SOA Application Development Lifecycle Tools for z/OS
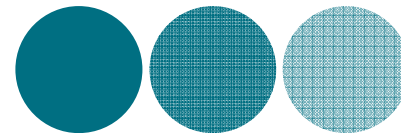
Name
Title
Email address
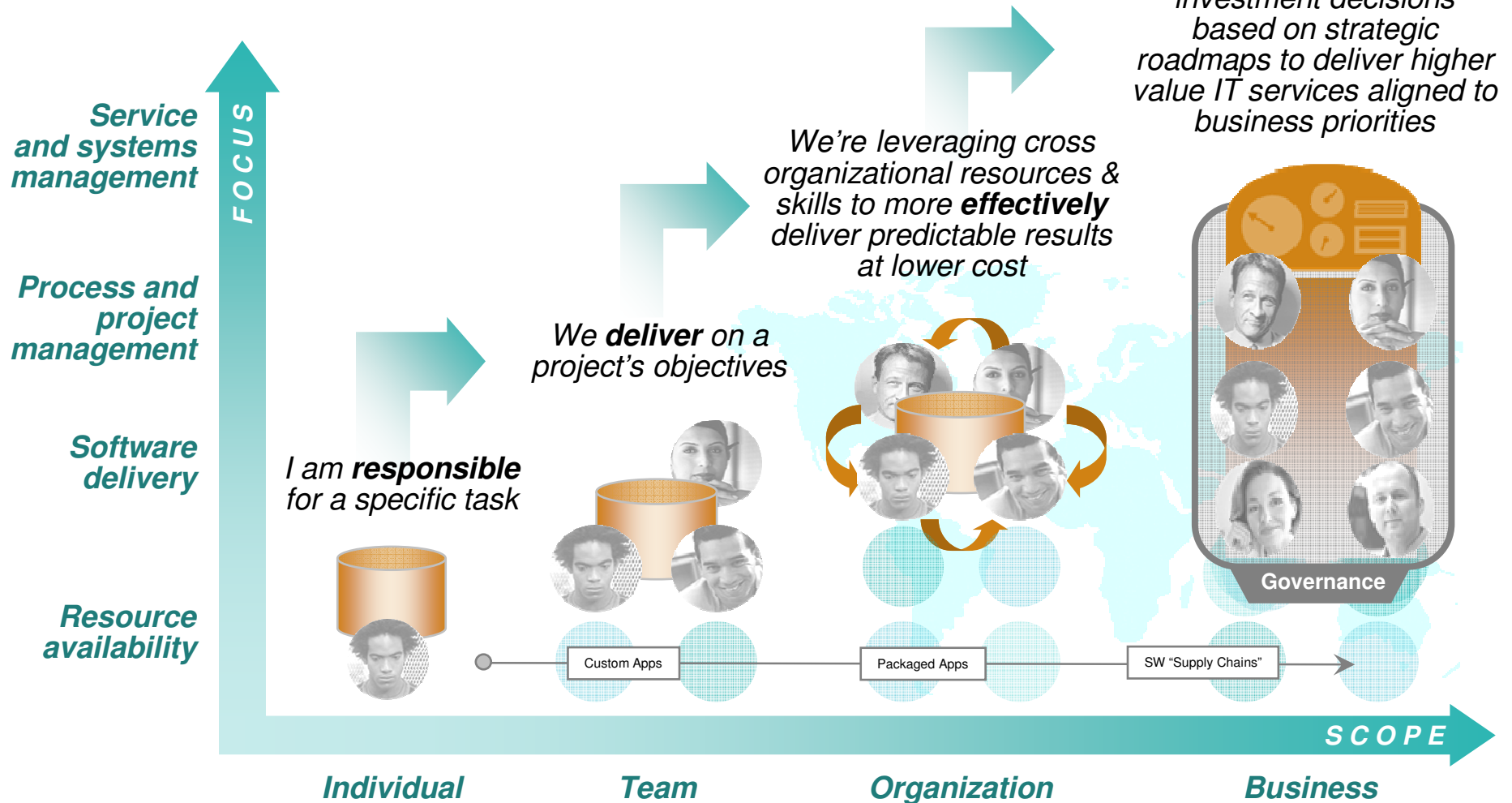
Rational. software

Agenda

- Today's Realities and challenges

- Overview of Rational Enterprise Modernization solutions

- Summary

- Q&A

The evolution of software delivery
Governing delivery in the context of the business

FOCUS

- Service and systems management
- Process and project management
- Software delivery
- Resource availability

*I am **responsible** for a specific task*

*We **deliver** on a project's objectives*

*We're leveraging cross organizational resources & skills to more **effectively** deliver predictable results at lower cost*

*We're **proactively** making investment decisions based on strategic roadmaps to deliver higher value IT services aligned to business priorities*

Governance

Custom Apps

Packaged Apps

SW "Supply Chains"

SCOPE

Individual   **Team**   **Organization**   **Business**

IT Challenges and the need for Modernization

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

- IT must overcome challenges to enable flexibility, 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

Enterprise modernization challenges

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

-- Phil Murphy, Forrester Research, April 2007

Software archeology

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

Architectures
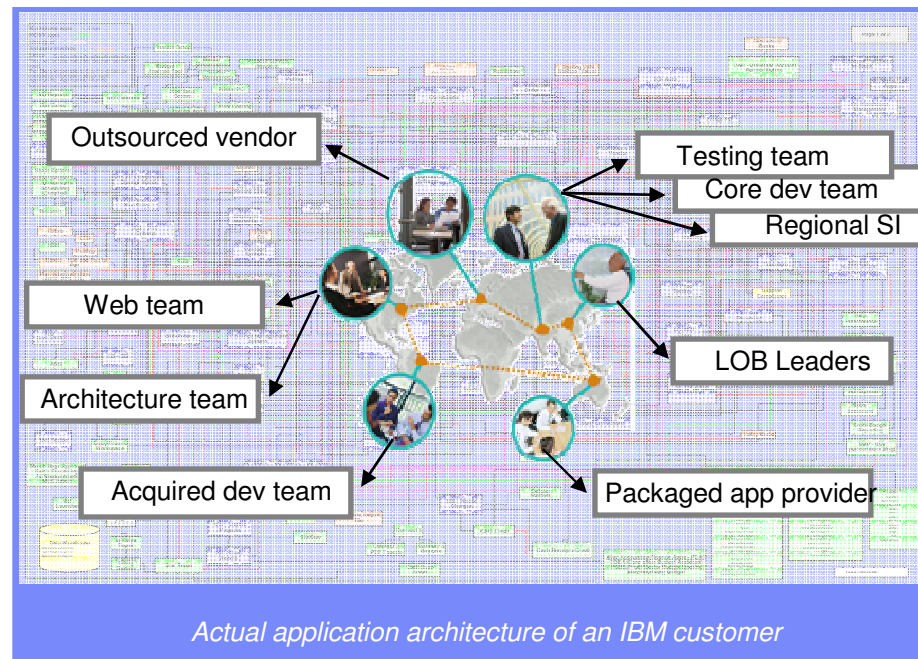Tightly-coupled architectures hindering IT flexibility

Skills
IT skills shortage and silos limiting staff productivity and mobility

Processes and tools
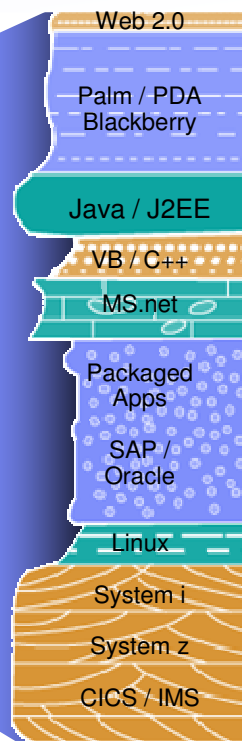Duplicate processes, tools and infrastructures limiting collaboration

Investments
Increasing maintenance costs limiting flexibility for new investments

Outsourced vendor

Testing team

Core dev team

Regional SI

Web team

LOB Leaders

Architecture team

Acquired dev team

Packaged app provider

Actual application architecture of an IBM customer

Web 2.0

Palm / PDA Blackberry

Java / J2EE

VB / C++

MS.net

Packaged Apps

SAP / Oracle

Linux

System i
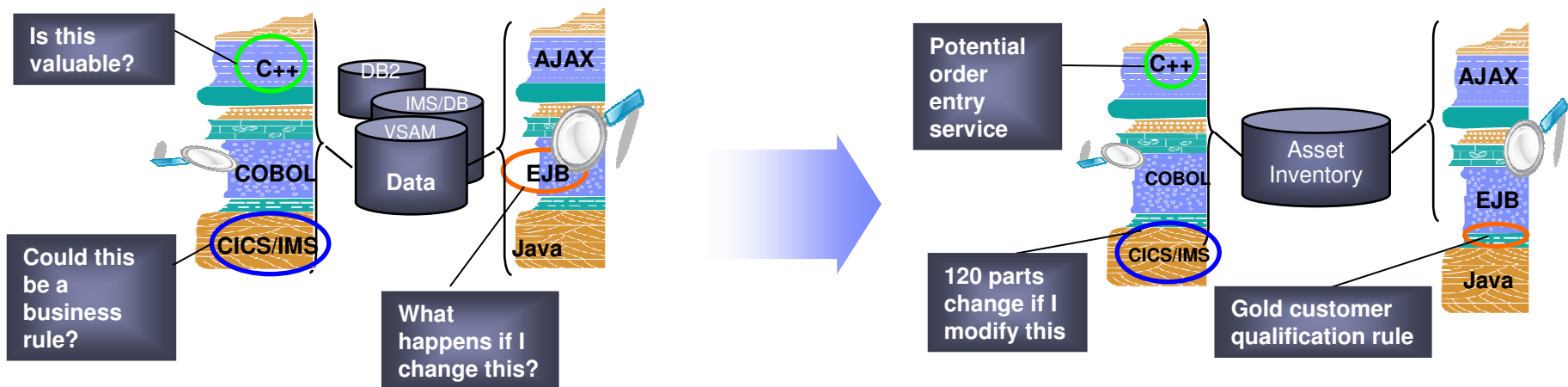
System z

CICS / IMS

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

Is this valuable?

C++

DB2

IMS/DB

VSAM

AJAX

COBOL

Data

EJB

Could this be a business rule?

CICS/IMS

Java

What happens if I change this?

