



PMC103

Business Rules Management with SAP: BRFplus and SAP NetWeaver BRM

Carsten Ziegler, SAP AG / Harsh Jegadeesan, SAP Labs India
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Agenda

Business Rules in the enterprise architecture

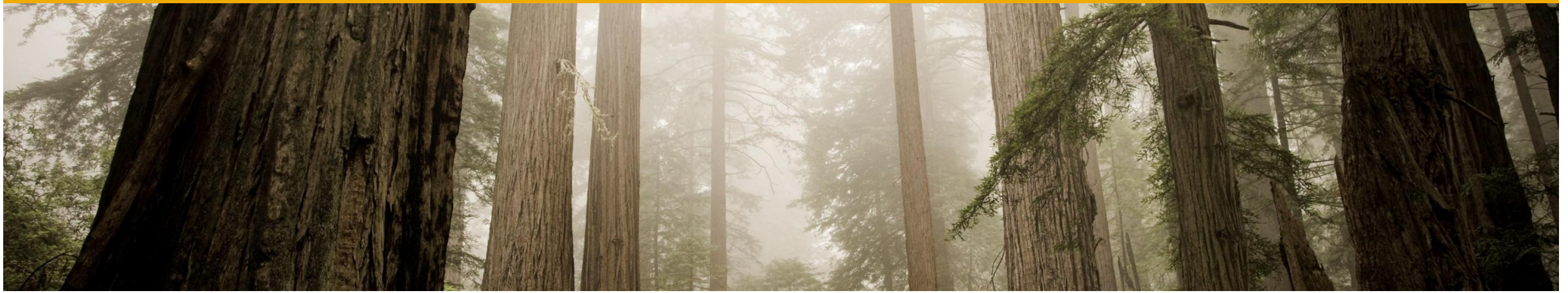
- Business analysts about business rules
- Agility versus automation
- Business Rules in the enterprise architecture

Business Rules Management with SAP

- BRFplus - live demo and components
- NW BRM - live demo and components
- Usage recommendations

Outlook: News from the Labs

Q&A



Business Rules in the Enterprise Architecture

The Top 15 Technology Trends EA Should Watch: 2011 To 2013

(Forrester Research, Oct 2010)

Rank	Technology trend	Impact	"Newness"	Complexity
1	Next-gen BI takes shape, combining real-time access with pervasiveness, agility, and self-service.	Very high	High	High
2	Business rules processing and policy-based SOA move to the mainstream.	Very high	High	High
3	SaaS and cloud-based platforms become standard.	Very	high High	Very high
4	System management enables continued virtualization.	Very high	Moderate	Low

“ ”

A key trend in application architectures is the **externalization of the policies and rules** that drive key decision points in application logic. Externalization exposes rules to policy subject-matter experts for explicit development and maintenance. Business rules processing enables **rule management by business-side experts**. Applications based on business rules processing are **moving from niche into mainstream as rules enable the creation of more-responsive, more-personalized experiences** based on more-complex conditions. Rules engines with the appropriate configuration management infrastructure enable business managers to maintain rules and more quickly explore ways of optimizing business processes.

Business Rules and Decisioning for Process Experts

(James Taylor, 2010)

“ ”

No organization can be more effective than its systems.

[...]

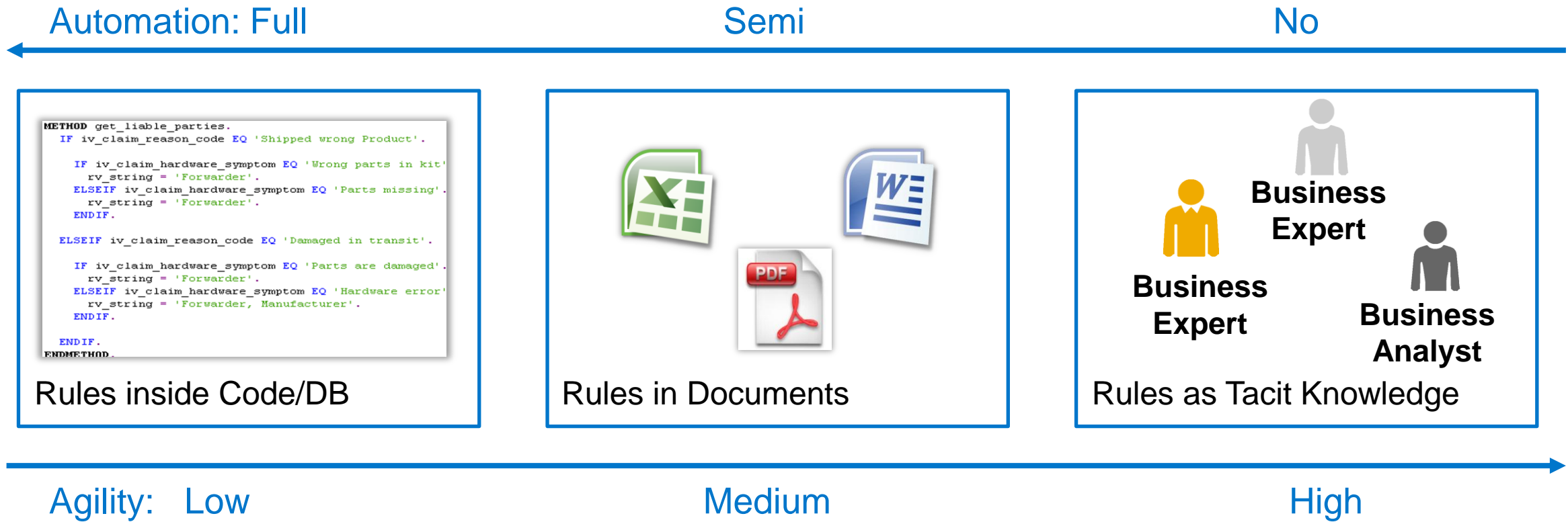
Adding decisioning to business process-oriented thinking creates **simpler and more agile processes, and more flexible business applications**. Externalizing decisions and applying business rules technology to effectively manage those decisions improves visibility, **builds in a capacity for change and helps ensure business/IT alignment**.

In each case – simpler processes, more flexible business applications, an increased capacity for change and improved alignment – decisioning enhances a business process orientation to **deliver greater value to the business**.

[...]

SAP has developed two robust business rules management platforms, supporting both its Java and ABAP environments. These technologies can be used to ensure that decisions are effectively managed and integrated throughout an SAP enterprise backbone.

