Why Business Rules and Business Process Management Are Important to System z Applications

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IBM – Product Line Management for BPM and Decision Management for zEnterprise)

Tuesday, August 9, 2011
12:15 to 1:15 – Lunch and Learn

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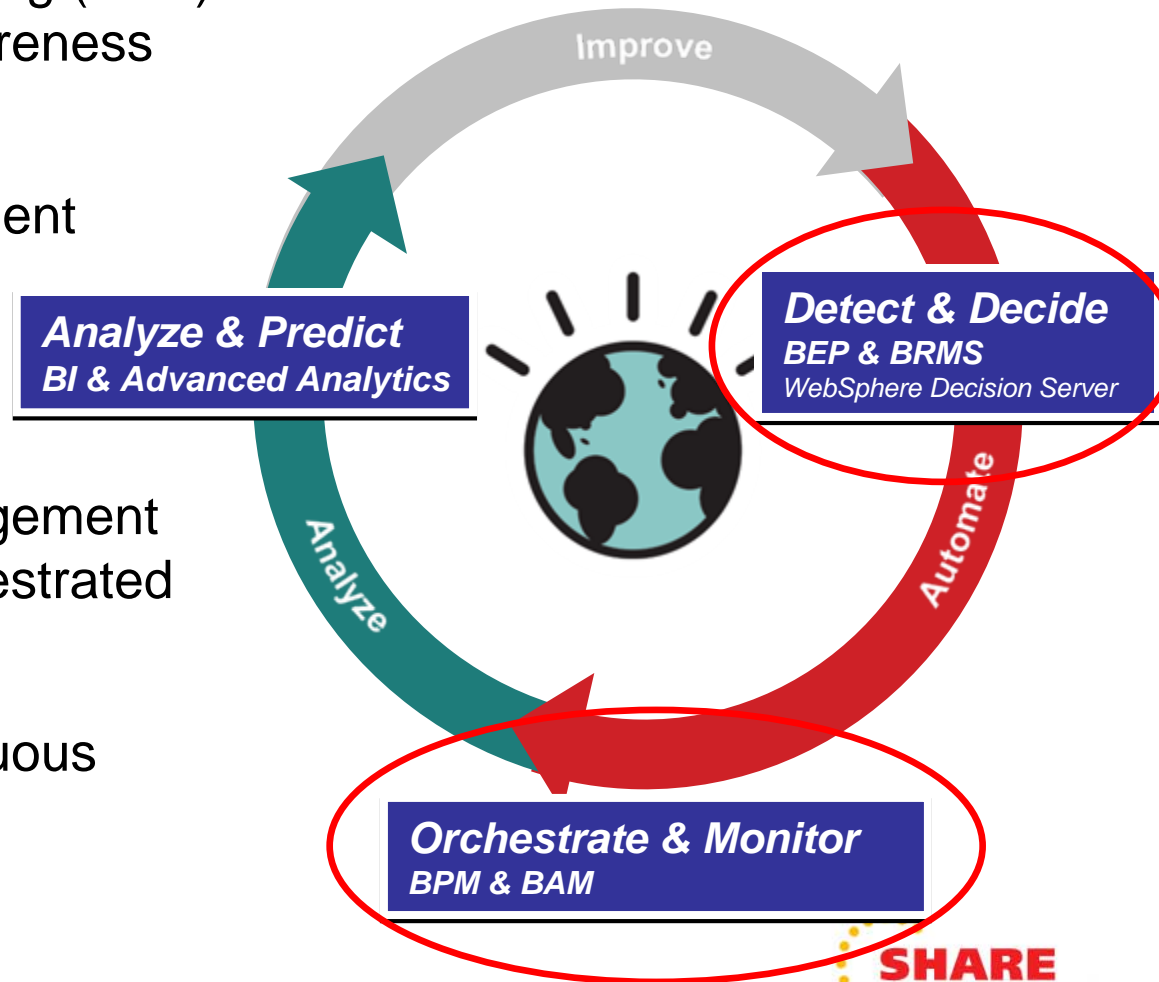
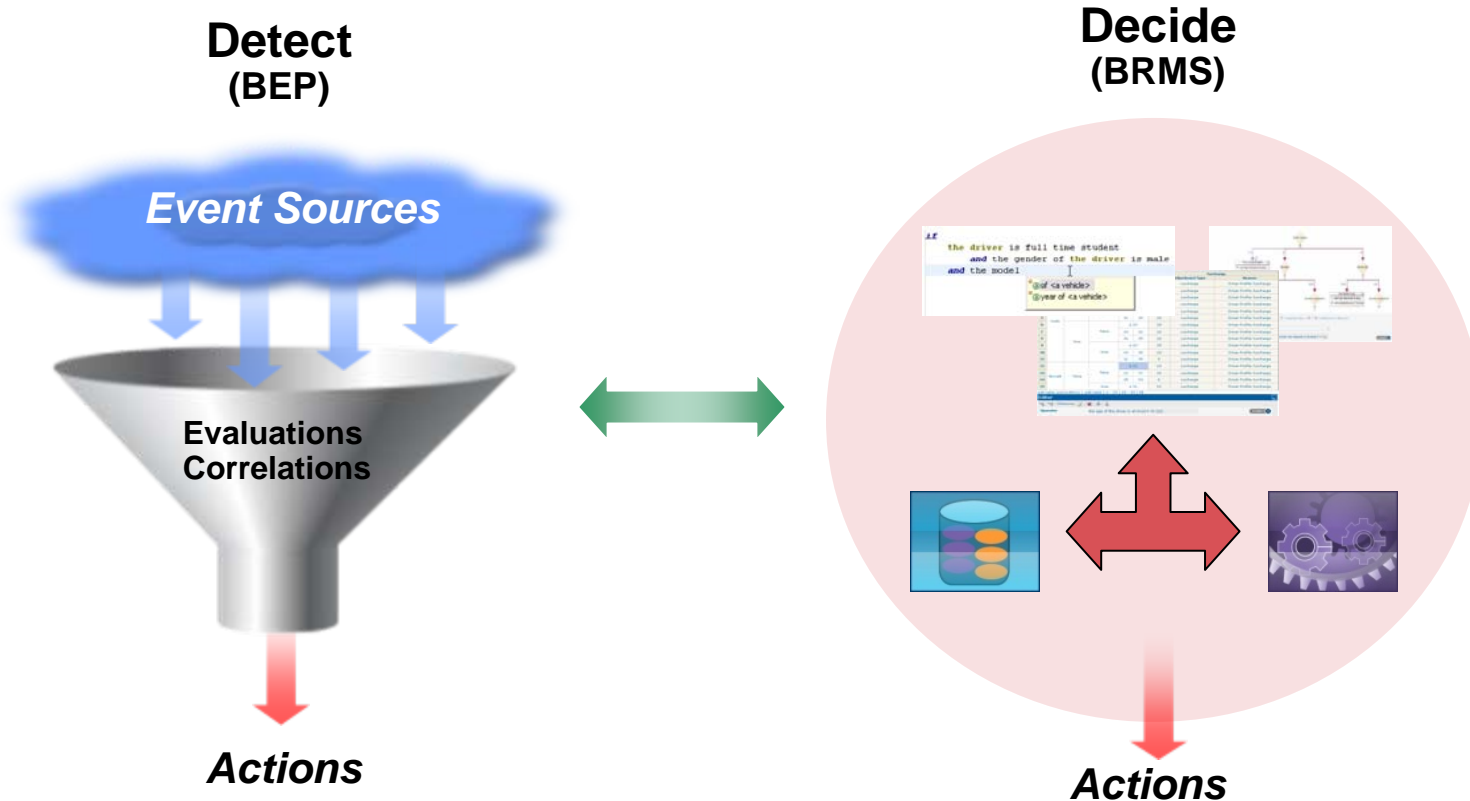# Business Challenges Requiring Improved Decision Automation

- **Healthcare insurance payer is paying millions of dollars each year against fraudulent claims**
  - Majority of fraud identification occurs through audits taking place months after claims have been processed

- **Retailer is losing market share to a new competitor that is launching new promotions more frequently**
  - Unable to coordinate promotional offers across its various sales channels, and survey research shows that its loyalty program is not retaining customers

- **Government agency has a budget deficit and spends more than comparable agencies in handling referrals and determining citizen eligibility for social services programs**
  - Over 80% of applications require manual approvals, and there are no self-service options for referrals or application submissions

BRMS & BEP are Core to Decision Agility & Effectiveness

- Business Event Processing (BEP) improves situational awareness and response

- Business Rule Management (BRMS) improves the quality of automated decisions

- Business Process Management uses outputs within orchestrated processes

- Analytics enables continuous decision improvement

Improve

Analyze

Automate

Analyze & Predict
BI & Advanced Analytics

Detect & Decide
BEP & BRMS
WebSphere Decision Server

Orchestrate & Monitor
BPM & BAM

Together: Additional Insight for Action

Detect
(BEP)

Decide
(BRMS)

Event Sources

Evaluations
Correlations

Actions

Actions

▶ BEP - <u>Detects</u> when events or patterns of events occur to notify people or systems to take action

▶ BRMS - <u>Decides</u> business outcome through execution of business rules against available data

Business Event Processing

Business Event Processing

What is…

…a Business Event?

Any electronic signal (message) indicating a change in the state of the business has occurred or contemplated

…Business Event Processing?

The ability to sense when a business event or pattern of events, representing a user defined actionable business situation, has occurred (or not occurred) – and to coordinate the right response (action) at the right time

A call to the help desk

New Customer

ATM Transaction

A PIN is changed

Correlation

Initiate Sales Follow-up

Product Inquiry via same or multiple channels

High-value customer and 2 inquires within 30 days

Situational Awareness and Response
BEP - - Sense and Respond as Situations Occur

Event
Account
Withdraw

Actionable Situation
Numerous small deposits and small withdrawals within short time frame

Action: Flag account and initiate money laundering evaluation

Event
Customer
Information
Change

Actionable Situation
Combination of mail address, PIN and or email changed and large withdraw within 36 hours

Action: Trigger automatic 24 hour hold and initiate client follow-up business process

Event:
Bedside
Monitoring

Actionable Situation:
Correlate readings detecting emergent conditions

Action: Notify Doc and Nurse of condition

Business Event Processing…

…Detects event patterns as they occur

- Between events of different types occurring across disparate systems…
- Where events may or may not be ordered…
- Where event presence or absence may be significant…
- Where the actionable event may be derived from real events…
- Where the response process is unstructured and driven by the occurrence of an event or pattern of events
- Where time to respond is of the essence

WebSphere Business Events Design Environment
"Codeless" graphical user interfaces

