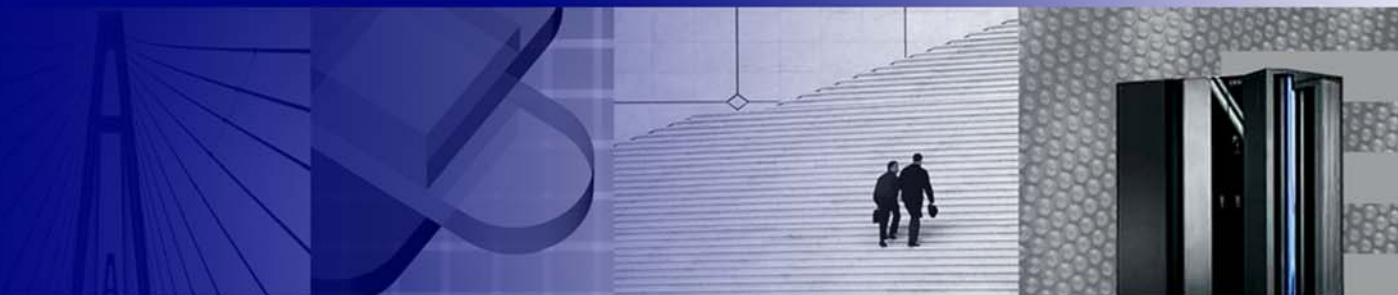# System z as the Hub for SOA – Enabling Innovation for System z

Yvonne Perkins

Vice President, Enterprise Platform Software

Innovation: The Top Focus for Business

- Due to competitive and market forces, CEOs plan to radically change their companies in the next 2 years.

- > 80% of CEOs stated their organizations have not been very successful at managing change

- 78% of CEOs believe integrating business and technology is fundamental for innovation

IBM Business Consulting Services

Expanding the Innovation Horizon

Global CEO Study 2006

Source: IBM Global CEO Survey, March 2006

The Goal: Strategic Flexibility Through Innovation

The Challenge

Business Objectives

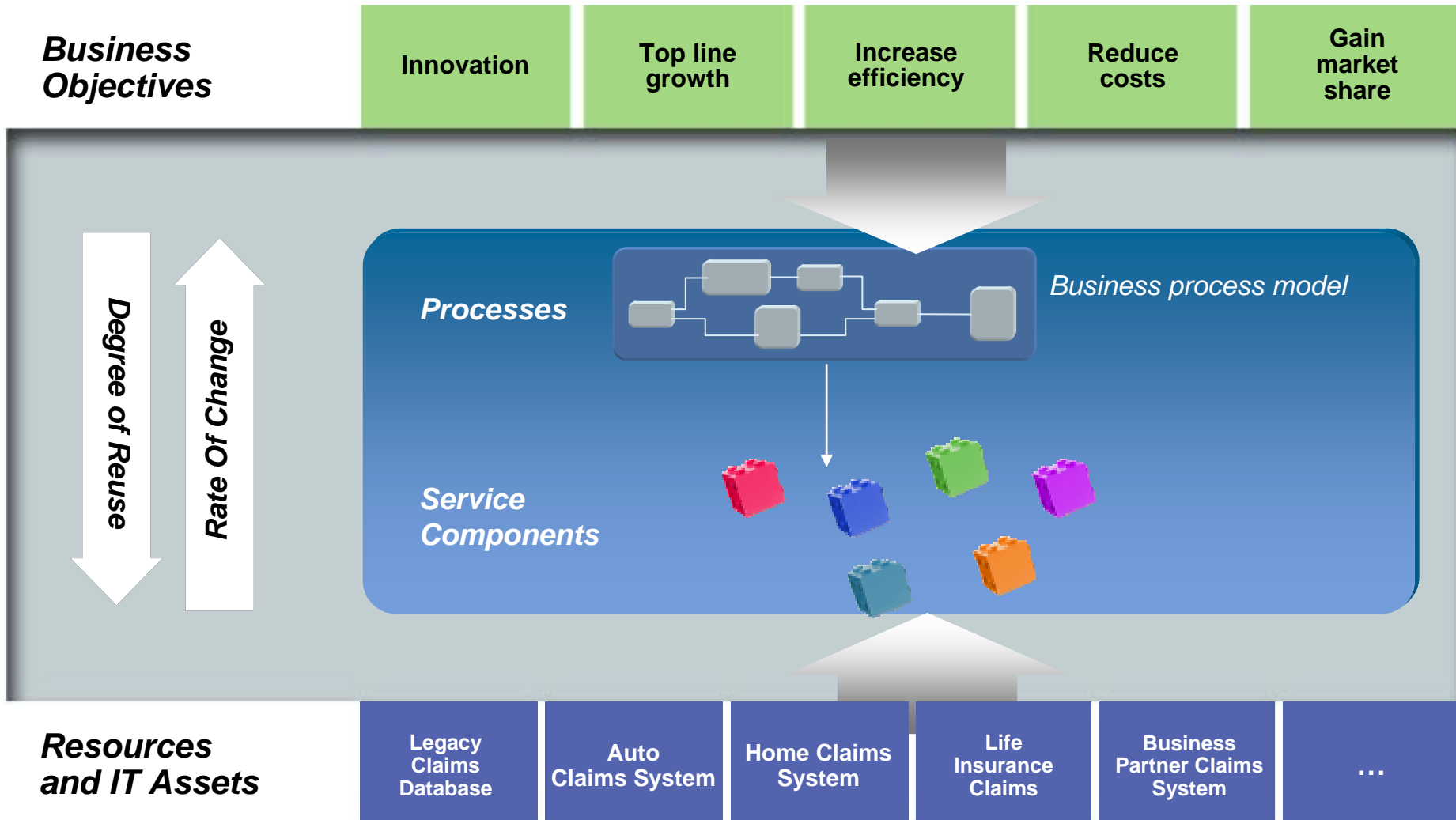| Innovation	Top line growth	Increase efficiency	Reduce costs	Gain market share
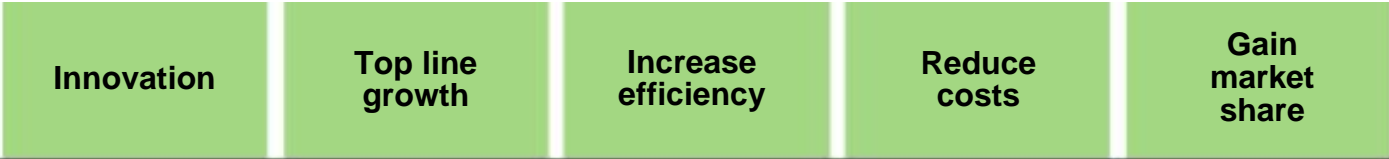
- *Complex processes & systems*

- *Complex applications & interfaces*

- *Difficult to adapt quickly*

- *Large portion of IT budget spent on maintenance, not on new value add investments*
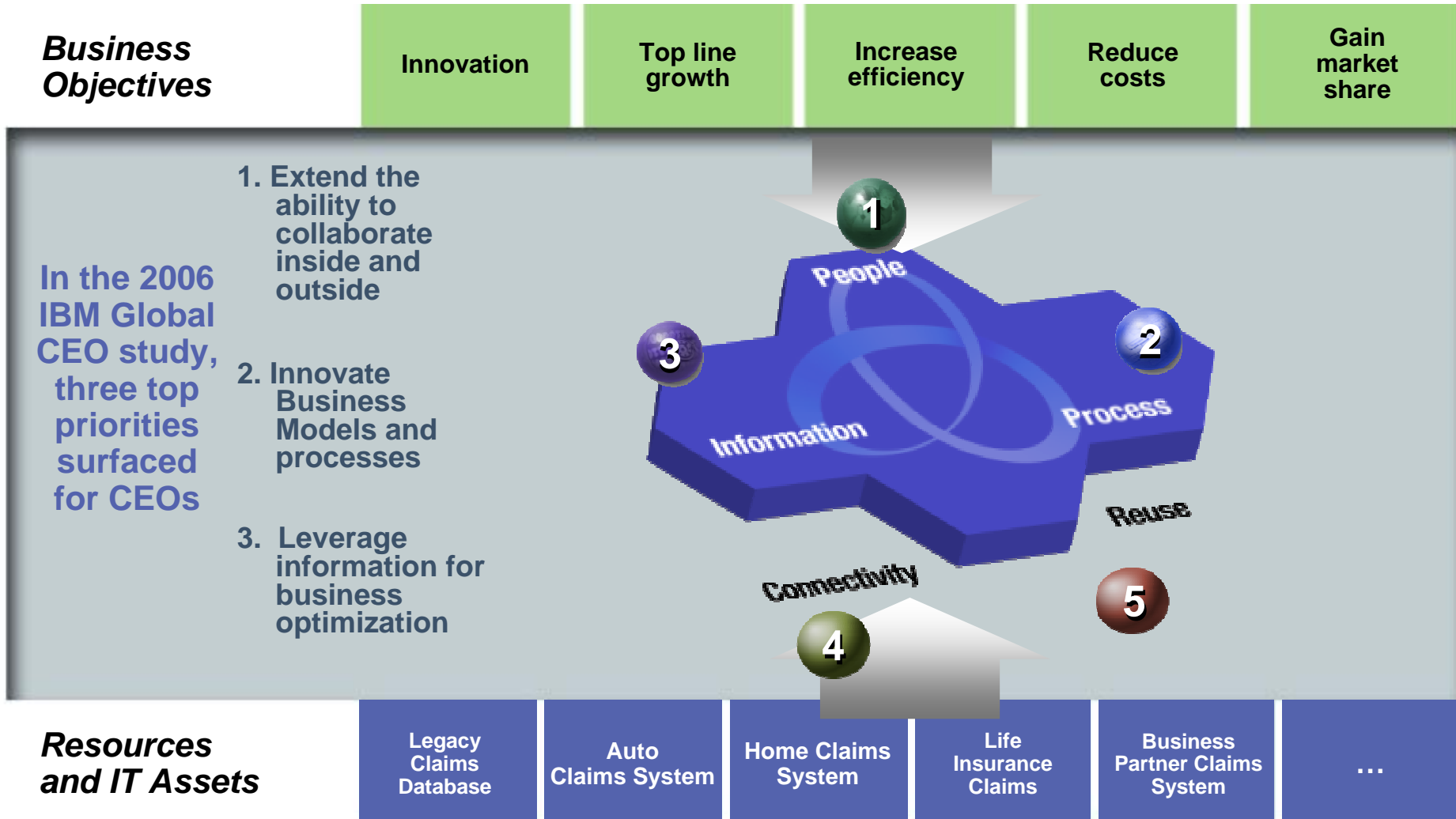
Resources and IT Assets

