Enterprise modernization: Making the business case

Michael Connor, Enterprise Tooling Market Manager, IBM Software Group

© 2007 IBM Corporation

Goal

- Discuss common modernization scenarios and value
- Clarify accepted customer strategies
- Propose Rational and complementary WebSphere solutions

© 2007 IBM Corporation

Scenario

- I'm not committed to SOA. And don't really understand the value? I'm not clear on what, if anything can be reused. Why should I be focused on this?
- Our recommendation
  - Compare and contrast change and reuse characteristics of traditional versus service oriented architectures
  - Determine a valuation of your portfolio
  - Project possible reuse of processing as services
- Rational Solution
  - For System z customers, Rational Transformation Workbench

© 2007 IBM Corporation

Architecture modernization

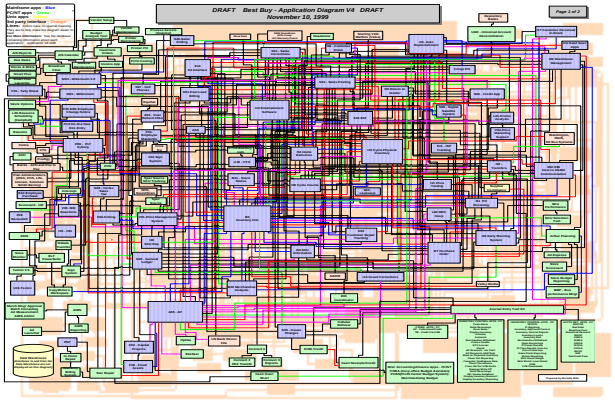
Challenge of tightly-coupled application architectures

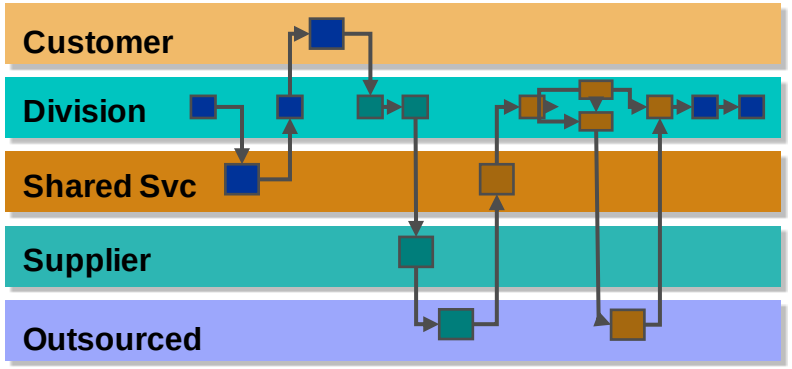
What you have…

- **Tightly-coupled architectures** reducing flexibility and speed in moving to new technologies
- **Complexity** that hampers the ability to reuse existing code for new projects
- **Multiple implementation technologies** and incompatible middleware limiting code mobility

What you want…

- **Services created** from existing business logic or user interfaces for wider use and value
- **Increased reuse** of existing highly stable code that embodies enterprise business intelligence
- **Service design separated from service implementation** to attain optimal flexibility





"SOAs cost 20% less to implement and saves 50% more with each reuse than traditional component-based development… the level of reuse in SOA development averages 2.5 times more than non-SOA development"

Jeffrey Poulin, PH.D. and Alan Himler, MBA, 2006 *"The ROI of SOA – Based on Traditional Component Reuse"*

"Today's IT architectures, arcane as they may be, are the biggest roadblocks most companies face when making strategic moves." ***The McKinsey Quarterly Special to CNET News.com, "Flexible IT, Better Strategy", January 24, 2004***

© 2007 IBM Corporation

Asset modernization

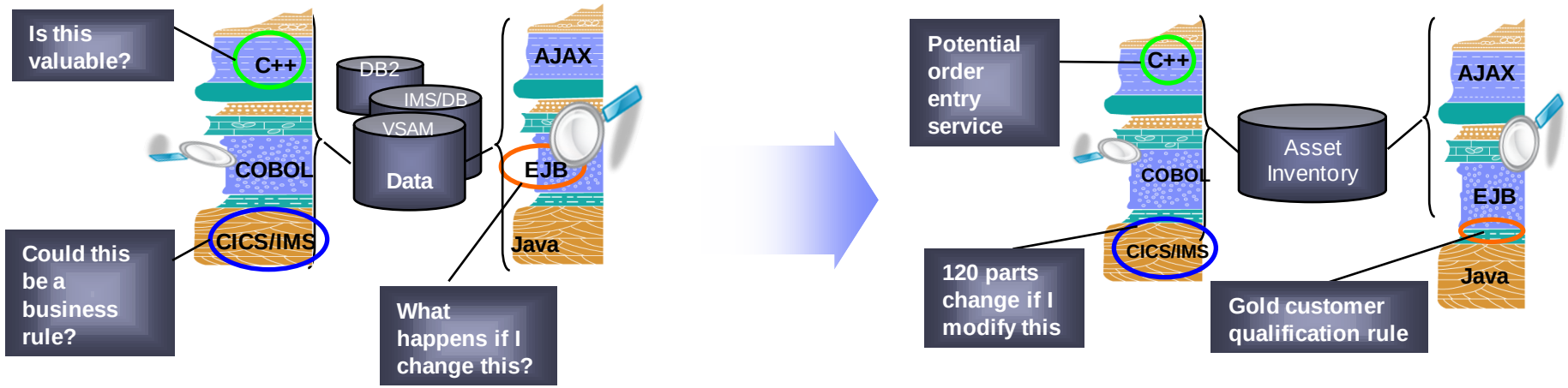
Challenge of managing knowledge assets

What you have…

- **A diverse application portfolio** evolved over many years and understood by few
- **Complexity** hindering the ability to gauge the impact of code changes resulting from new requirements
- **A lack of documentation** that limits reuse of existing business rules embedded within code

What you want…

- **An inventory** of existing highly stable code that embodies enterprise business intelligence
- **Ability to understand and manage** application complexity and change by making dependencies visible
- **Identify and document** existing business rules and business processes

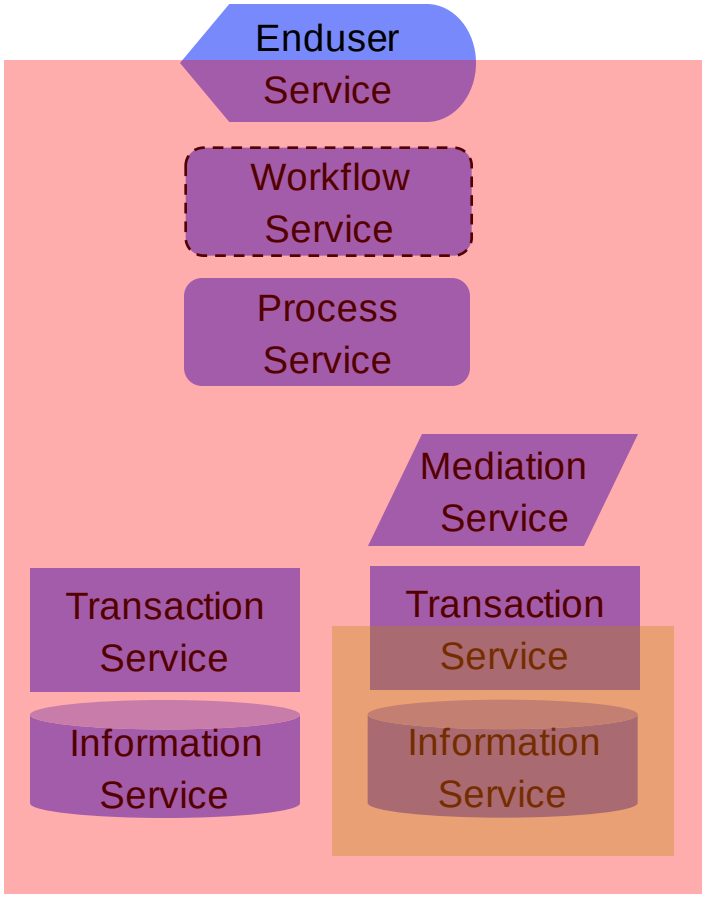


Analyst studies have found it 5x less expensive to re-use existing applications than to write new applications.

"Knowledge may be the most important source of competitive advantage for a firm, but capturing the potential gains is a continuing challenge". *William and Phyllis Mack Center for Technological Innovation, The Wharton School*

© 2007 IBM Corporation

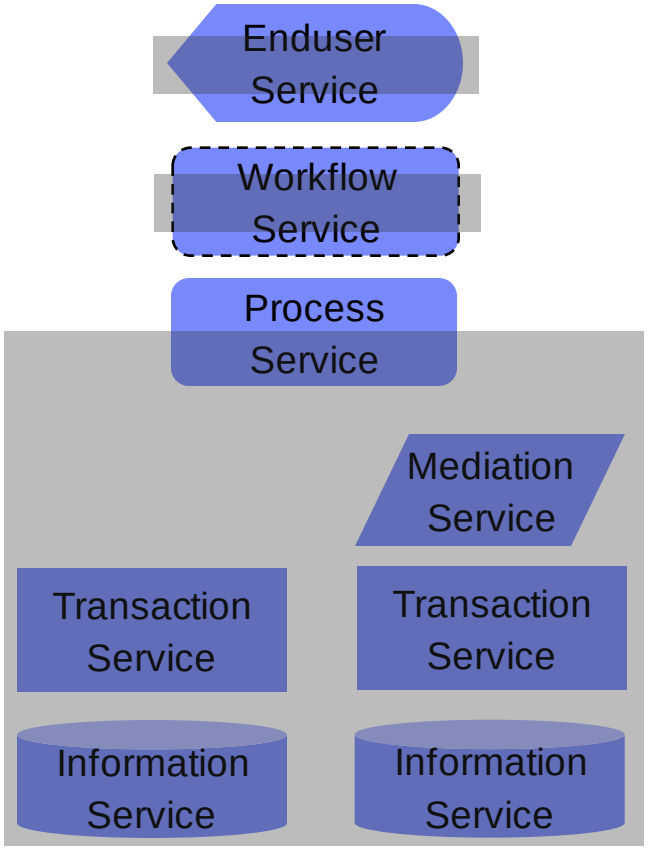
An Old Application



- The application assembly is statically bound within the application (the red rectangle)
- A subassembly is statically bound within the lime rectangle
- The application developer wrote some mediation code to adapt the subassembly interface. Typically this involves copying and reshaping data.
- The enduser service is controlled by a workflow process, and both are statically bound within the application
- **Making any change requires opening and redeveloping the application**