Building Blocks
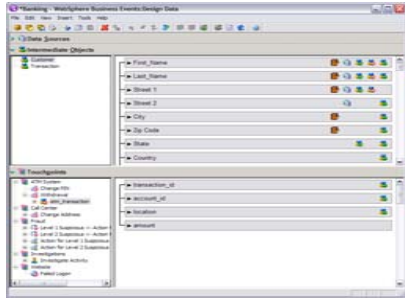
Event Flow

WBE Object Repository
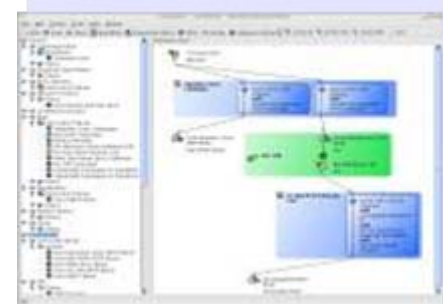
Interactions (Logic)
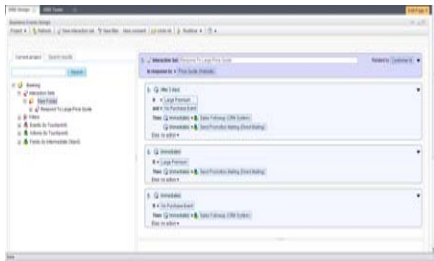
Dashboard

Web based Test Tools

Business Events Tester

Restart Testing

Send an Event | Filters | Actions | Context Data | Delayed Events and Actions

Select Event Template | Send Event

Order (Events_From_Order Mgt Sys)

▷ Order_Context
▽ Order_Data

CustomerNumber
OrderNumber
StockId
Quantity
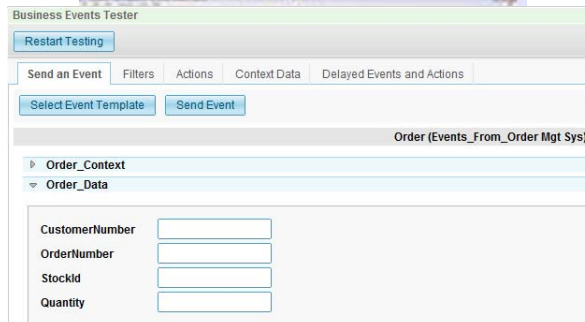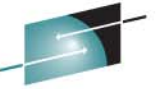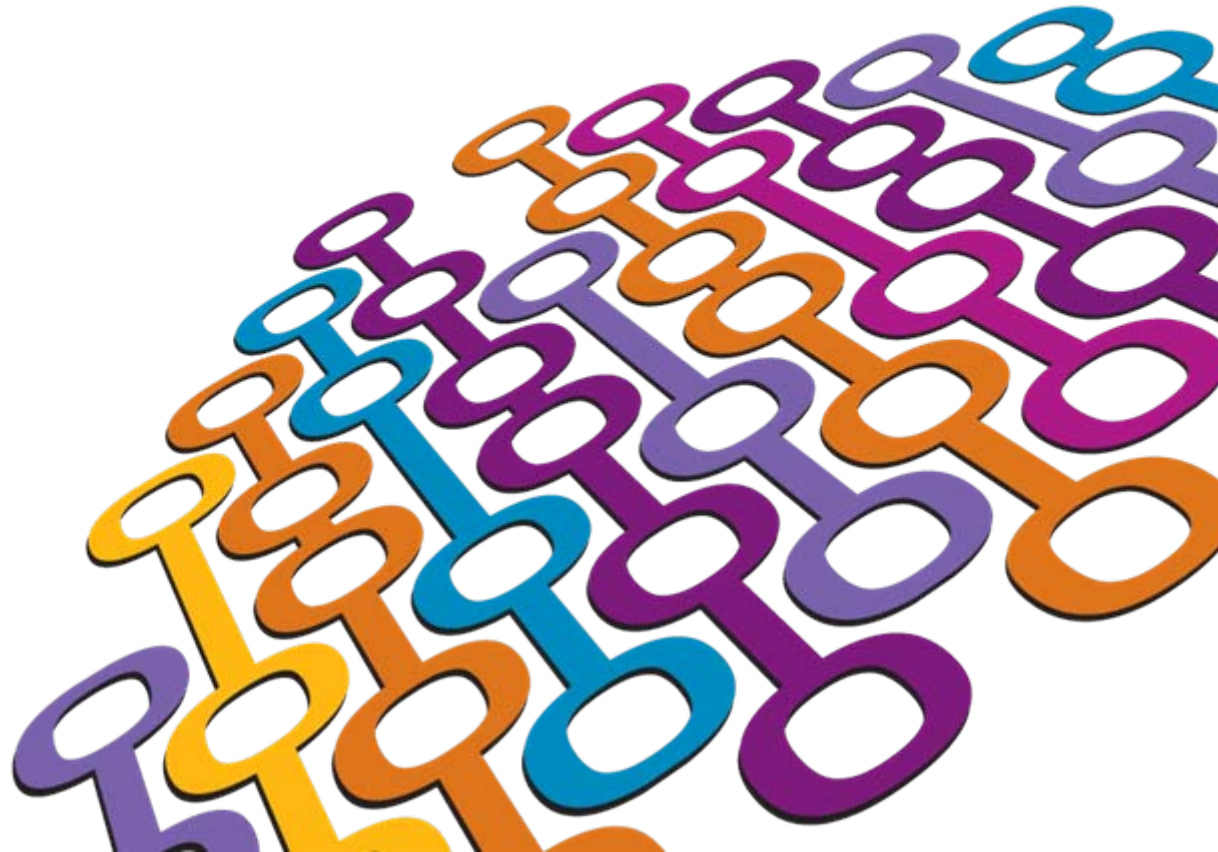
Business Rules

Traditional Approach for Managing Decision Change

The traditional (ad hoc) approach of dealing with rule changes leads to…

💣 Reduced organizational agility

💣 Reduced employee productivity

💣 Increased load on IT

Where Business Rules Typically Exist

Applications

Documents

People
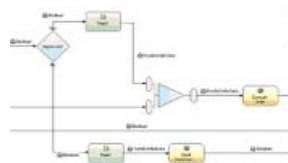
Processes

Issues

- Rules are hidden in code or isolated within the organization
- Changes are hard to track and maintain over time
- Rules used by systems have to be programmed and require IT resources
- Duplication and multiple versions of the same rules
- Lack of auditability, traceability
- Decision changes cannot be easily tested or simulated

Manage and Automate Decision Logic with BRMS

- Make decision logic accessible to Business and IT
- Reduce maintenance time & cost
- Increase decision automation
- Eliminate decision silos – drive consistency
- Create an audit trail for decisions & decision logic

Where Business Rules Typically Exist

Applications

Documents

People

Processes

Business **R**ule **M**anagement **S**ystem

User Tools

Rules are Defined, Analyzed and Maintained

Rule Repository

Rules are Stored and Shared

Rule Execution

Rules are Deployed, Executed and Monitored

Comprehensive Rule Governance

Rule Repository

Governance
- ✓ Rule meta-data
- ✓ Lifecycle management
- ✓ Versioning and History
- ✓ Role-based permissions
- ✓ Consistency checking
- ✓ Testing and Simulation

When will this rule take effect?

How do I undo a change?

Who can change what?

What has changed?

Does this change pass the test case scenarios?

What is the impact of changing this rule?`

What rules do I need to deploy?

Which rules were in effect when this transaction occurred?

WebSphere ILOG JRules 7.x Components

	Design
Development	Rule Studio

	Manage		
Line Of Business	Rule Solutions for Office	Rule Team Server	Decision Validation Services

Custom Web Applications

	Share
	Rule Repository

	Deploy		
Production	Transparent Decision Services	Rule Execution Server	Rules for COBOL
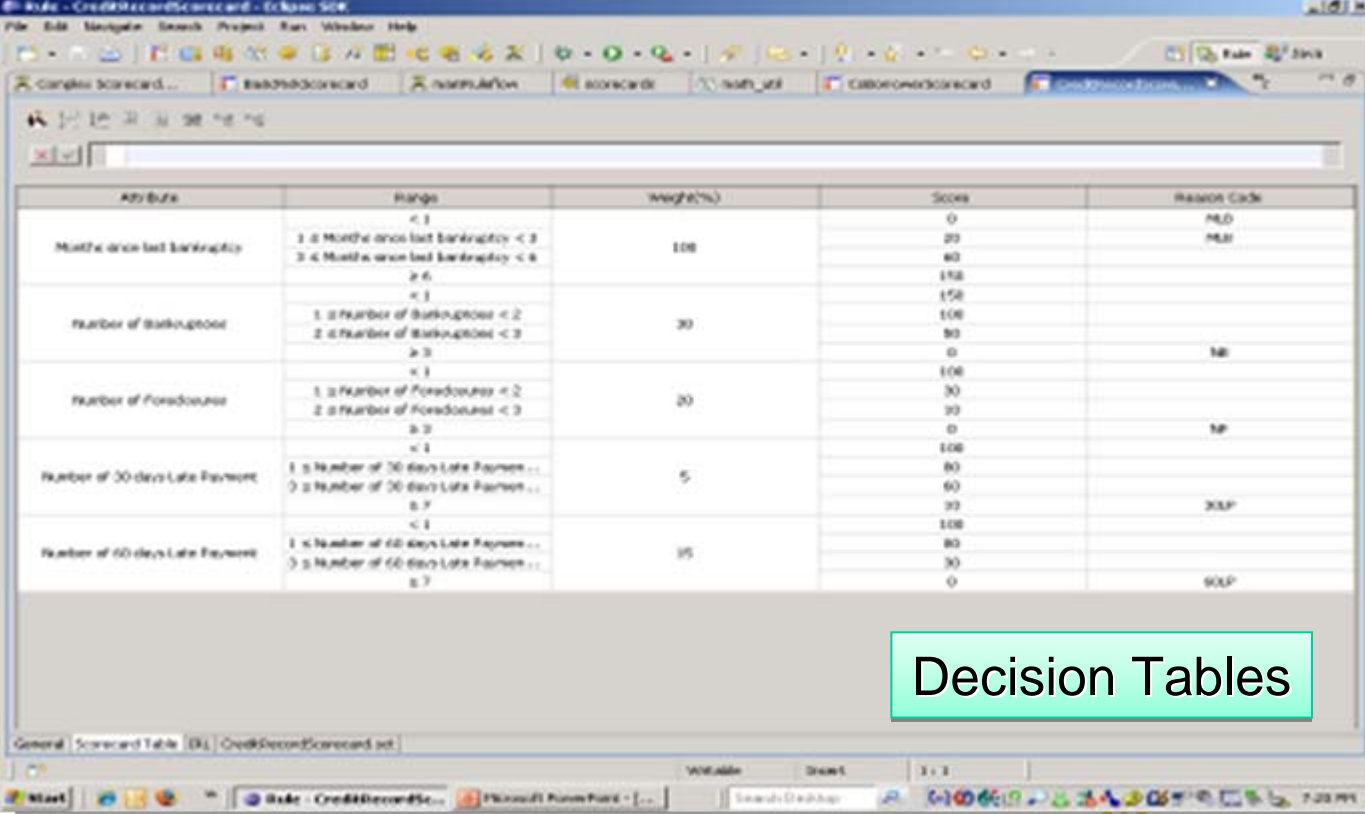
Intuitive Rule Authoring Environments

if

the one way driving distance of the vehicle coverage request [±] is more than ▼ 50 [±]
and the type of

then

add a ▼ $ 25

Labels

Operator

Decision Tables

Web-based Console for Rule Management

- Take control of very large rulebases with Smart Views, easy search and reporting

