The value of IBM WebSphere ILOG BRMS

Understanding the value of IBM WebSphere ILOG Business Rule Management Systems (BRMS). BRMS can be used to implement and manage change in a safe and predictable way using Transparent Decision Services.

Andrew Macdonald
ILOG Technical Professional
macdonald@uk.ibm.com

© 2010 IBM Corporation
IBM ILOG Products

**Powerful Business Rule Management System**

Adapt and respond dynamically, automating process-based decisions with business rule management

**Efficient Supply Chain Management**

Optimize supply chains, design & planning tools for improved efficiency and productivity

**Advanced Suite of Optimization Tools**

Produce the best possible action plans & schedules, enhancing abilities to explore alternatives, understand trade-offs, and respond to changes in business operations

**Innovative Visualization Tools**

Transform insight into action, enhancing collaboration for smarter role-based business decisions
ILOG Optimisation Suite - CPS components

Tools & Engines for Powerful Decision Management Applications

- Develop interactive state-of-the-art decision management applications
  - Automate decisions
  - Enforce individual business goals
  - Relax constraints
  - Conduct what-if analysis
  - Provide explanations for trade-offs
  - Edit and override results
- Support project-based analytical services or application prototyping
  - Help optimisation experts explain and present their sophisticated models
- Embed models and engines into existing development and application frameworks

Tools for model and application development

Two optimisation technologies

From long term planning to short term scheduling
LogicTools Suite

LogicNet Plus XE
Determine optimal number, location, territories, and size of warehouses, plants, and lines.

Strategic Network Design

Production Planning and Scheduling

Plant PowerOps
Planning and detailed finite scheduling for process manufacturing plants

Multi-Site Production Sourcing

Transportation Analyst
Strategic routing for fleet sizing, multi-stops, backhauls, and more.

Supply Chain Applications

Transport Routing

Product Flow Optimizer
Determine best flow considering inventory, transportation, and mode

Inventory Optimization

Inventory Analyst: Strategic
Determine push/pull locations, buffer locations, postponement, and policy analysis

Inventory Analyst: Tactical
Maintain the correct inventory levels on an on-going basis

© 2010 IBM Corporation
Agenda

- BRMS Overview
- Value of BRMS approach to IT & Business
- Demonstration of managing change
- Positioning with WebSphere tools
- Building a Decision Service from Scratch
- Conclusions
ILOG JRules BRMS Overview
Traditional Approach for Managing Decision Change

**Where Business Rules Typically Exist**
- Applications
- Documents
- People
- Processes

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

Business rules are crucial to operational systems, and they change over time. The traditional (ad hoc) approach of dealing with rule changes leads to...

- Reduced organizational agility
- Reduced employee productivity
- Increased load on IT
The Smarter Approach – Easy, Safe, Reliable Change with BRMS

Where Business Rules Typically Exist

- Applications
- Documents
- People
- Processes

Business Rule Management System

- User Tools
- Rule Repository
- Rule Server

- Rules are Defined, Analyzed and Maintained
- Rules are Stored and Shared
- Rules are Deployed, Executed and Monitored

- Eliminate decision silos
- Make decision logic accessible to Business and IT
- Allow business users to manage rules
- Implement fine-grained, context-specific decision automation
- Reduce maintenance time/cost
BRMS – What are the steps?

1- Discover, extract and model rules and vocabulary

2- Deploy rulesets as Decision Services

3- Integrate with Orchestration layers/client applications as a business component

