Business executives demand technology tools and technology solutions that will maximize the organization’s agility and flexibility in order to respond quickly and effectively to growth opportunities, rising customer expectations and volatile market forces.

The combination of Business Event Processing and Business Rules Management, drives intelligent, responsive decision automation, that can dramatically increase business process agility.

Operational Decision management is a business technology/architecture that combines software and human intelligence to improve business decision making for a Smarter Planet.
What is Decision Management?

**BEP, BRMS, BAM and BI**

A discipline that combines LOB and IT expertise to **automate and enhance operational decisions**, aligned with **business strategy**.

- Operational business decisions are **externalized**, **automated**, and aligned with business goals using
  - BRMS and BEP
  - Predictive Analytics, Optimization & other technologies

- Automated decisions are **improved** by
  - Actively monitoring to verify compliance and success
  - Systematically improving decision drivers against goals
  - Actively managing as goals and business conditions evolve
Beta Installation; lessons learned

- Hybrid solution
  - Fit for purpose
  - Diversity of technical skills

- Implement solution using two tracks
  - Infrastructure - installation, configuration, connectivity and customization
  - Rules - modeling, writing, testing, governance and integration

- Architect solution to support the enterprise
  - Service for reuse
  - Simple to industrial strength
  - Modernize to exploit

- Idioms and proverbs
  - Walk before you run
  - Look before you leap
  - Plan before you act
WebSphere Operational Decision Management

Agenda

1. **Solution Overview**

2. **Rules Authoring**

3. **Rule Execution Options**

4. **Rule Management**

5. **Business Events**

System z
Business Decisions Are Critical to Success

The 2011 IBM CIO Study interviewed more than 3000 CIOs worldwide.

72% of CIOs with mandates to expand cross-enterprise growth are leading the charge to “drive better real-time decisions.”

75% of CIOs with mandates to transform the business are looking to “drive better real-time decisions.”

Why?
- Decisions are at the center of managing risk and improving profitability
- Decisions are essential to ensuring compliance with internal policies and external requirements
Let's create a special promotion for our best customers.

We need to add an eligibility check to meet the requirements of the new regulation.

Can we automate approvals for this type of request?

Underwriting
Eligibility
Rating
Risk
Billing
Assessment
Commission Payments
Benefit calculation

Order Validation
Product Configuration

Up-sell/Cross-sell offer
Claims Processing
Compliance
Fraud assessment
Accounting
What is Decision Management?

Decision Management is a business discipline that enables organizations to automate, optimize and govern repeatable business decisions.

- Operational Decision Management
  - Policy
  - Regulation
  - Best Practices
  - Know-how

- Analytical Decision Management
  - Risk
  - Clustering
  - Segmentation
  - Propensity

- Business Processes, Applications & Solutions
- Decision Services
- Business Rules & Events
- Predictive Analytics & Optimization
- Scenario Analysis & Simulation
- Internal & External Data
Two Key Entry Points to Decision Management

Operational Decision Management

Focuses on the automation and governance of frequently occurring, repeatable decisions that control critical business systems

Enabled by:
- Business Rule Management with Business Event Processing

Closely integrated with:
- Analytical Decision Management
- Business Process Management

Analytical Decision Management

Focuses on the development and deployment of decision services bringing intelligence and predictive insight into repeatable decisions while maximizing outcomes

Enabled by:
- Predictive Analytics with Optimization

Closely integrated with:
- Operational Decision Management
- Business Intelligence
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Closely integrated with:
- Operational Decision Management
- Business Intelligence
WebSphere Operational Decision Management 7.5

- 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
- Advanced configuration management
What is a Business Rule?

Business Rule Examples

If the Passenger is a gold frequent traveler and the flight distance is more than 40000 miles and the flight destination is in Europe or Asia Then
Add 10.000 points to the fidelity card of the Passenger

If the Vehicle is not an SUV and all the following conditions are true
• the vehicle is equipped with dual passenger airbag
• the driver has a good driver certificate
• the driver age is between 30 and 50
• the number of accident the driver was responsible for is 0
then
Apply a 5% discount on the premium coverage price

Business Contexts

Passenger (age, address, gender, frequent traveler level, company)
Vehicle (VIN, Manufacturer, Data, Type, Brand)
Order (Amount, items) Promotion (Code, amount, type, article)
Flight (FID, Airline, Depart, Destination, Distance, Date)
Plant (Location; production, Profitability)
What is a Business Event?

Event Pattern Examples

If the low temperature has been detected more than 3 times in the last 5 minutes and the number of occurrences the outside air temperature has increased in the past 5 minutes is zero then
Raise a severity alarm
Notify the maintenance team
Reduce activity by 15%

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

Event Triggers

RFID badge detected at the room entrance
Customer withdraw in an ATM
Debts threshold exceeded
Application rejected
Incoming call at the call center
Application form submitted
Low temperature detected
Imagine an auto insurance company has 2 basic requirements for a new project:

1. Provide more detailed coverage pricing, in real-time, and to make it dependent on a wide-array of business data.

2. Follow-up on potential customers who have declined a quote from any channel (web, call center, office) a certain number of times, and are not yet customers.
Different Scenarios Have Different Requirements

1. Provide more detailed coverage pricing, in real-time, and to make it dependent on a wide-array of business data.
   - Adjust logic within an application
   - Return a fixed-set of information
   - Must be easy-to-use but have sophisticated governance

2. Follow-up on potential customers who have declined a quote from any channel (web, call center, office) a certain number of times, and are not yet customers.
   - Adjust logic across multiple applications
   - Decision criteria is time-based
   - Dependency on occurrence, and absence, of events
Different Requirements, Different Types of Decisions

1. Provide more detailed coverage pricing, in real-time, and to make it dependent on a wide-array of business data.
   - Adjust logic within an application
   - Return a fixed-set of information
   - Must be easy-to-use but have sophisticated governance

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   - Adjust logic across multiple applications
   - Decision criteria is time-based
   - Dependency on occurrence, and absence, of events

Business Rules

Event Rules
What a Rule is! What an Event is!