© 2007 IBM Corporation

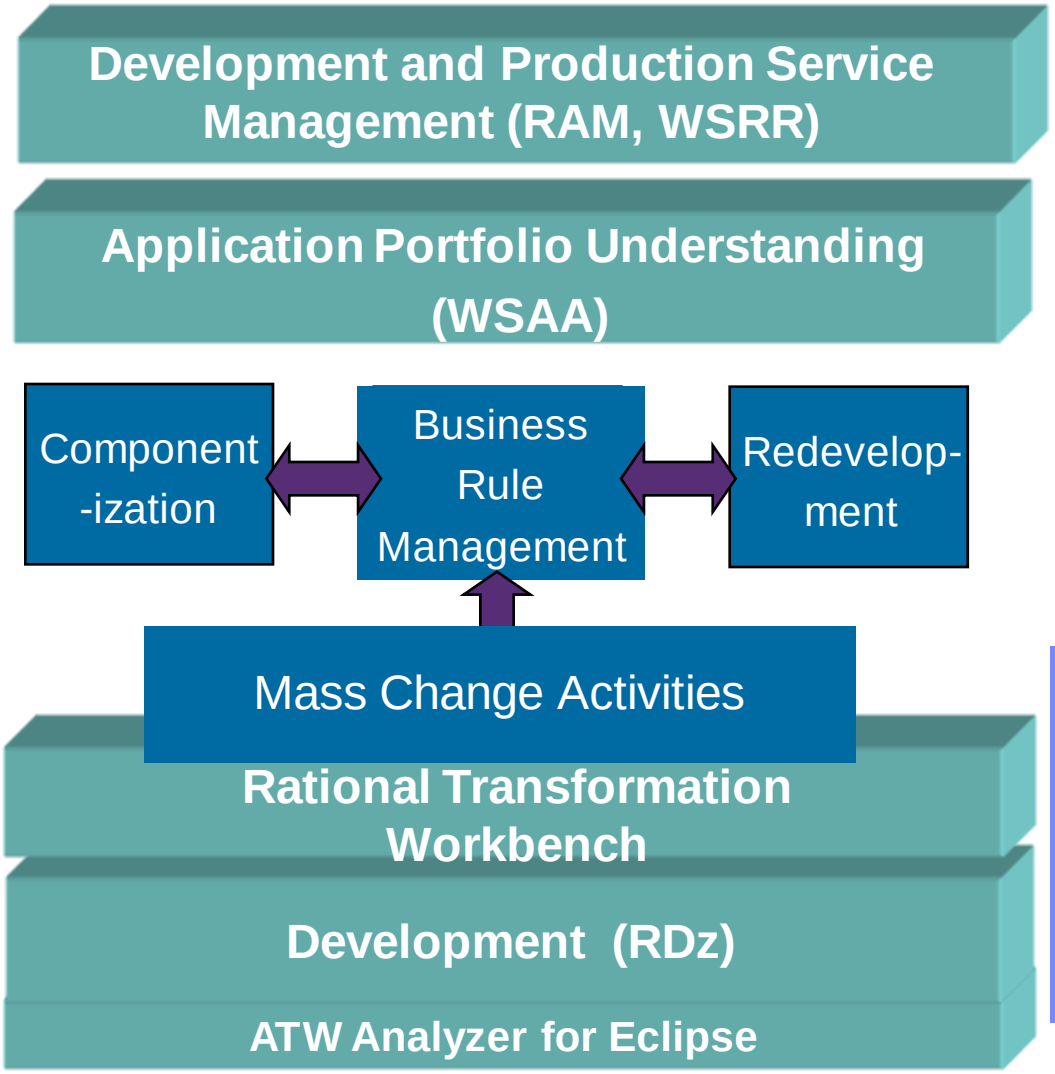
A Good Example of SOA



- The process service and its associated components have high performing but less malleable bindings
- Additional dynamic bindings may be made to the process service, increasing its value through reuse
- Workflow and enduser services are separated because they:
  - Tend to change more rapidly than other elements
  - Are rate limited by human performance

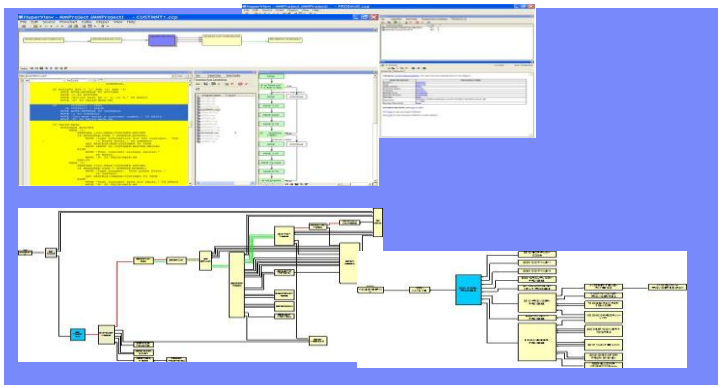
© 2007 IBM Corporation

Modernize with automation



Capabilities:

- Find and Use: Find Services and understand application processes
- Componentize: Enable reuse of monolithic processes
- Mine business rules: Tying business understanding and processing to code enabling activity
- Redevelop: Documenting to drive replacement strategies
- Mass Change: Addressing major new business initiatives in a timely manner



© 2007 IBM Corporation

Scenario

- I have a concern about lack of COBOL or RPG skills in the marketplace? What can I do?
- Our recommendations:
  - **Understand why you do COBOL and RPG ?** – easy, fast, self documenting business rules, performs very well against large volumes of data and can leverage mainframe based high speed transaction management.
  - **Determine what your risk really is?** Answer ?'s like:
    - How many COBOL/RPG developers do you have?
    - How many will retire in next 5 years? 10 years?
  - **Evaluate your internal developer career paths**. Do developers doing COBOL/RPG have same opportunity, salary as Web/Java developers that are perceived as more available?
  - **Understand where your developers of the future come from** – and why they will work for your company?
    - College trained C and Java developer communities
    - Technically oriented Business staff – including departmental (VB, PHP, others?) developers
  - **Implement internal training** or mentoring program, partner with local university, evaluate vendor 3rd party training programs (including IBM)
- Rational Solution
  - **Introduce IBM's newest business language EGL**, combining benefits of simple business oriented language with modern web development capabilities
  - **Bring in Lab sponsored "free" education** – ½ day Modern Application Architecture for COBOL developers seminar → then propose follow on Proof of technology sessions – or evaluation
  - **Propose Rational Developer for System z / i(WDSC) with Rational Business Developer extension**

© 2007 IBM Corporation

Skills modernization

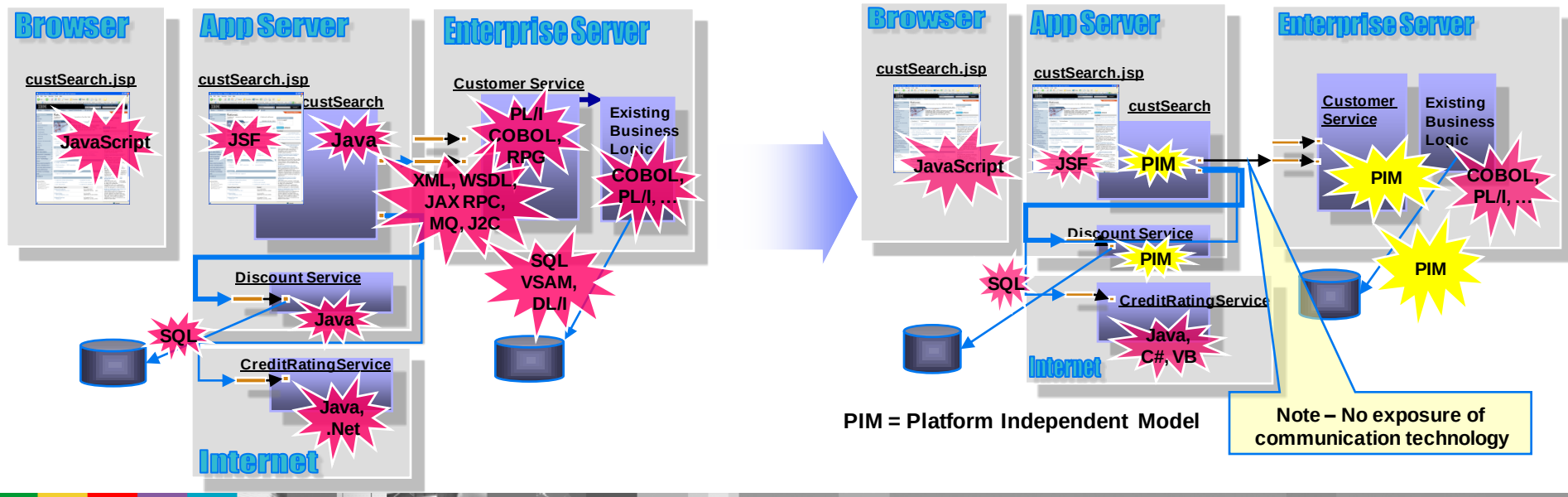
Challenge of IT skills shortage and silos

What you have…

- **Skills islands** preventing staff mobility and constrains IT flexibility resulting in application backlogs
- **Reduced capacity** due to dwindling IT skills and difficulty in attracting new development talent
- **Limited ability** to exploit technology innovations without retraining traditional developers to Java

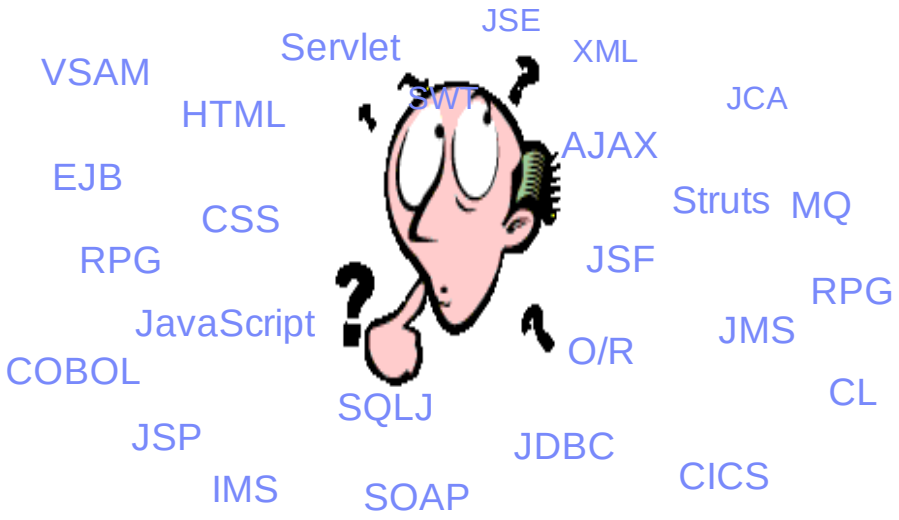
What you want…

- **Increased mobility** of existing "business-knowledgeable" staff on multi-platform projects
- **Increased capacity** by deploying new employees on any project independent of target platform
- **Increased productivity** by leveraging solutions that hide underlying platform and technology complexity



A new survey shows that a growing shortage of IT skills has put upward pressure on salaries as employers choose experienced workers over graduates. CBC News, Survey reveals 'sobering' IT skills shortage, July 16, 2007. Link

Is retraining an option?