Potential order entry service

C++

AJAX

COBOL

Asset Inventory

EJB

120 parts change if I modify this

CICS/IMS

Gold customer qualification rule

Java

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

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
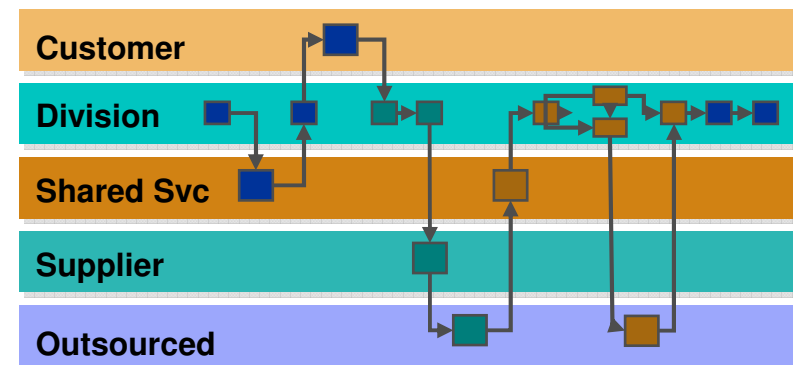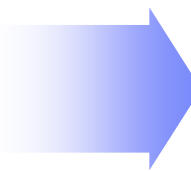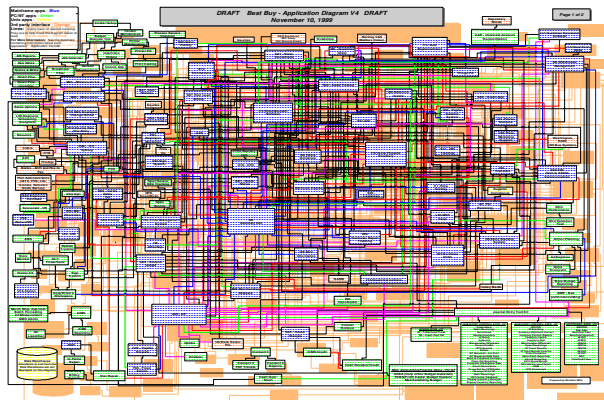
"SOAs cost 20% less to implement and saves 50% more with each reuse than traditional component-based development… the level of reuse in SOA development averages 2.5 times more than non-SOA development"
Jeffrey Poulin, PH.D. and Alan Himler, MBA, 2006 *"The ROI of SOA – Based on Traditional Component 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
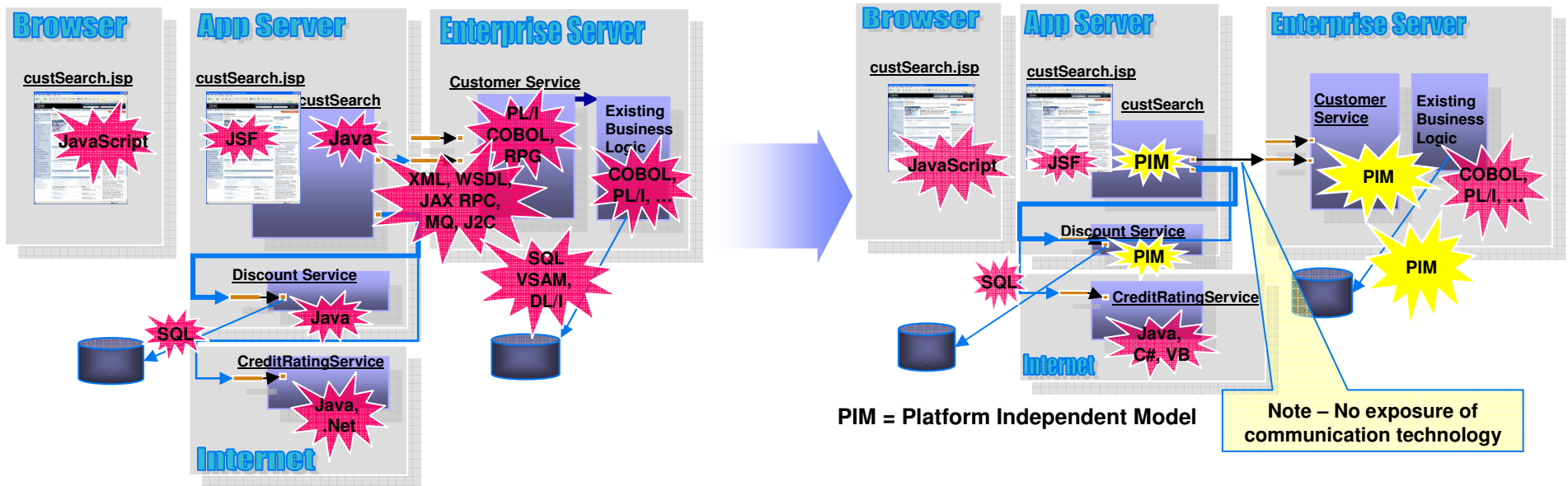
Page 7

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

PIM = Platform Independent Model

Note – No exposure of communication technology

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.
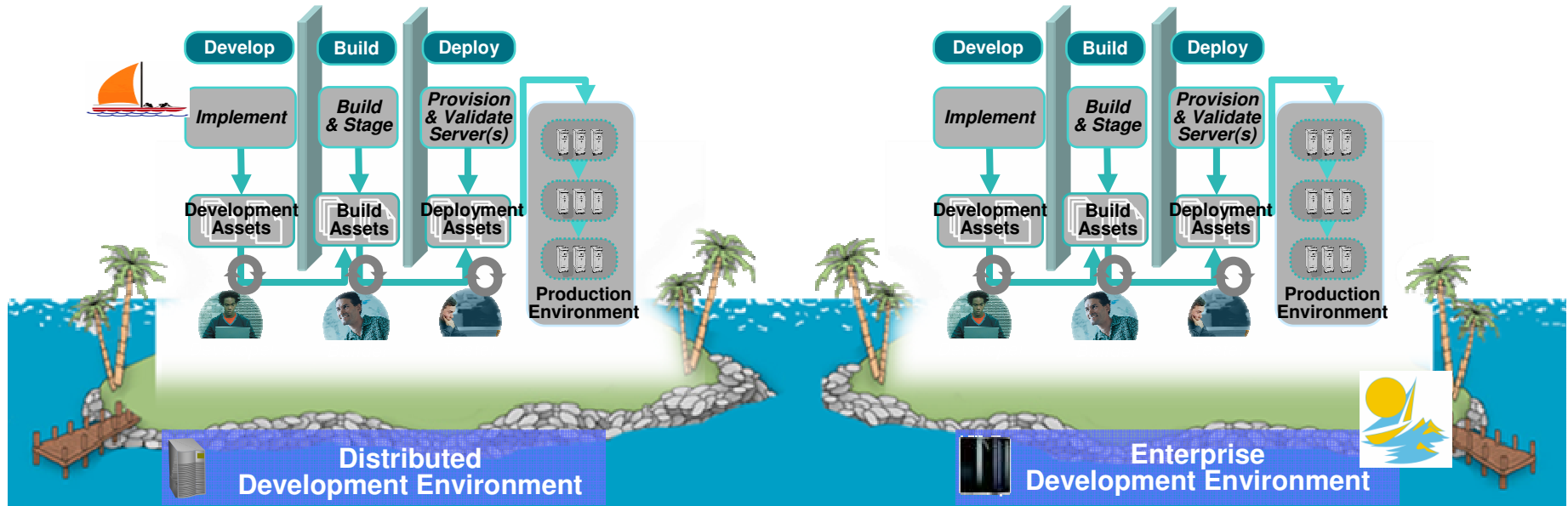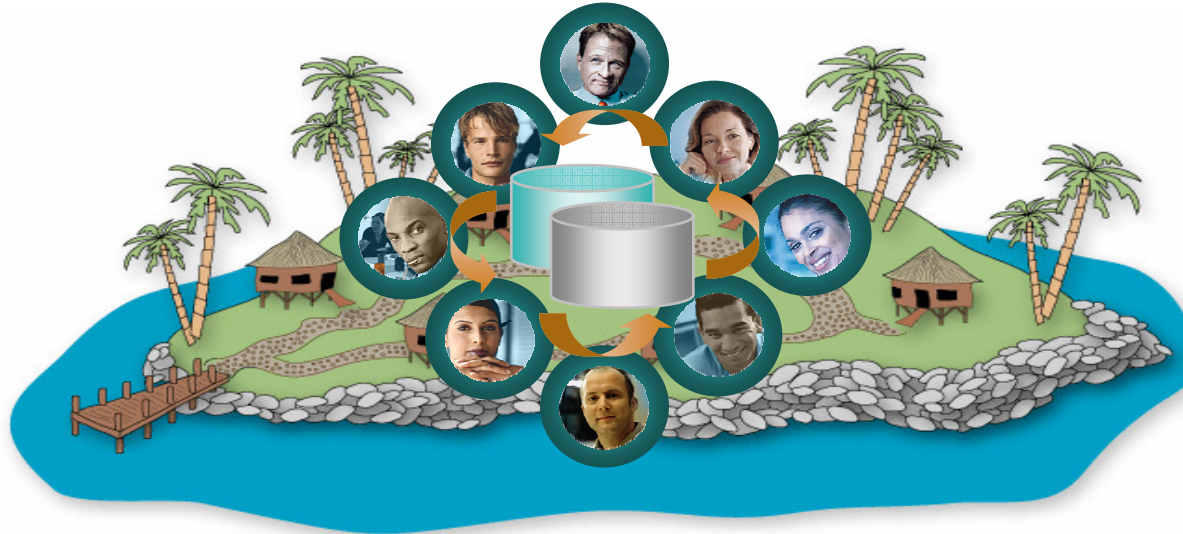
Page 8

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

Develop	Build	Deploy
Implement	Build & Stage	Provision & Validate Server(s)
Development Assets	Build Assets	Deployment Assets

Production Environment

Distributed Development Environment

Develop	Build	Deploy
Implement	Build & Stage	Provision & Validate Server(s)
Development Assets	Build Assets	Deployment Assets

Production Environment

Enterprise Development Environment

Processes and tools modernization
Challenge of IT development islands

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Consolidated Development Environment

Investment modernization
Challenge of lack of flexibility for new investments

What you have...

- **Shrinking IT budgets** with a significant % (~75-80) being applied towards maintaining existing systems
- **Outdated application development platforms** which cannot leverage modern technologies and middleware advances
- **An increasing application backlog** that limits ability to incrementally improve overall modernization posture

What you want...

