

The value of IBM WebSphere ILOG BRMS

Understanding the value of IBM WebSphere ILOG Business Rule Management Systems (BRMS).

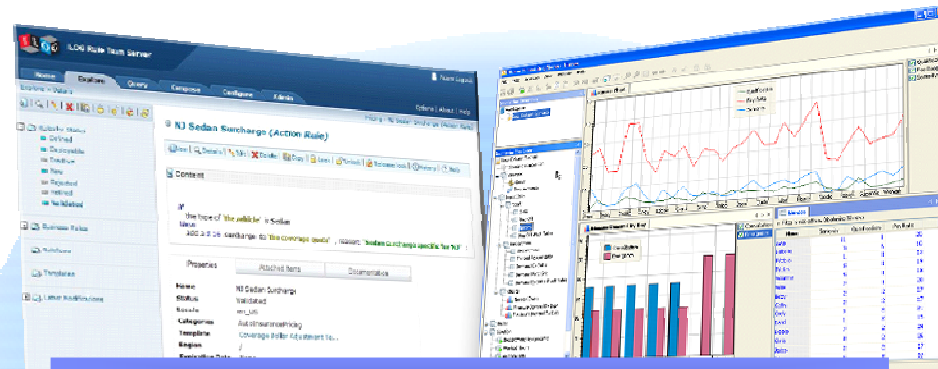
BRMS can be used to implement and manage change in a safe and predictable way using Transparent Decision Services.

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IBM ILOG Products

Powerful Business Rule Management System

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



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



Efficient Supply Chain Management

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

Innovative Visualization Tools

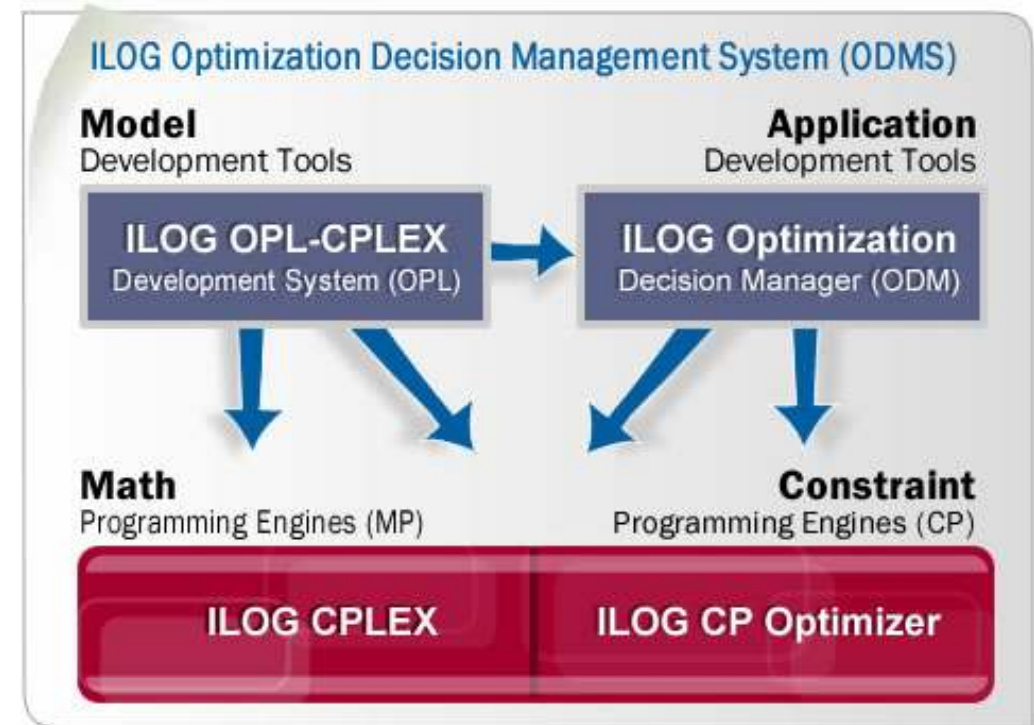
Transform insight into action, enhancing collaboration for smarter role-based business decisions

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

LogicNet Plus XE

Determine where products should be made.

Multi-Site Production Sourcing

Supply Chain Applications

Transportation Analyst

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

Transport Routing

Product Flow Optimizer

Determine best flow considering inventory, transportation, and mode

Inventory Optimization

Inventory Analyst: Strategic

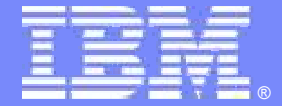
Determine push/pull locations, buffer locations, postponement, and policy analysis

Inventory Analyst: Tactical

Maintain the correct inventory levels on an on-going basis

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

```

#ifdef _WIN_
/*
 * Before performing any socket operation (like retrieving hostname
 * in init_common_variables we have to call WSASStartup
 */
{
  WSADATA WsaData;
  if (SOCKET_ERROR == WSASStartup (0x0101, &WsaData)
  {
    /* errors are not read yet, so we use english text here */
    my_message(ER_WSA_FAILED, "WSASStartup Failed", MYF(0));
    unreg_abort();
  }
}
#endif /* _WIN_ */

if (init_common_variables(MYSQL_CONFIG_NAME,
                        argc, argv, load_default_groups))
  unreg_abort(); // will do exit

init_signals();
if (!!(opt_specialflag & SPECIAL_NO_PRIOR))
  my_thread_setprio(pthread_self(), CONNECT_PRIOR);

```

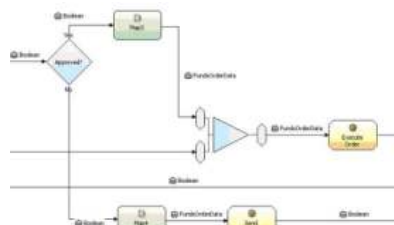
Applications



People



Documents



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

```

#ifdef _WIN_
/*
 * Before performing any socket operation (like retrieving hostname
 * in init_common_variables we have to call WSASStartup
 */
NSADATA Mcabata:
IF (SOCKET_ERROR == WSASStartup (0x0101, &wsadata))
{
/* errors are not read yet, so we use english text here */
my_message(EBL_MVAS_FAILED, "MSASStartup Failed", MYF(0));
unreg_abort();
}
#endif /* _WIN_ */

if (init_common_variables(MYSQL_CONFIG_NAME,
                        argc, argv, load_default_groups))
unreg_abort(); // Will do exit

init_signals();
IF (ECapt_specialFlag & SPECIAL_NO_PRIOR)
my_thread_setprio(pthread_self(), CONNECT_PRIOR);

