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Technology · Connections · Results

CICS, Rules and Events Perfect Together

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IBM

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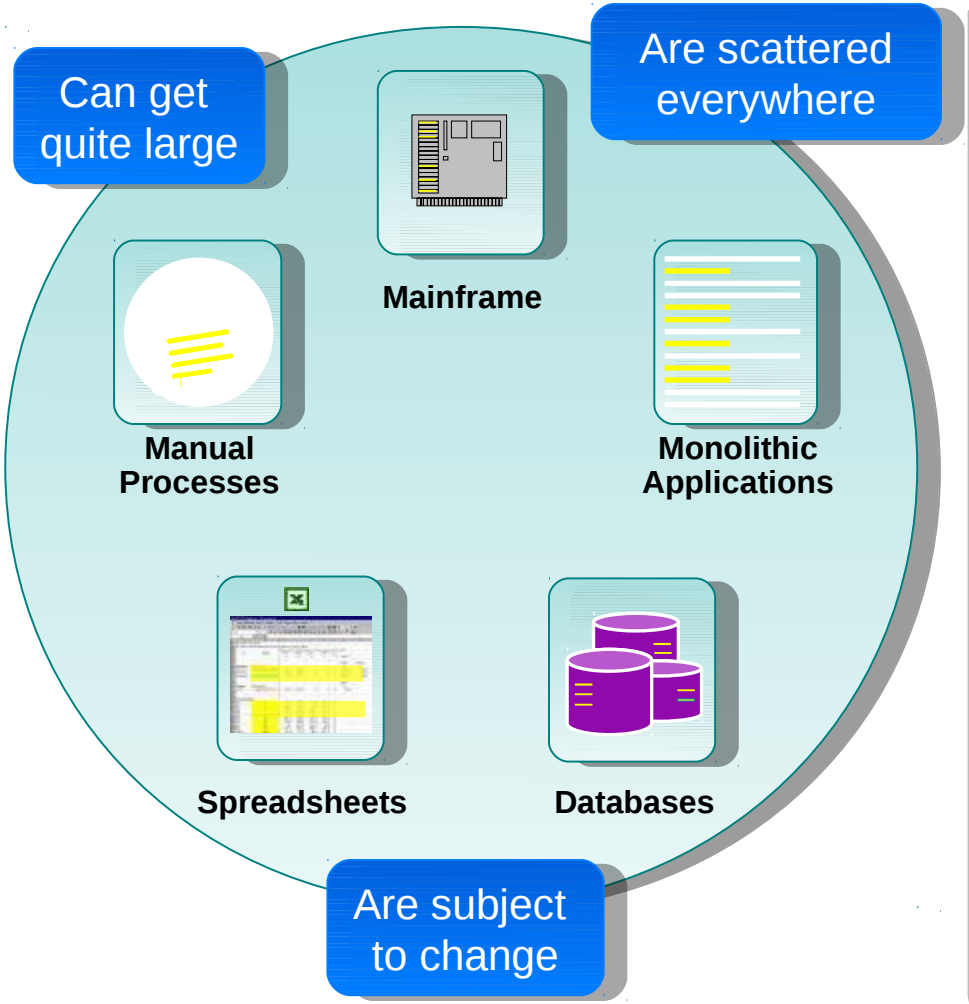
Agenda

- Concepts of Operational Decision Management (ODM)
- Exploiting ODM Capabilities in CICS
  - Rules
  - Events
- Bringing it all together

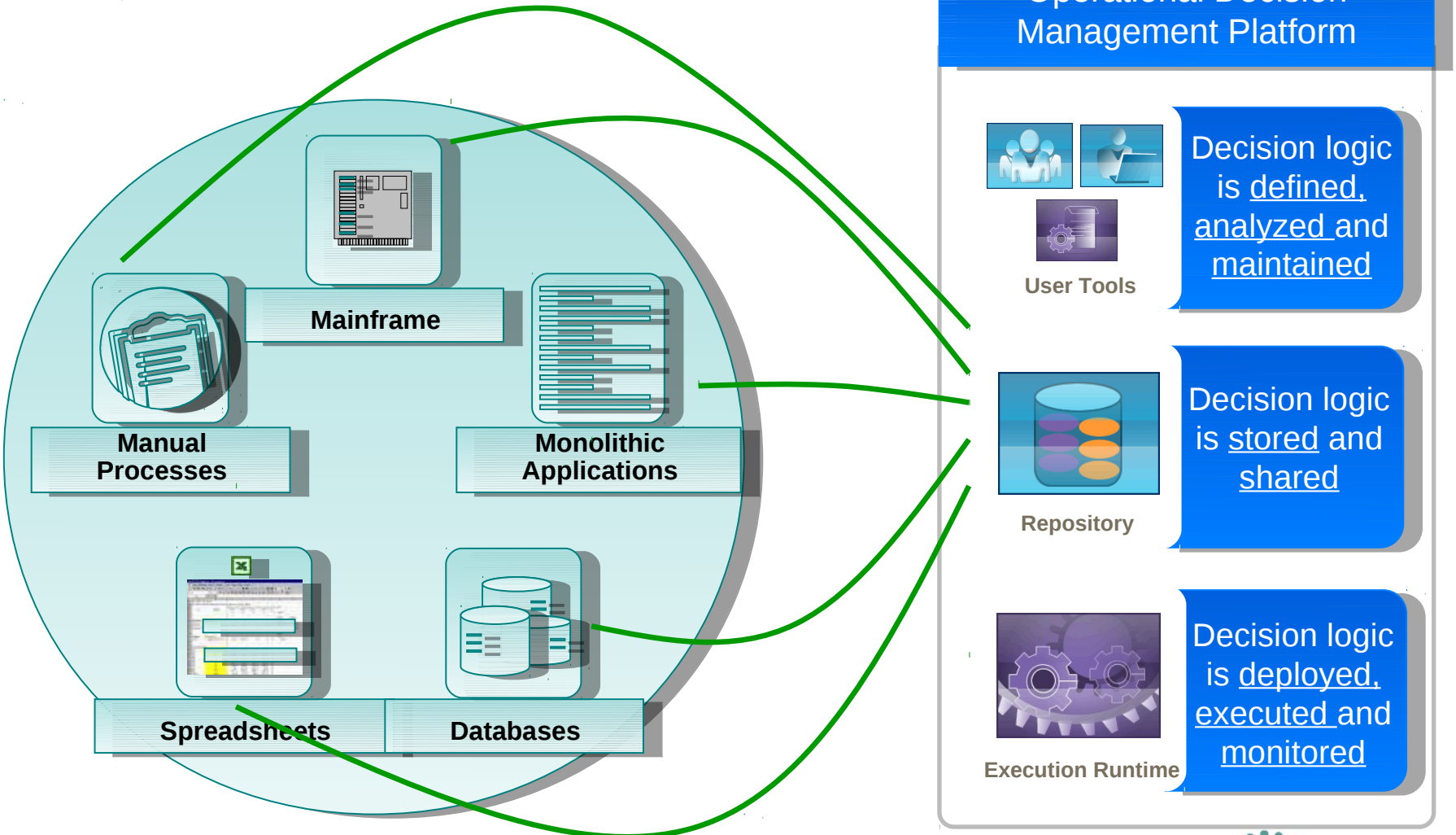
Operational Decisions in Organizations



Challenges for a Change Request

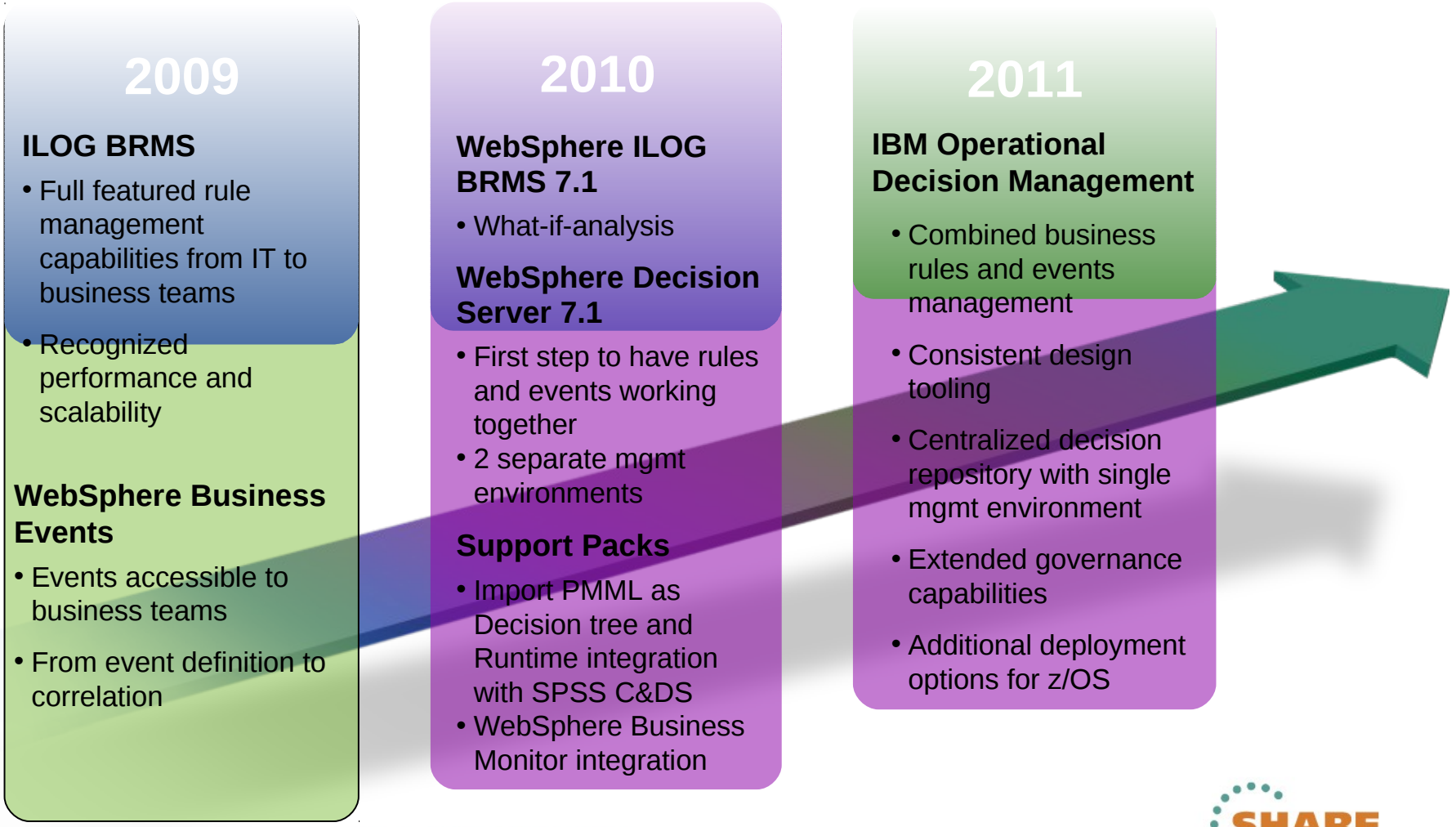
- Changes are costly, resource & time-intensive
  - **Hidden in code**
  - **Most changes have to be programmed – costly**
- Lack of consistency
  - **No central management**
  - **No reuse of decision logic**
- Gap between business analysts & IT administrators
  - **Knowledge fades over time**
- Lack of audit ability
- No easy way to test/simulate changes

