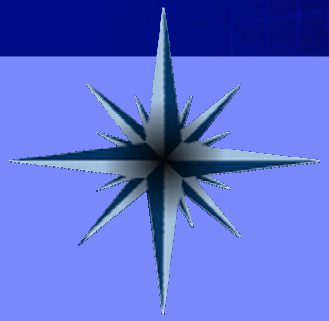
Enterprise Modernization

The Transformation of Application Development for System z

Hayden Lindsey

VP and Distinguished Engineer
IBM Rational Enterprise Tools & Compilers



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Agenda

- **Recent News**
- Key Messages
- Today's Realities
- IBM Rational Software
- Q&A

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Rational's Portfolio - Expanded for System z

Products moved from WebSphere to Rational

- Analysis, Design & Construction
  - WS Development Studio Client for System i (WDSC)
  - WS Development Studio Client Advanced Edition (WDSC AE)
  - Rational Developer for System z (RDz)
  - Application Development & Networking (AD&N)
- Project & Portfolio Management
  - WS Studio Asset Analyzer
- Change & Release Management
  - SCLM Advanced Edition
- Application Transformation
  - Rational Transformation Workbench
  - Host Access Transformation Services (HATS)
  - Web Facing Deployment Tool w/ HATS Technology (WDHT)
  - Host Publisher
- Host Integration
  - Host Access Client Package (HACP): Host On-Demand (HOD), Personal Communication (PCOMM)
  - Host Integration Solution (HIS): HOD, PCOMM, HATS or WDHT, Communication Servers, AD Tools, WAS
- Automated Software Quality
  - TPNS

Product renaming will occur during the normal release cycle.

- Compilers
  - XL C for AIX Enterprise Edition
  - XL C/C++ for AIX Enterprise Edition
  - XL C/C++ for Linux Advanced Edition
  - XL C/C++ for Mac OS X Adv Edition – EOL 4/2007
  - z/OS XL C/C++
  - C/C++ for z/VM
  - XL Fortran for AIX Enterprise Edition
  - XL Fortran for Linux Adv Edition
  - XL Fortran for Mac OS X Adv Edition
  - COBOL for AIX
  - PL/I for AIX
  - Enterprise COBOL
  - Enterprise PL/I
  - VA C++
  - XML Parsers and XSLT Processors
- VisualAge Tools
  - VA Java
  - VA Pacbase
  - VA Smalltalk
  - Versata
  - VA Generator
  - VA COBOL
  - VA PL/I
  - VA RPG

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Key Messages

Businesses need to change to stay viable, and IT must enable this flexibility.

IT must overcome challenges to enable flexibility.

Challenges, such as:

- No inventory of current IT assets
- Complex, tightly coupled architectures
- Skills lock-in
- Islands of development
- No flexibility for new investments

The **IBM Rational Software Delivery Platform** helps companies overcome these challenges with comprehensive support for **enterprise modernization**.

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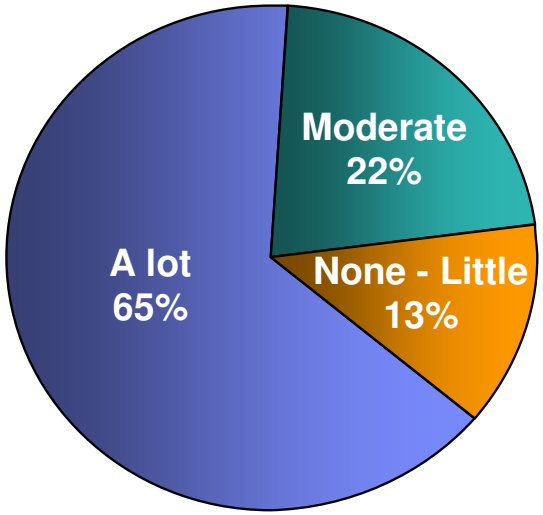
Enterprise Pressures and Opportunities

CEOs: extent of fundamental
change needed over the next two years



83% think it's likely that changes in a competitor's business model will change their industry

Source: IBM Global CEO Study, 2006

- commoditization pressures
- increased competition
- global marketplace opportunities
- adjacent marketplace opportunities
- global volatility and disruption
- competing business models

"Most organizations would like to use technology as a competitive weapon ... but they're not doing so because they have a performance-oriented mind-set." — IBM Global CEO Study, 2006

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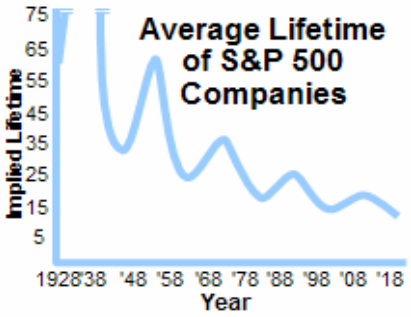
IT & Business Executive Pressures

Enable Innovation & Change



Increased competitive pressure to change and adapt while IT has an increasing role in every business process

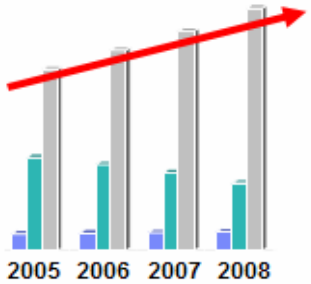
What IT wants to do!

Enact Compliance Mandates

The changing global regulatory and business environment requires security, privacy and ongoing audit capabilities

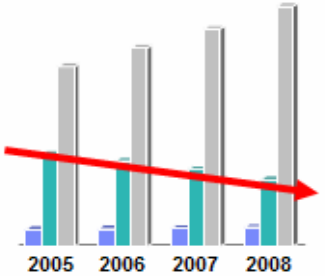
What IT must do!

Rising Cost of Operations



Operational costs continue to grow at 10% CAGR … twice the rate of the IT budget. The cost of failed projects & rework compounds the problem

Inability to Innovate



Application development & support budgets are shrinking at nearly 10% CAGR dropping from 50% to about 35% of total IT labor spend

Bottom line: IT flexibility enables business flexibility

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IT as a Core Business Process

"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 be successful, you must mature and modernize your IT tools and processes**
- **Companies face significant challenges getting from "here" to "there". These challenges include…**

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

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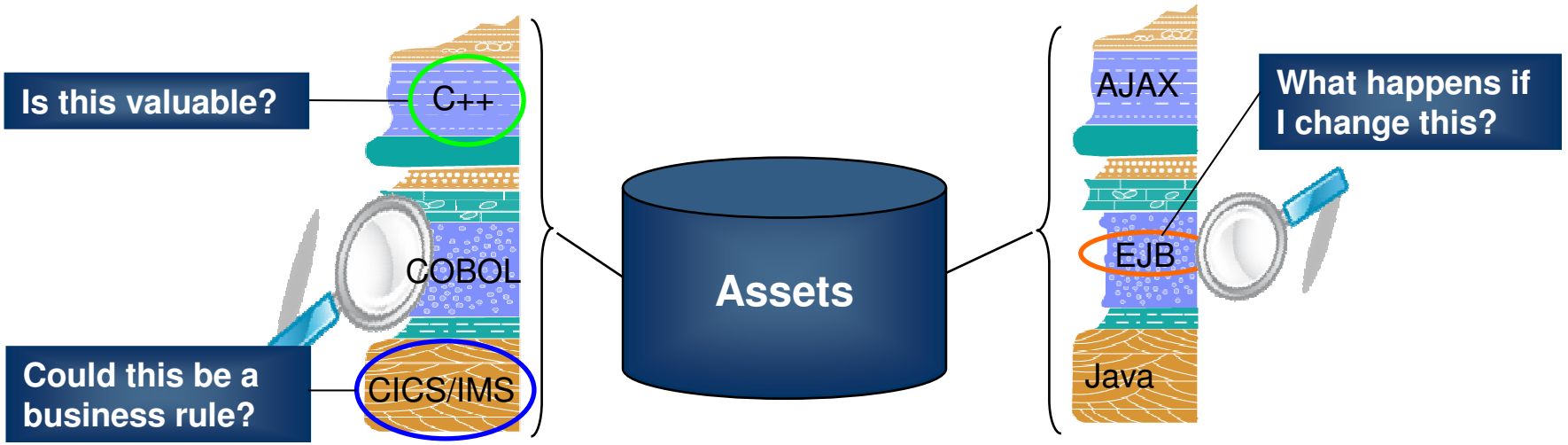
Challenge #1 No Inventory of Current Assets

- Makes it difficult to gauge impact of code changes w/o electronic dependency info
- Limits the ability to monitor quality of outsourced code
- Inhibits reuse of assets in new contexts (for example, as a service)
- Limits the ability to separate business rules from code