Legacy Claims Database	Auto Claims System	Home Claims System	Life Insurance Claims	Business Partner Claims System	…

Service Oriented Architecture Addresses this Challenge

Business Objectives

Innovation	Top line growth	Increase efficiency	Reduce costs	Gain market share

Degree of Reuse

Rate Of Change

Processes

Business process model

Service Components

Resources and IT Assets

Legacy Claims Database	Auto Claims System	Home Claims System	Life Insurance Claims	Business Partner Claims System	…

SOA Entry Points Help Customers Get Started to Address this Challenge
Both Business Centric and IT Focused

Business Objectives	Innovation	Top line growth	Increase efficiency	Reduce costs	Gain market share

In the 2006 IBM Global CEO study, three top priorities surfaced for CEOs

1. **Extend the ability to collaborate inside and outside**

2. **Innovate Business Models and processes**

3. **Leverage information for business optimization**

People (1)

Process (2)

Information (3)

Connectivity (4)

Reuse (5)

Resources and IT Assets	Legacy Claims Database	Auto Claims System	Home Claims System	Life Insurance Claims	Business Partner Claims System	…

The SOA Lifecycle

- **Discover**
- **Construct & Test**
- **Compose**

- **Integrate people**
- **Integrate processes**
- **Manage and integrate information**

- **Gather requirements**
- **Model & Simulate**
- **Design**
- **Define KPIs**

Assemble

Deploy
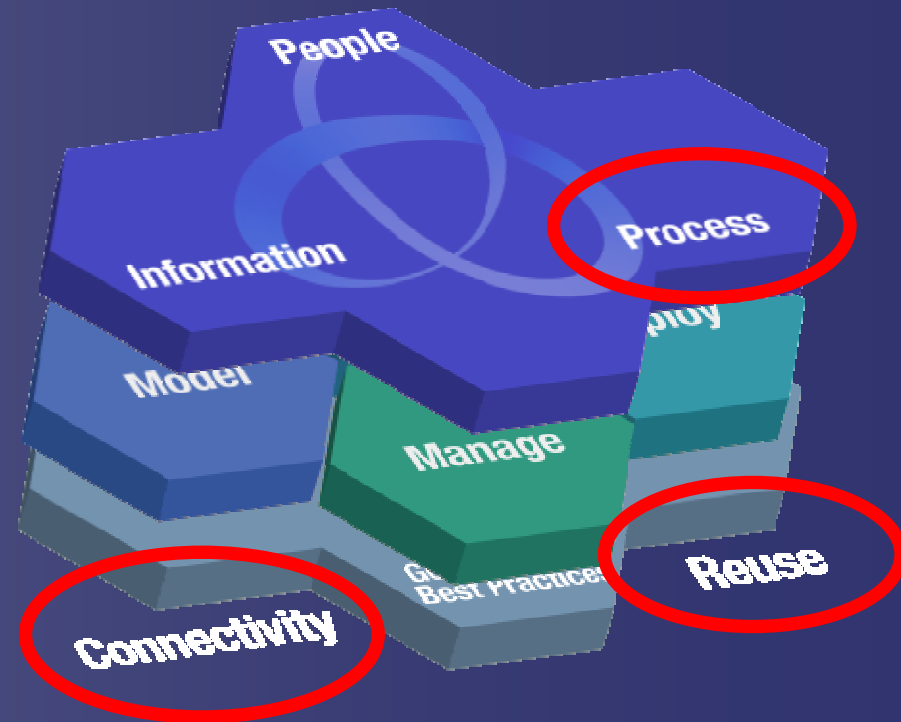
Model

Manage

Governance & Processes
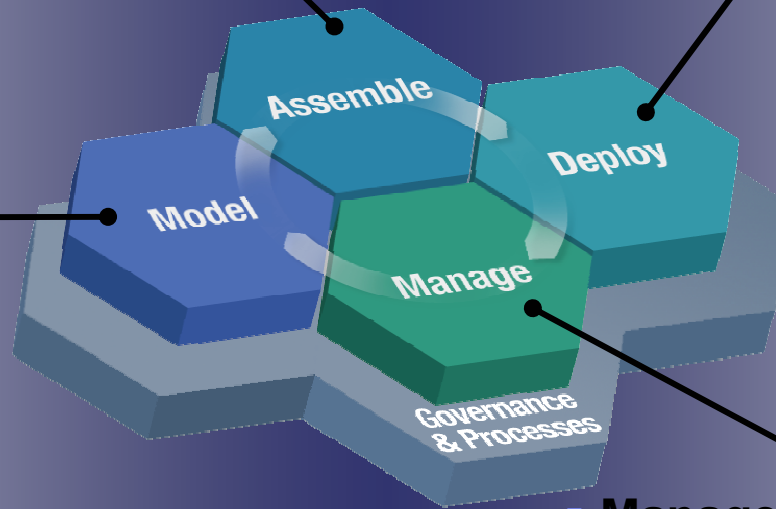
- **Manage applications & services**
- **Manage identity & compliance**
- **Monitor business metrics/KPIs**

SOA Entry Points in Process, Connectivity and Reuse
IBM's strategic SOA investments in System z

System z as the SOA Hub for:

- *Reuse*

- *Connectivity*

- *Process*

SOA Entry Points Help Customers Get Started
Both Business Centric and IT Focused

People
WebSphere Portal

Front End Tooling Innovation

SOA Dashboard Offerings

Information
WebSphere Information Server

DB2 Viper

WebSphere RFID Premises Server / Device Infrastructure

Master Data Management

Process
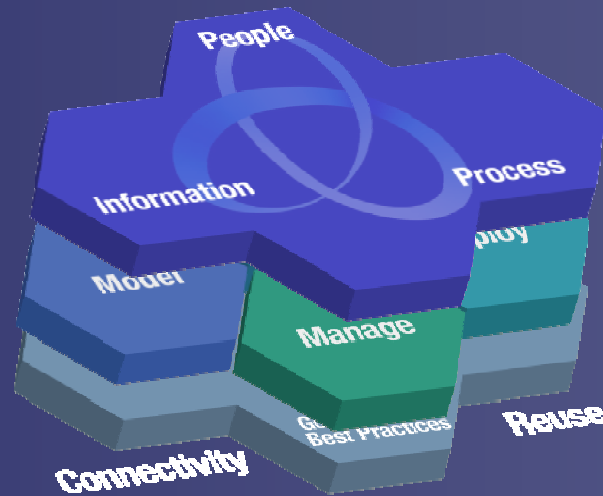WebSphere Process Server for z/OS

WebSphere Business Modeler

WebSphere Business Monitor

WebSphere Integration Developer

Connectivity
WebSphere MQ

WebSphere Enterprise Service Bus for z/OS

Web Sphere Message Broker

WebSphere Adapters for z/OS

WebSphere Service Registry/Repository

Reuse
WebSphere Application Server V6.1

CICS Transaction Server V3.1

z/Transaction Processing Facility

WebSphere Developer for z/OS

SOA Entry Point to Creating & Reusing Services
Create and Deploy Flexible, Service-based Business Applications

z Value

- Flexibility and elimination of duplication for reduced cycle times and lower project risks

- Expanded access to core applications and business rules

- Consultant studies have found it 5X less expensive to re-use existing applications than to write new applications

Start with

- Identify high-value existing enterprise assets and service-enable them for reuse

- Fill in gaps by creating new services for today's business needs and future reuse

- Registry/repository to facilitate centralized access and control of reusable services

A bright and rising future for CICS Transaction Server
Rock-solid deployment platform,100% aligned with SOA technologies

CICS Transaction Server V3.1

enhanced

- Build Web services with no change to existing applications

- Highest levels of data integrity and security

- Optimized throughput and performance

- Simple and intuitive management

- New SOA Statement of Direction
  - Extended integration of the CICS Service Flow Runtime with WebSphere Process Server
  - CICS support of WebSphere Service Registry/Repository
  - Support for Event Driven Applications

WebSphere Application Server v6.1
Powering your SOA for the Ultimate in Business Flexibility

Standards Based and Open

- J2SE 5.0
- Web services standards
  - WS-Interop Basic Security
  - WS-Notification
  - WS-BusinessActivity
- JSR168 Portlets
- JSR116 SIP Servlets

Platform Capability

- Proxy Server Enhancements
- Integrated User Registry
- Government Standards

Consumability

- Common code base for application portability and consolidation to System z
- Application Server Toolkit, including automation tools and Command Assistance
- Simplified Administration
  - Steps for many tasks reduced +50%
- Simplified SSL Key/Certificate Management
- Security enhancements
- IHS administration enhancements
- Integrated Support Assistant
- Install Factory

WebSphere Application Server V6.1

Advancing the Application Server to the next level

NEW!