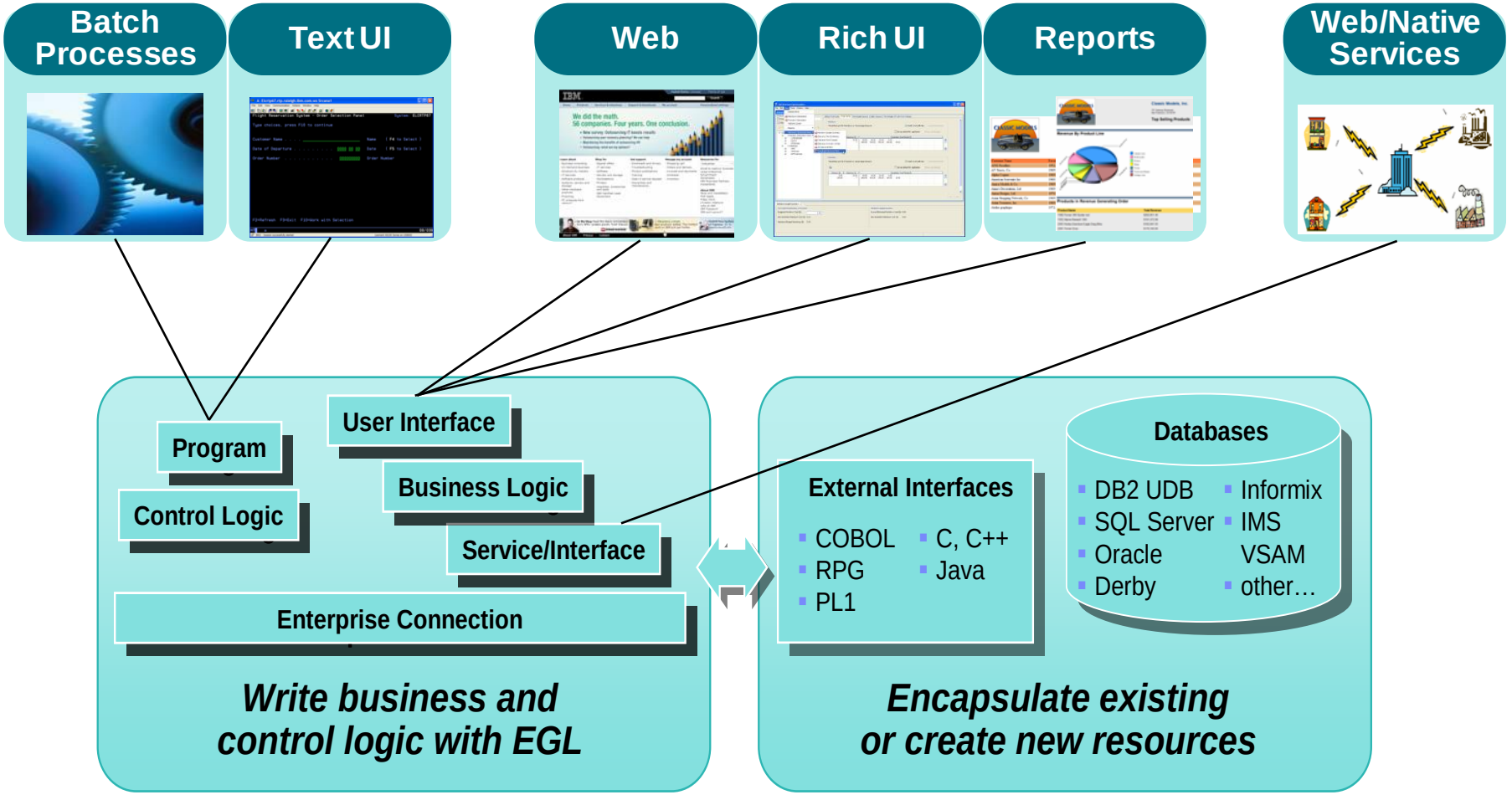


- High costs
- Business pressure may not afford time
- Results may be sub-optimal
- Some may not make it
- End up with poorly written applications

© 2007 IBM Corporation

Application Flexibility

End-to-end development for a broad variety of applications



© 2007 IBM Corporation

Rational Business Developer Extension (RBDe)

Empowering developers to quickly become productive with EGL

- Robust, unified approach to end-to-end construction of applications and services
- Developers are shielded from intricacies of runtimes and middleware

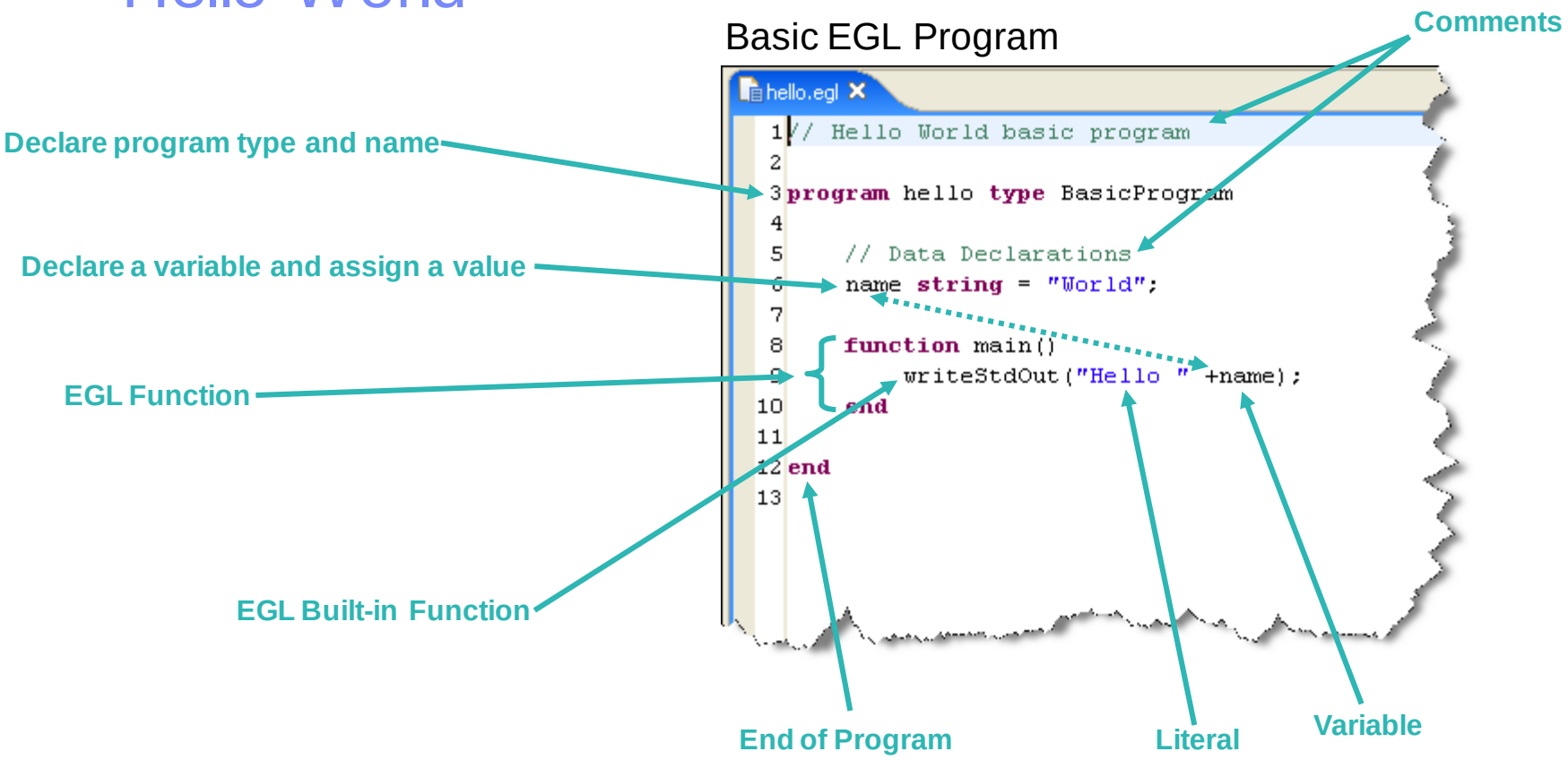
© 2007 IBM Corporation

The power of the Language

Simple and familiar

Hello World

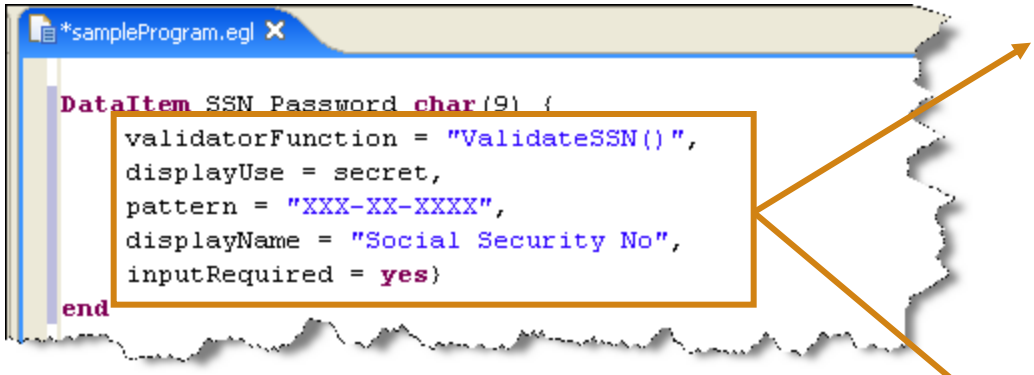
Basic EGL Program

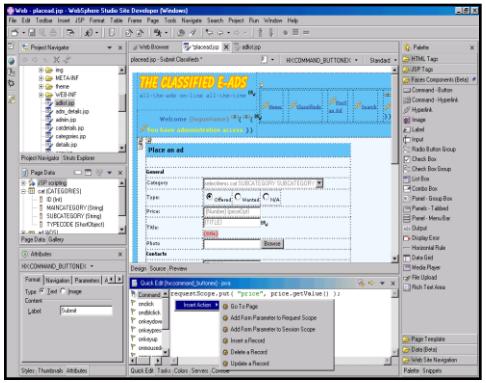


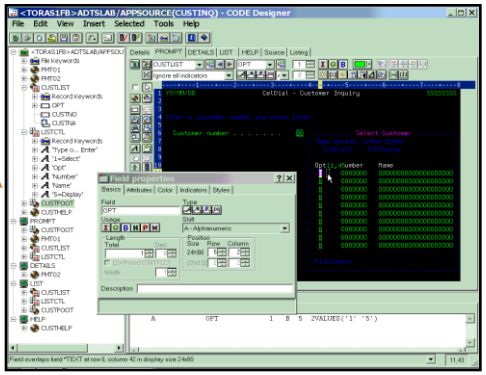
© 2007 IBM Corporation

The Power of Declarative Programming

- Validation/Editing Rules
  - Set properties in “Data Items”
  - Define formatting & validation rules in a common place
  - Reuse data items for Records, screens, web pages, reports







Consistently applied whether the data is bound to a field in a JSF-based web page or a field on a 3270 console screen.

© 2007 IBM Corporation

The Power of Abstractions

- Data access
  - Access SQL, Indexed, Relative, Serial, DL/I, and Service data through “Records”
  - Use common Verbs for data access (**Get, Add, Replace, Delete**)
  - Have complete access to SQL statements when needed
  - Use common Error Handling

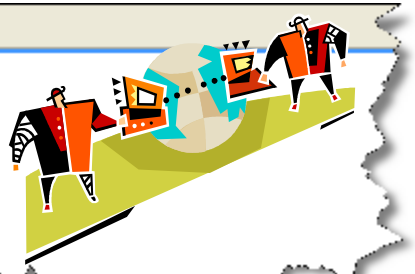
*sampleProgram.egl

```
function allLoans()
    loans LoanRec[];
    get loans;
end
```

- Remote Invocation
  - Call COBOL, RPG, C, Java
  - Keep linkage info separated from code
  - Resolve data mapping and protocol invocation at runtime… NO code necessary!