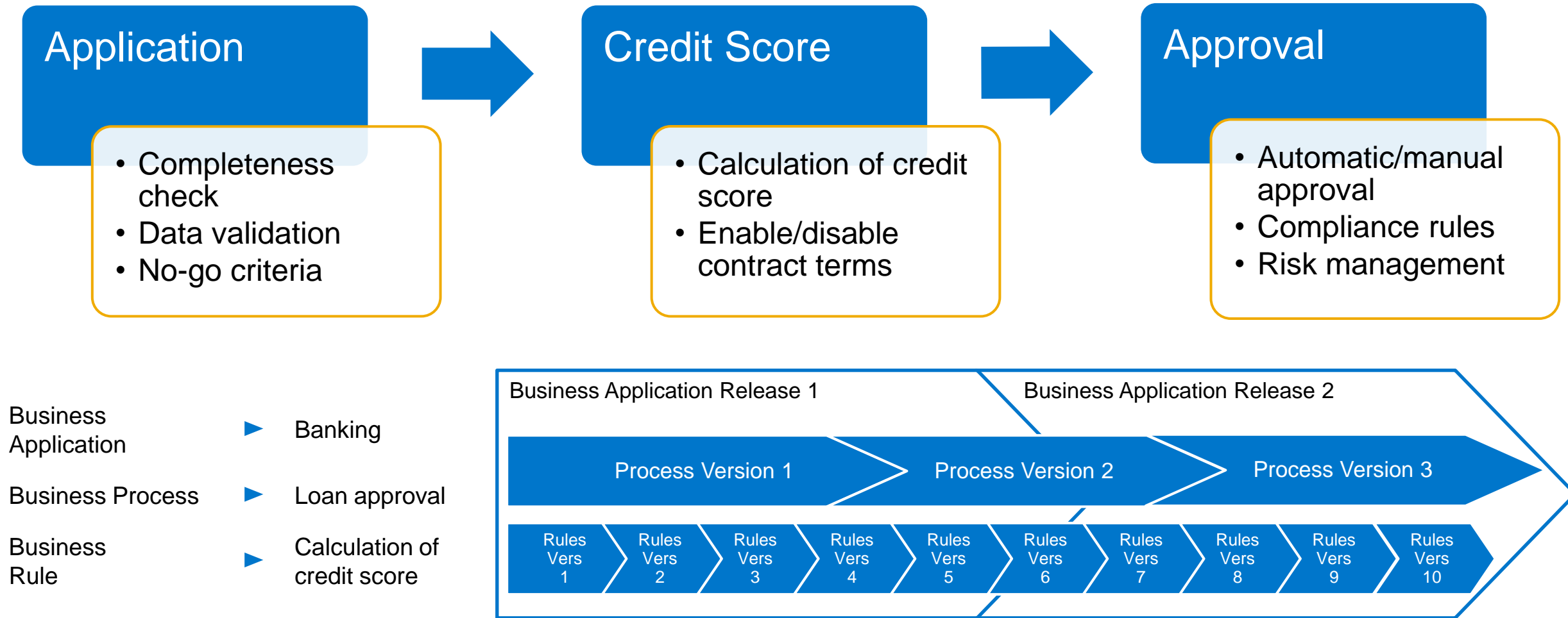
Agility vs. Automation



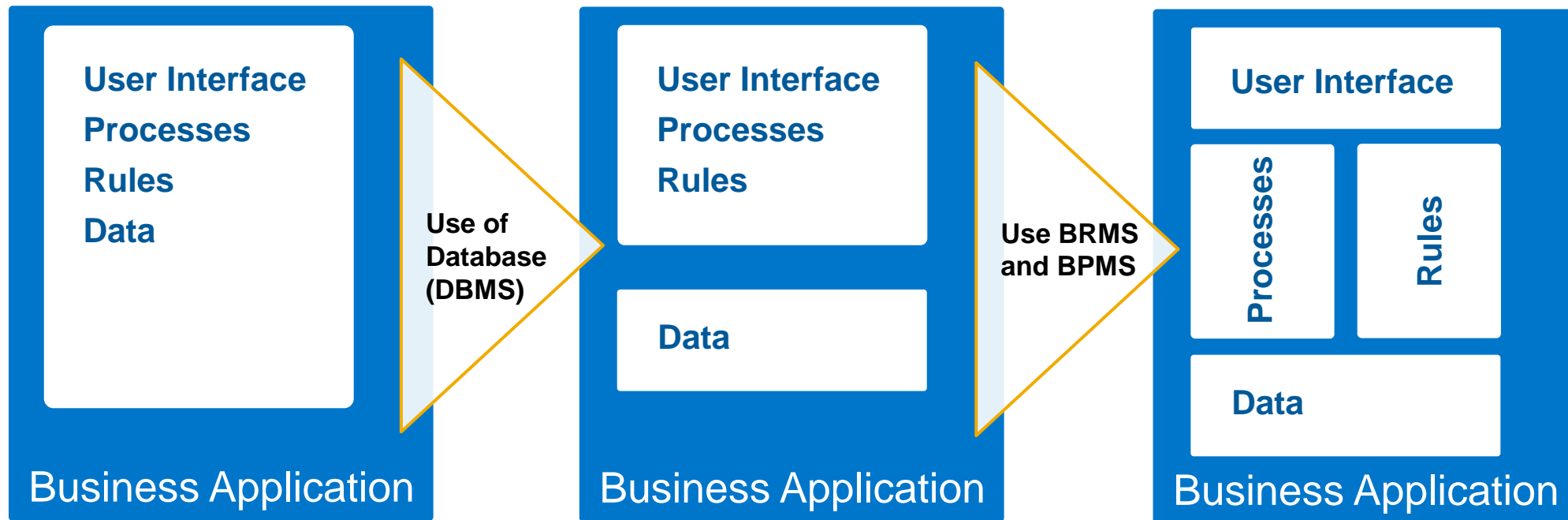
Questions:

- What are my costs for changes?
- How to gain transparency for business users?
- How to enforce policies in business operations?
- How to achieve legal compliance?

Business Applications, Business Processes, and Business Rules



Evolution of Business Application Architecture



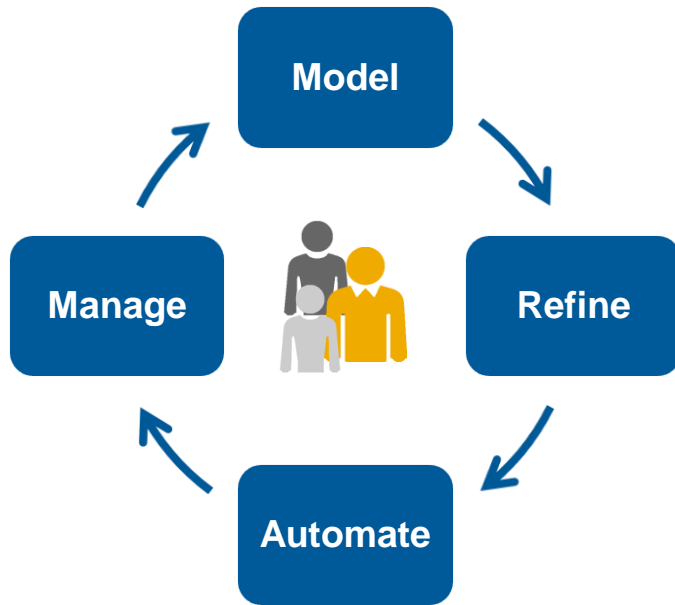
Use of a database management system (DBMS) helps separate application data and application logic