64-Bit Support on WAS 6.1

- Allows WebSphere Application Server to run in a 64-bit virtual addressing Mode

- Removes restriction on amount of virtual storage available to both the applications and the server

- Currently in Beta

- December deliverable

"Apache HTTP Server on z/OS" on WAS 6.1

- Provide and easier to use HTTP server on z/OS

- Port of distributed code base onto z

- Currently in Beta

- December Deliverable

WebSphere Extended Deployment for z/OS V6.0.1

Service mixed environments more efficiently

- *Enables REAL IT environments*
  - *Mixed application servers (WebSphere and non-WebSphere)*
  - *Mixed workloads (J2EE transactional batch and OLTP)*
- *Enhances quality of service management for a mixed application servers and data sources*

Easily manage large scale production implementations

- *At-a-glance assessments of system vitality and improved application management*
- *Interruption-free application updates to manage deployment of multiple application versions*

Improve the performance and throughput of your transactions

- *Near linear scalability for **high-end transaction processing***
- *Enhanced data access for accelerating throughput*
- *Partitioning facility enables development of highly scalable, high performance J2EE applications*

Accommodate peaks in demand by better utilizing existing resources

- *Compliment the value of z/OS workload manager (WLM) with granular prioritization of J2EE workloads and enhanced cross-LPAR routing capabilities*
- *Functions with Intelligent Resource Director (IRD)*

Bank of Montreal Exploits its Re-usable Assets
Integration with the mainframe is essential for BMO's SOA

Actions & Benefits:

To increase customer satisfaction, BMO needed a new teller application that integrated with its sales and CRM systems

"WebSphere was very attractive to us because of its ability to integrate with our existing main-frame legacy systems."
— *Randy Oswald, senior vice president, technology and solutions, BMO Financial Group*

Used flexible **Web services** to transform core CICS systems to integrate with Siebel CRM

Improved productivity& efficiency with reduced operating costs using WebSphere integration on z/OS

Built an SOA using **WebSphere's** open standards for interoperability between disparate products and platforms

Capabilities used: WebSphere Message Broker, WebSphere Application Server, CICS

BMO Financial Group

Standard Life's Re-usable Assets
Transactions reused as Web services

Actions & Benefits:

STANDARD LIFE®

Flexible integration through WebSphere MQ Message Broker, invoking CICS and IMS applications as Web services

Lowered development costs and risk by reusing **Web services based** code assets

Offer agents timely value-loaded portal access to data through WebSphere Application Server

Over 50% of Business Services are re-used, saving >$5M in development costs

Capabilities used: IBM WebSphere Message Broker, WebSphere Application Server, CICS and IMS

SOA Entry Points Help Customers Get Started
Both Business Centric and IT Focused

People

WebSphere Portal

Front End Tooling Innovation

SOA Dashboard Offerings

Information

WebSphere Information Server

DB2 Viper

WebSphere RFID Premises Server / Device Infrastructure

Master Data Management

Process

WebSphere Process Server for z/OS

WebSphere Business Modeler

WebSphere Business Monitor

WebSphere Integration Developer

Connectivity

WebSphere MQ

WebSphere Enterprise Service Bus for z/OS

Web Sphere Message Broker

WebSphere Adapters for z/OS

WebSphere Service Registry/Repository

Reuse

WebSphere Application Server V6.1

CICS Transaction Server V3.1

z/Transaction Processing Facility

WebSphere Developer for z/OS

SOA Entry Point to Connectivity
Connectivity to Support Business Centric SOA

z Value

- Deliver services through new business channels for a secure, consistent user experience

- Service-based connections with trading partners

- Potential savings of 2 – 4x over custom-built integration or FTP

Start with

- Messaging backbone as the foundation for SOA connectivity

- Enable mediated exchange between services, by leveraging an ESB

- SOA appliances integrate for ESB functions in a hardware form factor
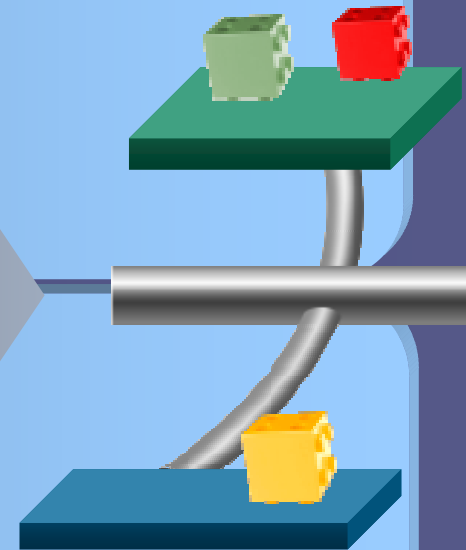
Connect Services

with WebSphere ESB and WebSphere Message Broker

Break through limits to deliver end-to-end reliable and secure connectivity with integration to all applications, systems, and services

ENHANCED!

WebSphere ESB

(for Web services including the latest WS-* standards)

- **Web Services connectivity, JMS messaging an Service Oriented Integration**

- **Seamless integration with the WebSphere platform**

- **Improved time to value**

Messaging Backbone

Enterprise Service Bus

ENHANCED!

WebSphere Message Broker

(the advanced ESB for high performance integration of Web services and non-Web services assets)

- **Provides Web Services connectivity and non standard interface connectivity**

- **Unmatched in integrating heterogeneous systems, platforms, devices, APIs, etc…**

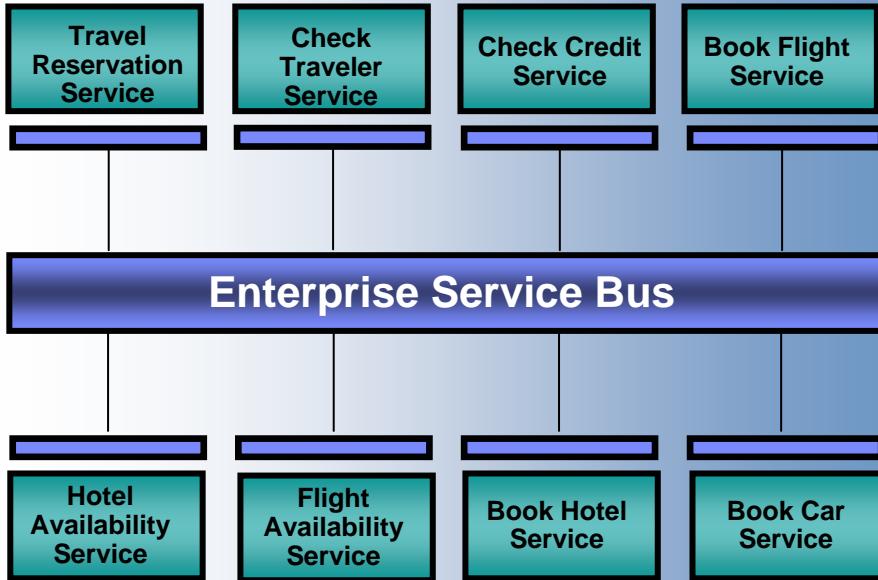- **Universal transformation, high performance, and integrated complex event processing**

WebSphere ESB and WebSphere Message Broker
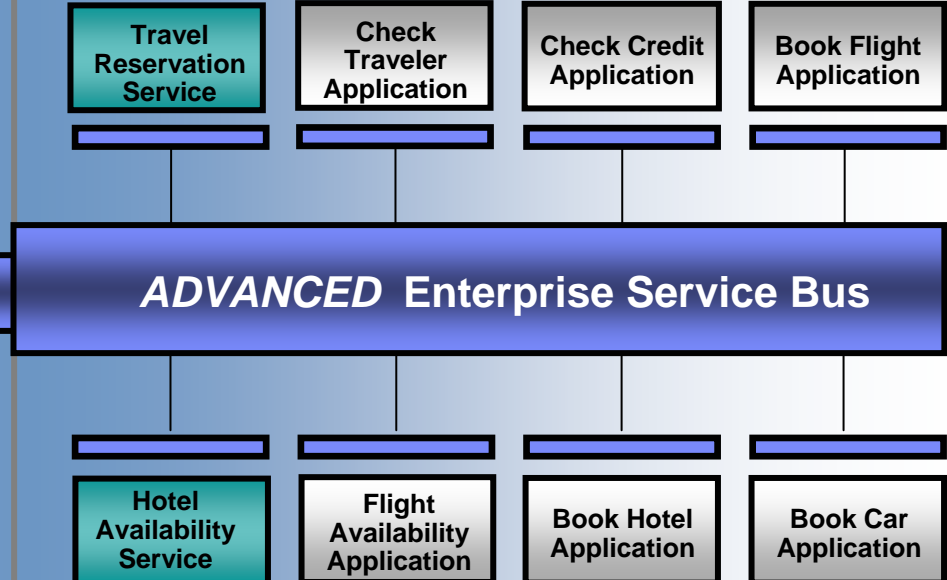*Connecting People, Process, and Information*

1 | **If all your applications conform to the Web Services standards…**

Travel Reservation Service	Check Traveler Service	Check Credit Service	Book Flight Service

Enterprise Service Bus

Hotel Availability Service	Flight Availability Service	Book Hotel Service	Book Car Service

…then all you may require is an **ESB** focused on standards-based service integration.

