

Following the "Business Rules" to Gain Agility with IMS Applications

Operational Decision Manager for z/OS



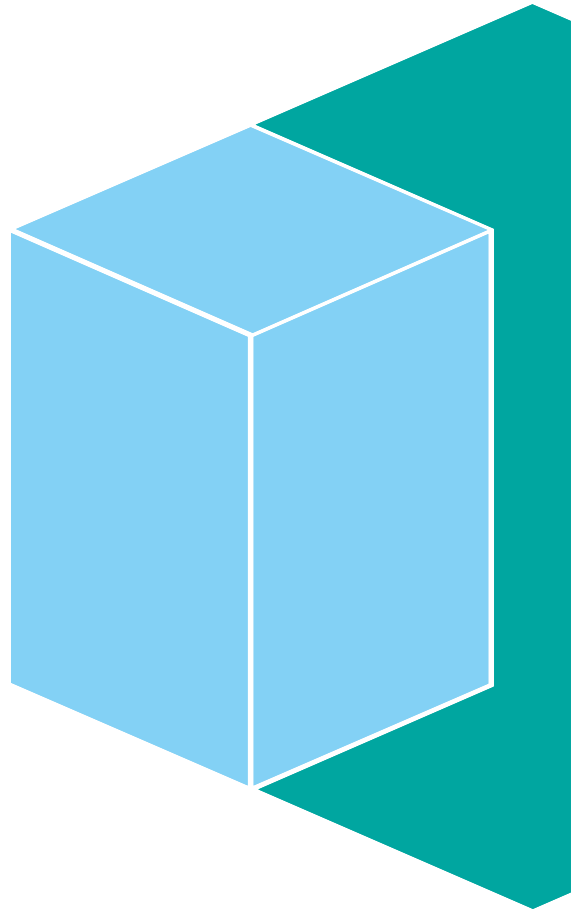
Sharpen your competitive edge

2016 IMS Technical Symposium

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Wiesbaden, Germany

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Analyst View of Operational Decisions

“ At the core of Decision Management is a focus on *Operational Decisions* .

These decisions are *those required to make day to day operations run effectively*. They ensure that customers are treated consistently, that the right price is offered, that the most effective offer is made.

While the value of each individual decision is small, *the cumulative effect is very large because organizations make these decisions often*.

”
~ James Taylor, *Decision Management Solutions*

Business Decisions are Everywhere...

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

Let's create a special promotion for our best customers.

Commissions / Royalties

Up-sell/Cross-sell offer

Product Recommendation

Underwriting

Billing

Fraud detection

Compliance Screening

Loan

Eligibility

Pricing

Tax calculation

Benefit calculation

This transaction looks suspicious. Can we detect fraud automatically ?

Can we automate approvals for this type of order?

And They Change Frequently

What we hear from customers

Decisions are not consistent across the organization

Disparate system / personalities / skills / channels

Decisions cannot be made at the right moment and on time

To much manual tasks and data to handle to make decisions

It is hard to keep decisions up to date

Business is asking for more agility than IT can support

It is hard to understand how decisions are made

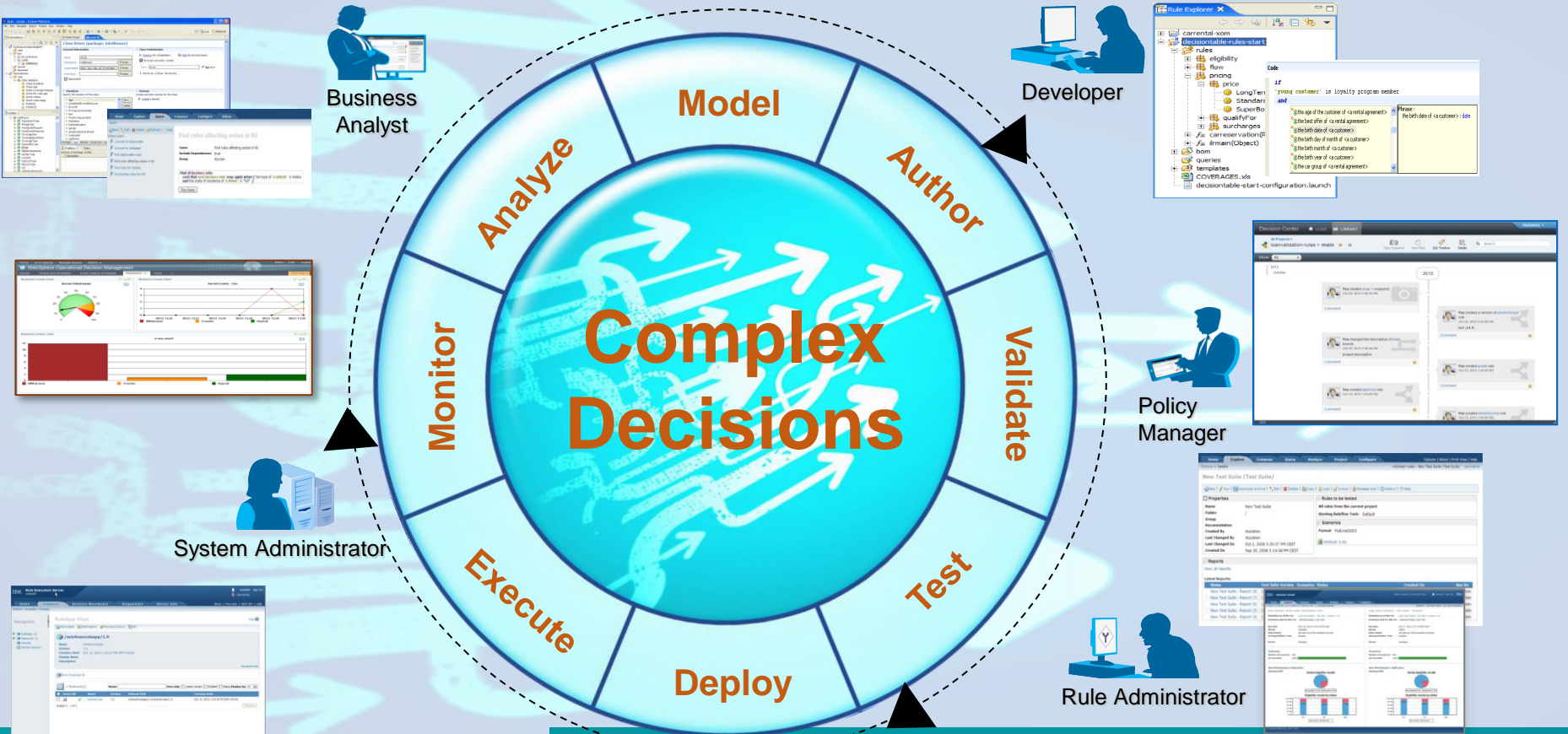
Business logic is in people's mind or application code

Lack of decisions ownership for business stakeholders

Development skills are required to update automated decisions

Full Decision Lifecycle Management

Manage changes in a safe and predictable environment



Why Modernize with ODM on z/OS

Consolidation, Isolation, Extension or Extinction of COBOL application portfolio

Cost savings

- Shorter change cycle
- Rule engine processing offload eligible

Be able to react to increasing variety and volume of change requests

Improved Time to Market

- Business decisions in natural language
- Decouple development and business decision change lifecycles

Sharing business rules across platforms & channels

Single version of the Truth

- Shared expression of business policy
- Maintain with Center of Competency

Ensuring seamless business experience in migration / application evolution

Incremental Adoption

- Deploy one decision at a time
- Focus on decisions that are complex or need to change often & quickly

Decision automation now available in 2 flavors



Transactional Decisions

- Invoked in context of a business process or application (request / reply)
- Use data from transactional records
- Stateless decisions
- Interactive or batch

DECIDE

Decision Server Rules

Whatever my action,
you are ready to respond

Situational Decisions

- Triggered by multi-channel interactions (event-driven)
- Use business event history, business context and analytics
- Stateful decisions over a context built over time
- At the earliest actionable moment (real-time)

DETECT & DECIDE

Decision Server Insights

Whatever my next step,
you have anticipated my needs

IBM Operational Decision Manager: Offerings

IBM ODM Standard

- To adapt the decision logic of applications at the pace of business
- Visibility into, control over, and automation of point-in-time business decisions

Transactional
Decision Automation

IBM ODM Advanced

New

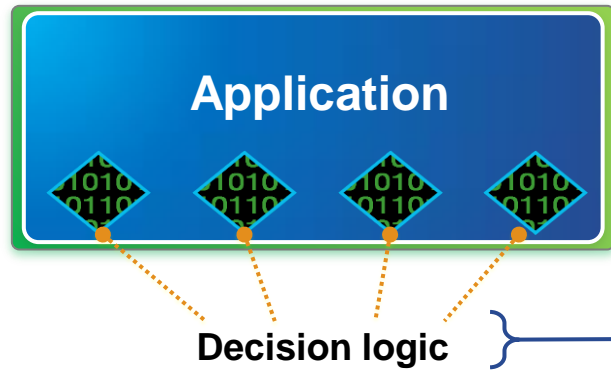
- To capture events, build context, and apply it to operational decisions in real-time
- To detect situations as they occur – presenting risks or opportunities – to enable action