Operational Decision Management Approach



IBM's Path to Operational Decision Management

Decision Management is an approach, combining software and expertise, to automate, improve and govern operational decisions across the enterprise



Operational Decision Management = ILOG + WBE

Business Rules

Primarily implements a decision model – given a snapshot view of data, determines best course of action at a specific point in a process or application

Main purpose is to automate a decision based on a combination of factors (business policies, regs, best practices)

If the Passenger is a gold frequent traveler and flight distance is more than 4000 miles and the flight destination is in Europe or Asia Then Add 10,000 points to the fidelity card of the Passenger

Business Events

Primarily implements a time-based pattern detection model – correlating events as data is in motion

Main purpose is to determine what of interest is transpiring and coordinate one or more responses by other systems or generate alerts to people

If more than 2 customer withdrawals in an ATM are done in the same day and the 2 ATMs are from 2 foreign countries Then Investigate possible fraud Reduce cash redraw max amount to 100$

***Gartner** characterizes Rules and Complex Event systems as complementary notions. The combination being required to implement intelligent decision management programs.*

ODM – Precise, Automated Decisions

Horizontal: best/appropriate price, cross-sell/ up-sell recommendations, loyalty promotions, exception identification, risk/fraud assessment, straight-through processing approvals

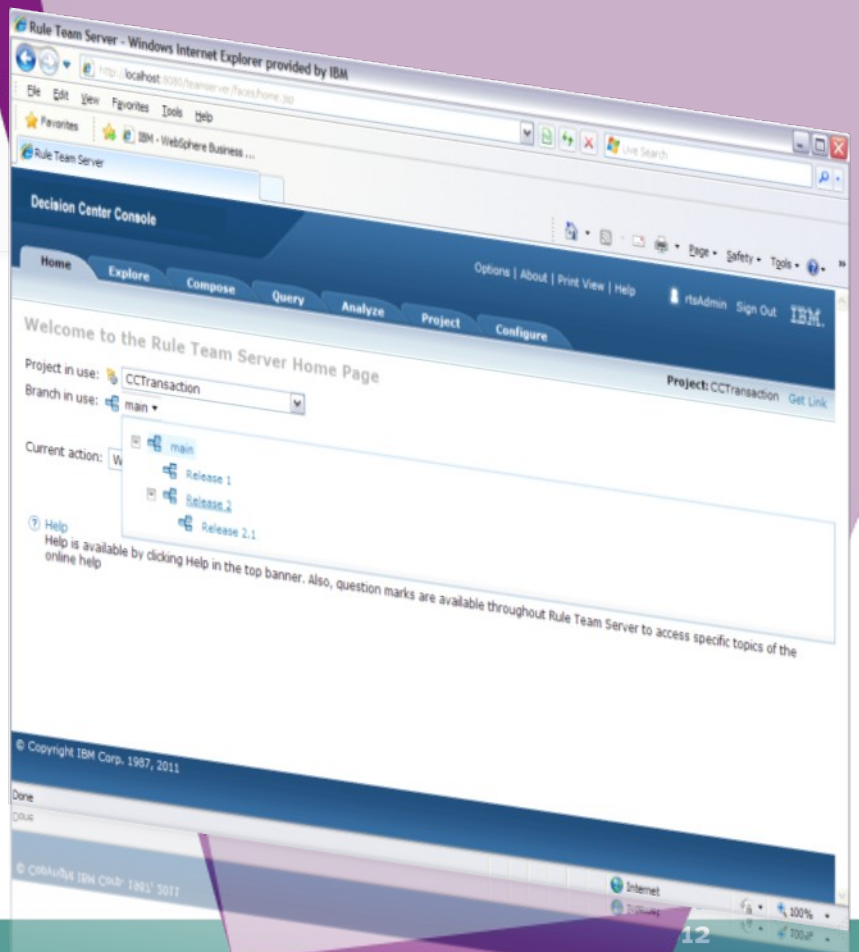




Insurance	Banking	Healthcare	Government	Energy/Utility
▪ Claim • Validation • STP approval • Exception routing ▪ Policy/ Underwriting • Eligibility • Risk • Pricing ▪ Annuity • Recommendation • Commissioning • Payout calc.	▪ Loan • Eligibility • Risk • Pricing ▪ Account • Cross-sell • Fraud/Alerts ▪ Credit Card • Mktg Offers • Fraud • Credit limit	▪ Patient Care • Drug interaction risk warnings • Follow-up alerts ▪ Member • Services recommendation • Eligibility • Benefit calculation ▪ Provider • Patient eligibility for services	▪ Benefits • Eligibility • Calculations ▪ Tax Payer • Classification • Audit flagging ▪ Citizen • Program(s) recommendation	▪ Land/Permits • Conveyance processing • Contract compliance ▪ Service Mgmt • Service prioritization • SLA alerts • Maintenance alerts • Order configuration

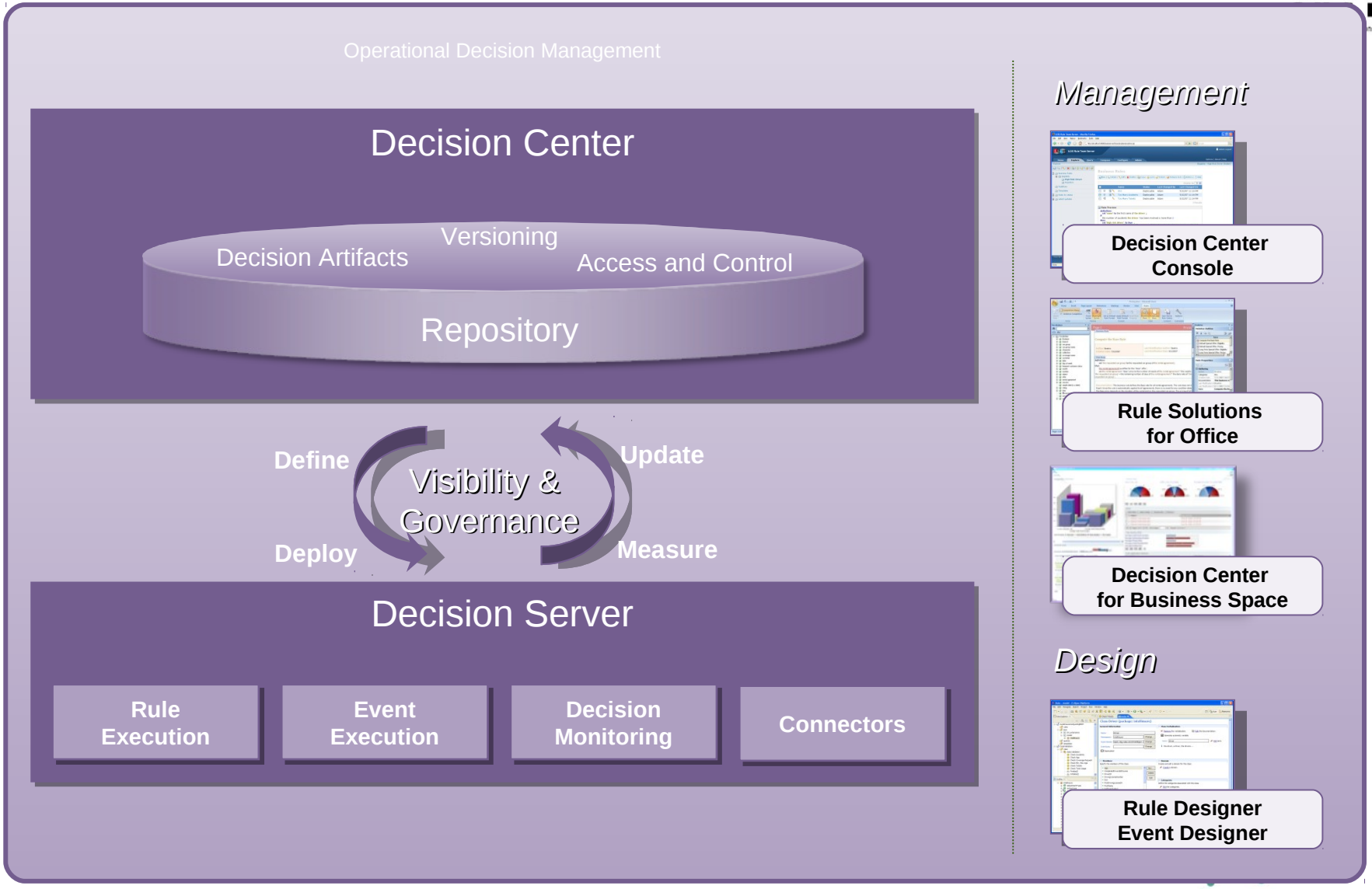
The Value to your CICS Applications

- *Operational Decision Management enables organizations in every industry to make their business rules and business decisions clear, consistent and **expressed in business language** to be able to change when the business needs.*
- *Transformation or **modernization** of z/OS applications*
- *Ability to **react to change** (timely reaction to market and competitive changes)*
- *Overcome IT and Business mis-alignment – keep up and service **business requests***
- *Eliminate resource drain on application maintenance – **reuse of business decisions** across applications and platforms*