2 | **If not all your applications conform to the Web Services standards…**

Travel Reservation Service	Check Traveler Application	Check Credit Application	Book Flight Application

ADVANCED **Enterprise Service Bus**

Hotel Availability Service	Flight Availability Application	Book Hotel Application	Book Car Application

…then you may require a more **advanced ESB** focused on the integration of services with existing non-services assets.

WebSphere ESB and WebSphere Message Broker

ESB:

WebSphere ESB

Advanced ESB:

WebSphere Message Broker

Web Services connectivity and data transformation ⟷ **Universal connectivity and data transformation**

HTTP   JMS

WebSphere MQ

Web Services   XML

WebSphere Adapters

HTTP   JMS   **WebSphere MQ**

Web Services   XML   WebSphere Adapters

Plus the following:

Weblogic JMS®   Biztalk®   TIBCO Rendezvous®

MQe   Multicast   Tuxedo®   FTP   TIBCO EMS JMS®

COBOL Copybook   HIPAA   EDI-FACT   HL7   SonicMQ JMS®

ACORD   Real-time IP   AL3   Word/Excel/PDF

SWIFT   FIX   ebXML   EDI-X.12   MQTT   Custom Formats

Customers face a range of ESB requirements. As a result, any given project might require an ESB or an Advanced ESB… OR BOTH.
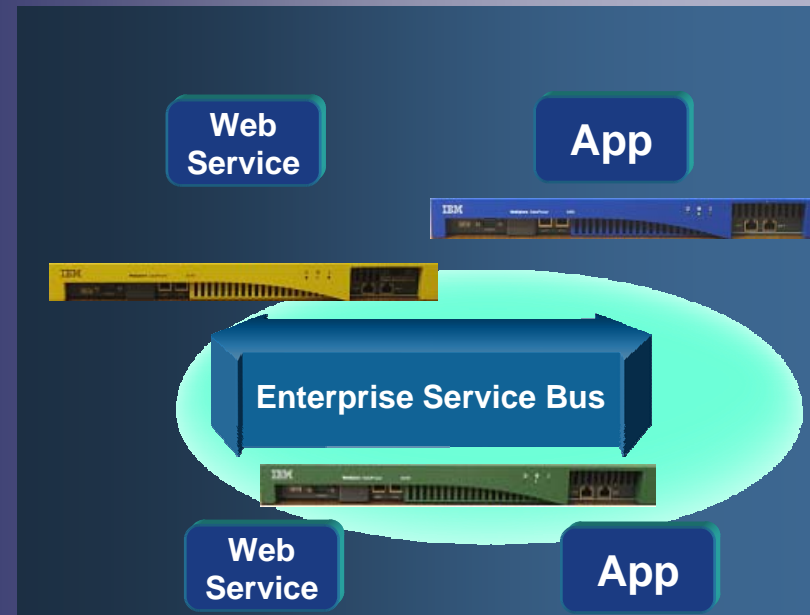
DataPower Appliances
Specialized SOA Hardware to Extend ESB Capabilities

NEW!

Extend ESB functionality in a hardware form factor using appliances

- Simplify SOA

- Help Secure Web services

- Accelerate SOA with wire speed performance

- Easy-to-deploy appliances

- Robust Service Level Management & Web Service Management

Web Service

App

Enterprise Service Bus

Web Service

App

Simplify, help Secure and Accelerate SOA and your ESB, with WebSphere DataPower SOA Appliances

DATAPOWER

WebSphere Service Registry and Repository
Promotes SOA Governance through management of assets

An enterprise-wide service registry and repository improves visibility, reusability, adaptability, and manageability of services

The WebSphere Service Registry and Repository …

- **A repository for service metadata**
  - ▸ for example, WSDL and XSD

NEW!

- **For publication of services**
  - ▸ to advertise their capabilities
- **For finding suitable services**
  - ▸ for reuse and runtime agility
- **For capturing service dependencies**
  - ▸ to support change management
- **An extensible framework**
  - ▸ to support validation and notification

Connect existing and new services & other assets
Avis creating value with their System z assets

Actions & Benefits:

Provided shared access to corporate-wide data across SOA Infrastructure

Flexible integration through WebSphere MQ Message Broker, reusing existing applications as Web services

Objective to be first to market with new capabilities, lower development time and costs

Accelerated service delivery time to address customer requirements and competitive pressures

Capabilities used: IBM WebSphere Message Broker, WebSphere MQ, WebSphere MQ, DB2, and Tivoli on Z/OS

SOA Entry Points Help Customers Get Started
Both Business Centric and IT Focused

Information

WebSphere Information Server

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WebSphere RFID Premises Server / Device Infrastructure

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Reuse

WebSphere Application Server V6.1

CICS Transaction Server V3.1

z/Transaction Processing Facility

WebSphere Developer for z/OS

People
Information
Process
Model
Deploy
Manage
Get Best Practices
Connectivity
Reuse

SOA Entry Point to a Process Centric Approach
Business Process Management for Continuous Innovation

z Value

- Innovative, SOA driven business models deployed quickly with flexible processes

- Automate and integrate core processes

- Centralize business critical processes with core services and communications hub necessary to support the enterprise

Start with

- A single process – model an underperforming process, and deploy as an enhanced process.

- Flexibly link multiple processes across the enterprise & to suppliers / partners. Monitor the process to measure & track performance.
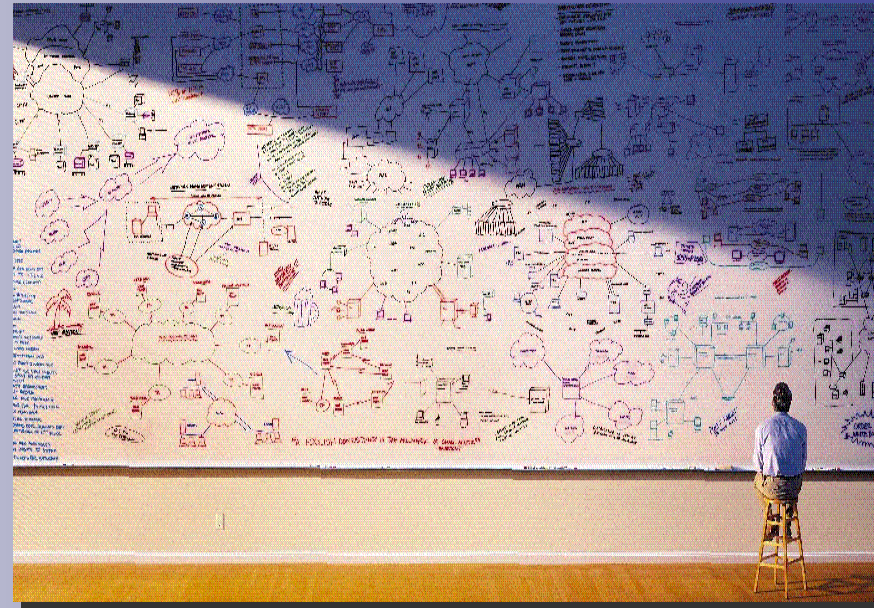
WebSphere Process Server for automated SOA runtime
A deployment environment for composite applications to ensure maximum flexibility at the speed of business

WebSphere Process Server for z/OS

enhanced

- Centralize your business process and share them across the enterprise

- Extend the value of core applications and databases, with the qualities of System z.

