POP103
Business Rules and Decision Service Management with SAP Software

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SAP

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Agenda

Operational Decision Management

Overview SAP Product Portfolio

- SAP NetWeaver Decision Service Management
- SAP NetWeaver Business Rule Management
- Rules on HANA

Outlook

Q&A

Operational Decision Management

Decisions are ubiquitous

Banking: Relationship-based pricing, credit decisioning, scorecards

Education: Fee calculations, course selections

Healthcare: Patient monitoring, fraud detection, claims

Logistics and Shipping: Parts management, calculation of duties, pricing calculations

Public Sector: Tax calculations, customs duties, land regulations, license fee calculations

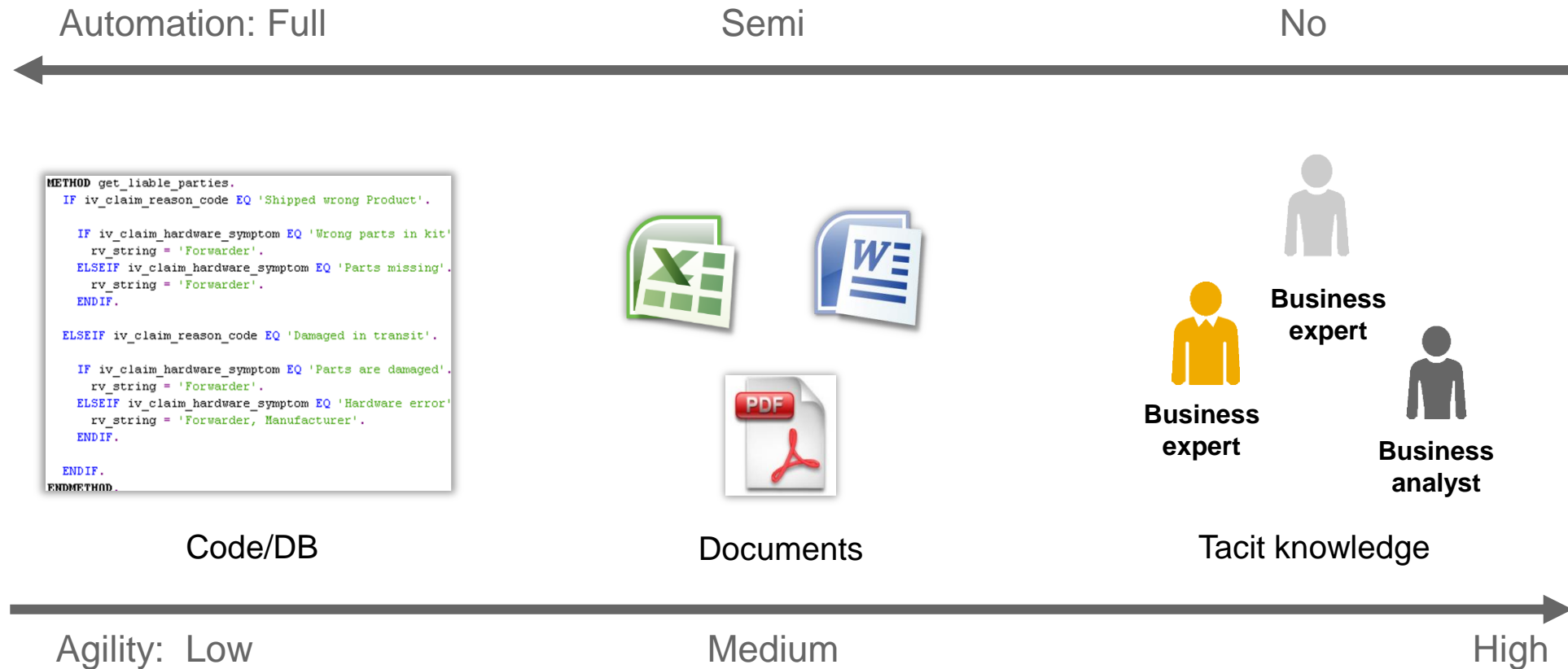**Insurance:** New products, claims settlement, agent commissions

Decisions are high-change components

Fraudsters adapt
Change the routing to focus on new fraud

Consumer behavior changes
Change to keep selecting the right deal terms

Competitors change
Change the discount to remain competitive

Decisions

Regulations change
Change to keep eligibility decisions compliant

Markets change
Change the assessment to manage risk

Policies change
Change validation to track new data requirements

Source: Inspired by James Taylor of Decision Management Solutions

Agility vs. Automation
… or Business vs. IT

Automation: Full   Semi   No


```
METHOD get_liable_parties.
  IF iv_claim_reason_code EQ 'Shipped wrong Product'.

    IF iv_claim_hardware_symptom EQ 'Wrong parts in kit'
      rv_string = 'Forwarder'.
    ELSEIF iv_claim_hardware_symptom EQ 'Parts missing'.
      rv_string = 'Forwarder'.
    ENDIF.

  ELSEIF iv_claim_reason_code EQ 'Damaged in transit'.

    IF iv_claim_hardware_symptom EQ 'Parts are damaged'.
      rv_string = 'Forwarder'.
    ELSEIF iv_claim_hardware_symptom EQ 'Hardware error'
      rv_string = 'Forwarder, Manufacturer'.
    ENDIF.

  ENDIF.
ENDMETHOD.
```

Business expert

Business expert

Business analyst

Code/DB   Documents   Tacit knowledge

Agility: Low   Medium   High

- No transparency
- Changes expensive

- No compliance, no consistent operations
- High costs for operations (no scale effects)

Decision (Service) Management

Decision service

A self-contained, callable service to make an operational business decision

Decision Service Management system

A software system used to define, deploy, execute, monitor, and maintain the variety and complexity of decision logic (**also called business rules**) that is used by operational systems

Authoring & Management

- Business-user friendly modeling and management environment
- Testing and validation

Deployment & Execution

- Deployment into target runtime containers
- API to invoke decision logic, logging and tracing

Repository

- Externalization of decision logic from core application code
- Lifecycle management (versioning, access control) and organization
- Auditing and reporting
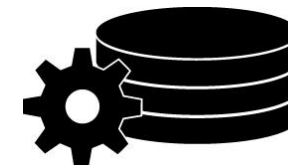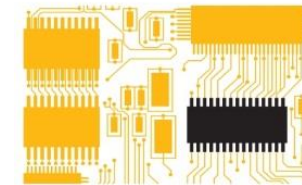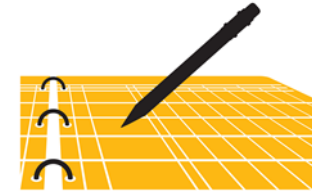
Decision Services implementation with business rules

