Managing the System z application development process

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Agenda

- The realities and challenges of today's IT Shop
- Overview of Rational System z Enterprise Modernization solutions
- Summary
- Q&A

IT Must be a Key Enabler of Change

"IT investments made 10 to 20 years ago are … constraining the speed with which these businesses can change and respond to industry threats." – *Gartner's Top Predictions for Industry Leaders, 2007 and Beyond*

- **IT flexibility is a key enabler for today's businesses to effectively and efficiently respond to change**
- **To be successful, you must mature and modernize your IT infrastructure**
- **However, doing so can be rather challenging…**

"Aligning IT with the business relates directly with an IT group attaining real flexibility." – *Butler Group*

To Enable Change, IT Must be Flexible

But it's easier said than done…

To enable flexibility, IT must overcome challenges such as:

- Poor understanding of current enterprise application assets
- Complex application architectures
- Skills lock-in
- Islands of development
- Limited funding for new investments

Enterprise modernization challenges

"Legacy modernization is morphing into a strategic function. IT can't afford to toss away reliable application transactions indiscriminately."

-- Phil Murphy, Forrester Research, April 2007

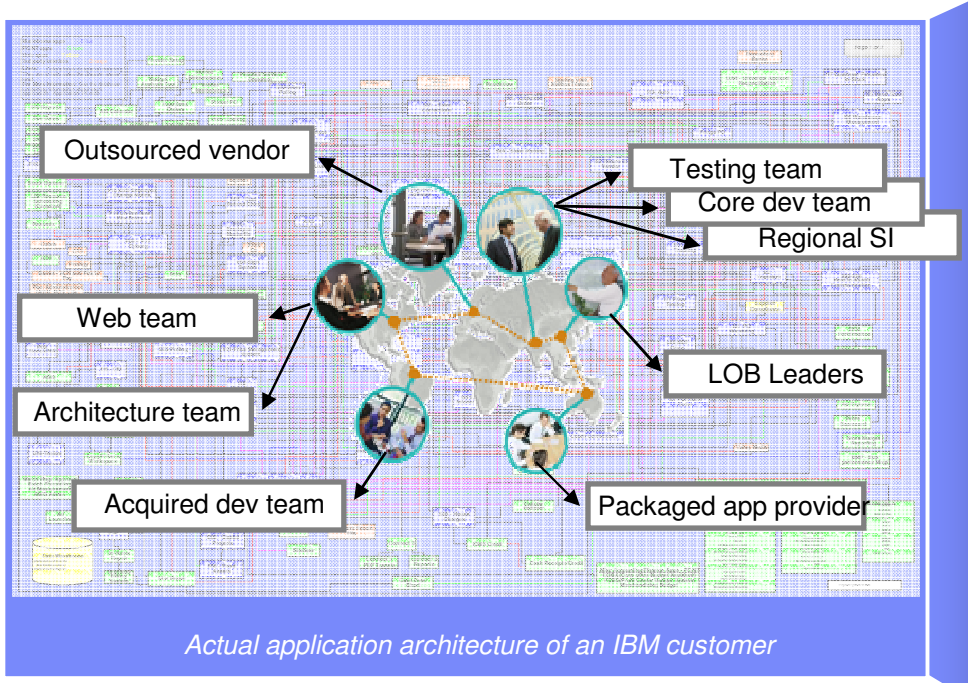
Assets
Layer of disjointed, poorly understood enterprise assets, preventing reuse

Architectures
Tightly-coupled architectures hindering IT flexibility

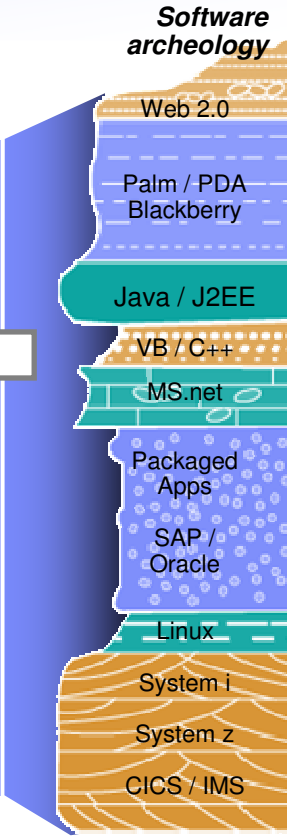
Skills
IT skills shortage and silos limiting staff productivity and mobility

Processes and tools
Duplicate processes, tools and infrastructures limiting collaboration

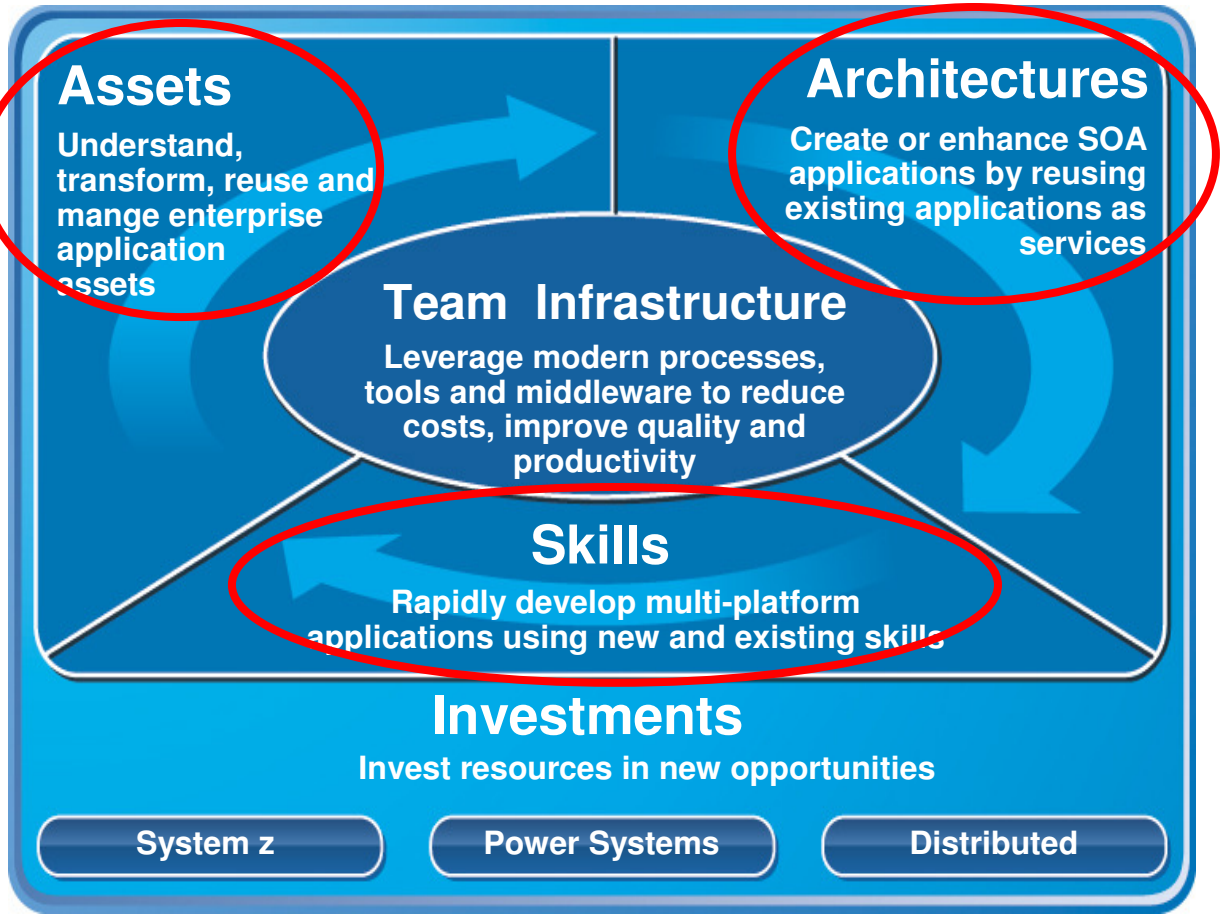
Investments
Increasing maintenance costs limiting flexibility for new investments



Actual application architecture of an IBM customer



Enterprise Modernization – Improving IT Flexibility



- ✓ *Leverage value in existing assets*
- ✓ *Drive innovation with SOA and web technology advancements*
- ✓ *Leverage existing and new staff on multi-platform projects*
- ✓ *Improve quality and flexibility with a consolidated team infrastructure*
- ✓ *Reduce maintenance costs*

http://www-306.ibm.com/software/info/developer/solutions/em/

Modernize your Asset Management

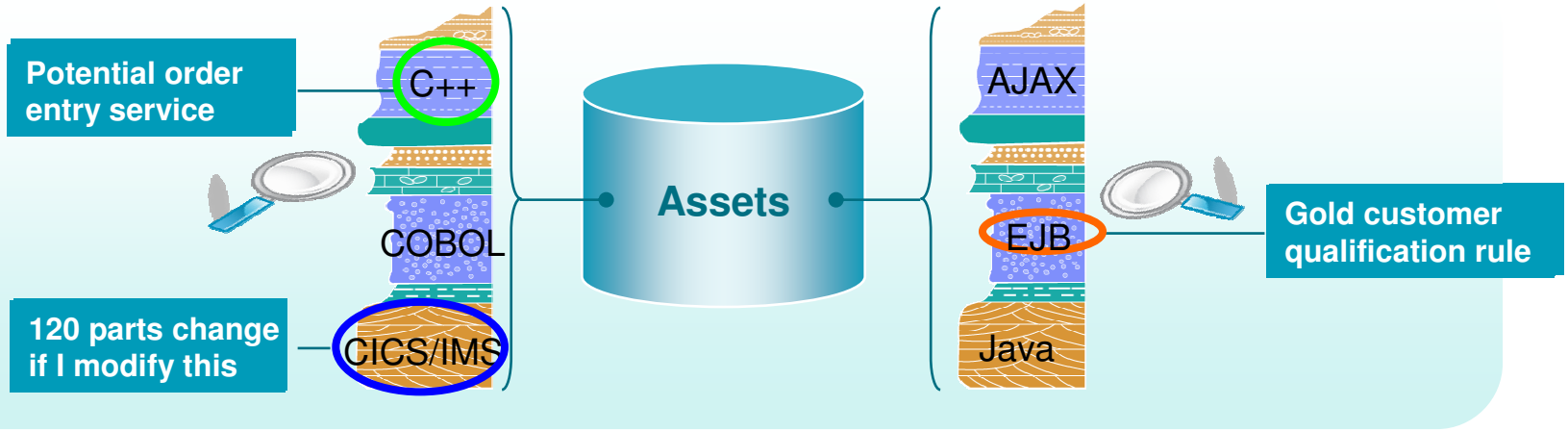
Business Challenge
Difficulty understanding or leveraging existing systems