4- Monitor Service

5- Maintain Rules
ILOG JRules Solution Lifecycle

**Rule Studio**
- Eclipse-based Rule IDE
  - Rule design & development

**Rule Team Server**
- Web-based console for Rule Maintenance & Testing
  - Deploy rules

**Rule Repository**
- Rule maintenance & testing
  - Deploy rules

**Decision Validation Services**
- Offline Rule Maintenance

**Rule Solutions for Office**
- Web-based console for Rule Maintenance & Testing
  - Deploy rules

**Decision Warehouse**
- Audit trail of decisions

**Runtime environment**
- Rule Execution Server
  - Single node or cluster (J2SE & J2EE compliant)

© 2010 IBM Corporation
JRules in the IBM SOA Reference Architecture

Rule integration
Rule authoring, governance, testing and simulation

Rule Team Server for business users
Rule Solutions for Office for business users

Business Innovation & Optimization Services

Interaction Services
- Decision Service
- Personalization

Process Services
- Decision Service
- Process routing

Information Services
- Decision Service
- Data processing

Facilitates communication ESB between services

Partner Services
Business App Services
Access Services

Rule Execution Server

Complex decision automation

Development Services

IT Service Management

Infrastructure Services

© 2010 IBM Corporation
Drivers for implementing the logic in JRules

- When the logic is more easily managed externally
- When there are large numbers of rules
- When the rule logic is complex
- When the business/policy owners need to be able to view or change the logic
- When the logic changes frequently
- When multiple versions of the logic are required for different date/time/regional/etc. criteria
- When the policies must be expressed in business terms
- When you need high performance
- When the decision services are needed in a SOA
Business Rule Language

if
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

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

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;
### 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>false</td>
<td>0.001</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></td>
<td>≥ 600,000</td>
<td>true</td>
<td>0.0075</td>
</tr>
<tr>
<td>6</td>
<td>100,000</td>
<td>300,001</td>
<td>true</td>
</tr>
<tr>
<td>7</td>
<td>300,000</td>
<td>600,000</td>
<td>true</td>
</tr>
<tr>
<td>8</td>
<td>&lt; 100,000</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>
<tr>
<td>12</td>
<td>Otherwise</td>
<td>true</td>
<td>0.022</td>
</tr>
</tbody>
</table>

**Built-in Gap/Overlap Checking**

**Actions**

**Automatic Rule Generation**

**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**

- 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

**Actions**

- 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;

**Condition**

- Loan amount
- Grade
- Error(s) on partition: Partition have gap(s).

**Built-in Gap/Overlap checking**

**Automatic Rule generation**

© 2010 IBM Corporation
Rule Solutions For Office (RSO)

- Business user rule authoring and maintenance using Microsoft Office Word and Excel

- Line Of Business
- Subject Matter Expert
Rule Authoring: Visual Decisioning Flow

- Graphical editor to model and control rule execution sequence (ruleflow)
Rule Management Services - Control

Business views of rules flexible rule organization & smart views

Manage custom rule information with rule properties

Control rule lifecycle with a configurable rule life cycle
Rule Management Services - Visibility

**Rule queries** to find, report, update and deploy rules with

Find all business rules **such that** the status of each business rule is deployable and the expiration date of each business rule is before • 1/1/2006 •

Do set the status of each business rule to rejected •

Track & manage changes with rule history and versioning

**Decision Warehouse**
Runtime rule execution history

**Rule reports**

**Table of Contents**
- Parameters
- Variable Sets
- Rule Artifacts
  - Project Version
    - DB Print
      - A. Invoice/Quote
    - X. Detail
    - B. Payment
  - DB Printing/Coverage Pricing/Price Premium/Policies
  - C. Costing Price Table
  - DB Pricing/Coverage Pricing/Price Premium/Software
  - D. Software Price Table
  - DB Pricing/Coverage Pricing/Price Premium/Comprehensive
  - E. Comprehensive Price Table
Rule Modelling – Business Analysts

Member Verbalization
- Remove the verbalization.
- Edit the subject used in phrases.

Navigation: "the number of accidents a driver has been involved"
Template: {number of accidents}, {this} has been involved

Domain
Create and edit a domain for this member.
Create a domain.

Business Object Model

Consistency Checker

Business Rule Template: Rejection Template
- General Information
  Name: Rejection Template
- Category Filter
  Categories:
- Documentation
  Code
  [definitions]
  if
    <select a condition>
  then
    reject this application with reason: ▼ <enter a value> [a]
  [else]
  Rule Templates
Value of BRMS approach to IT & Business
Examples of Customer BRMS Applications