SAP Application

Code Exit BADI

Custom Application

call

Decision Service

use

Business Rules/Rulesets

Decision Service
- Purpose
- Inputs and Output (vocabulary)
- Business Ownership
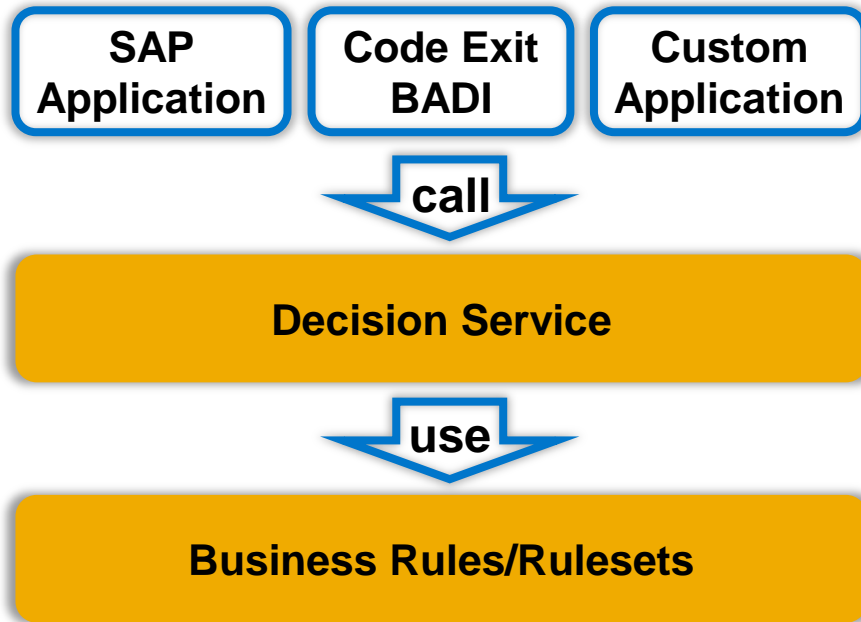
Business Rules/Rulesets
- Collections of rules
- IF <condition(s)> THEN <operation(s)>
- Expression types (Decision Tables, Flows, Formulas..)
- Action Types (Email, Workflow, Message Log..)


```
Driver Presence          Different Drop Off Place

Discount Table           Calulate Total amount

            Summer Discount
   X                      Discount Seasonal
Default

Pricing Task
```
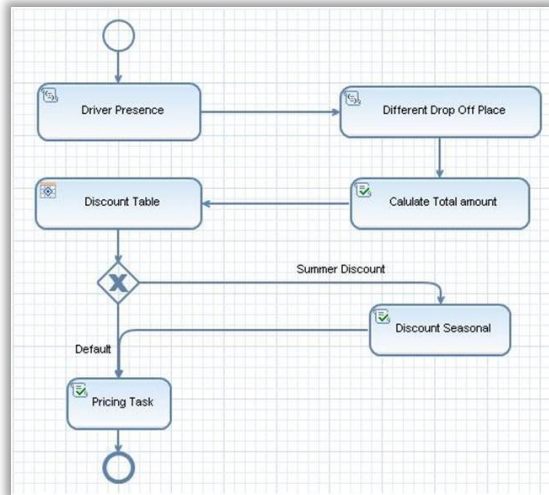
- (1) Rule: Check Decision Table for Promotions when Order > 5 - Unlimited Validity

If
   Order **is greater than** 5

Then
  (1) **Change** Promotion **after processing** Determine Promotion

Table Contents

Find: [_____] Next Previous   Table Settings

Customer	Product	Order	Promotion
	NWDSM (SAP NetWeaver Decision Service Manag	[5..10]	TP (Training Package)
	NWDSM (SAP NetWeaver Decision Service Manag	>11	SW_TP (Strategy Workshop and Training Pack
	DSM_C (SAP NW DSM COnsulting)	[10..100]	SW (Strategy Workshop)
	DSM_C (SAP NW DSM COnsulting)	>100	SW_TP (Strategy Workshop and Training Pack
DREA2 (Dream²)			SW_TP (Strategy Workshop and Training Pack
			NO (No Promotion)

Separating processes and decisions adds agility
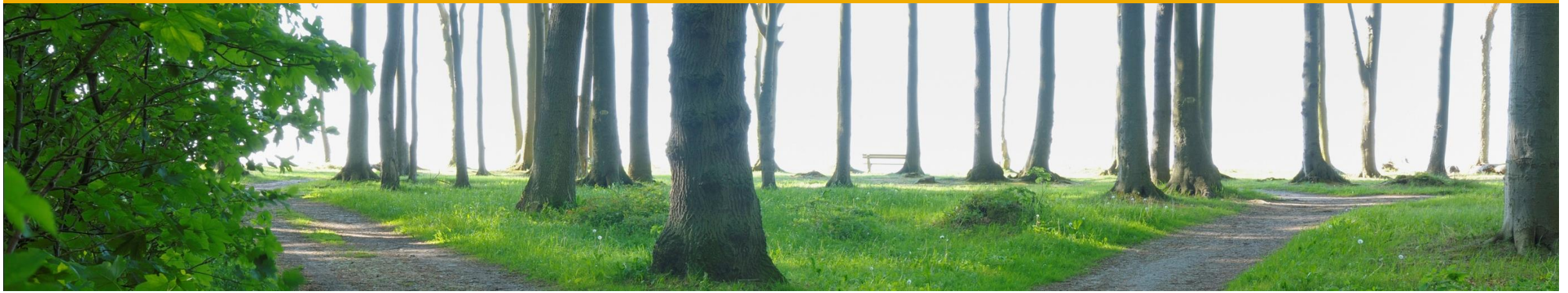## Example: Loan Application

Characteristics of decision services

- Called from a process step with context data on which a result is determined
- Process definitions are stable whereas decision services/business rules are high-change components

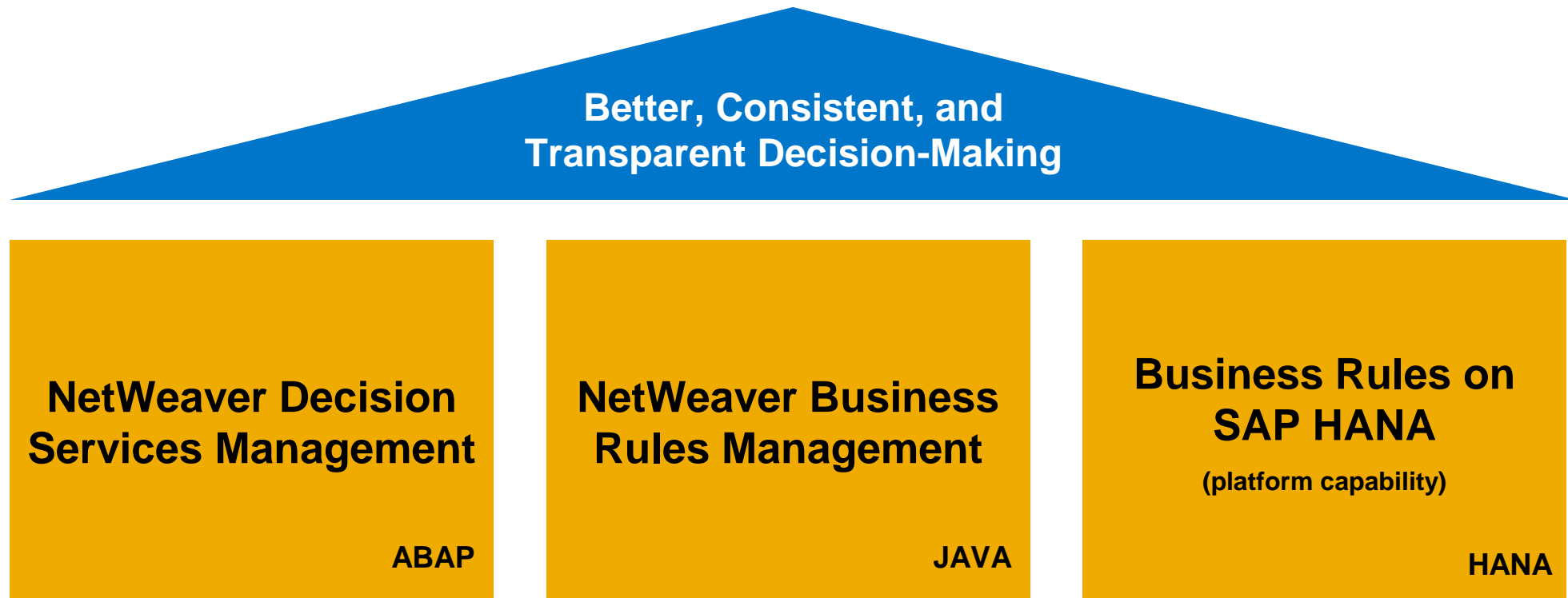| Application	Credit Score	Approval
• Completeness check • Data validation • No-go criteria	• Calculation of credit score • Enable/disable contract terms	• Automatic/manual approval • Compliance rules • Risk management
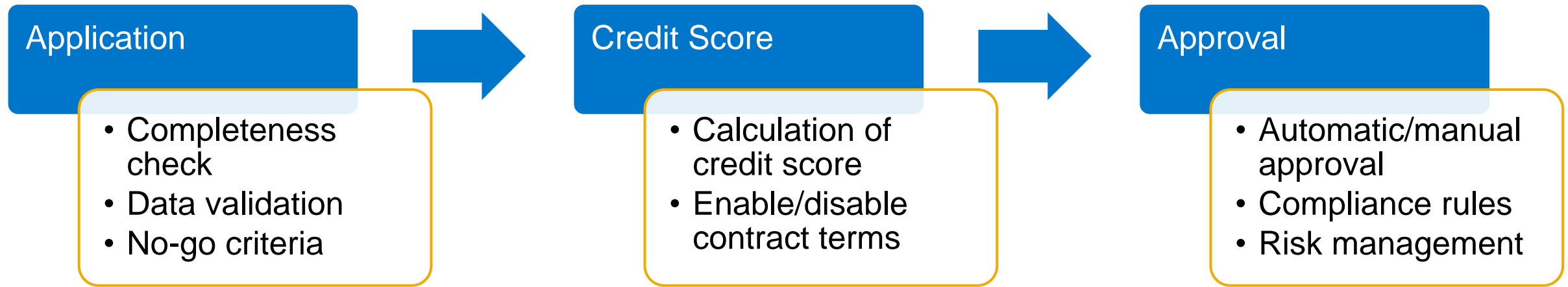
All banks run same processes…