**Rule Example:**

```
if
  the driver has completed drivers ed course
  and the number of accidents the driver has been involved is 0
then
  add a 2% discount to 'Auto Quote Response', reason: "Good Driver Discount";
```

<table>
<thead>
<tr>
<th>Vehicle Value</th>
<th>Lower</th>
<th>Upper</th>
<th>Deductible</th>
<th>Base Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$0</td>
<td>$4,000</td>
<td>$250</td>
<td>$36</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>$500</td>
<td>$33</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>$1,000</td>
<td>$23</td>
</tr>
<tr>
<td>4</td>
<td>$4,000</td>
<td>$10,000</td>
<td>$250</td>
<td>$39</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>$500</td>
<td>$29</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>$1,000</td>
<td>$27</td>
</tr>
<tr>
<td>7</td>
<td>$10,000</td>
<td>$30,000</td>
<td>$220</td>
<td>$47</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td>$500</td>
<td>$41</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>$1,000</td>
<td>$32</td>
</tr>
<tr>
<td>10</td>
<td>$10,000</td>
<td>$30,000</td>
<td>$250</td>
<td>$32</td>
</tr>
<tr>
<td>11</td>
<td>$30,000</td>
<td>$60,000</td>
<td>$500</td>
<td>$49</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>$1,000</td>
<td>$40</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td>$250</td>
<td>$62</td>
</tr>
<tr>
<td>14</td>
<td>$30,000</td>
<td>$100,000</td>
<td>$500</td>
<td>$59</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td>$1,000</td>
<td>$48</td>
</tr>
</tbody>
</table>

**Event Rule Example:**

```
if
  past occurrences of web quote rejected within 1 minute is at least 3
  and
  past occurrences of customer accepts web quote within 1 minute is 0
then
  follow up quote request;
  refer customer to call center;
```
How Decisions Can Be Different

Operational Decision

Pricing Rules

Request

Get Driver Information → Get Vehicle Information → Select Coverage Options → Display Pricing → Accept or Decline Quote

Event Rules

Reply

Event

Action

Call Center

Web Site Logic Flow
Ownership is Also Important

Operational Decision Management

Rule Author

Web Site Administrator

Call Center

Call Center Agent

Get Driver Information → Get Vehicle Information → Select Coverage Options → Display Pricing → Accept or Decline Quote

Web Site Logic Flow
IBM Solutions for Decision Management

IBM SPSS Analytic Decision Management

- SPSS Decision Management
- Optimization Decision Manager Enterprise
- SPSS Modeler
- SPSS Collaboration & Deployment Services
- Models

IBM WebSphere Operational Decision Management

- WebSphere Decision Center
- Rule Designer
- Event Designer
- WebSphere Decision Server
- Rules
- Events

Map PMML models to rules
Design and run time integration
Web services integration
Parallel Product Structure for BPM & DM

IBM Business Process Manager
- Process Center
- Process Server

WebSphere Operational Decision Management
- Decision Center
- Decision Server

Unify management of all BPM components
- IBM Blueworks Live
- IBM Case Manager

Unify management of business rules & events
- IBM Business Monitor
- WS Business Modeler
- IBM BPM Industry Packs
- IBM SPSS DM and C&DS

Working together to deliver effective solutions for business operation improvement
WebSphere Operational Decision Management - components

WebSphere Operational Decision Management

WebSphere Decision Center

- Decision Artifacts
- Versioning
- Access and Control

Repository

WebSphere Decision Server

- Rule Execution
- Event Execution
- Decision Monitoring
- Connectors

Management

- Decision Center Console
- Rule Solutions for Office
- Decision Center for Business Space

Design

- Rule Designer
- Event Designer

Visibility & Governance

Define
Update
Measure
Deploy
Run-time support begins with the Decision Center

Leverage a wide range of platforms in order to meet the varying needs of enterprise architectures

Decision Center

(Windows, AIX, Linux, zOS)

Repository

Decision Server

Windows  AIX  Linux  z/OS

Multiple z/OS deployment - runtime options planned
Decision Governance: Lifecycle Rules Management

Multiple Release Management

Capabilities:

- Enable business users to make changes to a deployed rule application without interfering with work they are doing on an upcoming release
- Merge and diff between releases

Availability through:

- Decision Center Console
- Decision Center for Business Space

Project X: Ongoing upcoming release work

- Release 1.0
- Release 2.0
- Release 2.1
Decision Center: Unified Governance

Business User Empowerment for Rule and Event-based Decision Logic

- **One business language** for capturing decisions including time based reasoning
- **Same management** and authoring environments for business users
- Team collaboration through **multi-user access** for business users and synchronization between IT and business user environments
- **Project governance**, including role-based security, history maintenance and custom metadata
Integration with Microsoft Office

- Extends rule maintenance across the organization
- "Ruledocs" have full understanding of object model and rule syntax
- Integrated with Rule Team Server
Web Commerce Use Cases

Response to Product Inquiry Abandonment
A new customer application might be started on the web and abandoned, while the customer may follow-up by phone, in a branch location, or not at all. BEP can recognize the pattern of activities and coordinate pro-active customer support or sales contact, improving customer experience and taking advantage of new customer opportunities.

Product Up-Sell and Cross-Sell: Customer account activity, including a pattern of new product inquiries, offer key insights into opportunities for development of profitable customer relationships.
Customer Relationship Use Cases

**Customer Retention and Responsiveness:** Changes in customer patterns of account activity (e.g. fewer or smaller orders) can help to identify customers that are potentially at risk of moving their accounts to a competitor. Immediately engaging with these customers can improve customer retention and ensure positive customer relationships.