"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*

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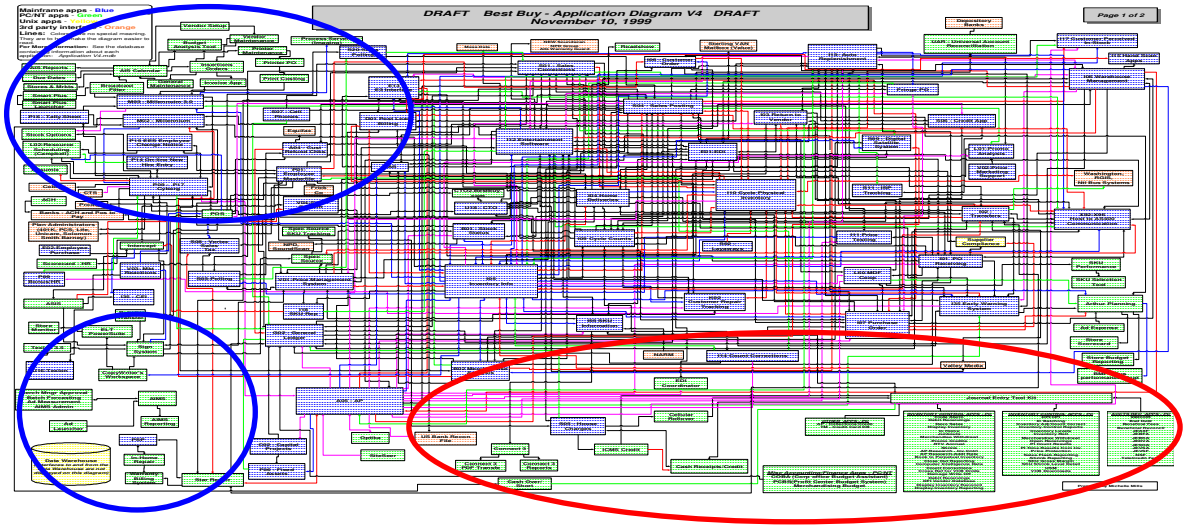
Challenge #2 Complex, Tightly Coupled Architecture

- Tight-coupling reduces flexibility and speed in moving to new technologies
- Complexity hampers the ability to reuse existing code for new projects
- Multiple implementation technologies and middleware limit code mobility



Legend:

= System z

= System i

"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

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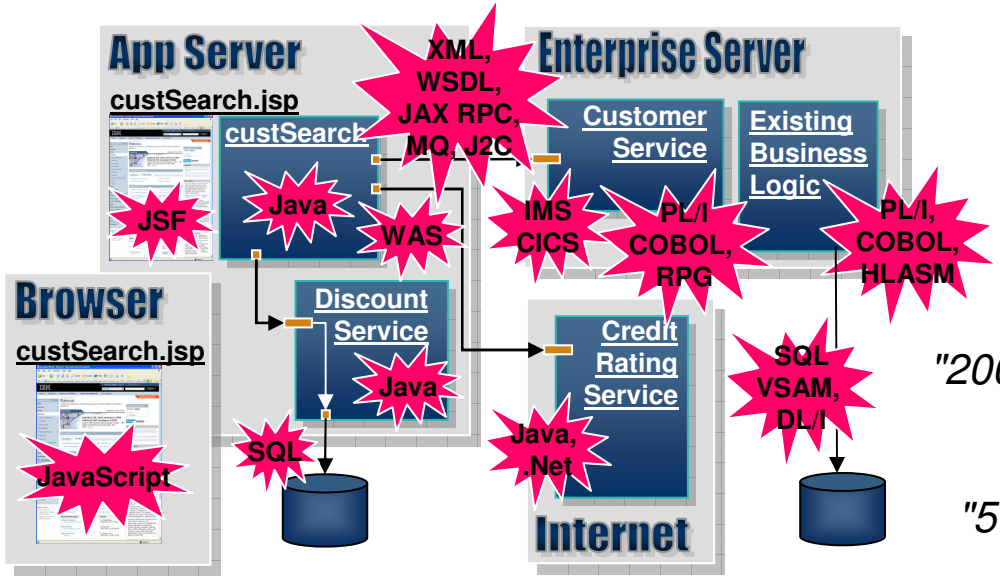
Challenge #3 Skills Lock-in

- Reduced capacity to maintain existing applications due to dwindling IT skills
- Difficulty in attracting new development talent
- Limited hardware innovation exploitation w/o retraining traditional developers to Java
- Constrained IT flexibility due to skills islands



"2M COBOL developers"
- Gartner

"200B lines of COBOL code in existence"
- eWeek

"5B lines of COBOL code added yearly"
- Bill Ulrich, TSG Inc.

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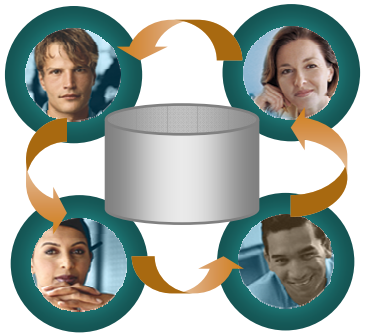
Challenge #4 Islands of Development

- Duplicate infrastructures limit flexibility, introduce errors, reduce productivity
- Multiple infrastructures incr. costs… less capital is available to invest in new projects
- Lack of traceability inhibits end-to-end governance



Distributed Development Environment

Enterprise Development Environment

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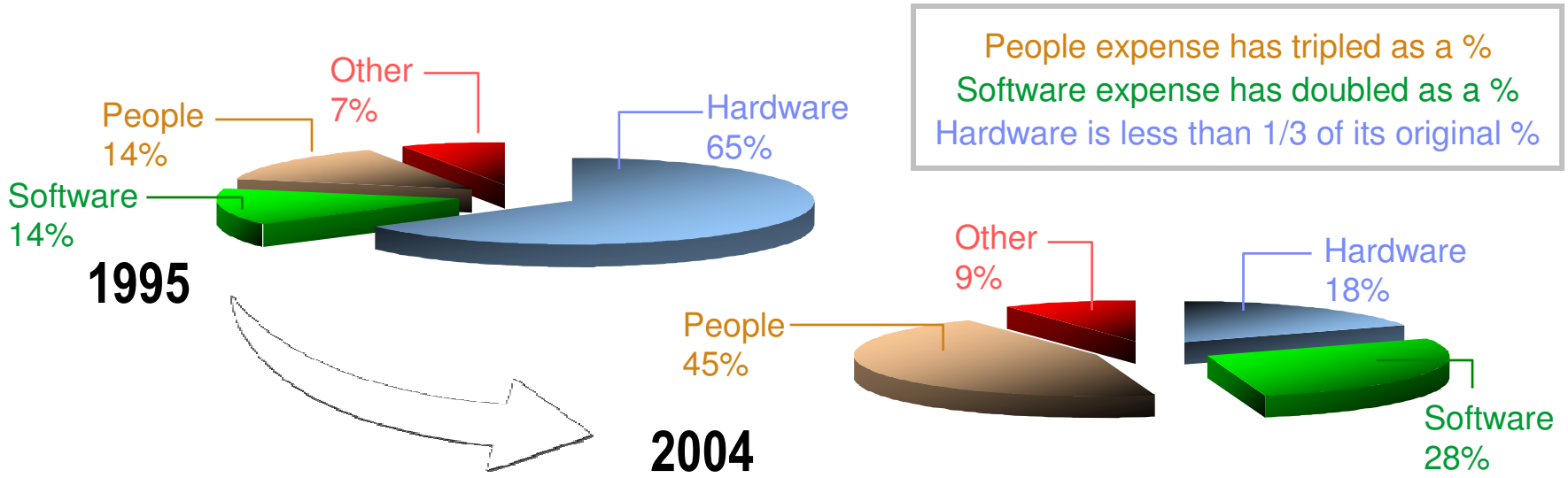
Challenge #5 No Flexibility for New Investments

- Resources are not available to exploit new opportunities
  - ~80% of IT budgets are used to maintain existing systems
- Systems stranded on expensive, unsupported, segregated development platforms
  - Cannot leverage new technologies and middleware advances
- No plan for enhancements that incrementally improve overall modernization posture



Over the past 10 years, the cost dynamics in IT has changed significantly.