How can we…

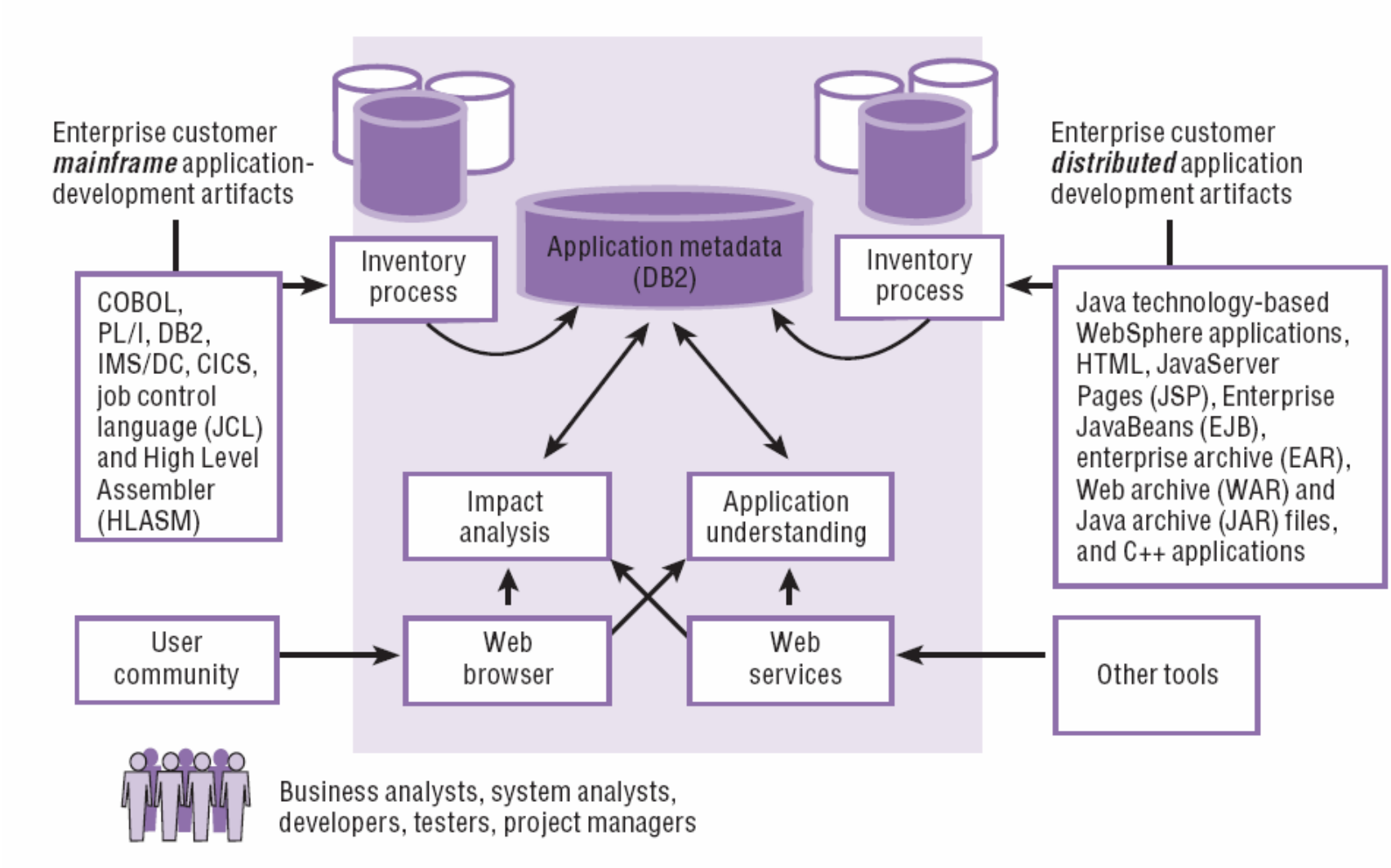
- Avoid application downtime due to unforeseen code dependencies?
- Teach new staff about existing systems quickly?
- Maintain control over code provided by outsourcers, business partners, or acquired through a merger?
- Accelerate SOA efforts?
- Improve portfolio evolution decisions?

Solutions
Comprehensive inventory of assets for impact analysis & reuse

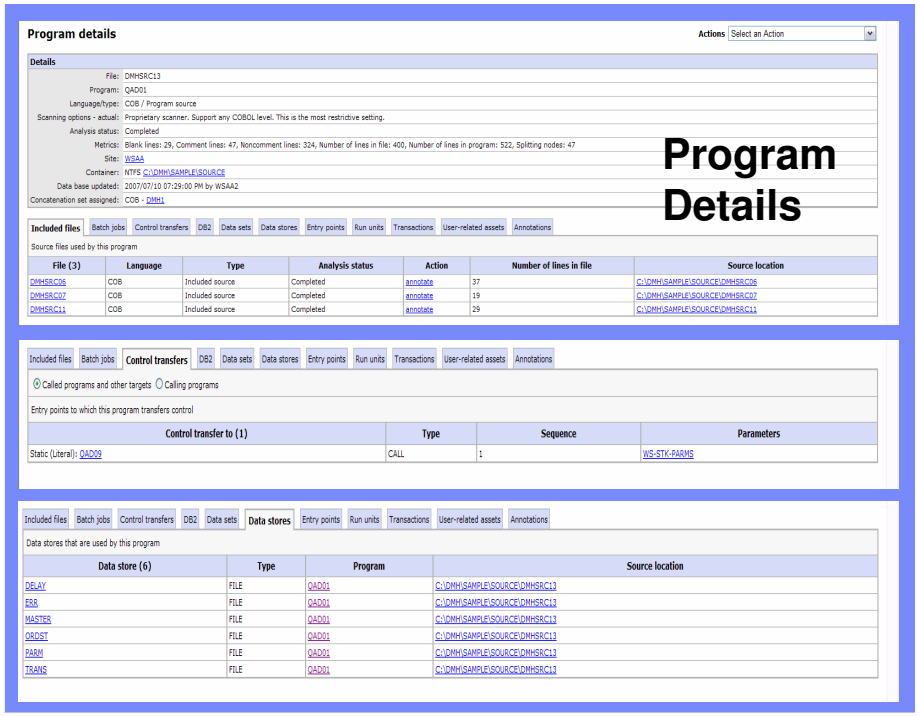
- ✓ Understand existing assets and relationships
- ✓ Identify services, refactor for reuse
  - *WebSphere Studio Asset Analyzer*
  - *Rational Asset Analyzer*
  - *Rational Transformation Workbench*
- ✓ Manage assets during development
  - *Rational Asset Manager*
- ✓ Manage deployed services
  - *WebSphere Service Registry & Repository*

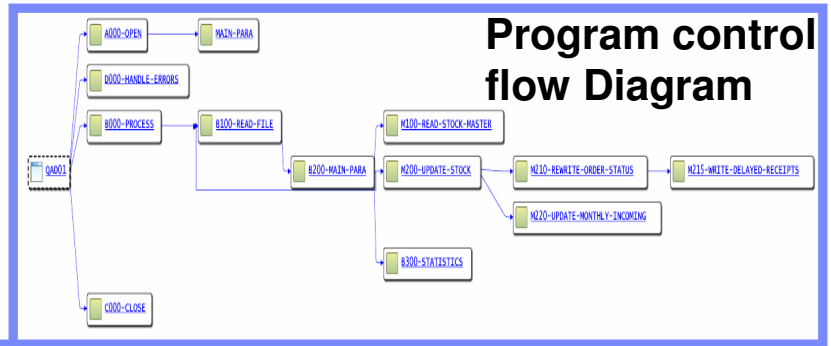


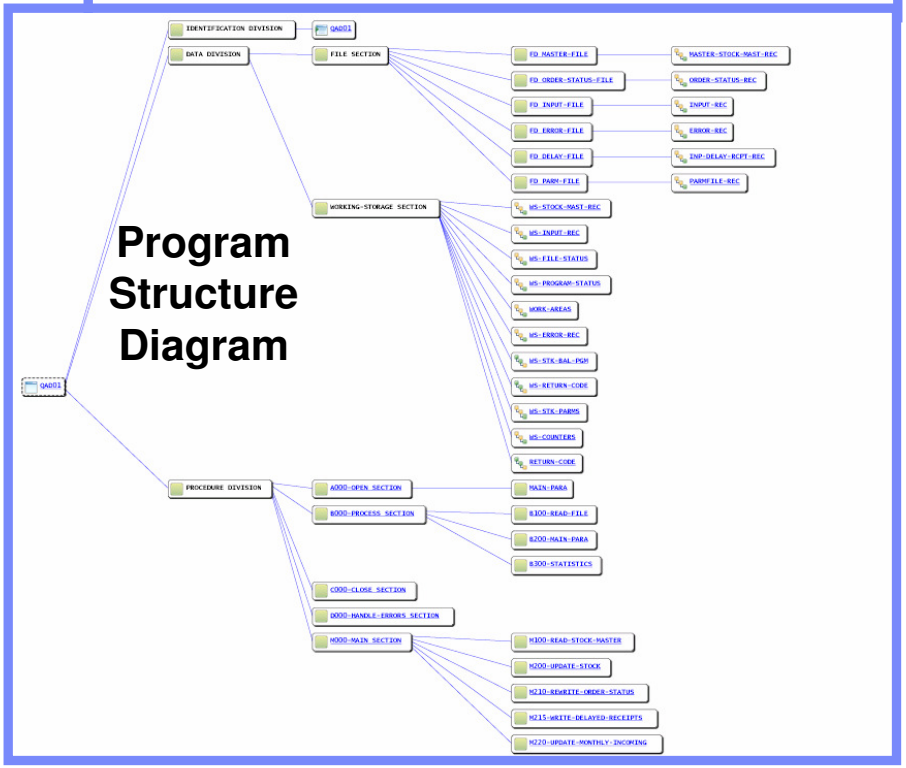
WebSphere Studio Asset Analyzer V5.1

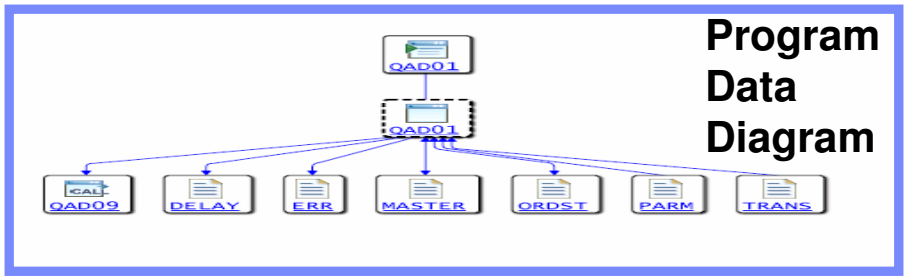


WSAA program insight

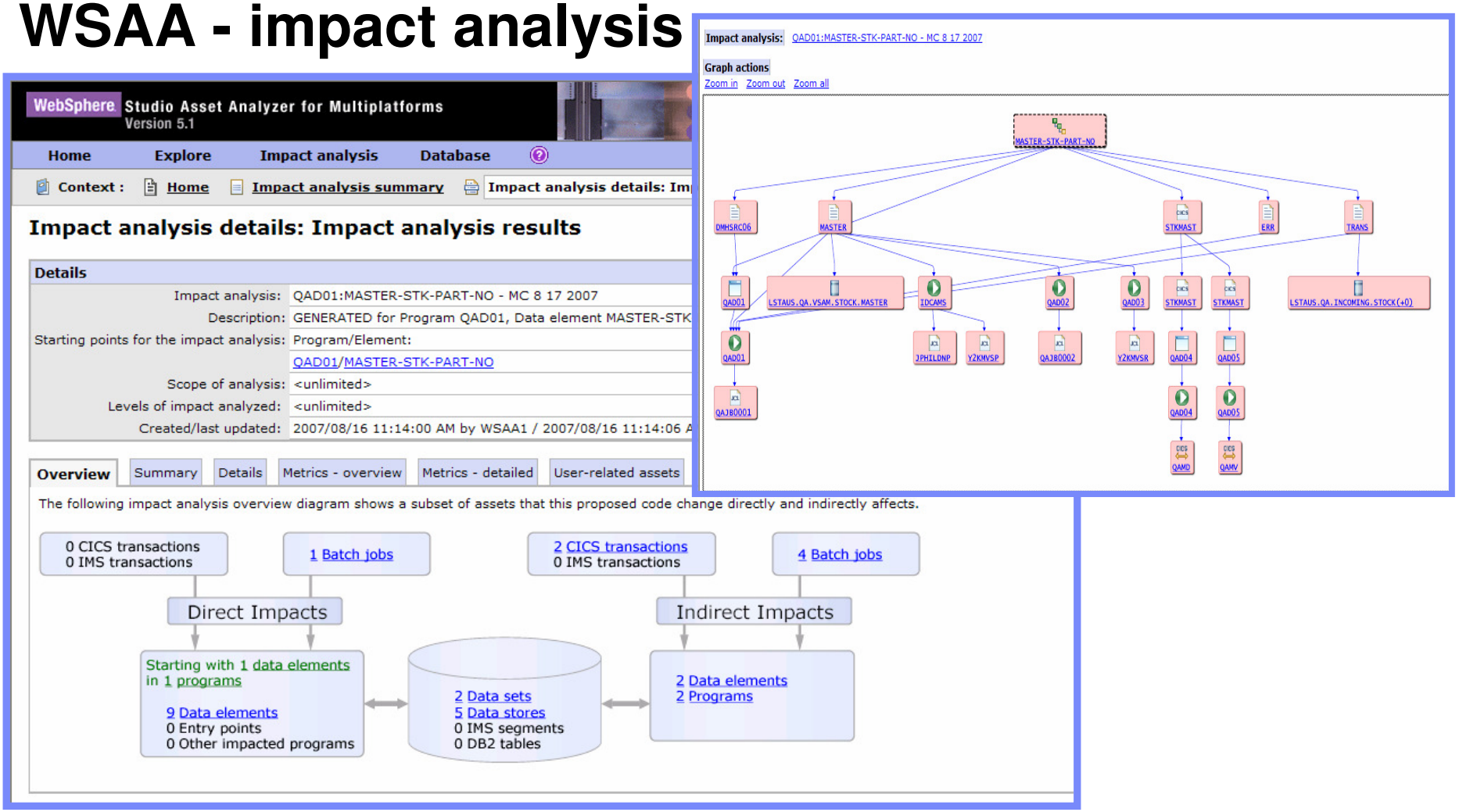








WSAA - impact analysis



- Find the needles in the haystack affected by a proposed change

Rational Asset Analyzer

Faster application change and reuse

Improved requirements definition processes and business-IT team collaboration

Rational. Asset Manager

Available July 2008

New!