… differentiation happens in the decisions

Overview SAP Product Portfolio

Business Rules and Operational Decision Management @ SAP

Better, Consistent, and Transparent Decision-Making

NetWeaver Decision Services Management	NetWeaver Business Rules Management	Business Rules on SAP HANA
ABAP	**JAVA**	**(platform capability)** **HANA**

Why rules offerings are platform specific?

Deep integration of BRMS into application is essential

- Performance
- Lifecycle management processes and tools
- Comply with applications' transactional, versioning, and authorization models
- Align with base type system for rules vocabulary (Java Objects, XSD, ABAP DDIC)
- Support application callback (computations, data lookups and other application specific actions

SAP NetWeaver Decision Service Management

Introducing a new approach
Simplify management of decision logic across SAP Business Suite apps

	Traditional approach	New approach: With SAP NetWeaver DSM
Time from request to implementation	Weeks to months	Instantly
Quality of implemented decision-making logic	Low as details lost in translation	High - no translation, no details lost!
Cost to implement, e.g. due to involved staff and system downtimes	High	Low, no IT involvement, no downtimes!
Transparency of decision-making logic applied across applications	Limited	Full
Ability to leverage latest **innovations** through release upgrades	Difficult	Easy

Components and key features

Authoring

- Web-based user interface
- Various rule representation formats
  - decision tables/trees
  - rule flows
  - text rules (IF-THEN-ELSE)
  - custom Types
- Analysis, (unit) testing, validation and refinement of decision services (no code)
- Support for business user and expert modes
- Access to data of other systems (e.g. Customizing or master data from ERP)
- Multiple tools available (dependency analysis, consistency checks, simulation, MS Excel integration, …)

Authoring	Engine
Repository	

Engine

- Local execution or deployment into target servers for execution
- Invocation by ABAP API, RFC or Webservices
- Logging and tracing of execution
- Code generation
- Webservices and RFC module generators
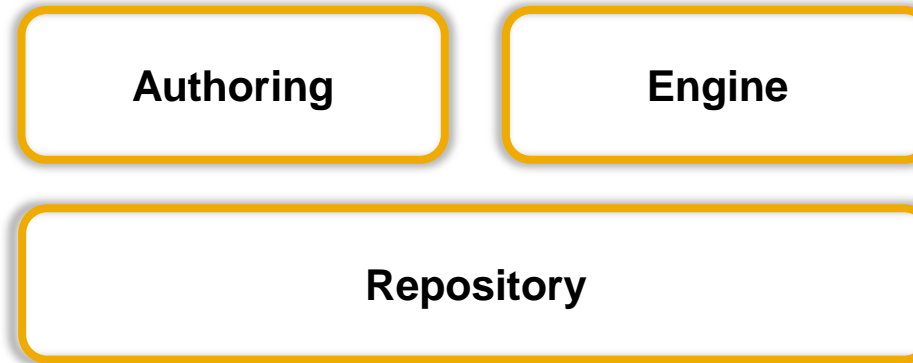
Repository

- Lifecycle management optimized for ABAP server
- Organization and grouping (in business rule catalogs)
- Search and browsing
- Auditing and reporting services

SAP NetWeaver Decision Service Management

Managed System 1 (such as CRM) — Connector

Managed System 2 (such as ECC) — Connector

Decision Service Manager

BRFplus

Access to Master Data, Customizing, Metadata

Deployment
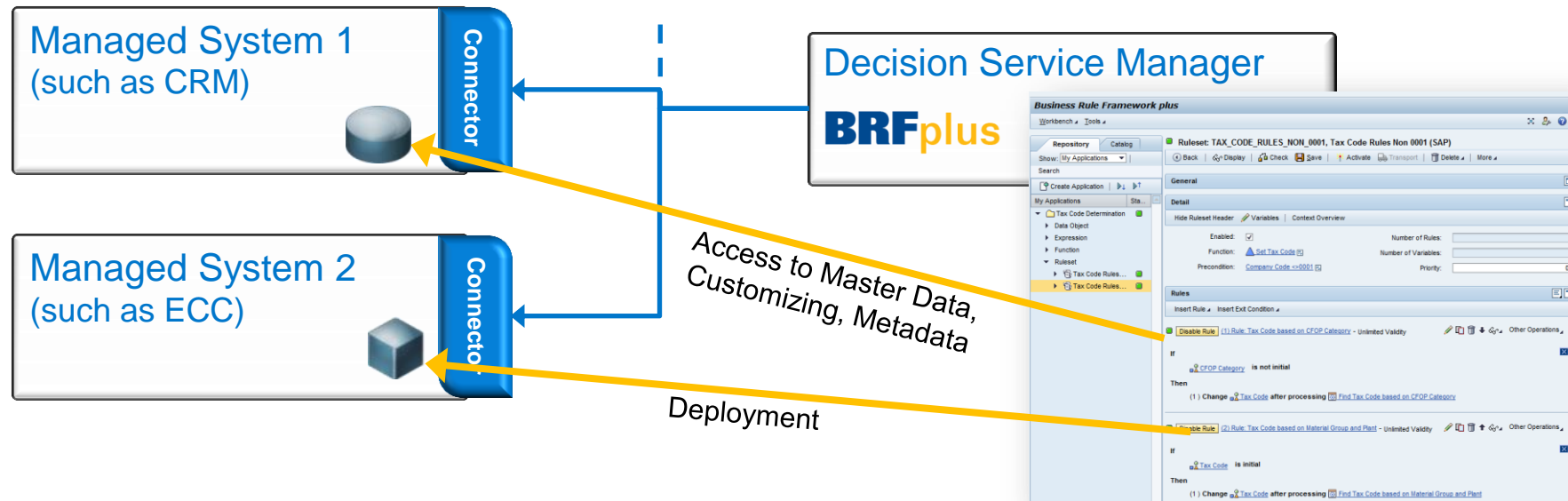
Superior Technology

- **Decision Service Manager** provides access to metadata, code and values (master data, Customizing) to **Managed Systems** such as ECC or CRM for **"local" modeling**
- From the modeled service, **Decision Service Manager** compiles an executable service on the managed system for **local execution**
- The **managed system** does not require upgrades (or Support Packages); **Decision Service Manager** can be upgraded independently

