16569: Dynamic Business Rules and other things you didn't think CICS could do

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SHARE is an independent volunteer-run information technology association that provides **education**, professional **networking** and industry **influence**.

Agenda

- The need for Operational Decision Management
- IBM Operational Decision Manager
- Request Driven Decision Automation
- Situation Driven Decision Automation

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Business Decisions are Everywhere…

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*

Operational Decision Manager for z/OS

Providing an easily manageable, single source of truth for
operational business decisions

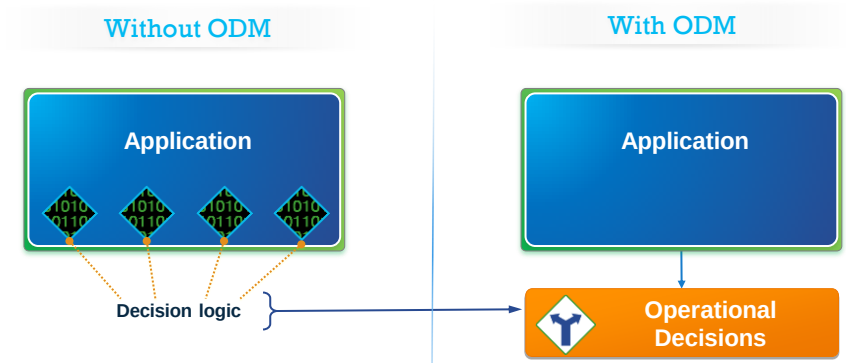
Codifies business policies, practices and regulations

Enables changes to be easily made by business people

Automates decision making with the fidelity of an expert

Codify business policies, practices, and regulations

Manage decision logic independently from applications

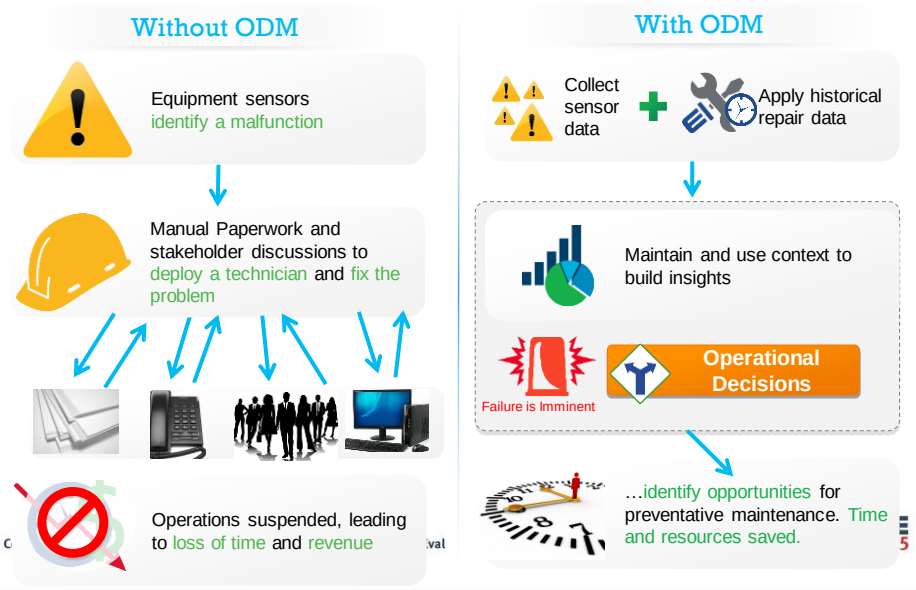


- Hard coded decisions are difficult to change
- Rules intertwined within applications cannot be reused by other systems

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

Detect Business Situations in context

Gather and apply context to act appropriately in real-time



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*

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

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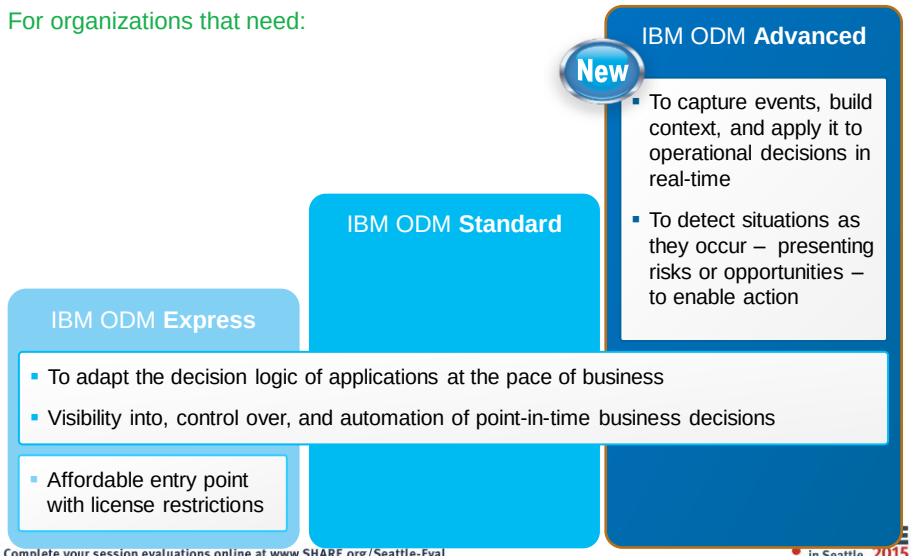
IBM Operational Decision Manager: Multiple editions to meet client needs