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IBM Rational Software

Our brand value

Rational. software

Governing the business process of software and systems delivery

Decades of proven process expertise and customer success

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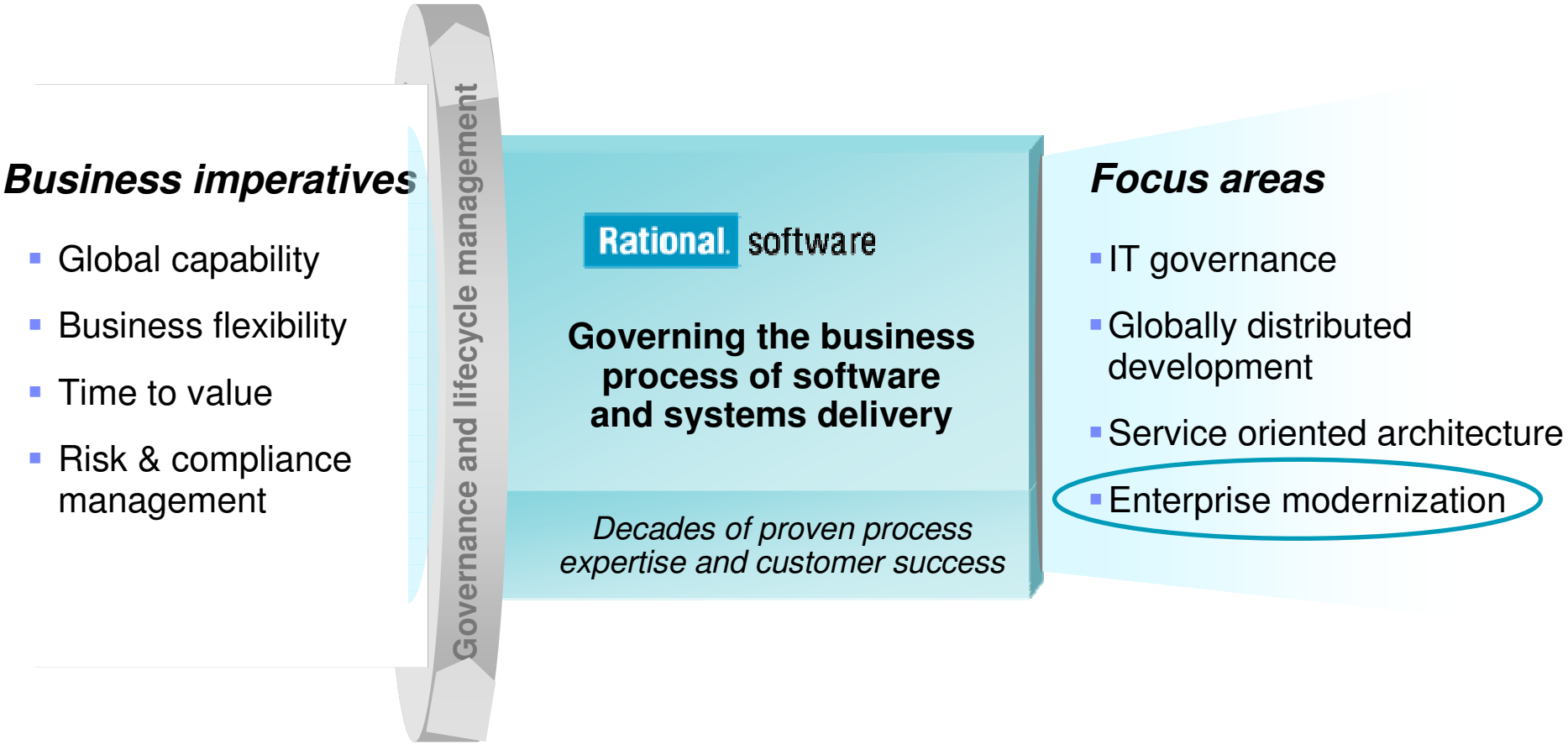
Enabling Transformation - Our Business Model

A strategic partner in business innovation and transformation



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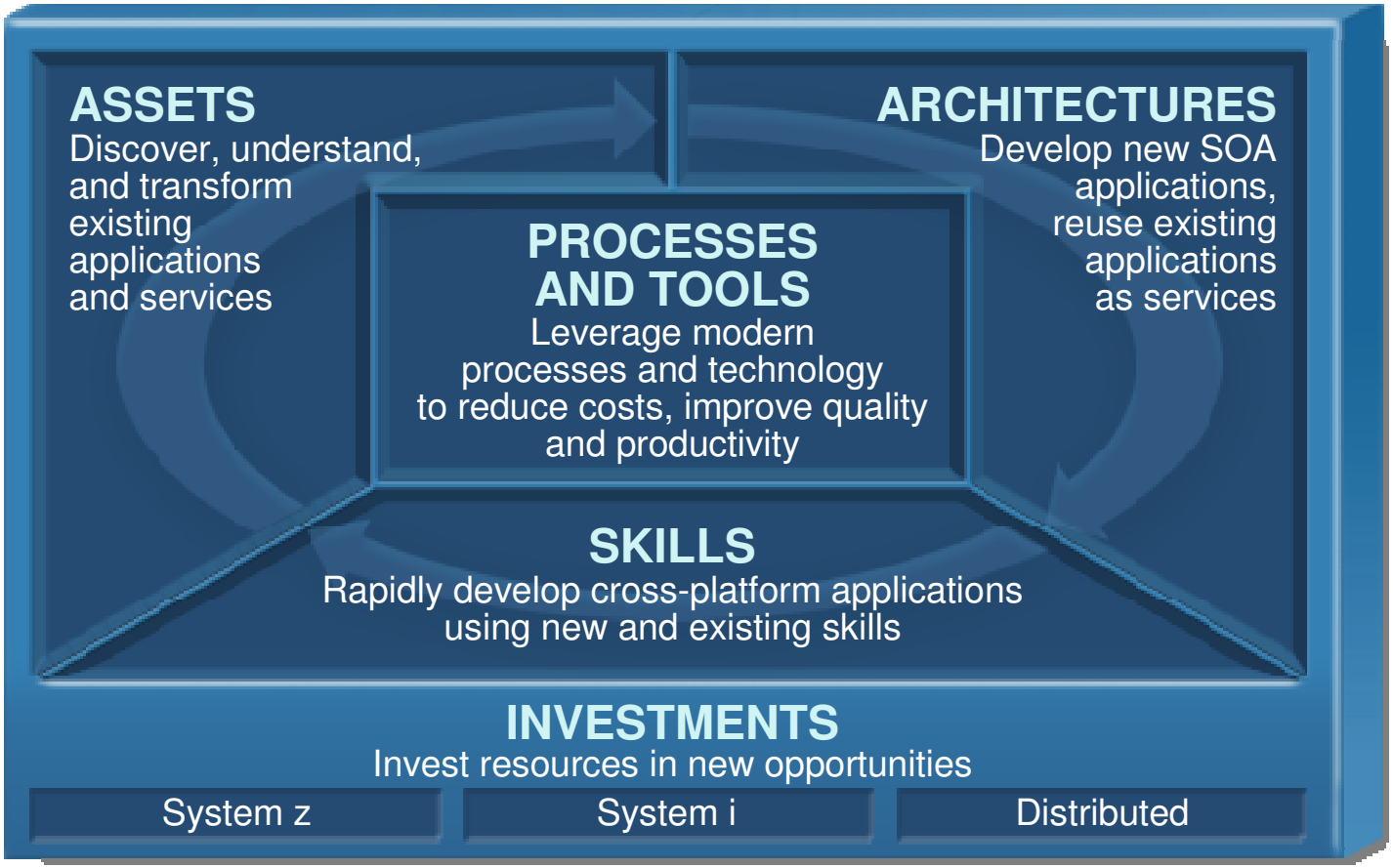
Aspects of Enterprise Modernization

Modernize your enterprise in the following areas to improve IT flexibility:



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Enterprise Modernization - The Road Ahead

- Consider common problem scenarios
- Establish a roadmap for how problems may be resolved
- Recognize that any road has multiple entry and exit points
- Find the right “on ramp” for *your organization*