Immediate Business Value / ROI

- Rapid change cycles in the hand of the domain experts
- Analyze, Optimize, Implement; service execution testing, tracing, analytics
- No IT involvement, no downtime, planned service availability, test deployments to any number of systems
- Automated business decisions with full transparency for better decision quality

Demo

Decision service creation, deployment, use with SAP NetWeaver Decision Service Management

From missed opportunities..
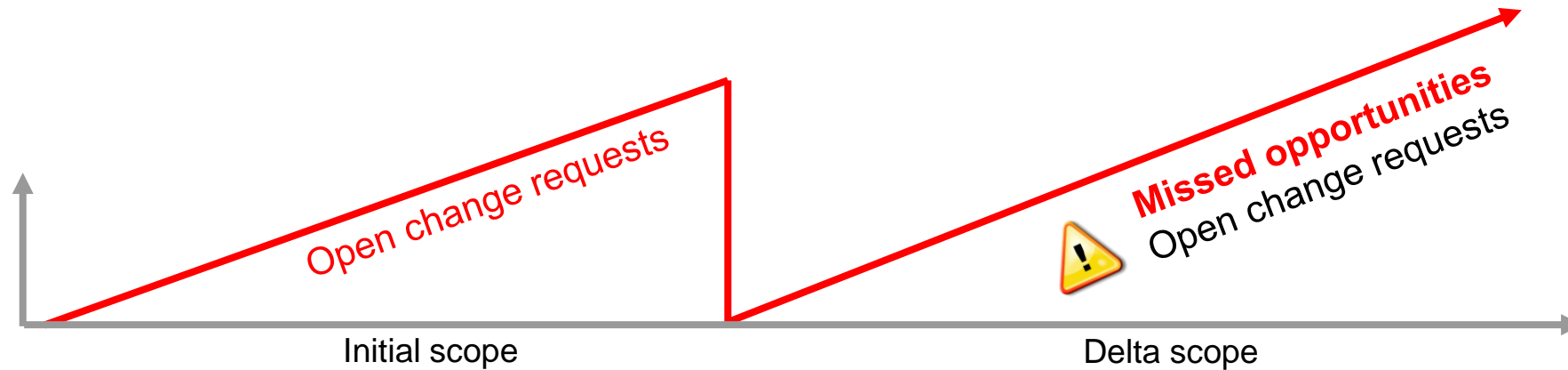
Traditional approach

- Waterfall process with release cycles: specification, design, code
- Same change management for all objects (DB, UI, decision logic)
- High costs also for small changes

..to realized opportunities
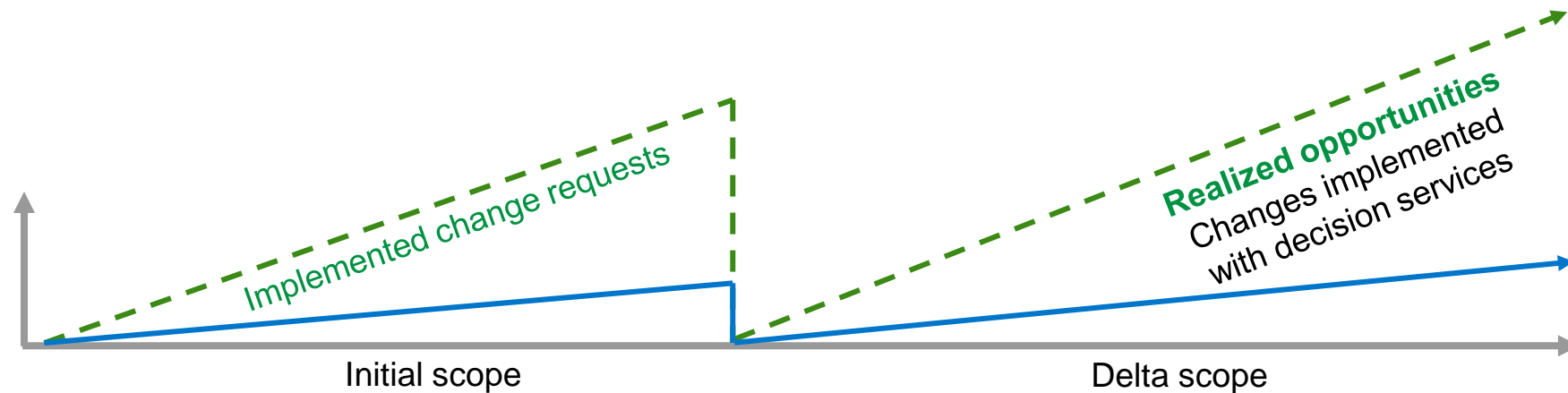
Decision Service Management

- Clear separation of decisions from processes (agile but robust systems)
- Domain experts own and change implemented decisions
- Permanent and incremental decision optimizations

Better business results and >90% cost reduction are possible
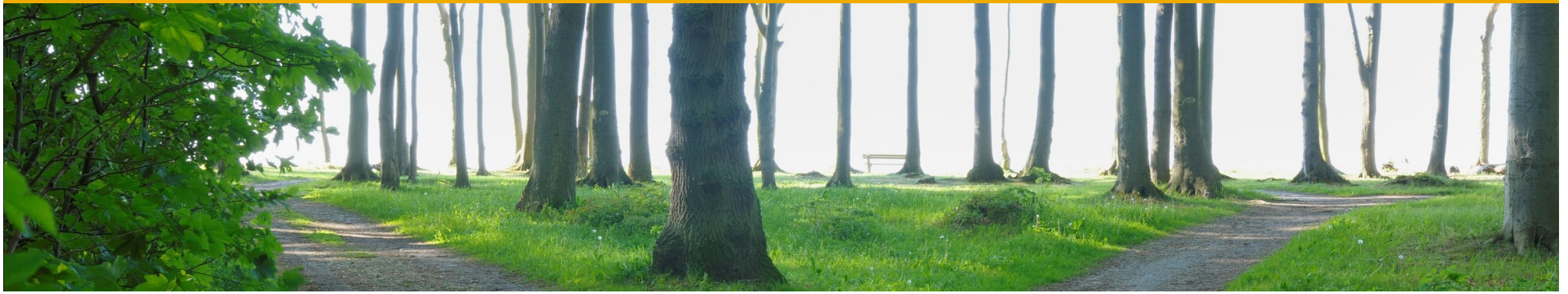
SAP NetWeaver Business Rule Management

Components and key features

**Business Rules
Authoring**

**Business Rule
Engine**

Business Rule Repository

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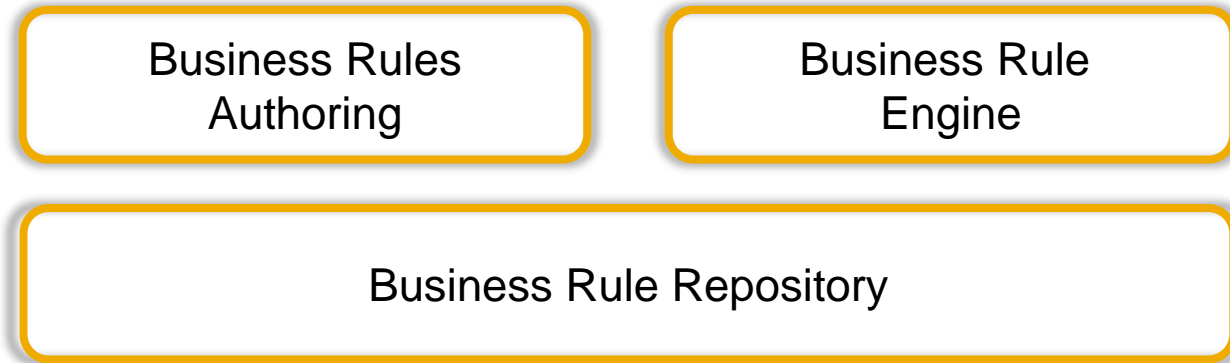
Business Rule Repository
- Supports end-to-end change management
  - Rules versioning
  - Access Control & Governance
- Design time repository integrated to NWDI