- **Freed-up IT budgets** to help devote resources to new development rather than maintenance
- **Move to standard development platforms** that support enterprise as well as distributed teams
- **Make incremental improvements** within the context of a long-term strategic modernization plan
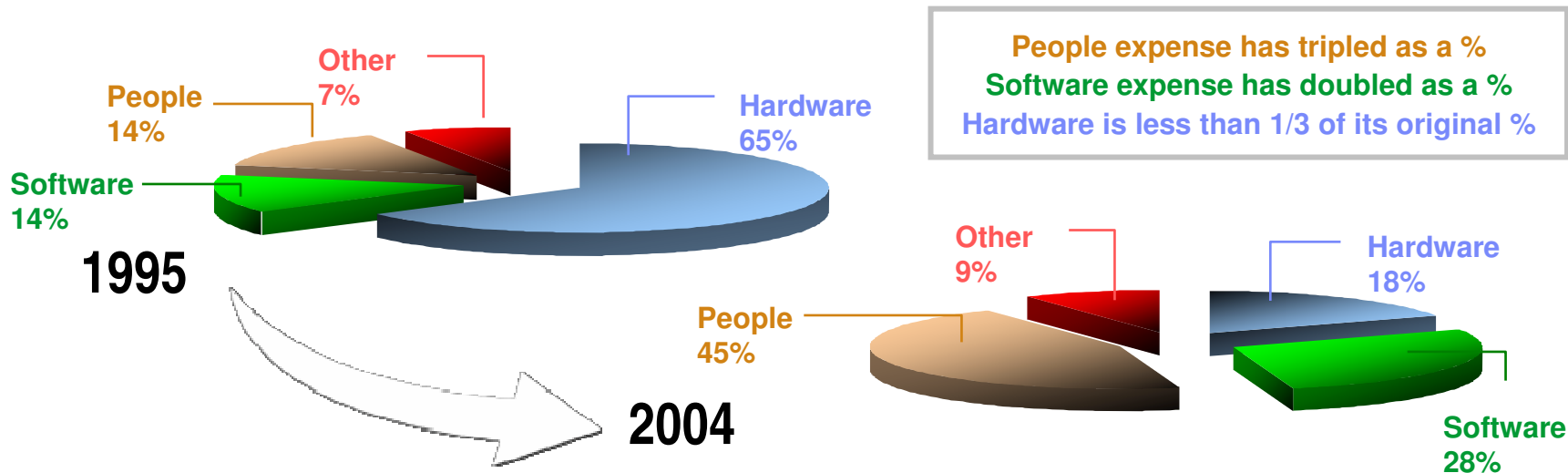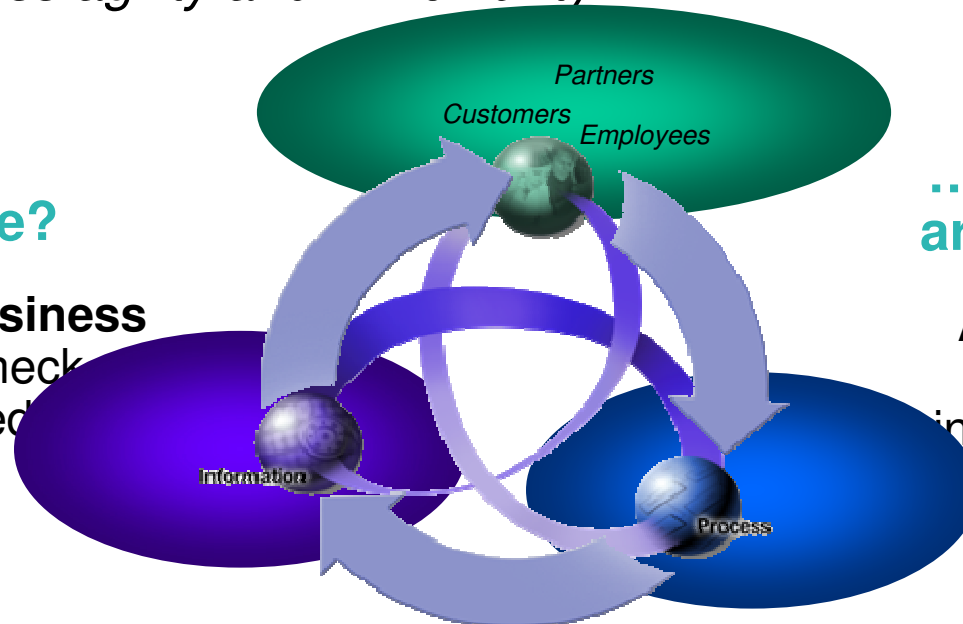
Other
7%

People
14%

Software
14%

1995

Hardware
65%

People expense has tripled as a %
Software expense has doubled as a %
Hardware is less than 1/3 of its original %

Other
9%

Hardware
18%

People
45%

2004

Software
28%

Services Oriented Architectures (SOA)

Enabling business agility and IT flexibility

… a service?

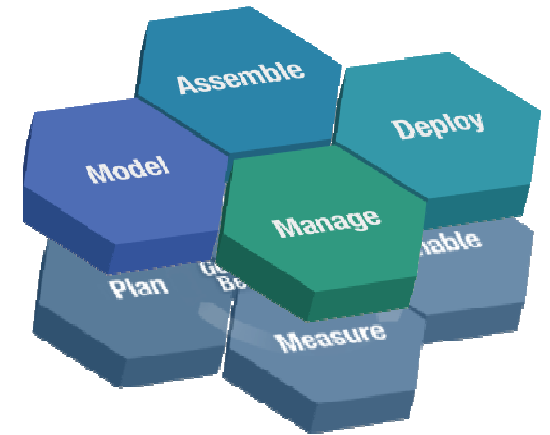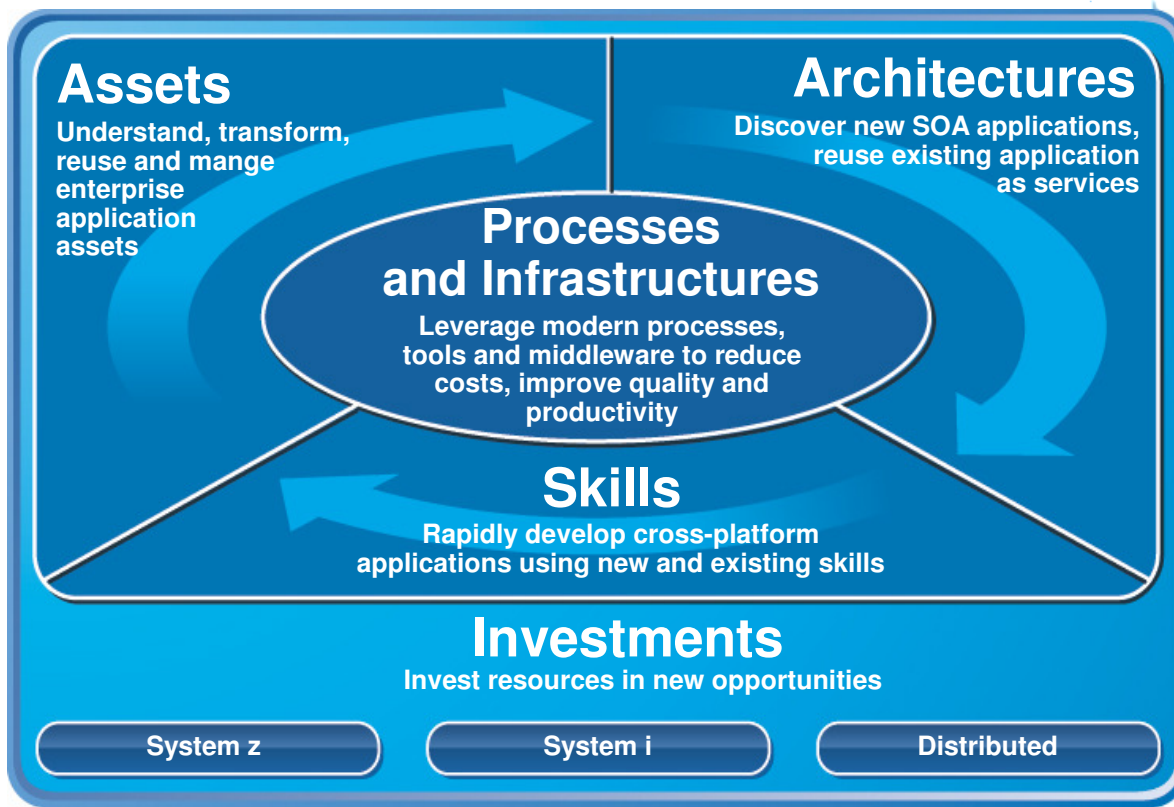A **repeatable business task** – e.g., check customer cred...

… service oriented architecture (SOA)?

An IT **architectural style** that supports integrating businesses as linked services