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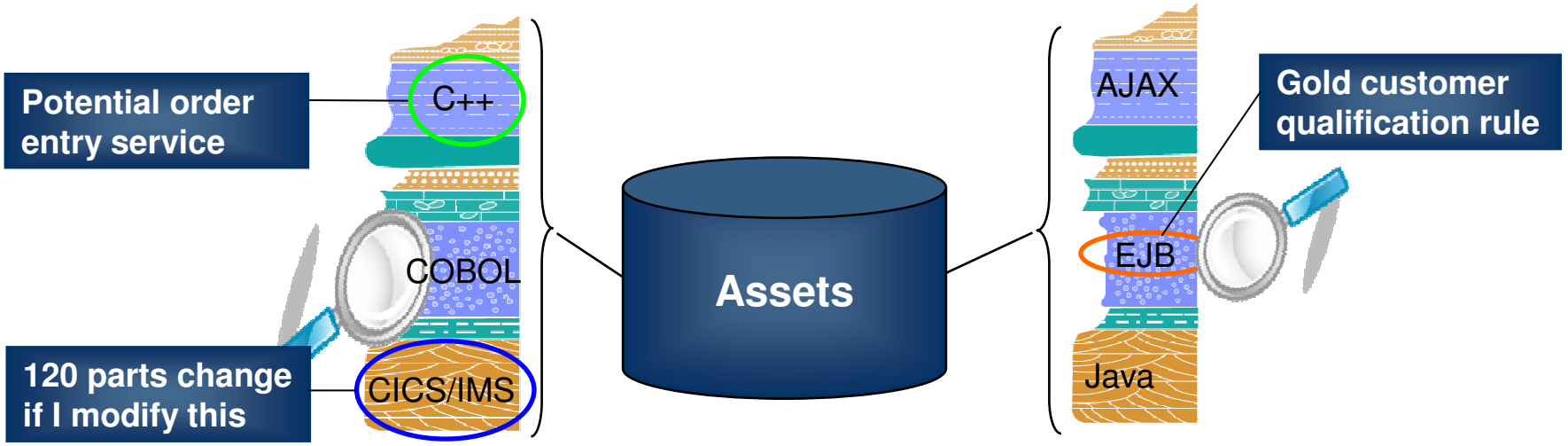
Modernize Your Asset Management

Comprehensive inventory of assets for reuse & modernization

- Discover and gain control over application relationships and structures
- Manage application complexity by making dependencies visible
- Extract business rules currently embedded in code
- Identify assets for reuse in a Service Oriented Architecture



Analyst studies: 5x less expensive to re-use existing applications than to write new ones.

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Modernize Your Asset Management

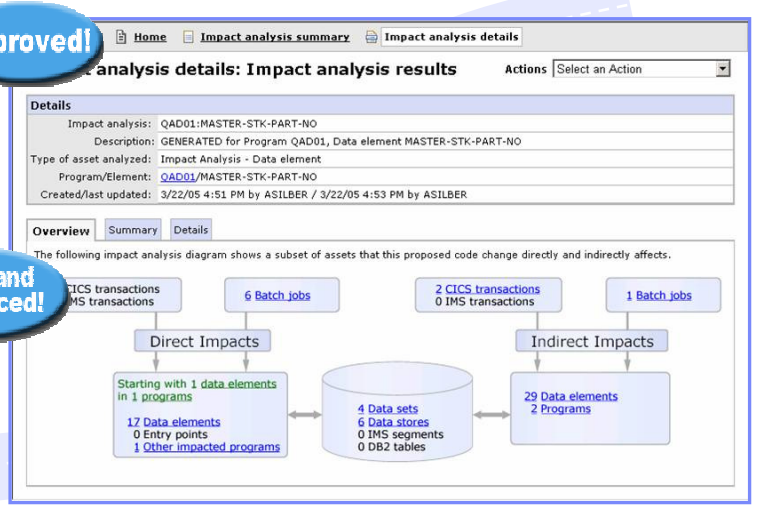
Discover, understand, and leverage existing applications & services

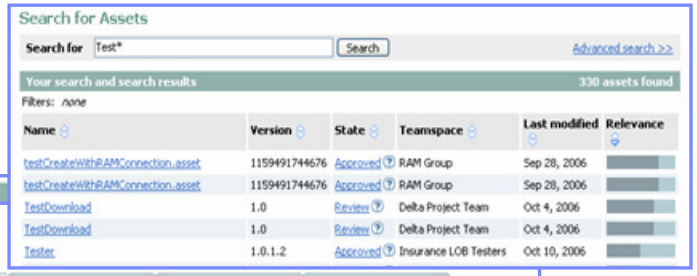
- Understand existing assets and interdependencies using **WebSphere Studio Asset Analyzer (WSAA)**
- Discover potential services and refactor existing assets with **Rational Transformation Workbench (RTW)**
- Manage assets across their lifecycle from design and creation to consumption and change with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

Improved!

New and Enhanced!

New!





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Modernize Your Asset Management

Customer examples

Background:

- Multinational auto manufacturer
- Current product accessories system includes IBM IMS™ transactions, databases and batch jobs

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

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

Background:

- One of US' largest health insurance providers
- In five-year program to modernize mainframe-based claims processing software

Challenge:

- Make code more component-based and manageable
- Identify business services to leverage across the enterprise

Solution:

- Use **RTW** to find and extract the valuable business logic buried within legacy applications
- Publish artifacts so they can be viewed and modified by business analysts using a Web browser

"We're finding that we can very rapidly go into existing COBOL code and extract the logic around certain business objects." - Gary Free, senior systems consultant, Highmark

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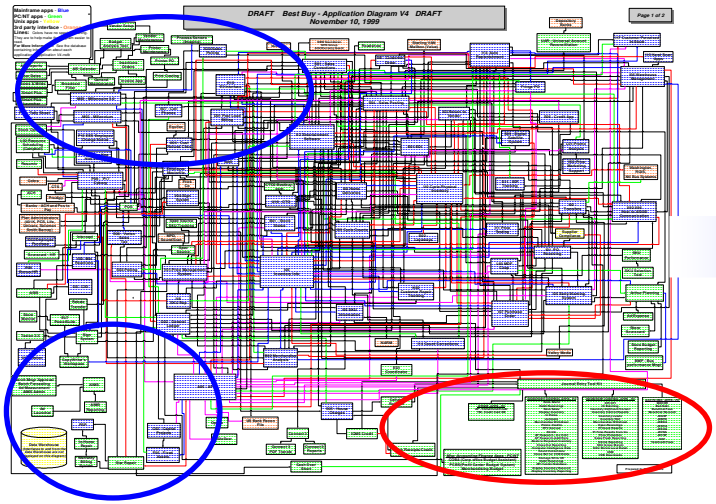
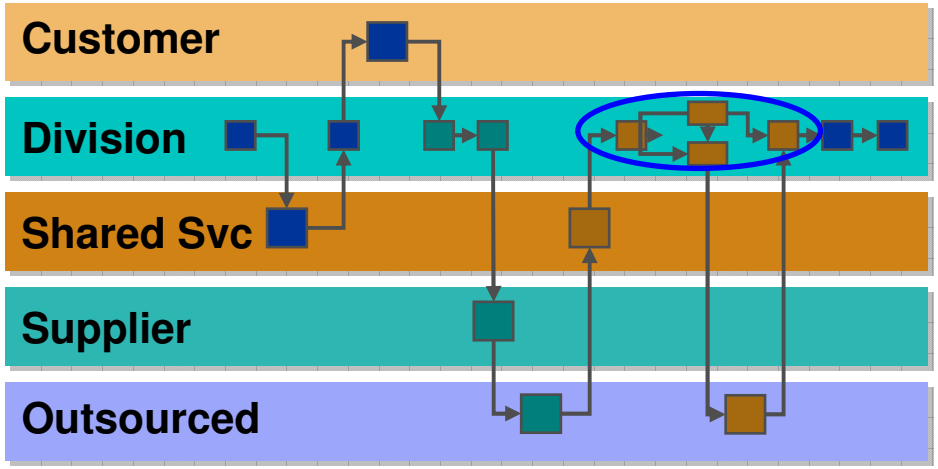
Modernize Your Architectures

Flexible architectures to enable business agility

- Easily create services from existing code (CICS, IMS, i5/OS, terminal applications)
- Define services for all deployment platforms from initial design to implementation
- Separate service flow 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. & Alan Himler, MBA, 2006 *"The ROI of SOA – Based on Traditional Component Reuse"*