- Add connectivity and mediation support for Web services and JMS applications anywhere

- Innovate new standards-based solutions for easy assembly/deployment of service components

System z for when your processes absolutely must be available

What we hear …

Increasing Business Value

*How do I better manage and **govern** the development and integration of all my assets regardless of platform?*

*How do I utilize my existing development **talent** and **skills** to build new applications that leverage modern service oriented architectures?*

*How do I **preserve my investment** in my System z assets by making them more available in new ways for new value?*

*How can I drive down costs by making sure my developers are **productive** and delivering **high quality** applications in a **predictable** manner (on time and on budget)?*

Software Development Lifecycle

GOVERNANCE DASHBOARD
Manage software configurations

Monitor Business
Monitor & manage business processes

Model Business
Model & simulate business processes

Manage Requirement
Manage business application requirements

Discover / Understand
Understand, identify & prepare existing assets

Model Applications
Model applications & data

Develop
Rapidly develop applications

System z Integrated Process & Workflow

Monitor Applications
Monitor & manage production applications

Deploy
Deploy applications

Test / Debug
Test & debug applications

Manage Data
Create & update enterprise data

Assemble
Visually construct process flows
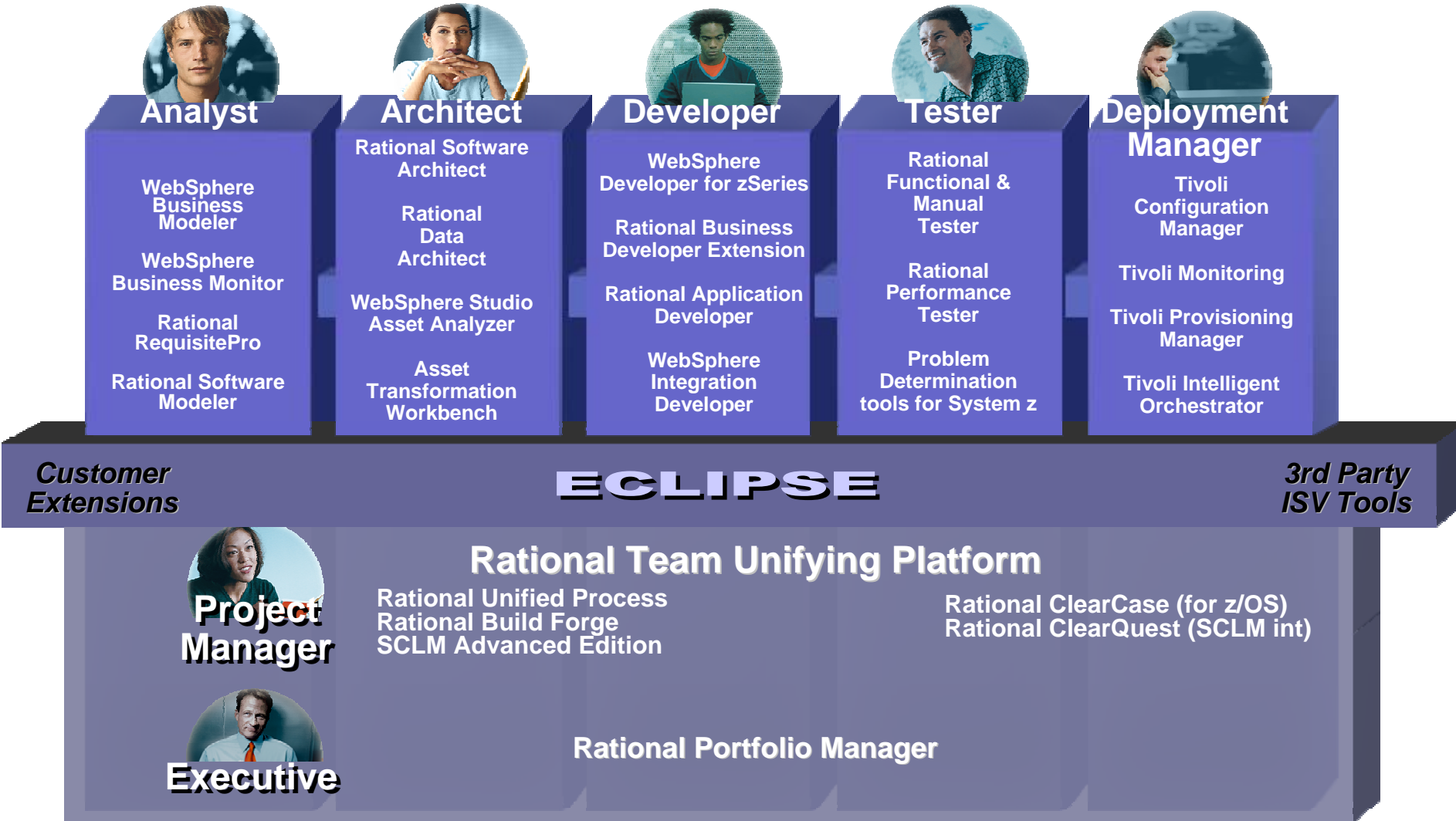
ISPF was good yesterday…the SDP carries you into the future…

The IBM Software Development Platform
Integrated and role-specific tools for SOA, z and multi-platform

Analyst
- WebSphere Business Modeler
- WebSphere Business Monitor
- Rational RequisitePro
- Rational Software Modeler

Architect
- Rational Software Architect
- Rational Data Architect
- WebSphere Studio Asset Analyzer
- Asset Transformation Workbench

Developer
- WebSphere Developer for zSeries
- Rational Business Developer Extension
- Rational Application Developer
- WebSphere Integration Developer

Tester
- Rational Functional & Manual Tester
- Rational Performance Tester
- Problem Determination tools for System z

Deployment Manager
- Tivoli Configuration Manager
- Tivoli Monitoring
- Tivoli Provisioning Manager
- Tivoli Intelligent Orchestrator

Customer Extensions

ECLIPSE

3rd Party ISV Tools

Project Manager

Executive

Rational Team Unifying Platform

Rational Unified Process
Rational Build Forge
SCLM Advanced Edition

Rational ClearCase (for z/OS)
Rational ClearQuest (SCLM int)

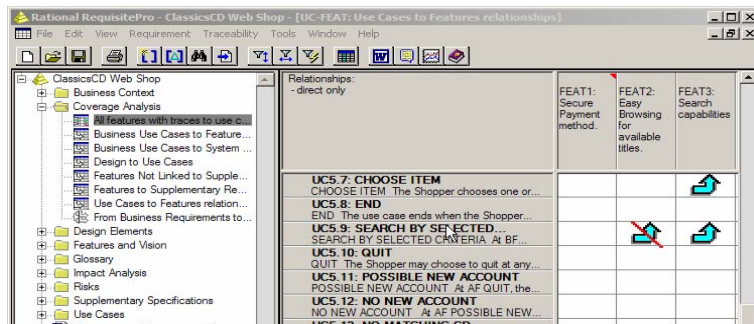## Rational Portfolio Manager

Manage Requirements
Understand what needs doing, and ensure it gets done

▶ **Scenario:**

- We need to formalize requirements management and trace requirements to designs, code, testcases, build records and deployment plans.
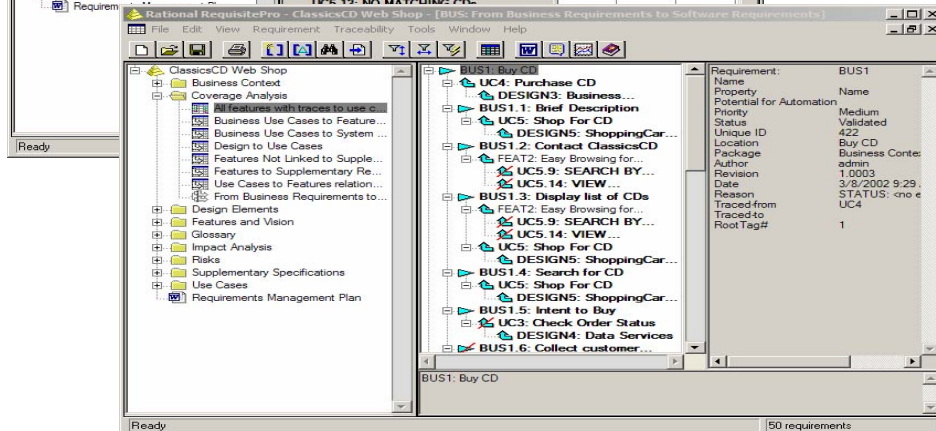
▶ ***What's here:***

- *Rational RequisitePro – handle requirements management for project teams*

✓ Graphical trace matrix

▶ ***What's coming:***

- *Rational RequisitePro – use DB2 for z/OS*

✓ Graphical trace tree

ReqPro just works, regardless of whether development is for System z, System i or distributed. Same for other parts of the SDP: RPM, WBM, RMT, etc.