Asset Analyzer

- **Inventory and analyze mainframe and distributed application assets**
- **Make changes more quickly & with less risk**
- **Reduce time & effort required to troubleshoot problem areas**
- **Identify code for reuse**
- **Shorten the learning curve for new developers**

Rational. Asset Analyzer v5.5

WebSphere Application Server

DB2.

Rational. BuildForge

Better insight into which artifacts need to rebuilt based on changes *

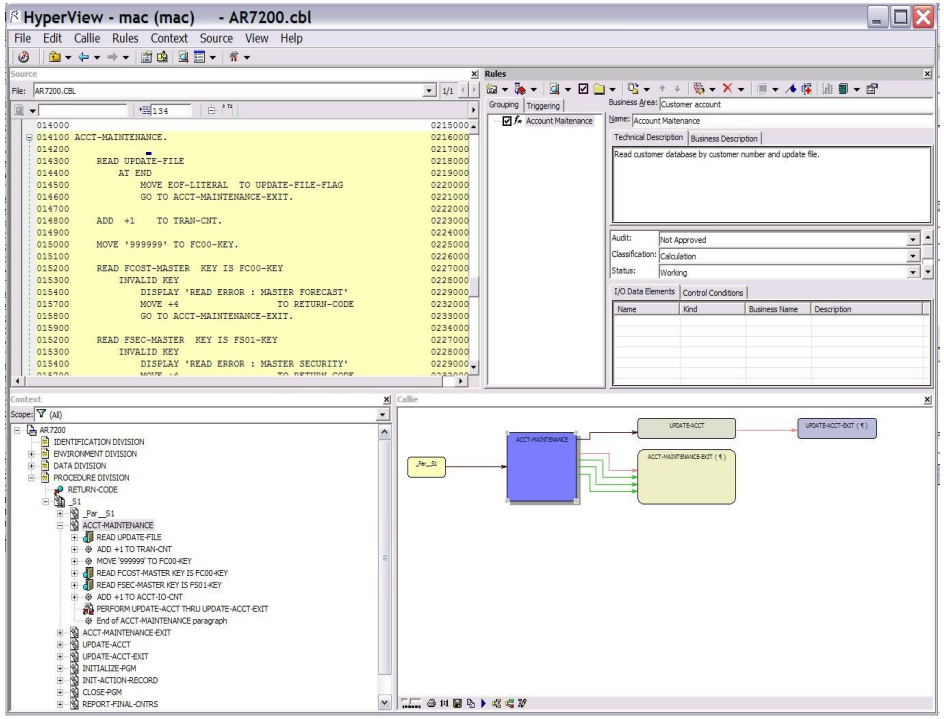
Build tools to leverage the rich data gathered by Asset Analyzer

• Use the web services interface to pull information from Asset Analyzer into other tools

*** Future Integration**

IBM Rational Transformation Workbench V3.1

Accelerate your path to reuse and SOA-readiness

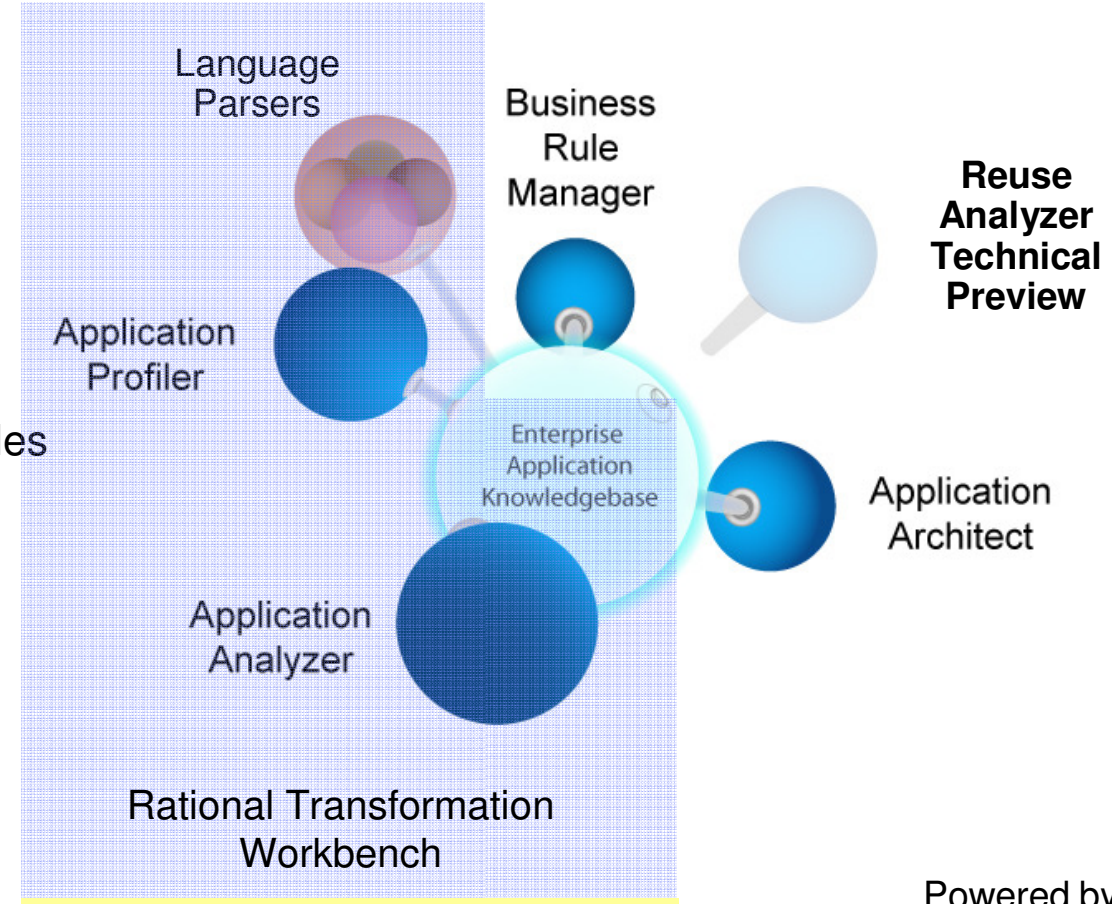


The new business rules extension can help speed the identification of your company valuable business rules

- ***Helps collect and abstract business and technical knowledge from highly complex systems for better understanding***
- **Demystify enterprise applications and their inter- and intra-relationships**
- **Gain intellectual control; make fact-based decisions; develop transformation roadmap.**
- **Identify key assets and restructure for reuse in SOA; reduce cost and time of modernization projects**
- **Reduce cost and time of on-going application maintenance**

RTW – Pieces and functions

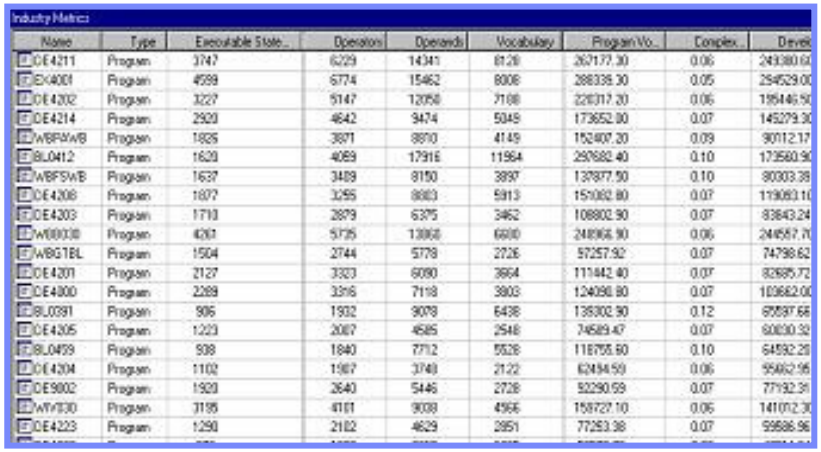
- **Application Analyzer**
  - Deep interactive analysis
- **Application Profiler**
  - Team access via the web
- **Business Rule Manager**
  - Find and manage business rules
- **Application Architect**
  - Create new, reusable components
- **Reuse Analyzer Technical Preview**
  - Analyze code for SOA
- **RTW Analyzer for Eclipse**



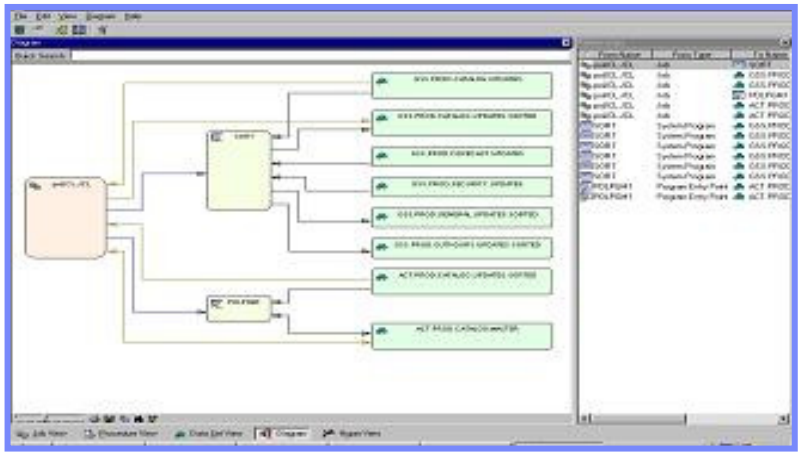
- **RTW Analyzer for Eclipse**
  - Analysis in Development workflow