Situational
Decision Automation

Codify business policies, practices, and regulations

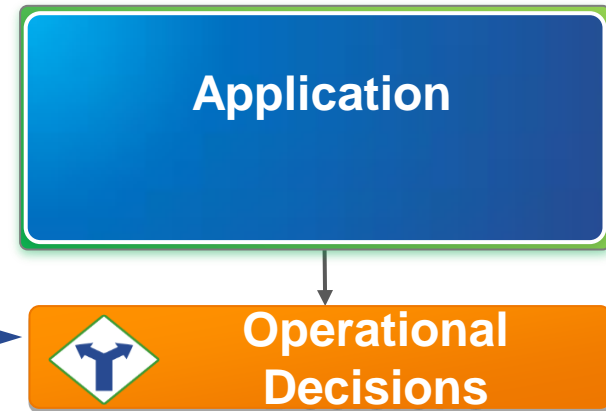
Manage decision logic independently from applications

Without ODM



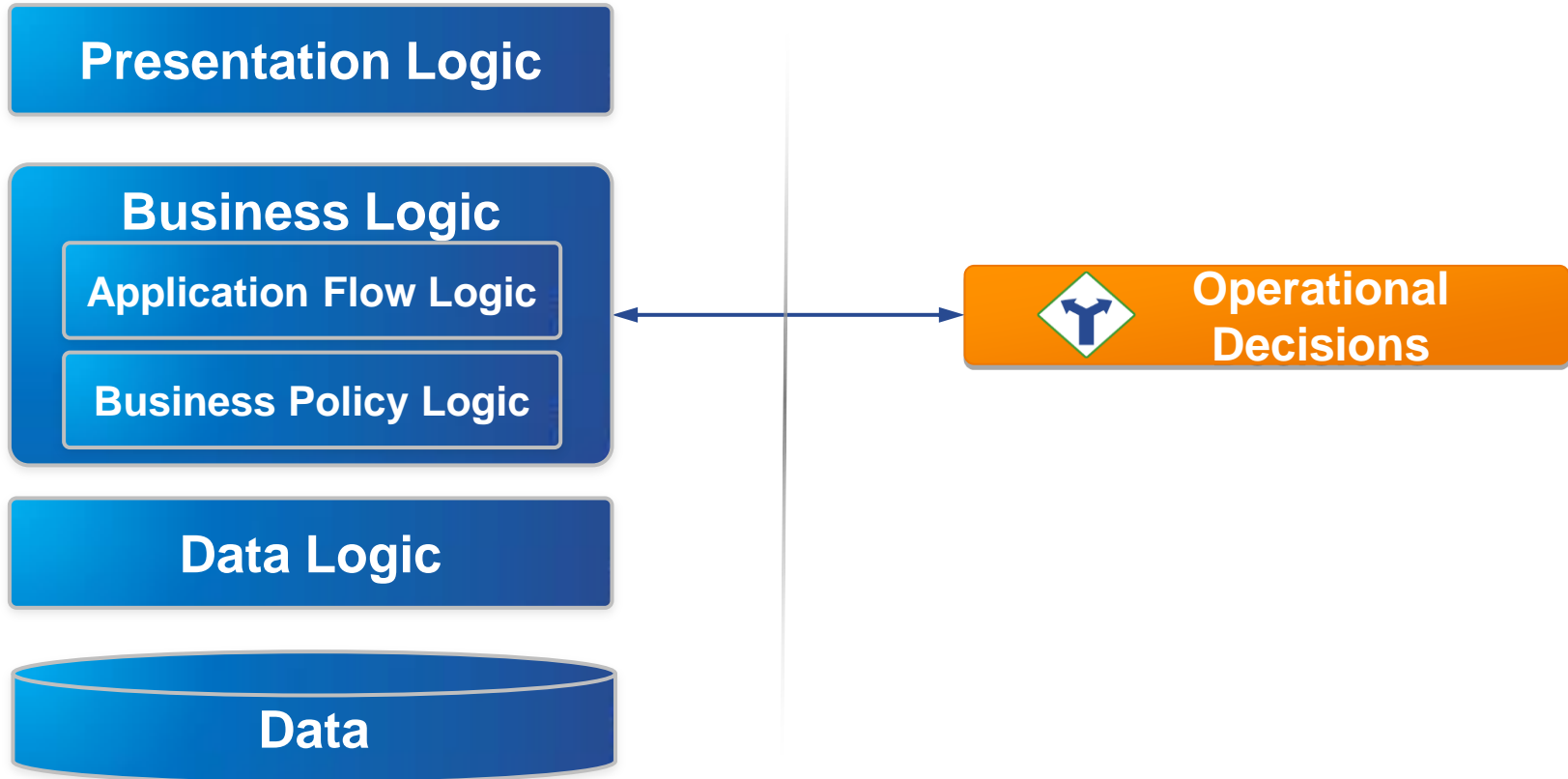
- Hard coded decisions are difficult to change
- Rules intertwined within applications cannot be reused by other systems

With ODM



- Externalized decisions are easy to change
- Centralized decisions enable reuse and consistency

Architecture of a typical business application



Large Northeast US Financial Services Company

Challenges:

- Current application change request is a 9 month process from initial request to production roll-out
- Number and frequency of changes increasing exponentially (regulation and competitive threat)
- System z skills declining or at risk
- Current rules methodology (home grown table driven) cumbersome and not auditable

Benefit:

- Implemented Business Rules for z/OS to replace home grown tool
- Deployed in support of Online systems and Batch
- Reduced Development life cycle due to new rule testing methodology from 6 months to 2 weeks
- Reduced overall implementation time from 9 months to 6 weeks (integration test 4 weeks)
- Seeing a HUGE reduction in overall cost
- Increased top line revenue, more responsive to the business and customer

Project Approach

Designed a decision management solution that conformed to Government regulatory requirements

Integrate the Java batch capabilities of Compute Grid and the Decision Management capabilities of Business Rules for z/OS

Running Decision engine in parallel to original application code

Looking for differences and exceptions

Challenges:

- Increase **flexibility** in pricing & underwriting to allow quick changes in response to evolving market conditions
- **Reduce** Time-To-Market for new products
- Reinforce **cross & up-selling** capabilities as a key element to increase average premium
- Integrate the end-client together with the broker and **back-office** as part of the Digital Strategy

Benefit:

- Started with a **cloud** solution based on IBM PureApplication Service on SoftLayer and ODM
- The **cloud** environment was ready in 2 days for the client to start working immediately!
- ODM zRES then deployed on Mainframe to enable the **same rules** to be called from IMS back-office.
- The project started in **June** and the first Eligibility Rules application went in **production in October**.

Project Approach

- 1) Designed a decision management solution using ODM on the cloud
- 2) Enabled that solution for ODM zRES called from IMS
- 3) Sharing rules between mainframe and the cloud.
- 4) The project earned a IBM Benelux Excellence Award.



"We are helping the business to make better decisions at higher speed."

—Jay Prag, First National Bank

Business challenge

Rules-based decision-making processes at FNB were not fast, agile or consistent enough to meet demands imposed by geographic expansion, increasing regulation and new consumer expectations.

Transformation

By deploying a centralized rules engine on its IBM mainframe, FNB greatly accelerated the creation, dissemination and processing of new business rules, driving smarter and faster decision-making.



Avsharn Bachoo Development
Manager responsible for Dynamic
Decisioning
First National Bank

Business benefits:

40x increase

in performance, for faster and more accurate decision-making

Accelerates

adaptation of business rules to meet changing demands

Reduces

latency to enable support for online channels

First National Bank

Driving faster, smarter, more consistent and more efficient decision-making

Established in 1838, First National Bank (FNB) is the oldest bank in South Africa and one of the region's largest financial institutions. FNB provides banking and insurance products to personal, commercial, corporate and public-sector customers.