- Tools optimized for data management

Use of a business rule management system (BRMS)

- Tools optimized for business rules management, targeting also non-technical user groups
- Once the BRMS services are defined and plugged into the application, rules changes do not require programming skills
- Business rules should be considered early in the application lifecycle

Benefits of Using Business Rules Management



Business Rules Management	Benefit
Separation of business rules and code	Agile and maintainable systems
Modeling of complex business logic	Automation of key business decisions
Central management of business rules	Consistent application of corporate policy and government regulations
Business Experts can find, change and test critical business rules	Visibility, accountability and error-free business

Business Rules Management

- Flexible & agile business systems
- Faster turnaround times for changes
- Reduced cost for changes
- Precise & informed decision making
- Improved visibility for the business

Ubiquitous Business Rules

Banking: Relationship based Pricing, Scorecards, Credit Decisioning



Education: Fee Calculations, Course Selections



Healthcare: Claims, Patient Monitoring, Fraud Detection



Logistics and Shipping: Parts Management, Duties Calculations, Pricing Calculations

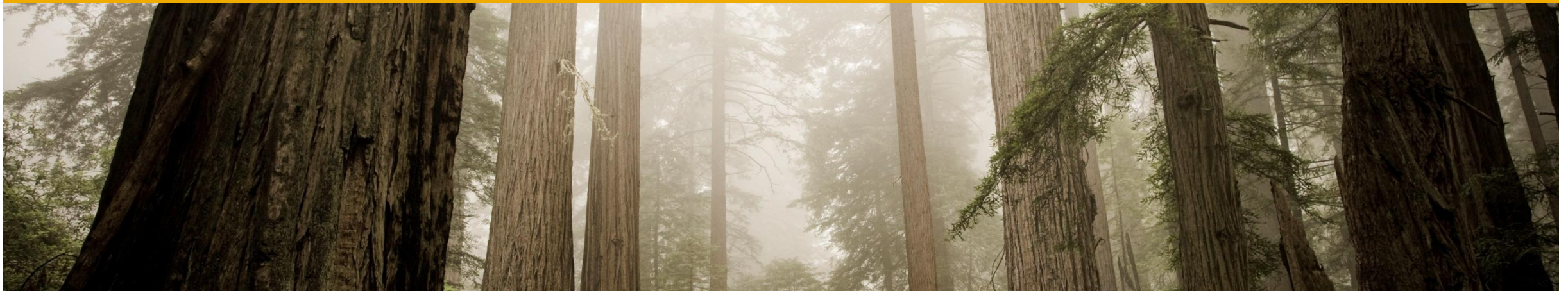


Public Sector: Tax Calculations, Customs Duties, Land Regulations, License Fee Calculations



Insurance: New Products, Claims Settlement, Agent Commissions

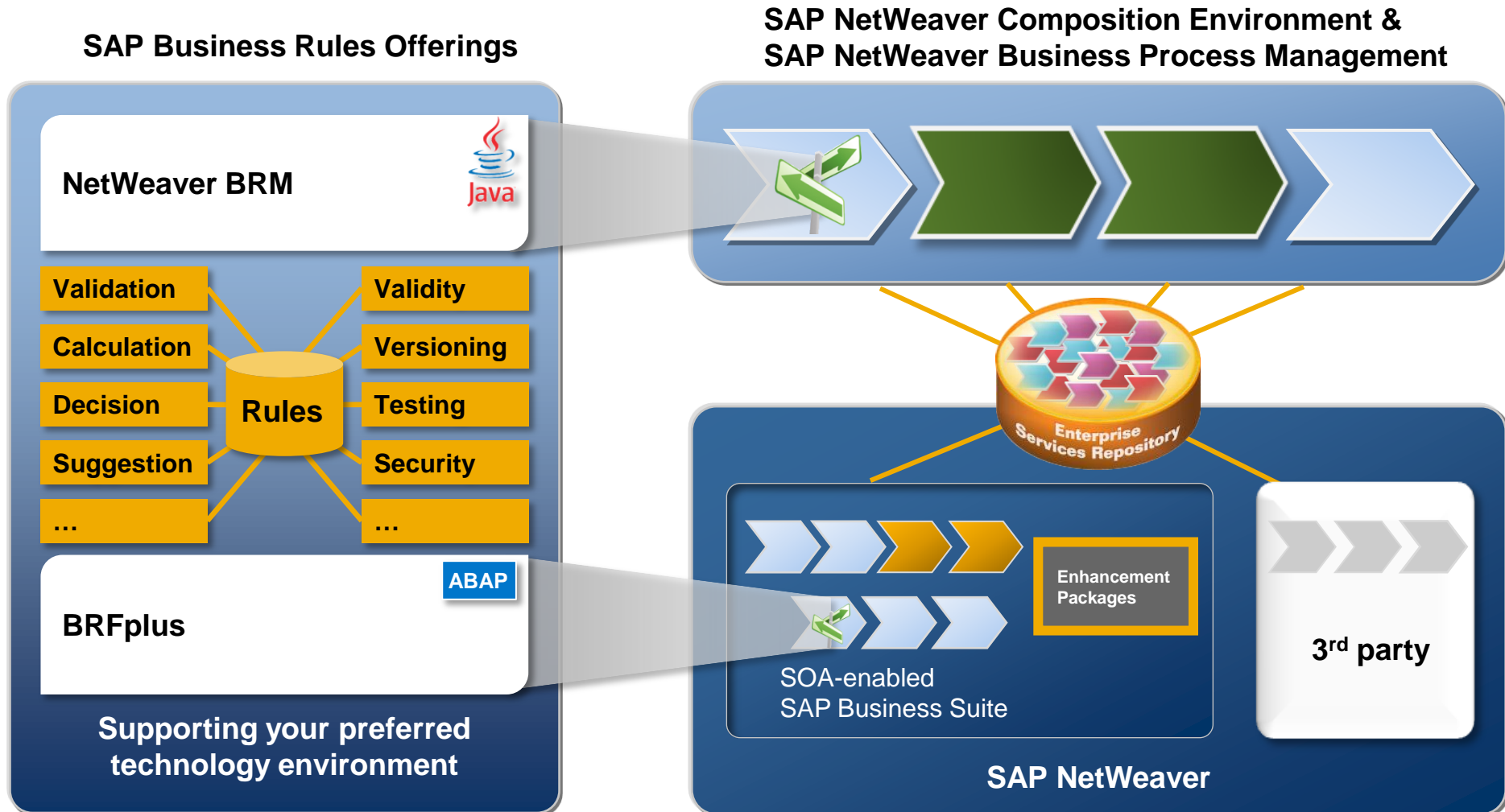




Business Rules Management with SAP

SAP Business Rules Offerings

Taking Control of the Rules of Your Business



Business Rule Framework plus

Components and Key Features

Business Rules Authoring

- Web-based user interface
- Testing, validation and refinement of business rules (no code)
- Various rule representation formats
 - decision tables/trees
 - rule flows
 - text rules (IF-THEN-ELSE)
 - custom Types
- Support for business user and expert modes
- Multiple tools available (dependency analysis, consistency checks, simulation, MS Excel integration, ...)