```

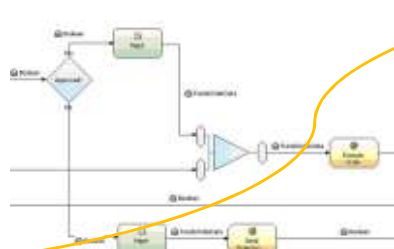
Applications



People



Documents



Processes

Business Rule Management System



User Tools

Rules are
Defined,
Analyzed and
Maintained



Rule Repository

Rules are
Stored and
Shared

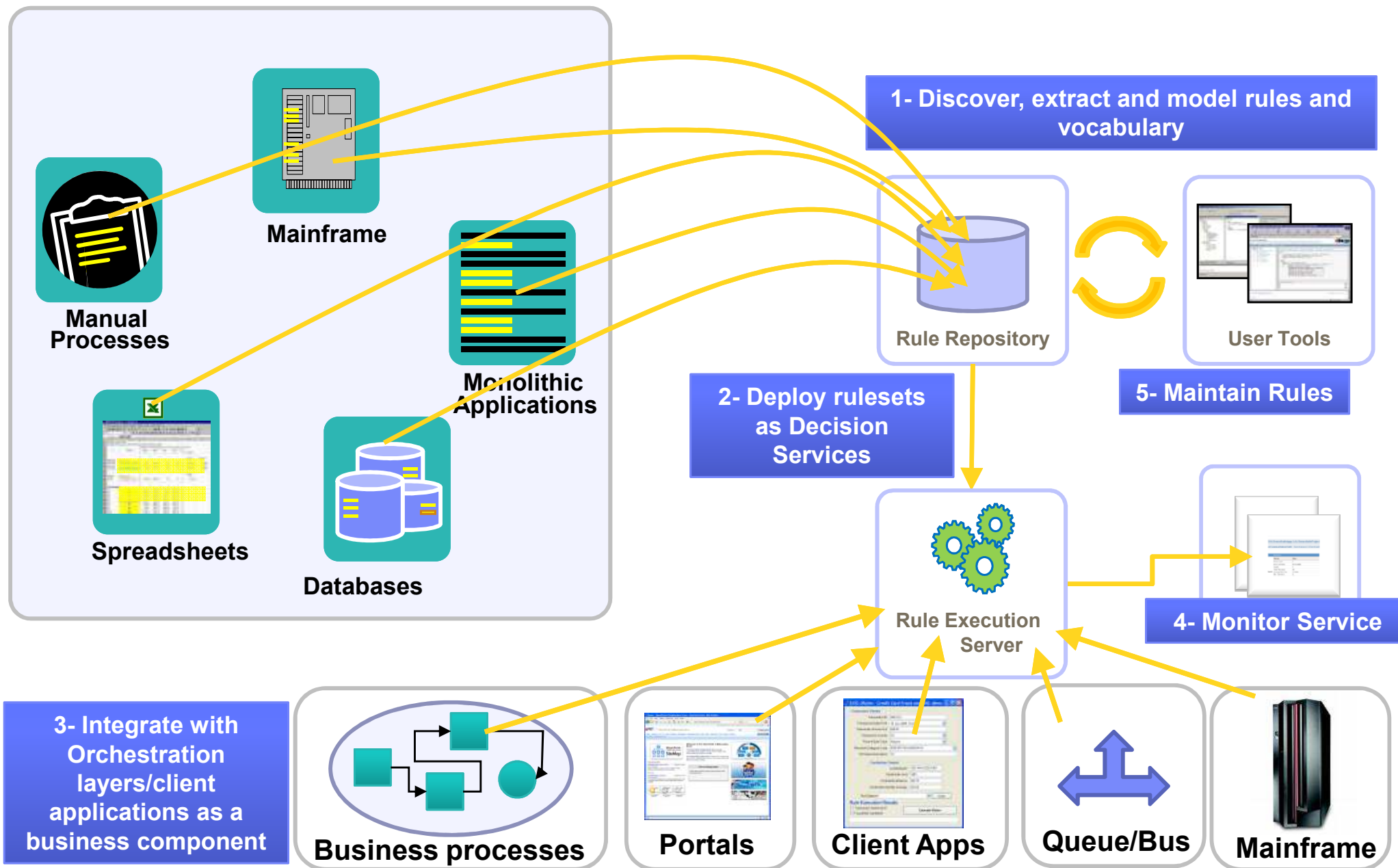


Rule Server

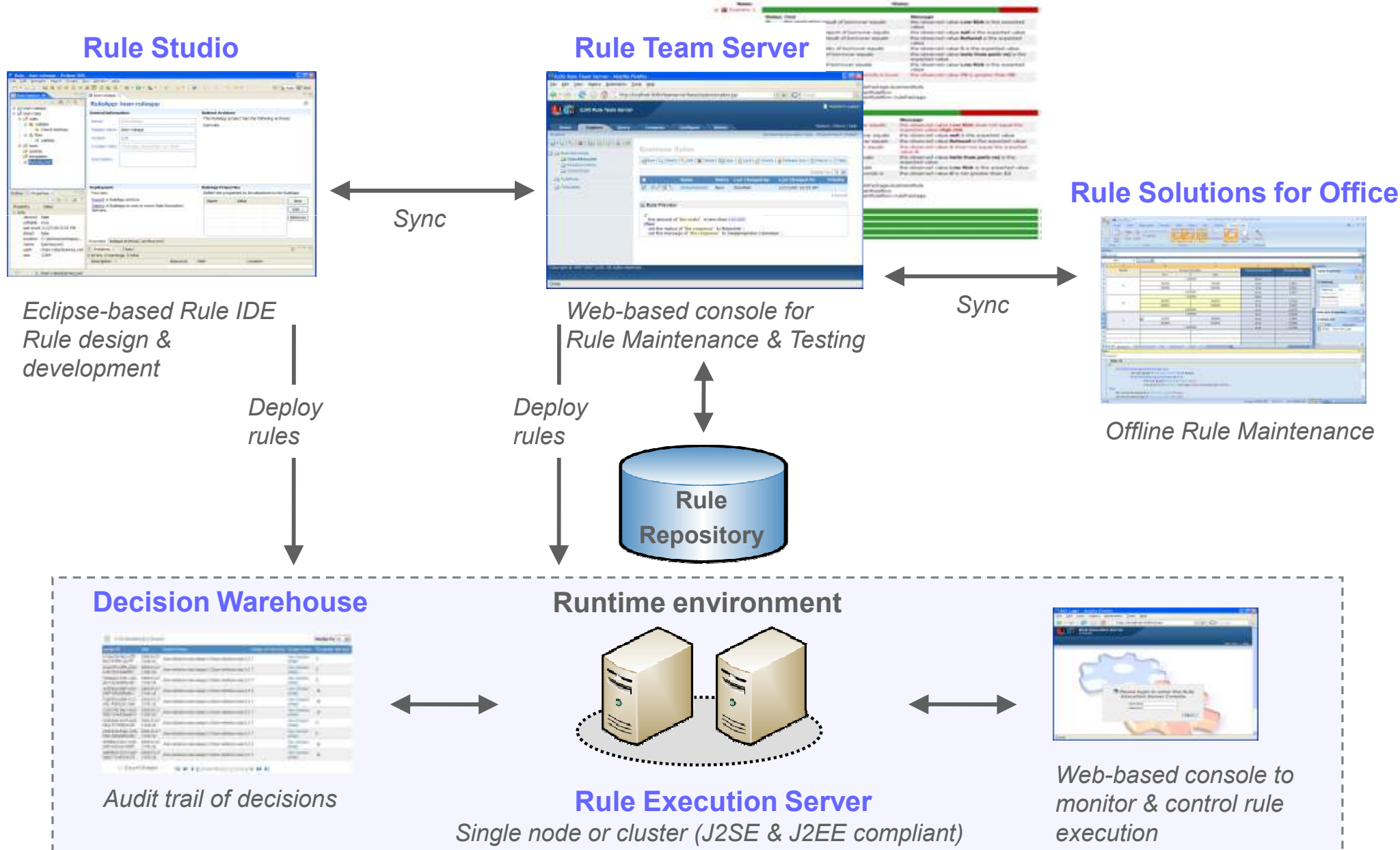
Rules are
Deployed,
Executed and
Monitored