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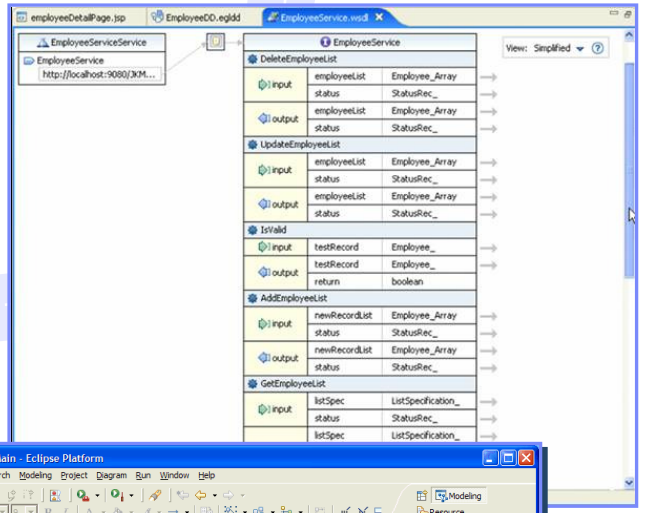
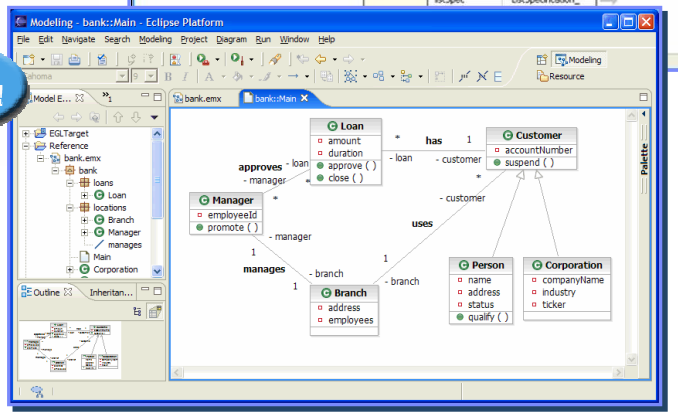
Modernize Your Architectures

Develop new SOA applications rapidly from the ground up

- Use Model-Driven Development (MDD) to architect services and data with **Rational Software Architect (RSA)** and **Rational Data Architect**
  - Transform UML to EGL, COBOL, Java, WSDL, and C++
- Rapidly build and publish services using support in **Rational Business Developer Extension (RBDe)**
  - Leverage *Service* and *Interface* keywords to re-enforce SOA development principles; supports CICS and J2EE
  - Generate a skeleton EGL program to match WSDL
- Generate a skeleton COBOL program to match a Web Service definition (WSDL) using **Rational Developer for System z (RDz)**



New and Enhanced!



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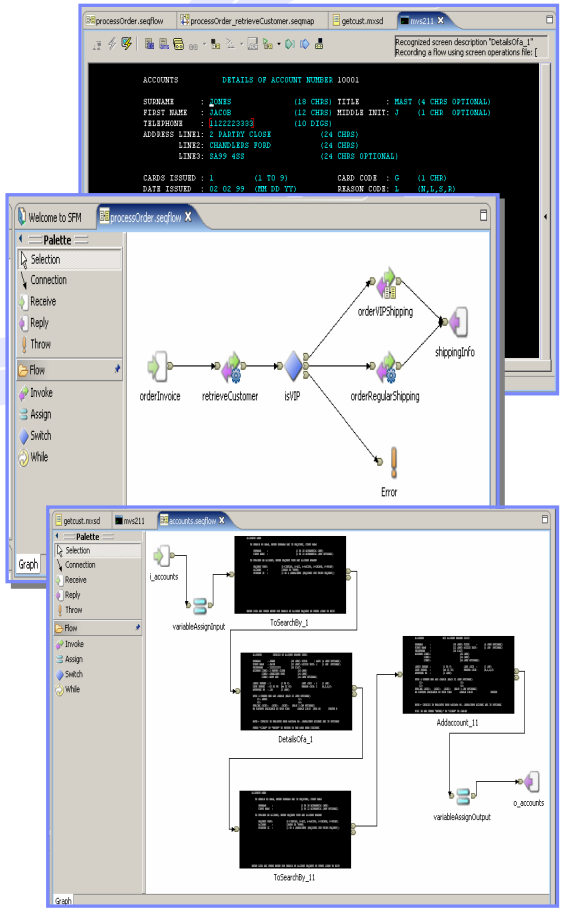
Modernize Your Architectures

Develop new SOA applications rapidly by reusing existing assets

- Quickly create Web Services from existing COBOL, PL/I, Java or EGL using **Rational Developer for System z (RDz)** **Rational Business Developer Extension (RBDe)**
- Generate Web Services from scripted navigation through existing terminal applications using **Host Access Transformation Services (HATS)**
- Build new services flows from existing Commarea, Channel, terminal-based, and MQ applications using the **Service Flow Modeler** in **RDz**
- Rapidly consume Web Services with **RBDe** or **RDz**



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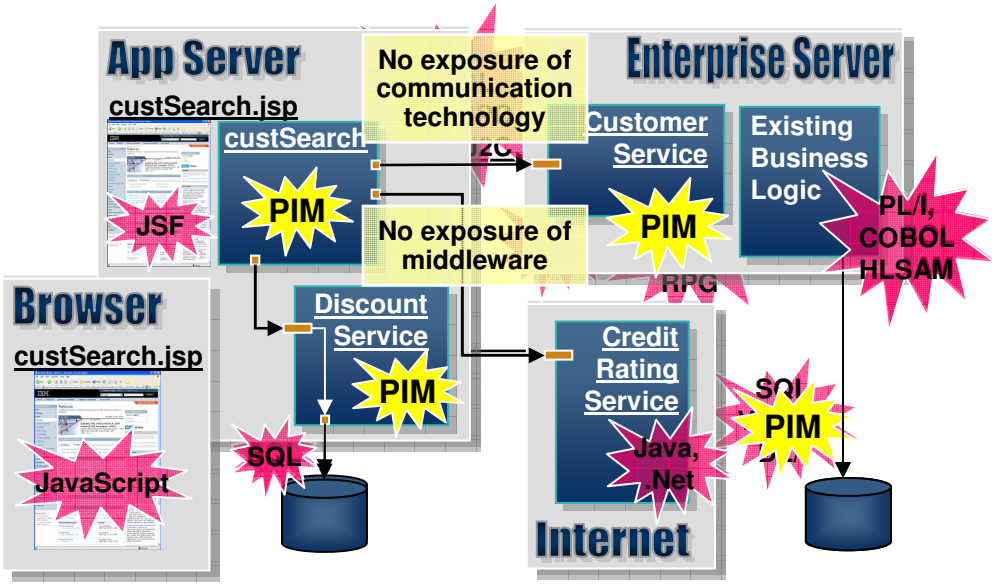
Modernize Your Skills

Powerful tools & abstractions for multi-platform development

- Apply existing “business-knowledgeable” staff on multi-platform projects
- Utilize new employees on any project independent of target platform
- Leverage abstractions that hide underlying middleware technology complexity



PIM = Platform Independent Model

“Software developers will come from less technical business-oriented backgrounds. And move between various business and IT organizations throughout their careers.”

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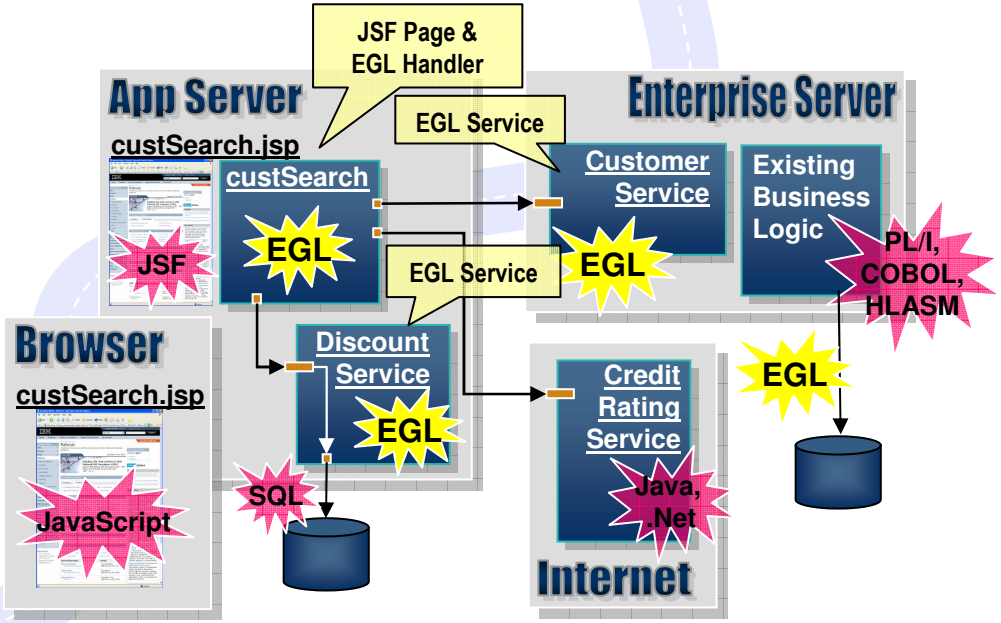
Modernize Your Skills

Develop technology-independent applications using all skills

- Exploit advances in middleware and technology while writing business applications using **Enterprise Generation Language (EGL)** support in **Rational Business Developer extension (RBDe)**

New!