- See where rules are used across projects using queries

- Access rule artifacts concurrently without conflict or delay

- Represent complex policies using rule overrides and hierarchies

- Get automatic notification of potential rule conflicts, redundancies

- Hot-deploy rule changes in minutes

- Secure: integrated with enterprise security facility including single sign-on
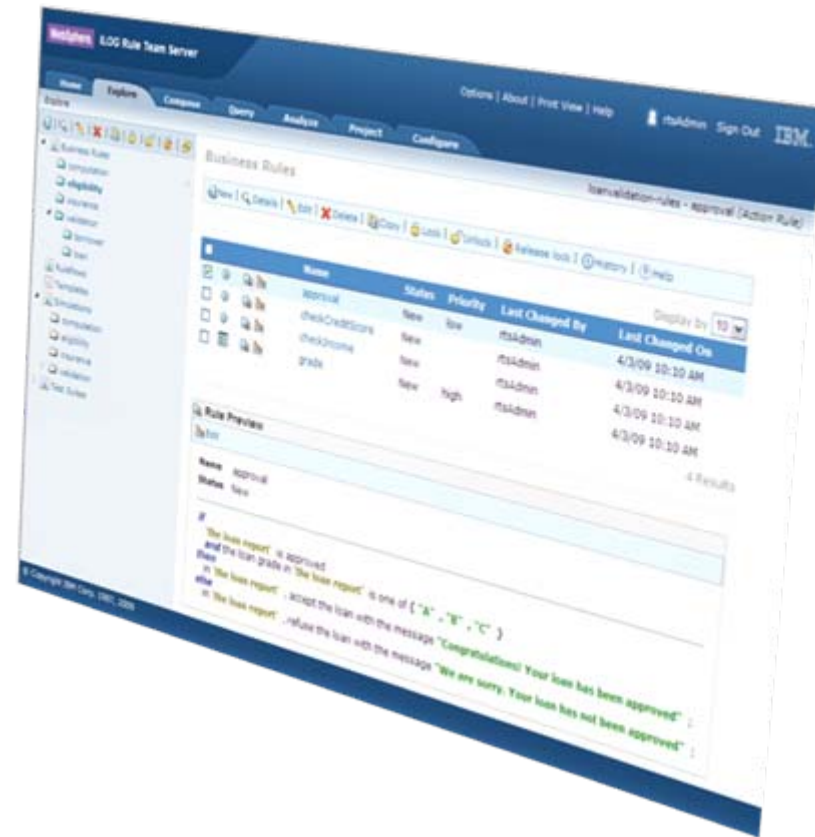
Rules Authoring Delivered to Business

Business-focused Testing & Simulation Capabilities

- Decision Validation Services extends Rule Team Server with:
  - Out-of-the-box ruleset testing
  - Business impact simulation
  - Detailed scenario reports

- Scenario configuration and customization in Rule Studio

- Audit - Decision Warehouse in Rule Execution Server
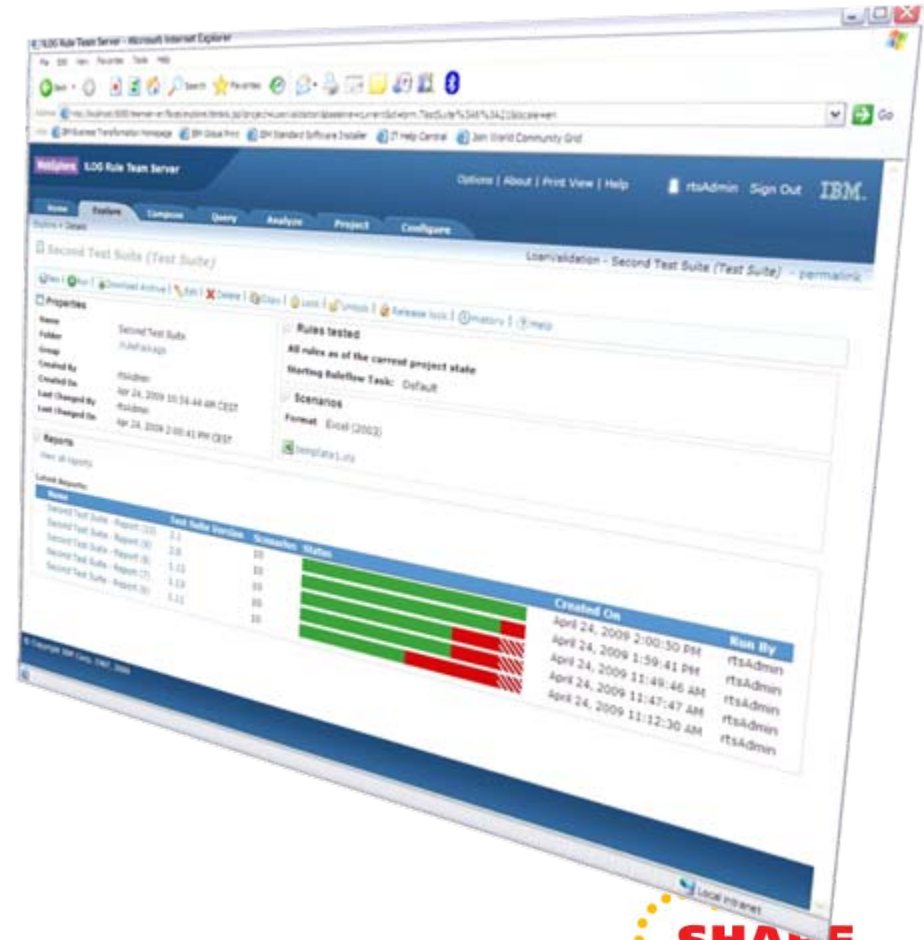
Business User Testing and Simulation

Detailed Scenario Reports

Impact and What-if Analysis

Integrating WebSphere ILOG JRules & Business Events

1. WBE identifies business situation and determines *when* to act

2. ILOG BRMS rules determines what should be done

3. WPS or Lombardi business process or human task is initiated to do it

WPS, WAS and other business event producing systems

Event Cloud

Events

1. Recognizes pattern which requires action

WBE Runtime

Correlate Business Events and detect Business Situations

3. Action to initiate required process

WPS or Lombardi

Business Processes and Human Task Applications

2. WS ILOG JRules determines what should be done

Rule Execution Server
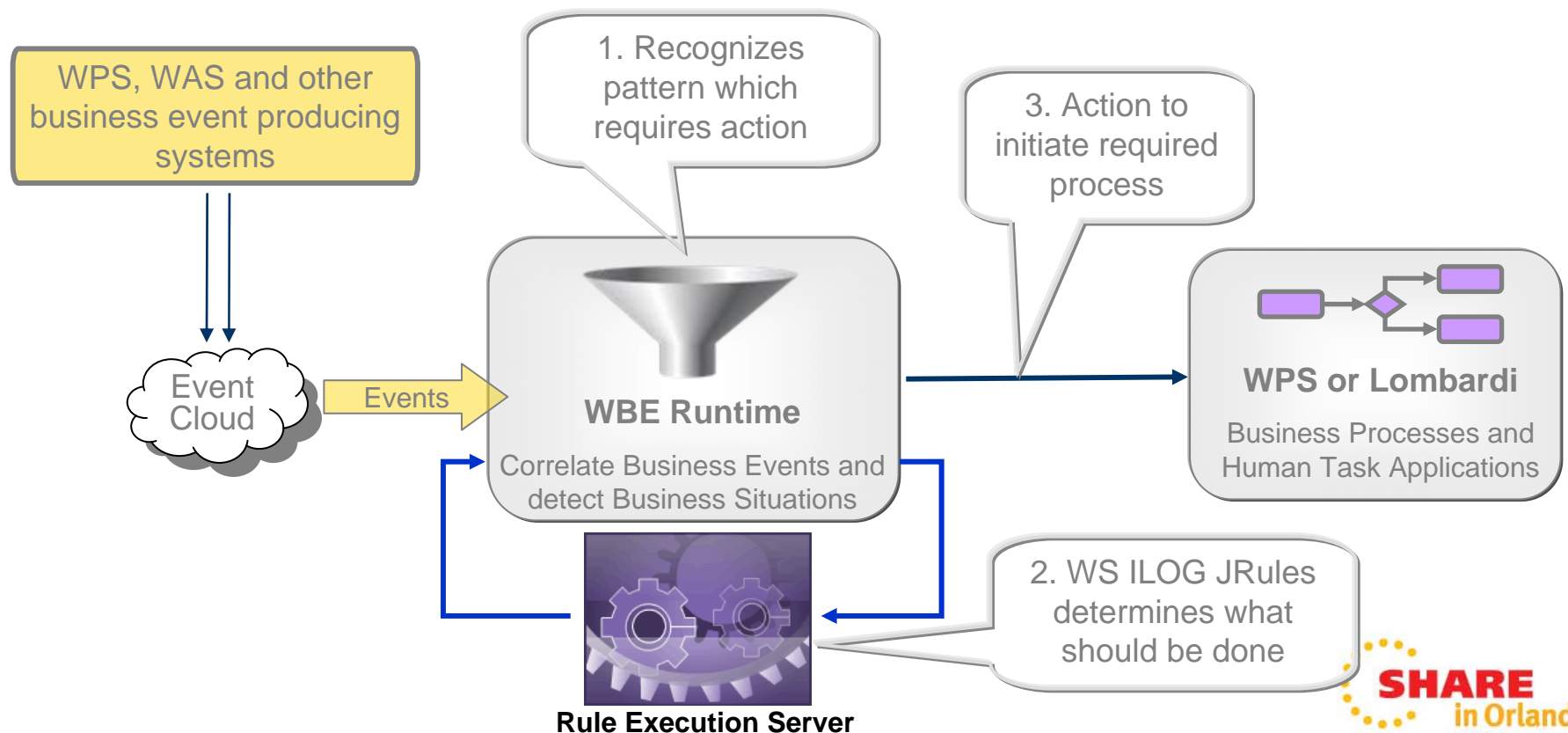
Maximize the Value of Business Interactions and Decisions

Customer Acquisition

(E.g. Car Insurance)

- WBE to monitor customer behavior and offer promotional discounts
  - Detect multiple requests for insurance quote over a short period of time
  - Detect quote requests that have not been accepted within a period of time
  - Trigger action to JRules to determine customer promotional offer

- JRules to determine whether to make an offer, and if so, for what
  - Tailor offer based on customer demographic and quote details
  - Provides ability to quickly introduce/remove offers as business policies, risk tolerance or regulatory requirements change

Value Add Personalized Service and Interaction

(E.g. Credit Card Services)

- WBE to monitor transaction behavior based on individual customer preferences
  - Detect patterns and subsequently notify cardholders about card activity behavior and thresholds (i.e. purchases exceed threshold over 24 hours)
  - Offers business users the flexibility to change rules and patterns definitions
  - Identify behavior patterns that meet promotional opportunity