- 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

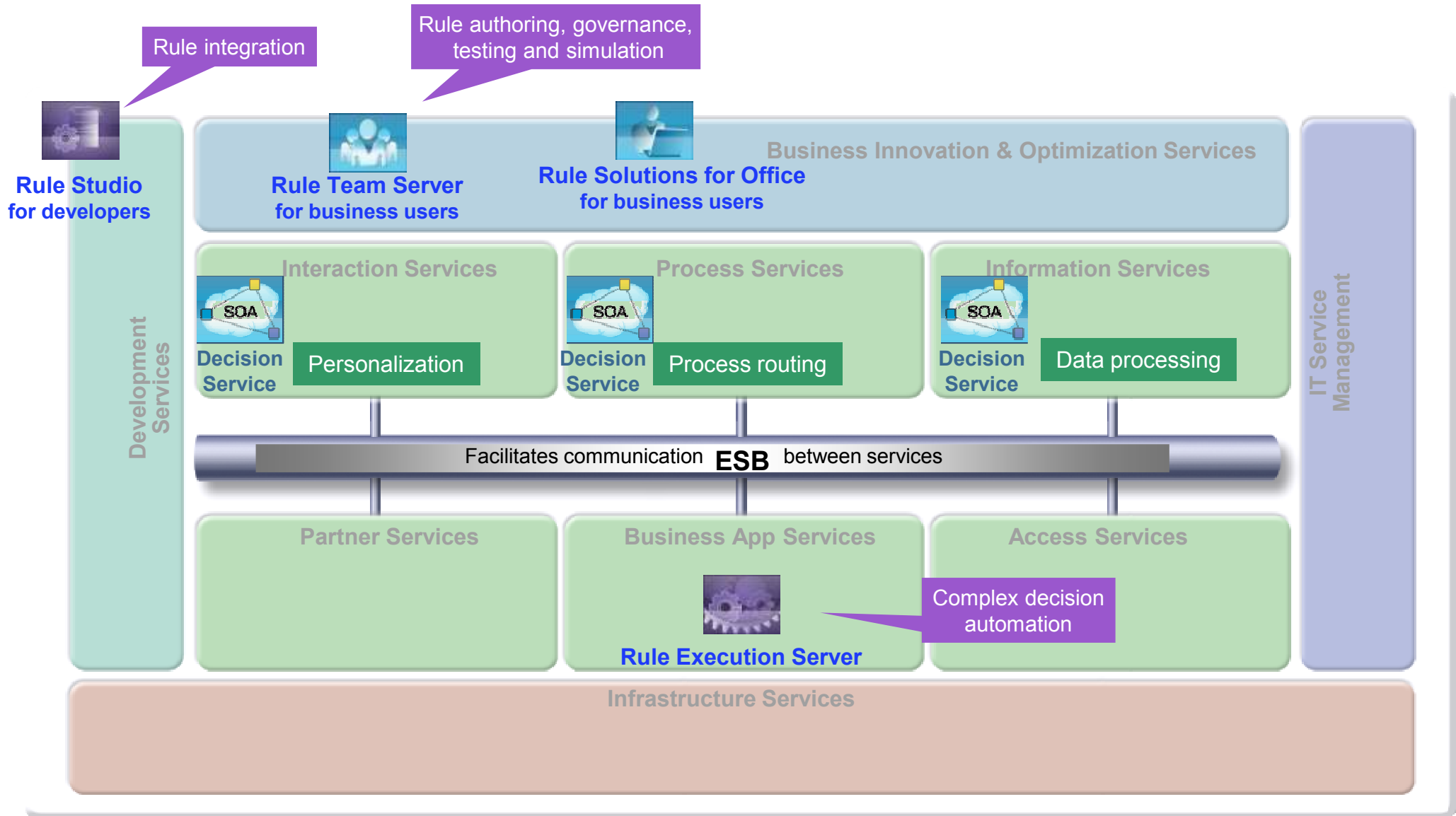
BRMS – What are the steps?



ILOG JRules Solution Lifecycle Decision Validation Services



JRules in the IBM SOA Reference Architecture



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  
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
- 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

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

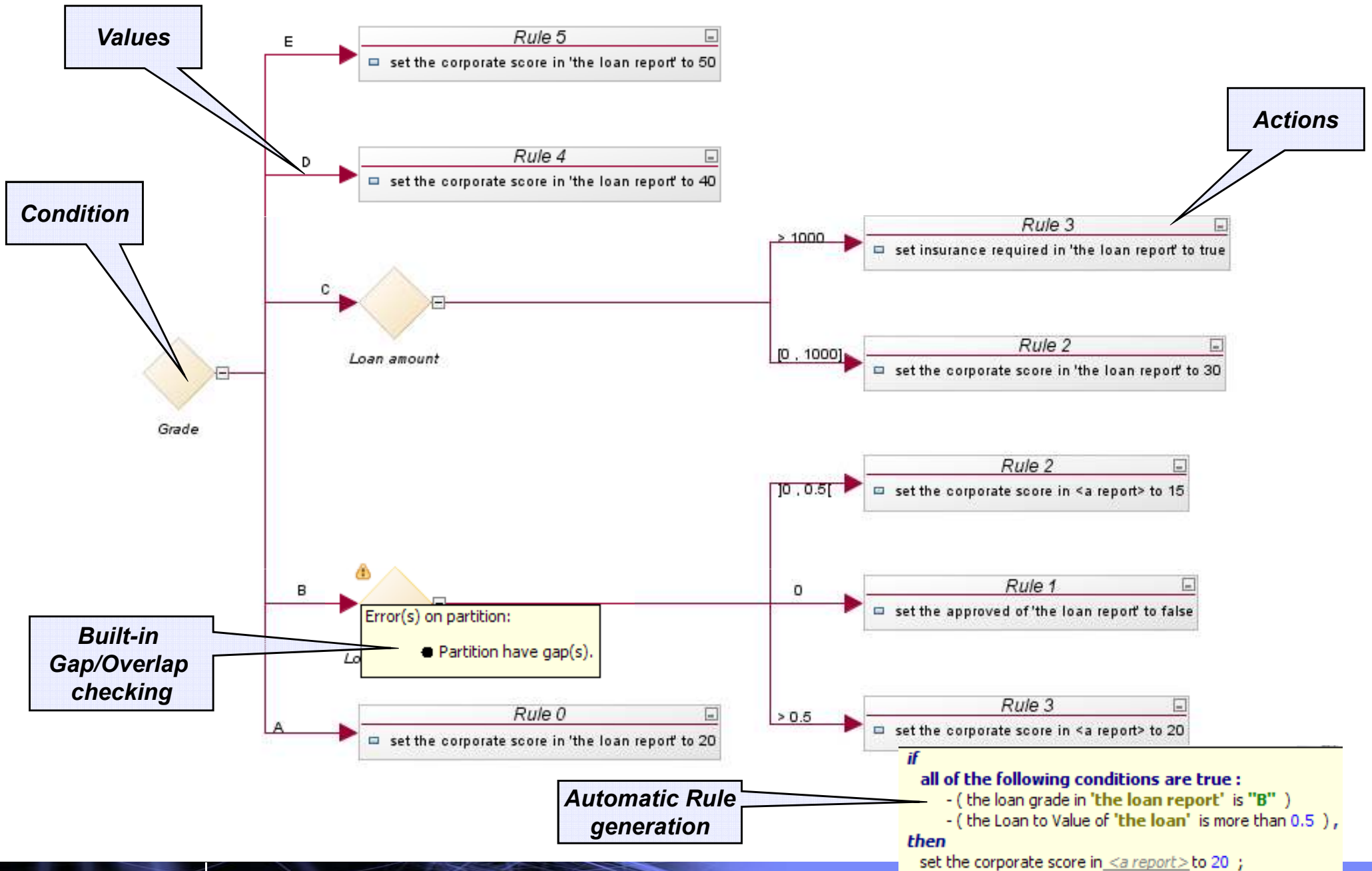
Built-in Gap/Overlap Checking

Actions

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 ;

Automatic Rule Generation

Decision Trees



Rule Solutions For Office (RSO)

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

MS Office Excel

| Grade | Min | Max | Insurance required | Insurance rate |
|-------|--------|--------|--------------------|----------------|
| A | 300000 | 300000 | false | 0.001 |
| | 300000 | 600000 | true | 0.003 |
| B | 300000 | 300000 | true | 0.005 |
| | 300000 | 600000 | true | 0.007 |
| C | 300000 | 300000 | true | 0.008 |
| | 300000 | 600000 | true | 0.010 |

Rule 12

```

all of the following conditions are true:
- the loan grade in the loan report is not empty
- all of the following conditions are true:
  - the loan grade in the loan report is "C"
  - the amount of the loan is at least 100000 and less than 300000,
then
set insurance required in the loan report to true;
set the insurance rate in the loan report to 0.006;
  
```

MS Office Word

```

checkIncome
Package: validation
definitions
if
set minimum income to 0.37 * the yearly income of the borrower;
then
the yearly repayment of the loan is at least minimum income!
in the loan report, refuse the loan with the message "Too big Debt/Income ratio." +
(format around) the yearly repayment of the loan / the yearly income of the borrower";
}

checkZipCode
Package: validation
Rule Body:
definitions
if
set zip length to 5;
and there are at least
zip length = 5;
then
the zip code of the address of the borrower is null or
the length of the zip code of the address of the borrower does not equal zip length;
then
the message "The borrower's Zip Code should have " +
zip length + " digits";
}
  
```

RuleDoc Outline

- Initial Corporate Score
- checkName
- checkIncome
- checkZipcode
- checkSSNareaNumber

Rule Properties

Authoring

Categories: Any

Creation Date

Documentation

Last Modification

Locale: English (United States)