Partners
Customers
Employees

Integration

Process

✓ **Enables business flexibility**
✓ **Better aligns *IT* & business investments**
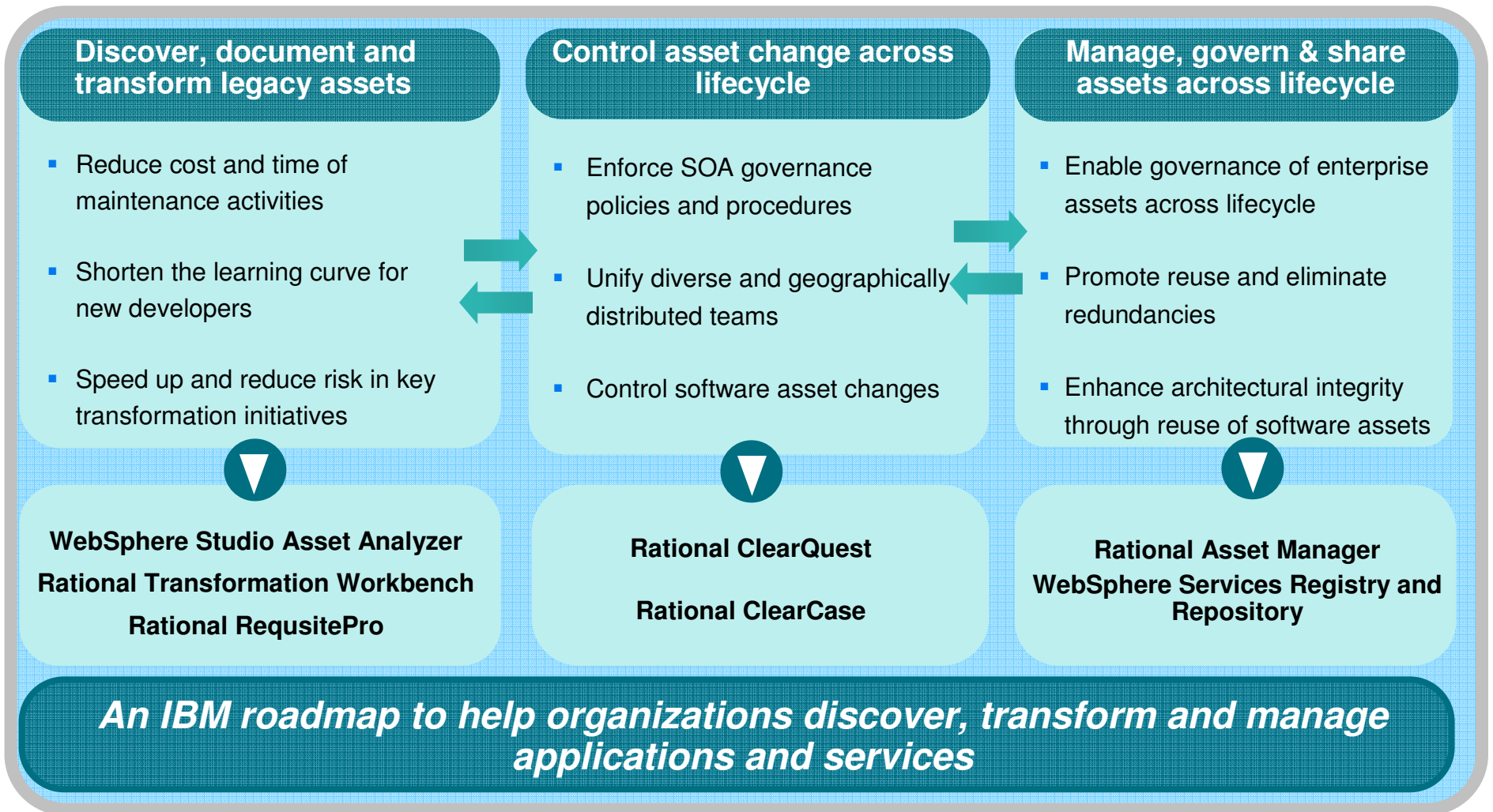✓ **Enables Adaptive business processes**
✓ **Lowers cost of *IT***
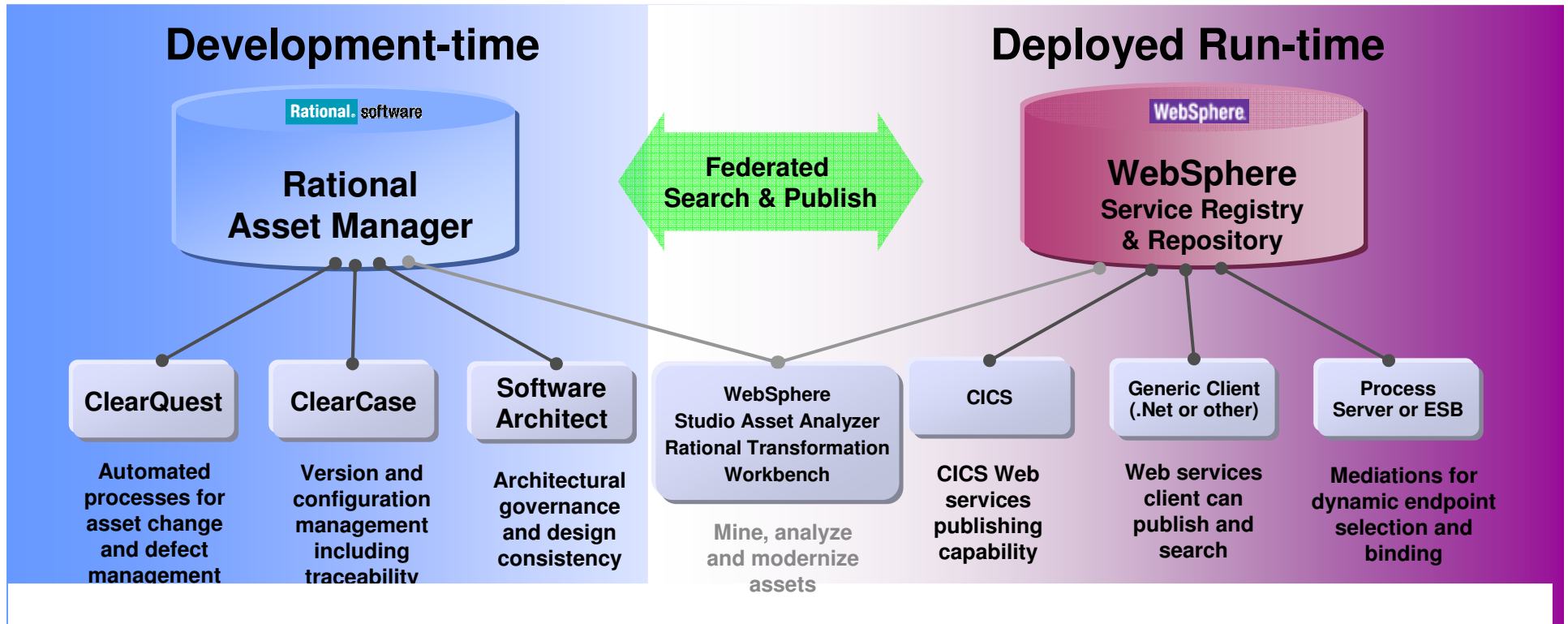
Accelerating Enterprise Modernization towards SOA

Assets
Understand, transform, reuse and mange enterprise application assets

Architectures
Discover new SOA applications, reuse existing application as services

Processes and Infrastructures
Leverage modern processes, tools and middleware to reduce costs, improve quality and productivity

Skills
Rapidly develop cross-platform applications using new and existing skills

Investments
Invest resources in new opportunities

System z   **System i**   **Distributed**

Assemble · Deploy · Model · Manage · Plan · Measure

Asset modernization

Comprehensive inventory of assets for reuse and modernization

Assets

Discover, document and transform legacy assets

- Reduce cost and time of maintenance activities

- Shorten the learning curve for new developers

- Speed up and reduce risk in key transformation initiatives

WebSphere Studio Asset Analyzer

Rational Transformation Workbench

Rational RequsitePro

Control asset change across lifecycle

- Enforce SOA governance policies and procedures

- Unify diverse and geographically distributed teams

- Control software asset changes

Rational ClearQuest

Rational ClearCase

Manage, govern & share assets across lifecycle

- Enable governance of enterprise assets across lifecycle

- Promote reuse and eliminate redundancies

- Enhance architectural integrity through reuse of software assets

Rational Asset Manager
WebSphere Services Registry and Repository

An IBM roadmap to help organizations discover, transform and manage applications and services

A comprehensive IBM solution to SOA asset discovery, transformation and management

Assets

Development-time

Deployed Run-time

Rational. software

**Rational
Asset Manager**

Federated
Search & Publish

WebSphere.

**WebSphere
Service Registry
& Repository**

ClearQuest	ClearCase	Software Architect	WebSphere Studio Asset Analyzer Rational Transformation Workbench	CICS	Generic Client (.Net or other)	Process Server or ESB
Automated processes for asset change and defect management	Version and configuration management including traceability	Architectural governance and design consistency	Mine, analyze and modernize assets	CICS Web services publishing capability	Web services client can publish and search	Mediations for dynamic endpoint selection and binding

CREATION

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

CONSUMPTION

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

WebSphere Studio Asset Analyzer V5.1

Assets

Enterprise customer *mainframe* application-development artifacts

COBOL, PL/I, DB2, IMS/DC, CICS, job control language (JCL) and High Level Assembler (HLASM)

Inventory process

Application metadata (DB2)

Inventory process

Enterprise customer *distributed* application development artifacts

Java technology-based WebSphere applications, HTML, JavaServer Pages (JSP), Enterprise JavaBeans (EJB), enterprise archive (EAR), Web archive (WAR) and Java archive (JAR) files, and C++ applications

Impact analysis

Application understanding

User community

Web browser

Web services

Other tools

Business analysts, system analysts, developers, testers, project managers

IBM Rational Transformation Workbench V3.1
Accelerate your path to reuse and SOA-readiness

Assets

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

***Rational Transformation Workbench v3.1** – helps collect and abstract business and technical knowledge from highly complex systems for better understanding*

- Demystify enterprise applications and their inter- and intra-relationships

- Gain intellectual control; make fact-based decisions; develop transformation roadmap.

- Identify key assets and restructure for reuse in SOA; reduce cost and time of modernization projects

- Reduce cost and time of on-going application maintenance

- New in 3.1

  ▸ New system level, source level and application glossary information to users

  ▸ Business rule extension improved usability, productivity, automation, auto-detection, visualization, reporting, abstraction and analytics

  ▸ Improved executive reports and additional report customization. Key reports available in batch mode

Modernizing existing systems to offer more higher-margin accessories

Multinational auto manufacturer

Challenge

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

Solution

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

Products include:

- WebSphere Studio Asset Analyzer
- IBM Rational Transformation Workbench

Assets

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

Architecture & skills modernization
Accelerate your path to reuse and service-oriented architectures

Architectures & Skills

Transform green screens to modern user interfaces

- Access to web, with lower cost and lower risk

- Improve appearance, usability and productivity

- Reduce transaction costs, training costs and employee turnover

Extend core business functions as services

- Expose key transaction capabilities as services

- Meet highest QOS requirements

- Reduce time to market and increased responsiveness

Accelerate cross-platform application development

- Apply existing "business-knowledgeable" and new staff on multi-platform projects

- Break skills silos

- Reduce retraining costs

- Accelerate adoption of modern architectures and technologies

Host Access Transformation Services (HATS)

Rational Developer for System z

Rational Business Developer Extension

An IBM roadmap to help organizations create new SOA applications and reuse existing applications as services

Host Access Transformation Services
Modernize user interfaces and create Web Services

Architectures

- Modernize and streamline "green screen" applications

- Combine data from multiple screens, applications and databases

- Non-invasive

Rich Client

Example: CICS App

3270 or 5250 Data stream
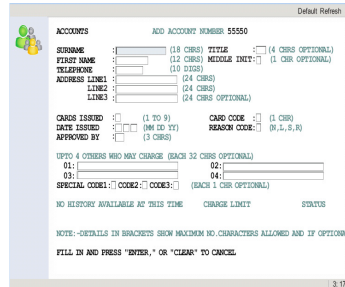
- Integration at the desktop with other Eclipse applications