**Distressed Financial Situation:** Late payments and credit rating reduction could identify a financially distressed customer situation. Identify this situation could be used to change credit and purchasing provisions.

Gain Customer Insight

Mitigate Risk
Decision Center/Server for z/OS: Business Rules Options

Rule Development and Management

- Development
- Rule Designer
- Decision Center

Rule Deployment

- System z
- COBOL code Generation
- zRule Execution Server for zOS
- Rule Execution Server on WAS for zOS

Application Developer, Architect

Business Analyst, Business Manager
Rule Invocation Options for System z Applications

- **z/OS Batch**
  - COBOL Application
  - Generated COBOL

- **z/OS Batch**
  - COBOL Application
  - zRES Stub
  - WOLA Stub

- **CICS**
  - COBOL Application
  - zRES Stub
  - WOLA Stub
  - JVMServer

- **IMS**
  - COBOL Application
  - WOLA Stub

- **zRule Execution Server Stand-alone**
- **WebSphere Application Server for z/OS**

- **COBOL <-> Java Marshaller**

- **Rule Execution Server for WAS for z/OS**
Insurance use case: Customer acquisition

ASIS: Today’s Business Decision Support

WebSphere Operational Decision Management

- Has Auto Insurance: Propose home coverage
- Existing Customer: Offer 5% discount
- Add Zipcode: Determine home premium

Business Rules

Versioning & Governance of Decision Logic

Decide

Act

WebSphere ILOG JRules

Internet
Call Center
Agency
TOBE: Richer, more Powerful Decisioning Capabilities

Business Rules and Events

Detect
Internet
Call Center
Agency

Decide

WebSphere Operational Decision Management

Versioning & Governance of Decision Logic

Act

Business Decisions

Has Auto Insurance:
Propose home coverage

Existing Customer:
Offer 5% discount

Add Zipcode:
Determine home premium

2 web quote requests & 1 direct contact in 3 days:
Trigger agent call back to assist

Same VIN with different addresses on call-in & web request:
Trigger inquiry

Pattern Identification
Thank You
WebSphere Operational Decision Management

Agenda

1. Solution Overview
2. Rules Authoring
3. Rule Execution Options
4. Rule Management
5. Business Events

System z
BRMS is the IBM technology for creating, maintaining and implementing decision service.

Relevant when…

• IT Executives are **under pressure** to respond more quickly to their internal customers
• LOB wants to **respond more quickly** to changes in the external environment
• **Automating** or standardizing business decisions across the enterprise or LOB
• Business users need to be **more involved** as part of the change management process
• Transforming or **modernizing** legacy applications
Traditional approach for managing change

Where Business Rules typically exist

- Applications
- Documents
- Databases
- 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

- Reduced organizational agility
- Reduced employee productivity
- Increased load on IT
Easy, safe, reliable change with BRMS

Where Business Rules typically exist

Applications
Documents
Databases
People
Processes

Business Rule Management System

User

Rules are Defined, Analyzed & Maintained

Rule Repository

Rules are Stored & Shared

Execution Server

Rules are Deployed, Executed & Monitored

Code

```c
#definitions
set item to an item in the items of 'list of products';
if the country of origin SE of the assembly of the product information of item is "Imported" then
add "Msg02-add a 2.5% restocking fee for returns" to the decision messages of item;
```
Rule Designer (RD)

- Eclipse-based Development Environment

- Developers
- Business Analysts
Designer: Low Cost of Ownership for Developers

- **Ease to learn**
  - Familiar environment
  - Project map for new users
  - Follows Eclipse style and design guidelines

- **Easy to use**
  - Auto-completion in rule text editor
  - Re-factoring
  - Wizard-driven Java, XML, WSDL data integration

- **Productivity**
  - Integrated Rules and Java debugging
Designer: Strong Support for Business Analysts

- Business rule modeling support
  - Business Object Model
  - Business vocabulary
  - Templates creation
    - If..then..else, Decision tables and decision trees
  - RuleFlow

- Support for large organizations
  - Modular Business Object Model
  - Modular Project organization
  - Semantic queries
Extended rule authoring experience

- Direct access to MS editing
- Ruleflow edition thru Word
- Automatic synchronization
- Automatic lock of edited elements
### Advanced Decision Tables

<table>
<thead>
<tr>
<th>Grade</th>
<th>Amount of loan</th>
<th>Insurance required</th>
<th>Insurance rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>&lt; 100,000</td>
<td></td>
<td>false</td>
</tr>
<tr>
<td>1</td>
<td>100,000</td>
<td>300,000</td>
<td>true</td>
</tr>
<tr>
<td>2</td>
<td>300,000</td>
<td>600,000</td>
<td>true</td>
</tr>
<tr>
<td>3</td>
<td>≥ 600,000</td>
<td></td>
<td>true</td>
</tr>
<tr>
<td>4</td>
<td>&lt; 100,000</td>
<td></td>
<td>false</td>
</tr>
<tr>
<td>5</td>
<td>100,000</td>
<td>300,0001</td>
<td>true</td>
</tr>
<tr>
<td>6</td>
<td>300,000</td>
<td>600,000</td>
<td>true</td>
</tr>
<tr>
<td>7</td>
<td>≥ 600,000</td>
<td></td>
<td>true</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>&lt; 100,000</td>
<td></td>
<td>true</td>
</tr>
<tr>
<td>10</td>
<td>100,000</td>
<td>300,000</td>
<td>true</td>
</tr>
<tr>
<td>11</td>
<td>300,000</td>
<td>600,000</td>
<td>true</td>
</tr>
<tr>
<td>12</td>
<td>≥ 600,000</td>
<td></td>
<td>true</td>
</tr>
<tr>
<td></td>
<td>Otherwise</td>
<td></td>
<td>true</td>
</tr>
</tbody>
</table>