Operational Decision Management Capabilities – Rules

IBM ODM: Components



Data Model - Verbalization

Business Object Model	Rule Vocabulary	Business Rule Language
Developer	IT / Business	Rule Developer / Business User

```
01 CUST
  05 NAME
  05 AGE
  05 NUMACCIDENTS
  05 RISKLEVEL
```

"customer"

- the name of …
- the birthday of …
- the number of accidents of …
- the … is a high risk driver

Rule: High risk driver

if

the birthday of **customer** is after **12/9/1975** **and**
the number of accidents of **customer** is at least **3**

then
set the **customer** as a **high risk driver**

- Automatic generation of the rule vocabulary.
- Comprehensive industry focused business terms to define its data and associated actions.
- Localizable vocabulary

"client"

- le nom du …
- l'anniversaire du …
- Le nombre d'accidents du …
- le … est un conducteur à risque …

Règle: Conducteur à risque

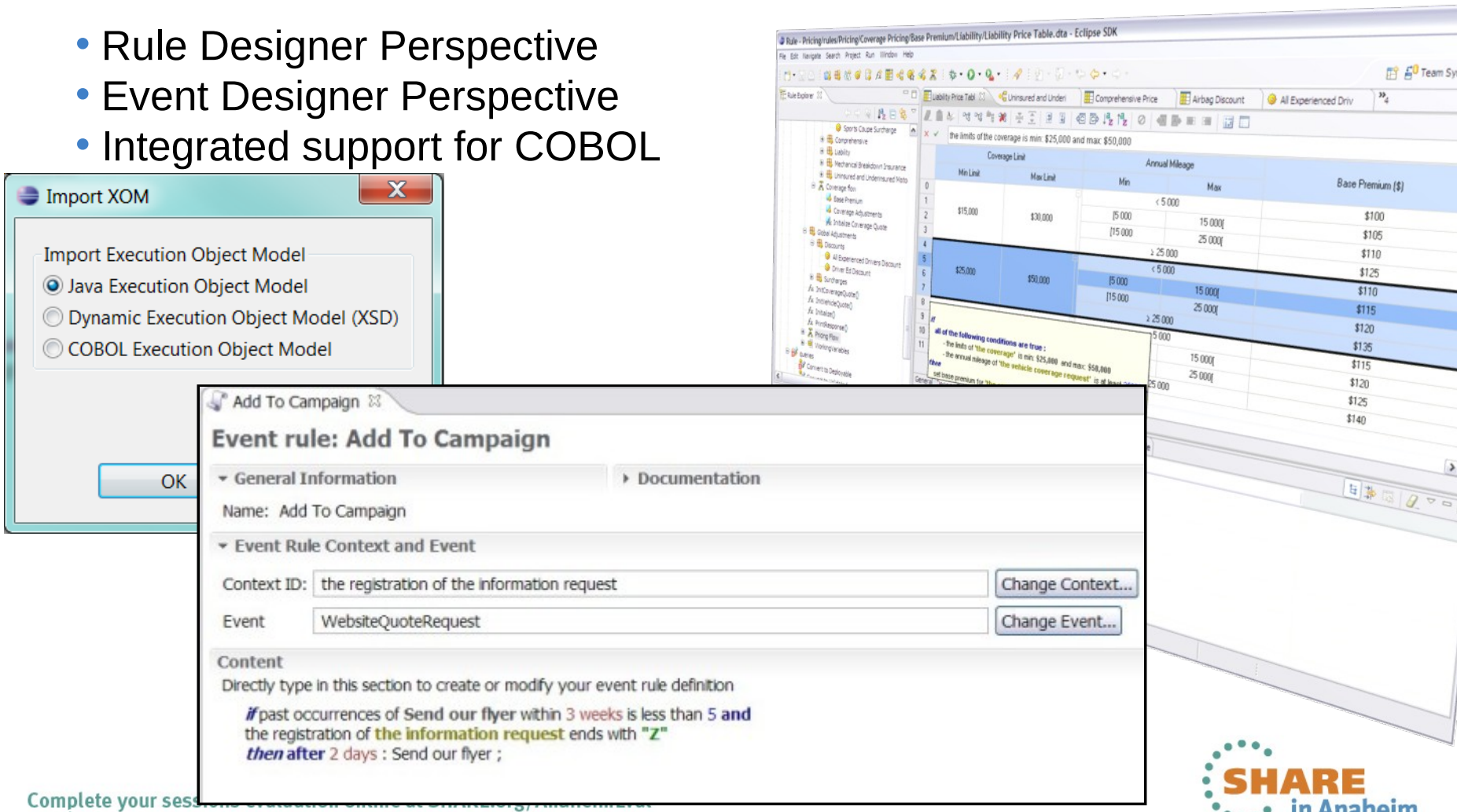
si

L'anniversaire du **client** est après le **12/9/1975** **et**
le nombre d'accident du **client** est au moins **3**

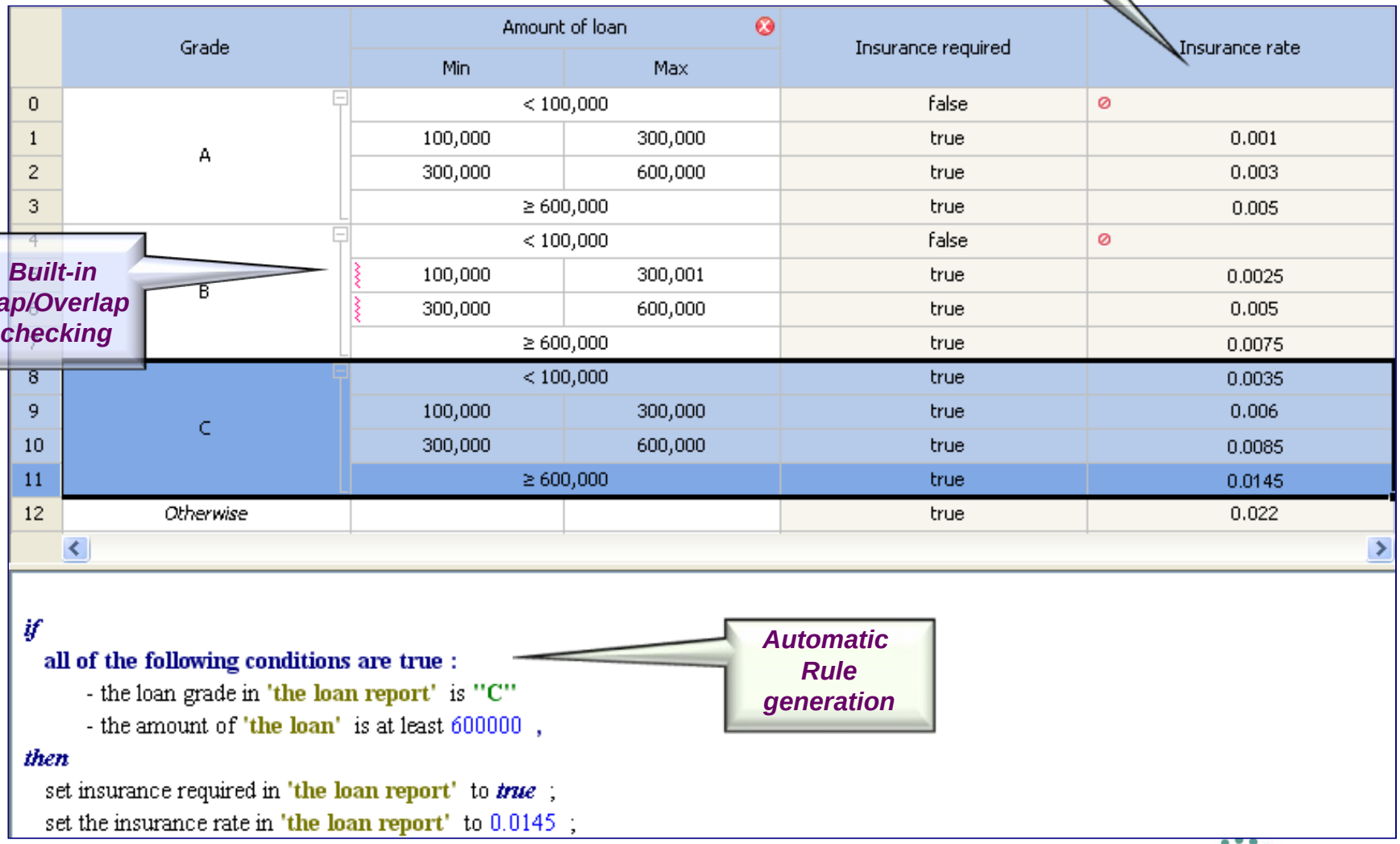
alors
Classer le **client** comme **conducteur à risque**

Rule and Event Designer

- Eclipse-based Development Environment
  - Rule Designer Perspective
  - Event Designer Perspective
  - Integrated support for COBOL