Solution components

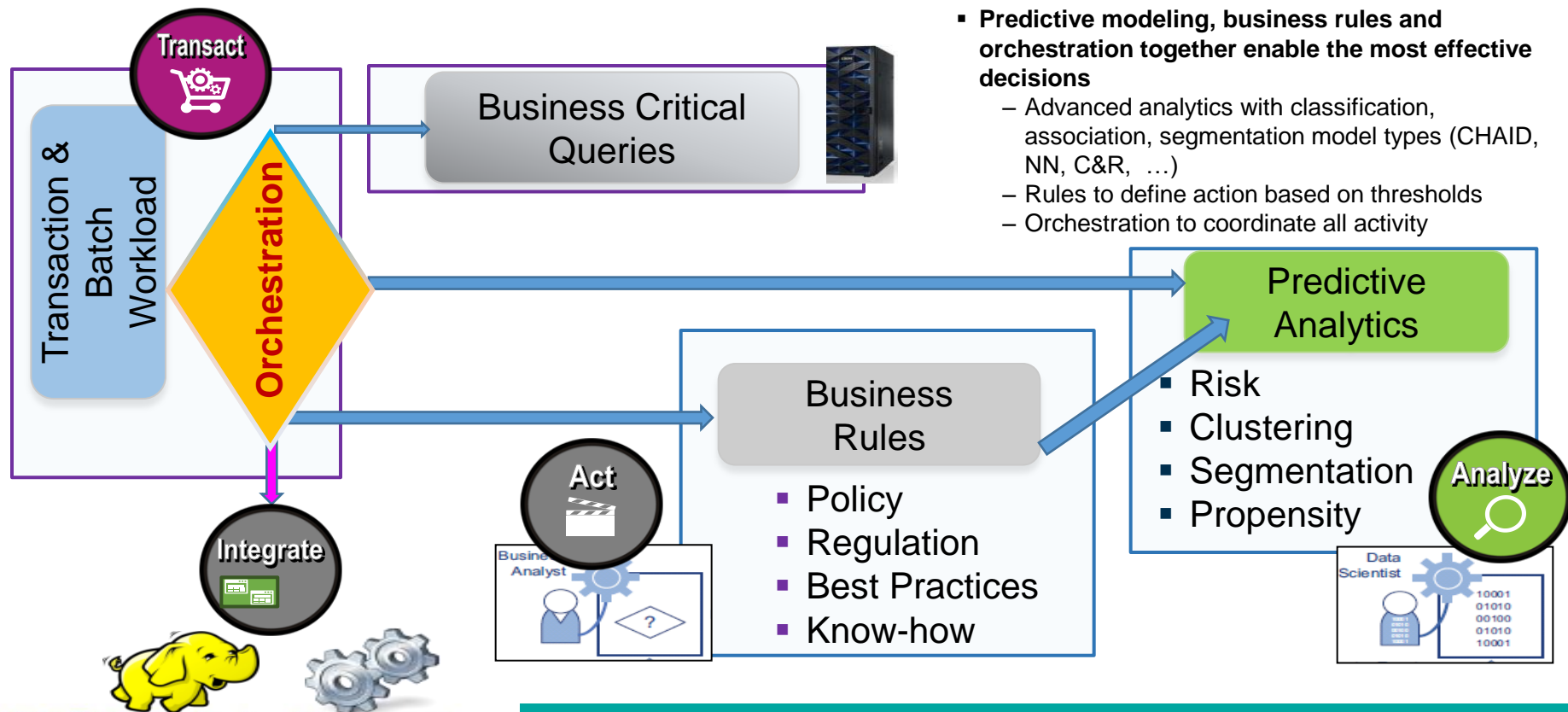
- IBM® Operational Decision Manager for z/OS®
- IBM PureData® System for Analytics
- IBM z Systems™
- IBM z/OS

Share this



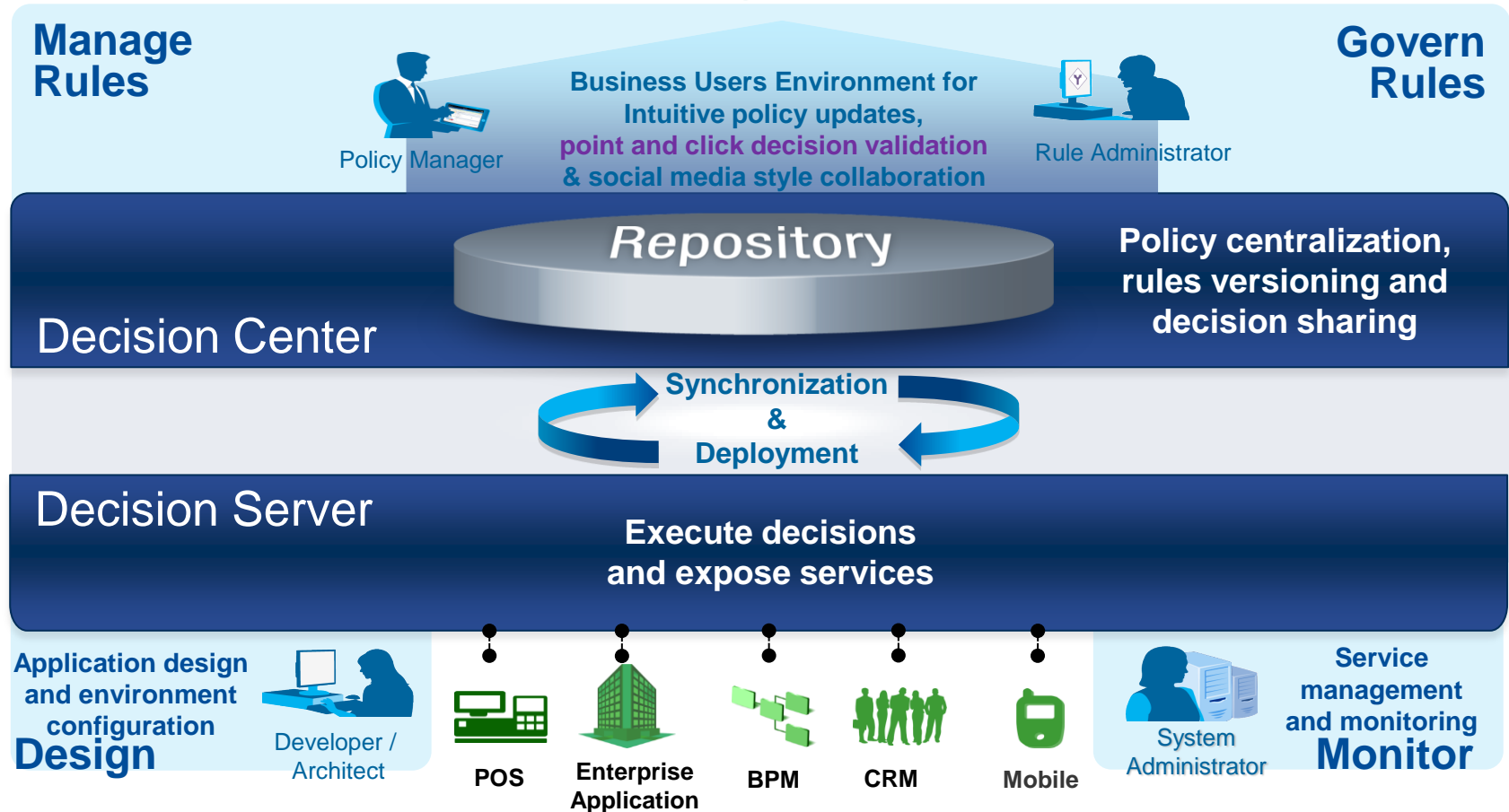
Focus on “Analytics for Business Applications”

The area for Real-Time Analytics Play



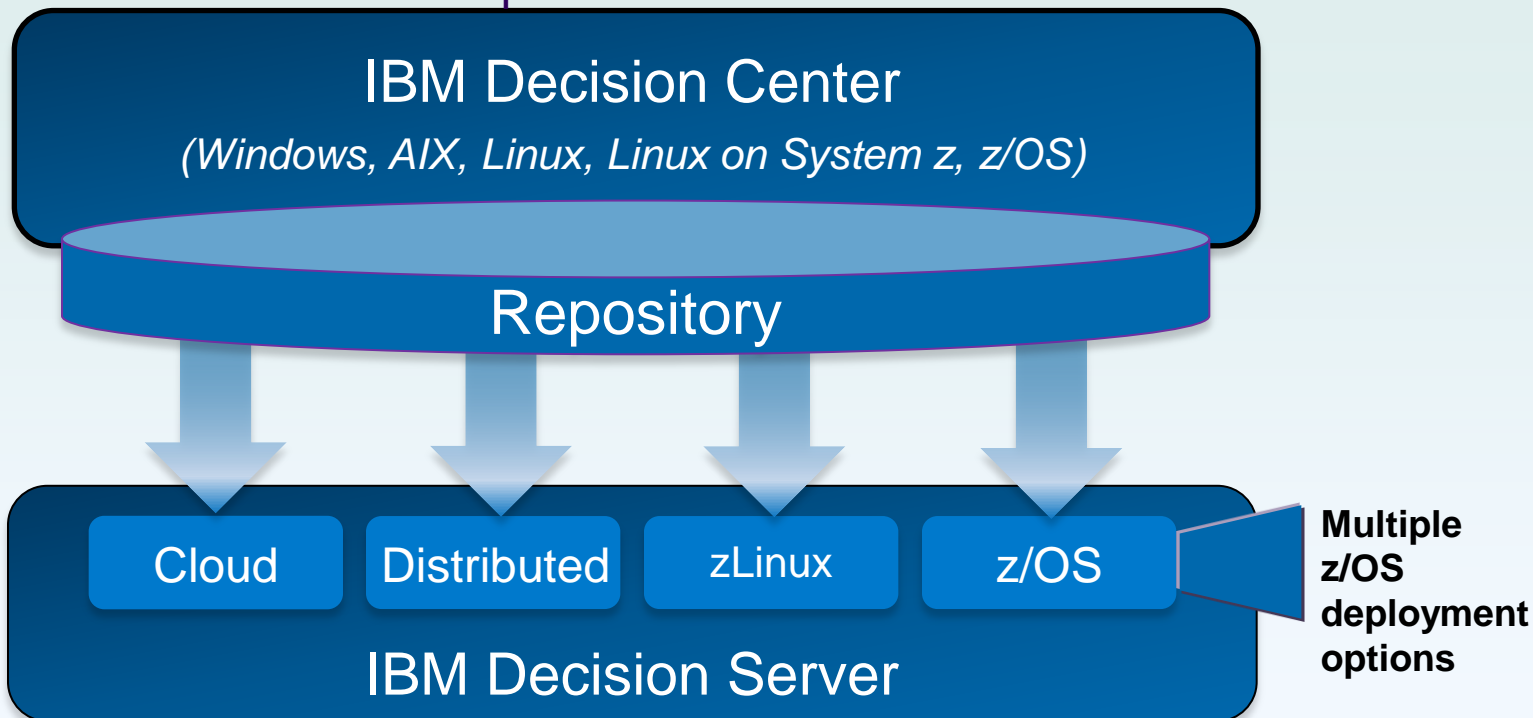
- IBM DB2 Analytics Accelerator augment analytics capabilities on historical data.
- Predictive modeling, business rules and orchestration together enable the most effective decisions
 - Advanced analytics with classification, association, segmentation model types (CHAID, NN, C&R, ...)
 - Rules to define action based on thresholds
 - Orchestration to coordinate all activity