**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;
Decision Trees

- **Values**
- **Actions**
- **Condition**

**Built-in Gap/Overlap checking**

**Automatic Rule generation**

---

**Rule 5**
- set the corporate score in 'the loan report' to 50

**Rule 4**
- set the corporate score in 'the loan report' to 40

**Rule 3**
- set insurance required in 'the loan report' to true

**Rule 2**
- set the corporate score in 'the loan report' to 30

**Rule 1**
- set the approved of 'the loan report' to false

**Rule 0**
- set the corporate score in 'the loan report' to 20

**if**
- all of the following conditions are true:
  - (the loan grade in 'the loan report' is "B")
  - (the Loan to Value of 'the loan' is more than 0.5)

**then**
- set the corporate score in '<a report>' to 20
One Business Language

Supports a wide range of business decisions

Easy to **Understand**

Same language for **Business and IT people**

Triggering real business **Actions**
### Business Rule Language

**If** the type of **claim** is **Veterinary cost**

**then**

Processing type for **claim** is: **Automate**

**else**

Processing type for **claim** is: **Manual**

- Customizable vocabulary specific to your organization, industry, application (etc.)
- Supports language localization
- Integrates with external data sources (e.g. list of countries)
- Drop down lists for customized domain data
- Templates facilitate new rule creation

**If** the credit score of the borrower is less than **200**

**then**

add "Credit score below 200" to the messages of the loan

**reject** the loan;

- Supports all kind of rules:
  - Basic to cross validations
  - Derivations
  - Inference based rules
  - Calculations rules
  - Product offering
  - Underwriting
  - Scoring
  - Rating...
Data Model - Verbalization

CustomerInfo
- name
- birthday
- getNumAccidents()
- isHighRiskDriver()
- ...

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

“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

“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 Authoring: Visual Decisioning Flow

- Graphical editor to model and control rule execution sequence (ruleflow)
Rule Authoring – XOM options

- 3 options for the underlying execution model
  - Java object graph
  - XML schema
  - COBOL copybook

- Java
  - Standard approach
    - Engine always uses Java regardless of choice
  - Best performance

- XML Schema
  - Java dynamically created at runtime
Rule Authoring – COBOL Copybook XOM

- Support Enterprise COBOL 3.4, 4.1 & 4.2
- A 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
Starting with a COBOL copy book

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

Benefits
- Modernize business policies in BRMS
- Rules can be invoked ‘naturally’ from existing application
- Business policy/rule lifecycle detached from application lifecycle
# COBOL data type mapping summary

<table>
<thead>
<tr>
<th>COBOL Model Type</th>
<th>COBOL usage</th>
<th>Picture string</th>
<th>Example</th>
<th>Java type</th>
</tr>
</thead>
<tbody>
<tr>
<td>COBOL AlphaNumericType</td>
<td>DISPLAY</td>
<td>X and combination of A, X, and 9</td>
<td>PIC X(12).</td>
<td>String</td>
</tr>
<tr>
<td>COBOL NumericType</td>
<td>DISPLAY</td>
<td>S9(1) through S9(4)</td>
<td>S9(1) through 9(4)</td>
<td>short</td>
</tr>
<tr>
<td></td>
<td>COMP-3</td>
<td>S9(5) through S9(9)</td>
<td>S9(5) through 9(9)</td>
<td>int</td>
</tr>
<tr>
<td></td>
<td>PACKED-DECIMAL</td>
<td></td>
<td>S9(10) through 9(18)</td>
<td>long</td>
</tr>
<tr>
<td></td>
<td>BINARY</td>
<td>As above with decimal (V or P)</td>
<td></td>
<td>BigDecimal</td>
</tr>
<tr>
<td></td>
<td>COMP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMP-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COBOL Internal Float Type</td>
<td>COMP-1</td>
<td></td>
<td></td>
<td>float</td>
</tr>
<tr>
<td></td>
<td>COMP-2</td>
<td></td>
<td></td>
<td>double</td>
</tr>
</tbody>
</table>

- Support for special type with marshal converter
  - Supplied date and boolean converters
  - Option to extend marshaling with custom converters
Starting with an existing Java Project

Scenario
- Existing Rule projects exist that are currently in use on distributed platforms
- Concurrent execution of rules required on System z

Benefits
- Consistent decision rules where ever executed
- Rules can be invoked ‘naturally’ from existing applications on all platforms
- Enables central rule management across System z and distributed execution
- Business policy/rule lifecycle detached from application lifecycle
Methods in BOMs – When to use

- **BOM methods should be used sparingly**
- Don’t try and integrate business logic with decision logic
  - Rules are not there to replace the application!
- **Best practices**
  - Use methods where it aids the verbalization for the business user
  - Use methods to simplify repeated, multi step actions
  - Use methods very sparingly to augment data supplied as ruleset parameters
    - Look up data in a VSAM file / DB2
    - Best practice is to pass in all data required for decision
  - Avoid using COBOL mapped methods wherever possible
    - Problems when later migrating to zRES execution
Thank You
WebSphere Operational Decision Management

Agenda

1. Solution Overview
2. Rules Authoring
3. Rule Execution Options
4. Rule Management
5. Business Events

System z
BRMS Artifact pipeline (basic architecture)

Authoring
- Rule Project
  - Vocabulary
- Business Object Model
- Business Rules

Deployment
- Business Rule Compiler
- Ant tasks

Execution
- RuleApp Archive
  - Ruleset Archive
  - eXecutable Rules
- eXecutable Model
- Rule Execution Server
- Rule Engine
Rule Engine