For organizations that need:



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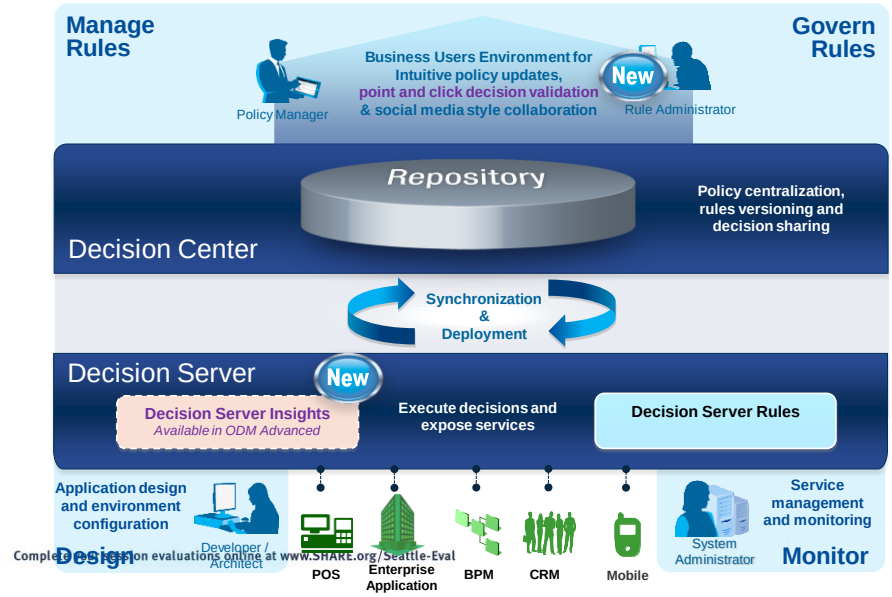
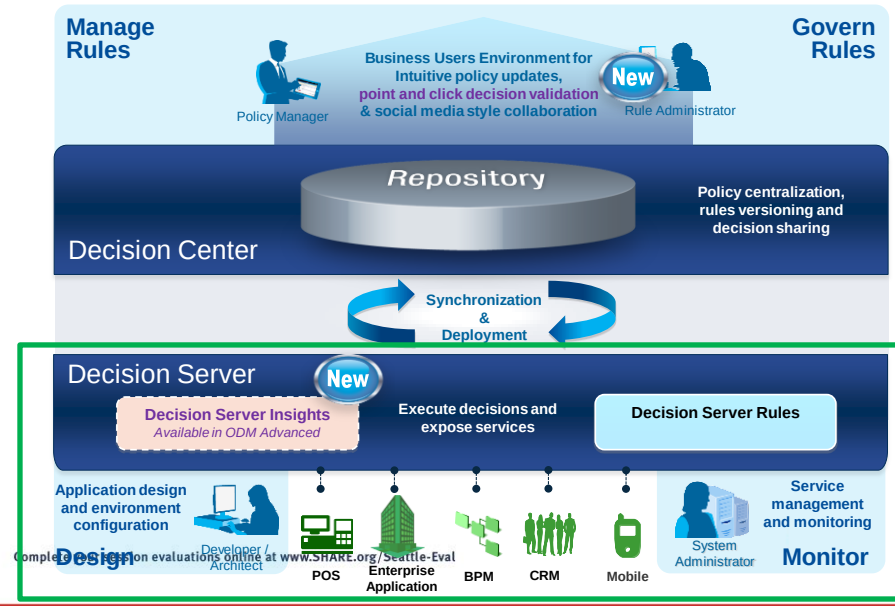
IBM Operational Decision Manager V8.7



IBM Operational Decision Manager V8.7



Designing rules based applications

Rule Designer

Model/Author

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

Validate/Test

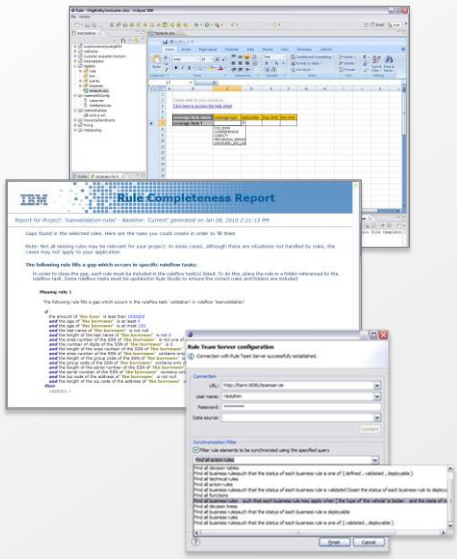
- Step-by-step debugging
- Value inspectors
- Test and simulation suites definition
- Completeness reports