- Client side processing

- Rich set of user interface widgets

- Built on the standard, open Eclipse foundation

- 3270e print directly to end user's printer

Web

- Zero footprint

- View through your favorite browser

Web Service

- Build self-service transactions

Portal
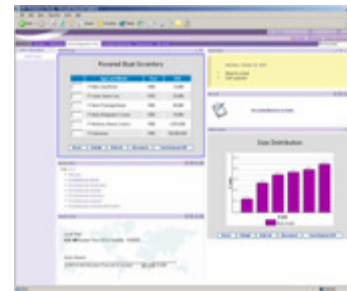
- Integration at the glass

- Click-to-Action support

Improving customer satisfaction and reducing costs
Mercantil do Brasil

Architectures

Challenge

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

Solution

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

Products include:

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

MERCANTIL DO BRASIL

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

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

IBM Rational Developer for System z V7.1

Preserve System z investment – and leverage existing assets

Architectures

- An intuitive, visual construction based on open standards (J2ee, Java Server Faces)

- Broad SOA support through Web Services and JCA with specialized System z capabilities

- Build Web services from existing CICS applications

- Comprehensive state-of-the-art facilities for developing, debugging and deploying COBOL, PL/I, C, Java, CICS, IMS, Batch, DB2 processing
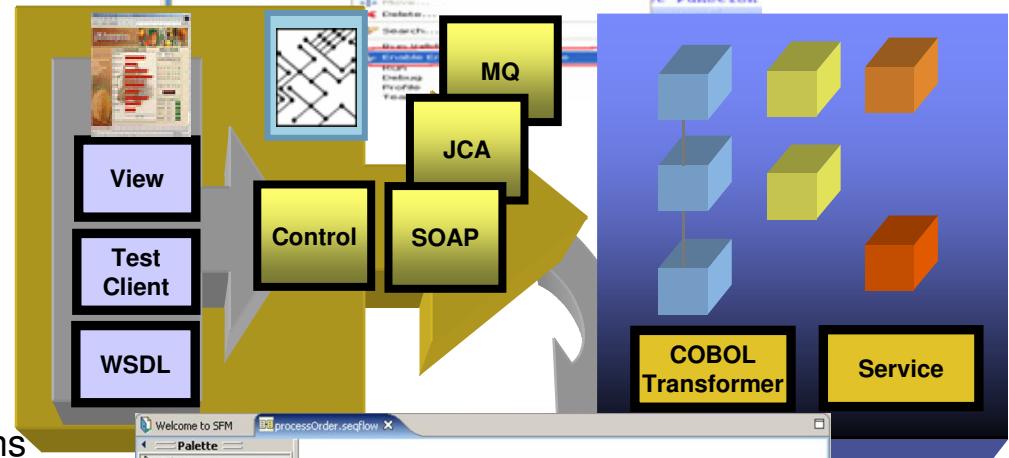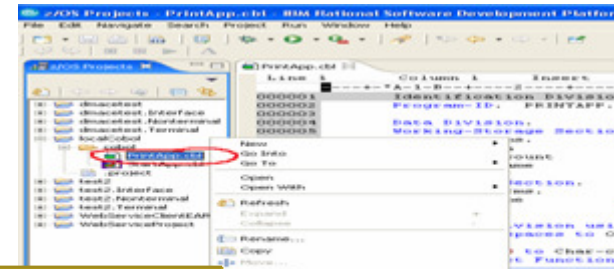
Service Flow Feature and Modeler for CICS v3.2

- Build Web services from existing CICS applications
  - ▸ Aggregates multiple CICS transactions into high-level business processes through visual modeling
  - ▸ Supports BMS (terminal-based), CICS COMMAREA, and CICS Channel/Container, and CICS Web Service applications
  - ▸ Highly optimized CICS runtime supporting Web services and XML interfaces
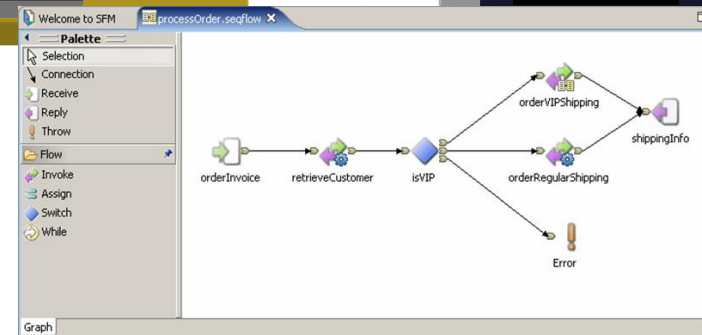
Extending COBOL applications for online banking
Commerzbank

Architectures

Challenge

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

Solution

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

Products include:

- IBM Rational Developer for System z

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

IBM Rational Business Developer Extension V7.0

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

Skills

Batch Processes	Text UI	Web	Rich Client	Reports	Web/Native Services

Program

Control Logic

User Interface

Business Logic

Service/Interface

Enterprise Connection

Write business and control logic with EGL

External Interfaces

- COBOL
- RPG
- PL1
- C, C++
- Java

Databases

- DB2 UDB
- SQL Server
- Oracle
- Derby
- Informix
- IMS
- VSAM
- other…

Encapsulate existing or create new resources

Improving productivity by breaking skills silos
KBC

Challenge

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

Solution

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

Products include:

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

"We want to avoid the 'skill silos'; what we really need is a large group of general developers who should not worry about target platforms and focus on developing business components, and only a small number of technology specialists, so that we can swiftly allocate general developers to upcoming business needs. . . . EGL is helping us achieve this goal." - Lieven Gouwy, IT architect, KBC

Processes and tools modernization
Shared development platform enterprise and distributed teams

Process
AND TOOLS
&
Infrastructure
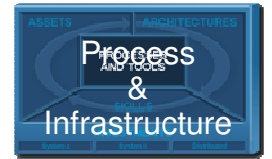
Manage application portfolio, requirements and processes

- Align organizational and business needs to prioritize investments

- Ensure modernization efforts align with business goals and requirements

- Govern service lifecycle within a clearly articulated decision framework

▼

Rational Portfolio Manager

Rational RequisitePro

Rational Method Composer

Enhance collaboration and traceability across teams

- Enforce development processes for better insight and predictability

- Establish shared repository for asset reuse and traceability

- Automate build management across platforms

▼

Rational ClearQuest

Rational BuildForge

Rational CleaseCase

SCLM Advanced Edition for z/OS

Test service functionality and scalability

- Save time and guarantee repeatability by automating tests

- Validate the scalability and reliability of services before deployment

- Manage service test scenarios for multiple projects and teams

▼

Rational Functional Tester

Rational Performance Tester

An IBM roadmap to help organizations enhance team productivity and collaboration by sharing a common development platform across teams

Rational Process and Portfolio Management
Putting process best practices to work

Process
&
Infrastructure

Now a library
of over **100 !**

Governance

New and
Enhanced!

Rational Method Composer v7.2

Customizable Process Library

Rational Unified Process	GDD	System z
ITUP	CMMI	SOMA

Over 100 process best practices to
leverage & customize…

Tooling

- **Author**
- **Manage**
- **Re-use**
- **Configure**
- **Tailor**
- **Publish**
- **Reporting**
- **Deploy**
- **Estimate**
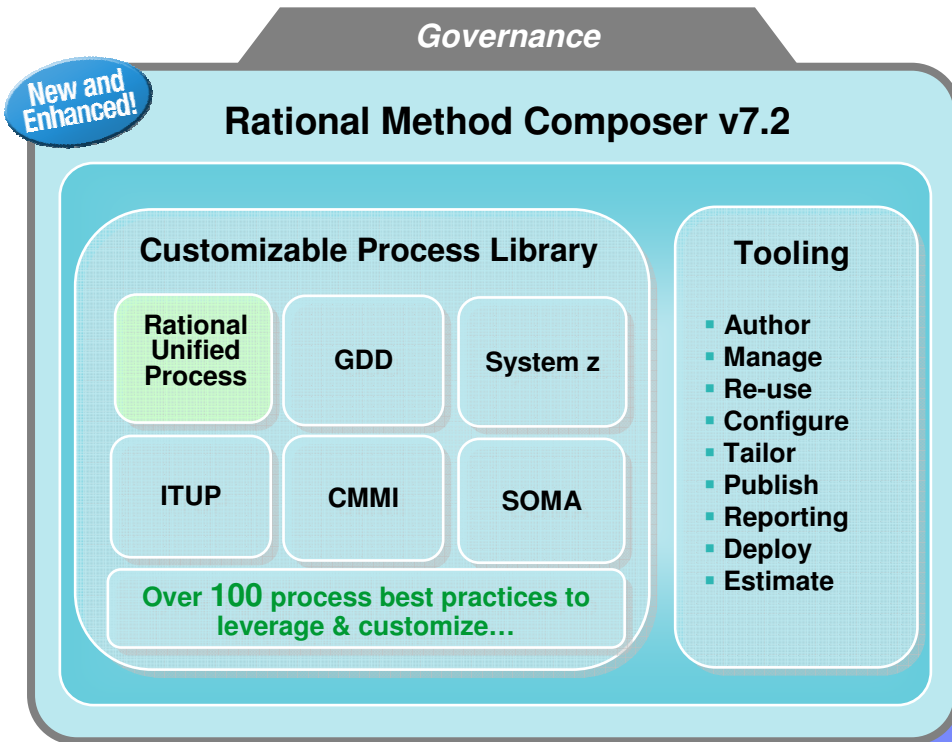
Examples of process best practices

- Rational Unified Process for System z

- IBM Tivoli Unified Process (ITUP) & Rational Unified Process (RUP) integration

- RUP for global distributed development

- CMMI level 2 with CMMI & RUP mapping

- Asset Based Development (ABD) process for producing and consuming assets

- Plug-in to govern asset investments

- SOA design and construction

Result: Easier, more effective deployment of customized and adaptable process best practices for enterprise-wide application development

WebSphere

WebSphere Business Modeler integration to analyze & simulate processes

Managing Requirements with IBM Rational RequisitePro
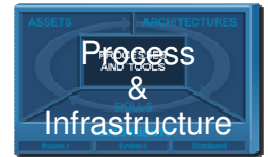
- Keep your team on track with interface of your choice

- Organizing and reporting on requirements

- Managing changing requirements for traceability

- Communicating changes and their impact

"With Rational RequisitePro's suspect links, my team members and I can immediately see changes that are made…"

Jason Oliver, Kodak

IBM Rational ClearQuest
## *Single solution to manage change across your project*
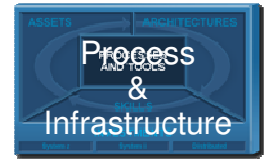
Governs, integrates, and automates your global development processes and workflow between your global teams IBM Rational ClearQuest orchestrates collaboration and work transfer between distributed team members.