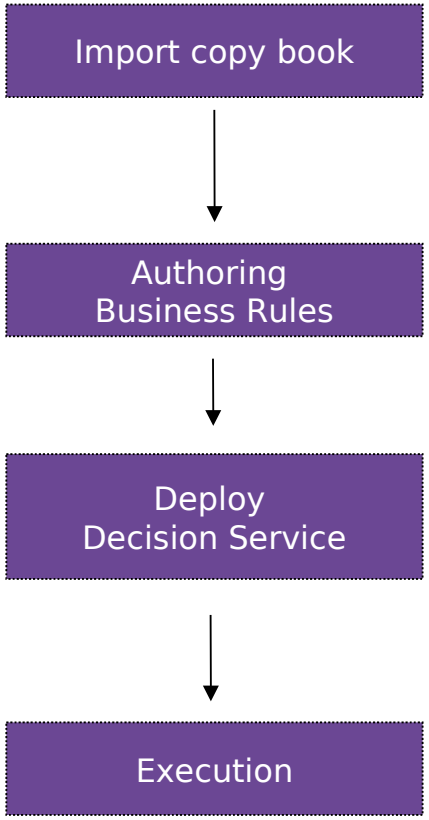
Decision Tables



	Grade	Amount of loan		Insurance required	Insurance rate
		Min	Max		
0	A	< 100,000		false	
1		100,000	300,000	true	0.001
2		300,000	600,000	true	0.003
3		≥ 600,000		true	0.005
4	B	< 100,000		false	
5		100,000	300,001	true	0.0025
6		300,000	600,000	true	0.005
7		≥ 600,000		true	0.0075
8	C	< 100,000		true	0.0035
9		100,000	300,000	true	0.006
10		300,000	600,000	true	0.0085
11		≥ 600,000		true	0.0145
12	*Otherwise*			true	0.022

```
if
   all of the following conditions are true :
        - the loan grade in 'the loan report' is "C"
        - the amount of 'the loan' is at least 600000 ,
then
   set insurance required in 'the loan report' to true ;
   set the insurance rate in 'the loan report' to 0.0145 ;
```

Starting from a COBOL Copybook



Scenario

- Existing COBOL containing business rules
- Data model defined in COBOL copybook
- Use ODM to modernize the business policy

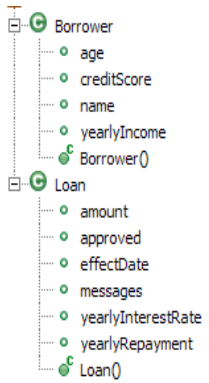
Benefits

- Modernize business policies in ODM
- Rules can be invoked ‘naturally’ from existing COBOL application
- Business policy/rule lifecycle detached from application lifecycle

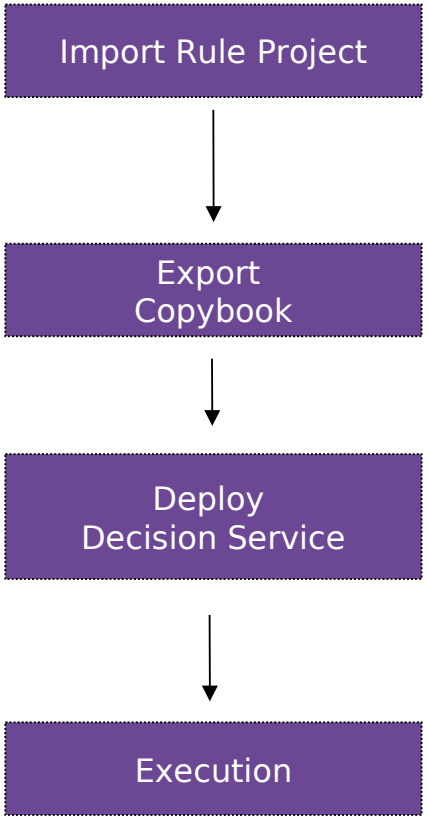
Rule Authoring – COBOL Copybook XOM

- Support Enterprise COBOL 3.4, 4.1 & 4.2
- Java is created from the copybook structure
  - Java XOM & Java code to marshal between COBOL <-> Java
  - 01 level structures mapped to class in BOM
- Redefines statements supported
  - Select which redefines structure to import
- COBOL Table support
  - Mapped to Java **`List<type>`** structures
- COPY statements supported
- Level 88 supported
  - Mapped to methods in BOM

```
01  Borrower.
    05  name                PIC  X(20).
    05  creditScore         PIC  S9(10).
    05  yearlyIncome        PIC  9(10).
    05  age                 PIC  9(3).
01  Loan.
    05  amount              PIC  9(10).
    05  yearlyInterestRate  PIC  99.
    05  yearlyRepayment     PIC  9(10).
    05  effectDate          PIC  X(8).
    05  approved            PIC  X.
    05  messageCount        PIC  9(2).
    05  messages            PIC X(60)
                            OCCURS 0 TO 99 TIMES
                            DEPENDING ON messageCount.
```



Starting from an existing Rule Project



Scenario

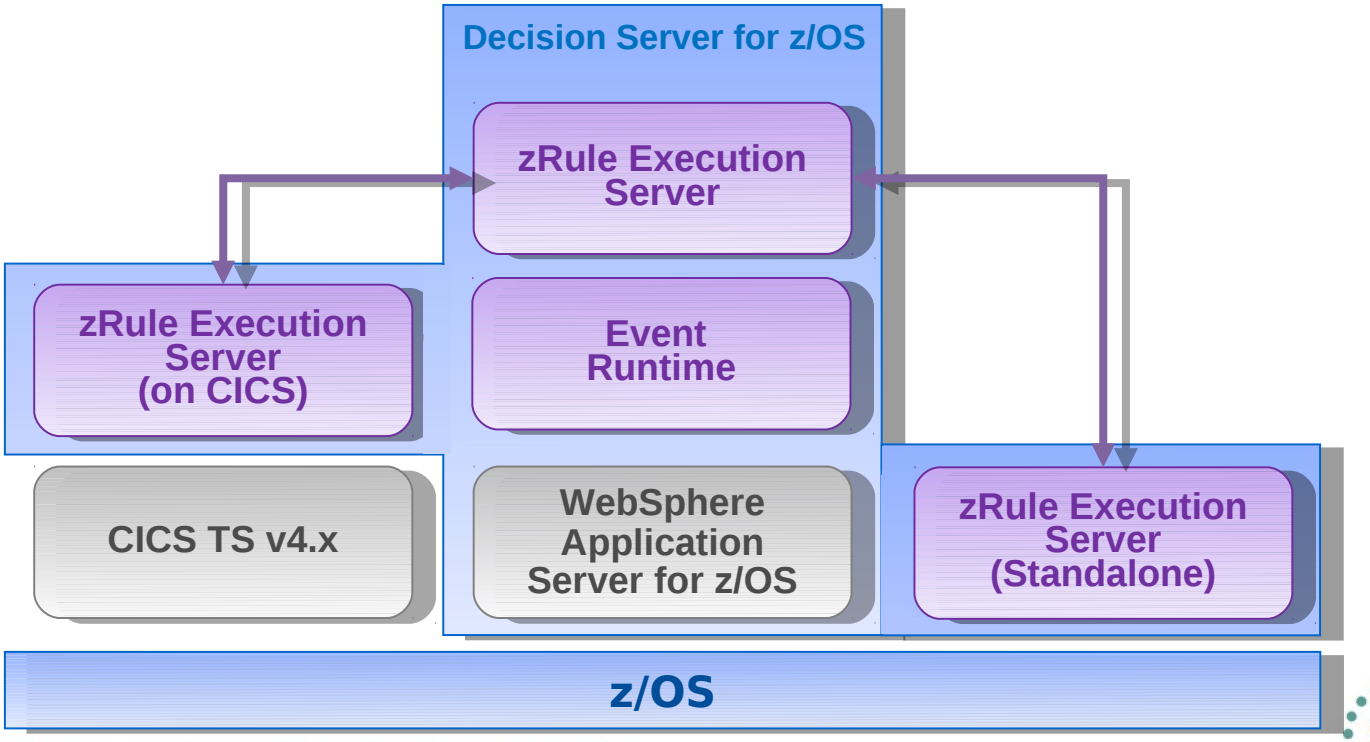
- Existing rule projects exist that are currently in use on distributed platforms
- Concurrent execution of rules is required on System Z

Benefits

- Consistent decision rules wherever they are executed
- Rules can be invoked ‘naturally’ from existing COBOL application
- Enables central rule management across System Z and Distributed platforms

Operational Decision Management on System z

- Decisions can be invoked from existing CICS, IMS and batch applications
- Runtime support for COBOL data types
- Flexible runtime deployment to fit any System z environment:
  - Deployed on WebSphere Application Server for z/OS
  - Deployed standalone to z/OS
  - Deployed in CICS TS 4.x JVM Server environment