*sampleProgram.egl

```
function callHelloWorldOniSeries()
    salutation char(30);
    call helloworld salutation;
end
```



© 2007 IBM Corporation

The Power of Abstractions

Annotations & stereotypes expressing complex semantics

- Annotations specify the mapping between records and database tables
- EGL statements are polymorphic with respect to stereotyped operands (e.g. get, add, delete)

```
Record Order type IndexedRecord {...} ...

Record Employee type SQLRecord {
  tableNames = [ "Employee" ],
  keyItems = [ssn]
}
  ssn SSN { columnName = "SSN" };
  name Name { columnName = "Name" };
End

Function MyFunc()
  order Order; employee Employee;
  get order;
  get employee;
End
```

Stereotypes

This information is used to:

- Generate DB access code
- Provide info to IDE for user assistance

Access a SQL database

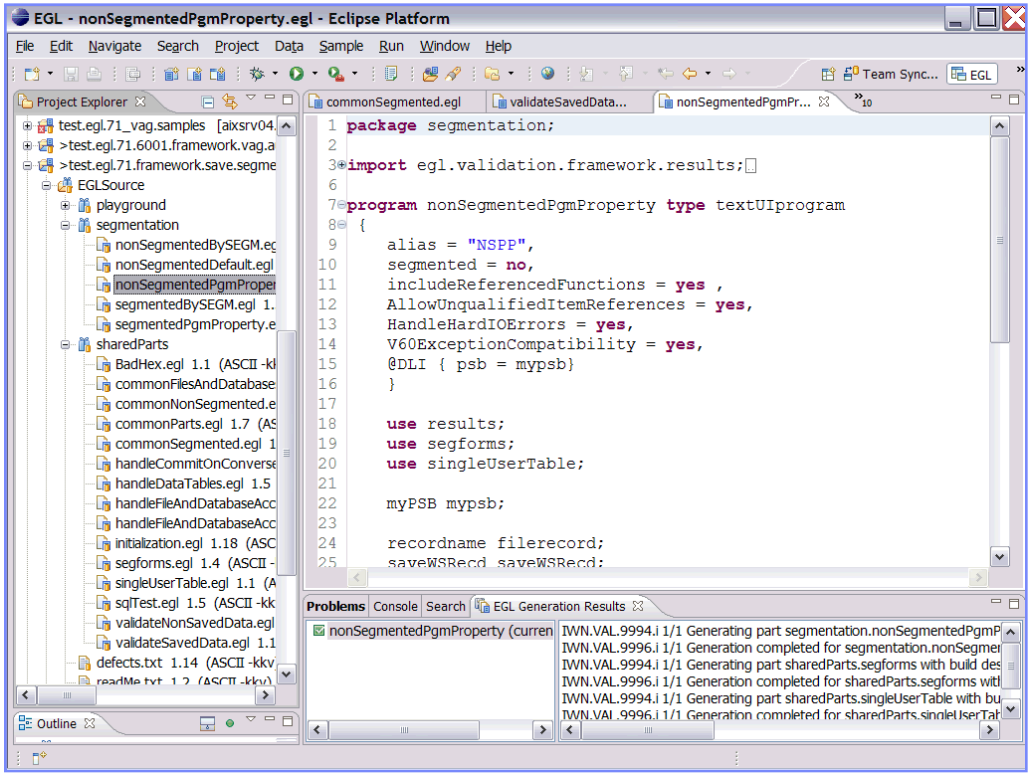
Access a file

© 2007 IBM Corporation

The Power of Tools

First class Eclipse workbench

- Folders and views
- Smart EGL editor
- Code templates and snippets
- Code completion
- Import data items from tables
- SQL visualization and editing
- SQL validation
- References and declarations
- Open on selection
- Refactoring
- Cheat sheets and Dynamic help

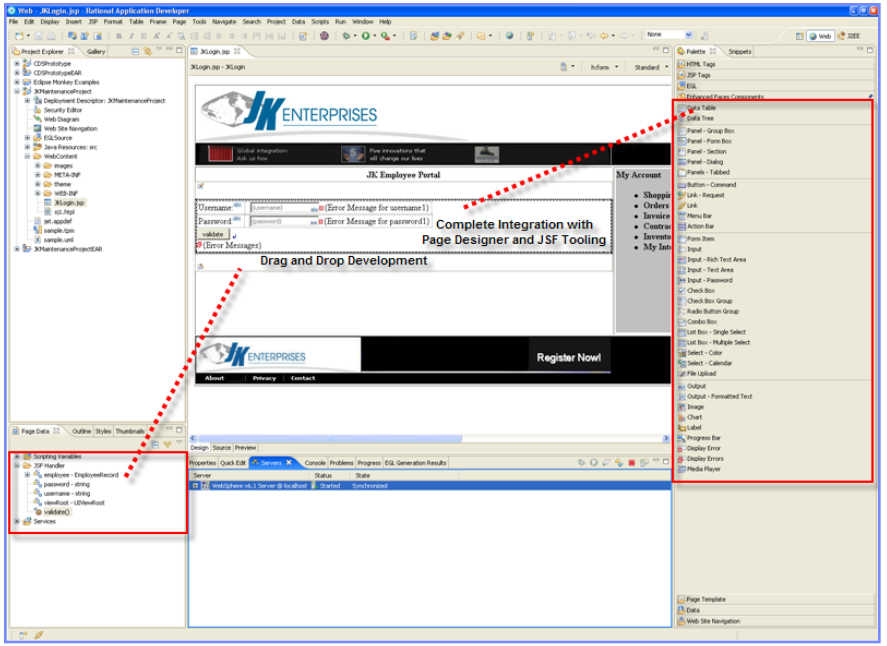


© 2007 IBM Corporation

The Power of Tools

Robust web development

- Integrate seamlessly with Page Designer and JSF tools
  - Drop EGL data structures on JSP
    - Validation, editing, formatting rules from EGL Data Items
    - UI controls rendered pre-bound to data declared in EGL Page
  - See EGL Server-side event handlers within context of page designer
- Wire EGL data to JSF w/o coding Java
- Handle JSP interactions with EGL
- Use built-in AJAX capability

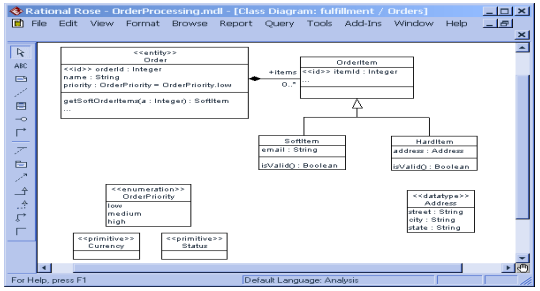


© 2007 IBM Corporation

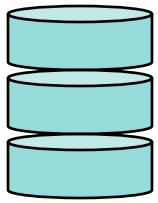
The Power of Tools

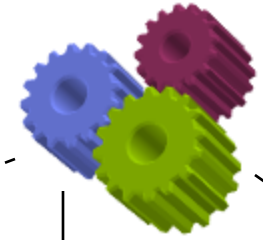
Model Driven EGL Development

UML Class Diagram

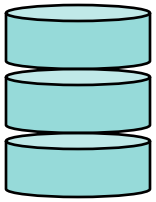


DB Schema

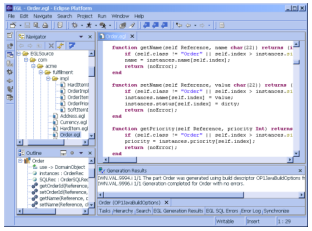




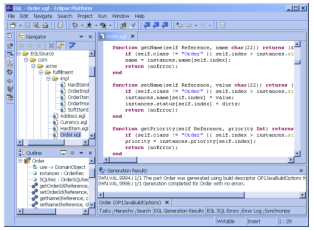
Transformation Engine



DB Schema



EGL Records and Items



EGL Functions
Libraries or Services

JSF Pages

© 2007 IBM Corporation

The Power of Services

Concepts built into the language

- Service part
  - **EGL Service** - accessed from EGL code using a local or TCP/IP connection
  - **EGL Web service** - accessed from any code using a HTTP connection