- Execution kernel
- Optimized for condition & test sharing
- Programming model
  - Passive component: runs only when invoked
  - Synchronous
  - Parameters & working memory
- In memory processing
  - No duplication of processed objects
  - No requirement on processed objects (Interface or contract)
- Object Model
  - Java - classes passed by the classloader
  - XSD
Java Rule Engine Implementation

- 100% Java
- One engine runs in one VM
- Deployment based on a ruleset archive
- Threading
  - Thread-safe
  - Execute in the current thread
  - No thread created in your back by the engine
- Byte code generated at parse & run time
Decision Service Deployment Artifacts

- Ruleset Archive
  - Contains
    - eXecutable Rules as text files
    - executable XSD
    - NOT Java eXecutable Object Model
      - Java XOM is passed by the calling app

- RuleApp archive
  - Kind of EAR for Business Rules
  - Aggregates one or several Ruleset archives
  - Versioning & path
  - Contains
    - Whole runnable business logic for execution
    - Metadata at RuleApp & Ruleset levels
Decision Warehouse

- Provides extension points to allow integration with existing analytics databases and 3rd-party business intelligence (BI) tools.
ASIS: WebSphere Business Rules for zOS

Rule Management and Development

Rule Studio (Eclipse)

Rule Team Server (RTS Web)

Decision Validation Services

RTS Rule Repository

Rule Execution Server zOS

Rules for COBOL

Application Developer, Architect

Business Analyst, Business Manager
TOBE: Decision Manager for z/OS – Rule Components

Rule Management and Development

- Rule Designer (Eclipse)
- COBOL Management
- Decision Center Console
- Rule Test and Simulation

Business Rules Execution for z/OS

- Rule Execution Server - z/OS
- NEW Rule Execution Srvr
- COBOL Generation Rules

Application Developer, Architect

Business Analyst, Business Manager
COBOL Generation Rules

- COBOL module generated to contain the implementation of the rules
- Considerations with this Approach
  - Fits in easily with COBOL application architecture
  - Better performance due to COBOL code and co-location of rule execution
  - No Hot deployment of rules - subject to code deployment process
  - No Rule Execution Server management capabilities
  - No simulation and testing capabilities
  - No Decision Warehousing functionality
  - Due to be deprecated in a future release
Rule Invocation Options for System z Applications

z/OS Batch
- COBOL Application
  - Generated COBOL

CICS
- COBOL Application
  - zRES Stub
  - WOLA Stub
  - zRule Execution Server
  - JVMServer

IMS
- COBOL Application

z/OS Batch
- COBOL Application
  - Generated COBOL

WebSphere Application Server for z/OS
- Rule Execution Server for WAS for z/OS
- COBOL <-> Java Marshaller

zRule Execution Server Stand-alone
Rule Execution Server for WAS on z/OS

- Port of distributed RES code
- Runtime support for COBOL data structures
- Best integration with existing COBOL applications through WOLA

- User COBOL Application
  - User Code: WOLA Stub

- Invocation

- WAS for z/OS
  - JVM
  - RES Mediation Layer
  - Rule Server
  - Console

- Notification

- WOLA

- User Coded EJB

- JVM

- DB2

- File System
  - zFS

- Runtime Rule Repository
Considerations with this Approach

- Full decision lifecycle and integration with WODM components
- Full scalability and HA capabilities through WAS container
- Local execution of Testing & Simulation of rules
- Support decisions on z and distributed
- % of execution cost zAAP offloadable

- Requires configuration of WOLA for best performance
  - Requires co-location of WAS with calling COBOL application
- Requires custom coding for WOLA stub / EJB endpoints
- Requires some Java knowledge
zRule Execution Server for z/OS – Stand alone (batch)
zRule Execution Server for z/OS – CICS TS 4.x

- Built on Java SE version of Rule
- Execution Server codebase
- Dual deployment options
  - Stand alone single server address space
  - Co-location in CICS JVMServer environment
- Support for 64 bit execution
New zRule Execution Server Environment

- Considerations with this approach
  - Full decision lifecycle and integration with key WODM components
  - Easy integration with existing z COBOL running in CICS & Batch
  - Initial tests show 96% of execution cost zAAP offloadable
  - Options for low impact, close location with COBOL applications
  - Scalability and full HA when deployed in CICS environment

- Single server, single JVM architecture as stand alone address space
  - Mitigated by option to have multiple instances per LPAR
- No Decision Warehouse support for rule auditing
- Requires some Java knowledge
zRES: Business Rule Execution

Runtime enablement

• Write the Decision Service invocation in COBOL

• COBOL code remains independent of the Business Rules lifecycle on a stable decision service signature

Decision Service Hot Deployment

• New decision version ‘instantly’ available

• From Rule Designer & Decision Center

• Versioned service made ready for execution from COBOL

• Let running executions complete

```cobol
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 +1.
   10 HBRA-CONN-RESERVED01  PIC S9(8) COMP VALUE +1.
   10 HBRA-CONN-INSTANCEN      PIC X(24).
   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-RA-PARMS OCCURS 32.
      15 HBRA-RA-PARAMETER-NAME PIC X(48).
      15 HBRA-RA-DATA-ADDRESS   USAGE POINTER.
      15 HBRA-RA-DATA-LENGTH    PIC 9(8) BINARY.
   10 HBRA-RESPONSE-AREA.
      15 HBRA-RESPONSE-MESSAGE  PIC X(256).
   10 HBRA-RESERVED.
      15 HBRA-RESERVED02       PIC X(128).
```

```cobol
PROCEDURE DIVISION.
   * Read input
     EXEC CICS READ FILE('SCENARIO')
       INTO('SELLER-Data')
       RIDFD('WS-SCENARIO-RID')
       RESP('WS-RESP')
     END-EXEC.
     IF 'WS-RESP' NOT = 'DFHRSP['normal']' THEN
        EXEC CICS RETURN END-EXEC.
     END-EXEC.
     PROCESS-_DATA.
     MOVE 'z/DB2'('Seller')['REPLACE TO
        HBRA-RA-RULEAPP-NAME
        MOVE LENGTH OF SELLER-Data TO HBRA-RA-DATA-LENGTH(1)
        MOVE "sellerData" TO HBRA-RA-PARAMETER-NAME(1)
        SET HBRA-RA-DATA-ADDRESS(1) TO address of SELLER-Data
     * Invoke the rule
        call 'HBRTRULE' using
        HBRA-CONN-AREA.
     * Check return code
        IF HBRA-CONN-COMPLETION-CODE = 'HBR-CC-OK' THEN
          DISPLAY 'Successful call'
```
## Rule Execution Options