Powered by Relativity TECHNOLOGIES

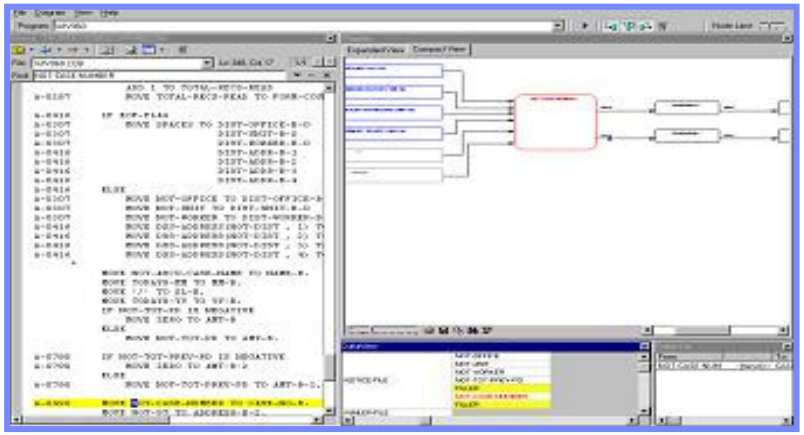
RTW Application Analyzer: Screen Shots



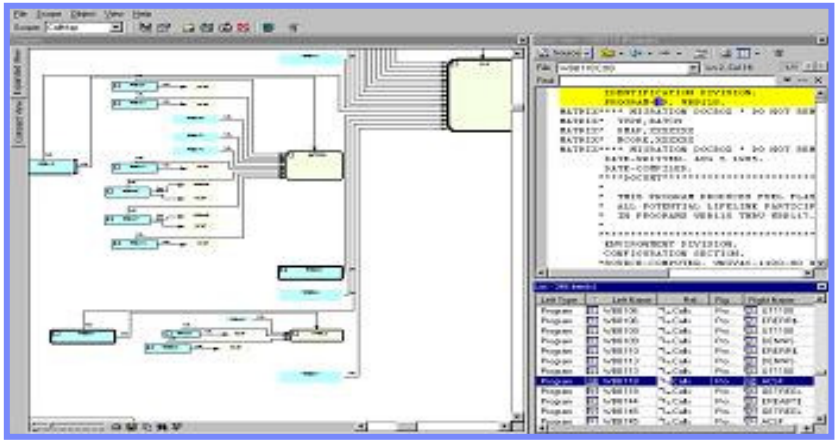
Complexity Report



Batch Application Viewer

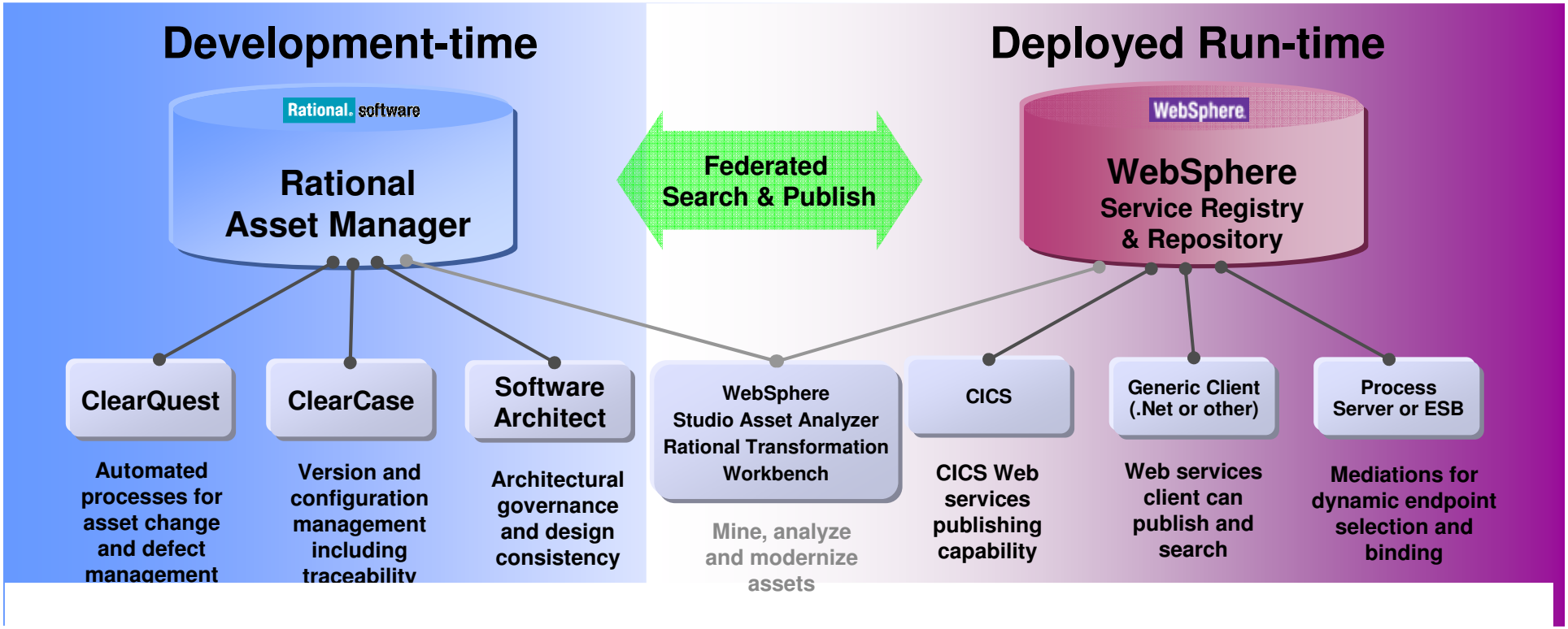


Global Data Flow Analysis



Call Map Diagrammer

Asset discovery, transformation and management



CREATION

Manages information that is useful for the creation and reuse of all types of reusable assets

CONSUMPTION

Manages information that is useful for the discovery and consumption of operational runtime services

Modernizing existing systems to offer more higher-margin accessories

Multinational auto manufacturer

Challenge

- Expand existing systems to offer more higher-margin accessories; requires change to field used by >1300 programs
- Identify obsolete code within their automotive systems and begin a “decommissioning” process

Solution

- Performed impact analysis with WSAA, coupled with GBS Test Environment Builder to accelerate system verification
- Now employing RTW to start decommissioning” process

Products include:

- WebSphere Studio Asset Analyzer
- IBM Rational Transformation Workbench

“We are very pleased with WSAA. It is doing just what we want and need it to do.” - AD manager

Modernize your Architectures

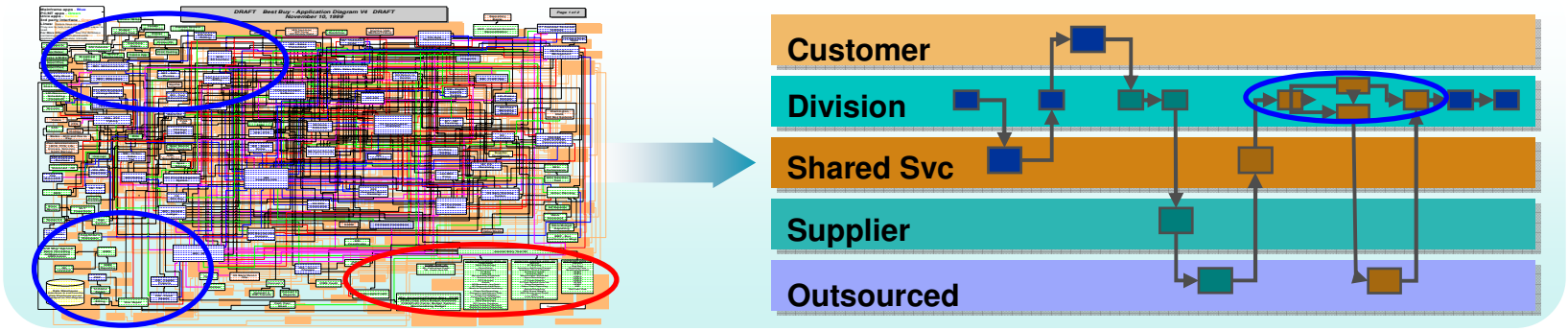
Business Challenge
Inflexibility in adapting applications in support of business needs

How can we…

- Progress our SOA maturity given all our existing code assets, including CICS, IMS, IBM i and green screen applications?
- Build services once and deploy them across my heterogeneous production environment?
- Ensure our new SOA system will be more easy to extend and maintain than my current ones?

Solutions
Flexible architectures to enable business agility

- ✓ Expose 3270 and 5250 applications as web services
  - *Host Access Transformation Services*
- ✓ Quickly create web services from existing COBOL, RPG, PL/I, Java, or EGL applications
  - *Rational Developer for System z (SFM)*
  - *Rational Business Developer*
- ✓ Create new platform-independent services
  - *Rational Business Developer (EGL Service keyword)*
- ✓ Leverage MDD - xform UML to EGL, COBOL, WSDL, etc
  - *Rational Software Architect*



Modernize your Skills - Languages

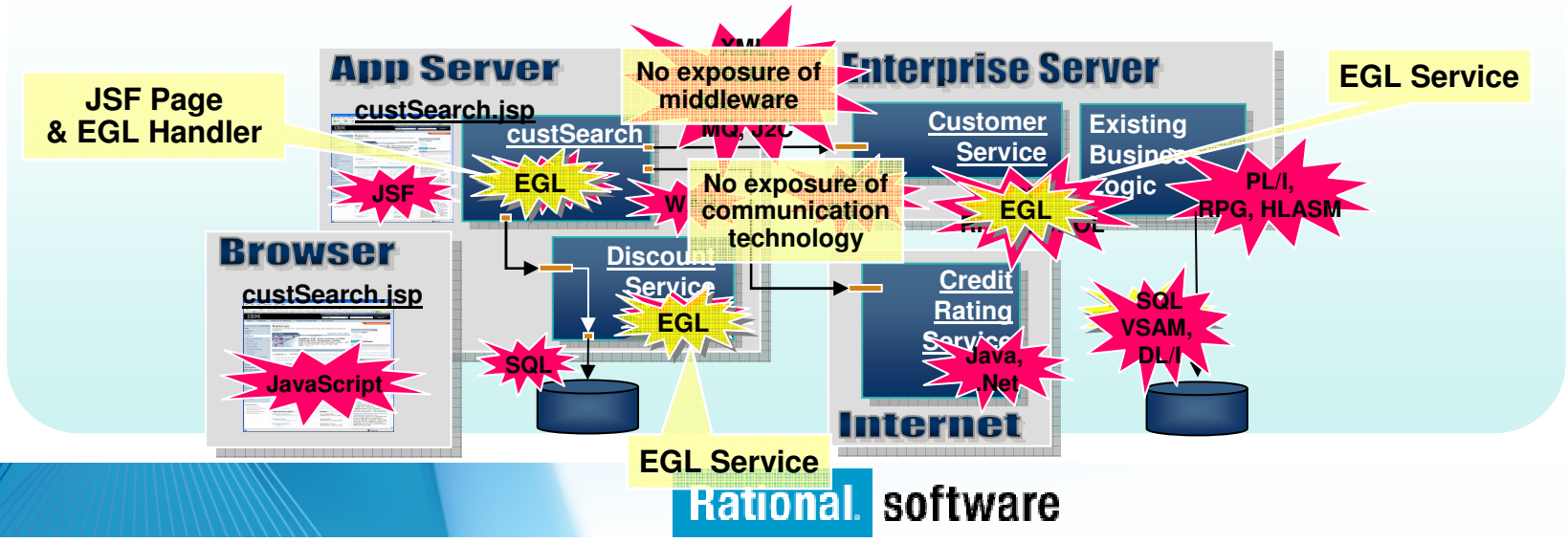
Business Challenge
Staff inflexibility due to "skills silos"

How can we…

- Exploit new technologies and innovation without retraining existing staff that knows the business?
- Use new employees on any project, independent of the target platform?
- Provide modern web UIs leveraging existing skills and systems?

Solutions
Powerful tools & abstractions for multi-platform development

- ✓ Apply existing business-knowledgeable staff to build all elements of multi-platform applications ... end-to-end from Web 2.0 to services to business transactions
- ✓ Attract new staff with "*IBM's newest business language*"
  - *Rational Business Developer (EGL)*



Modernize your Skills - IDEs

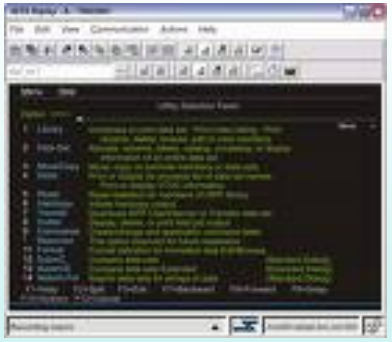
Business Challenge
Low productivity, non-competitive tools for new developers

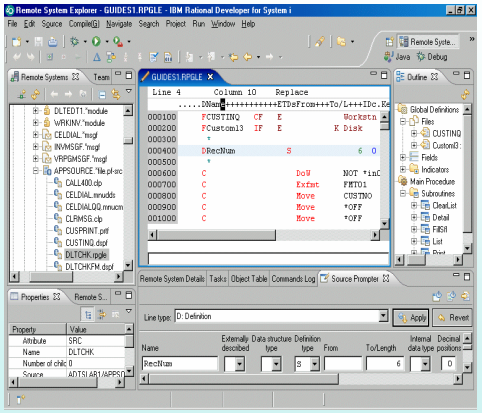
How can we…

- Achieve higher productivity for our enterprise developers?
- Attract new and younger developers to backfill retiring System z and IBM i developers?
- Simplify license management by standardizing on a single, multi-platform development IDE?
- Free up System z MIPS for production use?

