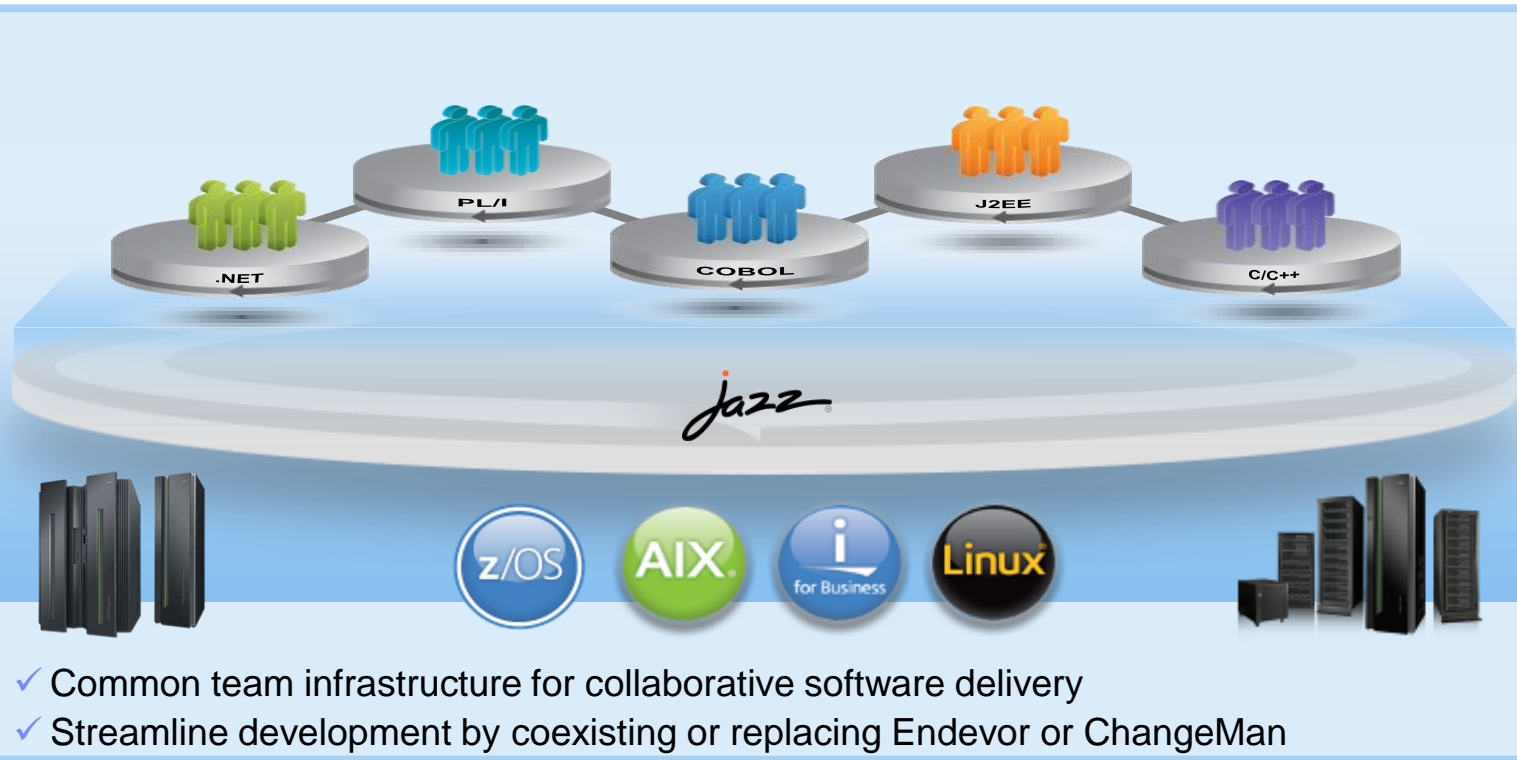
- New support for creating rich web UI business applications using open technologies (Dojo)
- Improved visual editing, debug and integrated test capabilities
- New Open Source EGL Development Tools Project now live at <http://www.eclipse.org/proposals/egl/>



# Announcing: Rational Team Concert v3.0

*Unify disparate teams, gain efficiency and productivity*

**NEW!** *Recently Announced*



- ✓ Common team infrastructure for collaborative software delivery
- ✓ Streamline development by coexisting or replacing Endeavor or ChangeMan