- Consolidated, real-time view of the entire project status

- Traceable, auditable relationships between development, testing, building and project artifacts

  ▸ Comprehensive quality metrics in project dashboards and reports

  ▸ Manage test planning, test results, quality metrics, and defects

  ▸ Secure, central repository

  ▸ Integrations with version control, build management and requirements management
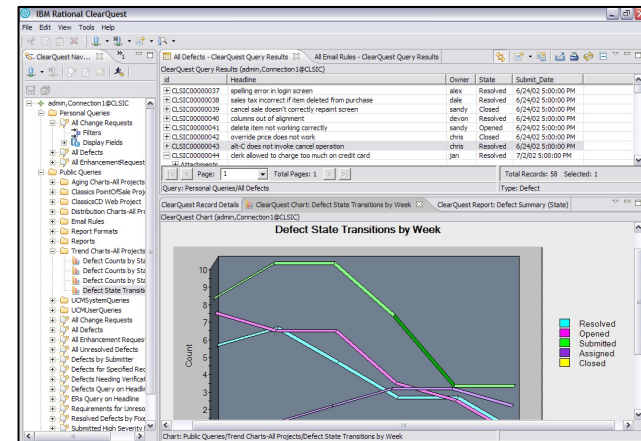
- Integration with Rational Asset Manager (RAM)
  ▸ maximizes asset reuse
- Enhanced integration with Rational Portfolio Manager
 ▸ maximizes project management
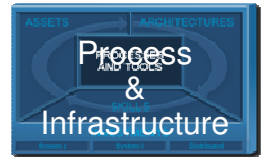
IBM Rational ClearCase
## *Complete Software Configuration Management*

An industry-leading solution that provides sophisticated version control, workspace management, parallel development support and build auditing to improve productivity

- Integration with leading IDEs allows you to work in your preferred environment

- Transparent real-time access to files and directories virtually anywhere in your organization

- Sophisticated branching and graphical merge tools enable concurrent access and efficient use of time

- Light-weight feature-rich clients allow you to work locally or remotely.

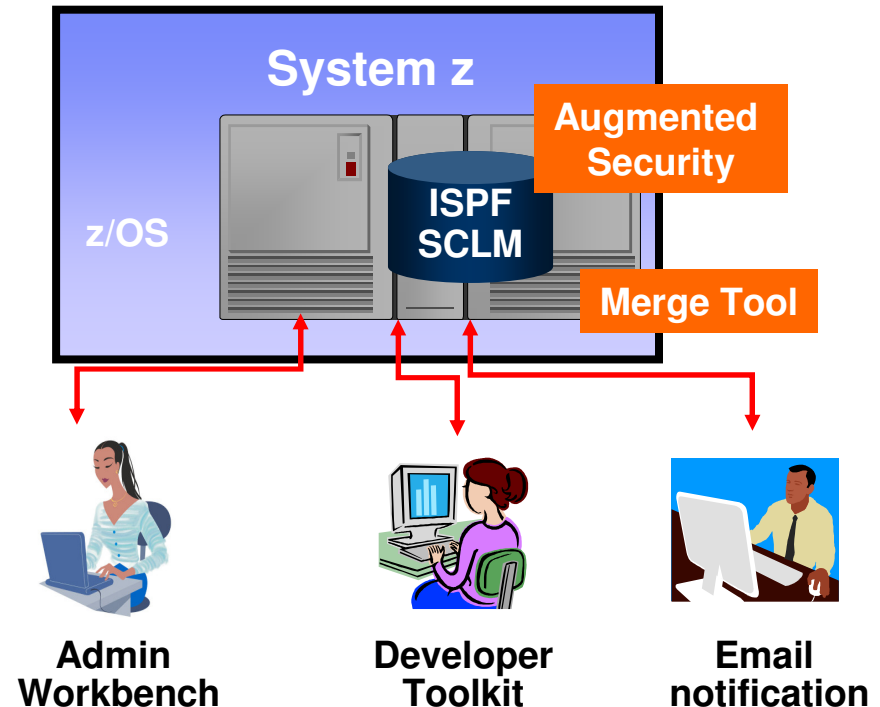- Support for open source environments provides added workspace flexibility

Customer Special

Release 1 Bug fix

Release 1.5
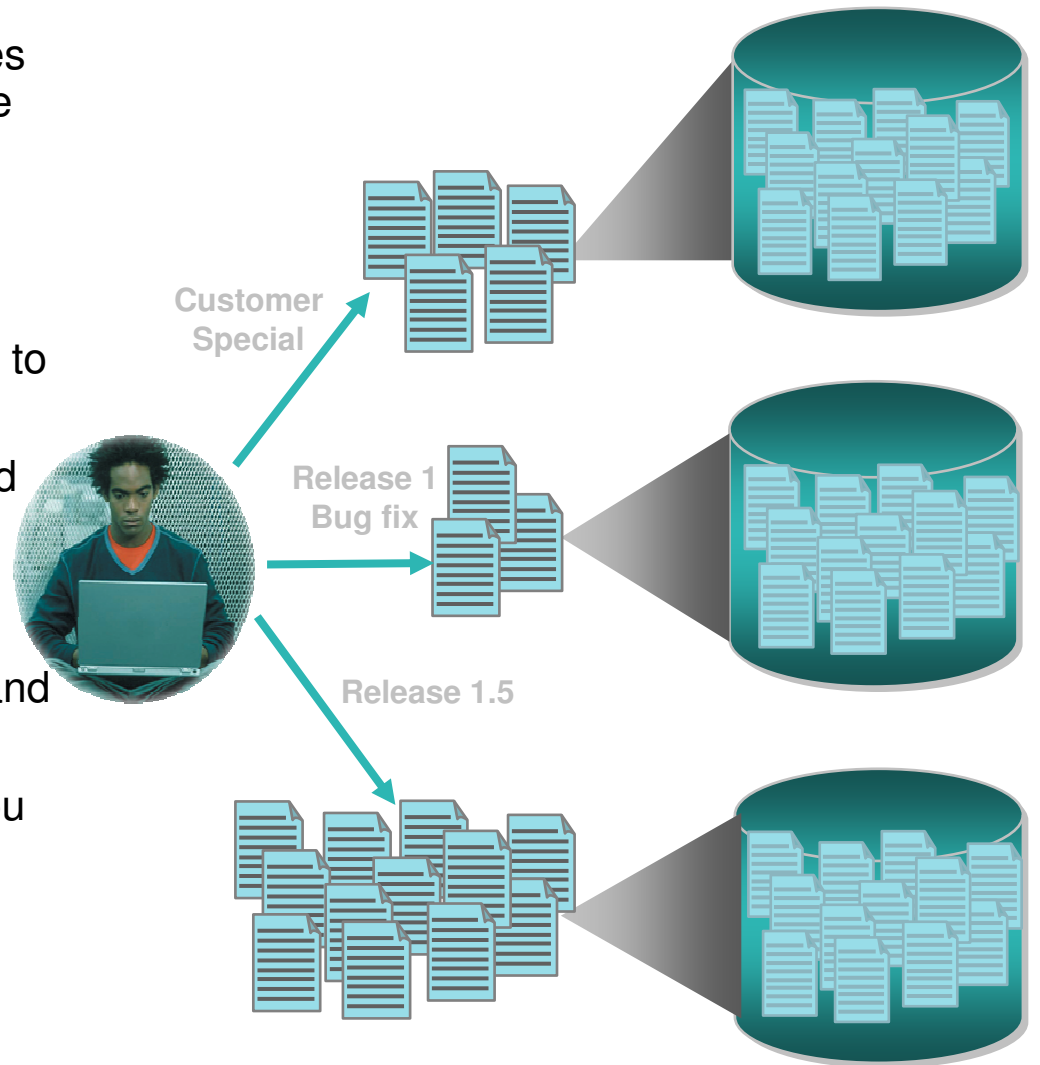
IBM SCLM Advanced Edition
Managing the application development process
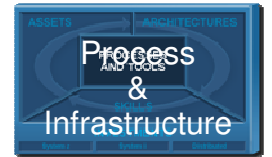
- **Provides**
  - ▶ Library and configuration management
  - ▶ Package approval processing
  - ▶ Granular security controls
  - ▶ Easy-to-use three-way merge tool
  - ▶ Easy-to-use GUI interface to ease administration tasks
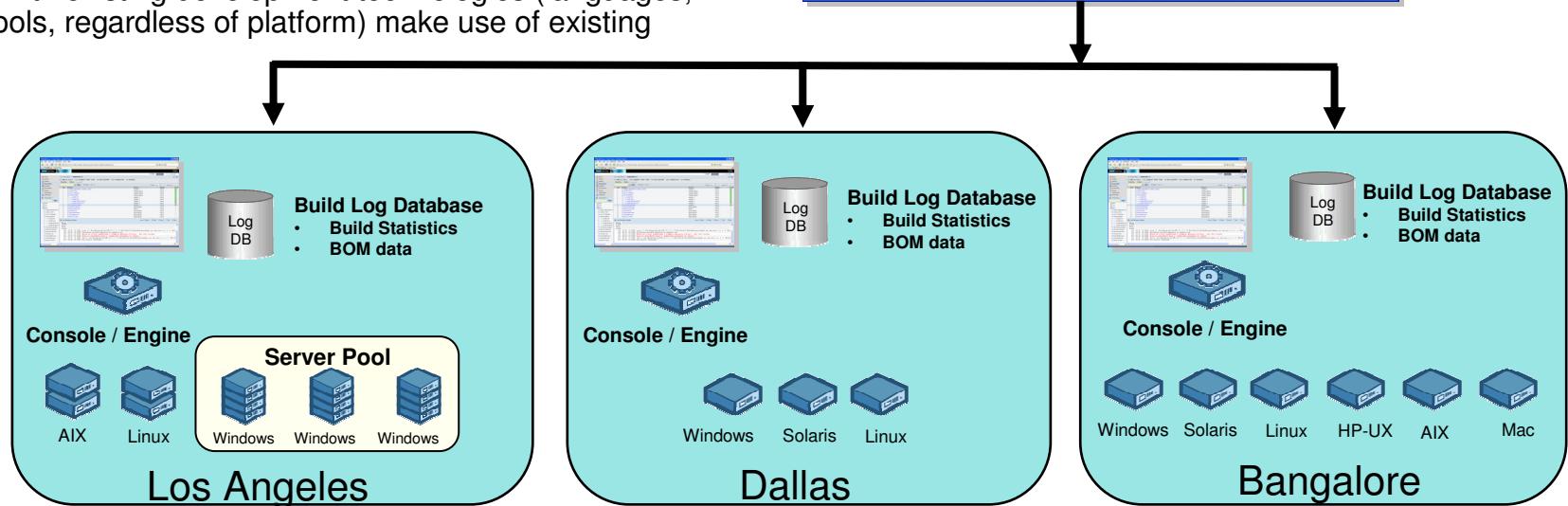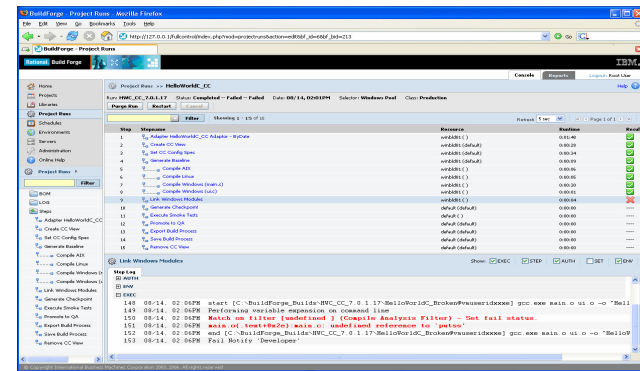 - ▶ Source code management of Eclipse based IDE projects