**Business Rules
Authoring**

**Business Rule
Engine**

Business Rule Repository

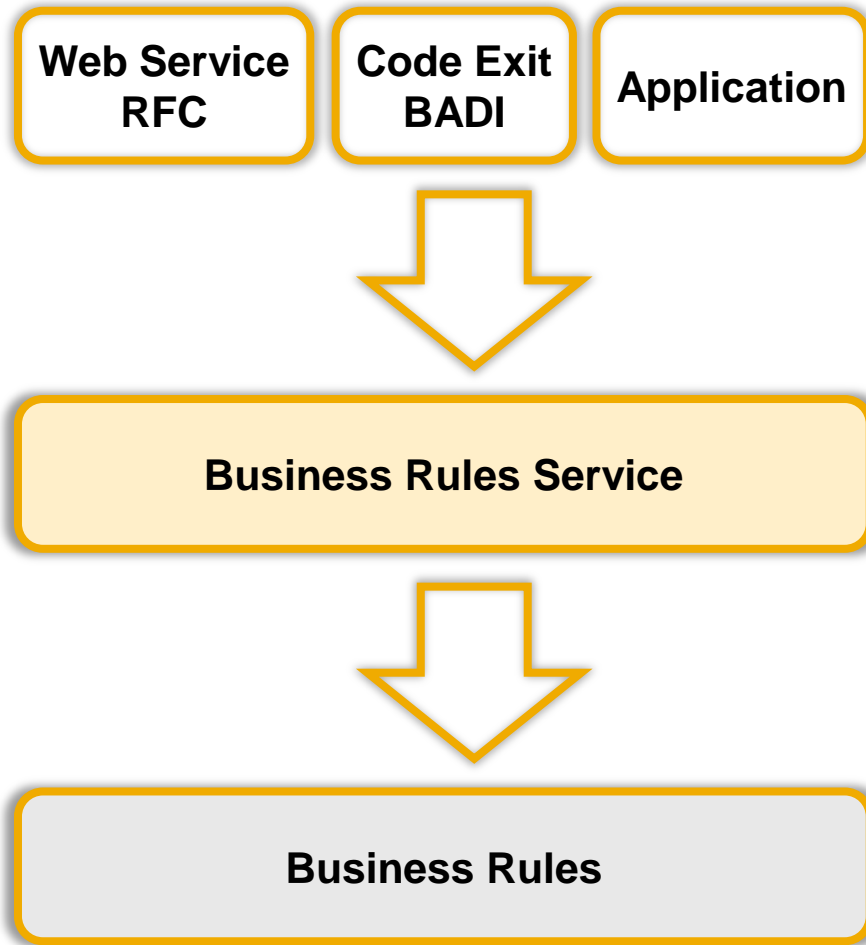
Business Rule Repository

- Life-cycle management optimized for ABAP server
 - Versioning services
 - Optional client concept, customizing, system and application data rules
 - Integrated with data dictionary and change and transport system (CTS)
 - Access, change and usage control
- Organization and grouping (in business rule catalogs)
- Search and browsing
- Auditing and reporting services

Business Rule Engine

- Invocation by ABAP API, RFC or Webservices
- Logging and tracing of rules execution
- On demand code generation
- Webservices and RFC module generators

Business Rule Services with BRFplus



BRFplus Function: Service Definition

- Input (Context), Output (Result), Purpose
- Can be called by ABAP API, RFC, or Web Service

1
*

BRFplus Rulesets: Service Implementation

- Collection of rules
- Preconditions, priorities, validity
- Context enrichment (additionally needed data)

BRFplus Rule: Step Implementation

- IF <condition(s)> THEN <operation(s)> ELSE <operation(s)>
- Usage of expression types (decision tables, decision trees, formulas, table operations, ...) to define complex conditions and value derivations/calculations
- Usage of action types (message log, workflow, email, ...) to trigger side effects

Rules Authoring with BRFplus

The screenshot displays the BRFplus interface with three main panels highlighted by blue callouts:

- Business Rules Catalogs:** Located on the left, it shows a tree structure under 'Pricing Rules' with sub-items like 'Pricing Calculation', 'Rulesets', 'Expressions', 'Decision Tables', and 'Formulas'. The 'Rulesets' item is selected.
- Ruleset:** The central panel shows the configuration for the 'Ruleset: PRICE_CALCULATION_RULES, Price Calc. Rules'. It includes a 'General' tab with options like 'Enabled', 'Function', and 'Precondition'. The 'Detail' tab shows a list of rules, including '(1) Rule: Get customer discount - Unlimited Validity' and '(2) Rule: Get promotion discount - Unlimited Validity'.
- Decision Table:** A pop-up window titled 'Decision Table: DT_CUSTOMER_DISCOUNT, DecTab Cus. Discount'. It shows a table with columns 'Item', 'Customer', and 'Customer Discount'. The table contains data for 'Balpen (Balpen)' and 'Pencil (Pencil)' with their respective customer discounts.
- Rules:** The bottom panel shows the 'Rules' section with a list of rules. The first rule is '(1) Rule: Get customer discount - Unlimited Validity'. The 'Detail' tab shows the rule's logic, including a condition 'Promotion Discount is greater than Customer Discount' and an action '(1) Change Final Price after processing f Apply Promotion'.

Blue arrows point from the 'Ruleset' and 'Rules' panels to the 'Decision Table' and 'Formula' panels, indicating the flow of data and logic.