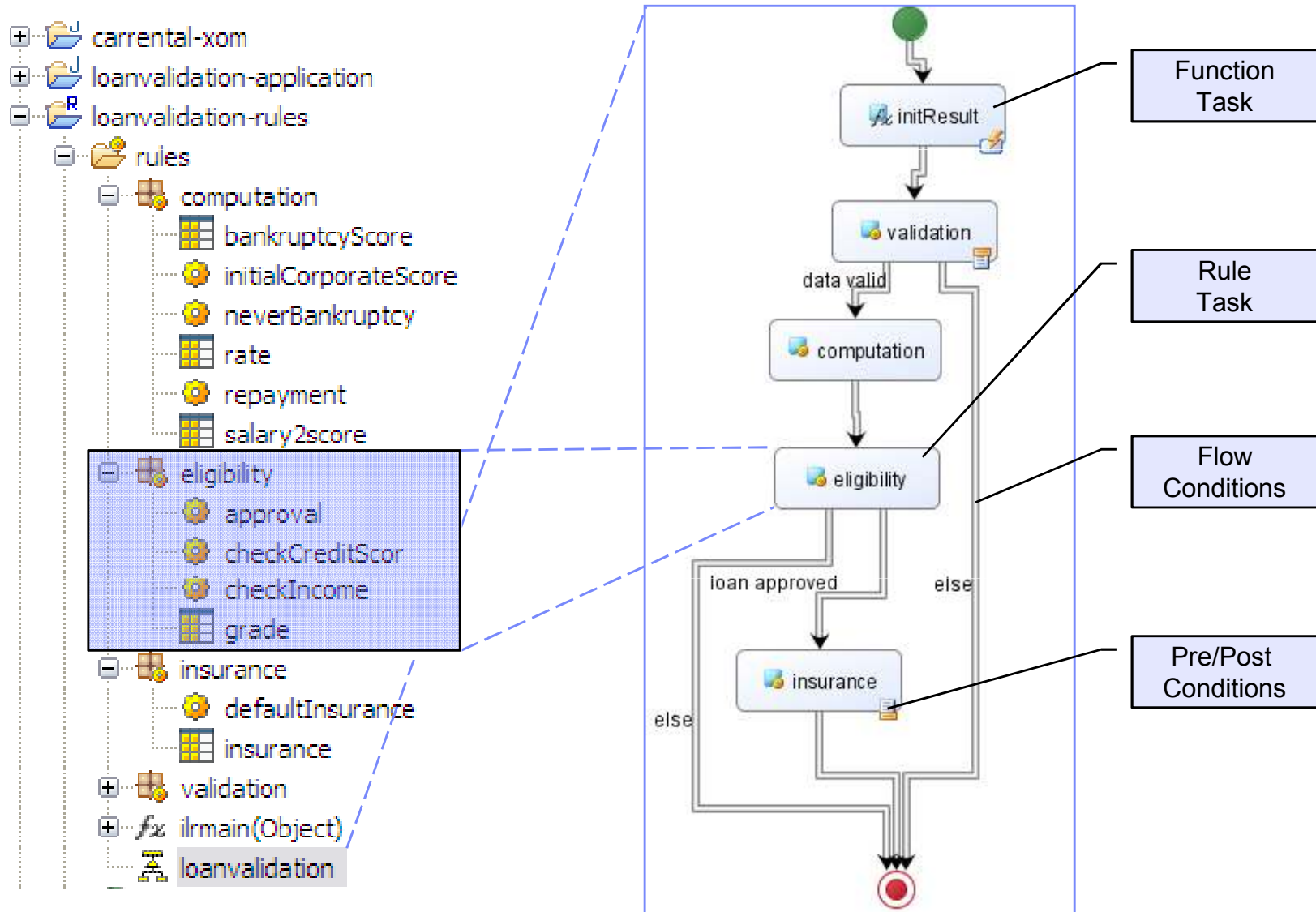
Problem List

- The place holder '<a number>' is not
- The place holder '<term>' is not filled

- Line Of Business
- Subject Matter Expert

Rule Authoring: Visual Decisioning Flow

- Graphical editor to model and control rule execution sequence (ruleflow)

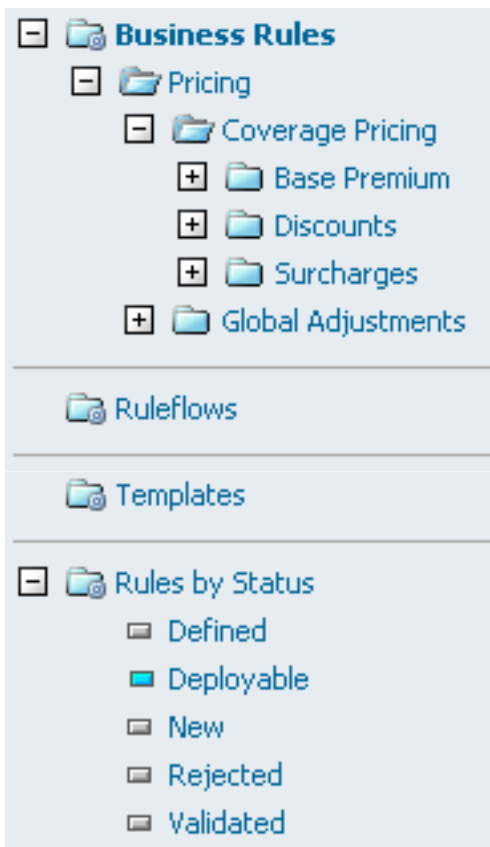


Rule Management Services - Control

Business views of rules
flexible **rule organization**
& smart views

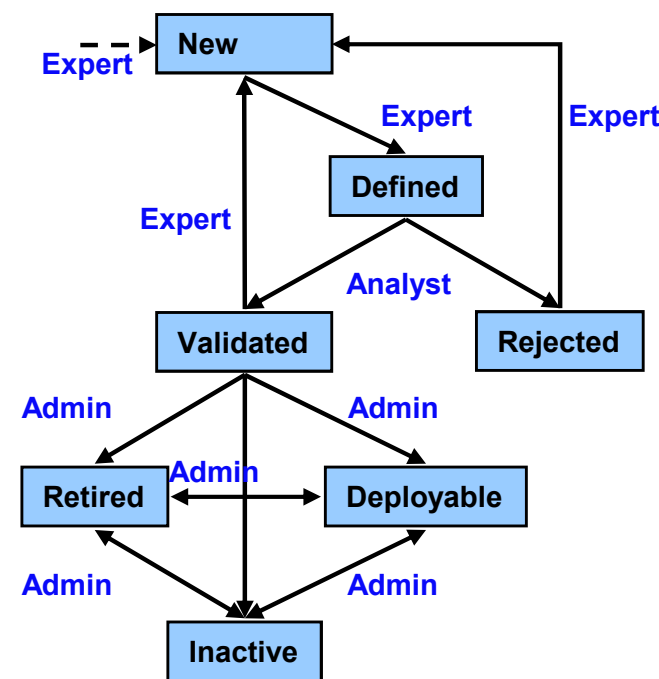
Manage custom rule information with
rule properties

Control rule lifecycle with a configurable
rule life cycle



A screenshot of a 'Properties' form for a rule. The fields are as follows:

- Name*: Collision Price Table
- Status: Deployable (dropdown)
- Priority: (empty text field)
- Categories: AutoInsurancePricing (dropdown)
- Expiration Date: None (calendar icon)
- Effective Date: None (calendar icon)
- Active:
- Folder: Pricing/Coverage Pricing/Base Prem (dropdown)
- Group: <none> (dropdown)