<table>
<thead>
<tr>
<th>Feature</th>
<th>Rule Execution Server for WAS AND z/OS</th>
<th>zRule Execution Server for z/OS</th>
<th>COBOL generation Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTTB integration with COBOL applications</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Full support for all rule authoring constructs</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Hot deployment support for new decision versions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Integration with Decision Center business tooling</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Testing and simulation support</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Decision Warehousing rule authoring support</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easy sharing of rules with distributed deployments</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Co-exists in same COBOL environment as calling app</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Local execution support for CICS TS v4.x</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Full HA &amp; transaction support through WAS for z/OS</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary: Fit For Purpose Recommendations

- **Customer has WAS for z/OS co-located in LPAR**
  - RES for WAS on z/OS provides the best QoS

- **Calling application is hosted in CICS TS 4.x**
  - zRES hosted in CICS JVMServer provides the best balance between functionality and performance

- **CICS TS 3.x**
  - zRES stand alone environment
    - One zRES to a CICS region with shared rules database

- **Batch workload**
  - zRES stand alone environment
    - One zRES per batch job
  - COBOL code generation (if restrictions aren’t too limiting)
Thank You
WebSphere Operational Decision Management

Agenda

1. Solution Overview
2. Rules Authoring
3. Rule Execution Options
4. Rule Management
5. Business Events
What are the challenges using and managing rules?

- Business involvement and new business processes
  - How do I know when rules change?
  - Where can I find the rules?

- Data modeling
  - What is the business vocabulary?
  - Where do my business objects come from?

- Rule acquisition, modeling, and execution
  - What is the complexity of rules? How do I write new rules?
  - How do I validate the rules?

- Integration, performance, and scalability
  - Will I have good performance at full production scale?
  - How do I integrate business rules into my IT architecture?
Decision Center: A Complete Set Of Capabilities

- **Authoring**
  - Plain English, Decision Table, Decision Tree
  - Quick edit mode using MS Office
  - Templates

- **Managing**
  - Queries
  - Smart Views
  - Version Management
  - Baseline

- **Validating**
  - Syntactic Check
  - Semantic Check
  - Semantic Queries

- **Testing / Simulating**
  - Decision Validation Services

- **Auditing**
  - Version Management
  - Baseline
  - Query-based reporting

- **Deploying**
  - Query base Extraction
  - Rule service management

- **Administration and configuration**
  - Authorization policies
  - Rule Service
  - Display Options
Rule Management for Business Users

- Web-based collaborative environment
- Easy-to-Use, Easy-To-Learn
- Powerful Governance Capabilities

- Integrated rule testing and simulation (*Decision Validation Services*)
- Integration with Microsoft Office Word and Excel for guided, offline rule editing (*Rule Solutions for Office*)
Decision Center: Web-based Console for Rule Maintenance

- Access rule artifacts concurrently without conflict or delay
- Represent complex policies using rule overrides and hierarchies
- Take control of very large rulebases with Smart Views, easy search and reporting
- Get automatic notification of rule conflicts, redundancies
- See where rules are used across projects using queries
- Hot-deploy rule changes in minute
- Integrated with enterprise security facility, including single sign-on
Flexible Rule Deployment with Versioning

Decision Center Repository

- Rule Query
- Rule Analysis
- Rule Hierarchy
- Rule Versioning
- Rule Templates
- Rule Overriding
- Rule Lifecycle
- Rule Permission
- Rule Status
- Rule Reporting
- Rule Testing & Simulation
- Rule Governance

Business Rule Management
Comprehensive Governance

- 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 rules do I need to deploy?
- Which rules were in effect when this transaction occurred?

Rule Repository

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

Diagram:
- New
- Defined
- Validated
- Deployable
- Retired
- Inactive
- Admin
- Analyst
- PM

Comprehensive Governance
Security and Rule Promotion

- **Authentication, Authorisation & Security**
  - Fine-grained permission management
  - Decision Center utilizes J2EE-standard role based security
  - Utilise any role/permission service via API - Lightweight Directory Access Protocol (LDAP), relational database management system (RDBMS)

- **Rule life cycle**
  - Control rule validation & promotion to the live environment
  - Tailored to fit your process
Decision Center Deployment Options for z

- **Distributed**
  - Decision Center
  - Deploy
  - Repository
  - Rule Execution
  - z/OS

- **Distributed**
  - Decision Center
  - Deploy
  - Repository
  - Rule Execution
  - z/OS

- **Distributed**
  - Decision Center
  - Deploy
  - Repository
  - Rule Execution
  - z/OS
Empowering Business Users

- Decision table editing in MS Excel 2007
  - Automatic Spread sheet generation from DC
  - Additional DT menus in MS Excel
  - Automatic Gap / Overlap detection in the spreadsheet

- Action rules and RuleFlow editing in MS Word 2007
  - Automatic Document generation from RTS
  - Additional Rule menus in MS Word
  - Guided rule edition in Word
  - Vocabulary access
Publish Ruledocs from Decision Center