customerService.egl

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

- Interface part
  - Access external services as EGL services

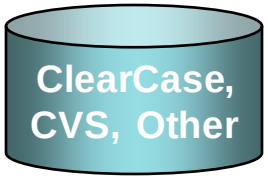
customerService.egl | creditCheck.egl

```
// interface
Interface creditCheck

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

© 2007 IBM Corporation

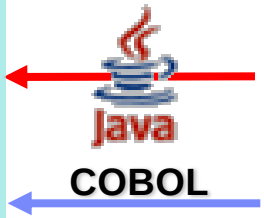
The Power of Native Deployment

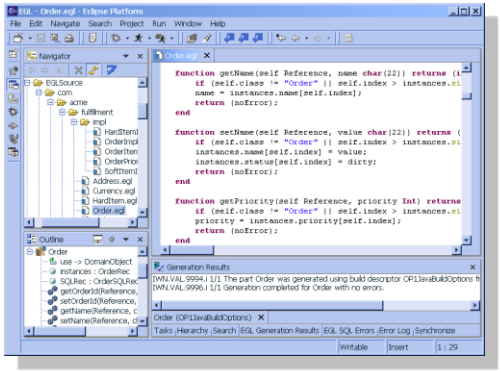


EGL
program/library/service

System z

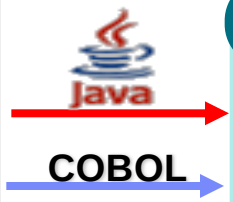
- WebSphere
- USS
- Linux
- Batch
- CICS
- IMS*





Windows, Linux, Unix

- WebSphere
- Tomcat
- Native



System i

- WebSphere
- Tomcat
- Native i5OS
- Native i5OS

* Planned (1H08)

© 2007 IBM Corporation

Scenario

- I need my COBOL or RPG developers to do Web Services and Web?

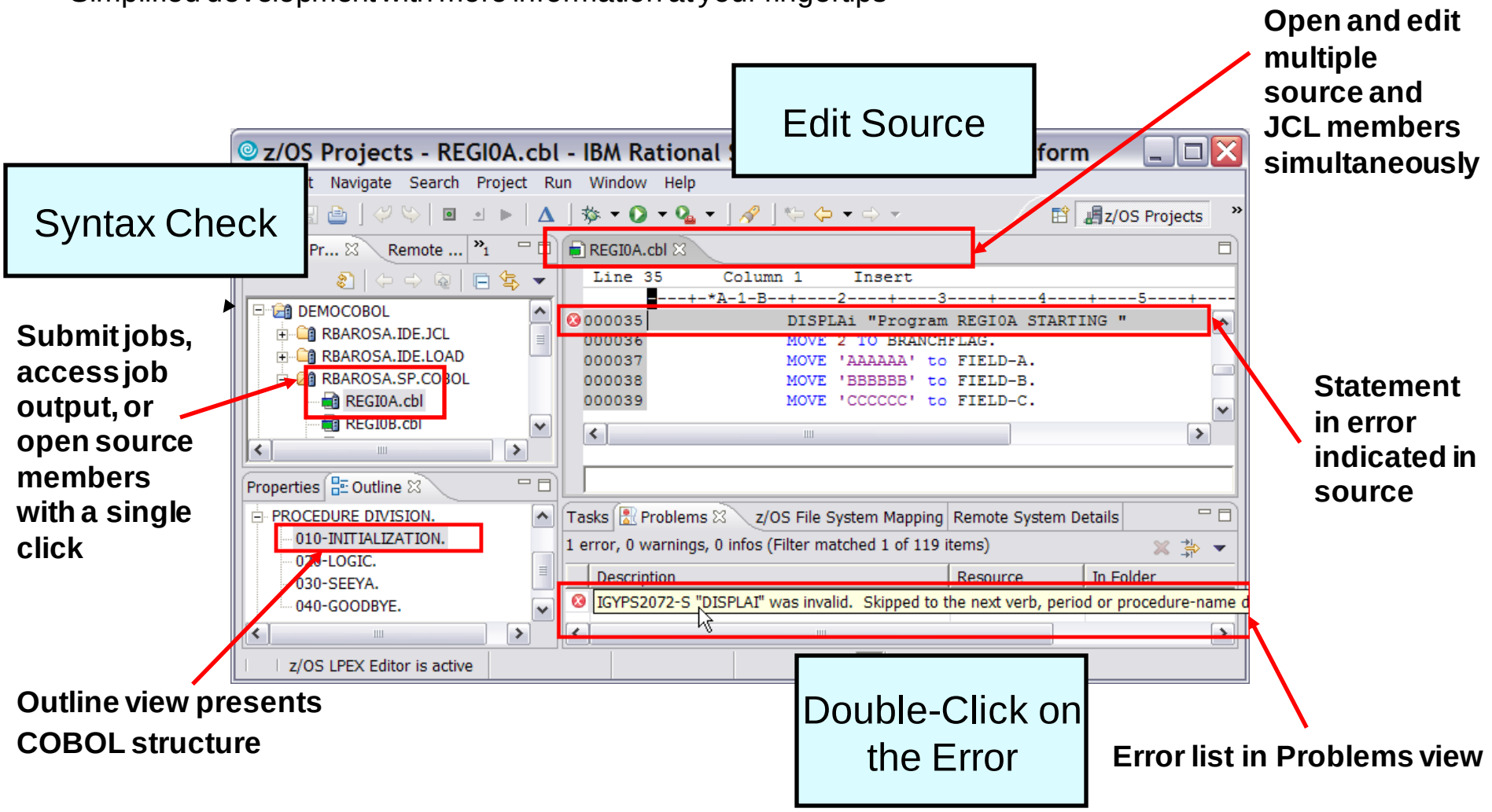
- Our Recommendation
  - Web enable existing COBOL and RPG with RDz / i (WDSC) at the same time improving productivity for core development activities
  - Introduce EGL: The “newest” business language for System z and System i

- Rational Solution:
  - Rational Developer for System z/i(WDSC)
  - Rational Business Developer Extension

© 2007 IBM Corporation

RDz-based development

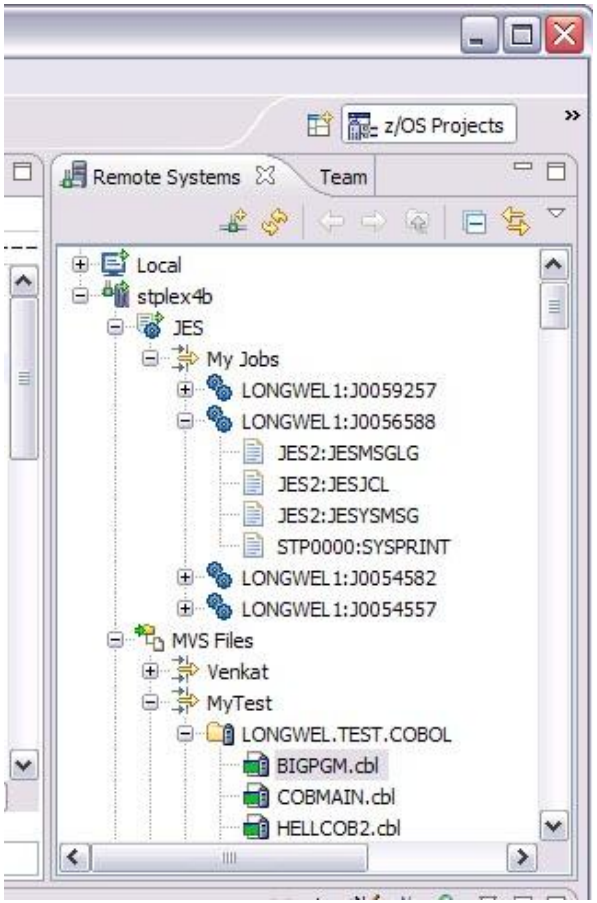
- Common development environment for COBOL, PL/I, C/C++, and Java
- Simplified development with more information at your fingertips

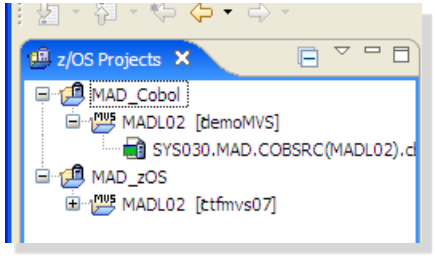


© 2007 IBM Corporation

Navigate datasets or jobs live on zOS

- Connect to multiple hosts concurrently
- Respects existing security configurations and user IDs
- Search, filter, browse, edit, compare, migrate, and allocate new MVS datasets and USS files
- Copy source code, members, or datasets between systems with a few mouse clicks.
- Access JES queues submit jobs, view job state, and open output spools
- Submit TSO or USS commands
- Add datasets and members into projects to group applications and work items together logically
- Open an emulator in the IDE to configured hosts

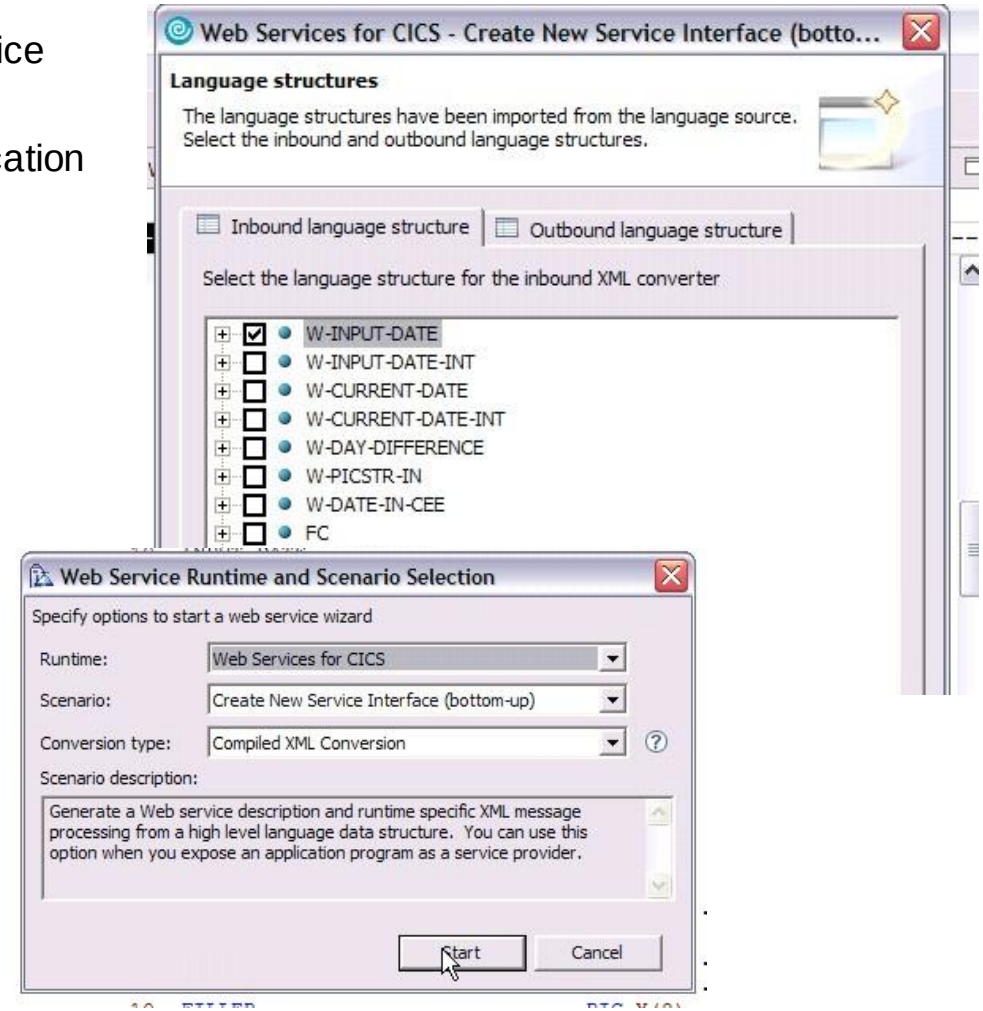




© 2007 IBM Corporation

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



© 2007 IBM Corporation

What's new in RDz V7.1

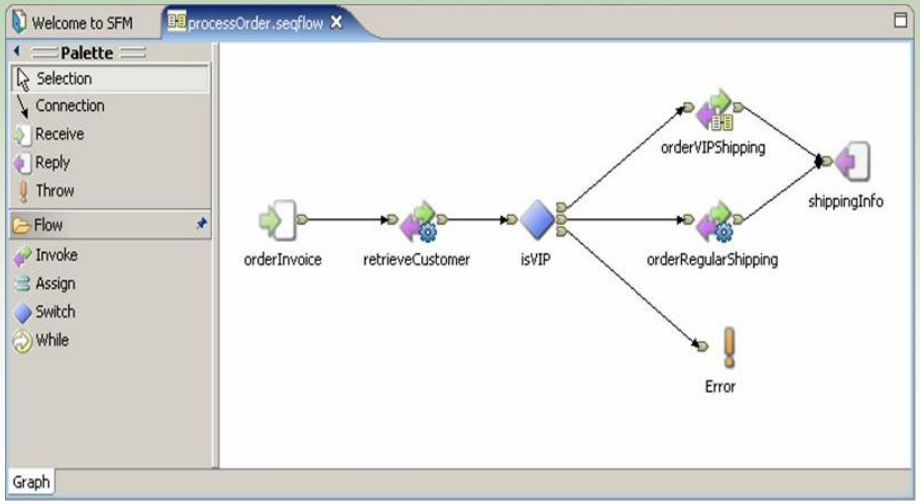
- Easier to configure/more secure host connection servers
- zOS Development tools
  - Support for CICS TS V3.2 and DB2 V9.1
  - Improved outline view
  - LPEX Editor enhancements including code templates, snippets insertion, and more ISPF commands
  - More DataSet filtering/search capabilities
  - WYSIWYG Map editor enhancements
  - New menu manager capabilities
- zOS Service Development
  - Support for CICS TS V3.2 web services and Service Flow Runtime V3.2 including channel and container application support
  - PLI support for web service creation
- Enhanced SCM integration
  - Enhanced APIs for roll-your-own SCM integration
  - Support for working with zOS resources in Rational ClearCase
  - More Integration of SCLM DT into RDz development tooling
- More Problem Determination tool integration
  - Access to File Manager for Browsing/Editing VSAM datasets
  - Access to Fault Analyzer problem reports for diagnosing application failures.

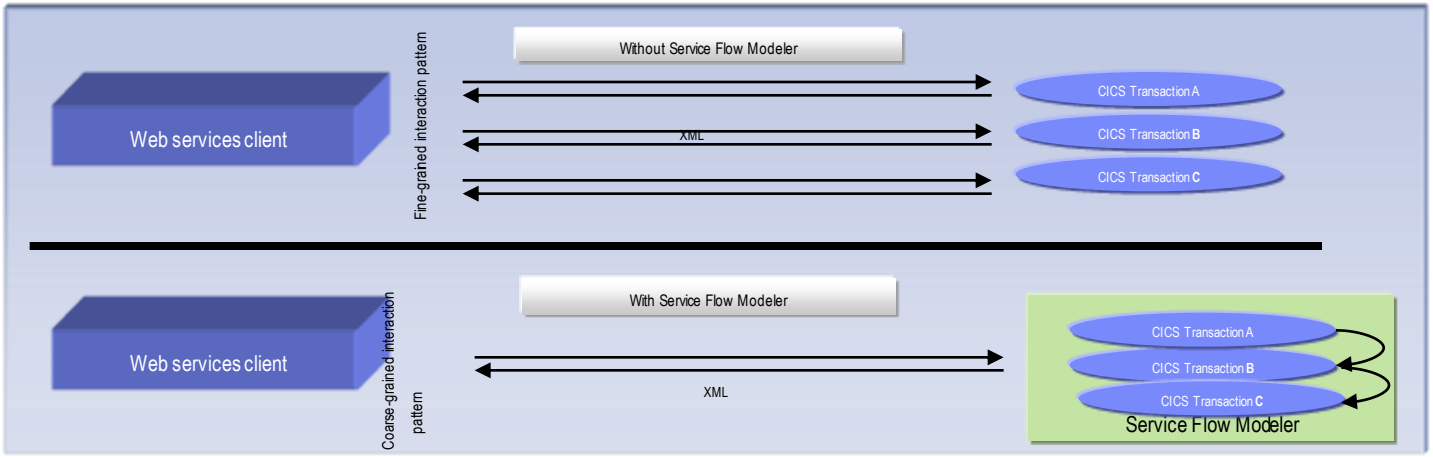