- JRules to determine whether to offer new/other products or services
  - Precise offer based on customer profile and behavior

Events and Rules Together with CICS

WebSphere Business Events and CICS

- Provide greater business agility for proven and trusted traditional System z applications

- Deliver new value and insight from legacy systems and transaction processing

- Enable the initiation of follow-on processing based on actionable patterns of transactions

- Provide means for coordinating information sharing across operational systems

- Increases efficiency and effectiveness providing faster time to value

Business Rules and CICS

- *Consolidation and/or maintenance of COBOL applications*
  - Author once, Manage Centrally, Deploy anywhere

- *Sharing Decisions across Platform/Running Parallel*
  - Author rules in JRules...verify which rules will move them into the future
  - Rules can now be shared across applications and across platforms

- *COBOL Maintenance Projects*
  - Projects that are change rules ... why not upgrade to a BRMS and make rules available to Business Users
  - Faster changes .... Decrease future maintenance costs and time

Reduce the Load on IT Development

Use ILOG BRMS to align Business and IT on decisions and rules
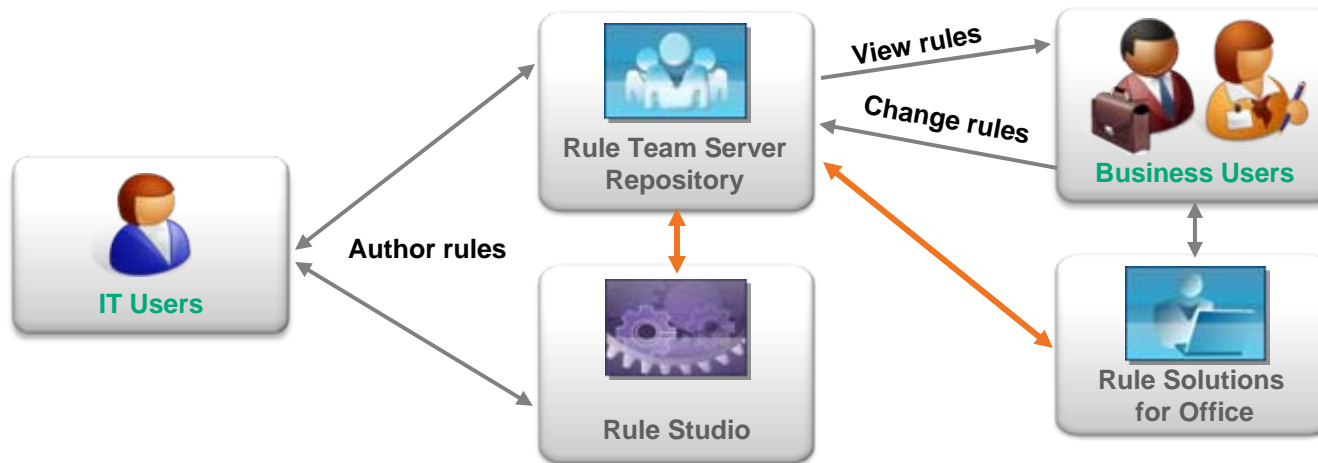
- Provide visibility of business rules to Business Users via Web interface
- Provide selective rule authoring ability to Business Users via Web interface
  - E.g. IT can enable rule parameters to be changed by business

A Top 5 North American Bank

▶ One of the largest financial service providers in the world

▶ Over 18 million clients worldwide

▶ Nearly ¼ million mortgages

▶ Nearly ½ million loan products

▶ Prioritizes branch office networks to build personal ties with its clients

Large opportunity for the bank to cross sell / up sell financial products to existing customers

Existing Scenario

What products is this customer eligible for

Branch Office

What products would benefit this customer

Branch Office

Product Application

Product Application

Product Applications System
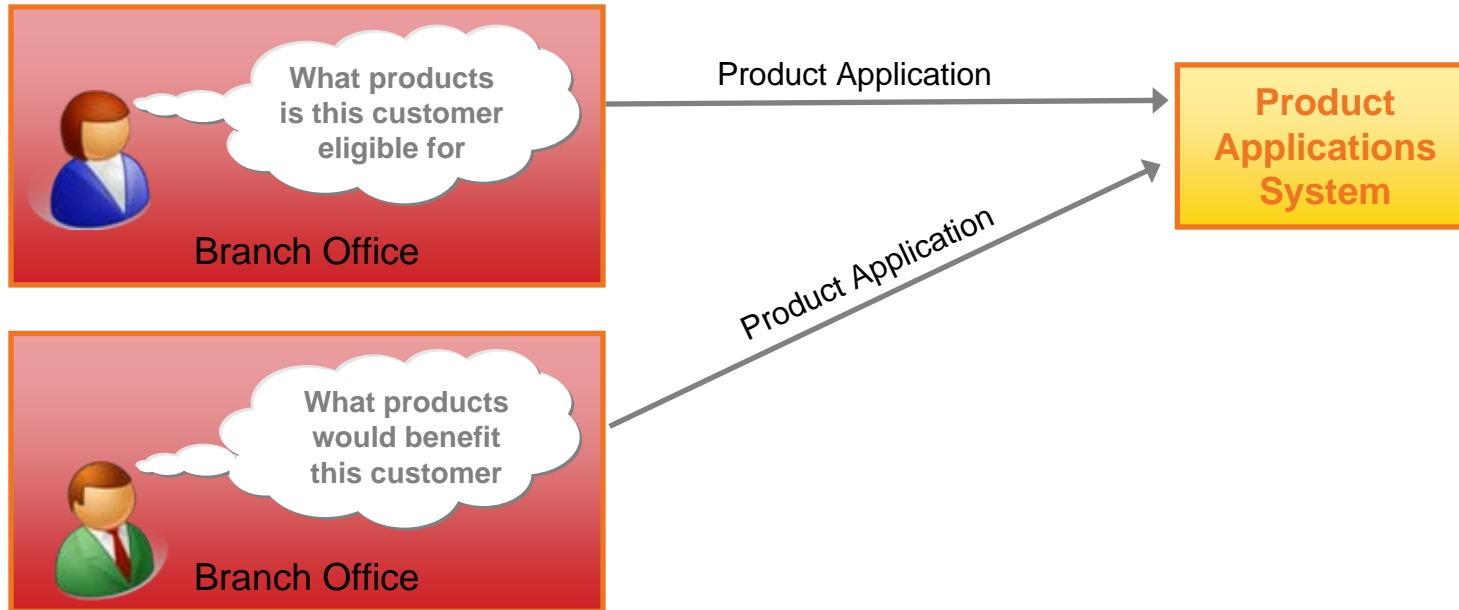
- ▶ **Poor customer experience**
    - ▶ Difficult to determine or identify who to cross sell or up sell to
    - ▶ Branch staff would sometimes try to cross-sell to clients who did not qualify
- ▶ **Inefficient use of customer service representative time**
    - ▶ Assessment times were too long
    - ▶ Separate application in order to know if client qualifies for an additional product

New Scenario

What products is this customer eligible for

Branch Office

Product Application

What products would benefit this customer

Branch Office

Product Application

Product Applications System

Prioritized list of product offers

Eligibility Service

Risk Service

Cross Sell Service

New Rule Based Decision Services
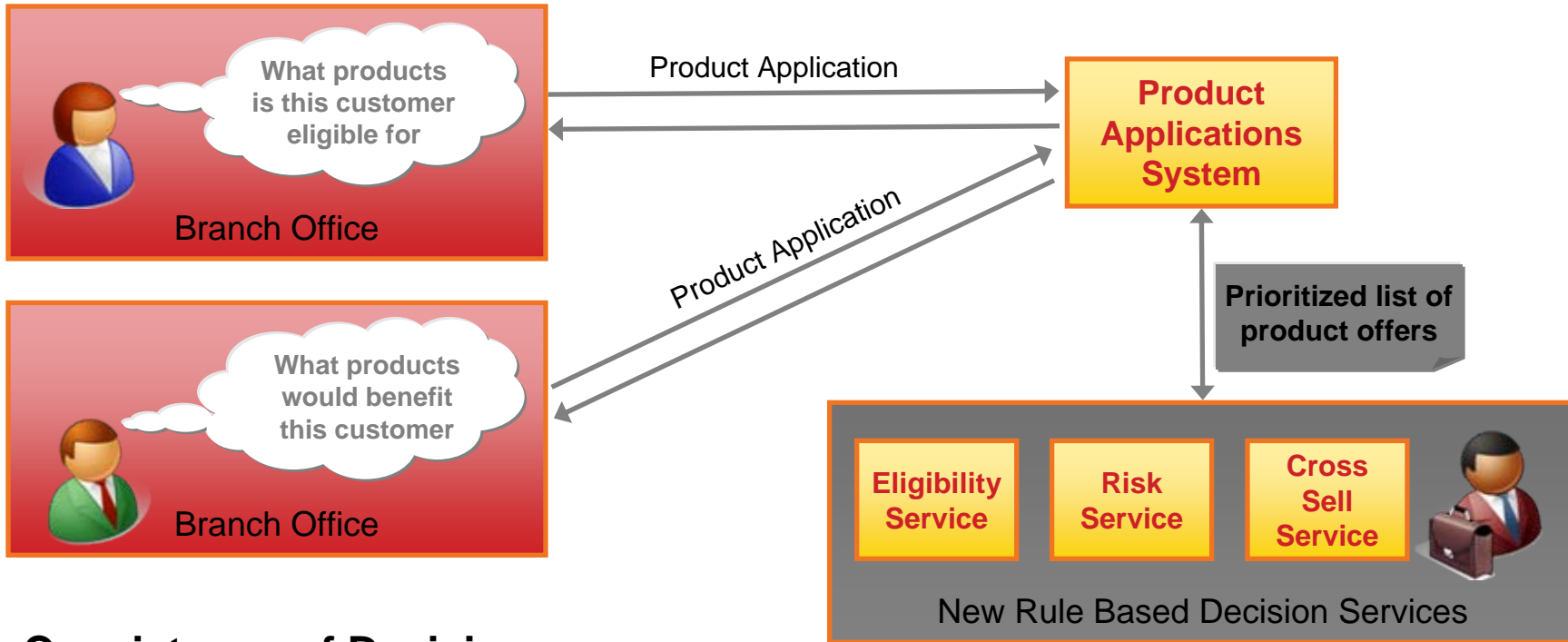
- **Consistency of Decisions**
  - Prioritized list of pre-approved product offers returned to customer service agent
  - New BRMS based decision services provides consistent decisions across branches
- **Improved time to market**
  - New policies can be introduced & managed across the company more effectively
- **Flexible solution enables incremental modernization**
  - Low development risk as new functionality incrementally added to existing application as new services