Configure

- Business environment (Decision Center)

Deploy

- Deployment to Decision Server Rules



Bringing 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**

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

"client"
- le nom du …
- l'anniversaire du …
- Le nombre d'accidents du …
- le … est un conducteur à risque …

Règle: Conducteur à risque

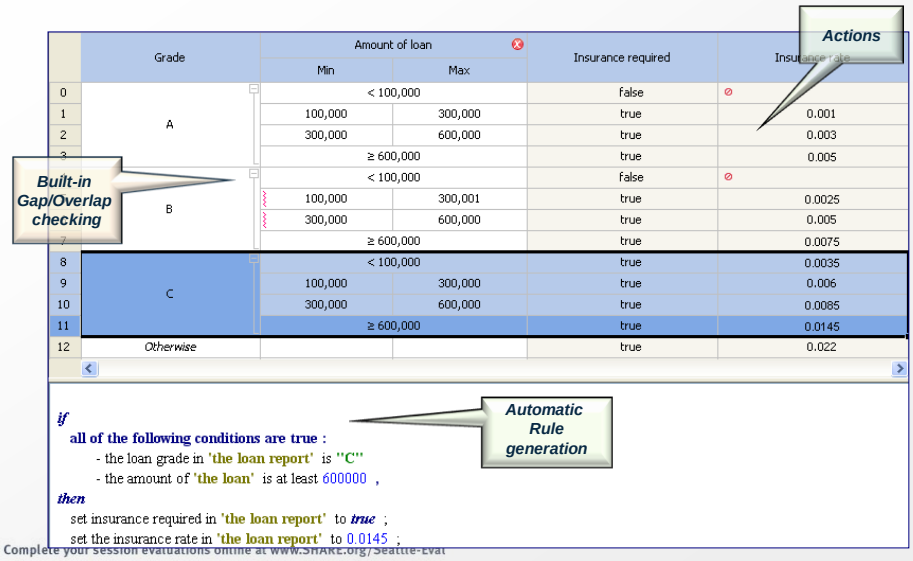
si

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**

Decision Tables



	Grade	Amount of loan Min	Amount of loan Max	Insurance required	Insurance rate
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

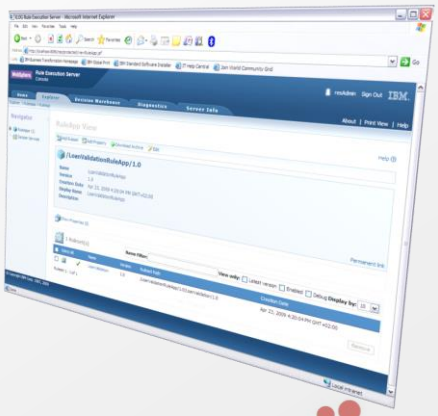
if
all of the following conditions are true :
- the loan grade in **'the loan report'** is **"C"**
- the amount of **'the loan'** is at least 600000 ,

then
set insurance required in **'the loan report'** to ***true*** ;
set the insurance rate in **'the loan report'** to 0.0145 ;

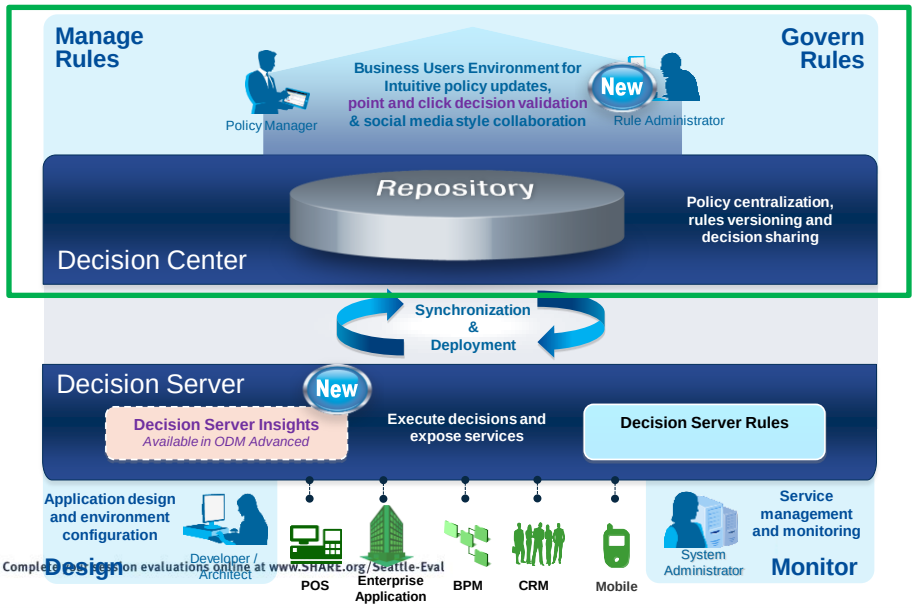
Rule Execution Server

High Performance and Scalability

- High performance and scalable rule execution
  - Support transactional and batch rule execution
  - Inference (forward-chaining) and sequential rule engine
  - Cluster enabled
- Integrate with Java, XML, Enterprise 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