Decision Center

Rule Solutions for Office

Publish

Locale Selection

Rule Filter

Rule Organization
Editing a Decision Table in MS Excel

Decision Table Toolbar

Artifact Properties

Problem List

Gap / Overlap Highlight

Automatic rule translation

MS Office Excel
Editing an Action rule in MS Word

Guided editor with automatic completion

Rule Toolbar

RuleDoc Outline

Problem List

Business Vocabulary

MS Office Word
Editing a Rule Flow in MS Word

Rule Toolbar

Complete Graphical toolbar

Graphical editor

Business Vocabulary

Problem List

MS Office Word
Rule & Software Development Lifecycles

Software Development Lifecycle

- **Design**
- **Construct**
- **Test**
- **Deploy**

> 4-6 months

Manage and Monitor

- **Deploy**
- **Validate**
- **Author**
- **Analyze**

< 1 month

Rule Management Lifecycle

- **Change Request**
- **Deploy**
- **Validate**
- **Author**
- **Analyze**

Additional tasks:

- **Functional enhancements**
- **Platform upgrade**

Change Request
Flexible Rule Deployment with Versioning

Rule Maintenance

Ruleset A
- Rule 1
  - Version 1.0
  - Version 1.1
  - Version 2.0 (Current version)
- Rule 2
  - Version 1.0
  - Version 1.1

Ruleset B
- Rule 3
  - Version 1.0
  - Version 2.0 (Current version)
- Rule 4

Runtime

RuleApp AB
- Version 1.0
- Version 2.0

Ruleset A
- Version 1.0
- Version 2.0

Ruleset B
- Version 1.0
- Version 2.0

Baseline

Ruleset Snapshot
<Date>
Testing and Simulation

- The feature formally known as Decision Validation Services

- Functionality Overview
  - Out-of-the-box ruleset testing in Rule Team Server
  - Business impact simulation in Rule Team Server
  - Scenario configuration and customization in Rule Studio
  - Audit - Decision Warehouse in Rule Execution Server
Simulation Capabilities

- Test suite comparison
- Simulation suite comparison
- Champion and challenger scenario
- Allows what if analysis
## Scenario Definition

<table>
<thead>
<tr>
<th>Scenario name</th>
<th>Description</th>
<th>Yearly Income</th>
<th>Credit Score</th>
<th>Loan Name</th>
<th>Loan Amount</th>
<th>Approved</th>
<th>Yearly Interest Rate</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>Good credit; get rate with insurance</td>
<td>75000</td>
<td>600</td>
<td>John Simons</td>
<td>250000</td>
<td>FALSE</td>
<td>0.0625</td>
<td>120</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>Good credit; get higher rate</td>
<td>110000</td>
<td>700</td>
<td>Jane Howe</td>
<td>300000</td>
<td>FALSE</td>
<td>0.0575</td>
<td>120</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>Good credit; get rate</td>
<td>125000</td>
<td>750</td>
<td>Isaac Mintner</td>
<td>500000</td>
<td>FALSE</td>
<td>0.0625</td>
<td>120</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>Great credit; get lower rate</td>
<td>100000</td>
<td>800</td>
<td>Fernando Rodriguez</td>
<td>300000</td>
<td>FALSE</td>
<td>0.075</td>
<td>120</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>Good credit; loan too high</td>
<td>90000</td>
<td>700</td>
<td>Jaclyn Perkins</td>
<td>500000</td>
<td>FALSE</td>
<td>0.0775</td>
<td>120</td>
</tr>
</tbody>
</table>

### Input Data

- **Scenario name**
- **Description**
- **Yearly Income**
- **Credit Score**
- **Loan Name**
- **Loan Amount**
- **Approved**
- **Yearly Interest Rate**
- **Duration**

### Expected Results

<table>
<thead>
<tr>
<th>Scenario name</th>
<th>Approved</th>
<th>Yearly Repayment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>TRUE</td>
<td>1595.45</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>TRUE</td>
<td>1755.45</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>TRUE</td>
<td>3190.9</td>
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<tr>
<td>Scenario 4</td>
<td>TRUE</td>
<td>1755.45</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>FALSE</td>
<td>0</td>
</tr>
</tbody>
</table>

### Rulset Tests

<table>
<thead>
<tr>
<th>Scenario name</th>
<th>Number of ruleflow tasks</th>
<th>Number of rules fired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

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Test Suite in Rule Studio

- **Configuration editing**
- **Generated Scenario Document**
- **Detailed Scenario Reports**

**WebSphere Execution Report**

- **Summary**
  - **Execution**: Local
  - **Decimal Precision**: Use all digits
  - **Scenarios**: 19
  - **Tests**: 19
  - **Success Rate**: 73%
  - **Failures**: 4
  - **Errors**: 1

**Details for all Scenarios**

<table>
<thead>
<tr>
<th>Name</th>
<th>Success Rate</th>
<th>Tests</th>
<th>Failures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>100%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>100%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>100%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>100%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>100%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 6</td>
<td>100%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 7</td>
<td>100%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 8</td>
<td>0%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 9</td>
<td>0%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 10</td>
<td>100%</td>
<td>1</td>
<td>0</td>
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</table>
Test Suite in Decision Server

DS Test Suite Results

Detailed Scenario Reports
Test & Simulate Options for z

Distributed

Decision Center

SSP

WAS

Test

Simulate

Deploy

zRES

RES on WAS

WAS

z/OS

Deploy

Distributed

Decision Center

SSP

WAS

Test

Simulate

Deploy

zRES

RES on WAS

WAS

z/OS
COBOL Rule Deployment for Execution

- Rule Designer + COBOL Management
  - Workstation

- Decision Center + COBOL Management
  - Distributed or System z

- COBOL Application
- Business Rules Decision Service
  - CICS
  - zRES
  - Batch
  - RES on WAS for z/OS
  - Distributed or System z

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Agile Business Rule Development

- Capture the raw business rules for one decision service
- Harvest rule using short workshop sessions

- Form a set of coherent business rules applying industry standard benchmarks, including redundancy and overlap checks
- Isolate and factor out common rules
  - Develop domain object model
  - Design a scalable rule repository structure
  - Develop ruleflow, rules, decision tables...

