Modernizing Mainframe Applications with Business Rules and Events

Chris Backhouse
cpbackhouse@uk.ibm.com

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Key challenges addressed by Decision Management

How can we ensure the right decision is being made at the right time?

Visibility

How can we rapidly respond to evolving market demands, competitive actions and regulatory requirements?

Collaboration

How can we ensure that business decisions are managed in a controlled environment?

Governance
Next Generation Business Rules

- Manage business policies at scale
- Operationalize enterprise intelligence
- Enable social collaboration to manage business change

Apply Operational Decision Management…

- To flexibly and reliably manage repeatable, automated decisions
- When decisions change frequently
- To increase straight-through-processing

- When decision services must be shared across systems
- To manage and govern large numbers of rules
- When real-time events require immediate actions

Introducing IBM Operational Decision Manager

IBM Operational Decision Manager

Your business decisions.
Made by your business experts. Delivered in real-time by technology.
## Rules vs Events

### 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 ATM withdraws from same account are done in the same day and the 2 ATM transactions are from 2 foreign countries

Then **Investigate possible fraud**

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### 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 customer is not primary card holder and age is less than 21 then Freeze account and notify primary card holder

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### Event Pattern Detection

#### CICS Events

<table>
<thead>
<tr>
<th>Time</th>
<th>Date</th>
<th>Event</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:00</td>
<td>08/09/2012</td>
<td>ATM 0123 WITHDRAW $ 400.00</td>
<td>CANNES</td>
<td></td>
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<tr>
<td>07:09</td>
<td>08/09/2012</td>
<td>WEB 2405 TRANSFER $1000.00</td>
<td>USA</td>
<td></td>
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<tr>
<td>08:09</td>
<td>08/09/2012</td>
<td>TEL 2948 DEPOSIT $ 269.00</td>
<td>USA</td>
<td></td>
</tr>
<tr>
<td>12:00</td>
<td>08/09/2012</td>
<td>ATM 0123 WITHDRAW $ 400.00</td>
<td>NICE</td>
<td></td>
</tr>
<tr>
<td>12:01</td>
<td>08/09/2012</td>
<td>WEB 9485 BILLPAY  $ 294.00</td>
<td>USA</td>
<td></td>
</tr>
<tr>
<td>13:04</td>
<td>08/09/2012</td>
<td>TEL 8204 WITHDRAW $2000.00</td>
<td>USA</td>
<td></td>
</tr>
<tr>
<td>14:10</td>
<td>08/09/2012</td>
<td>ATM 0123 WITHDRAW $ 500.00</td>
<td>MONACO</td>
<td></td>
</tr>
</tbody>
</table>

#### Business Event Pattern

If more than 2 ATM withdraws from same account are done in the same day and the 2 ATM transactions are from 2 foreign countries

Then **Investigate possible fraud**
**Event Driven Decision to Act**

- **Application**
- **Business Decision**

### 01 CUST
- **NAME** = Jane Doe
- **AGE** = 20
- **ACCOUNT** = 0123
- **PRIMARY** = NO

### Rule: ATM Fraud
If the customer is not primary card holder and age is less than 21 then Freeze account and notify primary card holder

**Business Rule**

If the **customer** is not **primary card holder**
and **age** is less than 21
Then
Freeze **account** and notify **primary card holder**

**True**

**Take Action!!**

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**Operational Decisions In Organisations**

- **Can get quite large**
- **Are scattered everywhere**
- **Mainframe**
- **Spreadsheets**
- **Databases**
- **Monolithic Applications**
- **Manual Processes**

**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 Manager Approach

Decision logic is defined, analyzed and maintained
Decision logic is stored and shared
Decision logic is deployed, executed and monitored

Why modernize with ODM on z/OS & why now?