Solutions
Achieve high productivity, attract new talent with modern IDEs

- ✓ Use modern IDEs to develop and maintain code
- ✓ Debug and test from workstation
  - *Rational Developer for System z*
  - *Rational Business Developer*





Rational Host Access Transformation Services

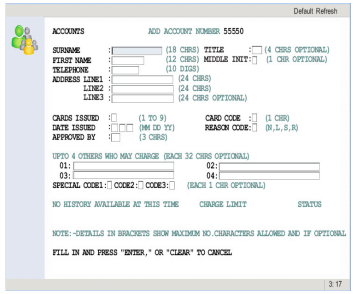
Modernize user interfaces and create Web Services

- **Modernize and streamline "green screen" applications**
- **Combine data from multiple screens, applications and databases**
- **Non-invasive**

Example: CICS App

3270 or 5250 Data stream

Rich Client

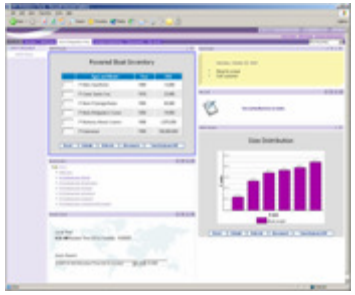


- **Integration at the desktop with other Eclipse applications**
- **Client side processing**
- **Rich set of user interface widgets**
- **Built on the standard, open Eclipse foundation**
- **3270e print directly to end user's printer**

Web

- **Zero footprint**
- **View through your favorite browser**

Portal



- **Integration at the glass**
- **Click-to-Action support**

Web Service

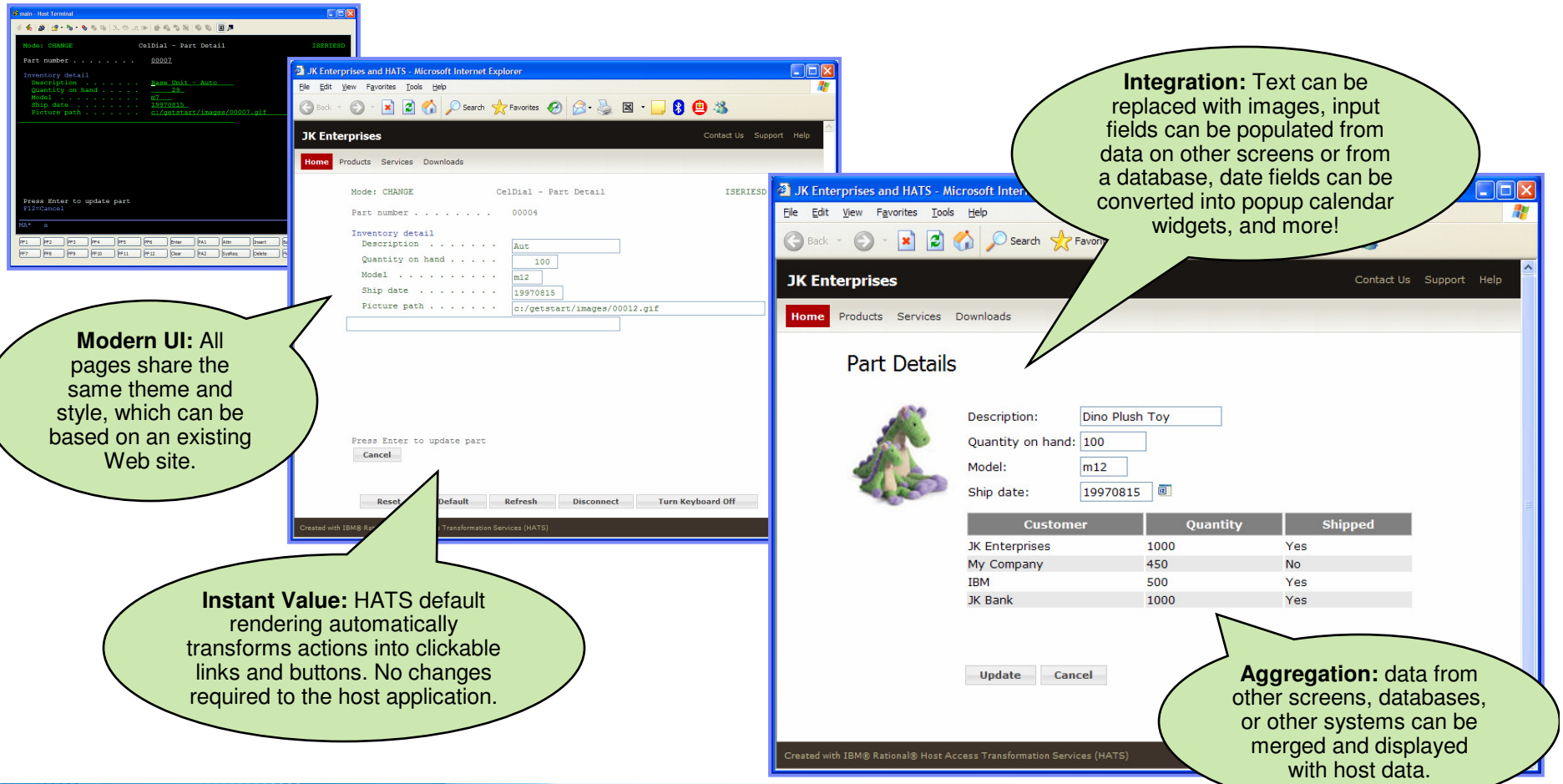
- **Build self-service transactions**

HATS - Modernization At Your Own Pace

Today

Day 1

Tomorrow



Modern UI: All pages share the same theme and style, which can be based on an existing Web site.

Instant Value: HATS default rendering automatically transforms actions into clickable links and buttons. No changes required to the host application.

Integration: Text can be replaced with images, input fields can be populated from data on other screens or from a database, date fields can be converted into popup calendar widgets, and more!

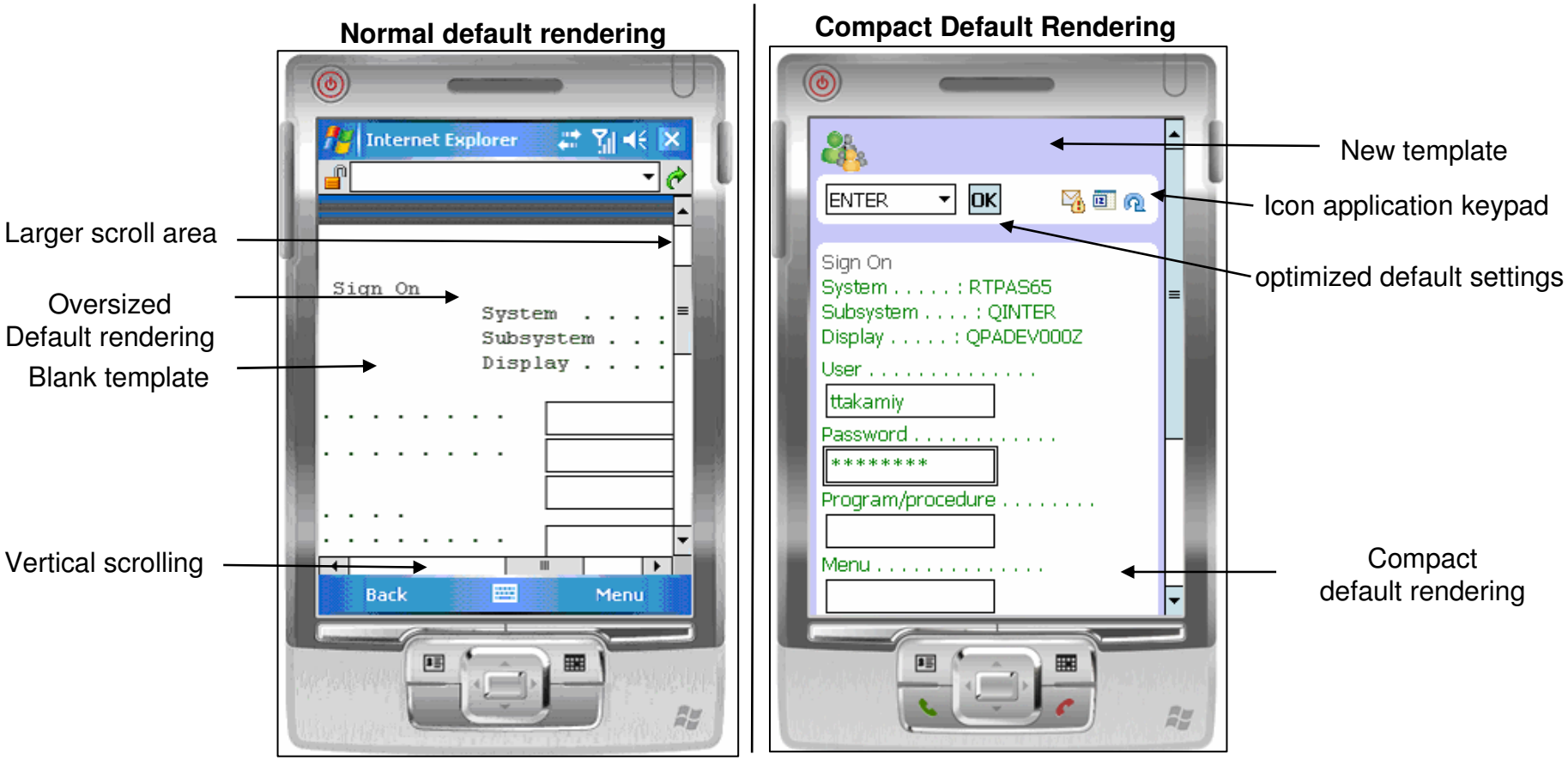
Aggregation: data from other screens, databases, or other systems can be merged and displayed with host data.

Host Access Transformation Services Values

Rich Client	Browser	Portal	Mobile	Web Services
				
• Integration at the desktop with other Eclipse-based applications • Client side processing • Rich set of user interface widgets • Supports Lotus Expeditor deployment	• Zero footprint • Pure HTML • Access through your favorite browser, including Internet Explorer and Firefox.	• Integration at the glass • Cooperative portlet support • JSR 168 compliant	• Access host applications from mobile devices	• Build self-service transactions • Expose host business processes as Web Services • Provide controlled access to vital host applications and host data.

- *Quick ROI : Host applications can be quickly deployed with a new user interface*
- *Low cost : No need to rewrite application*
- *Low risk : Leverage open, proven platforms and technologies*
- *Increase productivity and reduce training costs*
- *Improving work flow from multiple applications*
- *Provides integration of host business processes and data with other Web, portal, and rich client applications*

HATS Compact Default Rendering Example



Improving customer satisfaction and reducing costs

Mercantil do Brasil

Challenge

- **Help developers integrate the bank's .NET applications with its OS/390 environment.**

Solution

- Use IBM modernization tools to effectively bridge the gap between Mercantil do Brasil's .NET applications and its OS/390 operating environment.

Products include:

- Host Access Transformation Services (HATS)
- WebSphere Application Server for z/OS

"Beyond the financial benefits, this new solution gave us speed and quality in the execution of our services."