IBM Operational Decision Manager V8.8

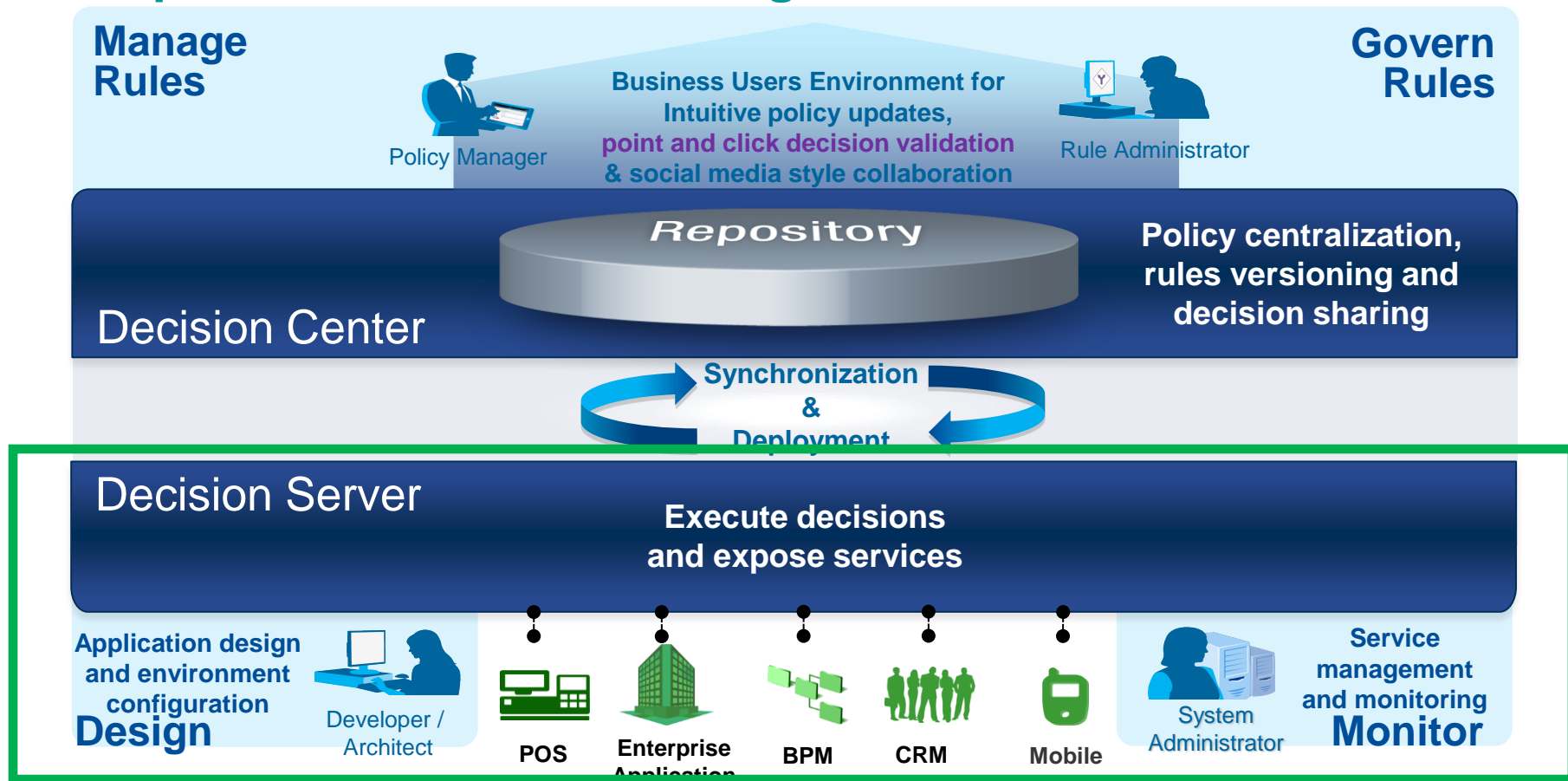


IBM Operational Decision Manager

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



IBM Operational Decision Manager V8.8



Designing rules based applications

Model/Author

- Capture business objects
- Vocabularies
- Projects structure and organization
- Rules templates and authoring

Validate/Test

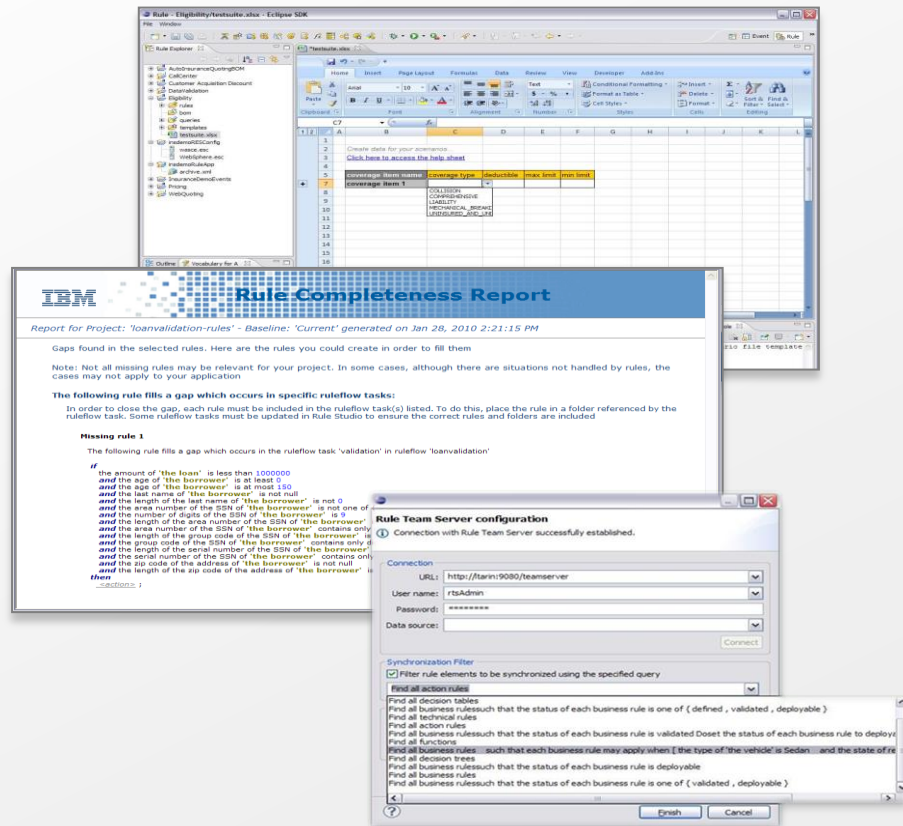
- Step-by-step debugging
- Value inspectors
- Test and simulation suites definition