IBM Operational Decision Manager V8.7



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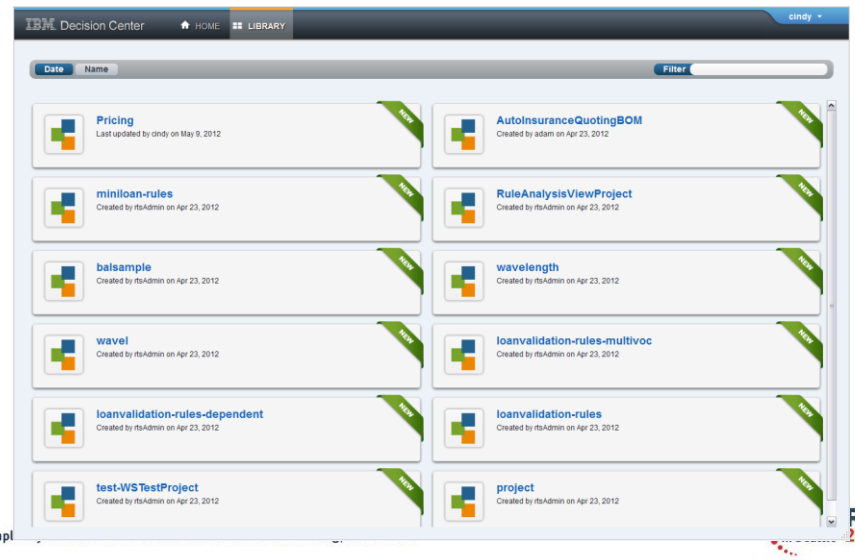
Business Console

Simpler Access to the Decision Repository

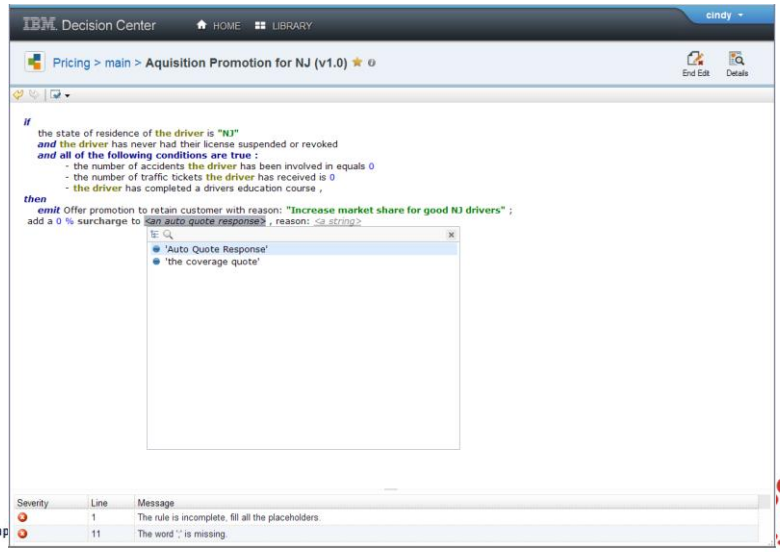
Using the Library to access the business rule projects



Business Console

Intelligent Rule Editor

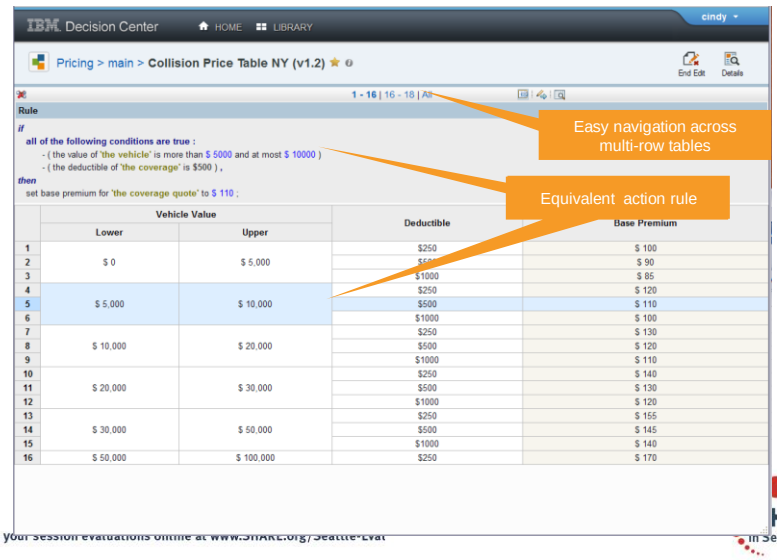
Using the Business Console for rule editing