-- Jaime Herrera, technical support manager, Mercantil do Brasil

IBM Rational Developer for System z V7.1

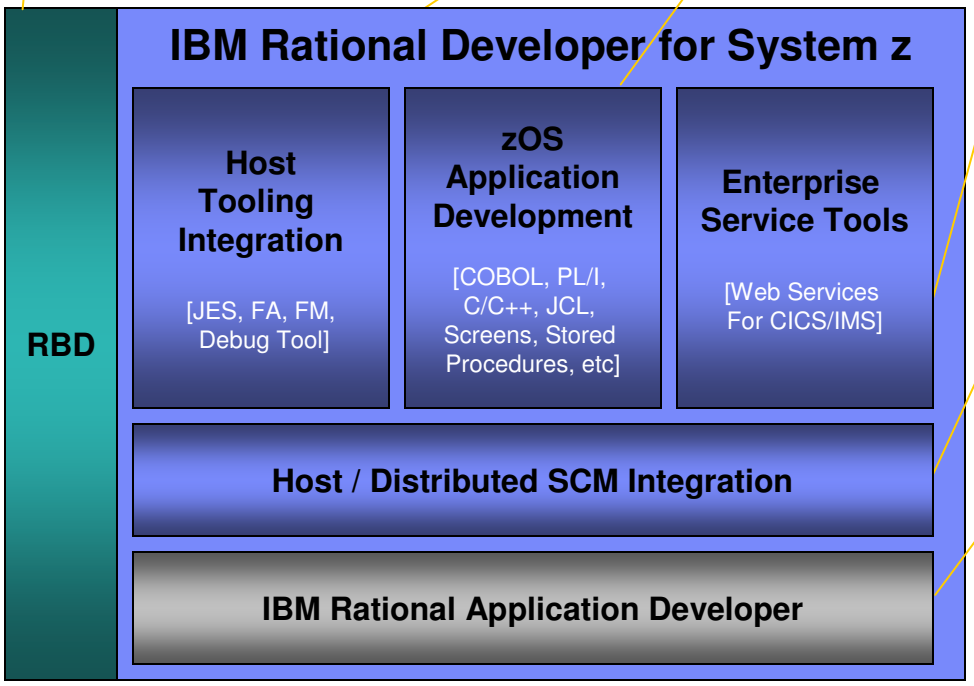
Preserve System z investment – and leverage existing assets

JES and PD Tools

- Debug zOS applications from the workstation as they execute live in the remote runtime
- Read/Write/Update VSAM datasets via integration with IBM File Manager
- Access IBM Fault analyzer reports for analyzing ABENDS and associating back to source code
- Interact with the Job Entry Subsystem (JES) to submit jobs, monitor jobs, and review job output

Integration with EGL using RBD

- Quick and easy development of modern enterprise applications for business programmers
- Simplify and speed up creation of Web applications and services without having to learn Java or J2EE



Traditional Development

Development Environment

- Connect to z/OS systems
- Work with z/OS resources like COBOL, PL/I , C, C++, JCL, assembler, etc.
- Perform dataset management actions like allocating datasets and migrating datasets
- Perform typical edit, compile, and debug tasks on remote z/OS resources from the workstation
- Create, build, and catalog DB2 stored procedures on zOS
- Compile and test programs locally to ensure correctness

Screen design

- Visually create, modify, build, and deploy BMS maps sets or MFS/IMS maps remotely or on the local workstation

Code Generation

- Generate CRUD DB2 program code from UML, which can also be easily integrated into web service applications

zOS Web Service and Flow Creation

- Implements SOA and Web Services
- SOA access to CICS V3.2 and IMS V9 COBOL applications
- Bottom-up/Top-down or meet-in-the-middle COBOL to XML mapping support
- Integrated COBOL XML converters, XML schemas, and WSDL generation
- Service Flow Modeler to build/deploy service flows out of your existing Commarea, Channel, MQ, and Terminal CICS applications.

SCM Support

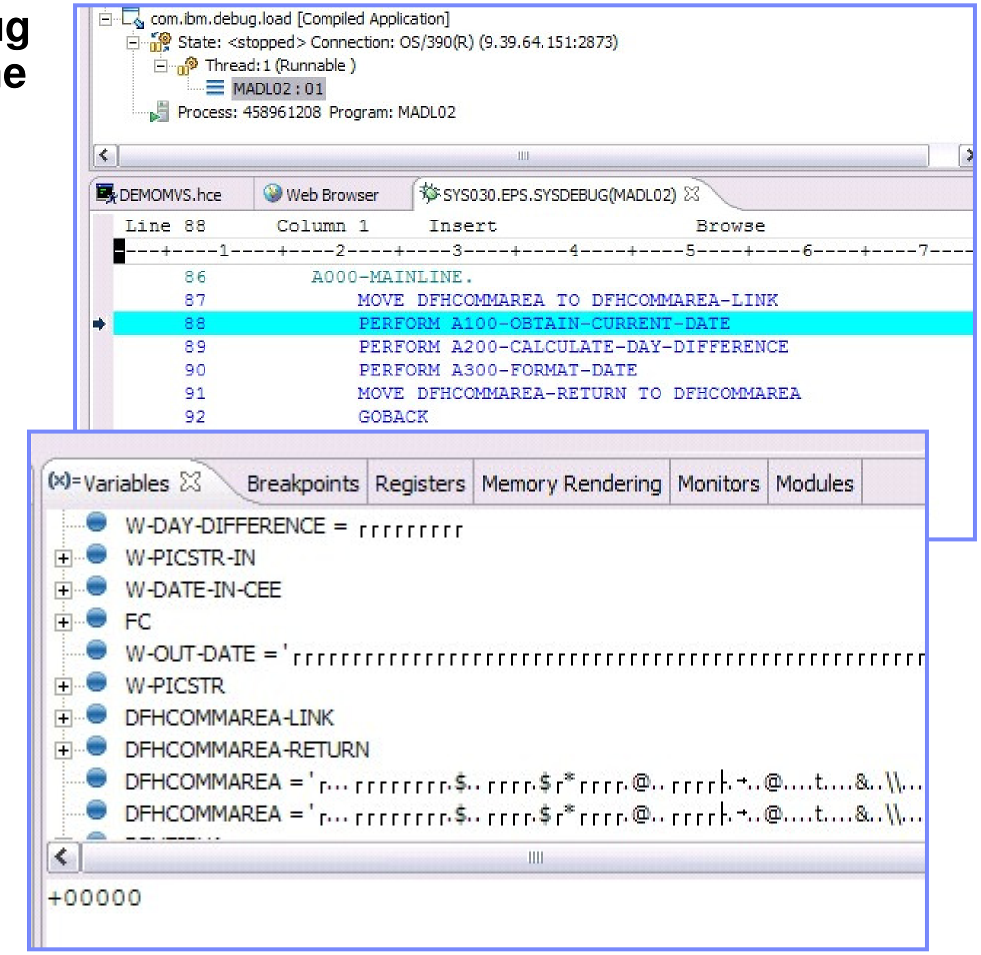
- Access to host SCMs such as SCLM
- Framework for writing/deploying custom SCM integration code
- Support for storing zOS resources in distributed SCMs such as ClearCase

Web and JEE Development

- Create Web Pages / JSF / Struts
- JEE/Java Development
- JCA Connectors
- Distributed debugger
- Web Services and Test environment

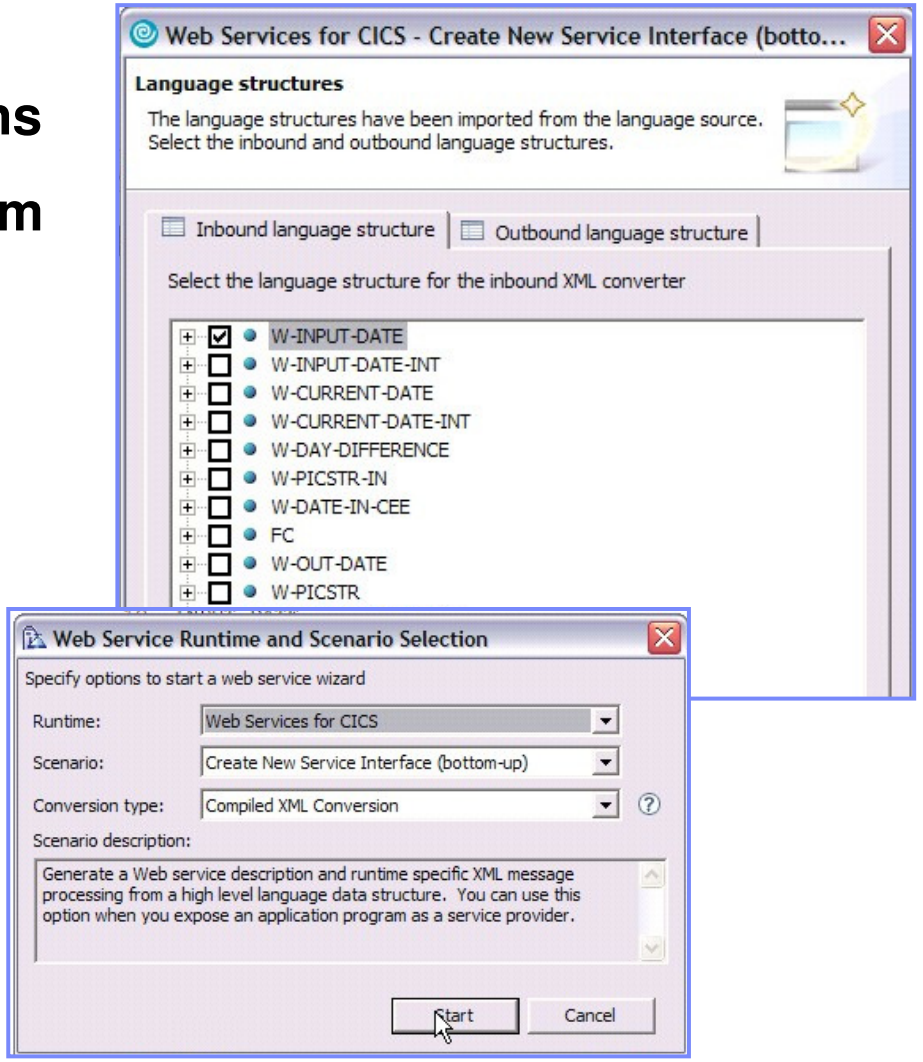
RDz - Debug Multiple Runtimes

- **Use the cross-platform debugger to debug end-to-end systems as they execute in the runtime**
  - CICS
  - IMS
  - DB2
  - Batch
  - WAS
  - Native LUW
- **From the workstation:**
  - View executing source code
  - Step through host code line-by-line
  - Set breakpoints
  - Alter working storage values
  - Alter register values
  - Etc…
- **Debug zOS and distributed code in the same interface even stepping between runtimes and platforms!**
- **Requires on IBM Debug Tool**



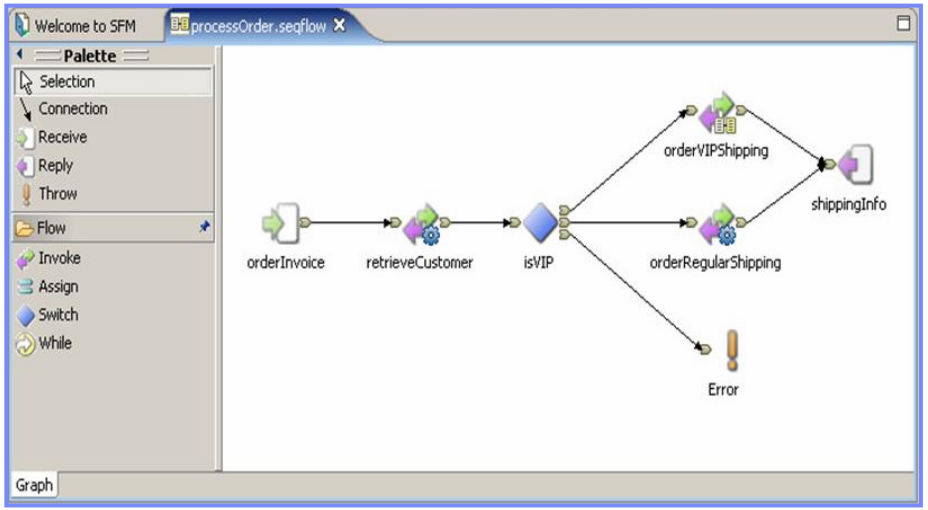
RDz - Create web services for zOS runtimes