Configure

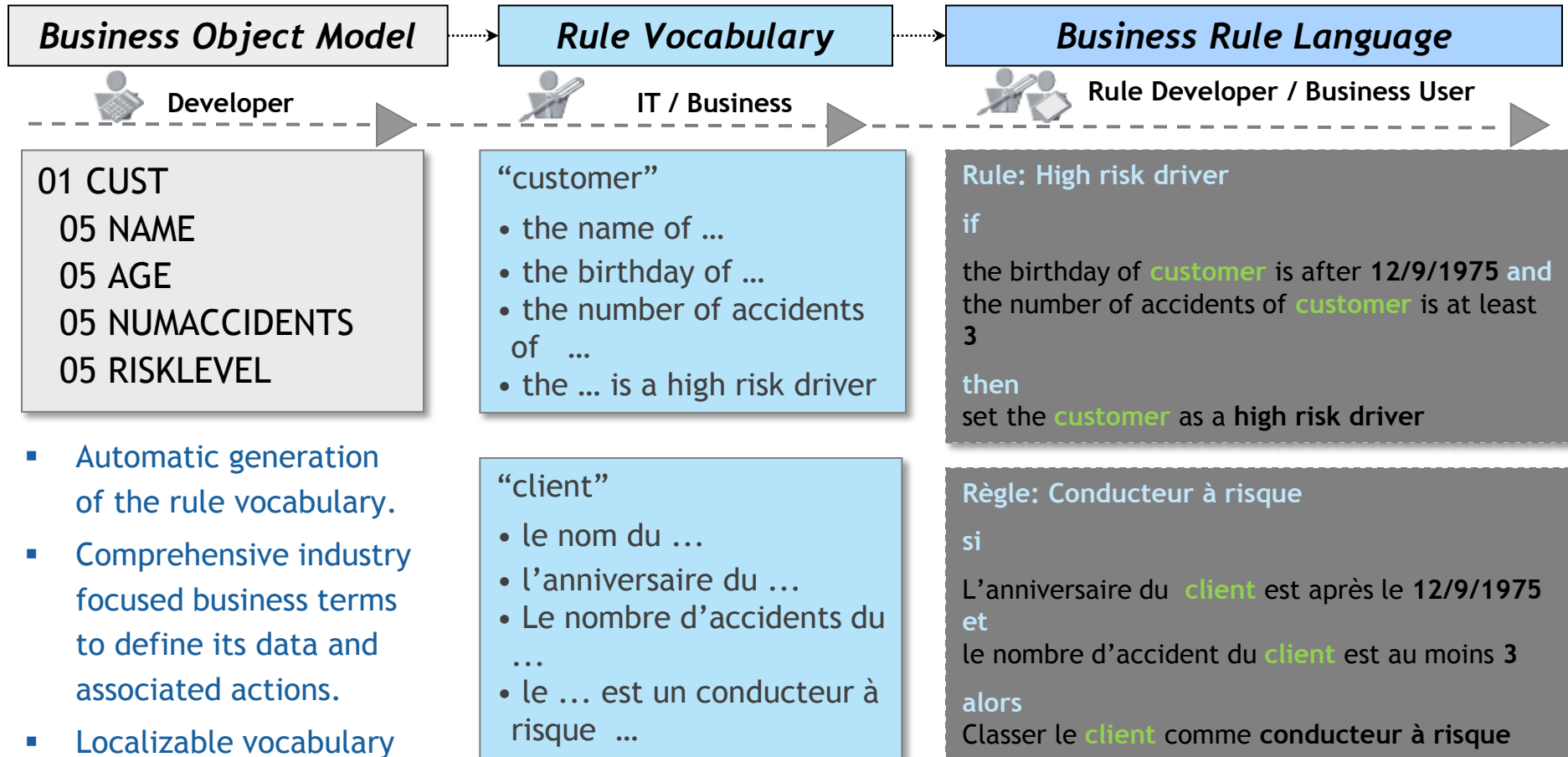
- Business environment (Decision Center)

Deploy

- Deployment to Decision Server Rules



ODM Brings the IT and Business World together



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

Actions

**Built-in
Gap/Overlap
checking**

**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 ;

Rule Execution Server

- **High performance & scalable rule execution**

- Support transactional and batch rule execution
- Inference and sequential rule engine
- Cluster enabled

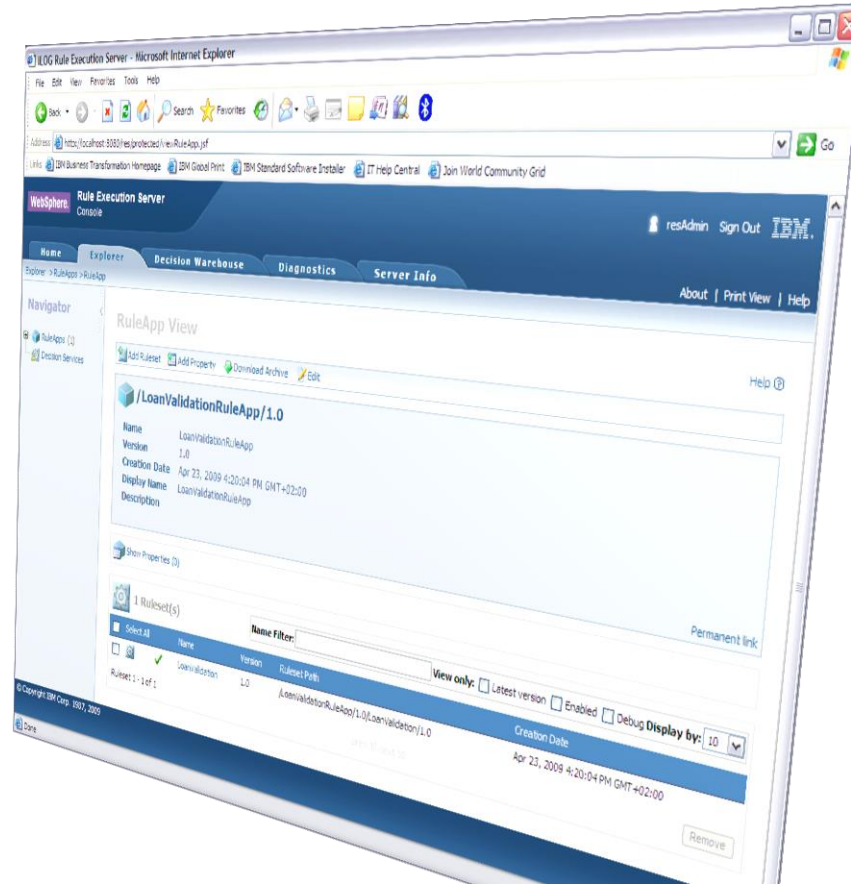
- **Integrate with Java, XML, COBOL & PL/I**

- **Exposes rule services as**

- Rule Session (POJO, EJB or MDB)
- Transparent Decision Services (Web Services)
- REST
- COBOL or PL/I Applications through dedicated API

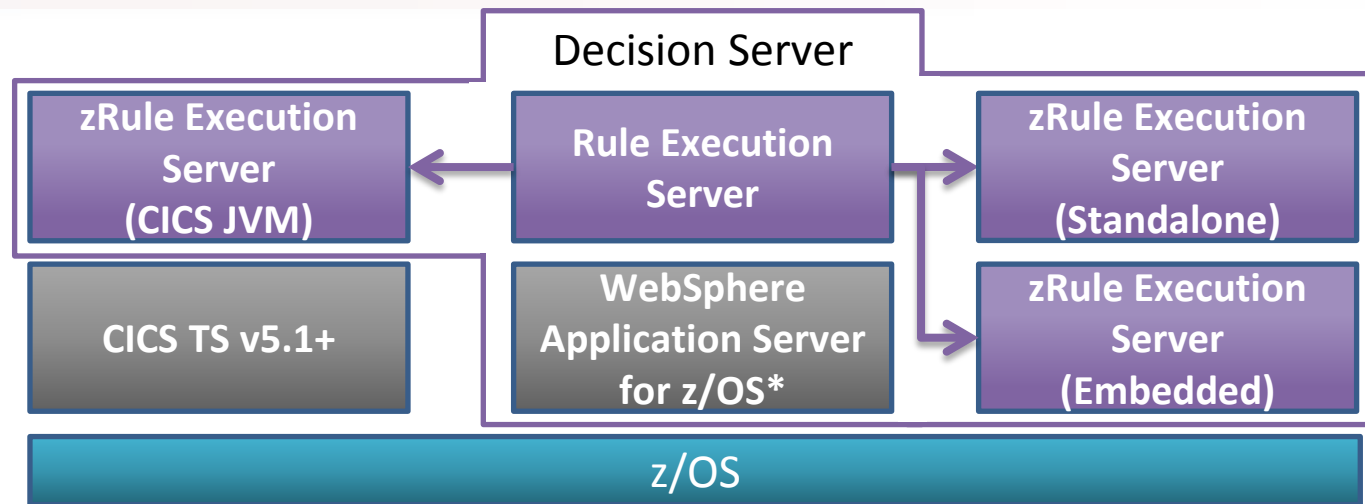
- **Rule services management & monitoring**

- Rule Persistence and Versioning
- Rule Execution statistics & trace
- Administration console