  - Eliminate skill islands – EGL developers are platform independent "business developers," able to develop applications for most platforms: CICS, IMS, z/OS Batch, WAS, Linux, Windows, AIX, i5OS, HP-UX, Solaris
  - Leverage [future] standard business language to achieve high productivity, platform independence



"Lack of skilled development resources" is the greatest inhibitor to implementing Web Services.
Evans Data Corp., 2007, "Web Services Development Survey, Vol. I"

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Modernize Your Skills

Customer examples

Background:

- Belgian bank and insurance company that has 50,000 employees, 12 million clients across Central Europe
- Numerous acquisitions, expect to continue
- Striving for cost reduction through synergy and integration

Solution:

- Standardize on **Rational Business Developer Extension** and **RDz** to unify application development across all platforms and transaction managers (e.g. WAS, IMS)

"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, Redmonk Podcast*

Background:

- Nordisk Copyright Bureau administers the copyrights for recording and production of music on CD, DVD, film, video and the Internet on behalf of composers, lyricists and publishers

Challenge:

- Provide Web access to copyright information
- Reduce data entry workload, be more responsive to clients
- Leverage existing expertise to take advantage of the benefits offered by newer, open technologies

Solution:

- NCB worked with IBM Business Partner Xact Consulting to enable its copyright registration system for the Web. A small team of developers with limited Java experience used **EGL** to rapidly develop a Java Server Faces (JSF) and Web-based solution that integrated with NCB's existing registration system

"We wanted to implement self-service solution not only to reduce our manual data entry and costs, but also to allow our customers to get vital information that they previously did not have access to. For example, we wanted to provide them with immediate and continuous access to all of their existing copyright information." - *Bjorn Skat Petersen, IT manager, NCB*

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Modernize Your Processes & Tools

Shared enterprise and distributed development environments

- Lower costs due to elimination of duplicate tools and processes
- Improve IT flexibility because employee skills can be leveraged across org
- Exploit single infrastructure for enterprise and distributed development
- Improve end-to-end communication and traceability across the entire lifecycle

Your governance solution should cover your entire topology as well as the entire lifecycle for all roles.

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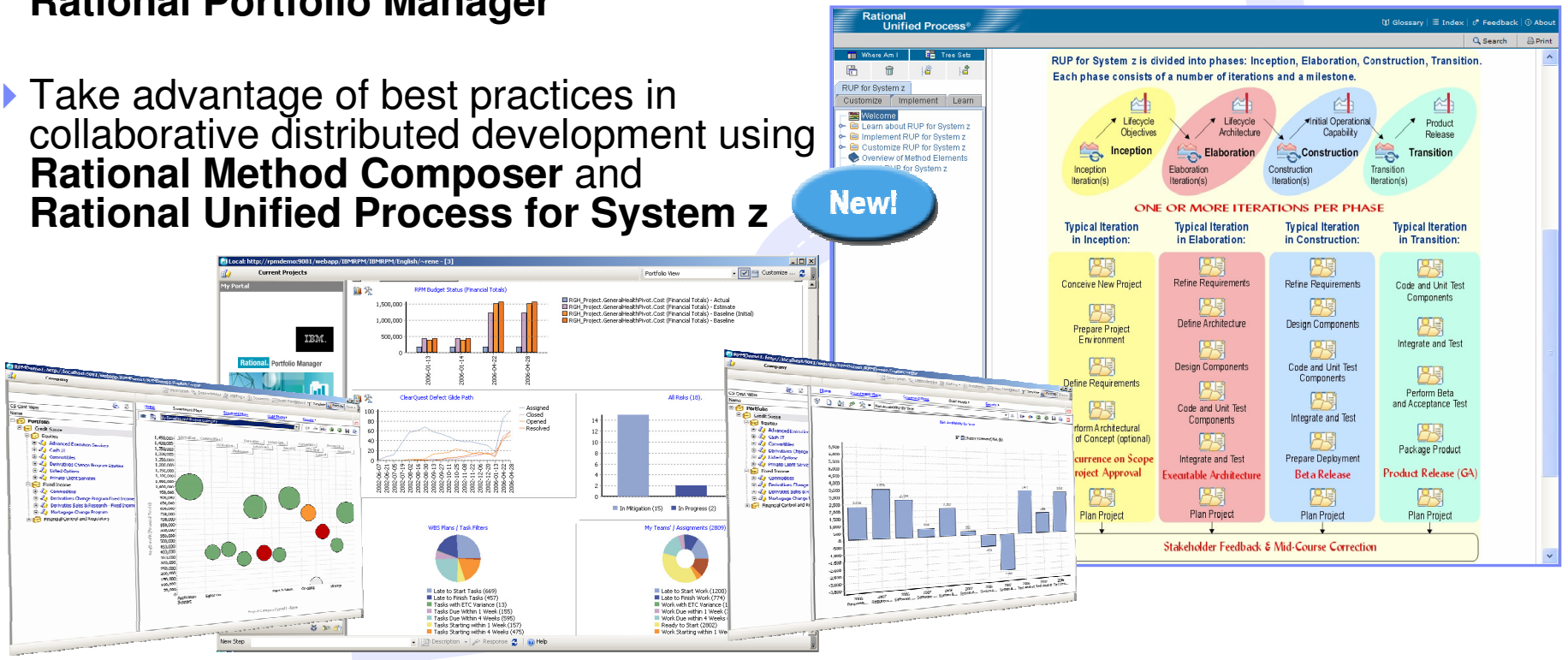
Modernize Your Processes

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**

New!



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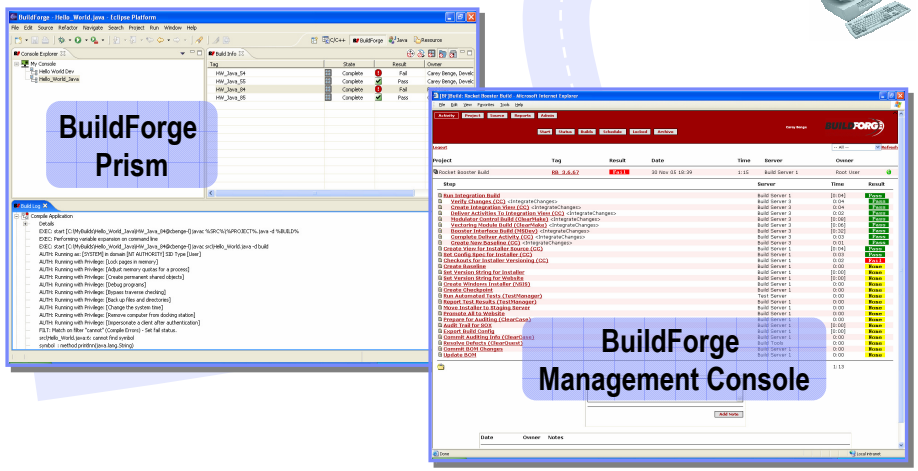
Modernize Your Team Infrastructure

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**



Improved!

New!

ClearQuest

Enterprise Lifecycle Portal

RDz, RBDe, ISPF check in & out

ClearCase

SCLM

System i

Windows, Unix, Linux, zLinux

System z

Enterprise Asset Repositories

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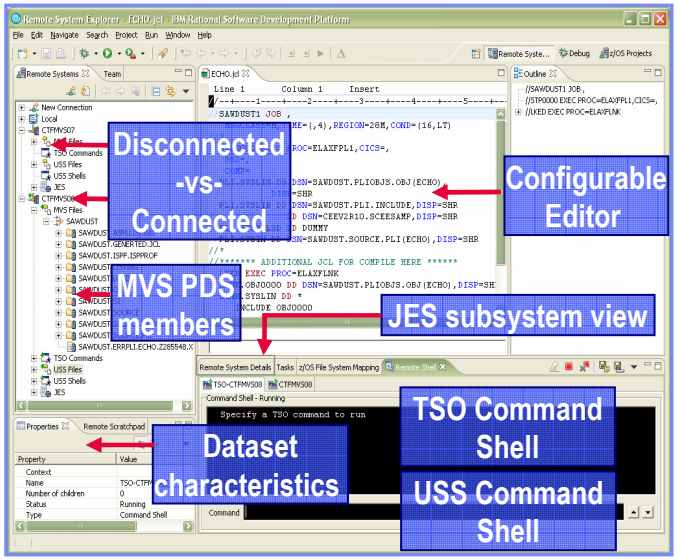
Modernize Your IDEs