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 representations

Decision Tables

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

Text Rules

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

Flow Rules

- Rules laid out in a flow like structure
- Perfect overview of the rule implementation
- Gateways and iterations
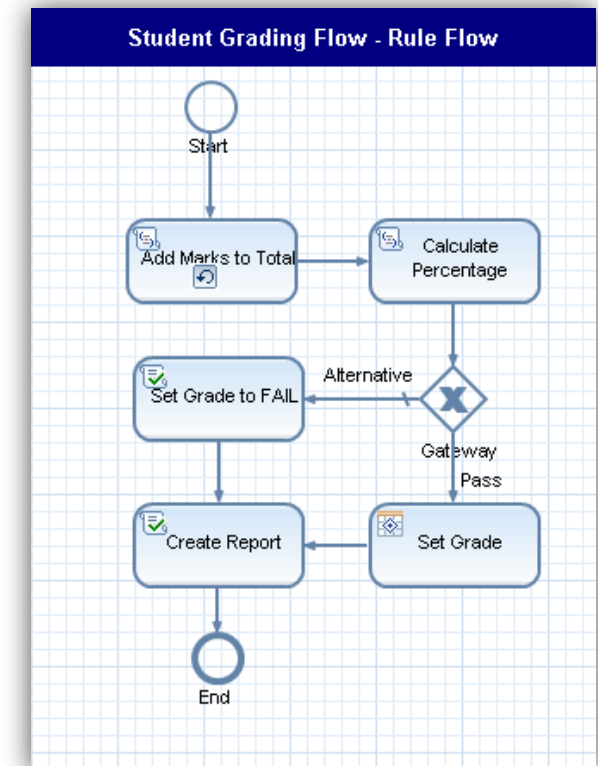
Authoring, deploying, and managing business rules

Rules Composer

Rules Engine

Rules Manager

Business Rule Authoring

Deploy & Manage

Business User Rule Authoring & Management
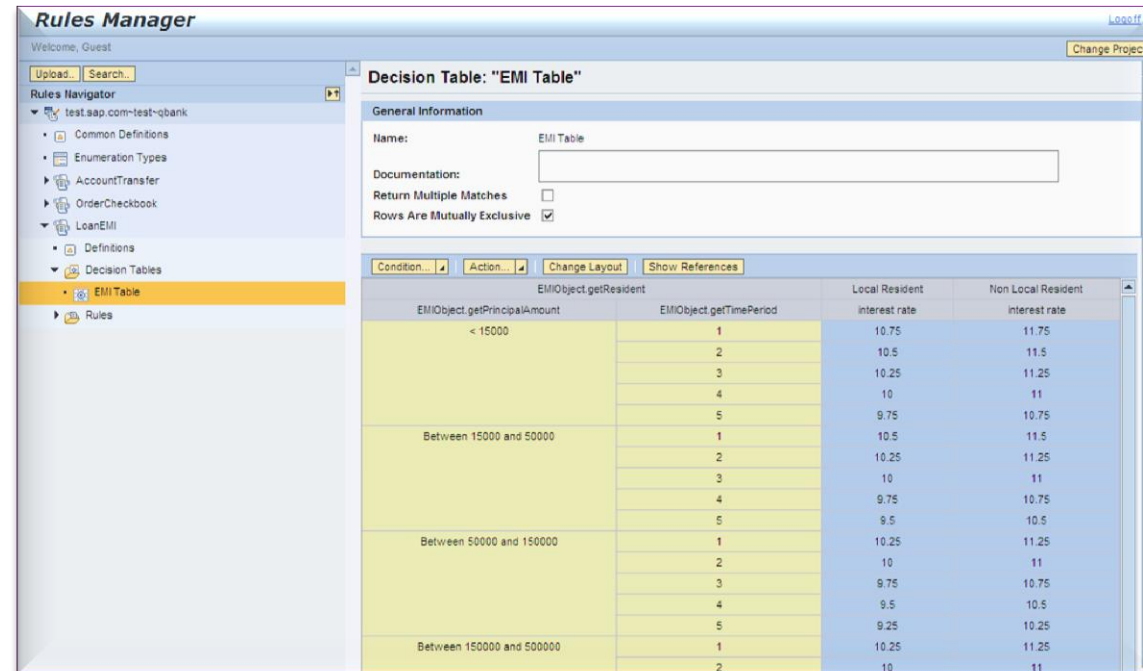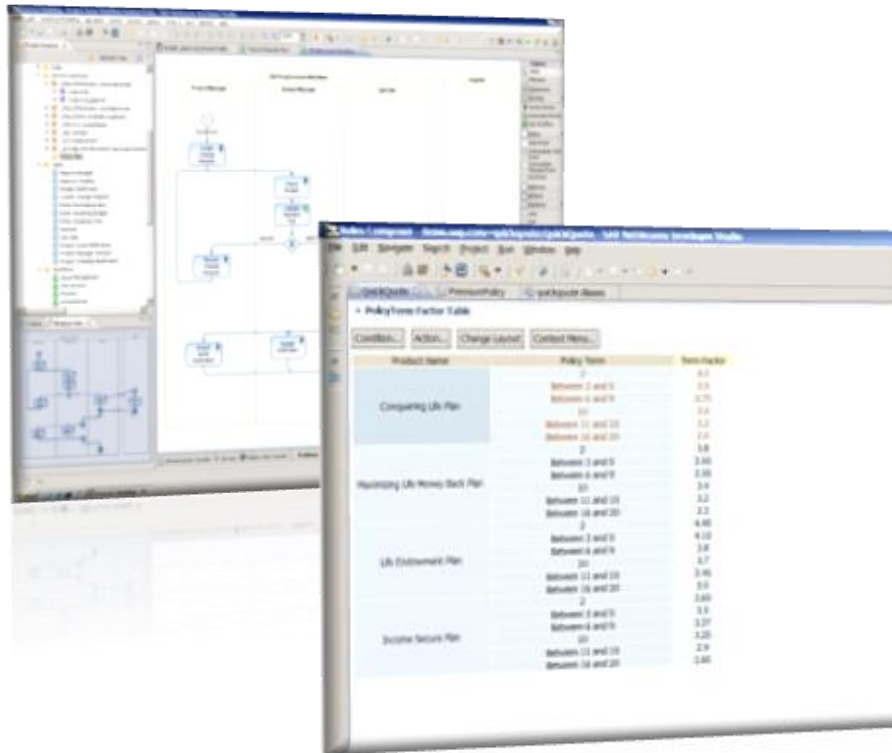
SAP NetWeaver BRM:
2 approaches to modeling rules

Stand-alone Rules Modeling

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

SAP NetWeaver Business Rules Management
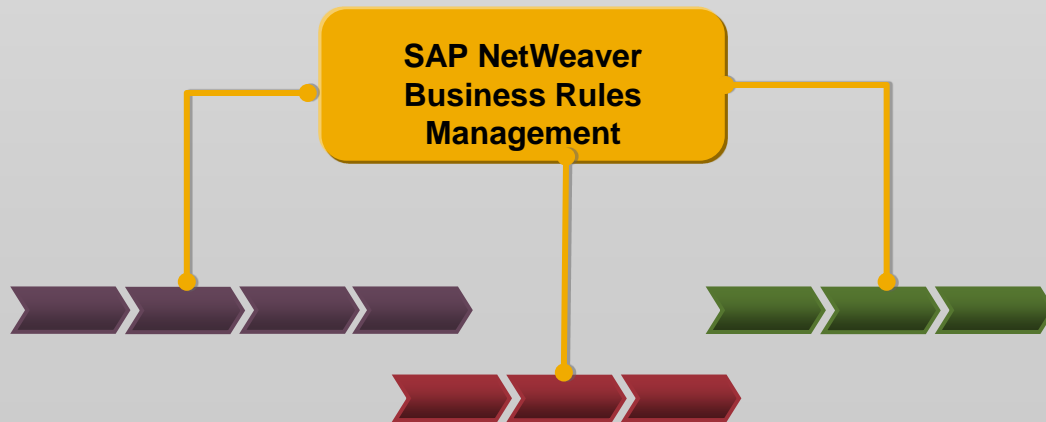
Embedded Rules & Process Modeling