New Scenario
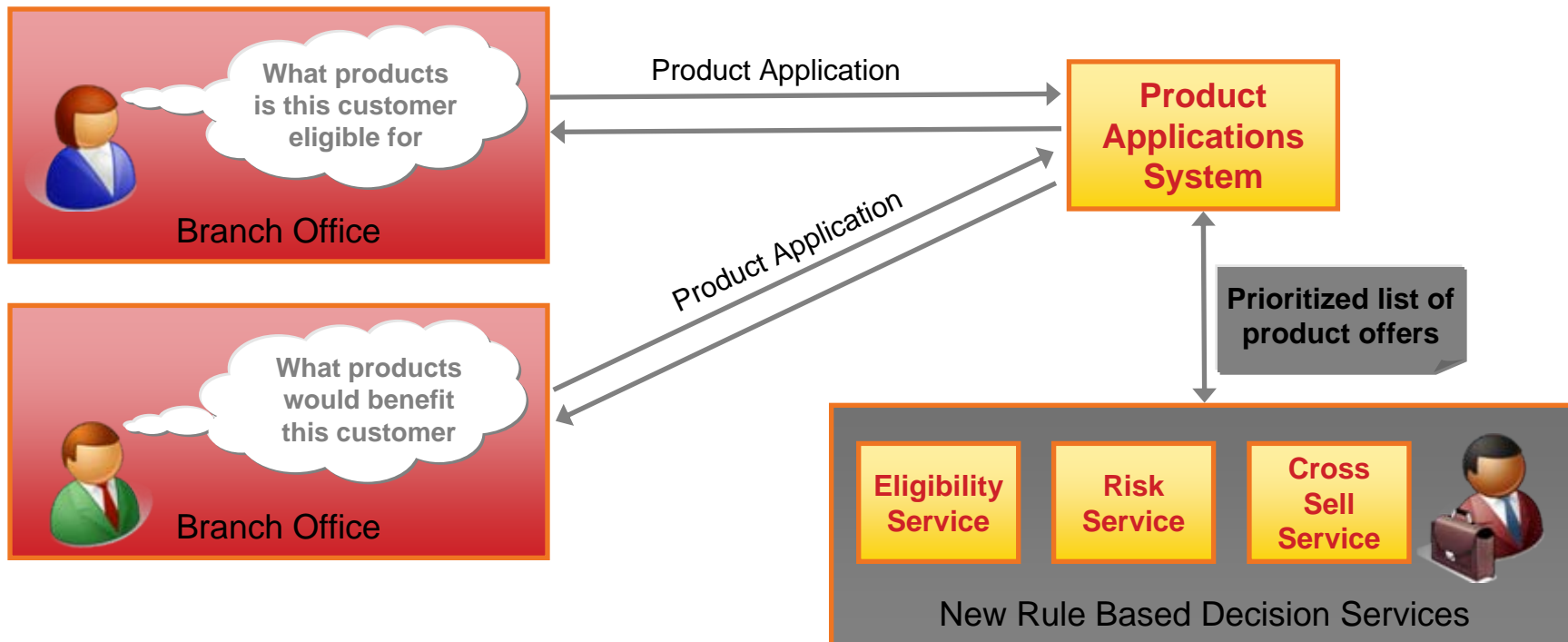
- **Employees equipped to make intelligent, consistent product recommendations in real time**
  - $14 million in new business in 2 ½ months
- **Customer experience enhanced with pre-approved offers that better match customer needs**
  - Offer acceptance increased from 3% to 20 – 30%

Events from CICS Transaction Server

Event Sources

Event Emission

Event Processing

Business Action

CICS TS V4.1

CICS Business Logic

- unmodified

Events captured by CICS runtime

CICS Events runtime support

- Transform into an event format
- WBE XML

- Add application context

Events

WebSphere Business Events
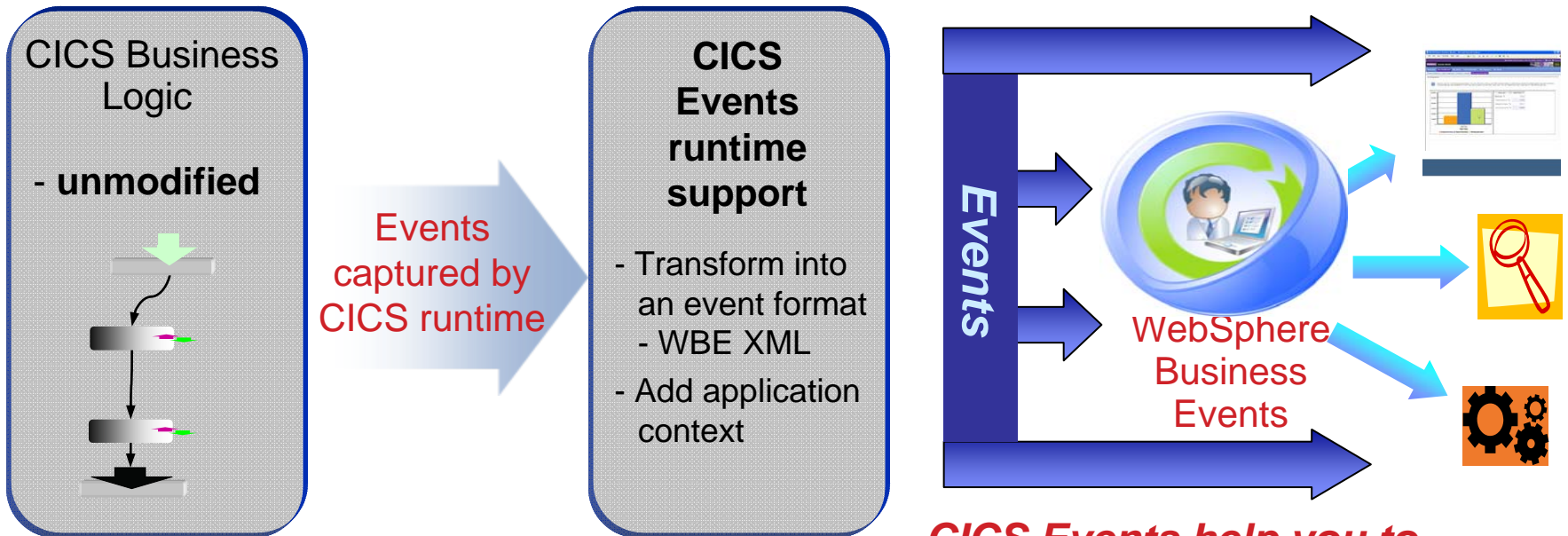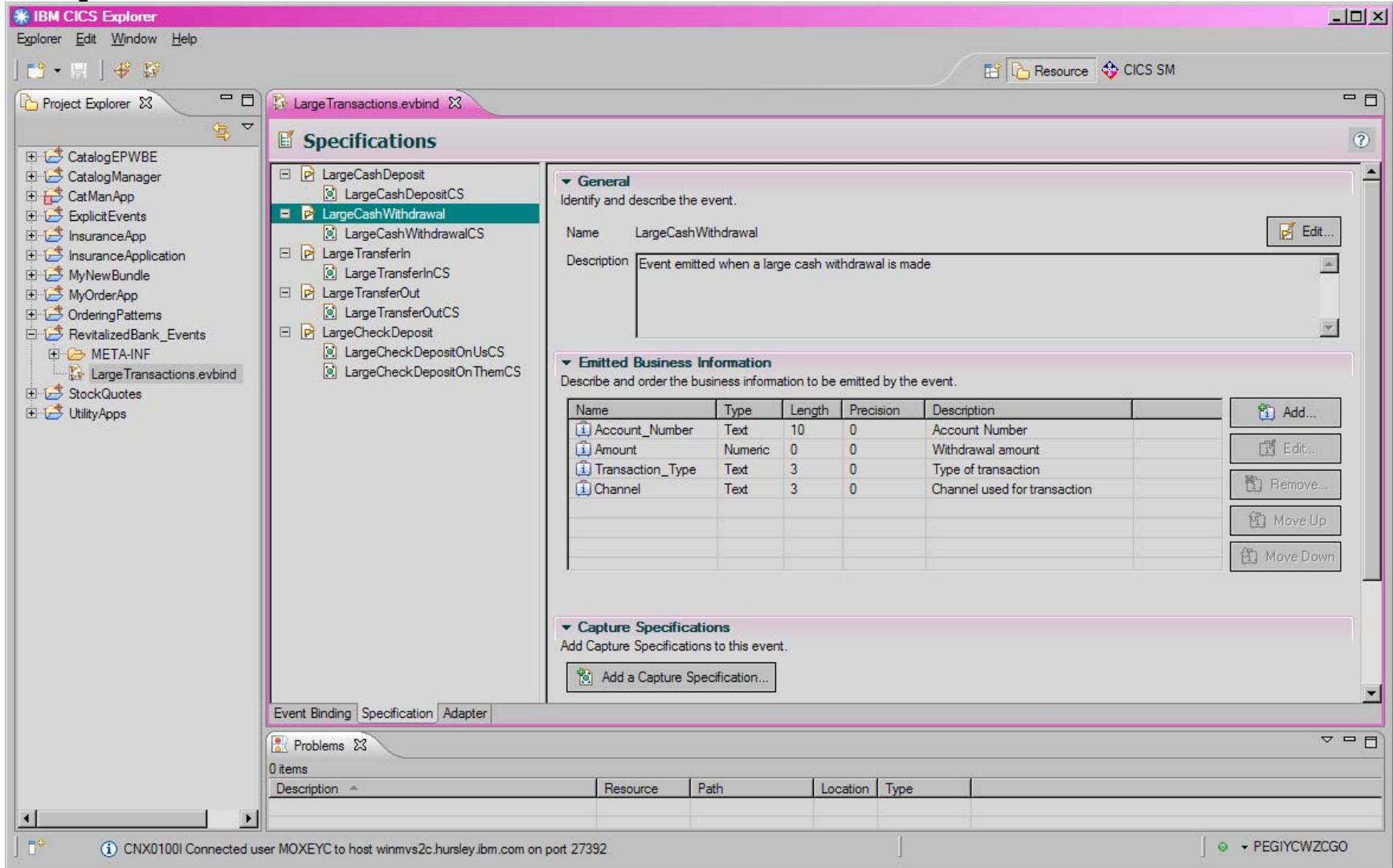
CICS Events help you to

- *Observe business processes*
- *Recognize suspicious activity*
- *Drive new processing*

Event Binding Editor Tooling – Event Specification

Event Binding Editor Tooling – Capture

Websphere Business Rules for zOS

ILOG BRMS Management and Development

Websphere ILOG Business Rules for z/OS

Application Developer, Architect

Development

Rule Studio (Eclipse)

RTS Rule Repository

Rule Management

Rule Team Server (RTS Web)