Achieve high productivity with modern development



- Use modern IDEs to develop and maintain code
  - **Rational Application Developer (RAD)**
  - **Rational Developer for System z (RDz)**
  - **Rational Business Developer Extension (RBDe)**
- Benefits of a modern IDE
  - Syntax highlighting and code assist
  - Error detection and debugging services
  - Cross-platform edit, compile, and debug
  - Recruit new developers w/ IDE built on open standards

"On average, compiling, testing, and debugging within [RDz] was 25% faster than traditional mainframe development tools"
Branham Group, Inc., November 2006
Developer Productivity Study, Comparing IBM® WebSphere® Developer for System z to Traditional IBM Development Tools

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Modernize Your Processes & Tools

Customer examples

Background:

- Third largest European insurance provider
- Worldwide operations and clients

Challenge:

- Spiralling maintenance and resource costs constrained the development organization
- Move to a standardized solution to improve developer productivity and flexibility for delivering software solutions

Solution:

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

Background:

- German bank providing financial services to private companies and SMBs across Europe
- Leading provider of online banking services

Challenge:

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

Solution:

- New application framework based on **IBM COBOL**
- **Rational Developer for System z** to design new COBOL and other code

"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

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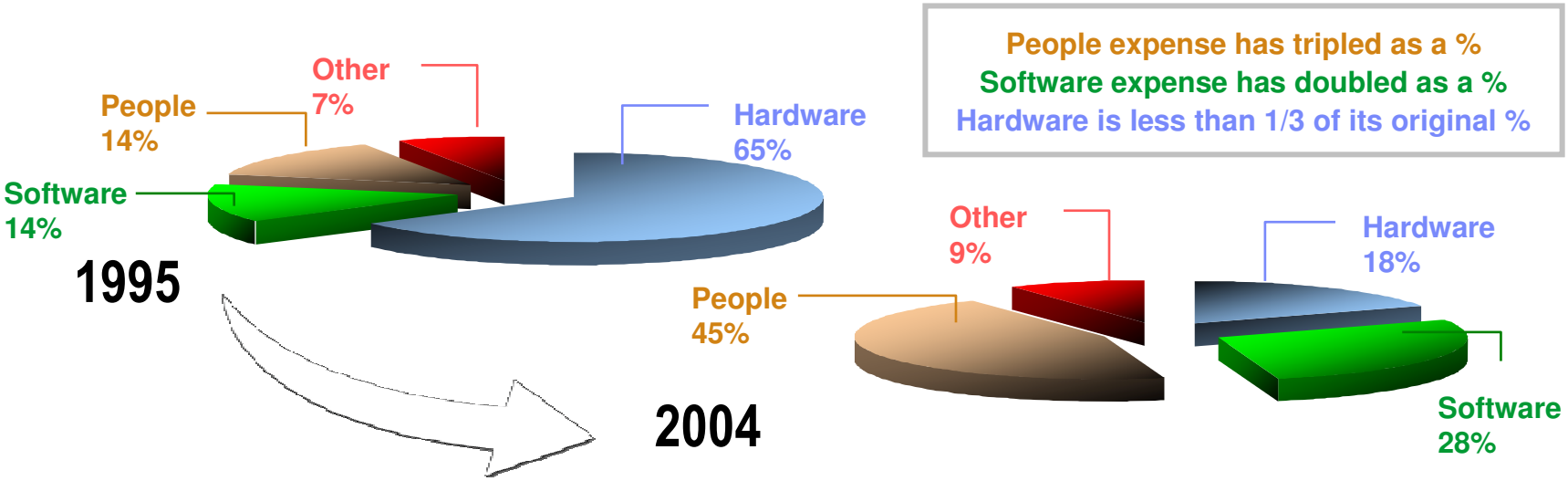
Modernize Your Development Investments

Free up people and budget to pursue new opportunities

- Devote more resources to new development rather than maintenance
- Move to supported development platforms and leverage the full capabilities of the IBM Software Development Platform
- Make incremental improvements within the context of a long-term strategic modernization plan



"There are many benefits to legacy modernization tools and they significantly reduce the risk of failure when maintaining or transforming aging legacy systems." - *Dale Vecchio, Gartner*

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Modernize Your Development Investments

Save time and improve quality with modern Asset Mgmt

- Dramatically improve change estimate accuracy, and significantly reduce the time to change applications by leveraging the Impact Analysis support in **WebSphere Studio Asset Analyzer (WSAA)**

- Renovate programs using **Rational Transformation Workbench (RTW)**
  - Reduced complexity increases maintainability
  - Componentization increases reusability, and enables SOA
  - Removal of dead code decreases cost of storage and maintenance

"We are finding things (code constructs) with [RTW] that may be the cause of some of our mystery defects"
- Application Programmer

"I am finding things with WSAA that I never would have found using the old, manual analysis process."
- Systems Analyst

"[WSAA] Inventory scan errors are identifying problems in our source…"
- Systems Administrator

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Modernize Your Development Investments

Save time and improve quality with modern Test Solutions

- Save time and improve quality by automating tests with **Rational Functional Tester (RFT)**, including extensions for 3270, 5250, and VT
- Ensure scalability of applications which expose existing assets in new ways (e.g. services) with **Rational Performance Tester (RPT)**
- Identify vulnerabilities, privacy issues, quality exposures, and standards non-compliance with **Rational AppScan**

Improved!

Improved!

New!

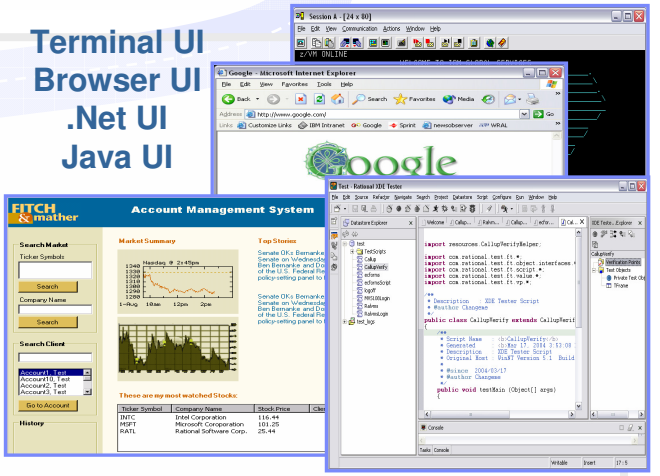
Background:

- Medical software developer for physicians in USA and Canada

Challenge:

- Relying on labor intensive, time consuming manual testing
- Need to improve software testing and QA processes

Terminal UI
Browser UI
.Net UI
Java UI



Benefits of Solution:

- Increased the product quality and sped time to market using **RFT** to automate regression testing
- Reduced the workload on support personnel and increased the overall quality of software products

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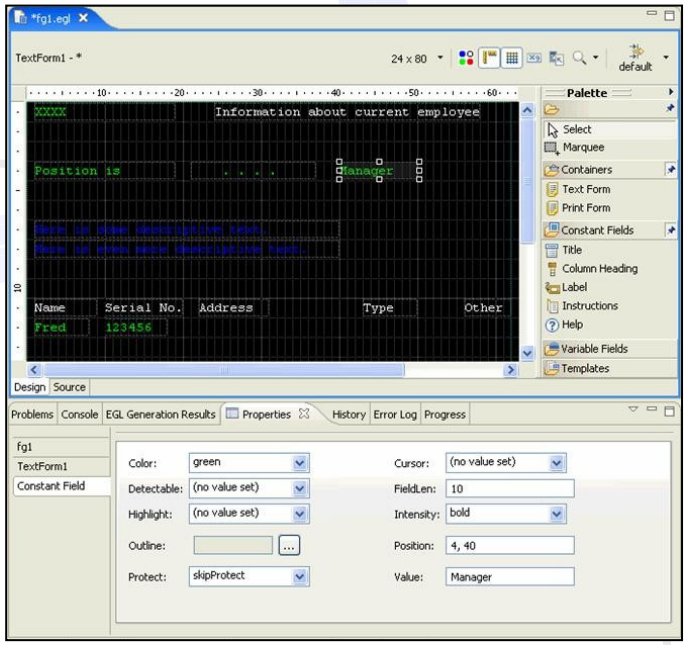
Modernize Your Development Investments

Increase productivity with advanced IDEs and high-level languages

- Increase developer productivity and reduce manual coding using WYSIWYG editors, code generation, integrated test environments and a high-level business language in **Rational Business Developer Extension (RBDe)**, **Rational Developer for System z (RDz)**



Background:

- A telephone service provider in Venezuela

Challenge:

- Lacking software dev lifecycle standards/procedures
- Need to improve application quality, reduce costs, and decrease time to market