- 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
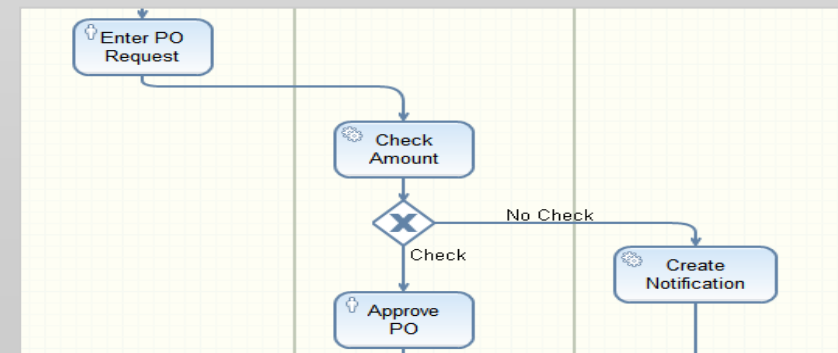
Archetypical Usage Patterns

1 | **Business processes** | Used in close conjunction with NetWeaver BPM in Business Processes

2 | **Rule-intensive applications** | Independent rule-intensive applications

3 | **Distributed deployment scenarios (LRE)** | Central lifecycle management with distributed deployment of rules

Demo

Scenario: Credit Decisioning Rules
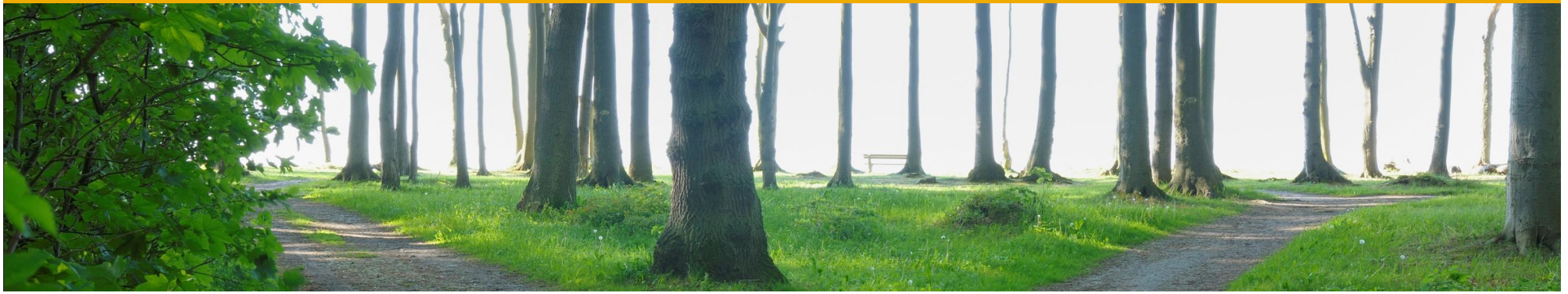
Business Rules on SAP HANA

Components and key features

Authoring

- Decision table editor in the HANA Studio
- Support for all HANA objects (tables, views, information models) as vocabulary
- Native support for formulas in decision tables
- Support for use of HANA expressions for conditions and actions
- APIs for creating, editing and managing decision tables

Engine

- Rules compiler transforms decision tables to highly-optimized SQL Procedures
- Invocation of a result view (column view)
- Usage in other calculation views

Authoring   **Engine**
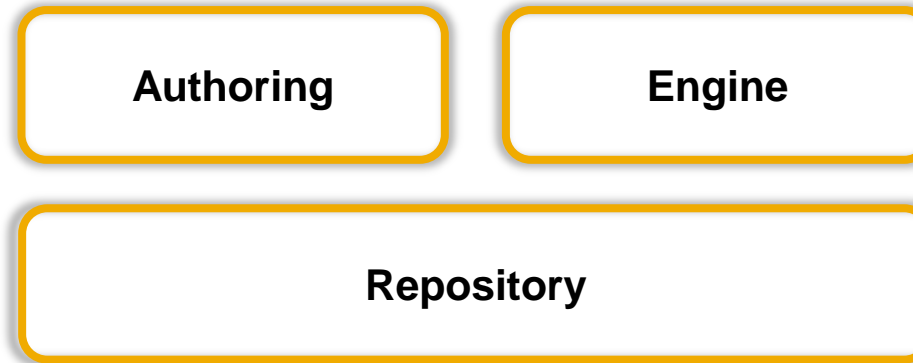
Repository

Repository

- Integrated with the HANA repository
- Support for versions and histories
- REST APIs to work with decision tables

Working with Decision Tables
Step 1: New decision table
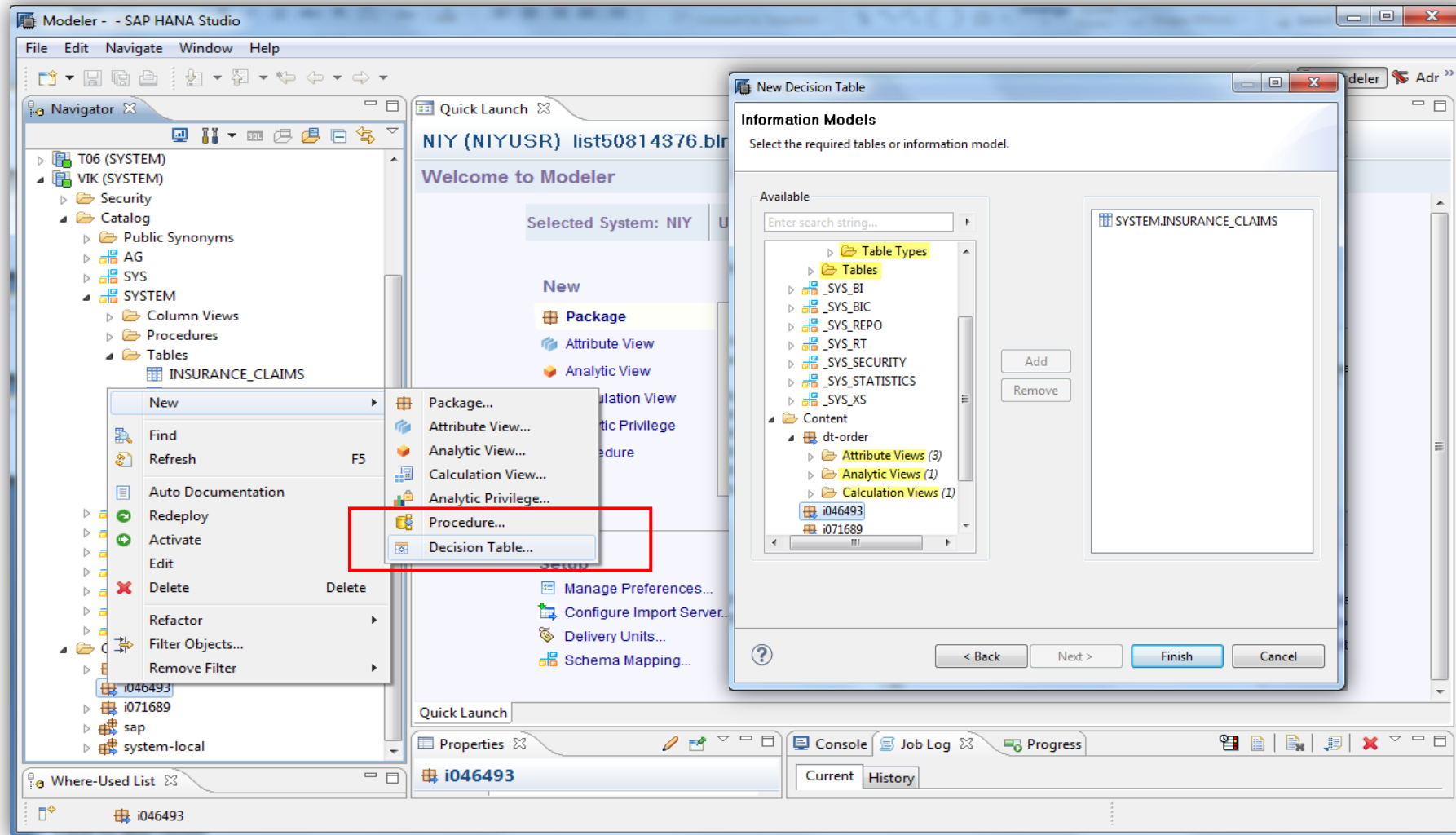
Decision table is available as a new native HANA model