<table>
<thead>
<tr>
<th>Banking</th>
<th>Insurance</th>
<th>Capital Markets</th>
<th>Public Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Loan Origination</td>
<td>• Claims Processing</td>
<td>• Automated Trading</td>
<td>• Claims Processing</td>
</tr>
<tr>
<td>• Credit Decisioning</td>
<td>• Underwriting</td>
<td>• Trade Order Management</td>
<td>• Entitlement and Benefit calculation</td>
</tr>
<tr>
<td>• Sales Advisory</td>
<td>• Quoting</td>
<td>• Accounting</td>
<td>• Fraud Detection and Management</td>
</tr>
<tr>
<td>• Payments</td>
<td>• Rating</td>
<td>• Compliance KYC / AML</td>
<td>• Screening and Targeting</td>
</tr>
<tr>
<td>• Accounting</td>
<td>• Commissioning</td>
<td>• On Boarding</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Telecom</th>
<th>Transportation and Travel</th>
<th>Retail</th>
<th>Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Offer Configuration</td>
<td>• Promotions Management</td>
<td>• Online recommendation</td>
<td>• Order Management</td>
</tr>
<tr>
<td>• Order Management</td>
<td>• Loyalty Programs</td>
<td>• Campaign Management</td>
<td>• Billing</td>
</tr>
<tr>
<td>• Fraud Detection and Management</td>
<td>• Customer Service</td>
<td>• Order Management</td>
<td>• Contract Management</td>
</tr>
<tr>
<td>• Loyalty Programs</td>
<td>• Billing</td>
<td>• Pricing</td>
<td></td>
</tr>
<tr>
<td>• Network Monitoring</td>
<td>• Contract Management</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Quantitative Benefits

- **Reduced Time to Market**
  - 40% to 70%

- **IT Cost Reduction in Product Development**
  - 25% to 45%

- **IT Cost Reduction in Product Modification**
  - 25% to 45% for new rules
  - 50% to 75% for existing rule maintenance

- **Process Improvement / Automation**
  - 10% to 90%
Qualitative Benefits

- Increased Business Agility
- Accurate and Repeatable decisions
- Increased Revenue Opportunities
- Customer Satisfaction
- Regulatory compliance
- Business and IT Collaboration
- Confident business change management
- Transparency of decision logic
Demonstration of managing change

Credit Card Fraud Rules
ILOG JRules Solution Lifecycle

**Rule Studio**
- Eclipse-based Rule IDE
- Rule design & development

**Rule Team Server**
- Web-based console for Rule Maintenance & Testing
- Deploy rules

**Rule Repository**
- Offline Rule Maintenance

**Decision Warehouse**
- Audit trail of decisions

**Runtime environment**
- Rule Execution Server
- Single node or cluster (J2SE & J2EE compliant)

**Decision Validation Services**
- Web-based console to monitor & control rule execution

**Rule Solutions for Office**
Positioning with WebSphere tools
Architecture/Integration Options

Departmental Application
- Embedded JRules engine
- Simple deployment model
- J2SE

Enterprise Decision Services
- SOA
- Re-usable rule services
- Centrally managed and hosted
- Shared platform

Large Application
- Application specific
- WebSphere J2EE
- Engine pool managed by WAS
- Clustered execution
- EJB, Web Service, JMS execution
- Hot deployment

Enterprise Application
- Global
- Batch / OLTP
- WebSphere XD
- z/OS
BPM & BRMS interoperability overview

The business logic within business processes changes more frequently than the business processes themselves.
Integration with IBM WID/WPS

IBM WebSphere Integration Developer

IBM WebSphere Process Server

Rule Execution Server

JRules SCA Component

Session Bean

JCA Common Client Interface

Common Event Infrastructure

ILOG connector components

Interface

Reference
Externalise your business decisions

Data Validation

Eligibility

Transparent Decision Service

SOA

Pricing
Change once, impact anywhere
JRules BRMS complimentary positioning IBM tools

- Fabric
- Business Events
- Process Server

- FileNet
- Lombardi
Building a Decision Service from Scratch

Create a running web service from a schema in 10 mins.
Business Rule: Over limit

if

the card holder balance of TXN + the trans amount of TXN

is more than the card holder limit of TXN

then

set authorised to false;
set message to "Over limit";
Conclusions
Benefits of Business Rules

- **Quantitative**
  - Reduced Time to Market
  - IT Cost Reduction in Product Development
  - IT Cost Reduction in Product Modification
  - Process Improvement / Automation

- **Qualitative**
  - Business Agility
  - Accurate and Repeatable decisions
  - Increased Revenue Opportunities
  - Customer Satisfaction
  - Regulatory compliance
  - Business and IT Collaboration
  - Confident business change management
  - Transparency of decision logic
Questions and Answers