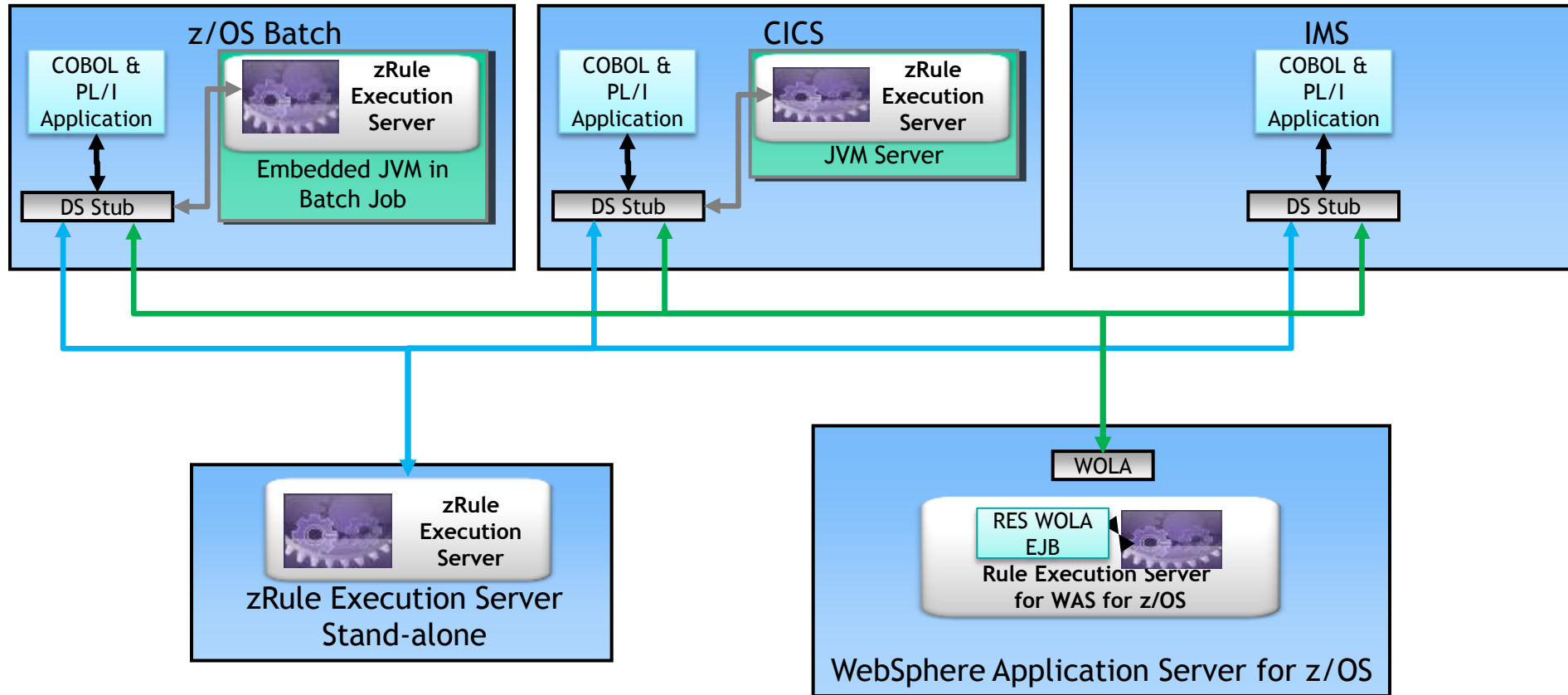
Decision Server Runtime Options

- Decisions can be invoked from existing CICS, batch and IMS applications
- Runtime support for COBOL and PL/I data types
- Flexible runtime deployment to fit any System z environment:
 - Deployed on WebSphere Application Server for z/OS
 - Deployed standalone or embedded to z/OS
 - Deployed in CICS TS 5.1 and above JVM server environment
 - Deployed local to the batch address space



* limited use entitlement included with Decision Server

Decision Invocation Options on z/OS



zRES Programming API

- **Connect to Execution Region**

```
call 'HBRCONN'  
    using HBRA-CONN-AREA
```

- **Populate parameter data**

- **Connect to Execution Server**

```
call 'HBRRULE'  
    using HBRA-CONN-AREA  
  
IF HBRA-CONN-COMPLETION-CODE = HBR-CC-OK  
THEN  
    . . .
```

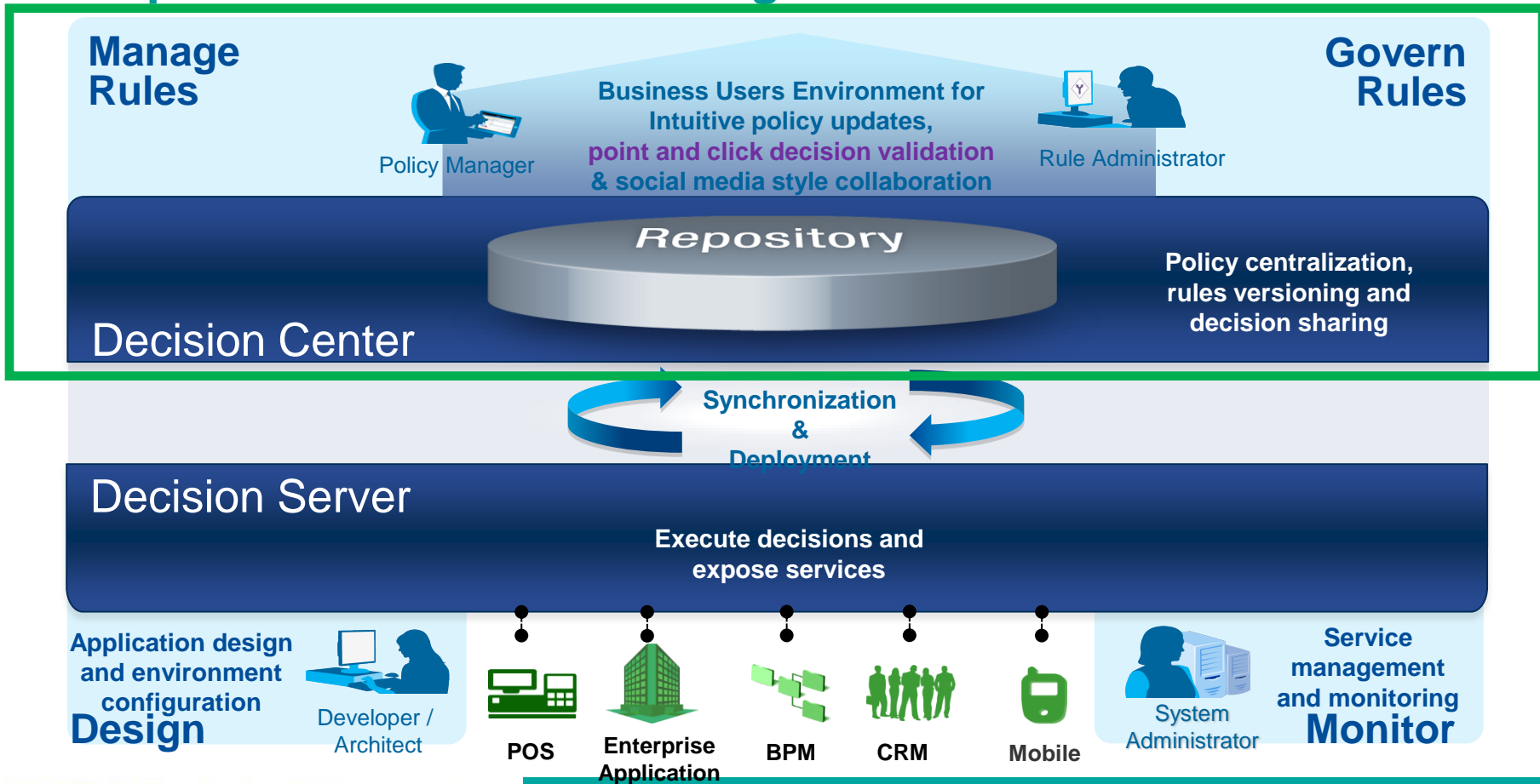
- **Disconnect from Execution Region**

```
call 'HBRDISC'  
    using HBRA-CONN-AREA  
  
. . .
```

- **Stubs can be dynamically bound to applications from V8.8**

```
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 +2.  
    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-CONN-FLAGS              PIC S9(8)  COMP VALUE +1.  
    10 HBRA-CONN-INSTANCE           PIC X(24).  
    10 HBRA-CONN-RULE-COUNT          PIC S9(8)  COMP.  
    10 HBRA-CONN-RULE-MAJOR-VERSION  PIC S9(8)  COMP.  
    10 HBRA-CONN-RULE-MINOR-VERSION  PIC S9(8)  COMP.  
    10 HBRA-CONN-RULEAPP-NAME        PIC X(256).  
    10 HBRA-RESPONSE-AREA.  
        15 HBRA-RESPONSE-MESSAGE     PIC X(512).  
    10 HBRA-RA-PARMETERS.  
        15 HBRA-RA-PARMS OCCURS 32.  
            20 HBRA-RA-PARAMETER-NAME PIC X(48).  
            20 HBRA-RA-DATA-ADDRESS   USAGE POINTER.  
            20 HBRA-RA-DATA-LENGTH    PIC 9(8)  BINARY.  
    10 HBRA-RESERVED.  
        15 HBRA-RESERVED02            PIC X(12).  
        15 HBRA-RESERVED03            PIC X(64).  
        15 HBRA-RESERVED04            PIC X(64).  
        15 HBRA-RESERVED05            PIC X(128).  
        15 HBRA-RESERVED06            PIC X(128).
```

IBM Operational Decision Manager V8.7



Simpler Access to the Decision Repository

Using the Library to access the business rule projects

The screenshot displays the IBM Decision Center Library interface. The top navigation bar includes the IBM logo, "Decision Center", and tabs for "HOME" and "LIBRARY". A user profile "cindy" is visible in the top right. Below the navigation bar, there are tabs for "Date" and "Name", and a "Filter" input field. The main content area is a grid of 12 project cards, each featuring a small icon, a title, a description, and a green "NEW" banner in the top right corner. The projects are arranged in two columns and six rows.