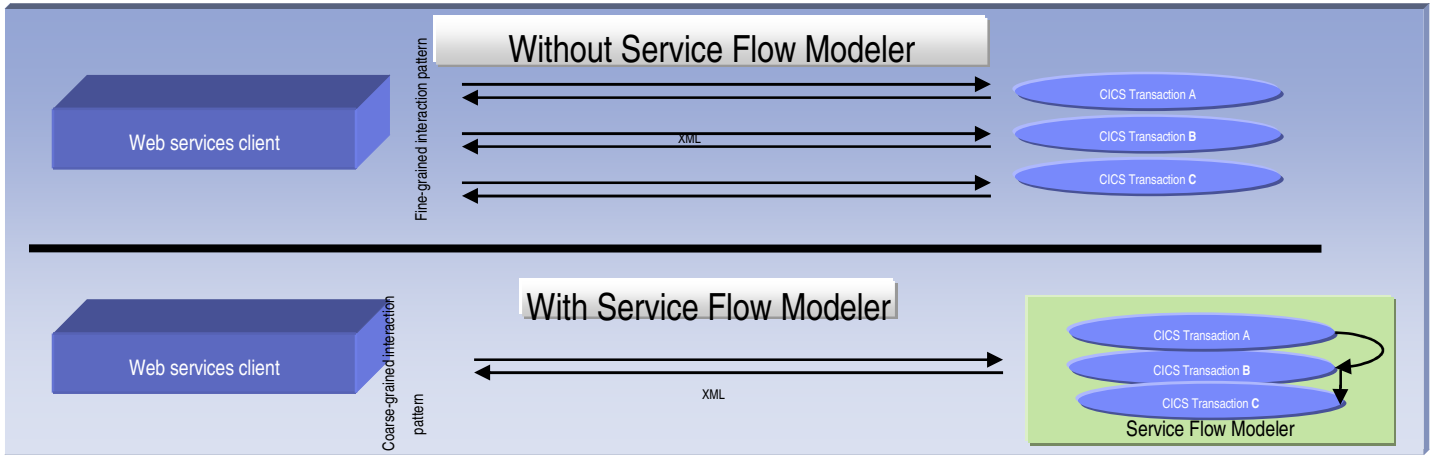
- **Build, Deploy, and Test Web services from existing applications**
- **Create source code skeletons from web service definitions**
- **Map web service definitions to existing application modules**
- **Supports traditional languages**
  - COBOL
  - PL/I
- **Supports zOS specific runtimes**
  - CICS
  - IMS
  - Batch



RDz - Orchestrate CICS services and screens

- **Model, Deploy, and Test Service Flows using Service Flow Modeler**
  - Aggregates multiple CICS transactions into high-level business processes through visual modeling
  - Supports CICS BMS (terminal-based) applications & CICS commarea/container/channel applications
  - Highly optimized CICS runtime supporting Web services and XML interfaces





Extending COBOL applications for online banking

Commerzbank

Challenge

- Upgrade teller workstations and ensure they continue to work with an existing third-party COBOL run-time environment

Solution

- Develop new application framework based on IBM COBOL
- Leverage single development that support both host and distributed platforms

Products include:

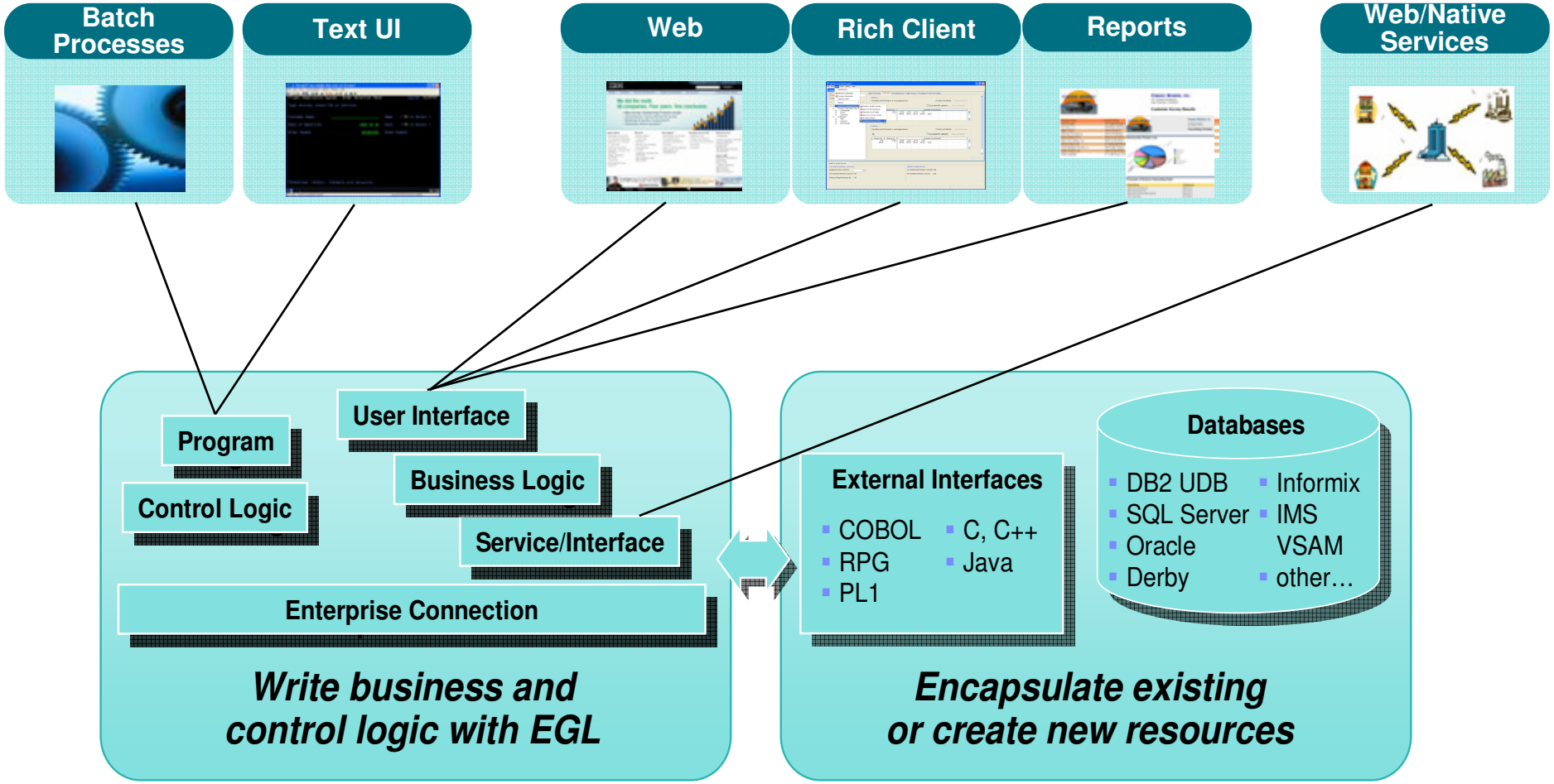
- IBM Rational Developer for System z

COMMERZBANK

"In one tool, we have a single development environment for multiple environments. I don't have to jump between different tools to do different tasks. The tool is very complete."
Armin Schiller, transaction banking payments and cash transactions, Commerzbank AG

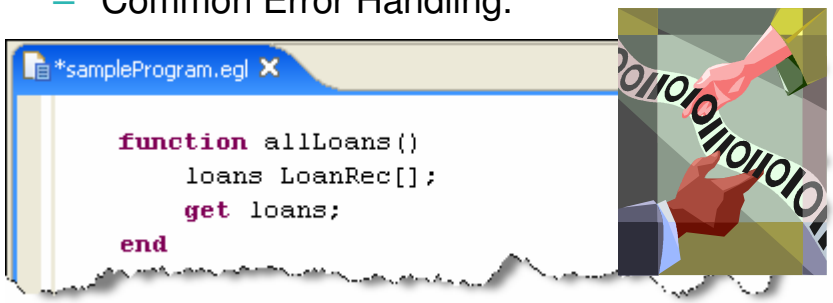
IBM Rational Business Developer V7.1

Unified approach to end-to-end construction that shields developers from intricacies of runtimes and middleware

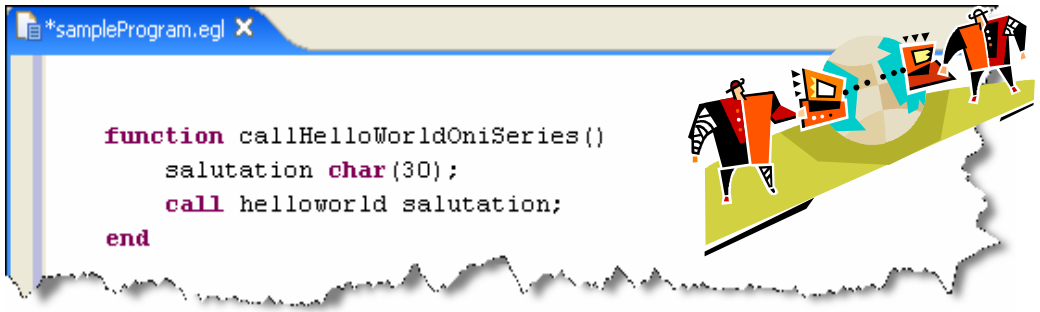


RBD - The power of abstractions

- **Data access:**
  - "Records" provide access to:
    - SQL, Indexed, Relative, Serial, DL/I, Service data, Message Queues
  - Common Verbs for data access (**Get, Add, Replace, Delete**).
  - Allows complete access to SQL statement if needed.
  - Common Error Handling.



- **Remote Invocation**
  - Call COBOL, RPG, C, Java.
  - Linkage information separated from code.
  - Data mapping, protocol invocation all resolved at runtime, NO code necessary!



- **User Interface:**
  - EGL "handlers" hide complexities of
    - Web (JSF) UI
    - Reports (BIRT)
    - Portlets
    - * Rich Web (Ajax)

* Tech Preview

RBD - The power of Services

Built into the language

SOA

- **Service part:**
  - a generatable part containing code that will be accessed:
    - from EGL code by way of a local or TCP/IP connection (*EGL Service*).
    - from any code by way of an HTTP connection (*EGL Web service*).

customerService.egl

```
// service
Service CustomerService
        Function getCustomer(custid String) returns (string)
//          …
        end
//      …
end
```

- **Interface part:**
  - Used to access external services as EGL services or simply to provide separation of concern.

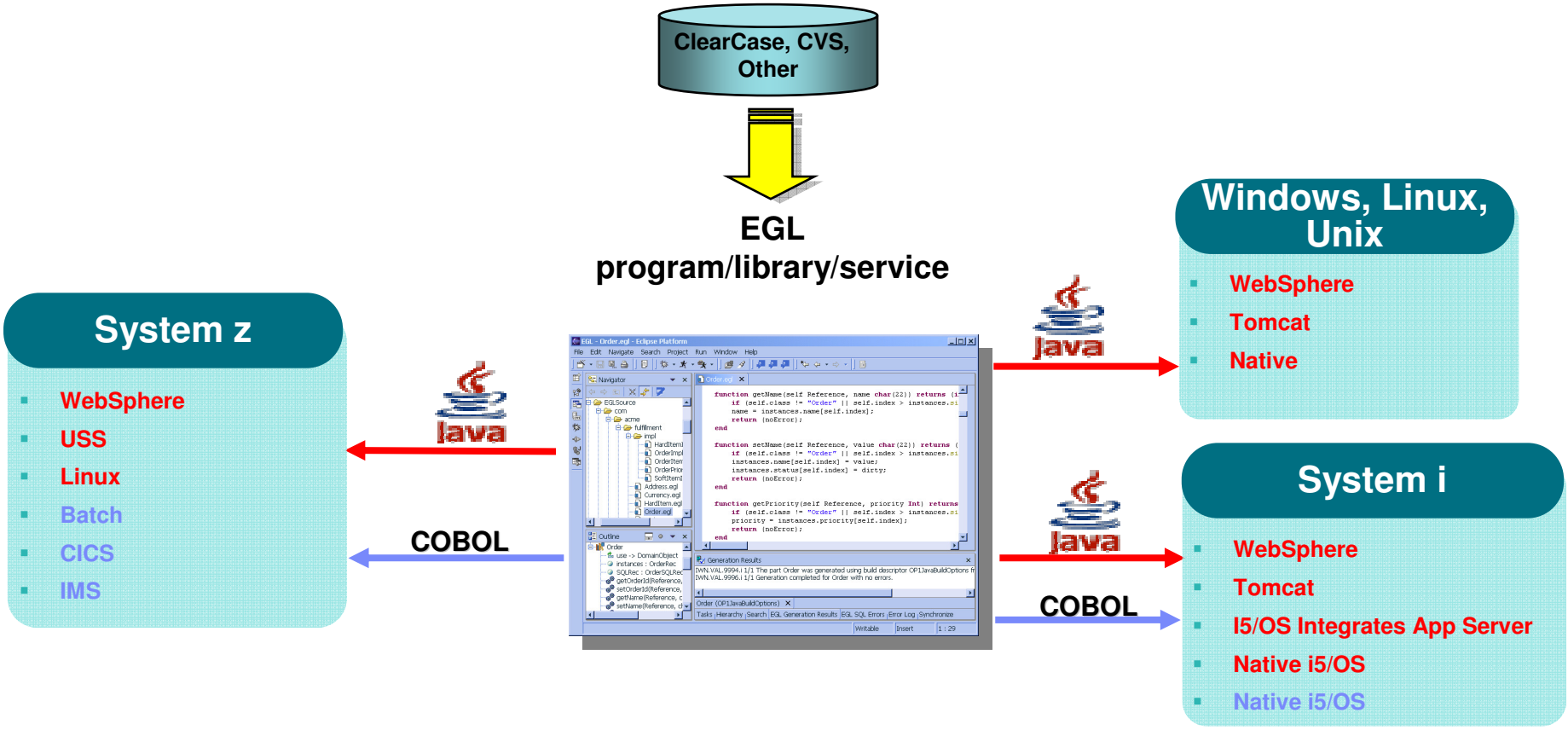
customerService.egl | creditCheck.egl

```
// interface
Interface creditCheck

    function checkCredit(SSAN string in) returns (string);
//  ...
end
```