Item	Customer	Customer Discount
Balpen (Balpen) ; Pen (Pen)	SAP	0.12
Pencil (Pencil)	SAP	0.15
Balpen (Balpen)		0.05
Pen (Pen)		0.07
Pencil (Pencil)		0.03
		0

Name	Description	Documentation
ABS	Absolute Value	Show
ARCCOS	Arc cosine	Show
ARCSIN	Arc sine	Show
ARCTAN	Arc tangent	Show
CONCATENATE	Concatenates two character strings	Show
CONDENSE	Trims off leading and trailing white spaces	Show
CONVERT_AMOUNT	Converts an amount to the specified currency	Show
CONVERT_QUANTITY	Converts a quantity to the specified unit	Show
COS	Cosine	Show
COSH	Hyperbolic Cosine	Show
DIV	Calculates the whole-number ratio of two numbers	Show

Business Applications Powered by BRFplus

Public Sector – Grantor Management - Tax and Revenue Management - Banking - Incentives and Commission Management - Benefit Decision Making Process – Loyalty Management - Territory Management

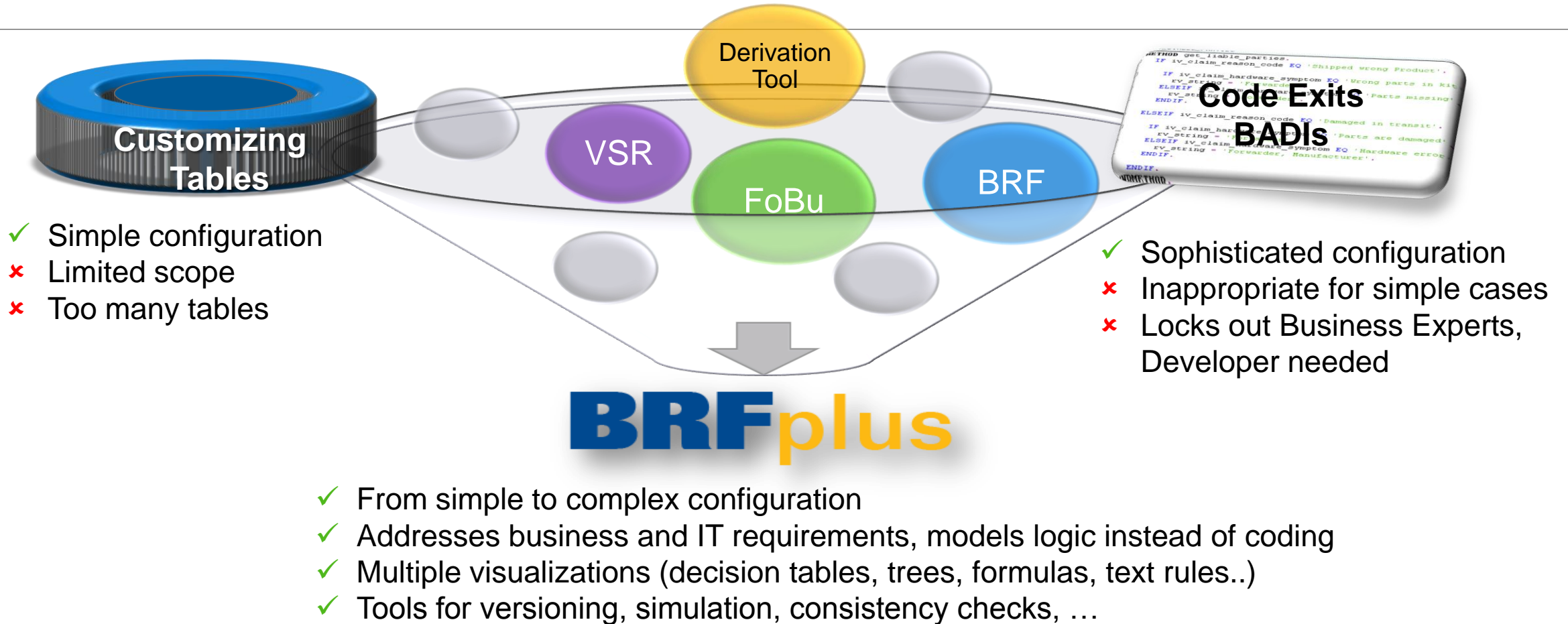
UI framework
element - CRM
Tech Services
Generic FIN
SRM
CRM
GR

Real-time Offer Management
Transportation Management
Freight Costs Calculation -
er determination
ment Calculation
Defense - GDS
ents
dent
ense
social
claims

Services
Managem
Business
Business
Social Application P
Risk Management
Deduction Plan Pro
Benefit Decision M
Demand Management - Revel
Master Data Governance - GF
Rule based event manager
CD - Freight unit filtering - Auto

Workflow
Approval
BYD - Bu
ht units -
Management - Field Control – Expense Report – ...

Customization and Configuration



Migration

Consolidation of tools and engines towards BRFplus for next generation business rules management in ABAP applications with better user experience and performance at lower TCO.



Demo

Pricing Scenario

NetWeaver Business Rule Management (BRM)

Components & Key Features



Business Rules Authoring

Rules Composer

- Business friendly rich rule formats
- Support for multiple data formats for rules vocabulary
- Validation, testing and refinement of business rules

Rules Manager

- Web-based interface for business users
- Support for import/export of Microsoft® Excel

Business Rule Engine

- High-performance rules engine
- Rete-based inference and sequential engines
- Integrated with NWA to support monitoring and logging
- Rules engine can be invoked as:
 - Stateless session bean
 - Web service

Business Rule Repository

- Supports end-to-end change management
 - Rules versioning
 - Access Control & Governance
- Design time repository integrated to NWDI

Business Rule Representations

Decision Tables

- Powerful visualization - compact and structured
- Completeness and consistency - error prevention made easier
- Modular knowledge organization - rules grouped into a single table

Decision Table : MaxInvestment

Documentation and Properties

Condition... Action... Change Layout Context Menu... Export... Import...

Input/PORequest...	IT	Production
month	maxMonthAmount	maxMonthAmount
1	2100	2000
2	2000	1800
3	3500	1800
4	3200	2500
5	2500	2700
6	1500	1500
7	2800	2600
8	6500	1600
9	3500	3000
10	2500	2400
11	2100	2600
12	1800	1500

Text Rules

- IF-THEN format
- Easy to learn and use
- Rules in natural language

```
Rule : Calculate Discount
Effectivity : Always

<Click to enter comments>

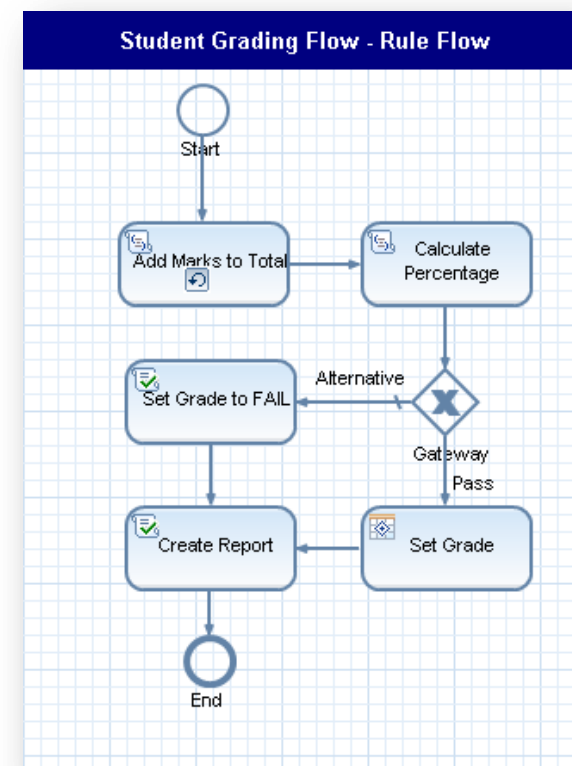
Preconditions :
+

If
customerStatus Equals Gold
+

Then
Assign :: discount = 3.0
+
```