Project Name	Description
Pricing	Last updated by cindy on May 9, 2012
miniloan-rules	Created by rtsAdmin on Apr 23, 2012
balsample	Created by rtsAdmin on Apr 23, 2012
wavel	Created by rtsAdmin on Apr 23, 2012
loanvalidation-rules-dependent	Created by rtsAdmin on Apr 23, 2012
test-WS TestProject	Created by rtsAdmin on Apr 23, 2012
AutoInsuranceQuotingBOM	Created by adam on Apr 23, 2012
RuleAnalysisViewProject	Created by rtsAdmin on Apr 23, 2012
wavelength	Created by rtsAdmin on Apr 23, 2012
loanvalidation-rules-multivoc	Created by rtsAdmin on Apr 23, 2012
loanvalidation-rules	Created by rtsAdmin on Apr 23, 2012
project	Created by rtsAdmin on Apr 23, 2012

Intelligent Rule Editor

Using the Business Console for rule editing

The screenshot displays the IBM Decision Center Intelligent Rule Editor. The top navigation bar includes the IBM logo, 'Decision Center', and links for 'HOME' and 'LIBRARY'. The user 'cindy' is logged in. The breadcrumb trail shows 'Pricing > main > Aquisition Promotion for NJ (v1.0)'. On the right, there are 'End Edit' and 'Details' buttons. The main editing area contains a rule with the following logic:

```
if
  the state of residence of the driver is "NJ"
  and the driver has never had their license suspended or revoked
  and all of the following conditions are true :
    - the number of accidents the driver has been involved in equals 0
    - the number of traffic tickets the driver has received is 0
    - the driver has completed a drivers education course ,
then
  emit Offer promotion to retain customer with reason: "Increase market share for good NJ drivers" ;
  add a 0 % surcharge to <an auto quote response> , reason: <a string>
```

A dropdown menu is open for the placeholder '<a string>', showing two options: 'Auto Quote Response' and 'the coverage quote'.

At the bottom, a table displays error messages:

Severity	Line	Message
✖	1	The rule is incomplete, fill all the placeholders.
✖	11	The word ':' is missing.

Decision Table Editor

Using the Business Console for decision table editing

IBM Decision Center HOME LIBRARY cindy

Pricing > main > Collision Price Table NY (v1.2) ★ ⓘ

End Edit Details

1 - 16 | 16 - 18 | All

Rule

if

all of the following conditions are true :

- (the value of 'the vehicle' is more than \$ 5000 and at most \$ 10000)
- (the deductible of 'the coverage' is \$500) ,

then

set base premium for 'the coverage quote' to \$ 110 ;

Equivalent action rule

	Vehicle Value		Deductible	
	Lower	Upper		
1			\$250	\$ 100
2	\$ 0	\$ 5,000	\$500	\$ 90
3			\$1000	\$ 85
4			\$250	\$ 120
5	\$ 5,000	\$ 10,000	\$500	\$ 110
6			\$1000	\$ 100
7			\$250	\$ 130
8	\$ 10,000	\$ 20,000	\$500	\$ 120
9			\$1000	\$ 110
10			\$250	\$ 140
11	\$ 20,000	\$ 30,000	\$500	\$ 130
12			\$1000	\$ 120
13			\$250	\$ 155
14	\$ 30,000	\$ 50,000	\$500	\$ 145
15			\$1000	\$ 140
16	\$ 50,000	\$ 100,000	\$250	\$ 170

Intuitive Timeline for History Visualization

Available for Business Rules, Decision Tables and Projects

The screenshot displays the 'Decision Center' interface with the 'LIBRARY' tab selected. The breadcrumb path is 'All Projects > loanvalidation-rules > main'. The timeline is set to '2012' and 'October'. A vertical timeline axis shows a sequence of actions:

- You created snap 1 snapshot** (Oct 22, 2012 3:46:35 PM) - Includes a 'Comment' link.
- You changed the description of main branch** (Oct 22, 2012 3:38:49 PM) - Includes a 'Comment' link.
- You created approval rule** (Oct 12, 2012 1:24:00 PM) - Includes a 'Comment' link.
- You created a version of checkAmount rule** (Oct 22, 2012 3:43:46 PM) - Includes a 'Comment' link and a star icon.
- You created grade rule** (Oct 12, 2012 1:24:00 PM) - Includes a 'Comment' link and a star icon.
- You created checkIncome rule** (Oct 12, 2012 1:24:00 PM) - Includes a 'Comment' link and a star icon.

Callout boxes highlight key features:

- Comments document each new release**: Points to the 'Comment' link in the first action.
- View and revert to a specific rule version in one click**: Points to the 'Comment' link in the 'checkAmount rule' action.

Side-by-side comparison

Decision Center HOME WORK LIBRARY Paul

Pricing > Spring Recovery Release > Patch the pricing policy

You are comparing Initial Snapshot with current state. Close this message to return to the change activity.

Glob Spring surcharge

Hide summary Content (3) Properties (1)

2 rules have been updated in current state since Initial Snapshot snapshot

version 3.0
Created by Paul on Apr 12, 2013

if the value of 'the vehicle' is at least \$ 30000 then add a 4 % surcharge to 'Auto Quote Response', reason: "Spring Surcharge"

version 10.1 (current)
Created by Bea on Apr 15, 2013

if the value of 'the vehicle' is at least \$ 30000 then add a 10 % surcharge to 'Auto Quote Response', reason: "Spring Surcharge"

Decision Center HOME WORK LIBRARY Paul

Pricing > Spring Recovery Release > Patch the pricing policy

You are comparing Initial Snapshot with current state. Close this message to return to the change activity.

Project: Pricing Added (0) Deleted (0) Updated (2) Unchanged (22) Filter

2 rules have been updated in current state since Initial Snapshot snapshot

Comprehensive Price Table

Hide summary Content (3) Properties (0)

row 1, column 3: content was changed from \$ 43 to \$ 53
row 2, column 3: content was changed from \$ 40 to \$ 50
row 3, column 3: content was changed from \$ 28 to \$ 38

version 3.0
Created by Paul on Apr 12, 2013

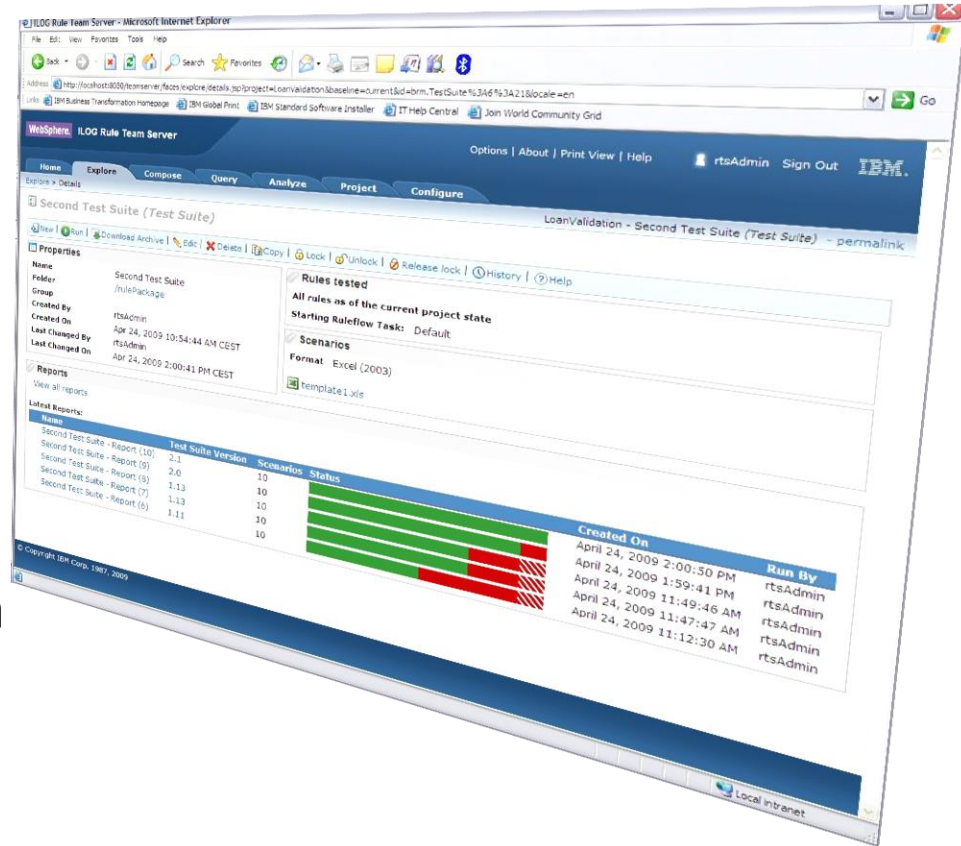
	Vehicle Value	Deductible	Base Premium
1	\$ 0, \$ 5,000]	\$250	\$43
2	\$ 0, \$ 5,000]	\$500	\$40
3	\$ 0, \$ 5,000]	\$1000	\$28
4	5,000, \$ 10,000]	\$250	\$48
5	5,000, \$ 10,000]	\$500	\$42
6	5,000, \$ 10,000]	\$1000	\$33
7	10,000, \$ 20,000]	\$250	\$52
8	10,000, \$ 20,000]	\$500	\$45

version 10.0 (current)
Created by Bea on Apr 15, 2013

	Vehicle Value	Deductible	Base Premium
1	\$ 0, \$ 5,000]	\$250	\$53
2	\$ 0, \$ 5,000]	\$500	\$50
3	\$ 0, \$ 5,000]	\$1000	\$38
4	5,000, \$ 10,000]	\$250	\$48
5	5,000, \$ 10,000]	\$500	\$42
6	5,000, \$ 10,000]	\$1000	\$33
7	10,000, \$ 20,000]	\$250	\$52
8	10,000, \$ 20,000]	\$500	\$45

Testing

- 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



Simulation in the Business Console

Define Simulation

- Metrics
- Key Performance indicators
- Simulation Data or custom data providers