Rule Management Services - Visibility

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

Decision Warehouse
Runtime rule execution history

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 ✘

178 Decision(s) found

| Decision ID | Date | RuleSet Version | Number of rules fired | Decision Trace | Processing Time (ms) |
|--------------------------------------|---------------------|--|-----------------------|-----------------------|----------------------|
| b754ed76-6ed5-479f-98c7-01f911217f | 2009-04-27 14:56:29 | /com.validation.rules.app/1.0/com.validation.rules/1.0.7 | | View Decision details | 0 |
| 624223f1-d8f5-4305-9126-07a332e6fc | 2009-04-27 14:56:29 | /com.validation.rules.app/1.0/com.validation.rules/1.0.7 | | View Decision details | 0 |
| f8e9a8a-5c86-4140-b0c4-003e9690c907 | 2009-04-27 14:56:29 | /com.validation.rules.app/1.0/com.validation.rules/1.0.7 | | View Decision details | 0 |
| ce78f63b-68ef-410a-a95f-02f2a9f9a981 | 2009-04-27 14:56:29 | /com.validation.rules.app/1.0/com.validation.rules/1.0.5 | | View Decision details | 15 |
| 37a95f13-1e89-4213-850c-7b590d170a6 | 2009-04-27 14:56:29 | /com.validation.rules.app/1.0/com.validation.rules/1.0.7 | | View Decision details | 15 |
| 53050750-9f83-4943-8993-7d4a22ba6927 | 2009-04-27 14:56:29 | /com.validation.rules.app/1.0/com.validation.rules/1.0.7 | | View Decision details | 15 |
| 12b59866-654f-4ed9-d0de-373095e7a320 | 2009-04-27 14:56:29 | /com.validation.rules.app/1.0/com.validation.rules/1.0.7 | | View Decision details | 0 |
| dd463046-83a0-4c50-8203-8a8a0d9a2363 | 2009-04-27 14:56:29 | /com.validation.rules.app/1.0/com.validation.rules/1.0.7 | | View Decision details | 0 |
| 2b7829e4-b9cc-4720-8069-a303c230f6f | 2009-04-27 14:56:29 | /com.validation.rules.app/1.0/com.validation.rules/1.0.5 | | View Decision details | 35 |
| 8992929-5724-4aaf-8aaf-71a4f652a525 | 2009-04-27 14:56:29 | /com.validation.rules.app/1.0/com.validation.rules/1.0.7 | | View Decision details | 35 |

1 - 30 out of 178 results

Track & manage changes with **rule history** and **versioning**

Rule reports

Explore > Details > **History**

Explore Version Details | Compare 2 Versions | Restore Version

Display by 10

| <input type="checkbox"/> | Version ↓ | Changed By | Comment | Date |
|-------------------------------------|-----------|------------|---------|----------------|
| <input checked="" type="checkbox"/> | 1.0 | Adam | | 3/6/06 5:44 PM |
| <input type="checkbox"/> | 1.1 | Adam | | 3/6/06 5:44 PM |

Business Rule Report

Report for Project: 'Pricing' - Baseline: 'current' generated on Jul 26, 2009 1:00:53 PM

Table of Contents

- Parameters
- Variable Sets
- Rule Artifacts
 - Project: Pricing
 - Pricing
 - IntCoverageQuote
 - Decision
 - IntRateQuote
 - PerResponse
 - Pricing/Coverage Pricing/Basic Premium/Collision
 - Collision Price Table
 - Pricing/Coverage Pricing/Basic Premium/Collision/WR
 - Collision Price Table
 - Pricing/Coverage Pricing/Basic Premium/Comprehensive
 - Comprehensive Price Table
 - Pricing/Coverage Pricing/Basic Premium/Comprehensive/WR
 - 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:

Domain

Create and edit a domain for this member.

[Create](#) a domain.

Business Object Model

Business Rule Template : Rejection Template

General Information **Category Filter**

Name : Rejection Template

Categories:

Documentation

Code

```
[definitions]
if
  <select a condition>
then
  reject this application with reason: ▼ <enter a value> (#)
[else]
```

Rule Templates

Edit Check and Build Options

Check the ruleset archive

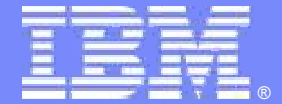
Build automatically

Enable rule analysis

- Rule never applies
- Rule may cause domain violation
- Rule makes other rule redundant
- Rules are conflicting
- Rule is self-conflicting (relevant if the checkbox "Rules are conflicting" is set)
- Rules have equivalent conditions
- Rules are equivalent

Include decision tables and decision trees in the inter-rule checks

Consistency Checker



Value of BRMS approach to IT & Business

Examples of Customer BRMS Applications

Banking

- Loan Origination
- Credit Decisioning
- Sales Advisory
- Payments
- Accounting

Insurance

- Claims Processing
- Underwriting
- Quoting
- Rating
- Commissioning

Capital Markets

- Automated Trading
- Trade Order Management
- Accounting
- Compliance KYC / AML
- On Boarding

Public Sector

- Claims Processing
- Entitlement and Benefit calculation
- Fraud Detection and Management
- Screening and Targeting

Telecom

- Offer Configuration
- Order Management
- Fraud Detection and Management
- Loyalty Programs
- Network Monitoring

Transportation and Travel

- Promotions Management
- Loyalty Programs
- Customer Service
- Billing
- Contract Management

Retail

- Online recommendation
- Campaign Management
- Order Management
- Pricing

Manufacturing

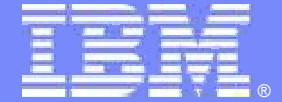
- Order Management
- Billing
- Contract Management

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

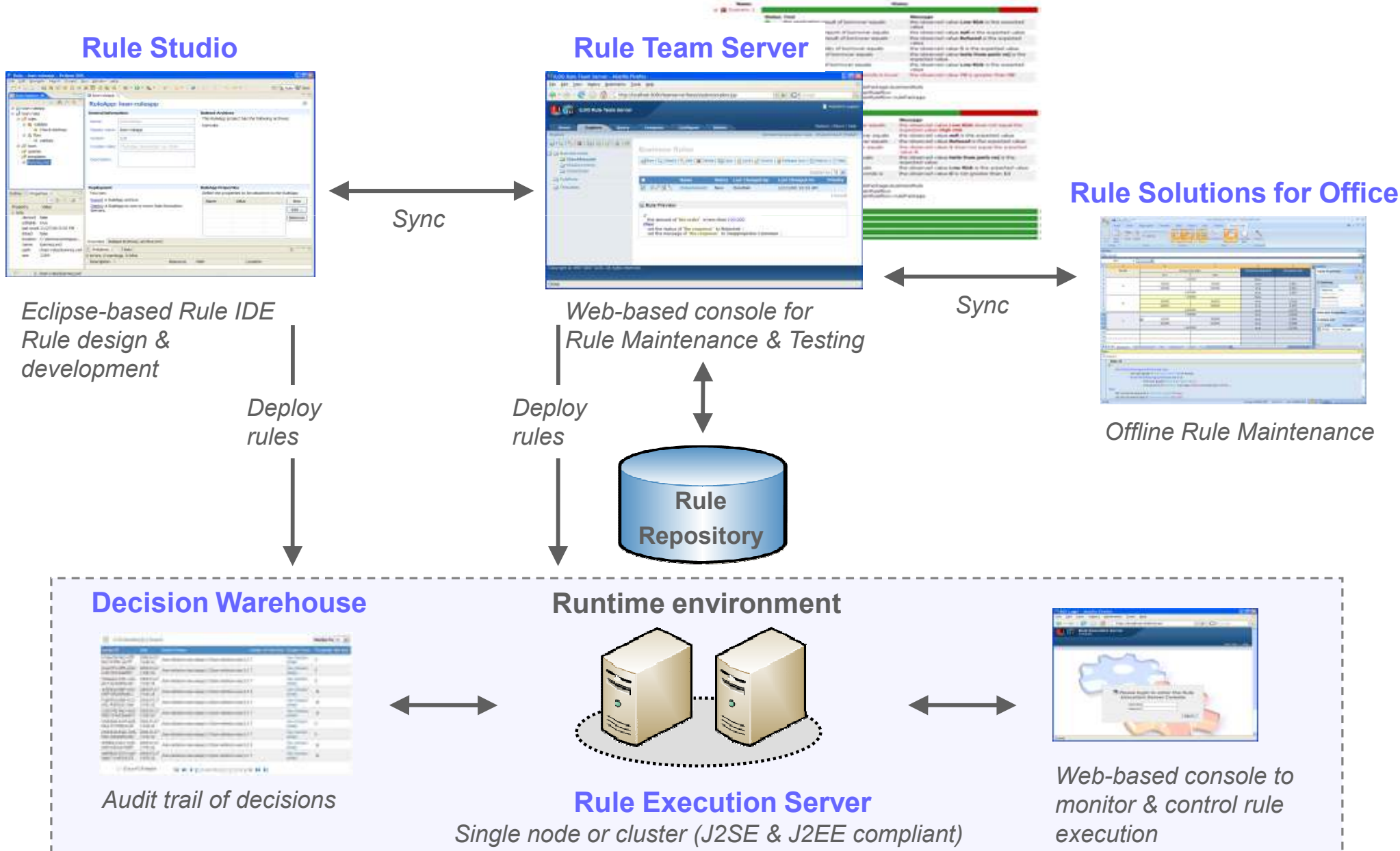
- Increased Business Agility
- Accurate and Repeatable decisions
- Increased Revenue Opportunities
- Customer Satisfaction
- Regulatory compliance
- Business and IT Collaboration
- Confident business change management
- Transparency of decision logic