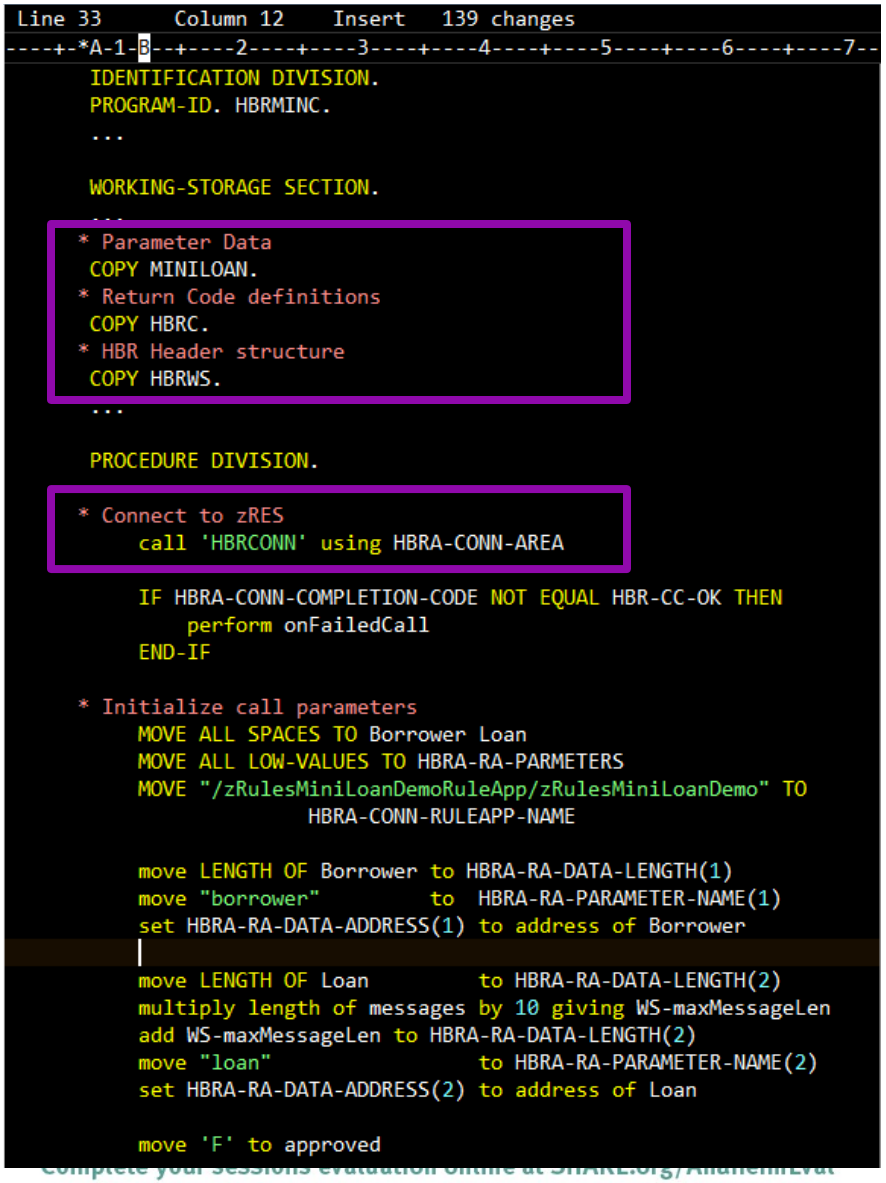


New COBOL Programming API

- HBRCONN
  - Connect to the rule engine using conn area
- HBRRULE
  - Run the rules copying in the rule name and data
- HBRDSC
  - Disconnect from the rule engine

```
01 HBRA-CONN-AREA.
   10 HBRA-CONN-EYE              PIC X(4)  VALUE 'HBRC'.
   10 HBRA-CONN-LENTH            PIC S9(8) COMP.
   10 HBRA-CONN-VERSION          PIC S9(8) COMP  VALUE +2.
   10 HBRA-CONN-RETURN-CODES.
      15 HBRA-CONN-COMPLETION-CODE PIC S9(8) COMP.
      15 HBRA-CONN-REASON-CODE     PIC S9(8) COMP.
   10 HBRA-CONN-FLAGS            PIC S9(8) COMP  VALUE +1.
   10 HBRA-CONN-INSTANCE         PIC X(24).
   10 HBRA-CONN-RULE-COUNT       PIC S9(8) COMP.
   10 HBRA-CONN-RULE-MAJOR-VERSION PIC S9(8) COMP.
   10 HBRA-CONN-RULE-MINOR-VERSION PIC S9(8) COMP.
   10 HBRA-CONN-RULEAPP-NAME     PIC X(256).
   10 HBRA-RESPONSE-AREA.
      15 HBRA-RESPONSE-MESSAGE   PIC X(512).
   10 HBRA-RA-PARMETERS.
      15 HBRA-RA-PARMS  OCCURS 32.
         20 HBRA-RA-PARAMETER-NAME   PIC X(48).
         20 HBRA-RA-DATA-ADDRESS     USAGE POINTER.
         20 HBRA-RA-DATA-LENGTH      PIC 9(8) BINARY.
   10 HBRA-RESERVED.
      15 HBRA-RESERVED02          PIC X(12).
      15 HBRA-RESERVED03          PIC X(64).
      15 HBRA-RESERVED04          PIC X(64).
      15 HBRA-RESERVED05          PIC X(128).
      15 HBRA-RESERVED06          PIC X(128).
```

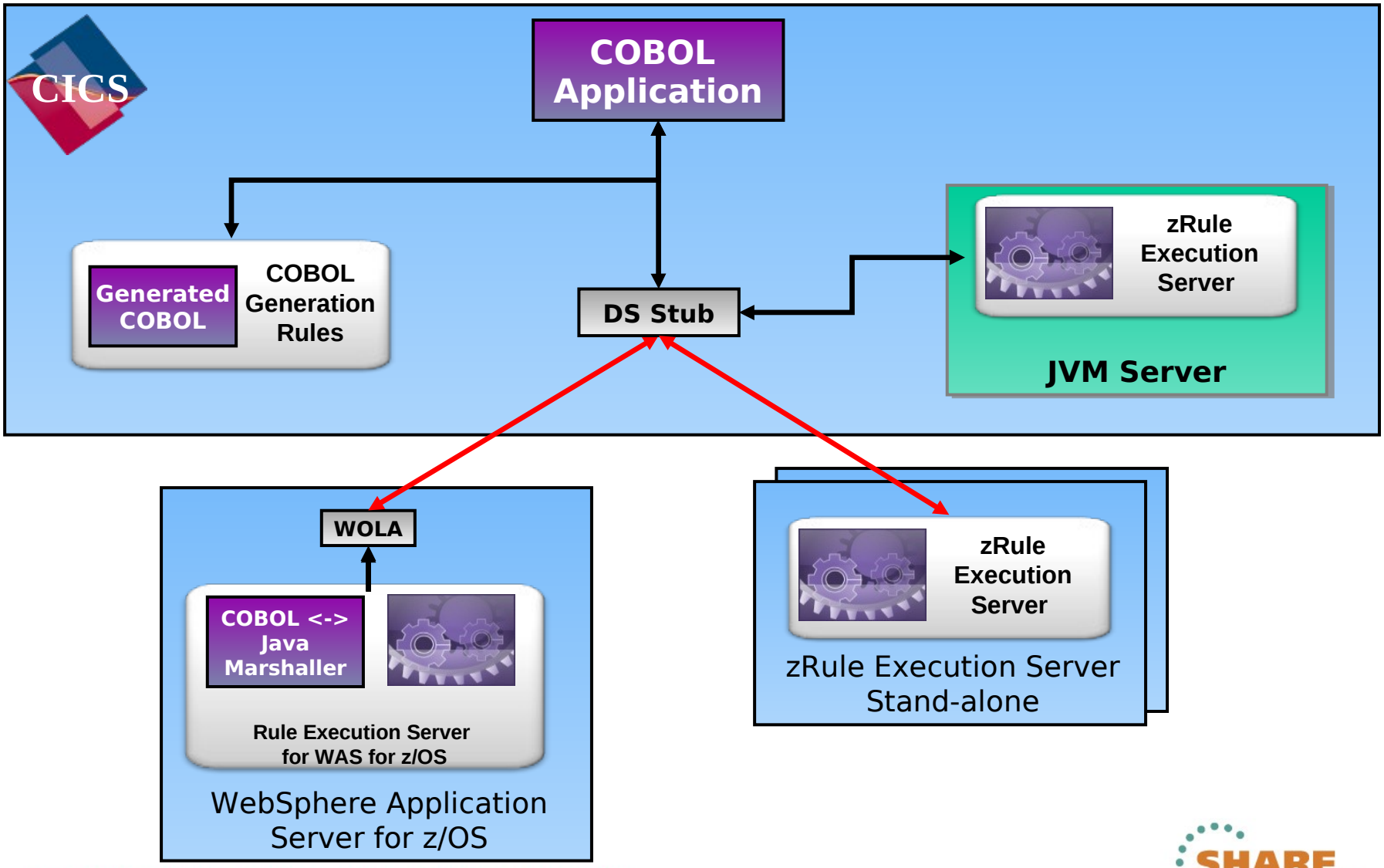
New programming API within a COBOL program



