



IBM SOA PoT

# C2040 Business Rules



## Business Rules - Externalize Business Logic for Business Flexibility

- **Most-Requested Business Rule Functionality**
  - “Ruleset” - If-then statements
  - “Decision Table” - Compact form for complex nested rules
  - Generally provides 80% of customer needs
- **Ease of Use**
  - Adjust business rules on the fly through web interface
  - NLS enabled free text representation for rules
  - Rule change audit
  - Staged development: Import/Export of Business Rules from staging to production server
- **3rd party rules engine plug-in**
  - ILOG

# Business Rules

## Rule Group

The screenshot shows the configuration for a Rule Group named 'getDailyRate'. It includes sections for 'Active Destinations', 'Available Destinations', and 'References'. The 'Active Destinations' section contains a table with columns for Start Date, End Date, and Destination.

Start Date	End Date	Destination
Dec 23, 2005 8:00 PM	Jan 8, 2006 8:00 PM	getDailyRateHolidays
Nov 23, 2005 8:00 PM	Nov 28, 2005 8:00 PM	getDailyRateHolidays

The 'Available Destinations' section lists 'getDailyRateNormal' and 'getDailyRateHolidays'. The 'References' section is currently empty.

## Rule Set

The screenshot shows the configuration for a Rule Set named 'OrderDiscount'. It includes sections for 'Interface', 'Variables', and 'Rules'. The 'Interface' section shows input and output types. The 'Variables' section shows a variable named 'FreeGift' of type 'LineItem'. The 'Rules' section contains three rules with their respective conditions and actions.

Input(s)	Name	Type
input1	input1	Order
Output(s)	output1	Order

Name	Type
FreeGift	LineItem

Name	Rule1
Presentation	
Action	output1 = copyBO( input1)

Name	Rule2
Presentation	
If	input1.custStatus == "gold"
Then	output1.orderTotal = input1.orderTotal * 0.85 output1.lineItems.add( FreeGift) return

Name	Rule3
Presentation	
If	input1.custStatus == "silver"
Then	output1.orderTotal = input1.orderTotal * 0.90 return

## Decision Table

The screenshot shows the configuration for a Decision Table named 'applyDiscount'. It includes sections for 'Interface', 'Initialize', and 'Table'. The 'Table' section contains a decision table with conditions and actions.

Input(s)	Name	Type
input1	input1	Order
Output(s)	output1	Order

Name	Rule1
Presentation	
Action	output1 = copyBO( input1)

Conditions	Actions
input1.custStatus == "gold"	input1.orderTotal * 0.85
input1.custStatus == "silver"	input1.orderTotal * 0.90
Otherwise	input1.orderTotal * 1

## Business Rule Group

- **Group Rule Sets or Decision Tables with common business focus**
- **Rule Group aggregates rules with the same interface**
- **Rules may be defined as Rule Sets or Decision**
- **Date/time ranges determine when a business rule is going to be invoked**
- **Date\time may be specified**
  - ▶ **As the Current Date,**
  - ▶ **Supplied by Java snippet**
  - ▶ **From the input parameters**

**Rule Group Editor**

The screenshot displays the Rule Group Editor interface. On the left, there are sections for 'General', 'Interfaces' (containing 'CalculateDiscount' with a 'disc' icon), and 'References'. The main area is titled 'Active Destinations' and includes a 'Default Destination' dropdown set to 'Regular'. Below this is a table with columns for 'Start Date', 'End Date', and 'Destination'. The table contains three rows of data. At the bottom, there is a 'Selection Criteria' dropdown set to 'Current date'.

Start Date	End Date	Destination
Dec 25, 2005 7:00 PM	Jan 15, 2006 7:00 PM	Boxing
Nov 30, 2005 7:00 PM	Dec 24, 2005 7:00 PM	Christmas
Aug 31, 2005 7:00 PM	Sep 14, 2005 7:00 PM	School

Selection Criteria: Current date

## Rule Set and Decision Table

- **Rule Set**
  - A set of if/then rule statements
- **Decision Table**
  - Balanced binary tree format
- **Templates**
  - Determine which aspects of the rule can be modified at runtime
  - User interface to modify rules
  - Rule Set and Decision Table can both be templetized

Rule Set Editor

The screenshot shows the 'Rules' section of the editor. It contains two rules:

- Rule2:** Name: Rule2, Template: Template 1. Presentation: If the assets are greater than 2000000 and the liabilities are less than 500000, then the rating is A.
- Rule1:** Name: Rule1, Template: Template 1. Presentation: If the assets are greater than 2000000 and the liabilities are less than 1000000, then the rating is B.

Below the rules is the 'Templates' section, showing 'Template 1':

- Name: Template 1
- Presentation: If the assets are greater than {0} and the liabilities are less than {1}, then the rating is {2}.
- Parameters table:
 

Index	Name	Type	Constraint
{0}	var1	double	None
{1}	var2	double	None
{2}	var3	string	None
- If: all of the following are true
  - info.assets > var1
  - info.liabilities < var2
- Then: rating = var3

Template

Decision Table Editor

The screenshot shows the 'Decision Table' editor with the following table:

	> 500000	<= 500000		
info.assets				
info.liabilities	< 10000	>= 10000	< 10000	>= 10000
rating	"A"	"B"	"C"	"D"

# Describing a Rule in WID

Call Parameters

Variables for local state

The screenshot shows the WID interface for a rule set named 'myRuleSet'. It is organized into several sections:

- Rule Set:** Shows 'Detailed properties for this rule set.' with a 'myRuleSet' button.
- Interface:** A table with columns 'Name' and 'Type'.