Model and Simulate Business Processes
Model process changes and simulate savings <u>before</u> committing resources
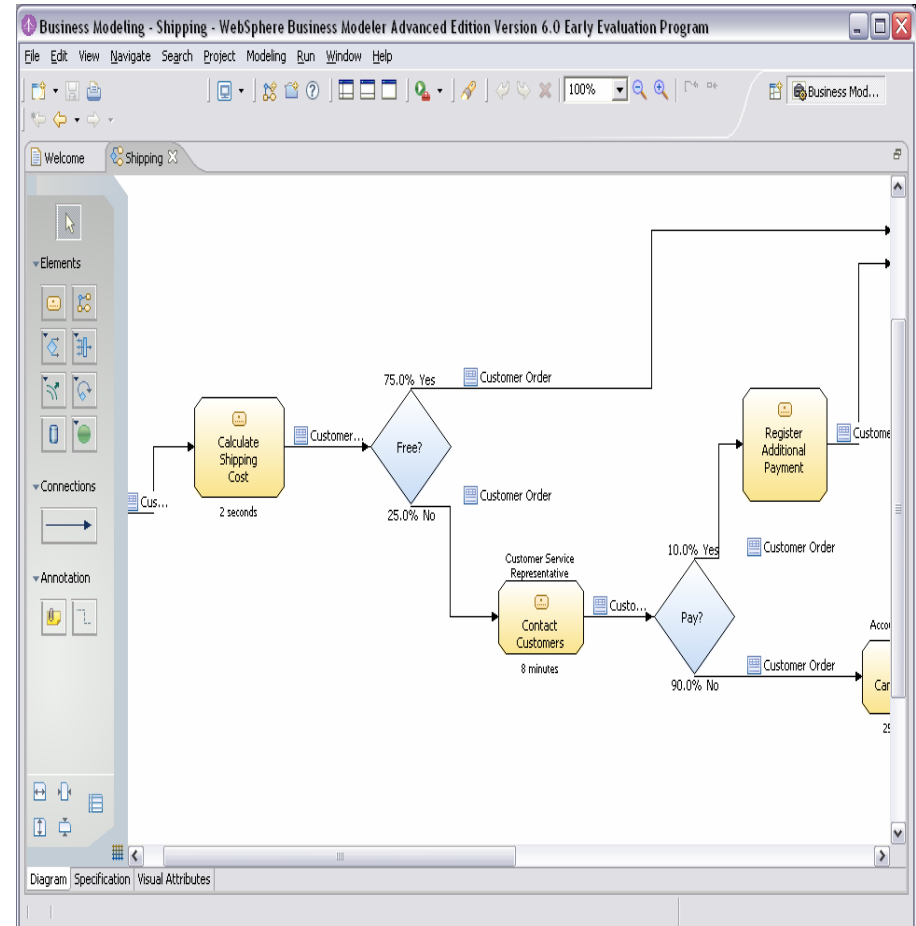
WebSphere Business Modeler

▶ **Scenario:**

- We need to visualize our critical business processes, and use modeling, simulation, and analysis to evaluate potential process enhancements prior to implementing changes.

▶ *What's here:*

- *WebSphere Business Modeler - visualize, comprehend, document and improve your business process events. Implementations can be deployed to WPS on z/OS.*

Assemble Composite Applications
with WebSphere Integration Developer

enhanced

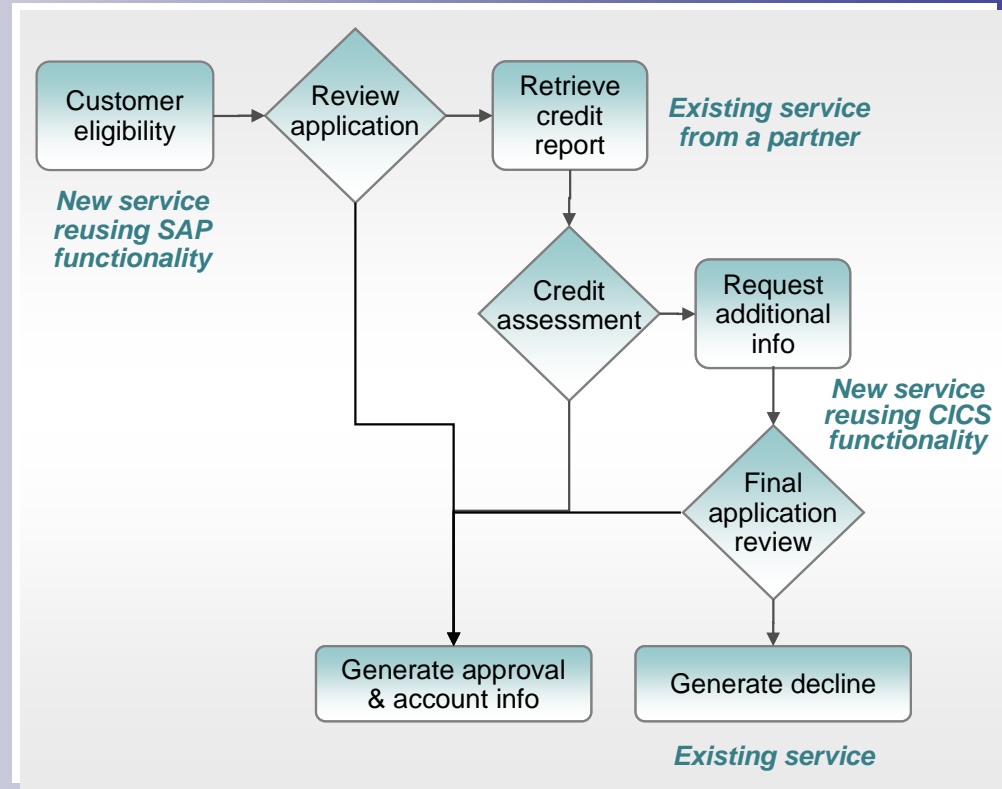## Streamlining process design hand-off between business and IT

- Import and work with business process models directly from the business analyst (WebSphere Business Modeler)

Simplifying and speeding development

- Easy to use tools where everything can be done through the GUI

- Single way to define all types of processes (human, automated, rules, etc.)

Maximizing re-use

- Ability to leverage existing services and develop for future reuse

---

New service reusing SAP functionality

Customer eligibility → Review application → Retrieve credit report

Existing service from a partner

Credit assessment → Request additional info

New service reusing CICS functionality

Final application review

Generate approval & account info

Generate decline

Existing service

WebSphere Business Monitor
Monitoring business performance across your SOA

enhanced

Improve business visibility

- Management dashboards and reporting capabilities, including trending information

- Tools to define or customize your dashboards

- See how your business is performing before issues arise

Ability to intervene in deployed processes

- Action Manager – supporting real-time response and action as performance data is received

Optimize flow of information

- Ability to export data to WebSphere Business Modeler for analysis and process improvement

- Run modeling simulations based on real data from the business monitor

Monitor KPI's based upon key performance objectives
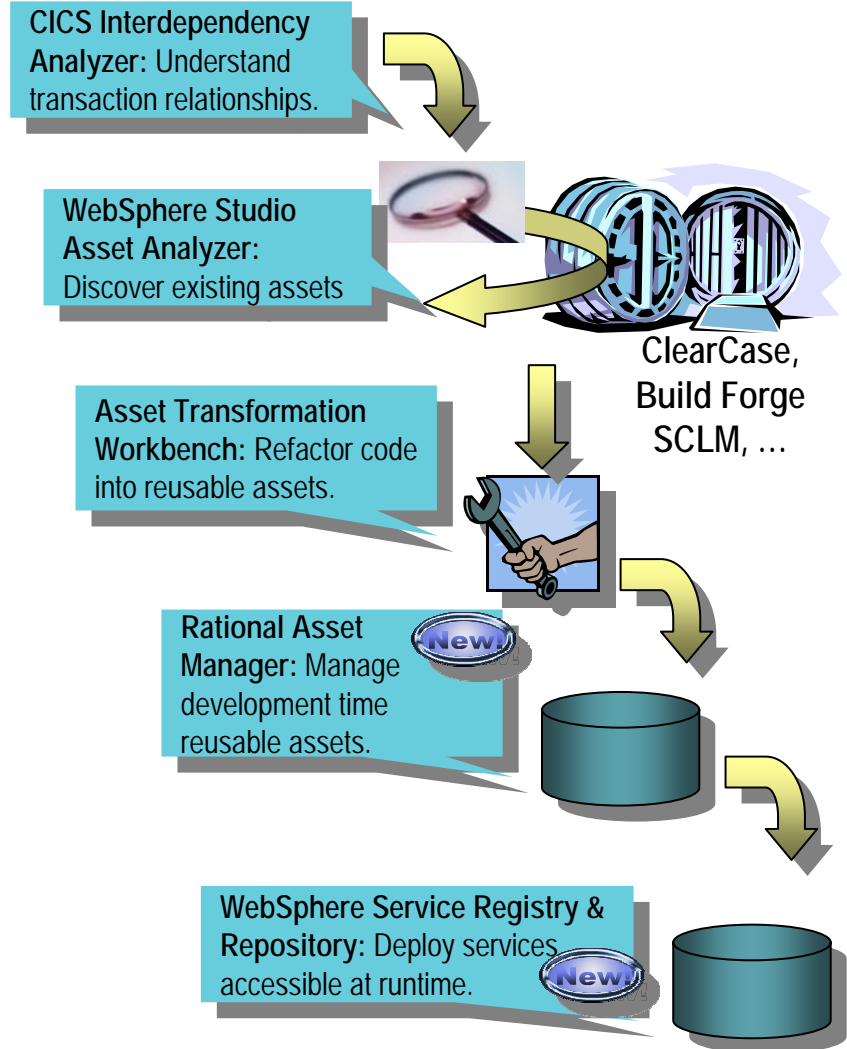
Discover, Understand & Reuse Assets
Optimize development investments

▶ **Scenario:**

- We need to understand the impact of changes to existing code, and leverage it more fully. When building new assets / services, we need to publish them for reuse.