© 2007 IBM Corporation

What is Service Flow Modeler

New Feature! *Service Flow Modeler in Rational Developer for System z*

- **Builds Web services from existing CICS applications**
  - Aggregates multiple CICS transactions into high-level business processes through visual modeling
  - Supports CICS BMS (terminal-based) applications & CICS commarea applications
  - Highly optimized CICS runtime supporting Web services and XML interfaces
  - New with V7.1 support for CICS Channels and Container based programs

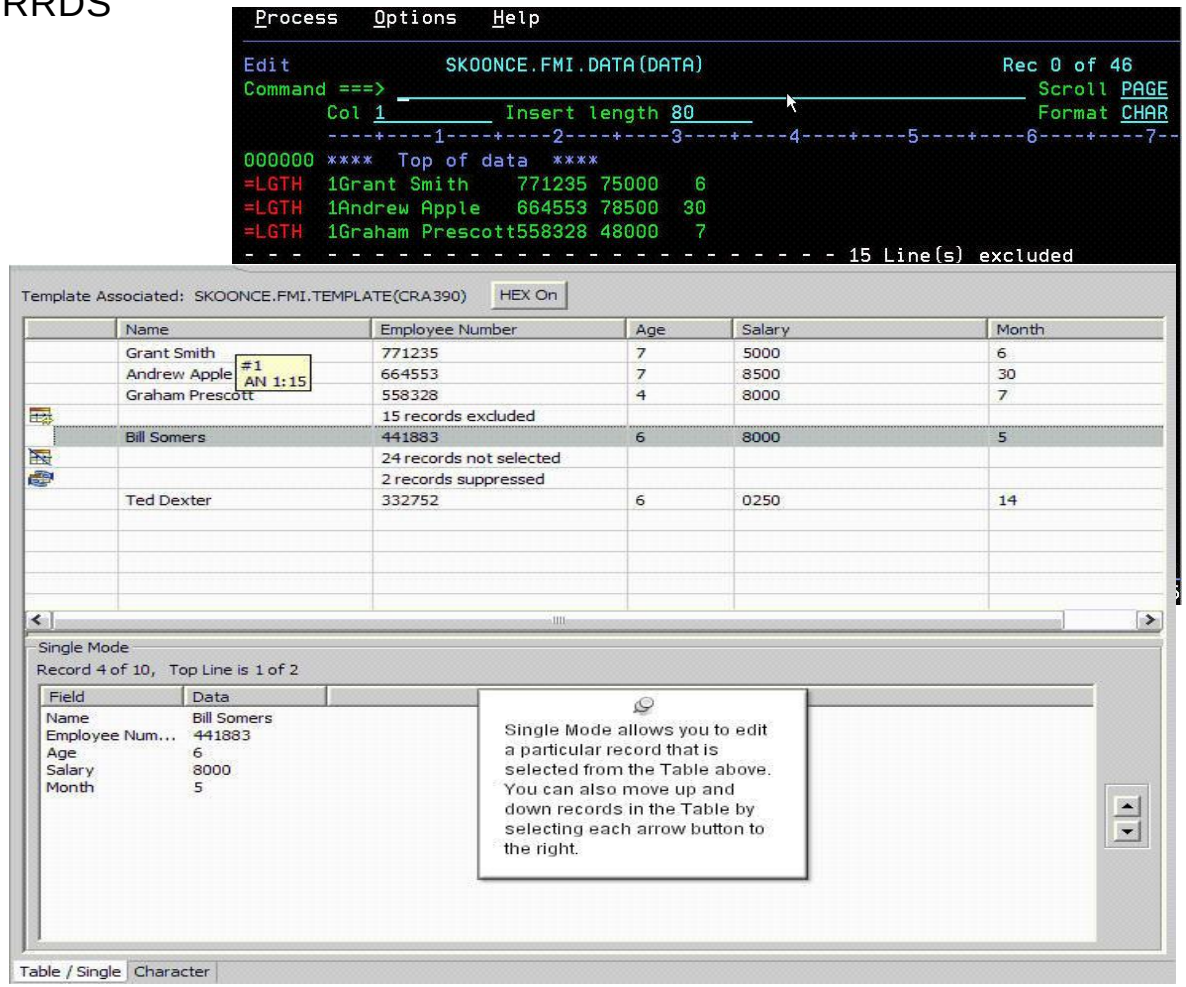




© 2007 IBM Corporation

File Manager Integration

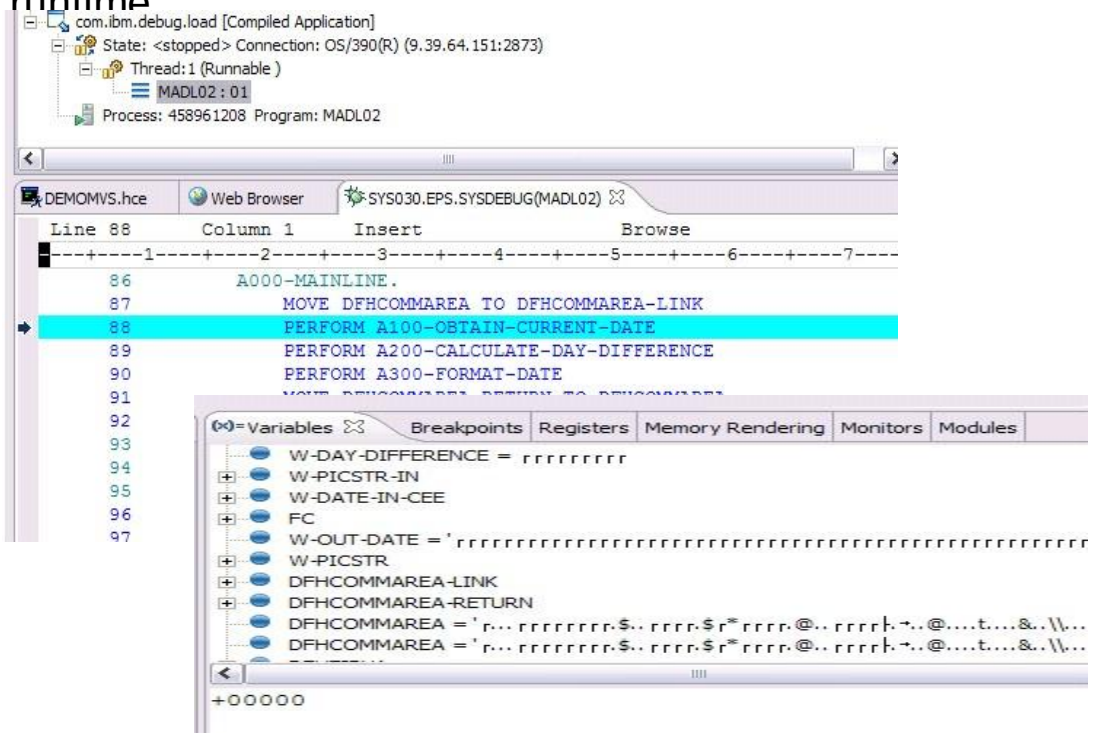
- Allows for a formatted edit session of many dataset types. Among the options are:
  - VSAM - KSDS, ESDS, RRDS, VRRDS
  - QSAM – PDS, SDS
- Multiple views of the data within the formatted edit session:
  - Table
  - Single Character
- Browse and alter VSAM data easily without having to leave your development environment
- Requires IBM File Manager



© 2007 IBM Corporation

Debug Tool Integration

- Use the cross-platform debugger to debug zOS applications as they execute in the runtime
  - CICS
  - IMS
  - DB2
  - Batch
  - Web Services
  - Etc
- From the workstation:
  - View executing source code
  - Step through host code line-by-line
  - Set breakpoints
  - Alter working storage values
  - View register values
  - Etc.
- Debug zOS and Distributed code in the same interface even stepping between runtimes and platforms!
- Requires IBM Debug Tool



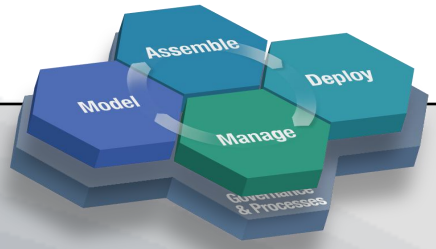
© 2007 IBM Corporation

Scenario

- I'm committed to Service Oriented Architectures? What is a simple roadmap to guarantee both early and ongoing success?
- Our recommendation
  - Document the Lifecycle – where are there holes, where are there deficiencies?
  - 3 key parallel paths forward
    - Implement Service Reuse and Management
    - Improve Development and Assembly
    - Evaluate Change and Release Management – including Deployment
- Rational solution:
  - Model and discover: Rational Asset Manager, WSAA, WSRR
  - Integration on ramp: Host Access Transformation Services
  - Develop and integrate: Rational Developer for System z, i(WDSC), RBDe

© 2007 IBM Corporation

System z Application Lifecycle



Model and simulate business processes

Model applications and data

Rational Software Architect

Understand, Identify and prepare existing assets for reuse

RAM/WSRR/WSAA /ATW /

Monitor and manage Business processes

WebSphere Business Modeler

Lifecycle Processes
ClearQuest, ClearCase, ReqPro, SCLM
BuildForge

N-Tier Visual construction

Tivoli WS Business Monitor

Monitor Business | **Model Business** | **Model Applications** | **Discover / Understand** | **Develop**

Rational Developer for System z / HATS / RBDE

System z Application Runtimes

Monitor Applications

Test | **Debug/ Deploy** | **Manage Data** | **Assemble**

Application performance, management and problem determination

Fault Analyzer ITCAM Omegamon Application Performance Analyzer

Functional and Load Testing

RPT/RFT

Application Test, Debug, and Deploy

Debug Tool Utilities and Advanced Functions

Data Creation, update

File Manager