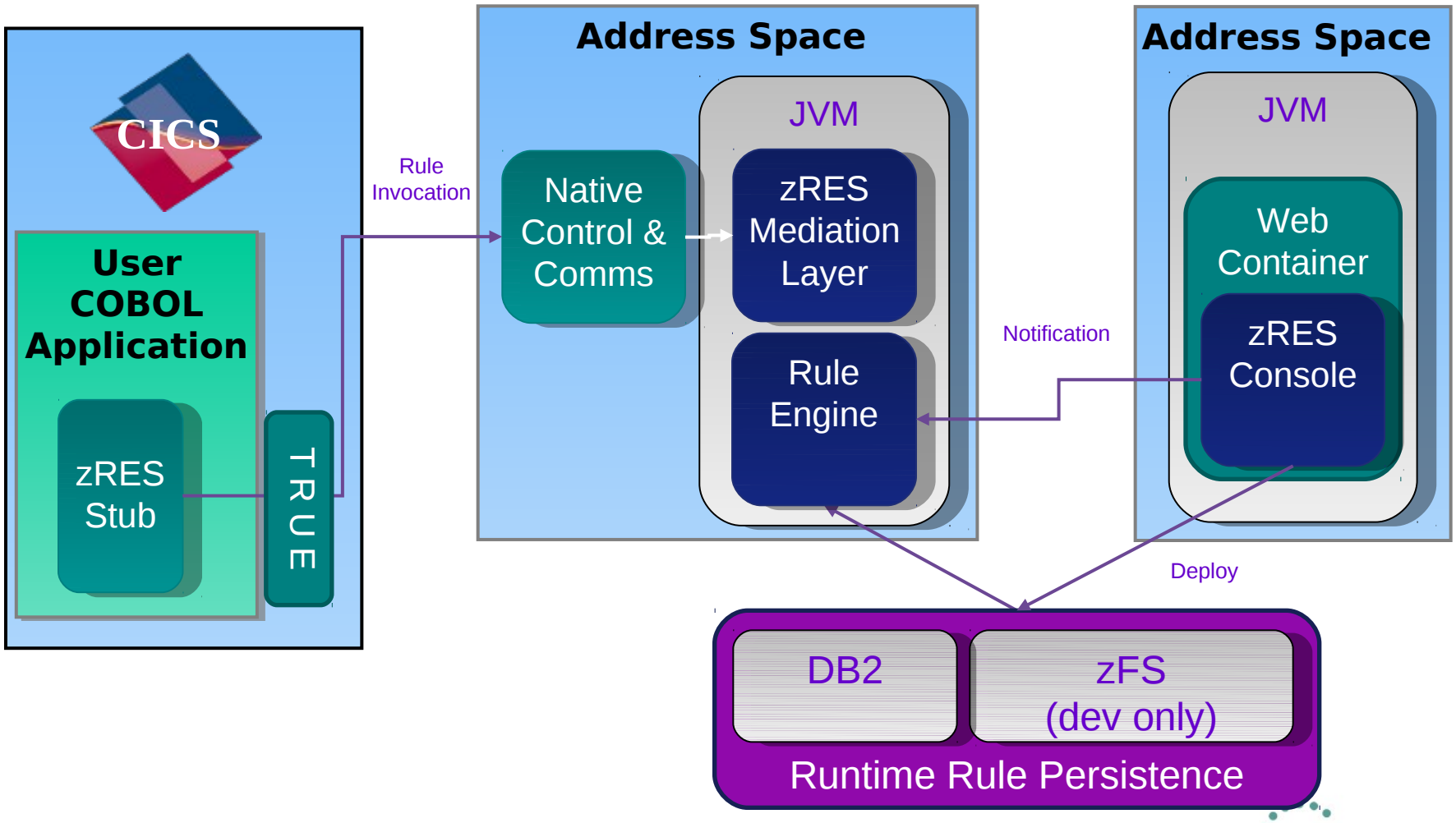
```
Line 33      Column 12    Insert   139 changes
----+-*A-1-B--+----2----+----3----+----4----+----5----+----6----+----7--
      IDENTIFICATION DIVISION.
      PROGRAM-ID. HBRMINC.
      ...

      WORKING-STORAGE SECTION.
      ...
     * Parameter Data
      COPY MINILOAN.
     * Return Code definitions
      COPY HBRC.
     * HBR Header structure
      COPY HBRWS.
      ...

      PROCEDURE DIVISION.

     * Connect to zRES
          call 'HBRCONN' using HBRA-CONN-AREA

          IF HBRA-CONN-COMPLETION-CODE NOT EQUAL HBR-CC-OK THEN
              perform onFailedCall
          END-IF

     * Initialize call parameters
          MOVE ALL SPACES TO Borrower Loan
          MOVE ALL LOW-VALUES TO HBRA-RA-PARMETERS
          MOVE "/zRulesMiniLoanDemoRuleApp/zRulesMiniLoanDemo" TO
                       HBRA-CONN-RULEAPP-NAME

          move LENGTH OF Borrower to HBRA-RA-DATA-LENGTH(1)
          move "borrower"         to  HBRA-RA-PARAMETER-NAME(1)
          set HBRA-RA-DATA-ADDRESS(1) to address of Borrower

          move LENGTH OF Loan          to HBRA-RA-DATA-LENGTH(2)
          multiply length of messages by 10 giving WS-maxMessageLen
          add WS-maxMessageLen to HBRA-RA-DATA-LENGTH(2)
          move "loan"                  to HBRA-RA-PARAMETER-NAME(2)
          set HBRA-RA-DATA-ADDRESS(2) to address of Loan

          move 'F' to approved
```

```
Line 81      Column 12    Insert   144 changes
----+-*A-1-B--+----2----+----3----+----4----+----5----+----6----+----7--
     * Read scenario data
          MOVE ALL LOW-VALUES TO WS-IN
          UNSTRING SCENARIO-DATA DELIMITED BY ','
                   INTO
              WS-IN-data(1) WS-IN-data(2) WS-IN-data(3)
              WS-IN-data(4) WS-IN-data(5) WS-IN-data(6)
     * Populate the borrower from scenario data
          move WS-IN-data(1) to name
          Compute creditscore        = Function numval(WS-IN-data(2))
          Compute yearlyIncome       = Function numval(WS-IN-data(3))
     * Populate the loan from scenario data
          Compute amount             = Function numval(WS-IN-data(4))
          Compute yearlyRepayment    = Function numval(WS-IN-data(5))
          Compute yearlyInterestRate = Function numval(WS-IN-data(6))

     * Invoke the rule
          call 'HBRRULE' using HBRA-CONN-AREA

          EXEC CICS SUSPEND END-EXEC

     * Display rule responses, or error code, as appropriate
          if HBRA-CONN-COMPLETION-CODE = HBR-CC-OK then
              display 'HBR CALL Sucessful'

     * Disconnect
          call 'HBRDISC' using HBRA-CONN-AREA

          IF HBRA-CONN-COMPLETION-CODE NOT EQUAL HBR-CC-OK THEN
              perform onFailedCall
          END-IF

          perform prtDemoText

          EXEC CICS RETURN END-EXEC
          GOBACK.
```