Demonstration of managing change

Credit Card Fraud Rules

ILOG JRules Solution Lifecycle Decision Validation Services



Demo

WebSphere. ILOG Rule Team Server Options | About | Print View | Help rtsAdmin Sign Out IBM

Home **Explore** Compose Query Analyze Project Configure

Explore CCFraud-TransactionCheck - 2-Velocity+Sequence Rules (Folder)

Business Rules

New | Details | Edit | Delete | Copy | Lock | Unlock | Release lock | History | Help

Display by 10

| | Name | Status | Priority | Last Changed By | Last Changed On |
|-------------------------------------|----------------------------------|------------|----------|-----------------|-----------------|
| <input type="checkbox"/> | Multiple TXNs at same termina... | New | | rtsAdmin | 3/17/10 4:45 PM |
| <input checked="" type="checkbox"/> | Post-midnight transaction fol... | Deployable | | rtsAdmin | 3/17/10 4:45 PM |

2 Results

ILOG JRules - Credit Card Fraud and AML demo

Transaction Details

Transaction ID: 12352356
 Transaction Date/Time: 01 Apr 2007 00:30
 Transaction Amount in £: 100.00
 Transaction Country: UK
 Point of Sale Type: Other
 Merchant Category Code: 6011
 Purchase Description: ATM Cash

Cardholder Details

CardholderID: 1234 5678 3456 2345
 Cardholder Limit: 1500.00
 Cardholder Balance: 350.00
 Cardholder Monthly Average: 45.78

TestDataset: Fraud - ATM either side of midnight

Rule Execution Results

Transaction Authorised?
 Fraud/AML Identified?

Fraud Detected - Two ATM transactions either side of midnight

Rule Preview

Edit

Name Post-midnight transaction fol...
Status Deployable

definitions

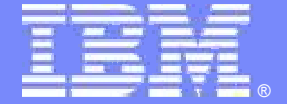
set 'txn' to a Transaction in the recent transactions of 'the cardholder'
 where the hour of the day of the date/time of this Transaction is 23
 and the MCC of this Transaction is "6011" ;

if

the hour of the day of the date/time of 'the transaction' is 0
 and the MCC of 'the transaction' is "6011"
 and the date/time of 'the transaction' is within 2 hours of the date/time of txn

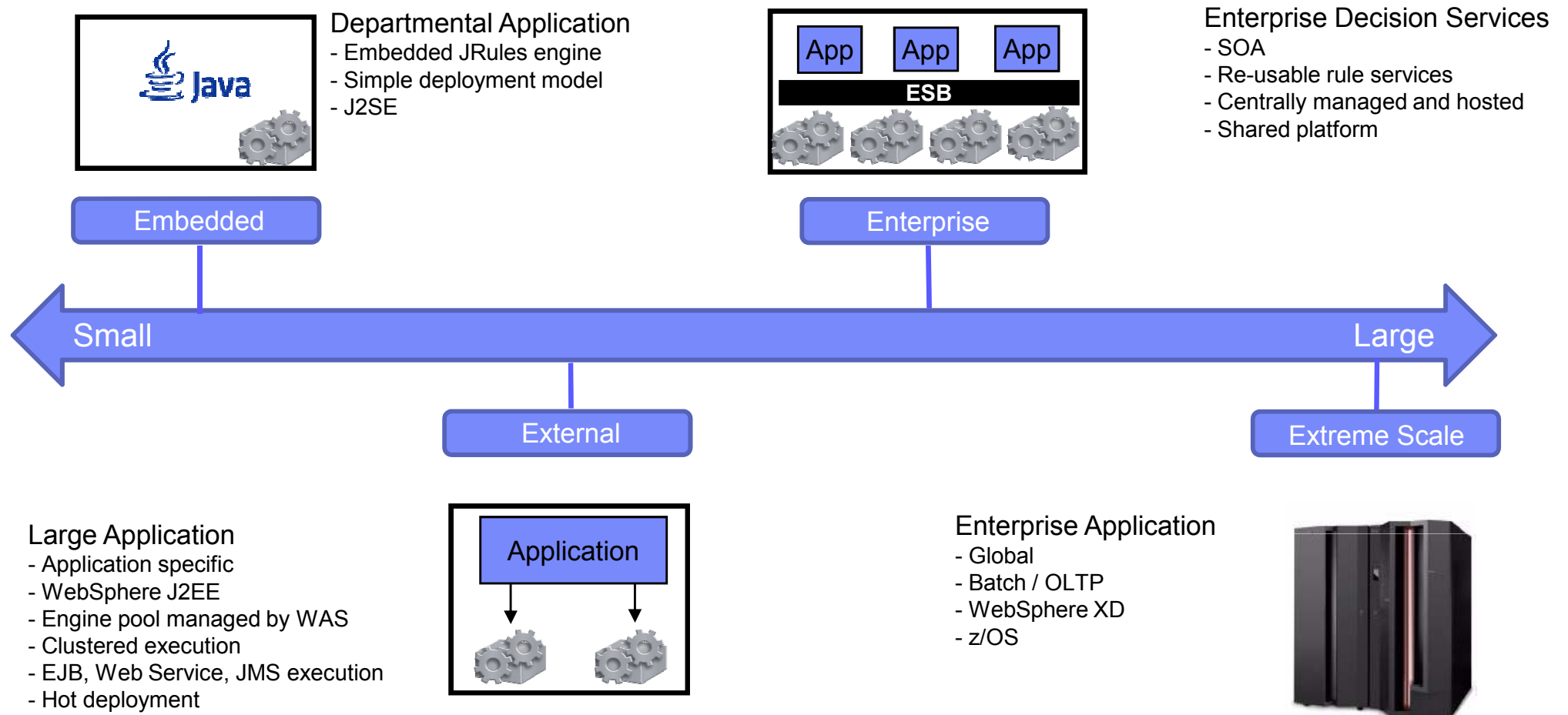
then

set fraudulent to true ;
 set reason to "### Fraud Detected - Two ATM transactions either side of midnight" ;