Business Console

Decision Table Editor

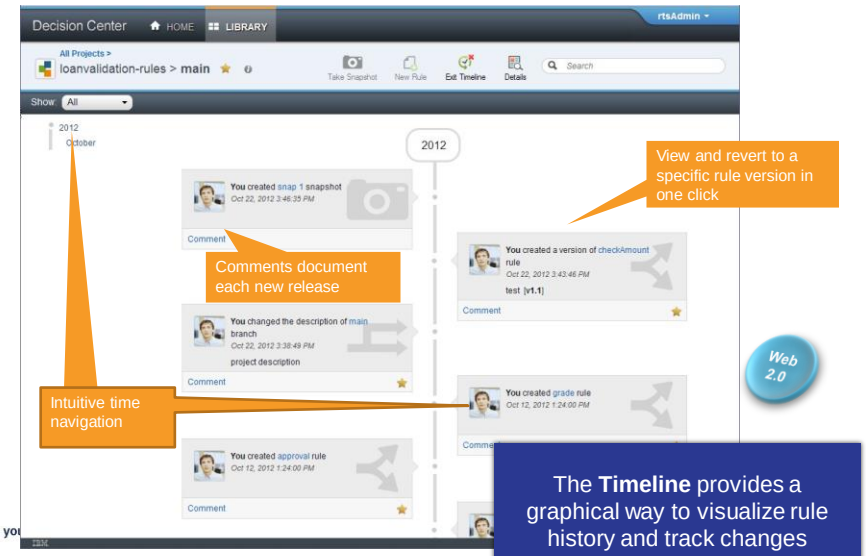
Using the Business Console for decision table editing



Business Console

Intuitive Timeline for History Visualization

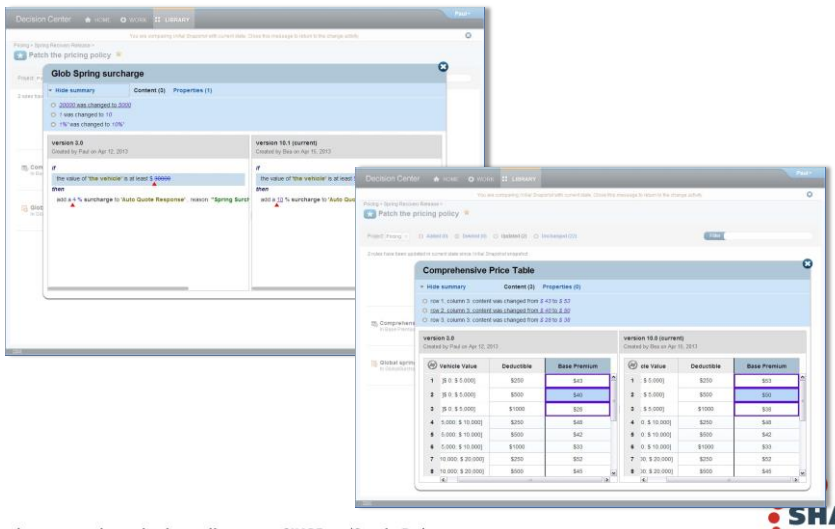
Available for Business Rules, Decision Tables and Projects



The **Timeline** provides a graphical way to visualize rule history and track changes

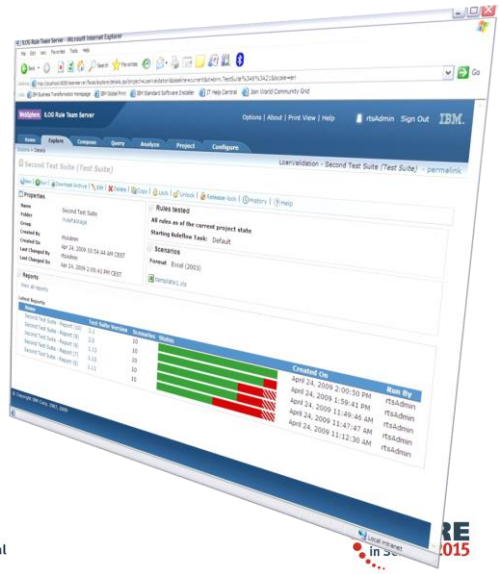
Business Console

Side-by-side comparison



Testing

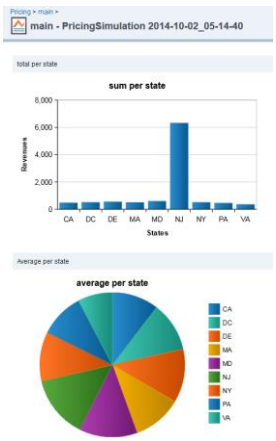
- The feature formally known as Decision Validation Services
- Functionality Overview
  - Out-of-the-box ruleset testing in Decision Center
  - Business impact simulation in Decision Center
  - Scenario configuration and customization in Rule Studio
  - Audit - Decision Warehouse in Rule Execution Server