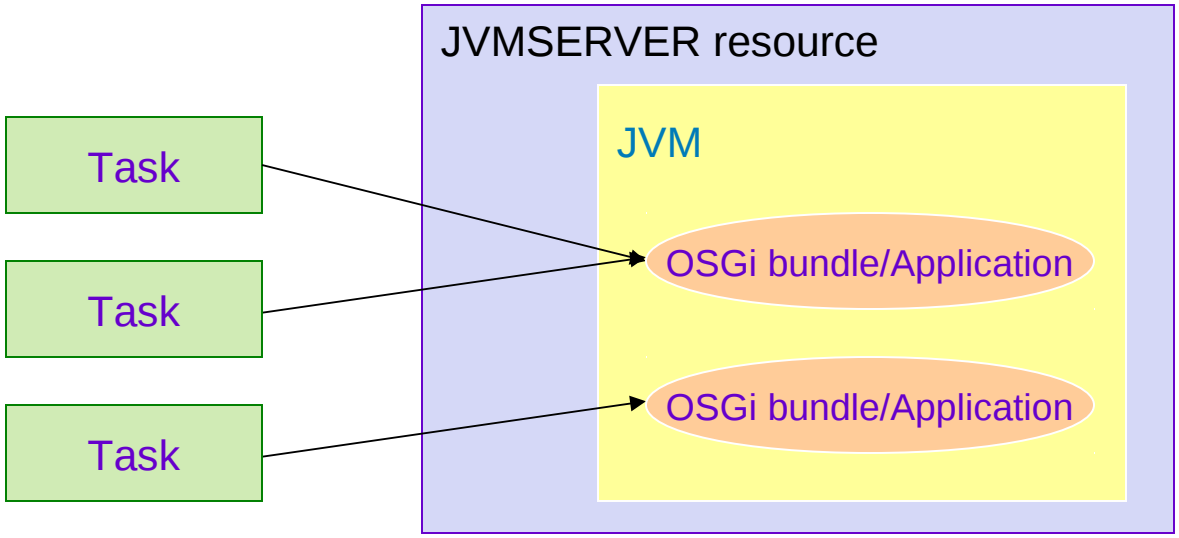
Rule invocation options for CICS



zRule Execution Server for z/OS – Stand Alone

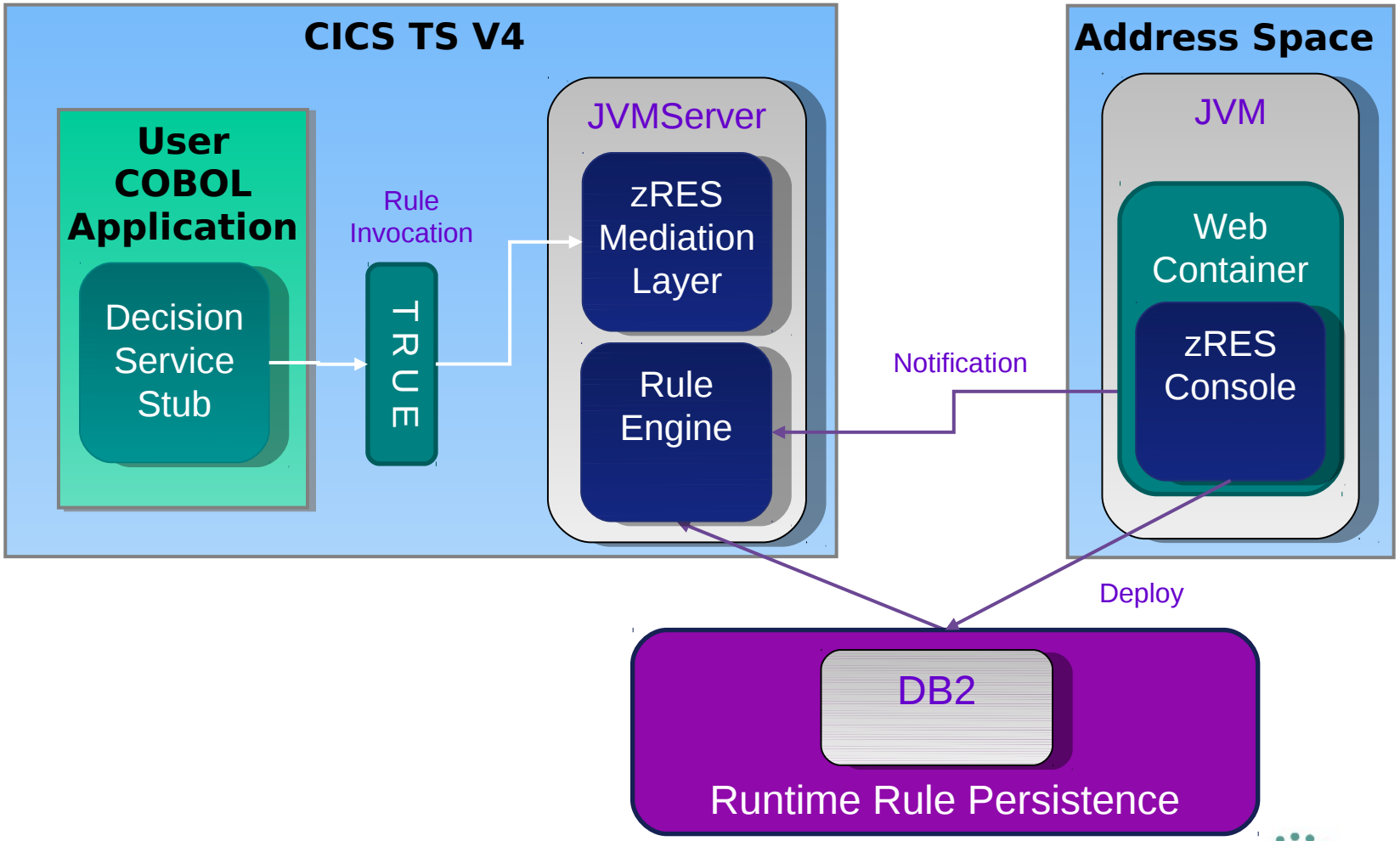


JVM Server Environment in CICS V4



- A CICS resource containing a long-running JVM
- The strategic direction of Java in CICS
  - Pooled Java will be discontinued in the future
- A JVM that serves multiple transactions concurrently
- A JVM in which applications/tasks run as OSGi bundles

zRule Execution Server for z/OS – CICS TS V4



Decision Server Options Summary

	zRule Execution Server deployed in WebSphere Application Server for z/OS	zRule Execution Server deployed as a Standalone environment	zRule Execution Server deployed in CICS TS v4.x JVM Server environment	COBOL Generation Rules
OTTB integration with COBOL applications	✓	✓	✓	✓
Full support for all rule authoring constructs	✓	✓	✓	
Business Event Execution Support	✓			
Hot deployment support for new decision versions	✓	✓	✓	
Integration with Decision Center business tooling	✓	✓	✓	✓
Testing and simulation support	✓	✓		
Decision Warehousing rule auditing support	✓	✓		
Easy sharing of rules with distributed deployments	✓	✓	✓	
Local execution support for CICS TS v4.x			✓	✓
Full HA & transactional support	✓		✓	

Operational Decision Management Capabilities – Events

Business Event Processing Defined

What is…

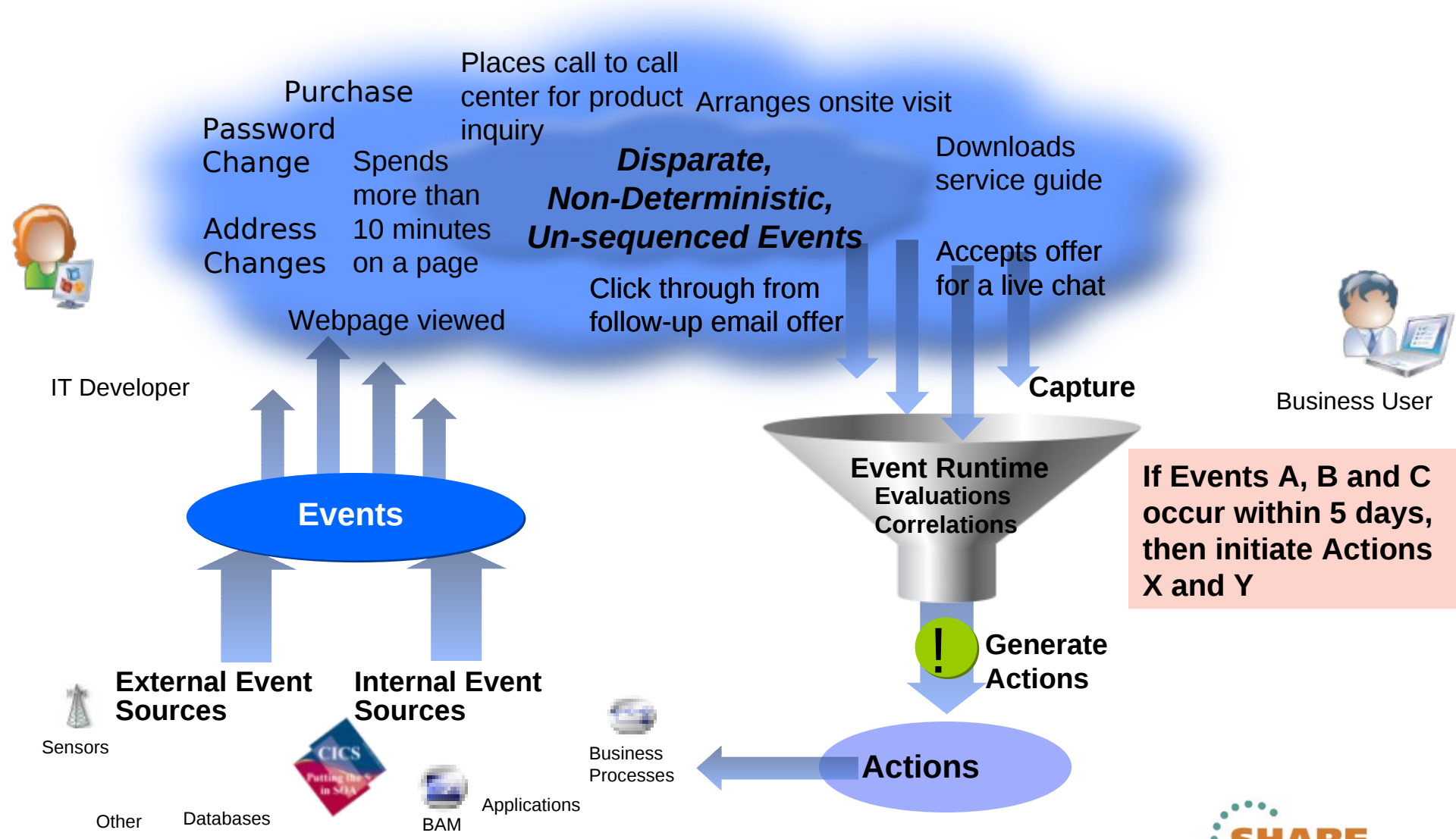
…a Business Event?

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

Business Event Processing



Business Events and System z

- 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

CICS and Business Events

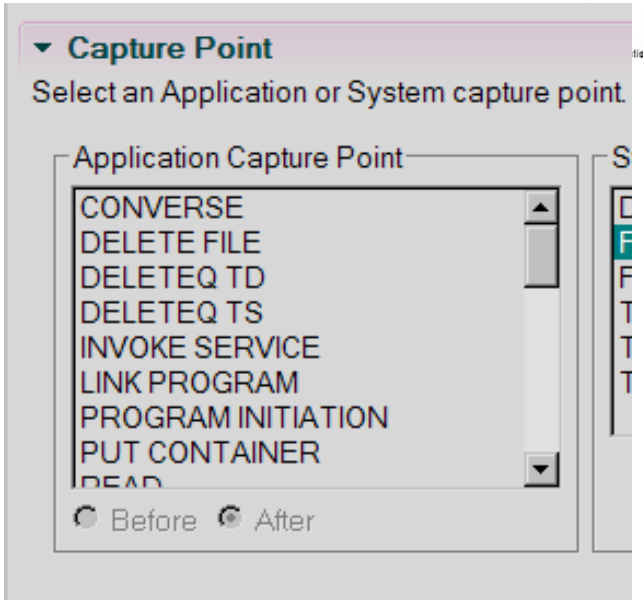
- Event processing addresses important aspects of Business Agility
  - Modern businesses must react quickly to circumstances
  - Decision makers need reliable, timely information

- Using an Event-based approach, it is possible to gain insight into the processing in CICS, and to introduce additional extensions to applications
  - In a dynamic, de-coupled fashion
  - Without the need to change the applications

- CICS allows you to emit events from existing applications
  - Supporting shifting corporate policies
  - Without having to modify the applications

- Driving a broad variety of event consumers
  - IBM Business Monitor, IBM Operational Decision Management, CICS application, application via WebSphere MQ, etc.

Where can CICS events be captured?