Business Analyst, Business Manager

Decision Validation Services

ILOG Rules for COBOL

ILOG JRules Rule Execution Server zOS

SHARE
in Orlando
2011

Business Rule Invocation Options
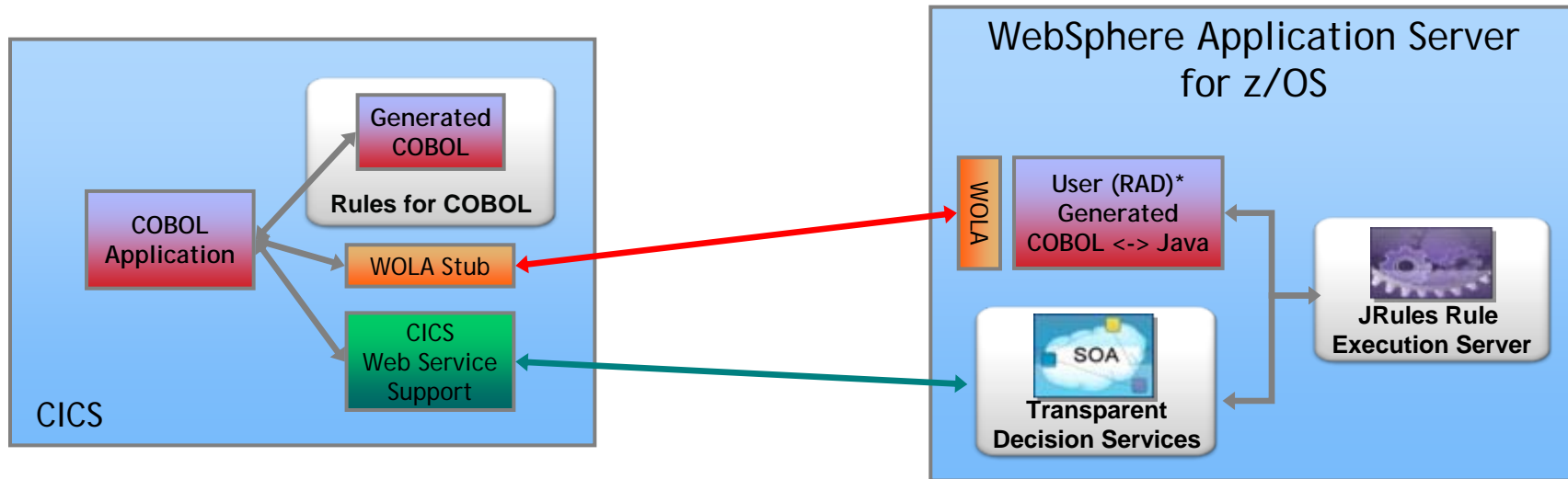
* Rational Application Developer provides tooling to map COBOL data structures to Java

- Generated COBOL Rules – direct invocation
- Web Service call
- WOLA Call

CICS calling JRules via Web Service

WebSphere Application Server (WAS)

JRules

RuleApp

Web Service

SOAP / HTTP

SOAP PIPELINE

Application
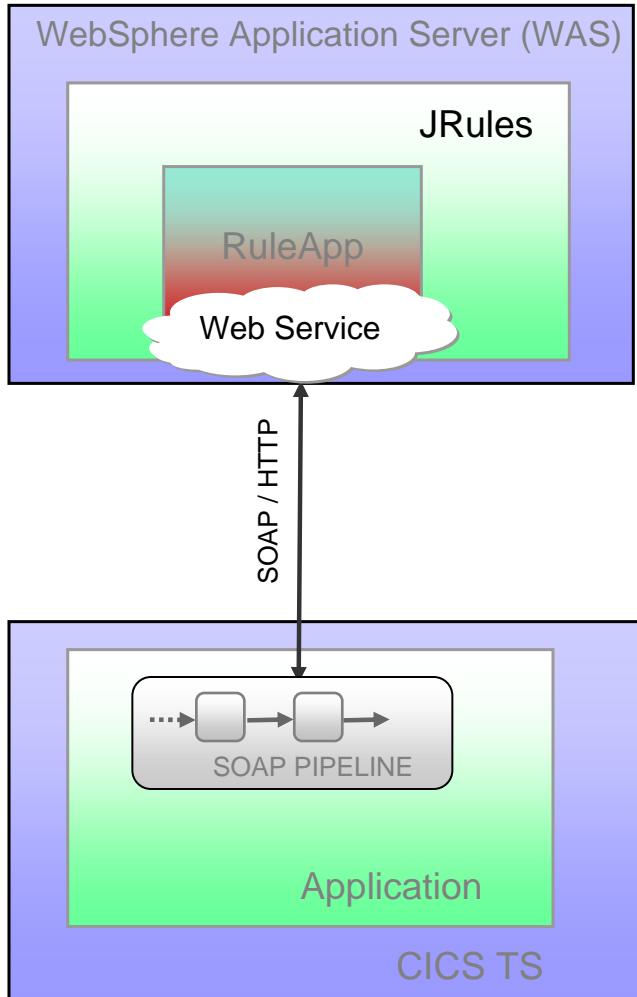
CICS TS

- **Scenario**

  Use CICS Web Services to call JRules hosted in WAS via a Web service

  - Full capability JRules Execution Server
  - Allows CICS to share rules with other platforms

- **Considerations with this Approach**

  - ✓ Standards-based integration
  - ✓ Decisions can be re-used/shared with other systems
  - ✓ Full BRMS management capabilities

  - ✗ Overhead of XML marshalling & network connection
  - ✗ Additional runtime to administer and maintain as the application processing is now split across multiple application servers

CICS calling JRules via WebSphere Optimized Local Adapter

WebSphere Application Server (WAS)

JRules

RuleApp

EJB
execute()

WOLA

CICS TS

WOLA Stub
Program

Application
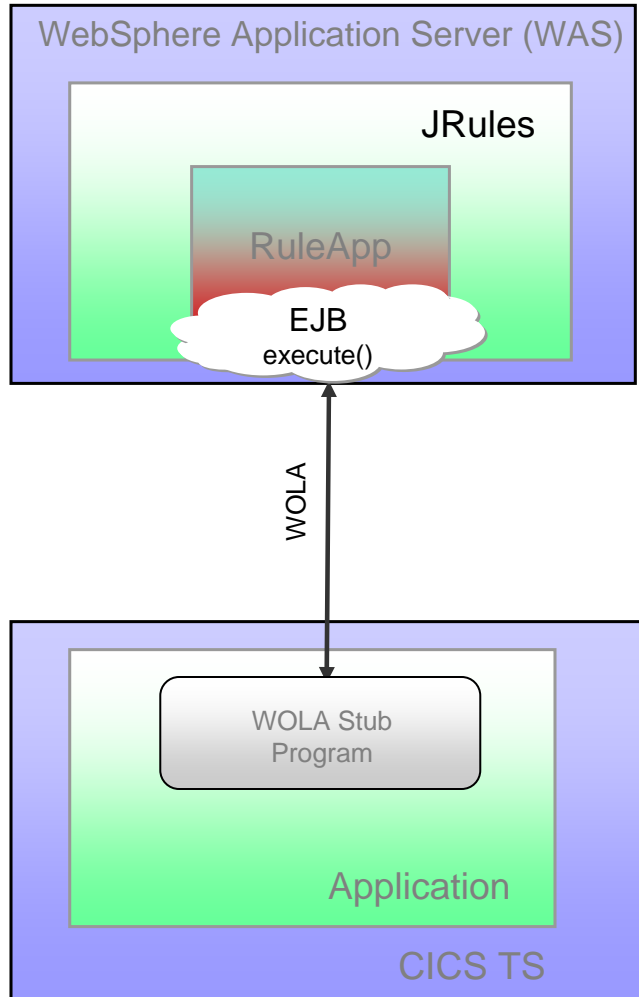
- **Scenario**

  Call JRules hosted in WAS in the same LPAR via a WebSphere Optimized Local Adapter (WOLA)

  - Full capability JRules Execution Server
  - Allows CICS to share rules with other platforms

- **Considerations with this Approach**

  ✓ High performance connection to WAS
  ✓ Decisions can be re-used/shared with other systems
  ✓ Full BRMS management capabilities

  ✗ CICS and WAS/JRules must reside in the same LPAR
  ✗ Custom EJB and marshalling code required to receive request and handle conversion to Java
  ✗ Additional runtime to administer and maintain as the application processing is now split across multiple application servers

Rules for COBOL – Generated Rule Invocation

Rules for Cobol Module

CICS Application

CICS TS
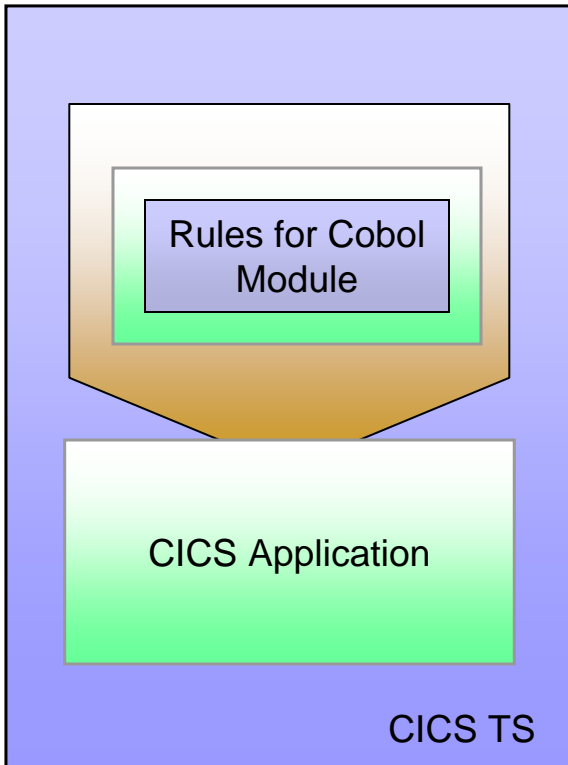
- **Scenario**

  Use Rules for COBOL to generate a COBOL module that embodies the rules and executes within the CICS region

  - CICS app can call the module via static or dynamic linking

  - Can be invoked via EXEC CICS LINK

- **Considerations with this Approach**

  ✓ Fits in easily with COBOL application architecture
  ✓ Better performance due to co-location of rule execution
  ✓ Easy to reuse the COBOL rules in batch as well as CICS environments

  ✗ No Rule Execution Server management capabilities
  ✗ No Decision Warehousing functionality
  ✗ No externally shared decisions

CICS calling JRules via MQ

WAS

JRules

RuleApp

JMS

MQ

WebSphere MQ

Application
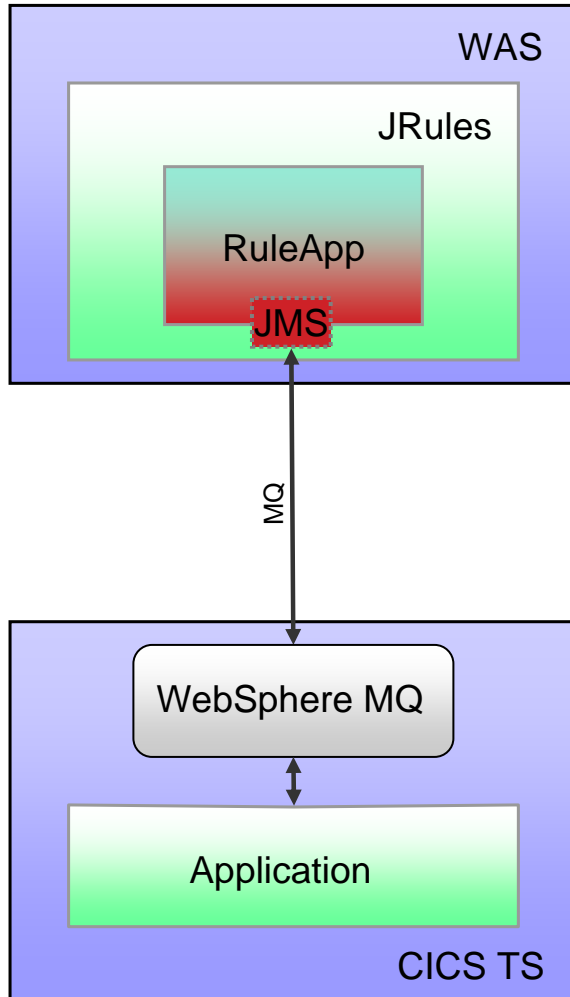
CICS TS

- **Scenario**

Call a message-driven bean on WAS by sending a message from CICS via MQ.