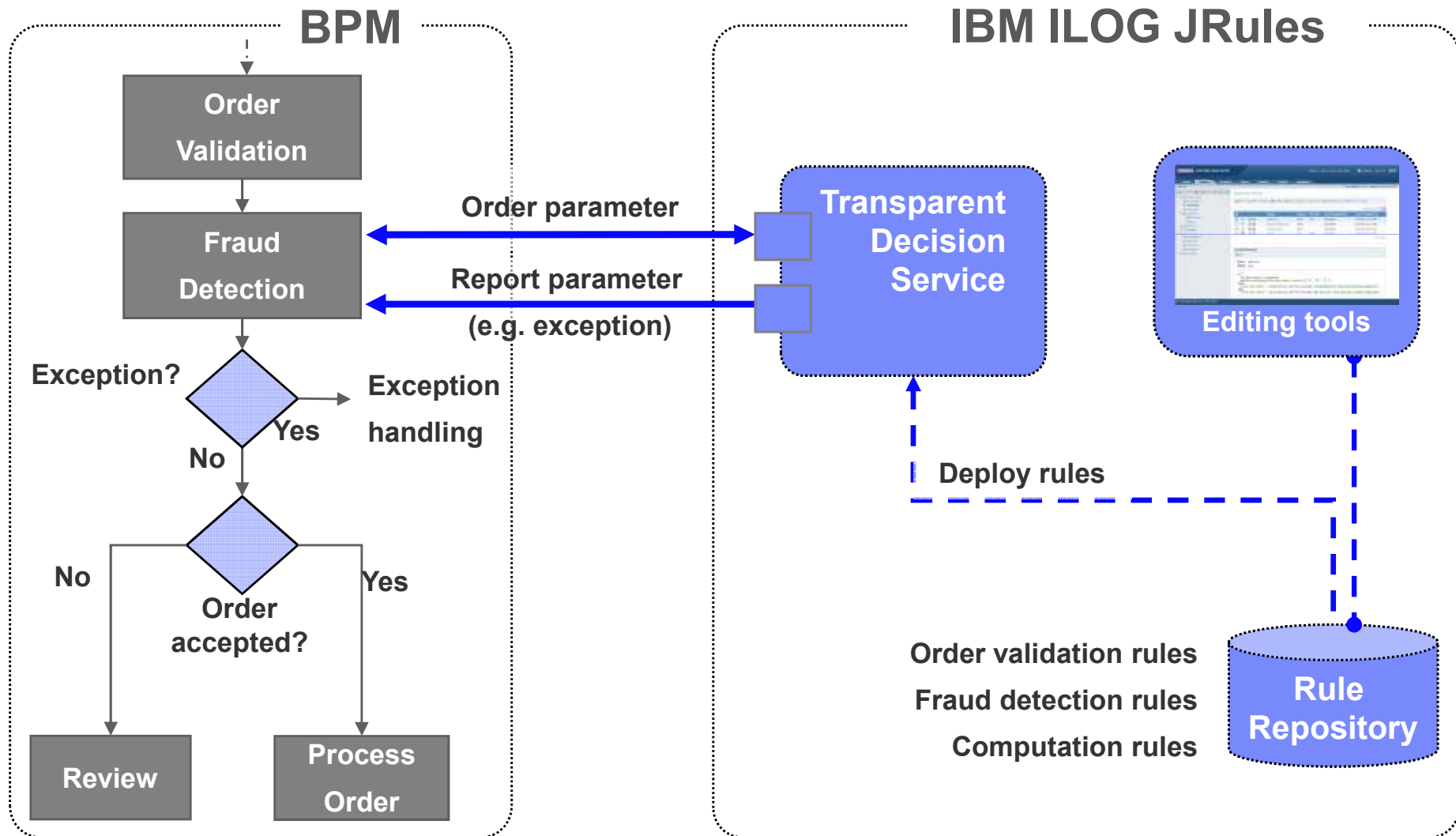


Positioning with WebSphere tools

Architecture/Integration Options

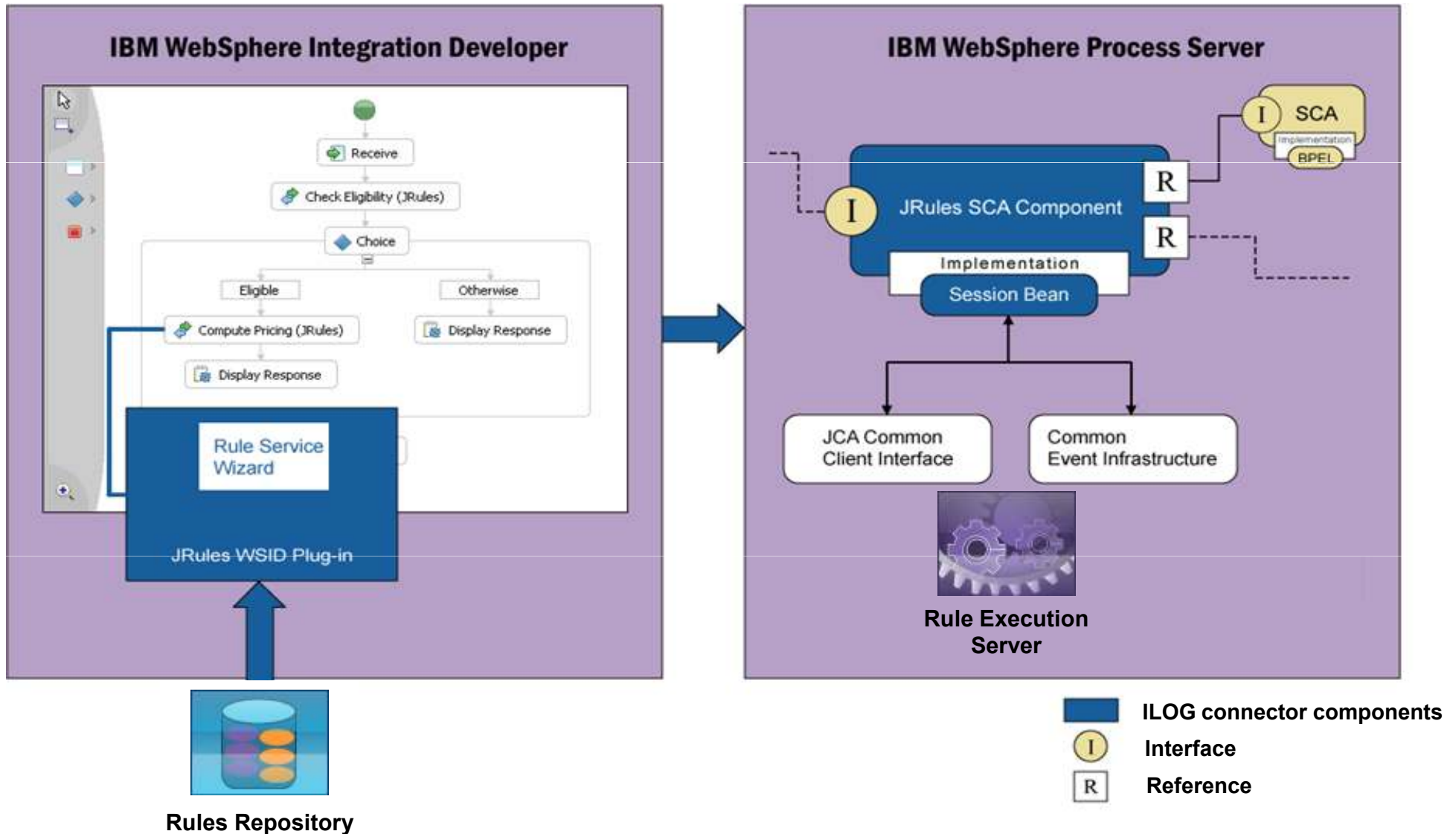


BPM & BRMS interoperability overview

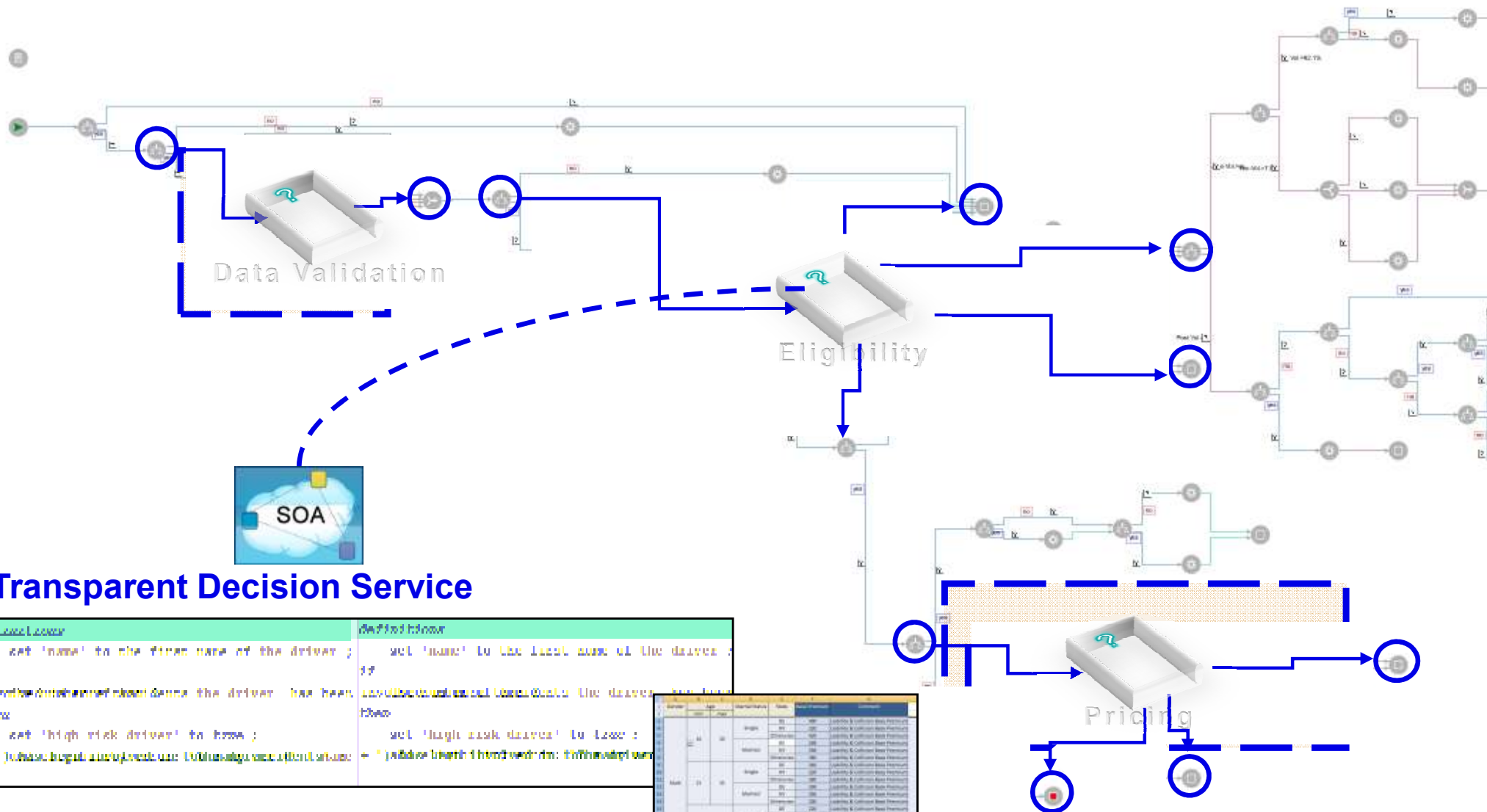


The business logic within business processes changes more frequently than the business processes themselves

Integration with IBM WID/WPS



Externalise your business decisions



Transparent Decision Service

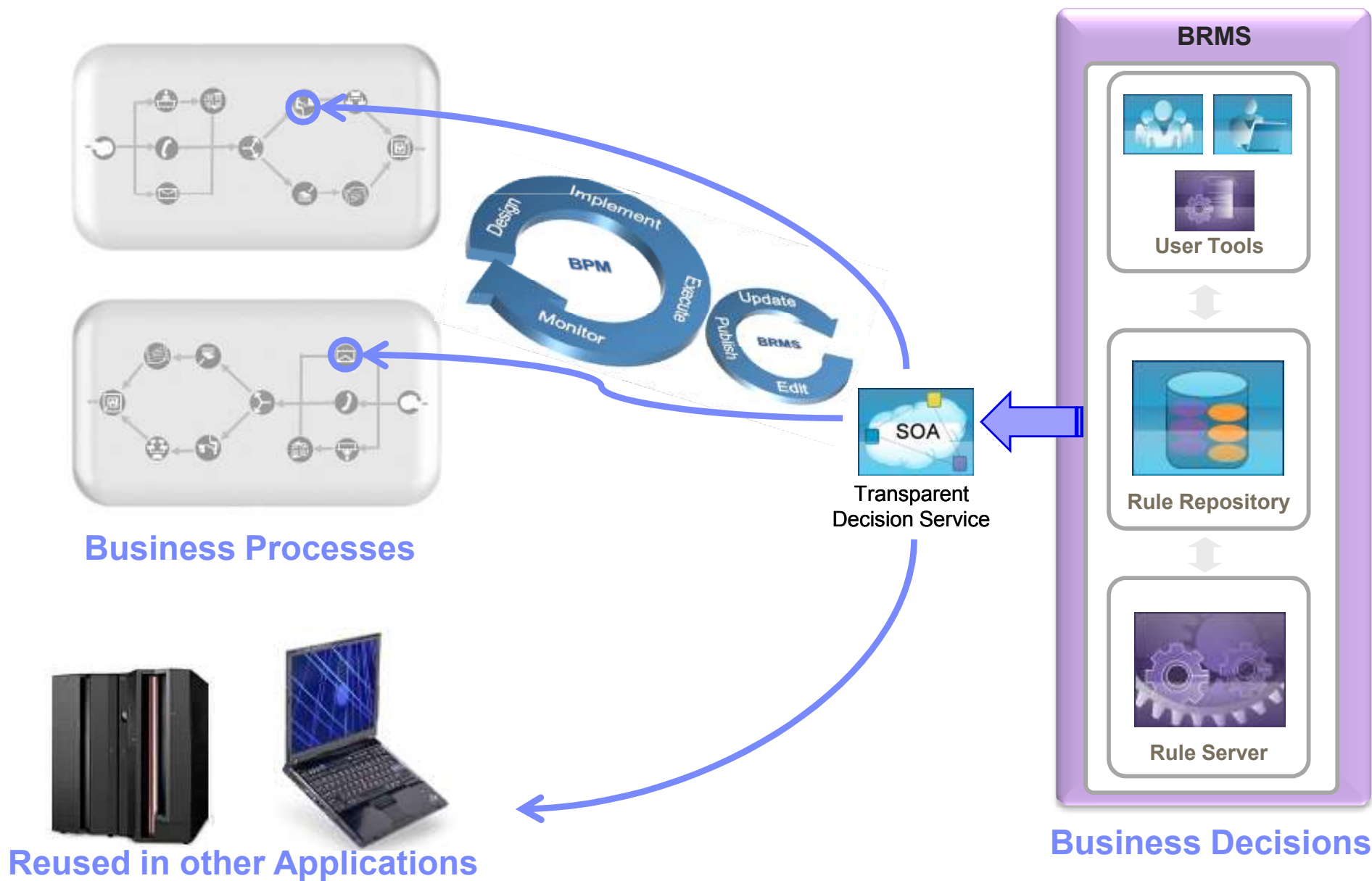
| Decision Logic | Definition |
|--|--|
| <pre> set 'name' to the first name of the driver ; if traveler/permissions/level <= 0 then the driver has been L0000 set 'high risk driver' to true ; else to have input data/level <= 0 then the driver is </pre> | <pre> set 'name' to the first name of the driver ; if traveler/permissions/level <= 0 then the driver has been L0000 set 'high risk driver' to true ; else to have input data/level <= 0 then the driver is </pre> |

| Driver | Age | Gender | Married | High Risk | Level |
|--------|-----|--------|---------|-----------|-------|
| John | 25 | Male | Yes | Low | 100 |
| Jane | 30 | Female | No | High | 200 |
| Mike | 35 | Male | Yes | Low | 100 |
| Anna | 40 | Female | No | High | 200 |

Rules:

- all of the following conditions are true:
 - the driver's gender is Male
 - the driver is single or married is not set
 - the driver's marital status is Married
 - the driver's level of membership is 100

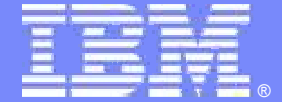
Change once, impact anywhere



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.