Flow Rules

- Rules laid out in a flow like structure
- Perfect overview of the rule implementation
- Gateways and iterations



Authoring, Deploying, and Managing Business Rules



**Rules
Composer**

Business Rule Authoring



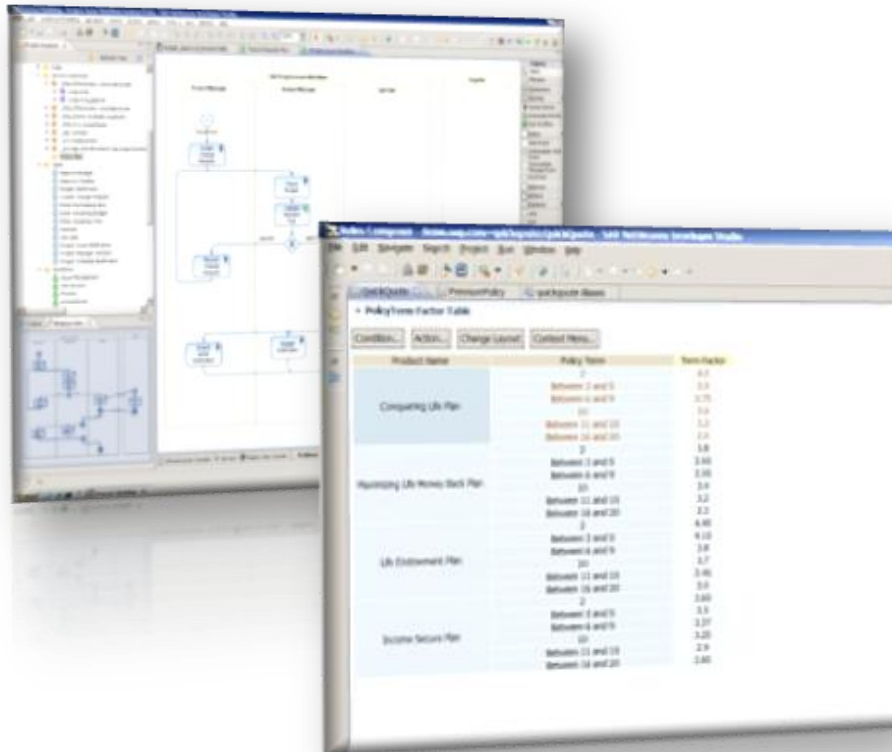
**Rules
Engine**

Deploy & Manage

**Rules
Manager**



Business User Rule
Authoring & Management



Rules Manager

Welcome, Guest

Upload Search

Rules Navigator

- test.sap.com-test-qbank
 - Common Definitions
 - Enumeration Types
 - AccountTransfer
 - OrderCheckbook
 - LoanEMI
 - Definitions
 - Decision Tables
 - EMI Table**
 - Rules

Decision Table: "EMI Table"

General Information

Name: EMI Table

Documentation:

Return Multiple Matches ☐

Rows Are Mutually Exclusive ☒

Condition... Action... Change Layout Show References

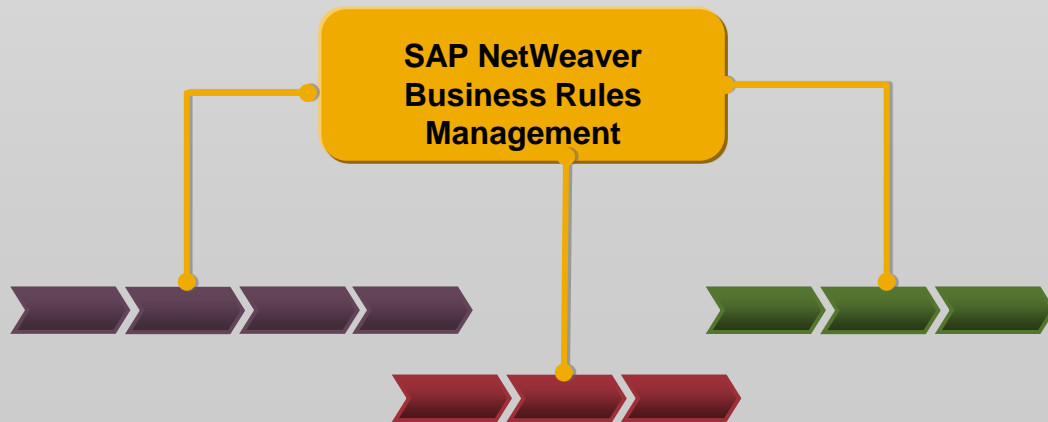
EMIObject.getPrincipalAmount	EMIObject.getResident	EMIObject.getTimePeriod	Local Resident interest rate	Non Local Resident interest rate
< 15000	1	1	10.75	11.75
	2	2	10.5	11.5
	3	3	10.25	11.25
	4	4	10	11
	5	5	9.75	10.75
Between 15000 and 50000	1	1	10.5	11.5
	2	2	10.25	11.25
	3	3	10	11
	4	4	9.75	10.75
	5	5	9.5	10.5
Between 50000 and 150000	1	1	10.25	11.25
	2	2	10	11
	3	3	9.75	10.75
	4	4	9.5	10.5
	5	5	9.25	10.25
Between 150000 and 500000	1	1	10.25	11.25
	2	2	10	11

SAP NetWeaver BRM:

2 approaches to modeling rules

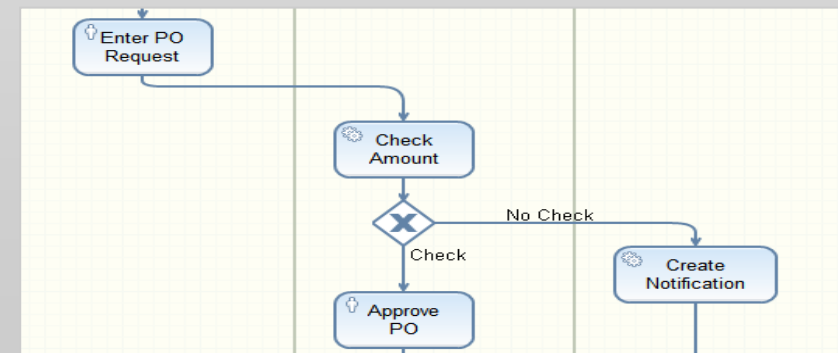
Stand-alone Rules Modeling

- For wider consumption across applications
- Via reusable business rules services



Embedded Rules & Process Modeling

- Allow process modelers to instantly embed rules in a process
- For consumption by a specific business process
- SAP NetWeaver BRM is embedded in SAP NetWeaver BPM