 – Full capability JRules Execution Server
 – Allows CICS to share rules with other platforms
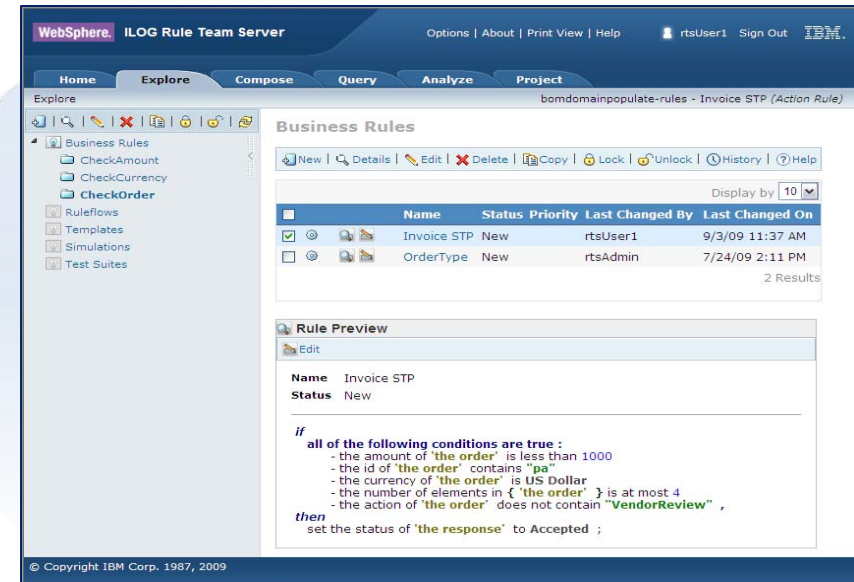
- **Considerations with this Approach**

✓ Standards-based integration (JMS)

✓ Decisions can be re-used/shared with other systems

✓ Full BRMS management capabilities

✗ Overhead of marshalling & network connection

✗ Custom marshalling code may be required to handle conversion to Java

✗ Additional runtime to administer and maintain as the application processing is now split across multiple application servers

Business Process Management for z/OS

Two-Pronged Approach to Business Process Improvement

Business Process Management

- Define and orchestrate the end-to-end process
- Combine automation with user interaction

Business Rules Management

- Define and execute specific decision points in processes and applications
- Automate and improve decisions

Why BPM on z/OS?

Enterprise data access in an integrated environment

System z is an integration platform, with system level awareness across the SW stack, enabling you to work smarter

Benefits include:

Message Broker WMQ

WebSphere BPM

CICS

IMS

DB2
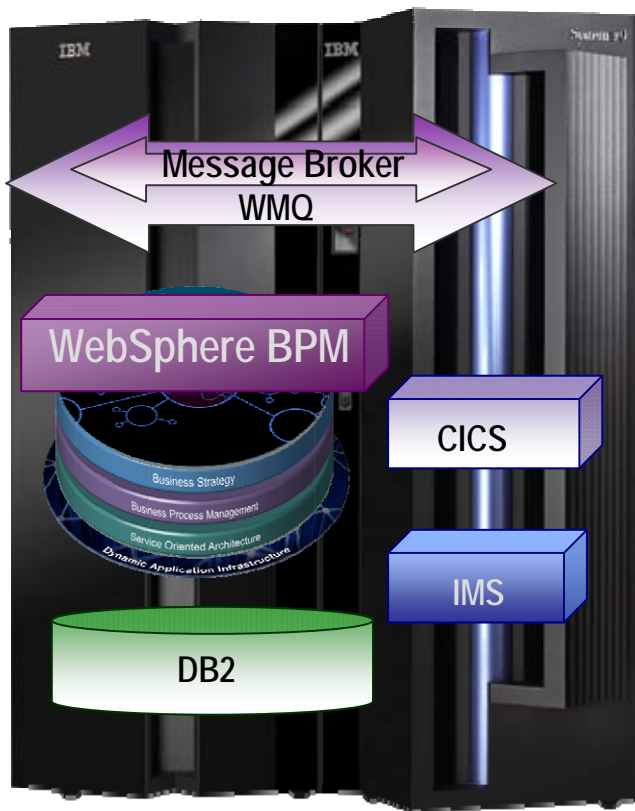
- **Easier Management**
  - ✓ Fewer components to administer
  - ✓ Vertical dynamic scalability

- **Stringent Security**
  - ✓ Reduced interception opportunity
  - ✓ Integration of RACF via SAF

- **Highly Available Infrastructure**
  - ✓ Parallel Sysplex enabled

- **Higher Performance**
  - ✓ No network time
  - ✓ No product specific network protocol construction / deconstruction

System z is the Undisputed Platform Leader in…

Availability ● Security ● Utilization ● Manageability ● Scalability

Processes that frequently interact with CICS, IMS, DB2 z/OS

... benefit most from co-location on z/OS

Process

End user

Web service

Asynchronous

WOLA

WebSphere Process Server

Price Quote

Change Acct

New Order

Web UI

Directory Access

Adapters

XML

CTG

CICS

IMS Connect

IMS

Resource Recovery Services

Security

DB2 Shared

Common application Infrastructure services

WAS for z/OS Global Transaction scope / RRS
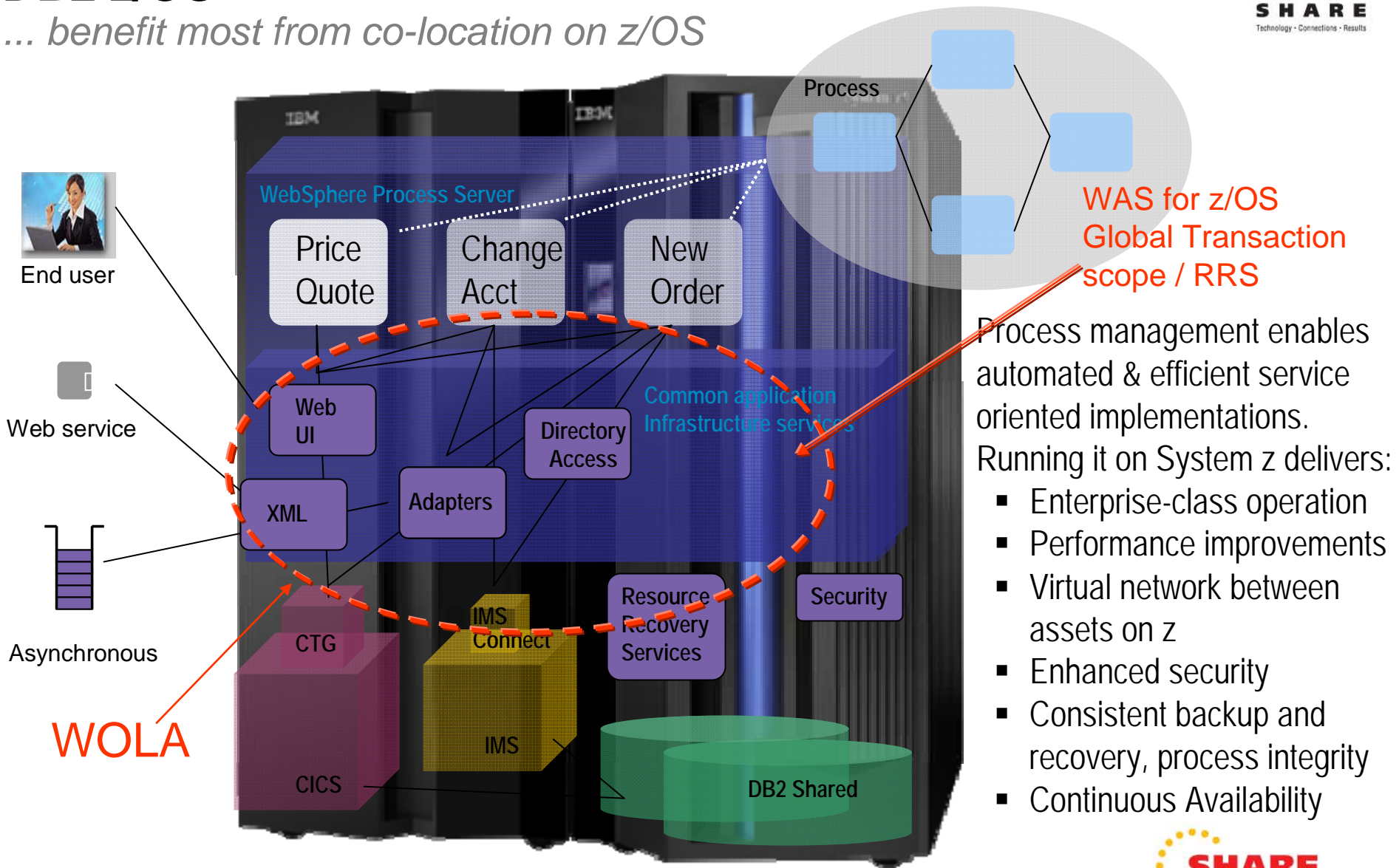
Process management enables automated & efficient service oriented implementations.
Running it on System z delivers:

- Enterprise-class operation
- Performance improvements
- Virtual network between assets on z
- Enhanced security
- Consistent backup and recovery, process integrity
- Continuous Availability