Simulation in the Business Console Objectives

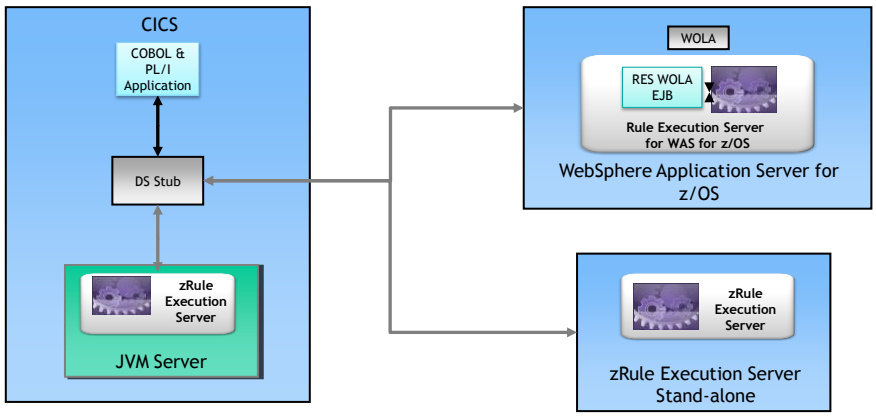
New in 8.7

- Empower business users to better evaluate the impact of their policy updates
- Estimate the decision quality during the update cycle
- Enable business users to proactively evaluate impact against new key performance indicators and scenarios
- Provide full autonomy to business users



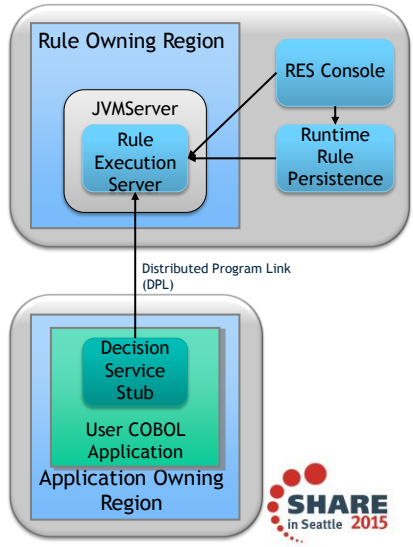
Business Rules on z/OS
Runtime Options

Decision Invocation Options for CICS



CICS Rule-Owning Regions (ROR)

- A CICS rule-owning region allows centrally hosted rules to be called by multiple CICS regions
- The rule-owning region hosts a zRule Execution Server for z/OS instance that runs locally in the CICS JVM server.
- The application-owning region uses a CICS Distributed Program Link (DPL) to run rules in a rule-owning region
- CICS DPL supports the ability for CICS to work load balance by having multiple rule-owning regions
- This is the only 'out of the box' configuration that supports cross LPAR communications