Working with Decision Tables
Step 2: Define vocabulary (attributes, conditions and actions)
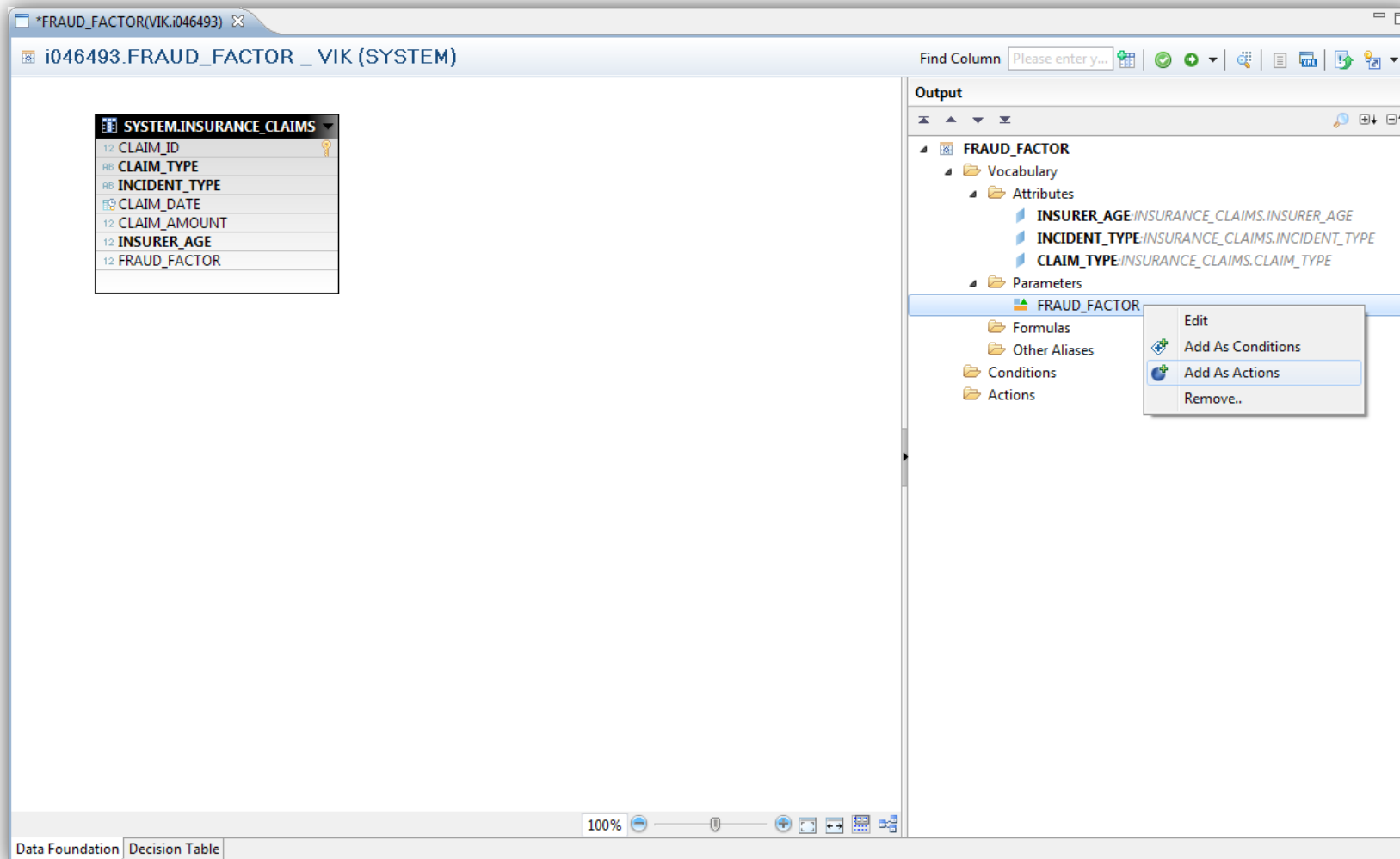
Vocabulary can be defined on HANA models

- Physical Tables
- Joins
- Table Types
- Calculation Views
- Attribute Views
- Analytical Views

Decision Table actions

- Direct Update
- Select

Working with Decision Tables
Step 3: Define business rules

Define conditions and actions. Use operations and expressions such as:

- Conditional expressions
- Date Operations
- Mathematical Operations
- Enumerations