System z

z/OS

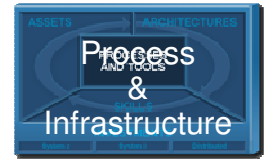ISPF SCLM

Augmented Security

Merge Tool

Admin Workbench

Developer Toolkit

Email notification

IBM Rational Build Forge

Centralized management across geographically distributed teams

Process & Infrastructure

A process execution framework that automates and accelerates build and release processes for Agile development and streamlined software delivery

- Quick builds using pre-configured build processes and environments automates tasks for increased efficiency

- A complete bill-of-materials list changes and the contents of each build for more accurate testing and problem resolution

- Enterprise reporting improves visibility into the build and release processes and helps to meet compliance mandates

- Integration with leading IDEs provides controlled, self service access to production build processes and allows you to work in your preferred environment

- Integration with existing development technologies (languages, scripts and tools, regardless of platform) make use of existing investments

Build Log Database
- **Build Statistics**
- **BOM data**

Log DB

Console / Engine

Server Pool

AIX   Linux   Windows   Windows   Windows

Los Angeles

Build Log Database
- **Build Statistics**
- **BOM data**

Log DB

Console / Engine

Windows   Solaris   Linux

Dallas

Build Log Database
- **Build Statistics**
- **BOM data**

Log DB

Console / Engine

Windows   Solaris   Linux   HP-UX   AIX   Mac

Bangalore

# ClearCase/ClearQuest/Build Forge for the Enterprise

- Extends ClearCase/ClearQuest/Build Forge to manage both distributed and z/OS assets

- Provides single point of control, single artifact repository, single set of user interfaces

- Provides consistent process paradigm across platforms

- Extends the power of the Software Delivery Platform and ClearQuest/ClearCase UCM to z/OS development
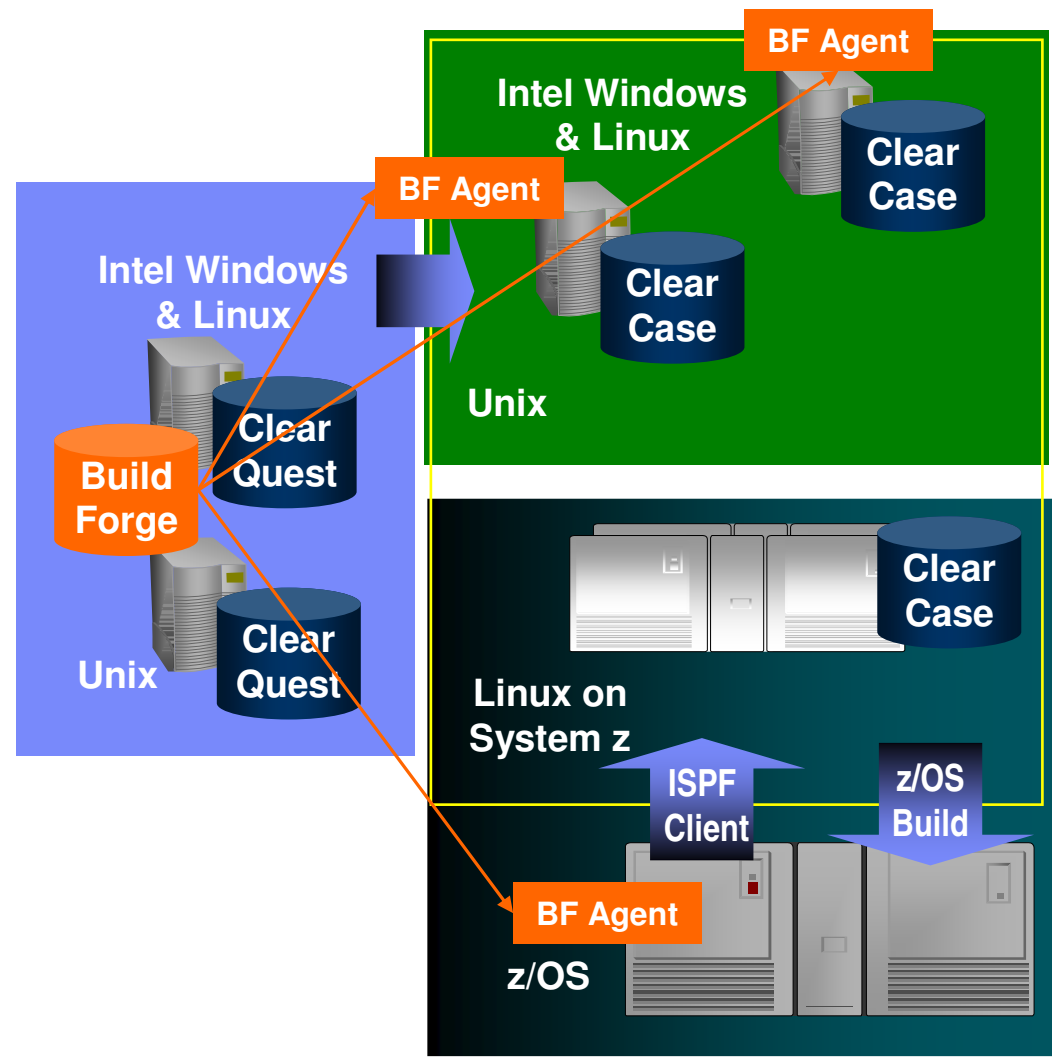
Functional Testing with IBM Rational Functional Tester
Test automation for the novice and the professional
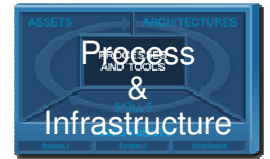
- **IBM Rational Functional Tester**
 - Automated regression testing for Web, J2EE and .Net applications
- ***IBM Rational Functional Tester Extension for Terminal-based Applications***
  - *lets you test your System z and System i terminal-based applications with the same tool – IBM Rational Functional Tester – used to test your Java, .NET and Web-based client server applications.*

- **Key Benefits**
  - Minimize test maintenance with scripts resilient to application changes
  - Wizard enhanced automation to speed test creation for the new user
  - Powerful scripting language and IDE for the professional tester
  - Supports Team oriented parallel development
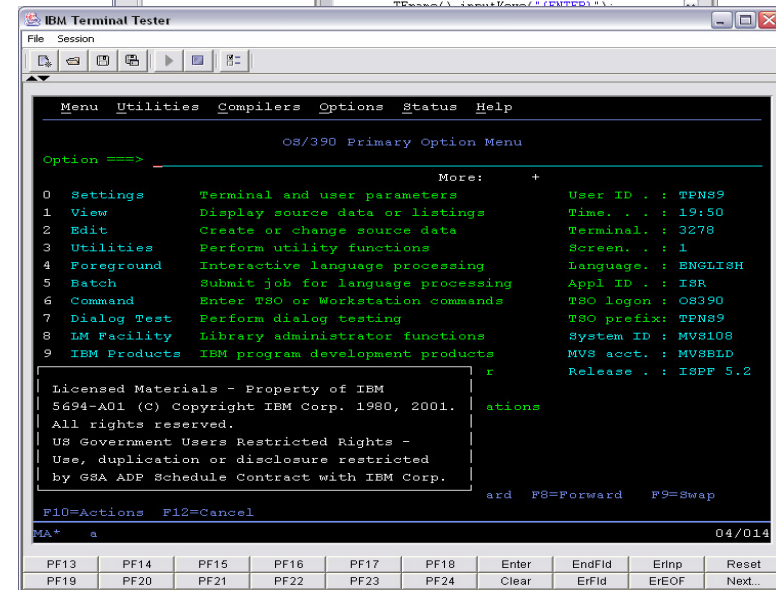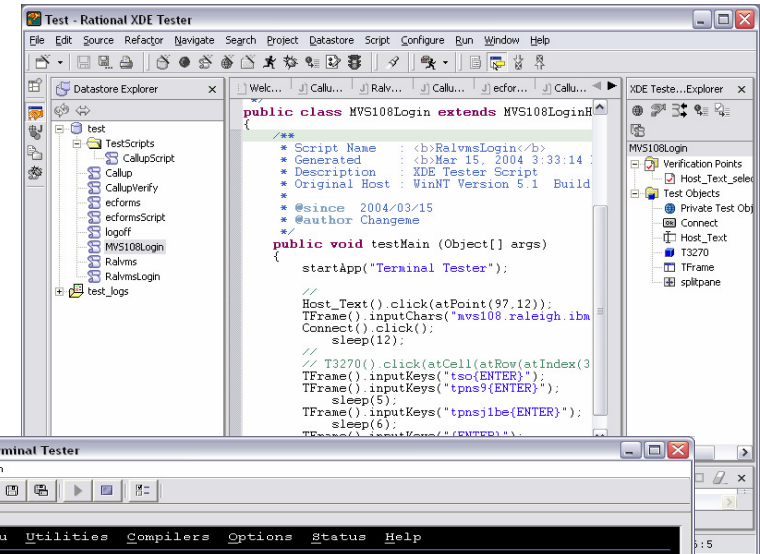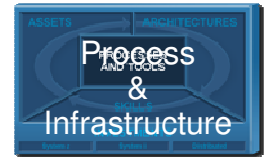
IBM Rational Performance Tester