- Test in Sandbox deployment environment
- Involve subject matter expert (SME) for feedback
- Use rule execution server staging platform

New Rule Set

Rule Discovery

Rule Analysis

Rule Authoring

Rule Validation

Rule Deployment

Complement

Improve

Enhance

Maintenance
WebSphere Operational Decision Management

Agenda

1. Solution Overview
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System z
Business Events are Everywhere

And Constantly Increasing
IBM Delivers Business Event Processing
Together: Additional Insight for Action

**Detect (BEP)**

- Event Sources
- Evaluations
- Correlations
- Actions

**Decide (BRMS)**

- Actions

**BEP** - Detects when events or patterns of events occur to notify people or systems to take action.

**BRMS** - Decides business outcome through execution of business rules against available data.
Business Event Processing

Events

External Event Sources
- Password Change
- Address Changes
- Webpage viewed

Internal Event Sources
- Purchase
- Places call to call center for product inquiry

Disparate, Non-Deterministic, Un-sequenced Events
- Spends more than 10 minutes on a page
- Click through from follow-up email offer

WBE Runtime Evaluations Correlations

Generate Actions

Actions

If Events A, B and C occur within 5 days, then initiate Actions X and Y
Define WBE Interactions (Logic)

Empowers IT and Business Analyst to define the logic

Interaction UI

Event

Conditions

Actions

- Drop-down, Point & Click Construction
- Business Vernacular
- Reusable Assets – Events, Filters, Actions

With Building Blocks Defined, Business Analyst Define the Logic
Assemble Event Flows

Drag & drop to visualize relationship between Interactions

With event logic defined, Business maps out the event flow
What’s in a pattern?

Use business events to identify event patterns
- Where the actionable event needs to be derived from physical events
- Where the action is not an immediate result of a single event
- Across multiple event types, different event sources
- Where the non-occurrence of an event is significant
- Where events or may not may not be ordered
- Where events are time related - must occur by a particular time, or within a particular time of one another
Patterns within the business

- **Event**: POS purchase
  - **Business Context**: 2nd purchase in a week and total purchases this year > $1000
  - **Action**: Offer loyalty program membership before customer leaves the store

- **Event**: No meter signal
  - **Business Context**: Third consecutive period without signal
  - **Action**: Trigger automated troubleshooting process

- **Event**: Position signal
  - **Business Context**: Calculated arrival > 30 min over SLA
  - **Action**: Phone customer to re-arrange delivery
Decision Server – Event Designer Development Tool
Event rule: Add To Campaign

Name: Add To Campaign

Context ID: the registration of the information request

Event: WebsiteQuoteRequest

Content:

if past occurrences of Send our flyer within 3 weeks is less than 5 and the registration of the information request ends with "Z"

then after 2 days : Send our flyer ;
Business Events Runtime Overview

- Events flow through XML/JMS connectors.
- RDBMS, File, HTTP, JMS, SMTP, FTP, SOAP, REST are supported.
- XSLT payload conversion is used.
- WebSphere Application Server acts as the Business Event runtime engine.
- Automated enrichment from external sources (DB, JavaScript, BRMS) is evaluated and detected.
- Actions flow through XML/JMS connectors.
- RDBMS, File, HTTP, JMS, SMTP, SOAP, FTP, REST are supported.
- XSLT payload conversion is used.
- RDBMS repository, history, and persisted data are managed.
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
Events from CICS Transaction Server

**Event Sources**

- CICS Business Logic
- CICS Events runtime support
- Events captured by CICS runtime

**Event Emission**

- Transform into an event format
  - WBE XML
- Add application context

**CICS TS V4.1**

**Event Processing**

**Business Action**

**CICS Events help you to**

- Observe business processes
- Recognize suspicious activity
- Drive new processing
CICS Event Binding Editor Tooling – Event Specification
Event Binding Editor Tooling – Capture Specification
IMS Business Event support for DM

- Enable WebSphere Business Events (WBE) to receive business event data from IMS applications for business events processing and execution.

- Empower business users to define and proactively manage business events with easy-to-use graphical tools.

- Provide the ability to detect, decide and dynamically react to both simple and complex relationships among people, events and information.

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**Generate and publish events**

**WebSphere Business Events**

**Perform operations on events**

**Event Consumer**

Generate, react to events:
- Alerts
- Trigger Workflow
- Automated actions
Location based marketing; smart meters

1) Person’s location is near 'your store'

2) Previous purchases > 0

3) Previous purchases within month = 0

Event: previous purchase

Event: person’s location

Offer for local 'your outlet'

Offer has been issued to customer x
Summary: Today’s Business Decision Support

WebSphere ILOG JRules

Versioning & Governance of Decision Logic

Decide

Act

Business Decisions

Has Auto Insurance:
Propose home coverage

Existing Customer:
Offer 5% discount

Add Zipcode:
Determine home premium

Insurance use case: Customer acquisition
Summary: Tomorrow's Business Decision Support

**Detect**
- Internet
- Call Center
- Agency

**Act**
- Has Auto Insurance: *Propose home coverage*
- Existing Customer: *Offer 5% discount*
- Add Zipcode: *Determine home premium*
- 2 web quote requests & 1 direct contact in 3 days: *Trigger agent call back to assist*
- Same VIN with different addresses on call-in & web request: *Trigger inquiry*

**WebSphere Operational Decision Manager**

**Versioning & Governance of Decision Logic**

**Insurance use case: Customer acquisition**
Thank You