BPM Solves Common Business Challenges

Processes aren't documented

Bottlenecks prevent efficiency

Limited visibility into performance

Complex integration across multiple processes and applications
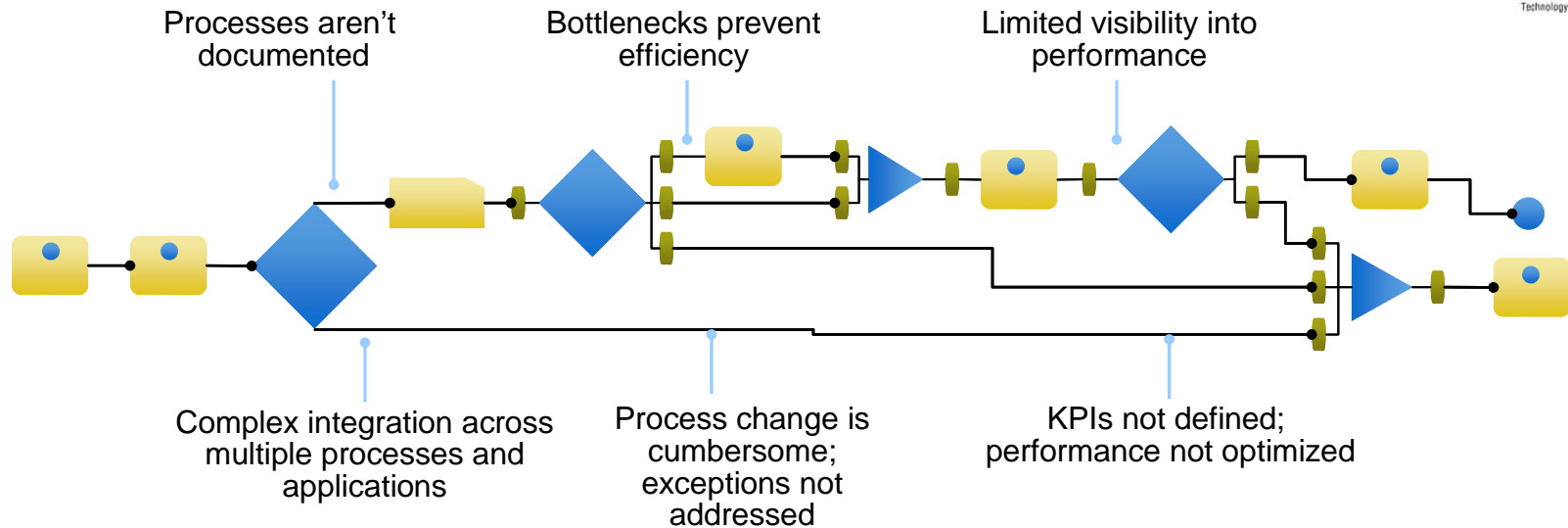
Process change is cumbersome; exceptions not addressed

KPIs not defined; performance not optimized
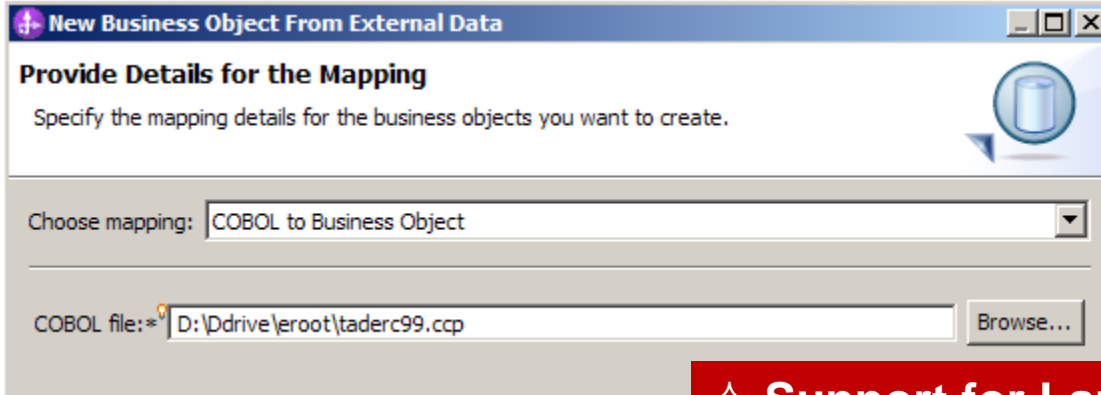
Your BPM journey…
- …can start with simply **documenting current processes**
- …proceeds into **simulation**, new process design and substantial **process automation** and **human-centric workflow management** support
- …or it can start with **monitoring current processes** to find opportunities for business optimization

In short, your journey into BPM can **start anywhere and grow anywhere**

Leverage Native z/OS Data Structures

 Reference data from COBOL copybook
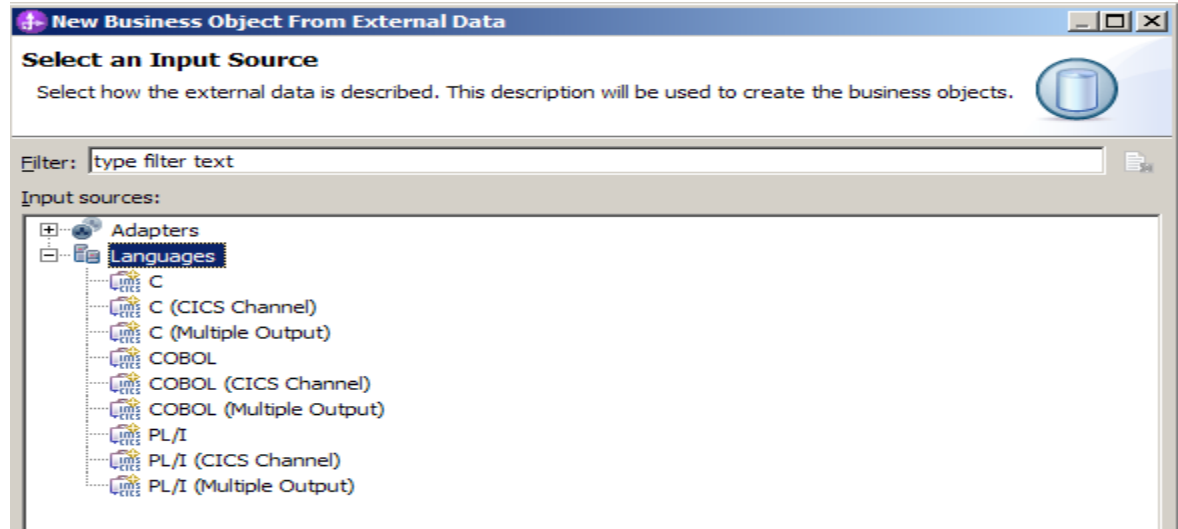
 Support for Language such as C, COBOL, PL/1, Channel Records, Multiple output

Connect to CICS and IMS z/OS Services

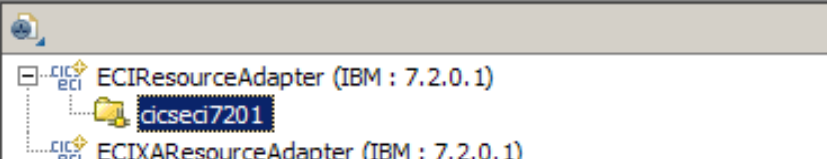**Designers will able to interact with applications on zOS using familiar COBOL data structures**

❶ Select Adapter

New External Service

Select an Adapter

Select the version of the adapter that you want to use.

- ECIResourceAdapter (IBM : 7.2.0.1)
  - cicseci7201
- ECIXAResourceAdapter (IBM : 7.2.0.1)

❷ Specify interaction Info

New External Service

Add, Edit, or Remove Operations

The adapter will use these operations to access native functions.

Operations:

- getCustomer (Taderc99 arg) : Taderc99

[Add...] [Edit...] [Remove]

InteractionSpec class: `com.ibm.connector2.cics.ECIInteractionSpec`

InteractionSpec properties for 'getCustomer'

Function name: * `TADERC99`

Commarea length: `-1`

[Advanced >>]

❸ Specify Service name

New External Service

Specify the Name and Location

Specify the name and location of the new service and its interface.

Module: `CICS` [New...]

Namespace: `http://CICS/CICSImport1`

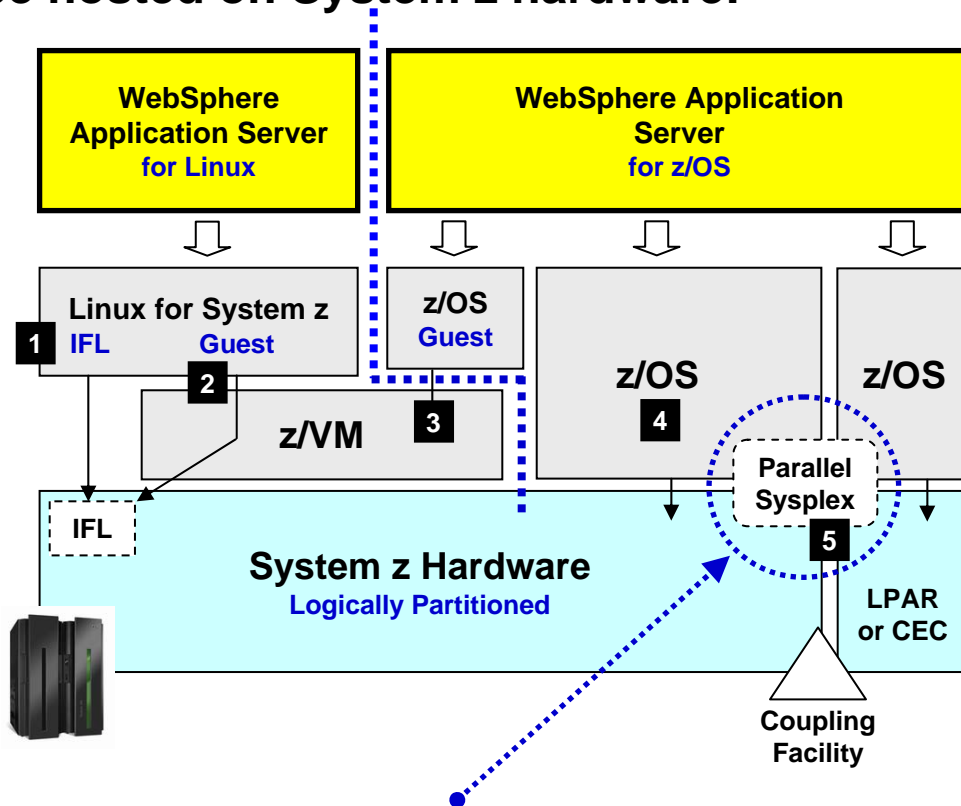☑ Use the default namespace

Name: * `CICSImport1`

☐ Deploy connector with module

The quality of service that is used to join the transaction provides a higher degree of data integrity, especially when a failure occurs. Because the adapter supports only local transactions, it must be the only one-phase commit resource in the transaction. More ...

☑ Join the transaction

BPM V7 for System z,
z/OS, Linux, and WebSphere Application Server

Here's a mapping of how the two flavors of WebSphere Application Server can be hosted on System z hardware:

WebSphere z/OS design and implementation capitalizes on the Sysplex environment

Much more to follow

BPM for z/OS exploits these QOS functions

1. **Linux for System z directly on IFL**
   Possible, but not very common. Solution where no zVM skills exist

2. **Linux for System z as guest on zVM**
   Very common. This provides excellent virtualization with z/VM with Linux running as a guest. Runs on the IFL.

3. **z/OS as guest on z/VM**
   Another example of zVM's virtualization capabilities. WAS z/OS as guest typically in a development or test environment.

4. **z/OS in a non-Sysplex environment**
   WAS runs directly on z/OS with no z/VM virtualization. No Sysplex more common in test environments or small production.

5. **z/OS in a Parallel Sysplex environment**
   This is the flagship environment. This is where high availability, scalability and maximum platform exploitation takes place.

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