Event-enabled API call

Non-invasive

Program initialisation

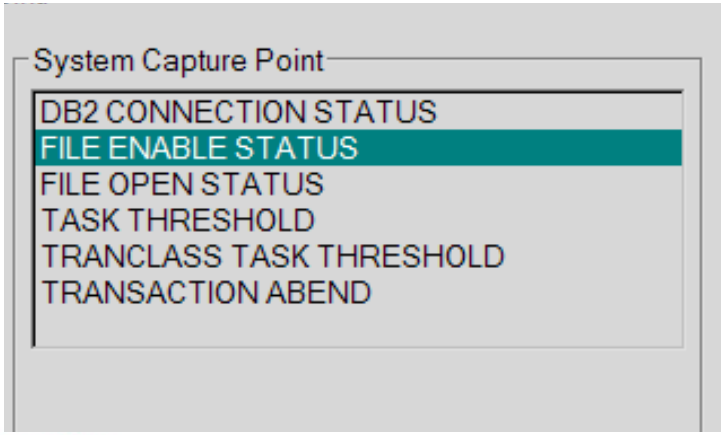
Non-invasive

Explicit EXEC CICS SIGNAL EVENT call

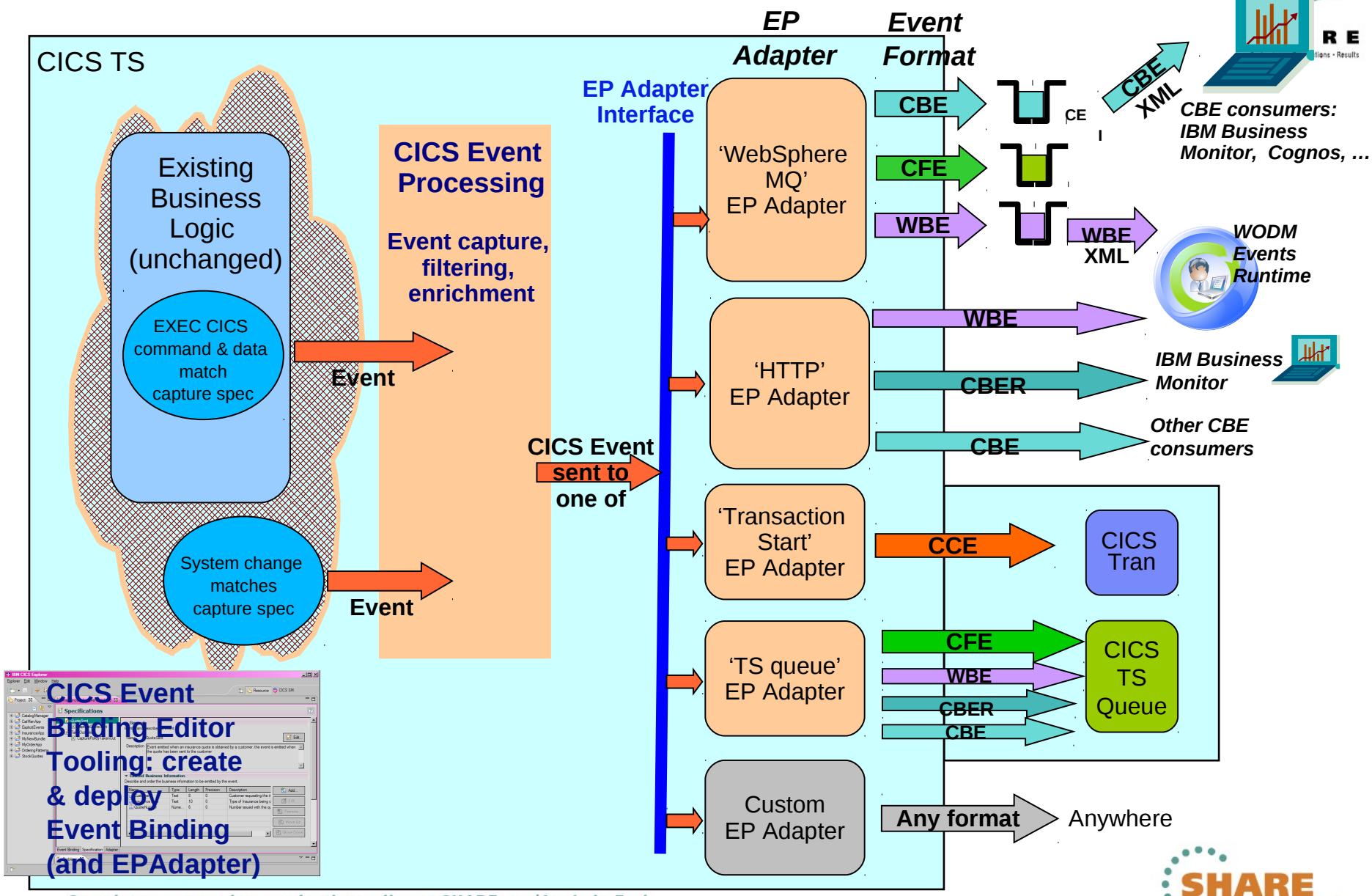
Simple program change required

System event points

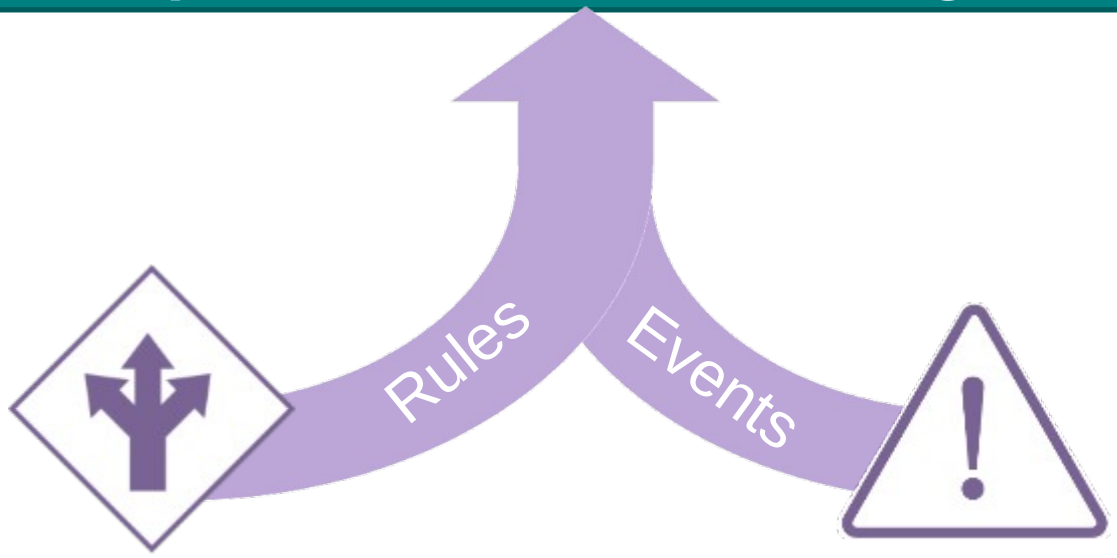
Non-invasive



How can events be emitted?



IBM Operational Decision Management



WebSphere ILOG BRMS

WebSphere Business Events

Operational Decision Management Vision

- **Combined business rules and events management**
  - Common tools/interfaces/repository
  - Aligned concept of operations
- **Full decision life cycle management**
  - Business – IT alignment and collaboration
  - Unified governance

Putting it together – Events and Rules

Detect → **Decide** → **Respond**

Multi-channel quote requests

CICS Application Algorithms

Call Center

Agency

Event Correlations

Event Pattern: Customer requests a series of quotes with increasing deductibles

Business Rules: Customer good prospect, find best promotion

Make a personalized offer

Event Pattern: 2 web quote requests and 1 direct contact in 3 days

Business Rules: Determine best product

Trigger agent call back to assist

Event Pattern: Same vehicle ID with different addresses on phone & Web request:

Business Rules: Is customer gaming the system?

Seek clarification

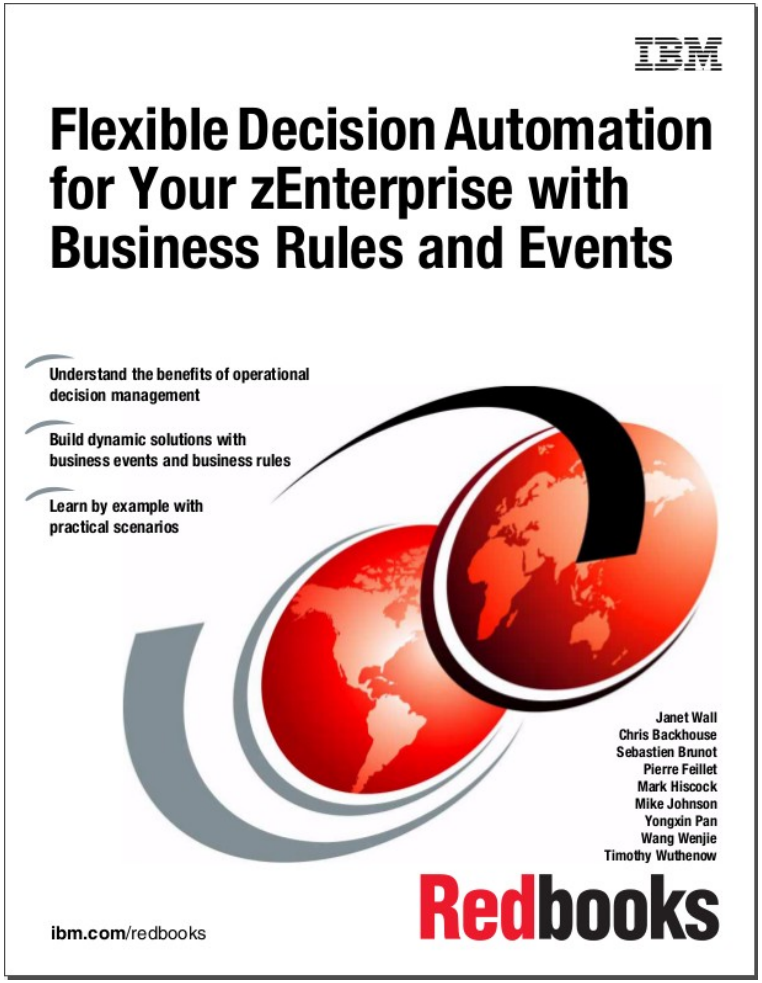
Events → **Rules**

IBM Operational Decision Management for z/OS

ODM for System z enables smart organizations to capitalize on modernization and innovation

- *Faster Time to Market:*
  New products or changes implemented in days vs. months
  - Ability to react to changes in a fast pace competitive marketplace
- *Lower cost of maintenance*
  - Leading to improvement operational efficiency and total cost of ownership
- *Better visibility and control*
  - Leading to improvement to better corporate governance
- *Ability to implement the best decisions for the best changes and for the best outcome*
  - Business users can see, understand and have the appropriate tools to support the needs of the organization by maximizing their IT investment
- *Ability to manage and document business decisions executed in System z applications*
  - Ability to generate native COBOL from rules within the WODM Rule Designer
  - Authoring rules for COBOL in business terminology
  - Ability to share business rules with Java and other COBOL applications

IBM ODM for z/OS Redbook



http://www.redbooks.ibm.com/abstracts/sg248014.html

I ♥ CICS

SHARE
Technology · Connections · Results

Thank You !

Any further questions?