Rule - CheckTXN/rules/Authorisation Rules/Over limit.brl - Eclipse SDK

File Edit Source Navigate Search Project Run Window Help

Rule Explorer

- CheckTXN
 - rules
 - Authorisation Rules
 - Over limit
 - Wrong Currency
 - Fraud Rules
 - RuleFlow
 - bom
 - queries
 - templates
 - Schemas
 - FraudApp
 - runtime

Business Rule: Over limit

General Information

Name : Over limit

Category Filter

Categories: Any. Edit

Documentation

Code

```

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" ;
    
```

Outline Vocabulary for Check

- currency code type (is a string)
- POSMethod type (is a string)
- TXN
 - {the card holder balance} of {a TXN}
 - {the card holder limit} of {a TXN}
 - {the card holder name} of {a TXN}
 - {the card number} of {a TXN}
 - {the currency code} of {a TXN}
 - {the merchant CC} of {a TXN}
 - {the POSMethod} of {a TXN}
 - {the purchase description} of {a TXN}
 - {the trans amount} of {a TXN}
 - {the trans country} of {a TXN}
 - {the trans date time} of {a TXN}

Intellirule IRL Over limit.brl

Rule Project Map Problems Tasks BOM Update DVS Project Validation

CheckTXN (0 Warning / 0 Error)

Design

- Import XOM (1)
- Create BOM (1)
- Define parameters (4)

Orchestrate

- Add rule package (2)
- Add ruleflow (1)

Author

- Add business rule (2)
- Add decision table
- Add decision tree

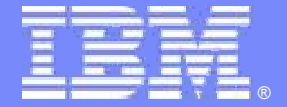
Enable

- Check pro
- Create sco
- Package r

Rule Team Ser

CheckTX

Writable Insert 1 : 3



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