Benefits of the ODM Approach

Modernization issues to resolve

1. Consolidation of COBOL application portfolio
2. Be able to react to changes requested by business in days, not months.
3. Sharing rules across platform
4. Running parallel

Cost savings
- More effective application development & maintenance with less business risk
- Consolidation/restructure of existing applications, saving hardware & resources
- Rule testing and simulation to ensure accuracy of changes prior to deployment which will minimize re-work

Change ratio of source inventory to development skills
- Forcing need for formal processes with an on-line electronic repository

Improved agility
- Decouple development and business decision change lifecycles
- New rules to enforce new business policies to multiple applications

Incremental rule modernization: applying technology and process to gain increased “decision making” agility
- Gradually pull out decisions from existing applications
- Incremental approach does not require a “big bang” change
- Manage business decisions in natural language
IBM Operational Decision Manager v8.0.1

Operational Decision Manager: Runtime Support

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

IBM Decision Center
(Windows, AIX, Linux (x, p & z), z/OS)

Repository

Windows  AIX  Linux  z/OS

IBM Decision Server

Multiple z/OS deployment options
ODM Brings the IT and Business World together

- 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

"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

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

Rule & Event Designer

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

Complete your sessions evaluation online at SHARE.org/SFEval
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>0</td>
<td>&lt; 100,000</td>
<td>false</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>100,000 - 300,000</td>
<td>true</td>
<td>0.001</td>
</tr>
<tr>
<td>2</td>
<td>300,000 - 600,000</td>
<td>true</td>
<td>0.003</td>
</tr>
<tr>
<td>3</td>
<td>≥ 600,000</td>
<td>true</td>
<td>0.005</td>
</tr>
<tr>
<td>8</td>
<td>&lt; 100,000</td>
<td>true</td>
<td>0.0035</td>
</tr>
<tr>
<td>9</td>
<td>100,000 - 300,000</td>
<td>true</td>
<td>0.006</td>
</tr>
<tr>
<td>10</td>
<td>300,000 - 600,000</td>
<td>true</td>
<td>0.0085</td>
</tr>
<tr>
<td>11</td>
<td>≥ 600,000</td>
<td>true</td>
<td>0.0145</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 ≥ 600000
then set insurance required in the loan report to true;
set the insurance rate in the loan report to 0.0145;

Rule Authoring: Visual Decision Flow

Function Task
Rule Task
Flow Conditions
Pre/Post Conditions
Decision Center: Console for Rule Maintenance

- Access decision 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 minutes
- Secure, integrated with enterprise security facility including single sign-on

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Decision Center Enterprise Console

Decision Center Business Console

Enterprise Console (current) functionality for **advanced business analysts and administrators** to fully develop, manage and govern decisions

Business Console (new) functionality for **business experts** to manage & govern lifecycle of decisions

Complete your sessions evaluation online at SHARE.org/SFEval
Track Versions through Timeline

Quickly browse through past versions

Multiple Release Management

Greater flexibility for deploying business decisions

- 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

Easily implement changes in distinct versions and better control how to merge them across different releases
Extended Rule Authoring Experience

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

RSO: Editing a Decision Table in MS Excel

Decision Table in MS Excel
Rule Flow in MS Word
Action rules in MS Word

Decision Table Toolbar
Artifact Properties
Problem List
Gap / Overlap Highlight
Automatic rule translation

Complete your sessions evaluation online at SHARE.org/SFEval
RSO: Editing an Action Rule in MS Word

Testing and Simulation

- The feature formally known as Decision Validation Services
- Functionality Overview
  - Out-of-the-box ruleset testing in Decision Center
  - Business impact simulation in Decision Center
  - Scenario configuration and customization in Rule Studio
  - Audit - Decision Warehouse in Rule Execution Server
Test Suite Results in Decision Center

Simulation Capabilities

- Test suite comparison
- Simulation suite comparison
- Champion and challenger scenario
- Allows what if analysis
The Lustratus BRMS Maturity Model

Rules Based Enterprise
- Full enterprise operations based on cross domain shared rules
- Rules based compliance management, audit & governance

Business Driven
- Business units create and manage rules
- Optionally, IT still controls deployment

Direct Business Interaction
- IT builds rules but business units can edit them as necessary

Development / Business Collaboration
- IT shares and discusses rules with business units

Development Efficiency
- IT Drive rule usage, to make maintenance quicker and easier