## Delivering...

- Single integrated platform for managing delivery of multiplatform projects
- New support for advanced dependency analysis and build capabilities for z/OS
- New integrated ISPF client for z/OS source edit, compile and debug

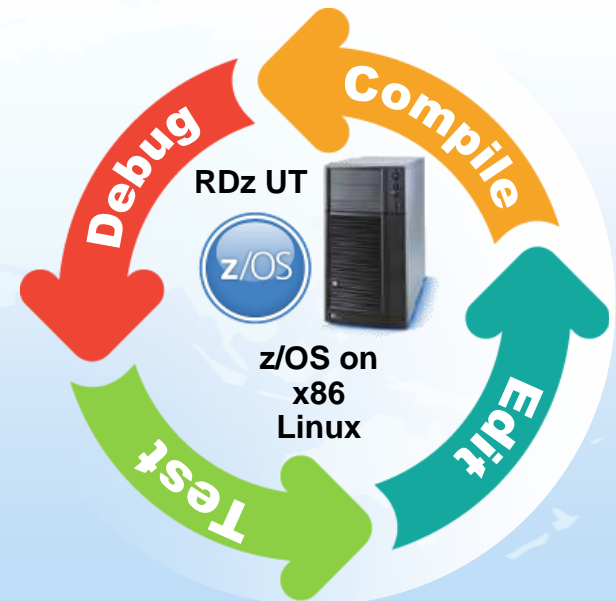


# Announcing: Rational Developer for System z Unit Test Feature v8.0.1

*Increase flexibility, portability and free-up production capacity*

**NEW!** Recently Announced

- ✓ Easy access to z/OS
- ✓ Free up production MIPs
- ✓ Enable quick, agile approach
- ✓ Portable z/OS development



## Delivering...

- Updated Middleware, now available for use in Education
- Develop and test z/OS applications on a dedicated x86 Linux machine
- Facilitates quick system changes to test configurations during development

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*



**Same hardware + *NEW* compiler = Increased Performance**  
***NEW* hardware + *NEW* compiler = Maximum Performance**

- z/OS XL C/C++ v1.12 on zEnterprise\* delivers up to 60% performance improvement
- Enterprise PL/I V4.1 on zEnterprise\* delivers up to 27% performance improvement
- XL C/C++ v11, XL Fortran v13 delivers *industry leading* SPEC® CPU2006 performance\*

✓ Lowers capital outlays by increasing capacity and improving performance of application suite

*“... the 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 and keep it readable and do it in a reasonable amount of time..”*

— Gregg Willhoit is the Chief Architect at DataDirect Technologies

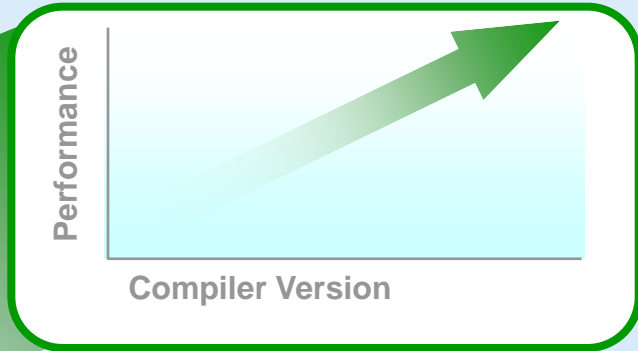
**PROGRESS**  
SOFTWARE





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- IBM XL C/C++ for AIX and Linux
- IBM COBOL for z/OS, AIX
- IBM WebSphere® Development Studio (IBM compilers)
- IBM XL Fortran for AIX and Linux
- IBM PL/I for z/OS, AIX

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# Announcing: Compilers for System z and Power Systems

*Improve application performance, productivity, and return on investment*



**Recently Announced**

## IBM zEnterprise 196

- z/OS XL C/C++ v1.12
- Enterprise PL/I for z/OS v4.1
- Enterprise COBOL for z/OS v4.2



## zEnterprise BladeCenter Extension (zBX)

- XL C/C++ for AIX and Linux v11.1
- XL Fortran for AIX and Linux v13.1
- COBOL for AIX v4.1

## Delivering...

- Performance improvements for applications with enhanced compiler optimization technology
- Exploitation of new zEnterprise 196 and POWER7 hardware
- Productivity improvements with enhanced reporting, problem determination, performance tuning and code portability support