RBD - The power of Generation

Platform Flexibility



Improving productivity by breaking skills silos

KBC

Challenge

- Leverage existing "business-knowledgeable" IT staff to create business services without dealing with platform and technology complexities

Solution

- Unify application development across all platforms and transaction managers (e.g. WAS, IMS)

Products include:

- IBM Rational Business Developer Extension
- IBM Rational Developer for System z

"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." - Lieven Gouwy, IT architect, KBC

Modernize Your Team Infrastructure

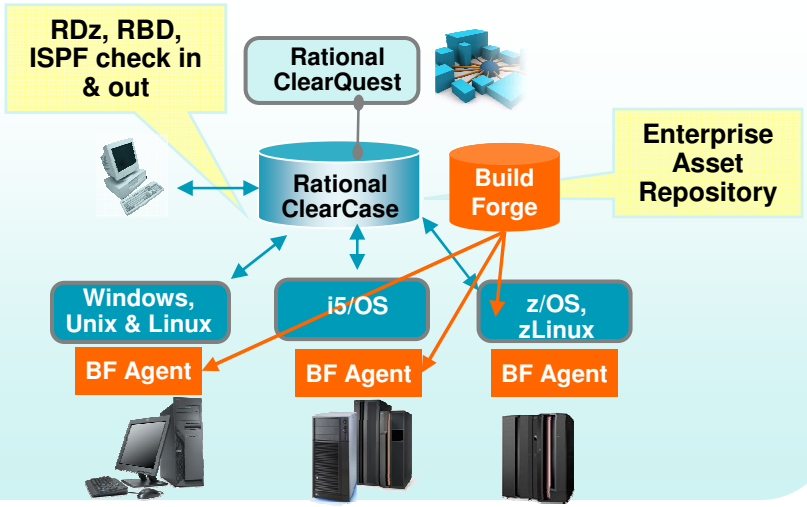
Business Challenge
Inefficiencies and quality problems in multi-platform development

How can we…

- Increase quality and improve responsiveness for multi-platform development teams?
- Simplify management of team infrastructure for multiple development teams?
- Reduce team infrastructure costs across the enterprise?

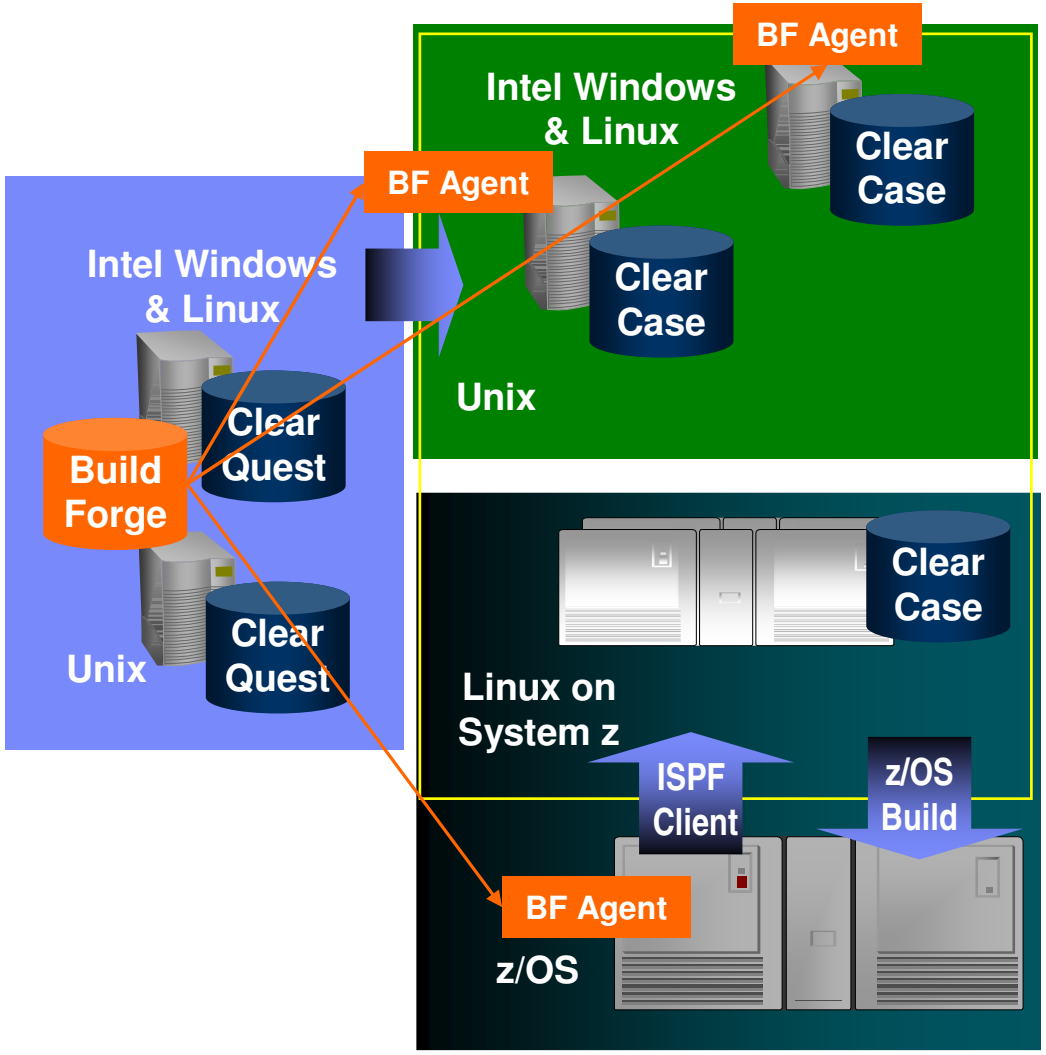
Solutions
Provide coordination, traceability, consistency across platforms

- ✓ Consolidate enterprise and distributed source code management
  - *Rational ClearCase*
- ✓ Automate and orchestrate defect tracking and configuration management across the enterprise
  - *Rational ClearQuest*
- ✓ Produce coordinated, traceable, automated, and cross-platform builds
  - *Rational BuildForge*



ClearCase/ClearQuest/Build Forge for the Enterprise

- Extends ClearCase/ClearQuest/Build Forge to manage both distributed and z/OS assets
- Provides single point of control, single artifact repository, single set of user interfaces
- Provides consistent process paradigm across platforms
- Extends the power of the Software Delivery Platform and ClearQuest/ClearCase UCM to z/OS development



Unifying enterprise and distributed teams

Generali

Challenge

- Spiraling maintenance and resource costs constrained the development organization

Solution

- Move to a standardized solution to improve developer productivity and flexibility for delivering software solutions

Products include:

- IBM Rational ClearCase

GENERALI Assicurazioni Generali S.p.A.

Highly automated cross-platform solution using **Rational ClearCase** to manage and support the software lifecycle for COBOL and Java development, from start to finish

Modernize your Development Investments

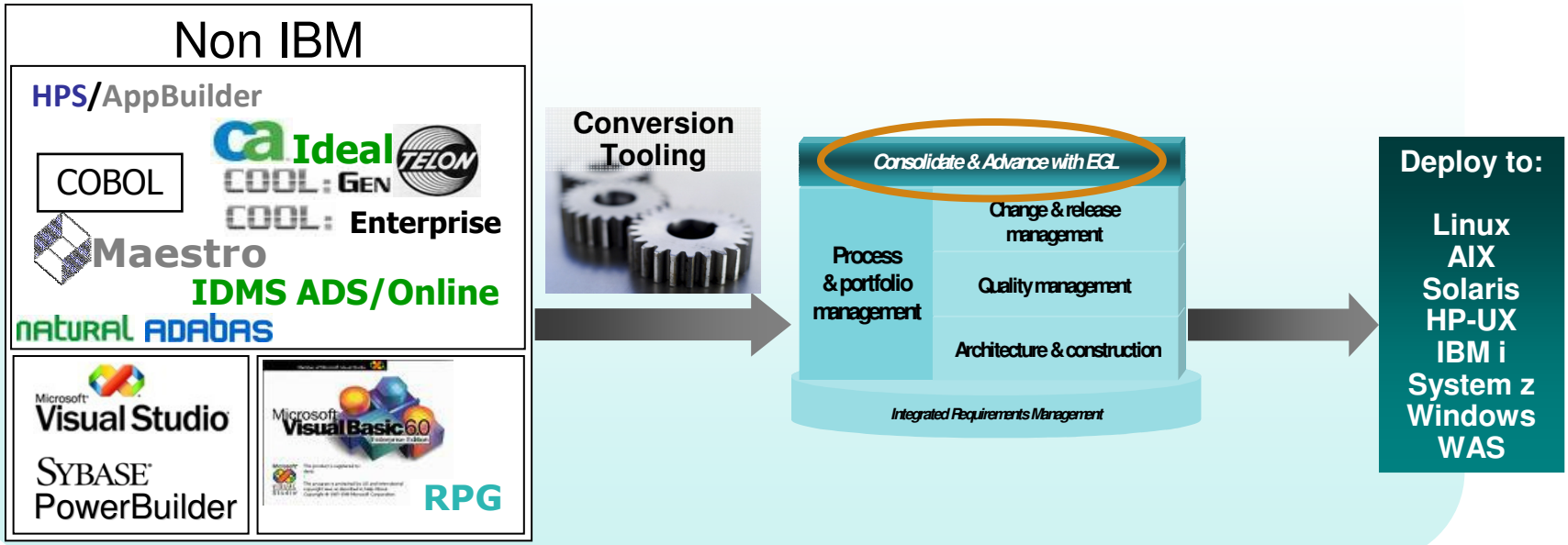
Business Challenge
Unsupported legacy development platforms

How can we…

- Efficiently move to modern development platforms, languages, and tools?

Solutions
Save money by moving off old platforms and languages

- ✓ Migrate from out-of-date and expensive legacy development platforms onto the IBM Rational Software Delivery Platform (SDP)
  - *EGL, DB2*
  - *All SDP tools*



Where can you get more information?

System z Sandboxes

Fully hosted online System z environments to experiment, try and buy

www.ibm.com/developerworks/downloads/emsandbox/

More details

Videos, product factsheets, whitepapers, demonstrations

www.ibm.com/software/info/developer/solutions/em/

Education Series

Modern Application Architecture for COBOL Developers

Learn how to design and integrate composite applications across CICS and WebSphere

EGL Distance Learning

10 days of FREE instructor-led virtual class!

EGL Cafe

Resources:	**Download, Learn, Presentations, Video/viewlet, Sample Code**
Community:	**Clients, Partners, Influencers, Press, News & Events**
Collaboration:	**Blogs, Forums, Tips & Techniques Comments, Ratings**
Testimonials:	**Case Studies**

www.ibm.com/rational/eglcafe

- **Change is at the heart of most businesses**
- **IT flexibility is a key enabler of change**
- **Rational EM solutions provide this flexibility**
- **You can get started today**

Learn more at:

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Questions