Rules on z/OS
Starting from a COBOL copybook

**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

**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 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

Decision Server Runtime Options

- Decisions can be invoked from existing CICS, batch and IMS 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 JVMServer environment
Decision Invocation Options on z/OS

- z/OS Batch
  - COBOL Application
  - DS Stub
- CICS
  - COBOL Application
  - DS Stub
  - zRule Execution Server
- IMS
  - COBOL Application
  - DS Stub

zRule Execution Server – Stand Alone

- User COBOL Application
- Decision Service Stub
- Native Control & Comms
- JVM
- Rule Server
- Notification
- Web Container
- RES Console
- DB2
- File System
  - zFS
- Runtime Rule Persistence

Complete your sessions evaluation online at SHARE.org/SFeval
zRES New Programming API

* Connect to Execution Region
call ‘HBRCONN’
using HBRA-CONN-AREA

* Populate Header with parameter data

* Connect to Execution Server
call ‘HBRRULE’
using HBRA-CONN-AREA

IF HBRA-CONN-COMPLETION-CODE = HBR-CC-OK
THEN
  . . .

* Disconnect from Execution Region
call ‘HBRDISC’
using HBRA-CONN-AREA

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zRES API Within a Program

Complete your sessions evaluation online at SHARE.org/SFEval
## Decision Server Options Summary

- Since v7.5
- New in v 8.0
- New in v 8.0.1

<table>
<thead>
<tr>
<th>Feature</th>
<th>v7.5</th>
<th>v8.0</th>
<th>v8.0.1</th>
</tr>
</thead>
<tbody>
<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 auditing 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>Local execution support for CICS TS v4.x</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Full HA &amp; transactional support</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

## Business Rule Execution

### System z
- CICS
- zRES
- z/OS Batch
- RES on WAS for z/OS

### Workstation
- Rule Designer + COBOL Management
- Decision Center + COBOL Management
- Decision Center Repository

### Deploy
- Architect, Application Developer
- Business Analyst, Business Manager
- System z
- Business Rules
- Service
- IMS
- COBOL Application
- COBOL Management
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 through Business events and rules

- **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 rules for the best changes / rules 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**
  - Authoring rules for COBOL applications in business terminology
  - Ability to share business rules with Java and other COBOL applications
  - Integrate seamlessly with existing COBOL applications

Where can I find out more this week?

- **12503: Modern environment for z/OS development**
  Today 4:30pm Golden Gate 4

- **12446: CICS and Java: How the JVM Server Transforms Java in CICS**
  Thursday 1:30 Grand Ballroom B

- **12177: Modernizing CICS - Hands on Lab**
  Thursday 4:30 Union Square 23-24
Where can I find out more?

  - IBM Operational Decision Manager for z/OS

- White papers & tech docs
  - WebSphere z/OS – The Value of Co-Location
  - Brief introduction to WebSphere Optimized Local Adapters
  - WebSphere for System z Prescriptive Use Cases (Oct. 28, 2011 Addendum)

- Redbooks
  - Flexible Decision Automation for Your zEnterprise with Business Rules and Events
  - Batch Modernization on z/OS
  - Patterns: Integrating WebSphere ILOG JRules with IBM Software

- IBM Operational Decision Management YouTube demo

- Top 10 Business Use Cases for Operational Decision Management

- Good Decision! Decision Management blog

System z Social Media Channels

- **Top Facebook pages related to System z:**
  - IBM System z
  - IBM Academic Initiative System z
  - IBM Master the Mainframe Contest
  - IBM Destination z
  - Millennial Mainframer
  - IBM Smarter Computing

- **Top LinkedIn groups related to System z:**
  - System z Advocates
  - SAP on System z
  - IBM Mainframe- Unofficial Group
  - IBM System z Events
  - Mainframe Experts Network
  - System z Linux
  - Enterprise Systems
  - Mainframe Security Gurus

- **Twitter profiles related to System z:**
  - IBM System z
  - IBM System z Events
  - IBM DB2 on System z
  - Millennial Mainframer
  - Destination z
  - IBM Smarter Computing

- **YouTube accounts related to System z:**
  - IBM System z
  - Destination z
  - IBM Smarter Computing