Design Simulation Reports

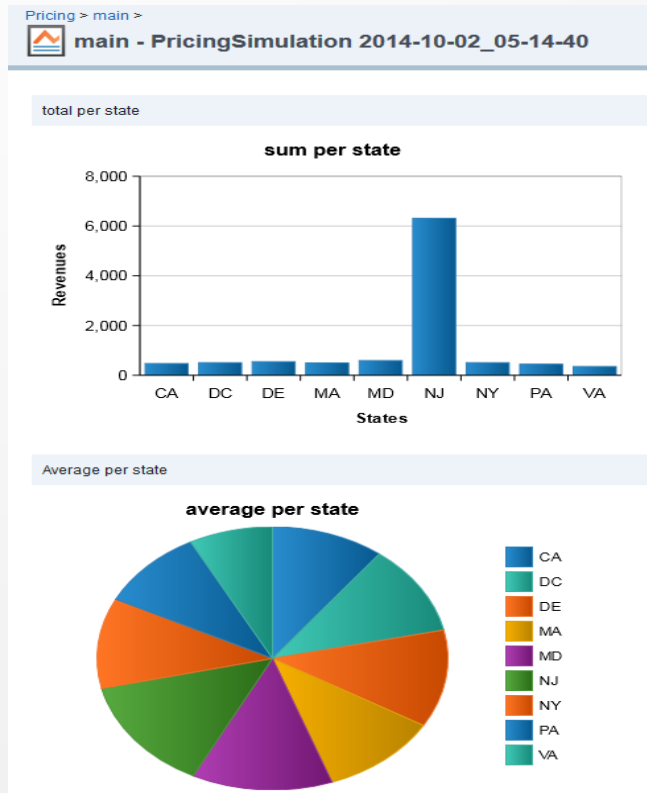
- Point and click report edition
- Use of Graph objects for KPI rendering

Execute

- Dedicated simulation environment
- Isolated from production servers
- Integrated as part of the Validation Activity in the Decision Governance Framework

Analyze

- Simulation reports
- Side-by-side comparison



Defining Scenarios and simulation data

Simulation data

Generate Scenario File

Filename:

Operation:

Scenario file format:

Locale:

Download

A scenario file can be generated to let the user enter the simulation data in MS™ Excel

The generated file is pre formatted to receive the required data to run the simulation

driver list		quote ID	vehicle coverage lists
driver 3		Dummy-Simulation-ID01	vehicle coverage request 1
driver 4			
driver 5			
driver 3			vehicle coverage request 2
driver 4			
driver 5			vehicle coverage request 3
driver 3			
driver 4			
driver 5			
Scenario 2	simulation	Dummy-Simulation-ID02	vehicle coverage request 4
driver 3			
driver 4			
driver 5			vehicle coverage request 5
driver 3			
driver 4			vehicle coverage request 6
driver 5			
driver 3			
driver 4			
driver 5			
Scenario 3	simulation	Dummy-Simulation-ID03	vehicle coverage request 7
driver 3			
driver 4			
driver 5			vehicle coverage request 8
driver 3			
driver 4			
driver 5			

Custom data providers can also be provided to get data from a database for example

Custom Data Provider

dataFile

Name:

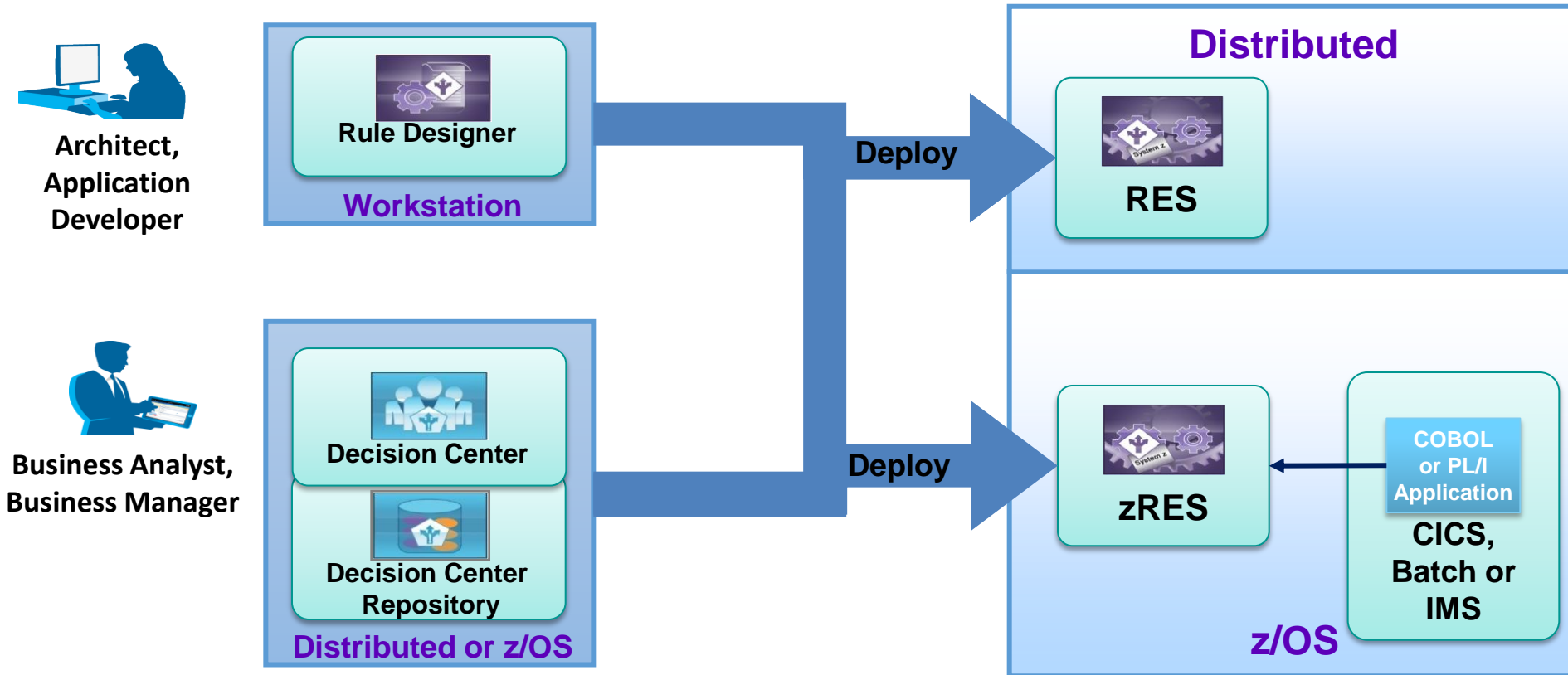
Operation:

File: **Browse...**

Type:

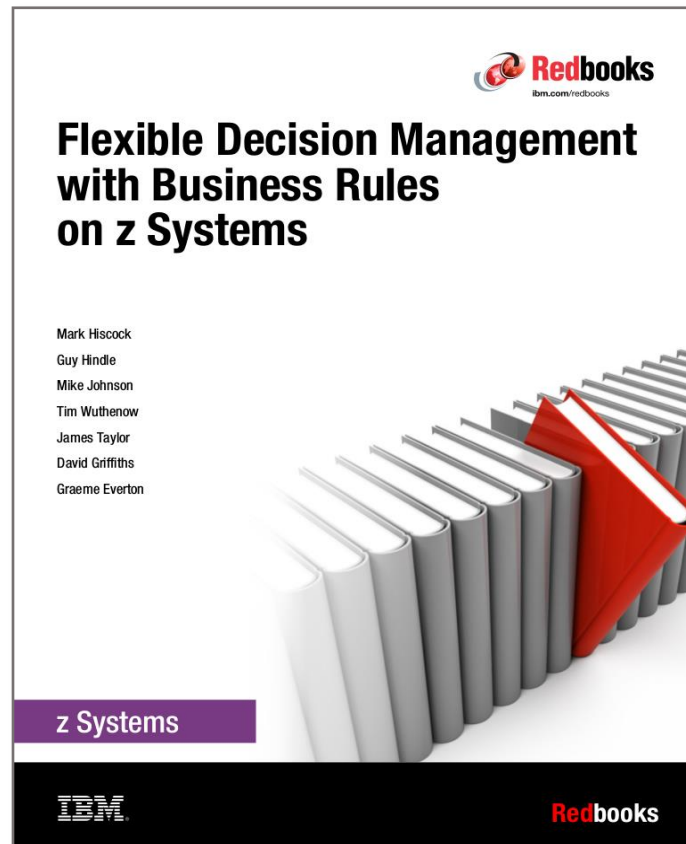
Update

Managing and Deploying Decisions



Updated Redbook for 8.7.1

- Update to the second edition based on ODM 8.0.1
- Details all new features in 8.7.1
- New chapters added for:
 - zRES embedded mode
 - Liberty
 - SMF 120
- Focus on business rules



Where can I find out more?

- <http://www.ibm.com/operational-decision-management>
 - Shortcut: <http://ibm.com/ibmodm>
 - [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](#)
- [Operational Decision Management eBook: Enabling Faster, More Consistent Business Decisions in Enterprise Applications \(April 2014\)](#)
- [Optimizing Decision Management with IBM WebSphere and System z \(YouTube\)](#)
- IBM Operational Decision Management YouTube demo
- [Good Decision! Decision Management blog](#)

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