zRES 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
```

```
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).
```

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Monitoring Decision Execution

Enhanced in 8.7

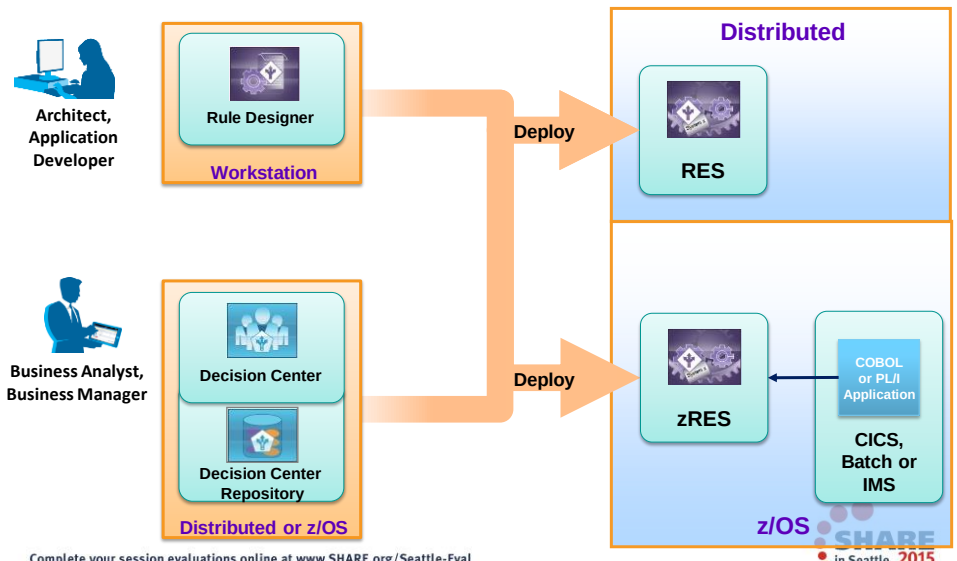
SMF 120 subtype 100 Usage Records

- Each record contains
  - Standard SMF Header
  - ODM Header
  - Zero to many Execution Segments Records
- Execution segment record contains data collected for each decision defined by a unique ruleset path
  - E.g. /MiniLoanDemoRuleApp/1.0/MiniLoanDemo/2.0/

- Data Collected contains
  - Number of times decision is invoked
  - Number of times decision invocation failed
  - Sum of all rules 'fired' for this decision
  - Total 'wall clock' time of executions for this decision
  - Max and Min 'wall clock' times
  - Total CPU time spent in JVM
  - Max and Min CPU time spent in JVM

New in 8.7

Managing and Deploying Decisions



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What if I could …

Detect more complex patterns of fraud and update them faster?

A payment processing organization tracks transactions, establishes trends, detects patterns and predicts risks to identify fraud situations, take appropriate actions and alert the involved parties.

Make my advisors always-aware of client activities and needs?

A global financial services firm wants to be aware of all client activities across all channels – on premise, call center, online, social media, etc. – to be able to better serve their clients' needs.

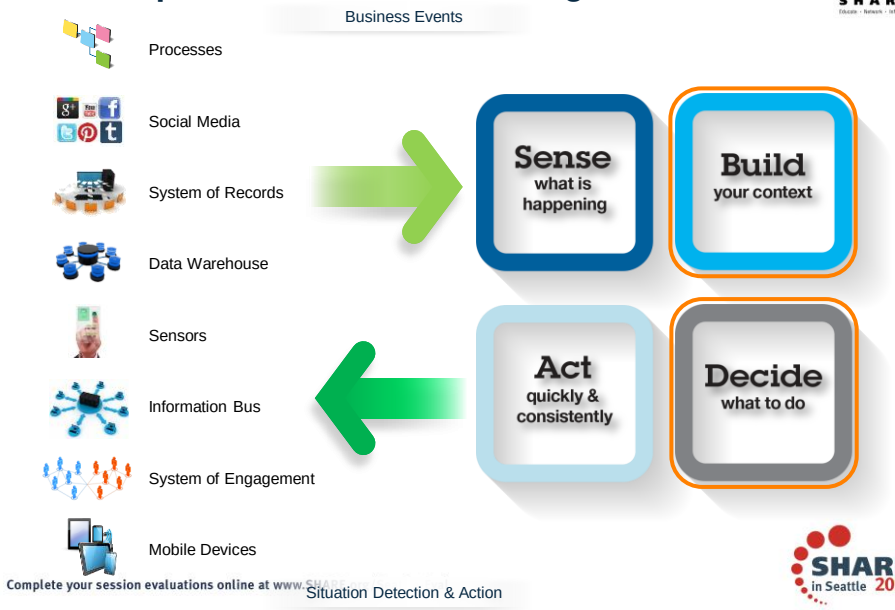
Maximize the efficiency of my operations and predict equipment maintenance?

A national railway company monitor their freight operations to optimize fuel consumption, enable predictive maintenance, facilitate re-planning and continuously inform customers about reached milestone or unexpected delays.

Optimize the traveler experience and proactively address and mitigate imponderables?

A national airline monitors the journey of its customers, pro-actively informing them of schedule changes and compensating for any inconveniences.

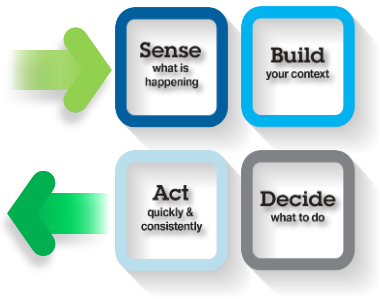
Four Steps toward decision making in context



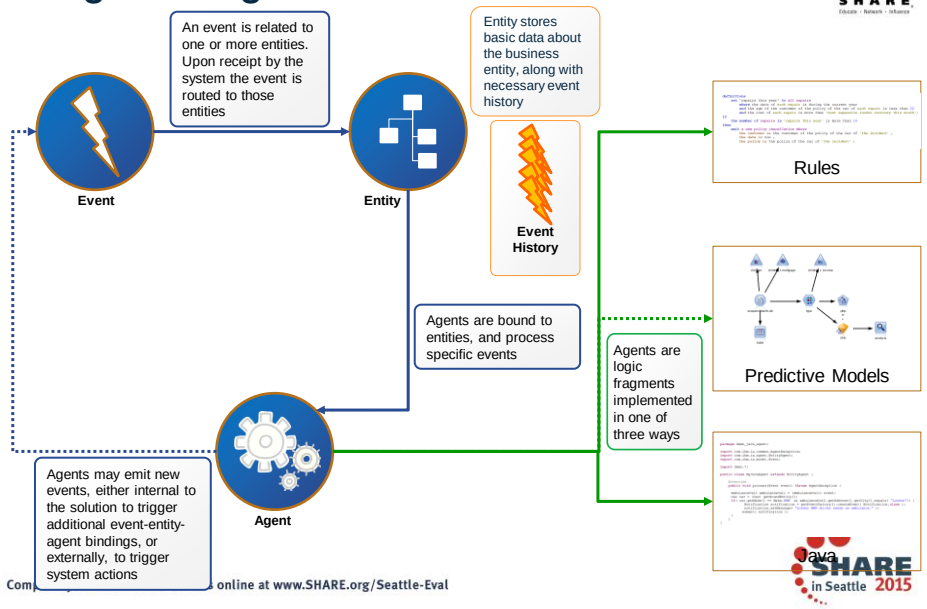
Decision Server Insights

Decision Server Insights wraps ***business rules, events, predictive*** and ***real-time analytics*** in an integrated, easy to operate, elastic platform.

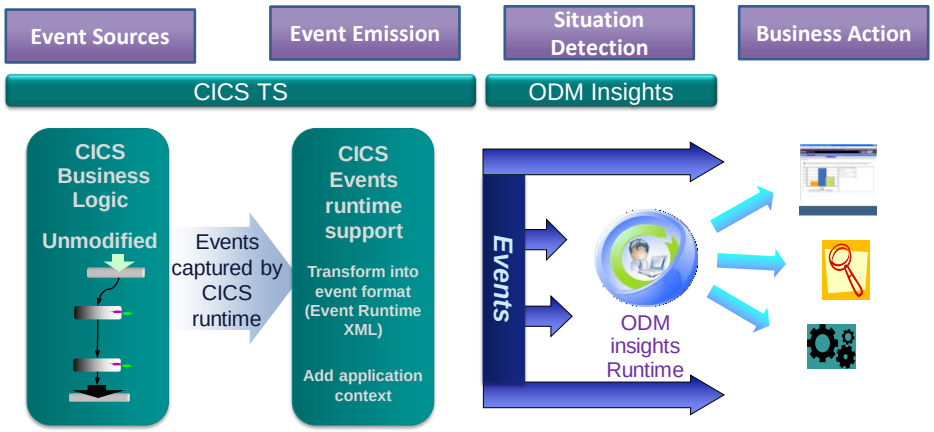
Allows continuous analysis and optimized decisions at the time of interaction leveraging ***the enterprise's up-to-date analytic models and business policies.***



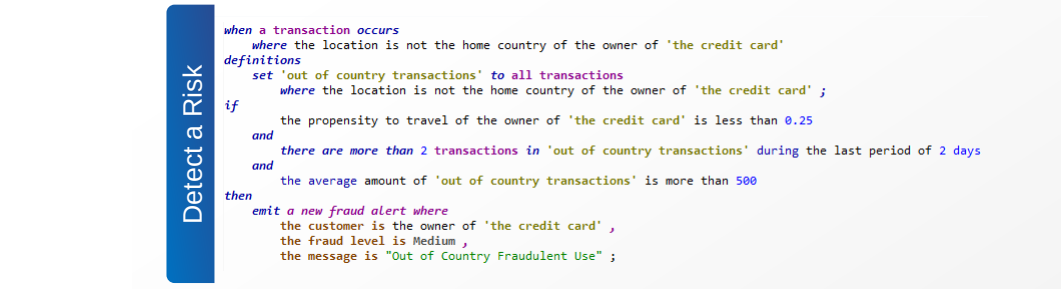
Programming Model



Event Emission from CICS TS



Decision Server Insights rule examples



Detect a Risk