Benefits of Solution:

- Reduced dev costs by 20%, decreased time to market by 50%, and reduced production environment problems by 80% using **HATS**, **WDSC**, and other tools in **IBM Rational Software Delivery Platform**

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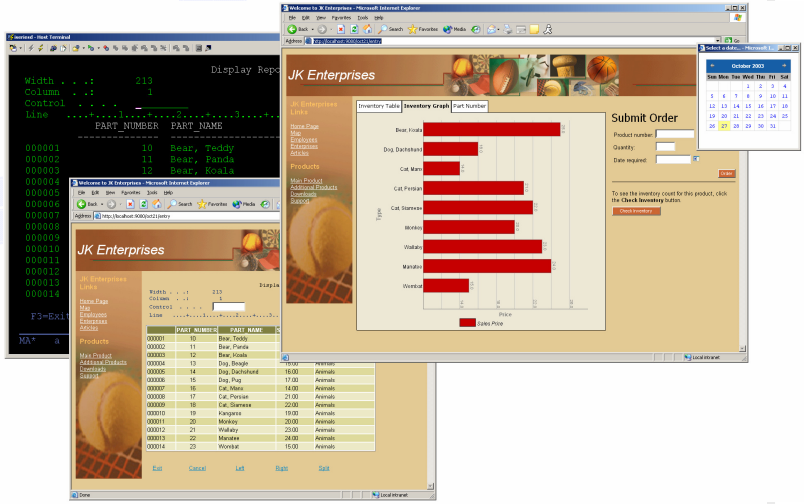
Modernize Your Development Investments

Deliver impressive UIs quickly with UI revitalization

- Extend your existing applications with GUI, web, portlet or Web Service I/F using **Host Access Transformation Services (HATS)** **New and Enhanced!**

Background:

- Brazilian bank with .NET applications on Windows, and existing transactional applications on System z



Challenge:

- Applications with communication between .NET and System z averaged 11 months to develop
- Creating a new customer account took many days to run due to non-standard cross platform communication

Benefits of Solution:

- Cut application development cycle by ~50% using **HATS**
- Exposed back end transactions as Web Services
  - Standardized cross platform communication ran 11x faster

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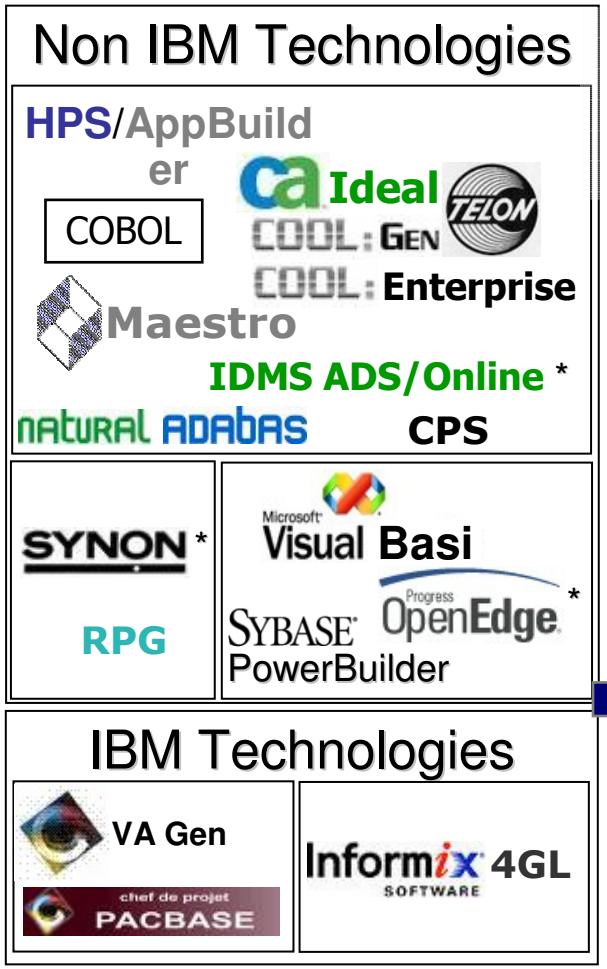
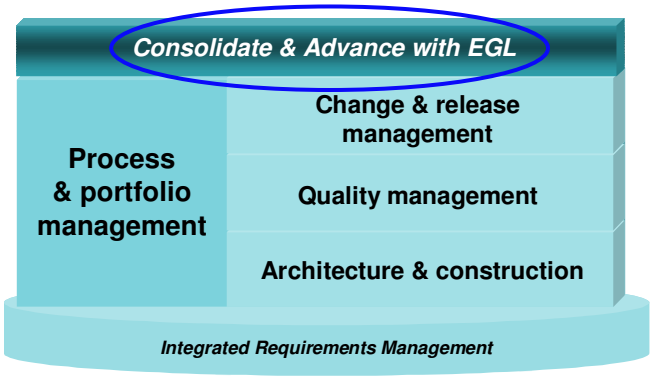
Modernize Development Investments

Transform your legacy applications…move to the SDP



- Migrate from out-of-date and expensive legacy development platforms onto **IBM SDP** via **Enterprise Generation Language**



Deploy to:

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

* Future Capability

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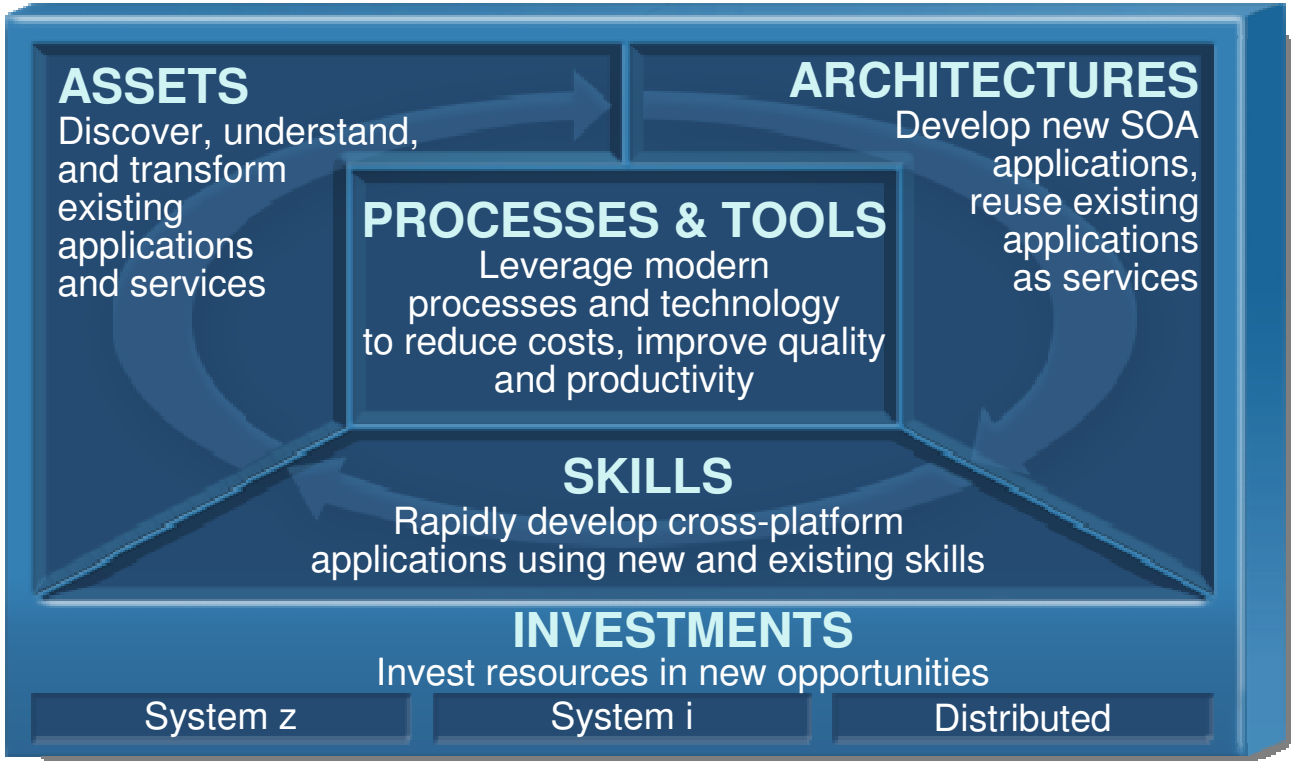
Summary



IBM Rational SDP offers leading-edge, high-productivity solutions to help you modernize your IT environment. Get started today!

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Agenda

- Recent News
- Key Messages
- Today's Realities
- IBM Rational Software
- **Q&A**

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