▶ *What's here / coming:*

- *CICS Interdependency Analyzer – capture interdependency information and analyze transaction affinities*
  - *New in v2.1: Eclipse-based user interface to view runtime relationships*
- *WebSphere Studio Asset Analyzer – perform impact analysis across the enterprise*
- *Asset Transformation Workbench – perform pattern identification, extract business rules, assess suitability for reuse in SOA*
  - *New in V2.1: Reuse analyzer to identify potential services in COBOL code*
- *Rational Asset Manager – manage reusable assets during development*
- *WebSphere Service Registry & Repository – store, access, and manage info. about services*

CICS Interdependency Analyzer: Understand transaction relationships.

WebSphere Studio Asset Analyzer: Discover existing assets

ClearCase, Build Forge SCLM, …

Asset Transformation Workbench: Refactor code into reusable assets.

Rational Asset Manager: Manage development time reusable assets.

New

WebSphere Service Registry & Repository: Deploy services accessible at runtime.

New

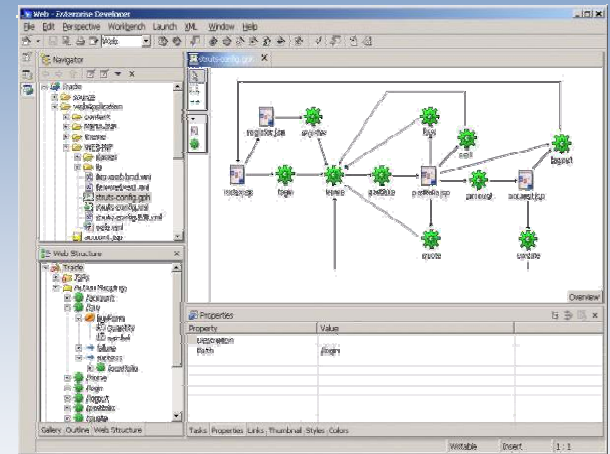# *WebSphere Developer for zSeries*
Assemble Services Across Platforms

Assemble

Create composite applications with Core Assets

- Bridges mainframe and client-server development
  - ▸ For end-to-end integrated processes running across platforms
  - ▸ Shared developer repositories and tooling framework

- For deployment to WebSphere, CICS, IMS, DB2 and batch
  - ▸ Cross platform development
  - ▸ Workstation based development tool
  - ▸ Workstation based mainframe application analysis tool

- Develop SOA systems that combine Web services, web applications and traditional applications
  - ▸ Cobol, PL/1, EGL (4GL)
  - ▸ Java, J2EE, WSDL, Java Beans, XML adapters
  - ▸ Portlets and complex user interfaces
  - ▸ Service flow modeler for CICS and HATS

WebSphere Developer for zSeries became generally available in June 2005.

Manage Source Code, Config Mgmt across the Enterprise
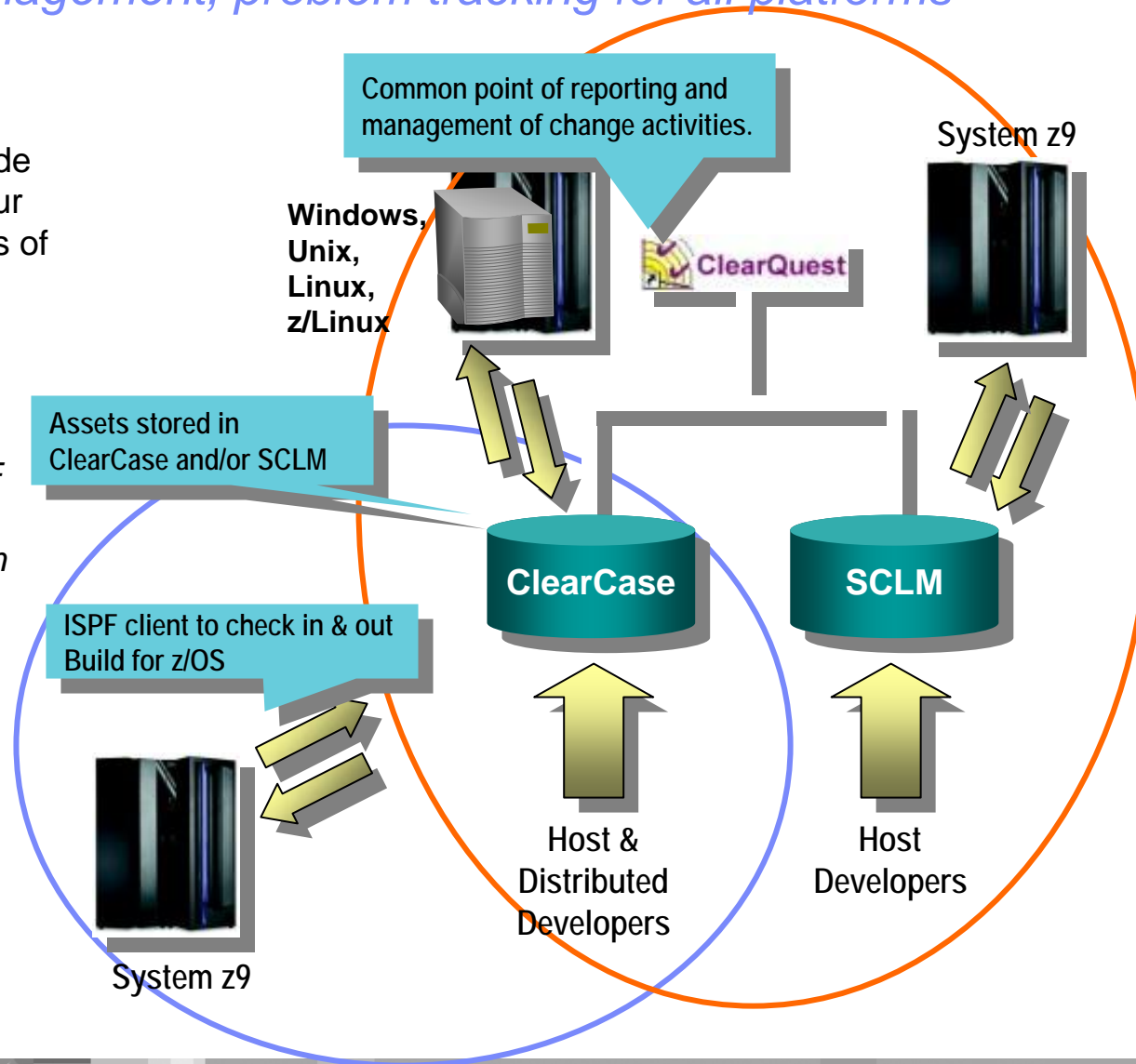## *Integrate configuration management, problem tracking for all platforms*

▶ **Scenario:**

- We need a consistent source code management solution for all of our business applications, regardless of platform

▶ *What's here:*

- *ClearCase - build for z/OS, ISPF client, run on z/Linux*
- *ClearQuest & SCLM - integration*
- *Source Code Library Manager (SCLM) - Eclipse client*

▶ *What's coming:*

- *ClearQuest – use DB2 for z/OS*
- *ClearCase – run on z/OS*

Common point of reporting and management of change activities.