```
when a transaction occurs
    where the location is not the home country of the owner of 'the credit card'
definitions
    set 'out of country transactions' to all transactions
        where the location is not the home country of the owner of 'the credit card' ;
if
        the propensity to travel of the owner of 'the credit card' is less than 0.25
    and
        there are more than 2 transactions in 'out of country transactions' during the last period of 2 days
    and
        the average amount of 'out of country transactions' is more than 500
then
    emit a new fraud alert where
        the customer is the owner of 'the credit card' ,
        the fraud level is Medium ,
        the message is "Out of Country Fraudulent Use" ;
```

Size an opportunity

```
when a credit card activated event has occurred 7 days ago
if
        the home country of the owner of 'the credit card' is US
    and
      ( there is no transaction during the last period of 7 days
          or
        the average amount of all transactions during the last period of 7 days
                                    is less than 'Average Last Week Transaction Amount' )
then
    emit a new offer where
        the customer is the owner of 'the credit card' ,
        the offer type is Discount ,
        the message is "We offer you a 10% discount" ;
```

Why Operational Decision Manager for z/OS?

Agility	▪ Operationalize policy changes in days versus months ▪ Decrease cost of implementing business practices, policies & regulations
Efficiency and Productivity	▪ Improve straight-through-processing ▪ Involve business users for change requests with built-in governance
Decision Quality and Precision	▪ Implement more fine-grained, targeted decisions ▪ Perform what-if and impact analyses prior to deployment
Consistency	▪ Automate and consistently enforce decision policies ▪ Ensure policies and associated semantics are consistent across channels
Transparency, Auditability, Compliance	▪ Track what decisions were made and why (runtime) ▪ Track what policies were changed and by whom (rule management)

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

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
- Top System z blogs to check out:
  - Mainframe Insights
  - Smarter Computing
  - Millennial Mainframer
  - Mainframe & Hybrid Computing
  - The Mainframe Blog
  - Mainframe Watch Belgium
  - Mainframe Update
  - Enterprise Systems Media Blog
  - Dancing Dinosaur
  - DB2 for z/OS
  - IBM Destination z
  - DB2utor

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