Rules in Integration Processes

More in PMC 166: [Combining SAP NetWeaver BRM and SAP NetWeaver Process Integration ...](#)

Decision Rules



Automate complex decisions, e.g. decide on administrator involvement or workload dependent message distribution

Validation Rules



Check message contents considering field relationships

Recommendation Rules



In case discrepancies in a message have been detected, provide rule-based derived recommendations for business experts

Calculation Rules



Complete messages by calculating e.g. prices, discounts taxes, and rebates while messages are passing the integration engine

Alert Rules



Trigger alerts for critical business events in case of suspicious message content, e.g. to detect fraud

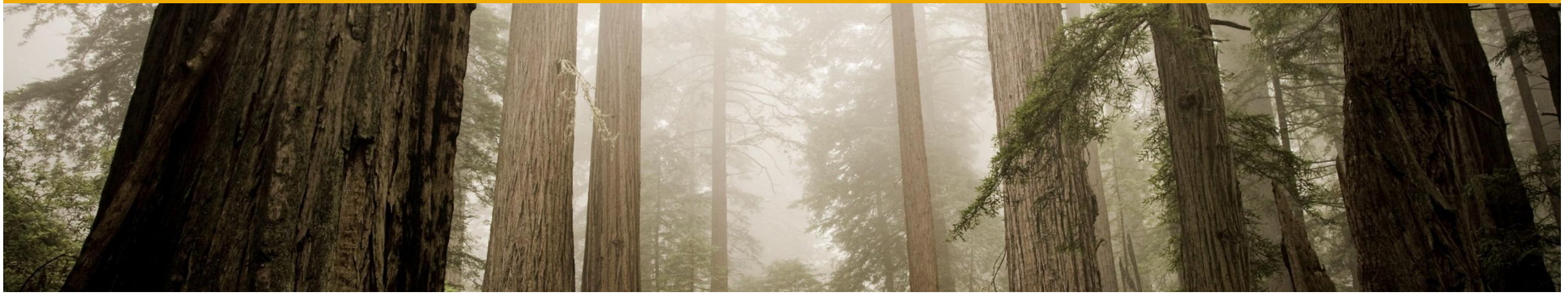


Demo

Scenario: Home Loan Processing Application

Usage Recommendations

	Suite Core Processes	Composite Processes
NetWeaver BRM	<ul style="list-style-type: none">• Solving decisioning problems using Rete rules (not available yet in BRFplus)• ABAP applications in a heterogeneous landscape having tight integration with 3rd party applications	<ul style="list-style-type: none">• Loosely coupled composite applications, modeled business processes• Rules embedded in Business Process model to support gateway decisioning (to control process flow)
BRFplus	<ul style="list-style-type: none">• Extend core business applications in the Suite by externalizing business rules• ABAP custom-development projects	<ul style="list-style-type: none">• Reuse of existing business rules in composite applications and modeled business processes• Data on which business rules are supposed to be invoked is in the suite
Mixed-Case Scenarios		



Outlook: News from the Labs

BRFplus

Improved User Experience, Remote Code Generation, BRM alignment

User experience

- Reworked editors: rules, decision tables/trees, formulas..
- Flow expression type (like in NW BRM)
- Drag'n'Drop

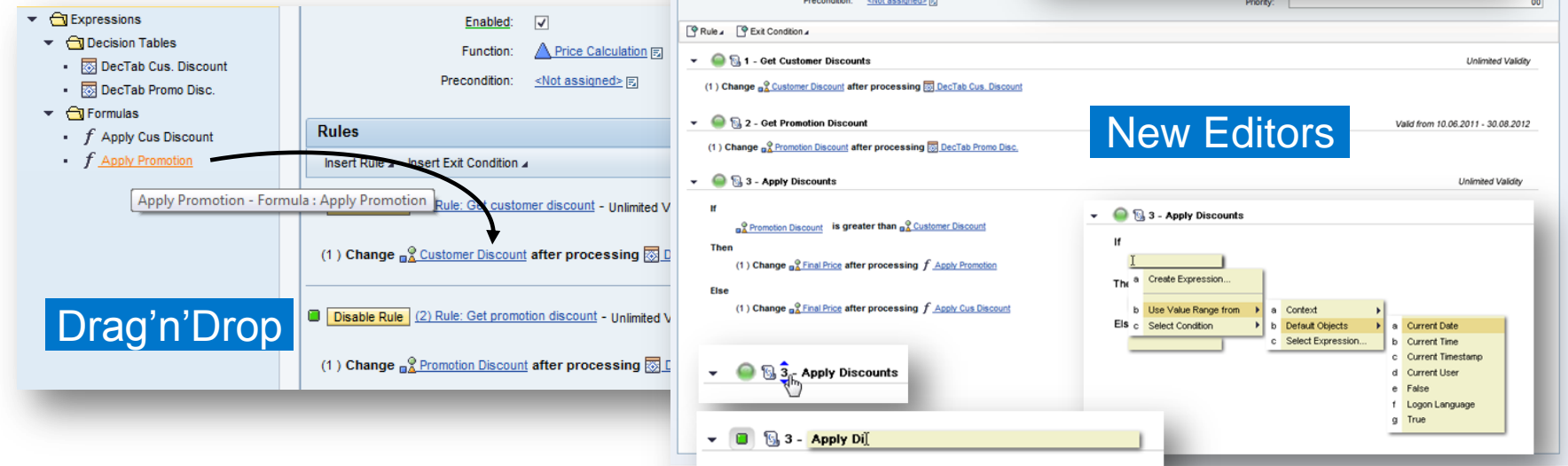
Alignment with NW BRM

- Vocabulary Alignment
- Rules Exchange

Remote code generation



LAB PREVIEW



NetWeaver BRM

Improved Lifecycle Management of Rules for Business Users

Several improvements in managing rules artifacts using Rules Manager for Business Users

Rules Manager

Welcome, Administrator

Active Version Download Rules Content Save

Search

Rules Navigator

- emi-calculator
 - Common Definitions
 - Enumeration Types
 - Effectivities
 - EMI Calculator
 - Rule Flows (1)
 - Rule Scripts (0)
 - Rules (1)
 - Decision Tables (1)
 - Interest Rate Table
 - Salaried EMI Calculator
 - Definitions
 - Rules (1)
 - Decision Tables (1)
 - Student EMI Calculator
 - Salaried EMI Calculator_
 - Student EMI Calculator_

Definitions of Project: emi-calculator

Add... Delete Duplicate Rename Convert To Show References

Fixed Definitions

LAB PREVIEW

Variable Definitions

Working copy				Version 1			
Name	Country	Currency	Table	Name	Country	Currency	Table
CountryCurrencyTable				CountryCurrencyTable			
Documentation				Documentation			
Return Multiple Match	false			Return Multiple Match	false		
Rows Are Mutually Exclusive	true			Rows Are Mutually Exclusive	true		