System z9

Windows, Unix, Linux, z/Linux

ClearQuest

Assets stored in ClearCase and/or SCLM

ClearCase

SCLM

ISPF client to check in & out Build for z/OS

Host & Distributed Developers

Host Developers

System z9

Share a Process across your Enterprise
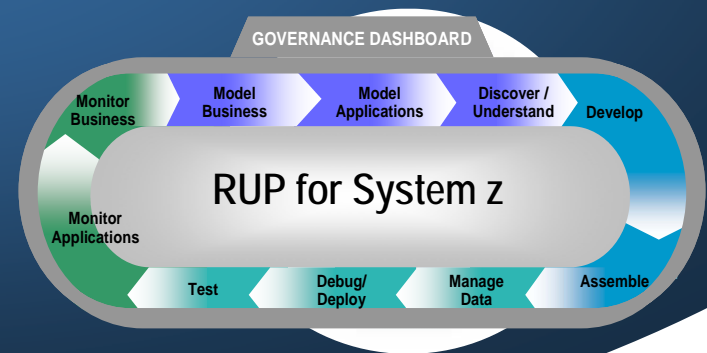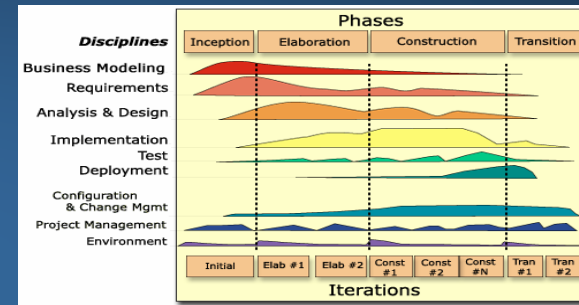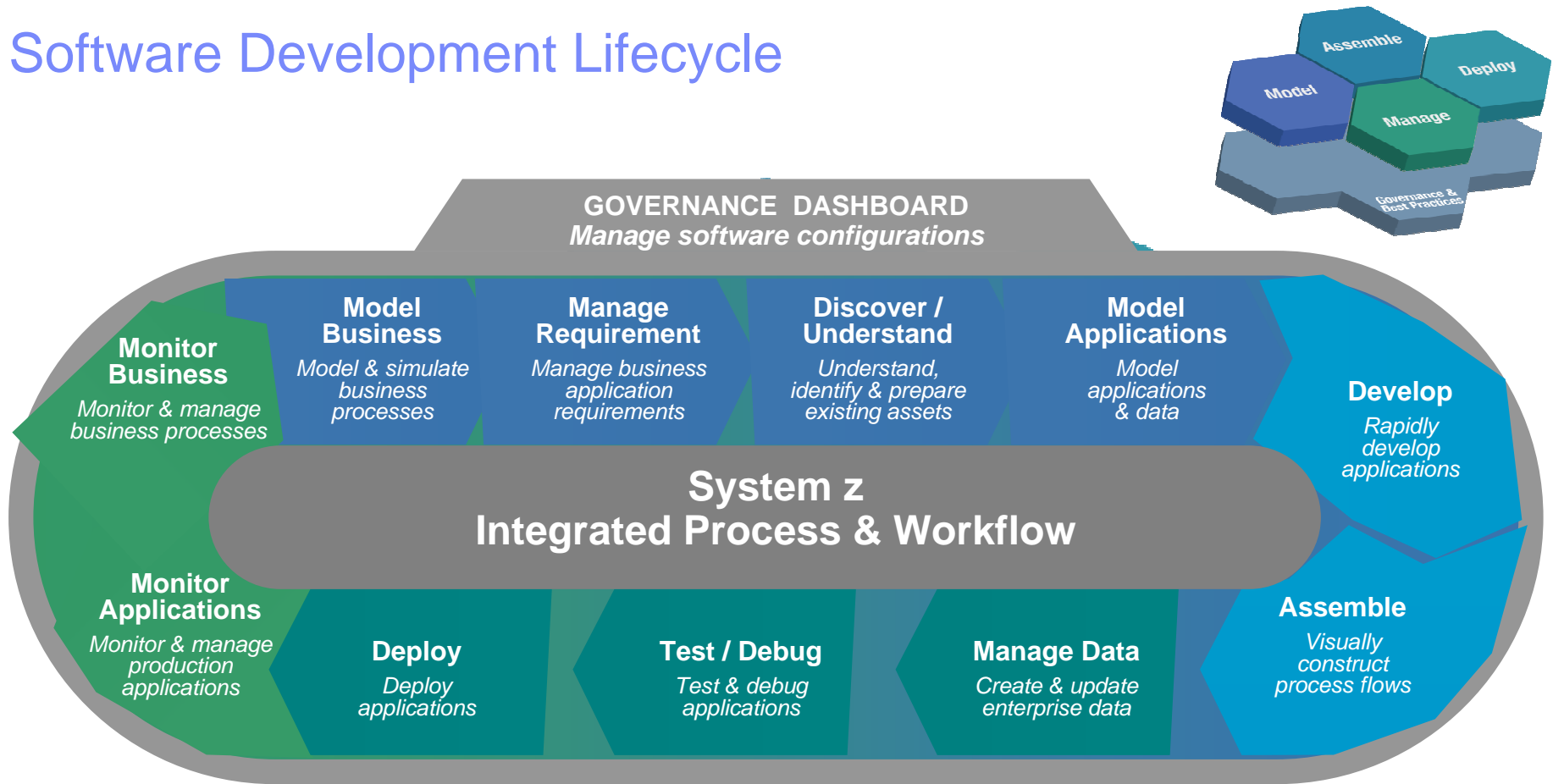## *Leverage platform uniqueness across a common process*
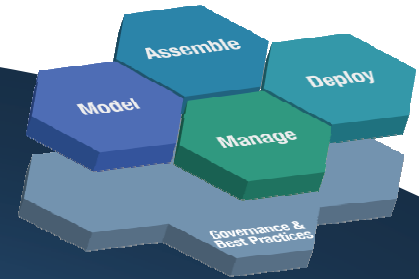
▶ **Scenario:**

- We need a common development process across my enterprise that considers platform uniqueness

▶ *What's coming:*

- *A specialization of RUP for SOA targeting development for System z*

- *Best practices for discovery, reuse and service creation from existing COBOL and PL/I code*

- *Integrates with*

  - *Rational Portfolio Manager for project execution and management*

  - *Eclipse-based development environments for non-intrusive practitioner guidance*

Software Development Lifecycle

GOVERNANCE DASHBOARD
Manage software configurations

Monitor Business
Monitor & manage business processes

Model Business
Model & simulate business processes

Manage Requirement
Manage business application requirements

Discover / Understand
Understand, identify & prepare existing assets

Model Applications
Model applications & data

Develop
Rapidly develop applications

System z Integrated Process & Workflow

Monitor Applications
Monitor & manage production applications

Deploy
Deploy applications

Test / Debug
Test & debug applications

Manage Data
Create & update enterprise data

Assemble
Visually construct process flows

▸ The IBM SDP provides
- Coverage of the complete software development lifecycle
- Products that support System z, System i, and distributed platforms via platform-specific and platform-agnostic support

IBM Get Started with SOA on zSeries

- **SOA Assessment Workshop**
  - ▸ Identify business goals, technical requirements, leverage existing systems, identify new development opportunities

- **SOA Architecture and Design Workshop**
  - ▸ Gain a deeper understanding of your project requirements, evaluate existing infrastructure, develop recommended architecture

- **SOA for Project Scoping Workshop**
  - ▸ Identify enterprise applications as an SOA zSeries project, identify skills and resources, develop a comprehensive project plan

- **Advanced SOA and Web Services Mentored Workshop**
  - ▸ On-site advanced mentoring workshop for architects and developers focused on SOA for zSeries and Web Service technologies and skills.

  SOA Center of Excellence
  - ▸ Provide assistance with improving your SOA for zSeries software development, delivery and operations

Key Takeaways

IBM and our Business Partners are the leaders in SOA

- Over 3,000 engagements and 1,300 new partners
- Over 300 customers deploying SOA on CICS Transaction Server V3.1 … and the fastest uptake of any version of CICS TS
- WebSphere Application Server for zSeries had 21% growth in 2005…. and 25% penetration in z accounts
- zAAPs outperformed expectations by 36% in 2005
- New System z9 processor range from 26 to 18,000 MIPS

IBM's SOA approach of "Flexible Entry" enables customers to deploy SOA with z at the rate and pace they need with real business results

Model Business Processes for SOA roll-out
with WebSphere Business Modeler

enhanced

- **Modeling For Compliance/Documentation**
  - ▸ Document processes for use by a business to understand the business process
  - ▸ Customers use output for training, collaboration, documentation requirements for compliance regulations (Sarbanes-Oxley and Basel II)
  - ▸ Linkage to real-time monitoring provides a feedback mechanism for reporting requirements needed for compliance
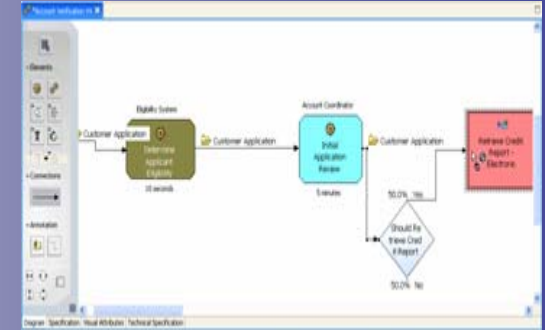
- **Modeling For Redesign**
  - ▸ Document both the current state and future state business process and the comparison to determine Return on Investment (ROI) analysis
  - ▸ Six Sigma and Process Improvement are common methodologies
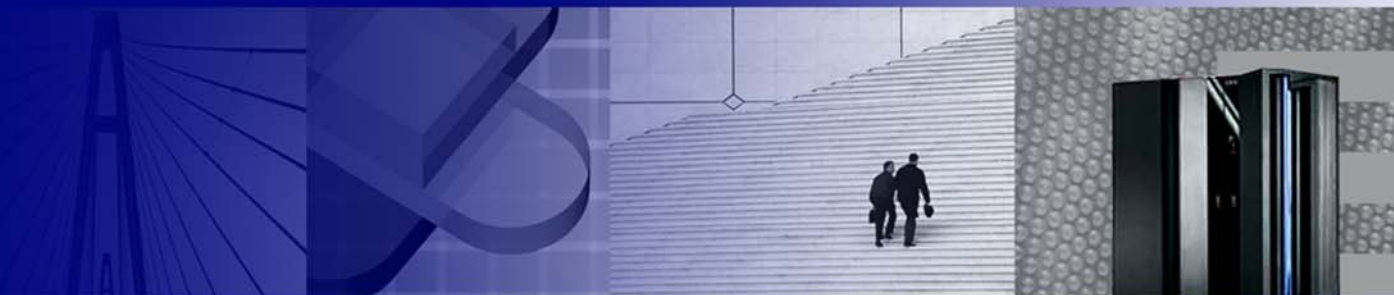
- **Modeling For Execution**
  - ▸ Modeler can create artifacts from the business model and make them available in technology development tools to reduce the overall implementation time of new business processes.

Set KPI's based upon key performance objectives

System z Executive Briefing

IBM System z – SOA for Today's Modern Applications