N-Tier Model based Application and process generation

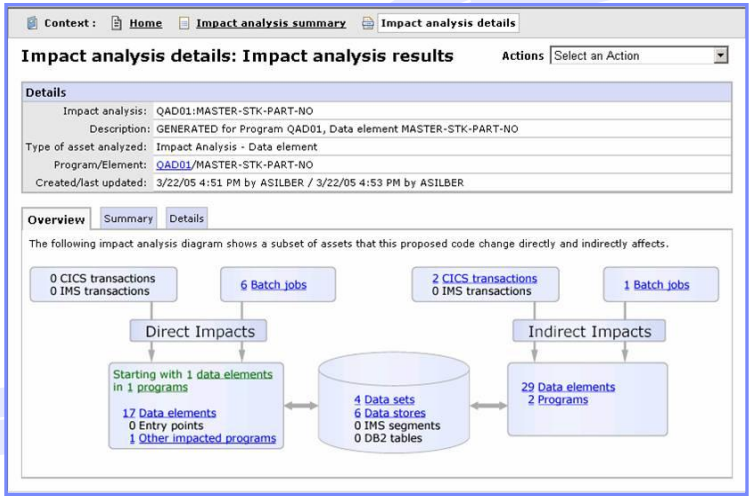
WebSphere Integration Developer

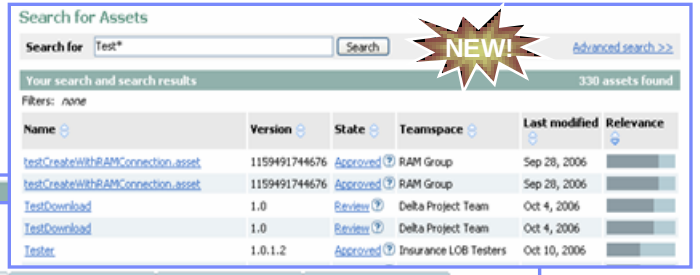
© 2007 IBM Corporation

Service Management for your Portfolios

Discover, understand, and leverage existing applications & services

- Manage assets across their lifecycle from design and creation to consumption and change with **Rational Asset Manager (RAM)**
- Understand existing assets and interdependencies using **WebSphere Studio Asset Analyzer (WSAA)**
- Discover potential services and refactor existing assets with **Asset Rational Transformation Workbench (ATW)**
- Deploy and manage runtime services using **WebSphere Service Registry & Repository (WSRR)**





© 2007 IBM Corporation

Bridge the gap between services and processing

Manages information that is useful for developing, re-using and managing all types of *reusable assets*

Manages information that is useful for the runtime operation, management and development use of *services*

ClearQuest | ClearCase | Software Architect

CICS/IMS | Generic Client (.Net or other) | ESB, Message Broker | Process Server

Rational Asset Manager

Define | Search/ Retrieve | Create/ Modify | Measure | Govern

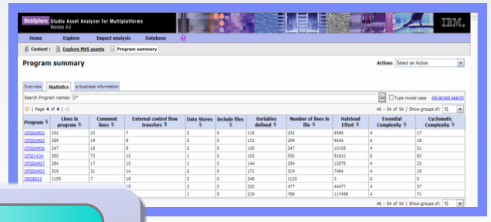
Federated Search And Publish

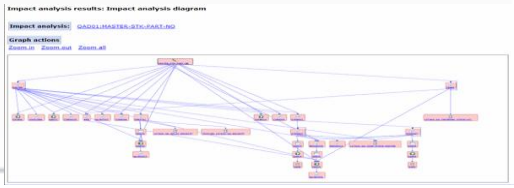
WebSphere Service Registry and Repository

Publish | Find | Enrich | Manage | Govern

WebSphere Asset Analyzer/Asset Transformation Workbench

Measure Quality | Evaluate Standards | Validate Architecture | Mine Business rules | Understand Impact | Estimate Change





Capabilities:

- Gain asset clarity with respect to assets, services and relationships
- Combine logical and physical views of service(WSDL) assets and processes
- Discern application impacts of services and underlying processing
- Publish and manage assets across organizations

© 2007 IBM Corporation

Host Access Transformation Services

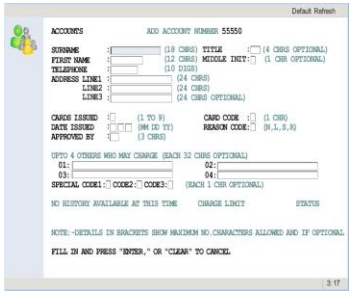
Modernize user interfaces and create Web Services

- 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

Web

- Zero footprint
- View through your favorite browser

Portal

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

Web Service

- Build self-service transactions

© 2007 IBM Corporation

Scenario

- I'm not getting enough out of my IT organization? What can I do.
- Our Recommendation
  - Evaluate organizational productivity bottlenecks
- Rational Lifecycle Solution:
  - Rational ClearCase for System z
  - Rational ClearQuest for System z
  - Rational BuildForge for System z
  - Extend to ReqPro, RPM, Method Composer

© 2007 IBM Corporation

Processes and tools modernization

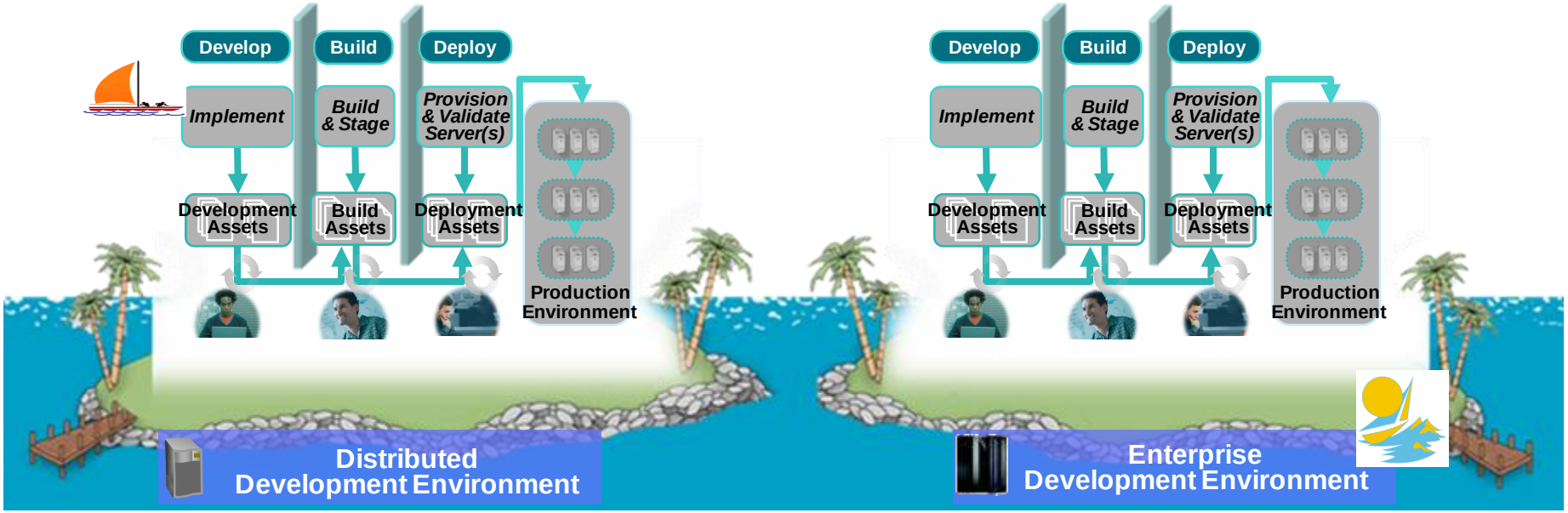
Challenge of IT development islands

What you have…

- **Different infrastructures** for host and distributed development limiting IT and staff flexibility
- **Increased costs** to support multiple infrastructures, with less capital available to invest in new projects
- **Lack of traceability** inhibiting end-to-end governance

What you want…

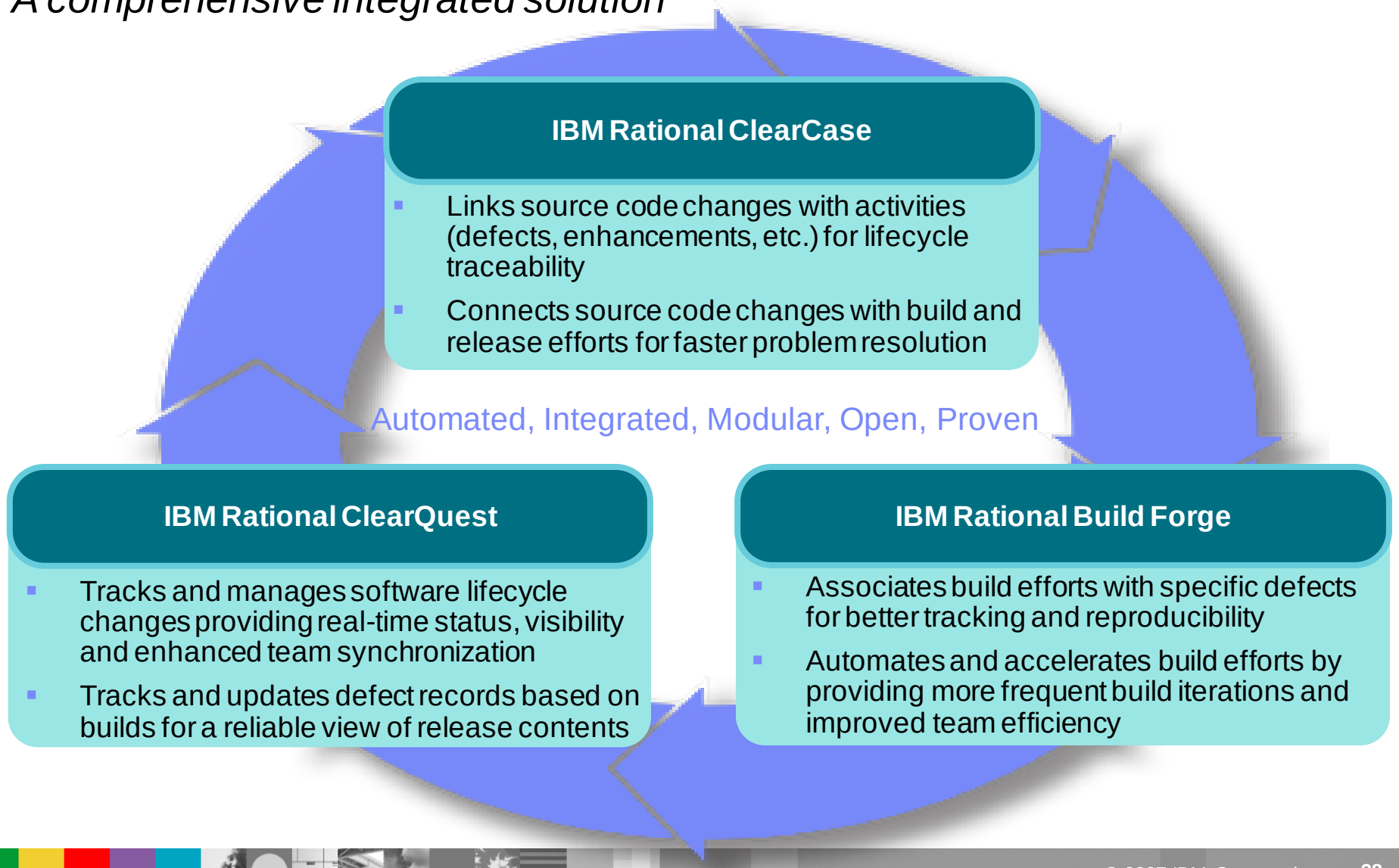
- **Consolidated** towards a single infrastructure for host and distributed development environments