	Name	Type
Input(s)	basePrice	double
Output(s)	discount	double
- Variables:** A table with columns 'Name' and 'Type'.

Name	Type
- Rules:** A section with icons for adding, deleting, and refreshing rules.
- Templates:** A section with icons for adding, deleting, and refreshing templates.

Rules that will be defined

Templates (to be discussed)

## A Detailed Rule

Create Rule

▼Rules

Name	Rule1
Presentation	
If	all of the following are true <ul style="list-style-type: none"><li>basePrice <math>\geq</math> 0</li><li>basePrice <math>&lt;</math> 100</li></ul>
Then	discount = 0

Condition

Action

## Multiple Rules ...

Rules

Name	Rule1
Presentation	
Action	discount = 0

  

Name	Rule2
Presentation	
If	all of the following are true <ul style="list-style-type: none"><li>• basePrice &gt;= 0</li><li>• basePrice &lt; 100</li></ul>
Then	discount = 0

  

Name	Rule3
Presentation	
If	all of the following are true <ul style="list-style-type: none"><li>• basePrice &gt;= 100</li><li>• basePrice &lt; 500</li></ul>
Then	discount = 0.05

Name	Rule4
Presentation	
If	all of the following are true <ul style="list-style-type: none"><li>• basePrice &gt;= 500</li><li>• basePrice &lt; 1000</li></ul>
Then	discount = 0.10

  

Name	Rule5
Presentation	
If	all of the following are true <ul style="list-style-type: none"><li>• basePrice &gt;= 1000</li><li>• basePrice &lt; 999999999</li></ul>
Then	discount = 0.15



# Templates ...

**Rules**

Name	Default_discount
Presentation	Default discount is 0
Action	discount = 0

**Template Rules** (indicated by three red arrows pointing to Rule1, Rule2, and Rule3)

Name	Rule1
Template	Range_Template
Presentation	Price between 100 and 499 then the discount is 0.05

Name	Rule2
Template	Range_Template
Presentation	Price between 500 and 999 then the discount is 0.10

Name	Rule3
Template	Range_Template
Presentation	Price between 1000 and 9999999 then the discount is 0.15

**Templates**

Name	Range_Template												
Presentation	Price between {lowerPrice} and {upperPrice} then the discount is {discountAmount}												
Parameters	<table border="1"><thead><tr><th>Name</th><th>Type</th><th>Constraint</th></tr></thead><tbody><tr><td>lowerPrice</td><td>double</td><td>None</td></tr><tr><td>upperPrice</td><td>double</td><td>None</td></tr><tr><td>discountAmount</td><td>double</td><td>None</td></tr></tbody></table>	Name	Type	Constraint	lowerPrice	double	None	upperPrice	double	None	discountAmount	double	None
Name	Type	Constraint											
lowerPrice	double	None											
upperPrice	double	None											
discountAmount	double	None											
If	all of the following are true <ul style="list-style-type: none"><li>basePrice &gt;= lowerPrice</li><li>basePrice &lt; upperPrice</li></ul>												
Then	discount = discountAmount												

**Annotations:**

- Create Rule from Template:** Red arrow pointing to the 'New' icon in the Rules toolbar.
- Template Parameters:** Red arrow pointing to the Parameters table in the Range\_Template.
- Presentation in Rules:** Red arrow pointing to the Presentation field of Rule1.
- Condition:** Red arrow pointing to the If condition in the Range\_Template.
- Action:** Red arrow pointing to the Then action in the Range\_Template.

## Dynamicity with Business Rules

Rules	
Name	Rule2
Template	Template 1
Presentation	if [330] abd [589] then HIGH
Name	Rule3
Template	Template 1
Presentation	if [590] abd [749] then MED
Name	Rule4
Template	Template 1
Presentation	if [750] abd [830] then LOW

- Programmer defines rules from templates
- Templates expose rule parameters to **Business Rules Manager**

**Tools**  
**WebSphere Integration Developer**

### Runtime WebSphere Process Server

- Using **Business Rules Manager**, the Business Analyst changes rules at runtime
- No need to restart the application
- Users are authenticated using standard WAS authentication / security
- Changes may be exported back to WID

Welcome | Logout | Help  
 > CreditRiskAssessmentBusinessRule\_206424068 > InputCriterion  
**Edit Mode: InputCriterion - Ruleset**  
  Messages:   


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**General Information**  

Last Published	Nov 22, 2005 13:51 (Local Time)	Status
Description	<input type="text"/>	

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**Rules**  


Name	Rule	Action
Rule2	if [300] abd [340] then HIGH	<input type="button" value="↓"/> <input type="button" value="Delete"/>
Rule3	if [341] abd [400] then MED	<input type="button" value="↓"/> <input type="button" value="↑"/> <input type="button" value="Delete"/>
Rule4	if [401] abd [830] then LOW	<input type="button" value="↑"/> <input type="button" value="Delete"/>

## Lab Objectives

- **Achieve business agility**
- **Allow changes to business rules at runtime**
  - **No recoding, retesting, and redeploying**
- **Role: Integration Developer**

## What are we going to do in the Lab?

- **Change the CreditRiskAssessment Task to a Business Rule**
- **Define a Rule Set**
- **Save and Verify the Business Rule**
- **Re-test the SimpleAccountVerification process**
- **Modify the Business Rule at Runtime**
- **Re-test the Business Rule again**

# Lab 8

## 30 Minutes

# Thank You