Test automation for the novice and the professional

Process & Infrastructure

- **IBM Rational Performance Tester**

  ▸ Performance problem identification and diagnosis for Web, SAP, Siebel, Oracle and Citrix based applications

- **Performance test automation**

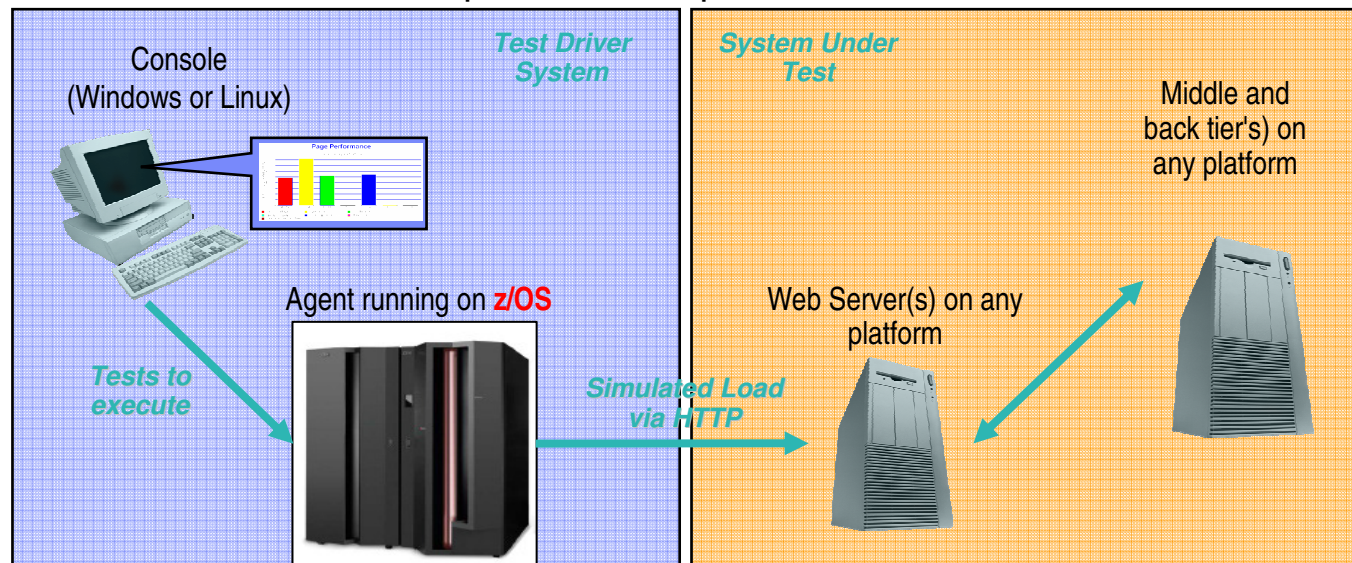 ▸ **Built for Day 1 Productivity**

  • Mask complexity to get the job done

  ▸ **Advanced Data Access & Manipulation**

  • Automated data variation and synchronization

  ▸ **Root Cause Analysis**
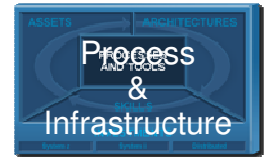
  • Identifies location and **root cause** of performance problem in hardware and software

Topography of Rational Performance Tester for z/OS

Console (Windows or Linux)

Test Driver System

System Under Test

Middle and back tier's) on any platform

Page Performance

Agent running on **z/OS**

Tests to execute

Web Server(s) on any platform

Simulated Load via HTTP

Unifying enterprise and distributed teams
Generali

Challenge

- Spiraling maintenance and resource costs constrained the development organization

Solution

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

Products include:

- IBM Rational ClearCase

GENERALI
Assicurazioni Generali Sp.A.

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

Investments modernization
Redirect people and budget to pursue new opportunities

Investments

Take control of your assets

- Dramatically improve change estimate accuracy

- Reduce application maintenance time

- Reduce complexity and increase maintainability

- Componentization increases reusability, and enables SOA
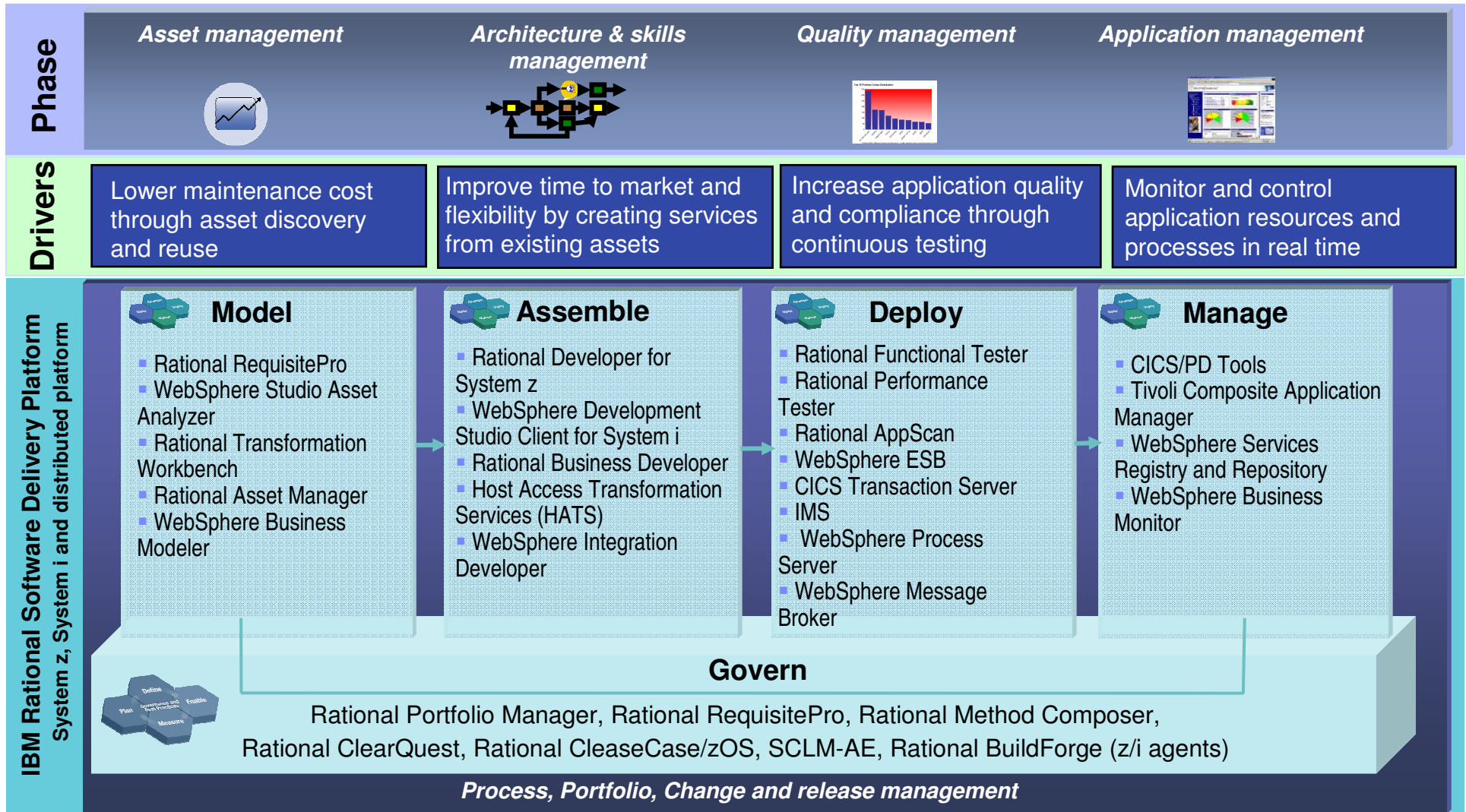
Leverage modern architectures

- Quickly extend existing applications to the web

- Increase developer productivity and reduce manual coding

- Save time by automating application testing

- Verify application scalability

Transition to a standard software delivery platform

- Reduce expenditure by eliminating obsolete technologies or platforms

- Reduce risk by reusing proven assets

- Leverage existing IT staff for new development

- Simplify application development

The IBM Rational Software Delivery Platform offers leading-edge, high-productivity solutions to address your enterprise modernization and SOA needs!

Accelerating Enterprise Modernization towards an SOA with the IBM Rational Software Delivery Platform

Phase	Asset management	Architecture & skills management	Quality management	Application management

Drivers	Lower maintenance cost through asset discovery and reuse	Improve time to market and flexibility by creating services from existing assets	Increase application quality and compliance through continuous testing	Monitor and control application resources and processes in real time

IBM Rational Software Delivery Platform
System z, System i and distributed platform

Model
- Rational RequisitePro
- WebSphere Studio Asset Analyzer
- Rational Transformation Workbench
- Rational Asset Manager
- WebSphere Business Modeler

Assemble
- Rational Developer for System z
- WebSphere Development Studio Client for System i
- Rational Business Developer
- Host Access Transformation Services (HATS)
- WebSphere Integration Developer

Deploy
- Rational Functional Tester
- Rational Performance Tester
- Rational AppScan
- WebSphere ESB
- CICS Transaction Server
- IMS
- WebSphere Process Server
- WebSphere Message Broker

Manage
- CICS/PD Tools
- Tivoli Composite Application Manager
- WebSphere Services Registry and Repository
- WebSphere Business Monitor

Govern
Rational Portfolio Manager, Rational RequisitePro, Rational Method Composer, Rational ClearQuest, Rational CleaseCase/zOS, SCLM-AE, Rational BuildForge (z/i agents)

Process, Portfolio, Change and release management

Want to learn more?

- Get this complimentary kit for mainframe developers for a practical, how-to guide for making the most of an existing development environment, including the skills and infrastructure already in place at an established enterprise.
  - ▶ Did you say mainframe? e-kit http://www.ibm.com/developerworks/integrate/kits/mainframe/
    - • This kit contains the following:
      - – **Podcast series**: Did you say mainframe?!
      - – **Webcasts**
      - – **Tutorials**:
      - – **White and red papers**:
      - – **Demos**
      - – **developerWorks articles and other resources**:

- You can also find out more about other IBM Enterprise Modernization offerings at this site
  - ▶ http://www.ibm.com/rational/modernization

Thank You

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