- **Improved efficiency** and reduced costs by eliminating duplicate tools and processes
- **Improved governance** and traceability across the entire software lifecycle



© 2007 IBM Corporation

Our exclusive solution

A comprehensive integrated solution

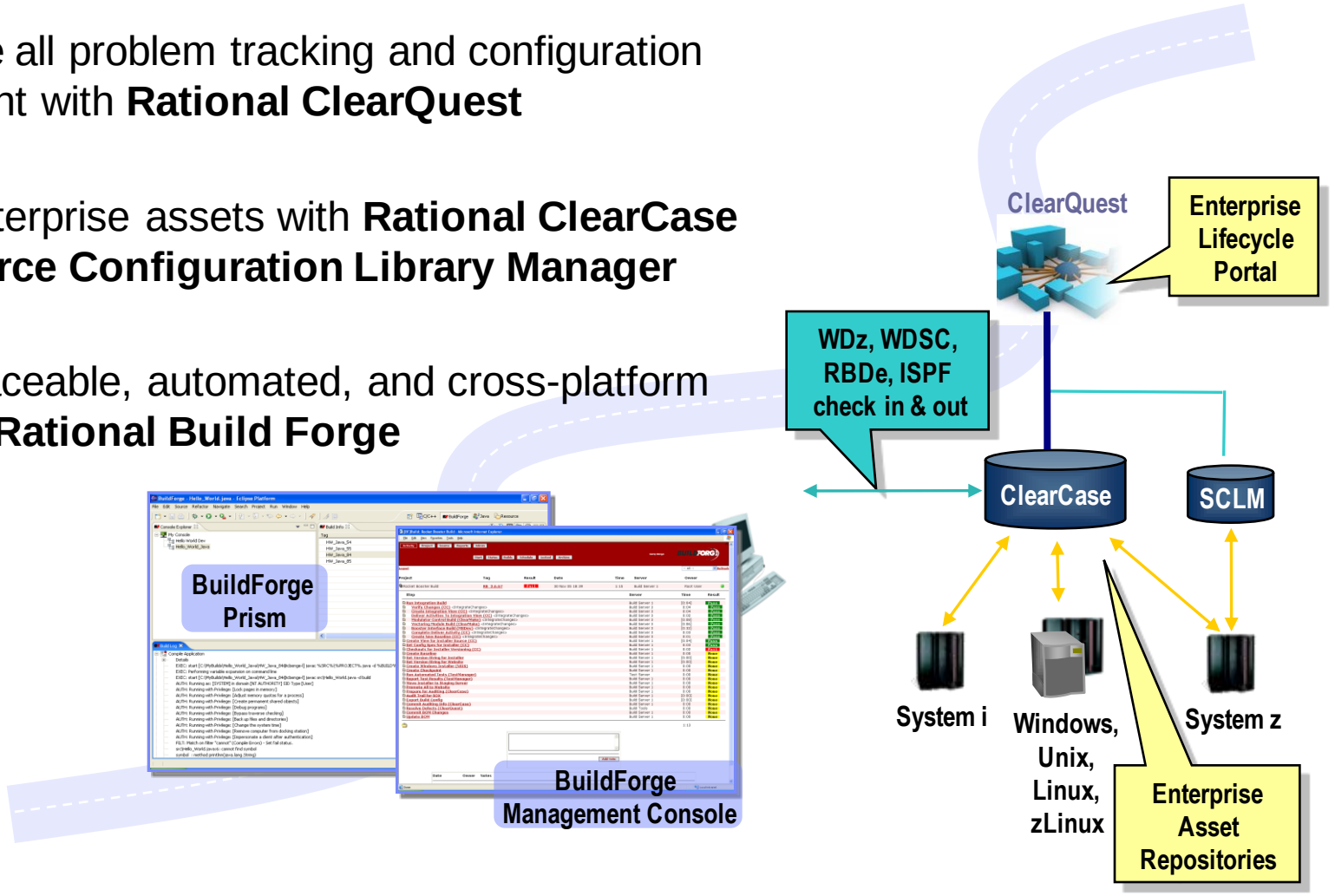


© 2007 IBM Corporation

Modernize Your Team Infrastructure

Provide coordination, traceability, consistency across platforms

- Orchestrate all problem tracking and configuration management with **Rational ClearQuest**
- Manage enterprise assets with **Rational ClearCase** and/or **Source Configuration Library Manager**
- Produce traceable, automated, and cross-platform builds with **Rational Build Forge**

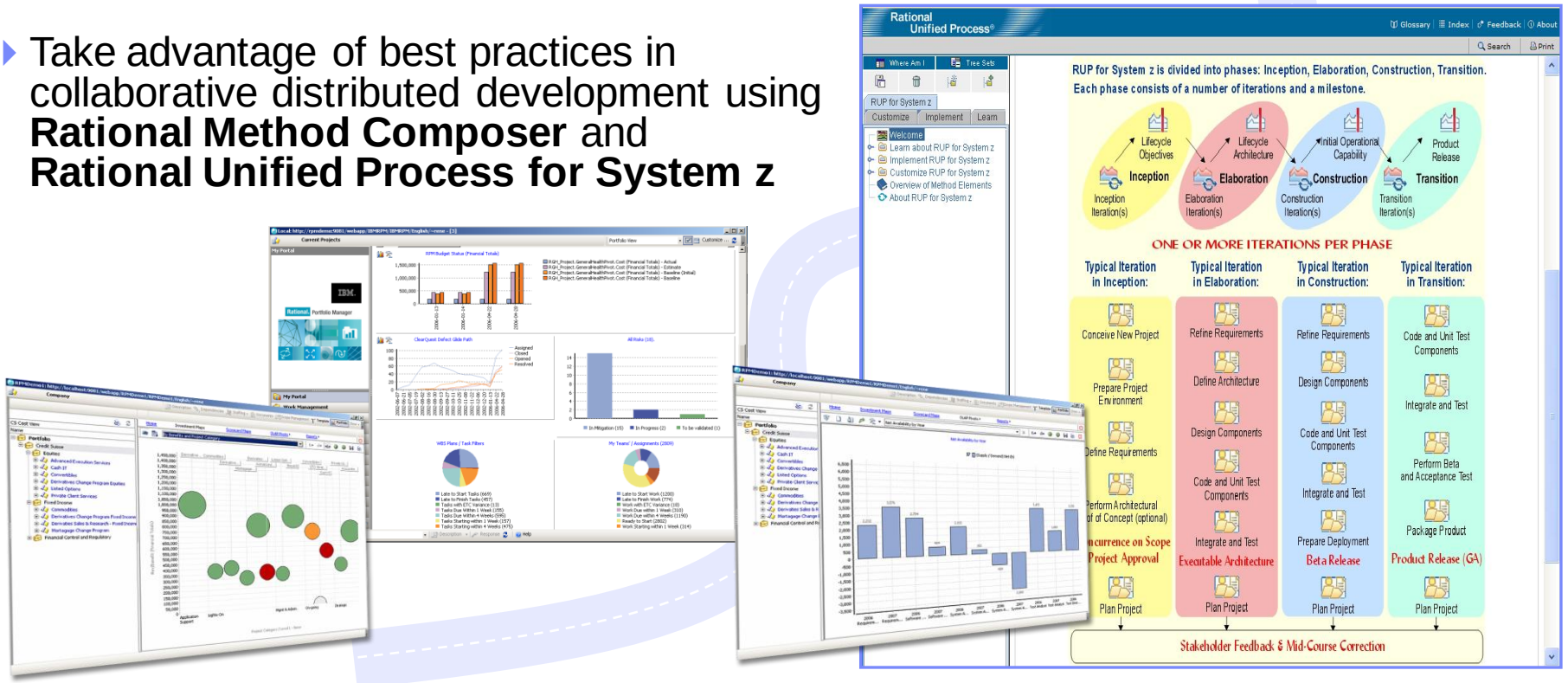


© 2007 IBM Corporation

Modernize Your Processes

Centrally manage requirements, processes, activities, projects

- Manage requirements for both distributed and enterprise projects with **Rational RequisitePro**
- Provide a unified dashboard for your organization with **Rational Portfolio Manager**
- Take advantage of best practices in collaborative distributed development using **Rational Method Composer** and **Rational Unified Process for System z**



© 2007 IBM Corporation

Summary

Value of:

- Modern vs. Traditional Applications
- SOA and Reuse
- Existing portfolios and processing
- Developers and skills
- Increasing productivity
- Managing and lowering costs

© 2007 IBM Corporation

Learn more at:

- IBM Enterprise Modernization Solutions
- IBM Rational Software Delivery Platform
- Process and portfolio management
- Change and release management
- Quality management
- Architecture management
- Rational trial downloads
- developerWorks Rational
- IBM Rational TV
- IBM Rational Business Partners

© **Copyright IBM Corporation 2007. All rights reserved.** The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, these materials. Nothing contained in these materials is intended to, nor shall have the effect of, creating any warranties or representations from IBM or its suppliers or licensors, or altering the terms and conditions of the applicable license agreement governing the use of IBM software. References in these materials to IBM products, programs, or services do not imply that they will be available in all countries in which IBM operates. Product release dates and/or capabilities referenced in these materials may change at any time at IBM's sole discretion based on market opportunities or other factors, and are not intended to be a commitment to future product or feature availability in any way. IBM, the IBM logo, the on-demand business logo, Rational, the Rational logo, and other IBM products and services are trademarks of the International Business Machines Corporation, in the United States, other countries or both. Other company, product, or service names may be trademarks or service marks of others.

Thank You for Joining Us today!

If you would take a moment to fill out the feedback form which will display on the next slide, it would be greatly appreciated. Your comments are very important to us.

Go to **www.ibm.com/software/systemz** to:

- Replay this webcast
- View previously broadcast webcasts
- Register for upcoming webcasts

© 2007 IBM Corporation