Working copy				Version 1			
index	countryCode	countryDesc	currencyCode	index	countryCode	countryDesc	currencyCode
1	US	United States	USD	1	US	United States	USD
2	BZ	Brazil	BRL	2	BR	Brazil	BRL
3	AT	Austria	EUR	3	AT	Austria	EUR
4	AE	Arab Emirates	AED	4	AE	Arab Emirates	AED
				5	AR	Argentina	ARS
6	AU	Australia	AUD	6	AU	Australia	AUD
7	AZ	Azerbaijan	AZN	7	AZ	Azerbaijan	AZN
8	BD	Bangladesh	BDT	8	BD	Bangladesh	BDT
100	BH	Bhutan	BTN				
9	BE	Belgium	EUR	9	BE	Belgium	EUR
10	BM	Bermuda	BMD	10	BM	Bermuda	BMD
11	CA	Canada	CAD	11	CA	Canada	CAD
12	CH	Switzerland	CHF	12	CH	Switzerland	CHF

Capabilities:

- **Import/Export** of decision table with other conditions and other actions
- **Edit** common definitions and re-usable rulesets in Rules Manager
- **“Diff”** of ruleset entities in rules manager
- **Fine-grained** access control for ruleset entities in Rules Manager

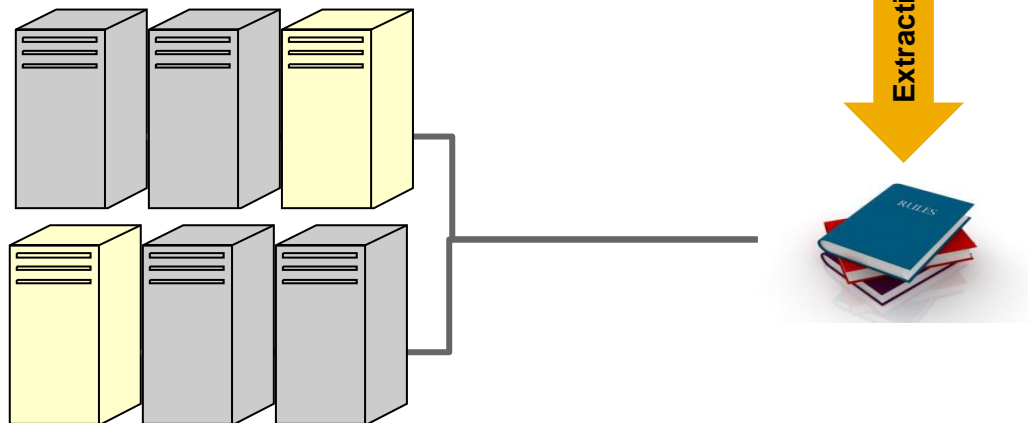
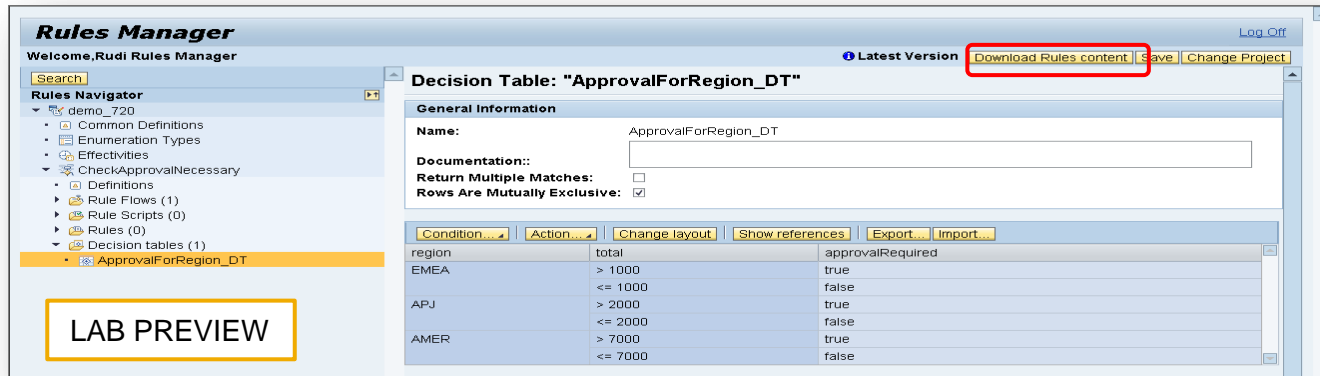
Value Proposition:

- **Improved** business user experience to manage rules
- **Improved governance** due to fine-grained access control to rule entities

NetWeaver BRM

Decentralized Business Rules Deployment (Lean Business Rules Engine)

Decentralized Deployment of Business Rules Outside of JEE Application Server



Capabilities:

- Download of Business Rule from **BRM Rules Manager**
- Extract and deploy **Lean Rules Engine** decentrally on a JVM

Value Proposition:

- Lean business rules engine for **distributed deployment of business rules**
- Lean development and deployment of business rules, e.g.,
 - Embedded in applications
 - Distributed across multiple local branches or plants (or business departments)

Note: Feature is downported to BPM 7.3 SP01



Q & A

Further Information

SAP Public Web:

Business Rules in SDN: <http://www.sdn.sap.com/irj/sdn/nw-rules-management>

SAP Press

Carsten Ziegler, Thomas Albrecht: BRFplus – Business Rule Management for ABAP Applications, <http://www.sap-press.com/products/BRFplus-%E2%80%93-Business-Rule-Management-for-ABAP-Applications.html>

Related Workshops/Lectures at SAP TechEd 2011

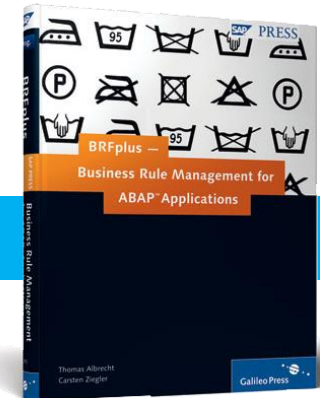
PMC101 Overview of SAP NetWeaver BPM and SAP NetWeaver BRM

PMC163 Business Rules with BRFplus: Agile and Transparent Business Processes

PMC265 Accelerating Business Rules with SAP NetWeaver BRM

PMC-P06 Business Rules Management with SAP

Watch out for expert sessions!





Feedback

Please complete your session evaluation.

Be courteous — deposit your trash,
and do not take the handouts for the following session.

THANK YOU !



Thank You!

Contact information:

Carsten Ziegler

Chief Product Owner BRFplus
SAP AG

Dietmar-Hopp-Allee 16
69190 Walldorf, Germany
c.ziegler@sap.com

Harsh Jegadeesan, PhD

Product Manager Integration & Orchestration
SAP Labs India

138 EPIP Area, Whitefield
Bangalore-560066, India
harshavardhan.jegadeesan@sap.com