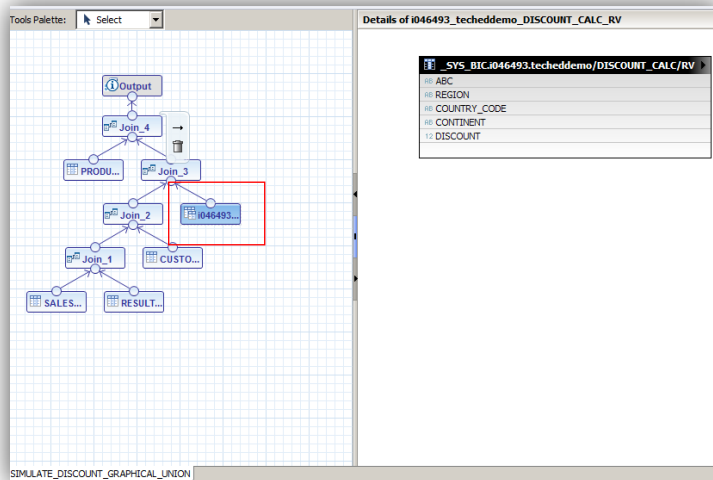# Working with Decision Tables
Step 4: Explore, simulate and adapt
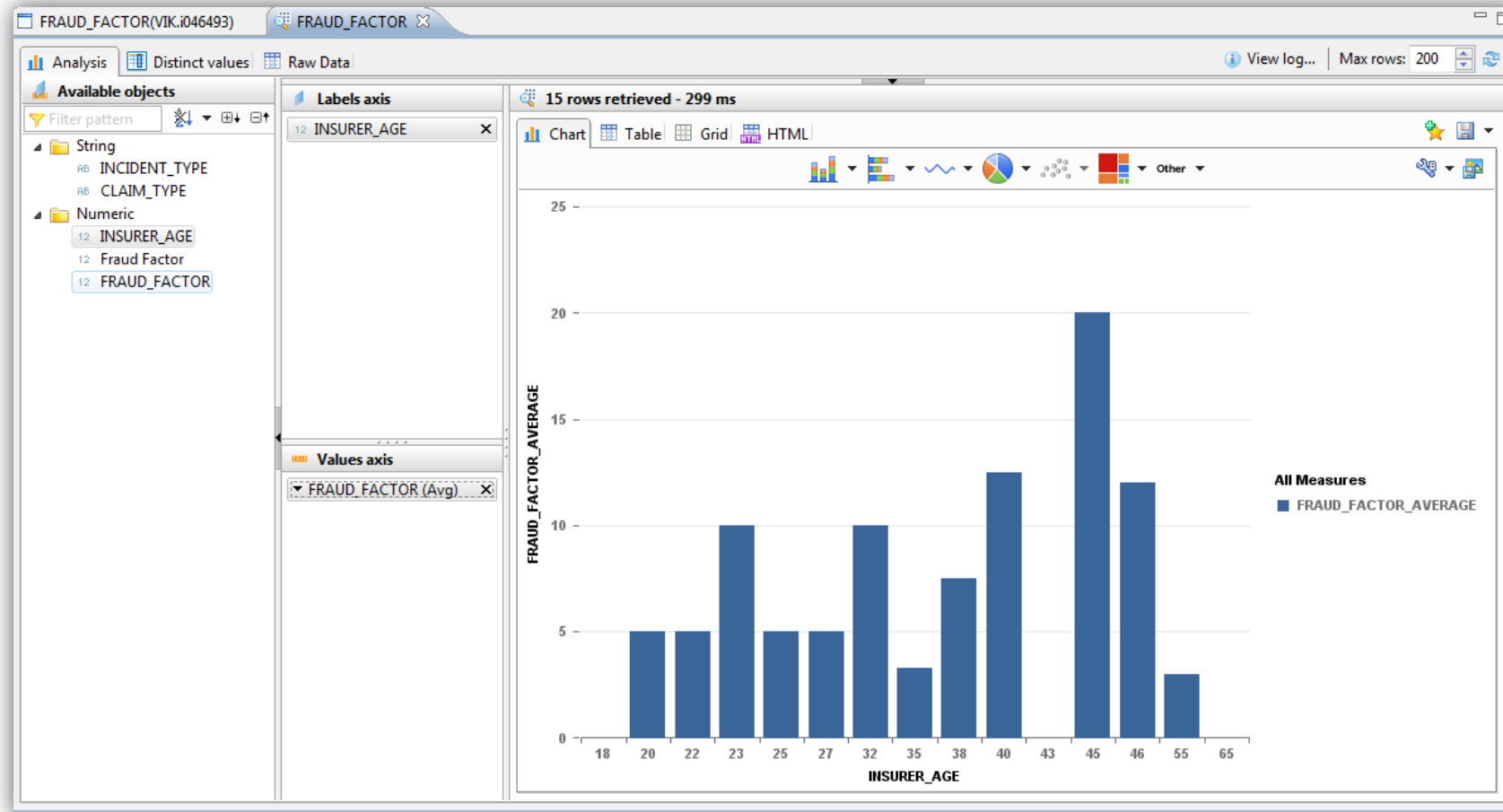
- Simulate, explore and adapt using slice and dice operations

- Consume the column view in other calculation views

- Consume the decision table in HANA analysis tools such as SAP Visual Intelligence

Creating a Decision Table
Step 5: Consume decision tables

- Use in calculation views

- Use in other SQL procedures

- Consume the decision table in HANA analysis tools such as SAP Visual Intelligence

- Use for mobile scenarios

High-Level Architecture

App developer,
Data Architect
Information Modeler
(power user)

Business User

HANA Studio

1 Decision Table Editor

Browser

HANA XS

Rules Web-editor

APIs

3

2

SAP HANA

Rules Compiler

SQL Script compiler

SQL Engine

HANA Repository
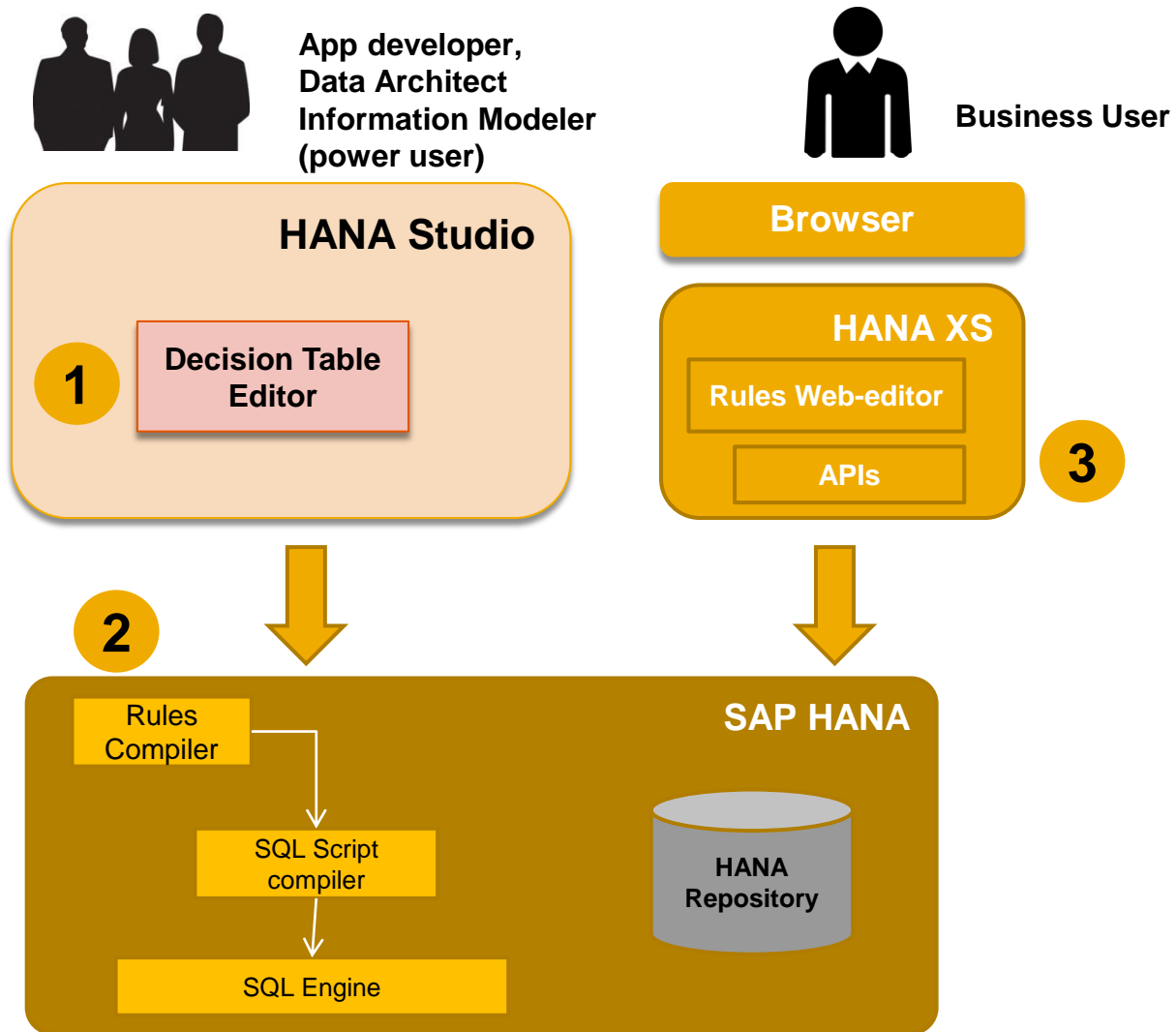
Demo

Scenario: Procurement Rules

SAP®

Outlook

Business Rules and Decision Management @ SAP – Outlook

**Better, Consistent, and
Transparent Decision-Making**

NetWeaver Decision Services Management

HANA Optimizations
- Deployment into HANA
- Calling HANA procedures (predictive, data retrieval)

Partner integration
- Clients (for non-SAP platforms)
- Generators

Analytics

Business Rules on SAP HANA

- Support for HANA developer mode
- SQL Procedure alias as conditions and actions
- Support for aggregation functions in formulas
- Support for Flows
- Decision Support in SAP Operational Process Intelligence

NetWeaver Business Rules Management

HANA Optimizations
- Support for HANA as a database as part of NetWeaver Process Orchestration
- Lifecycle Management enhancements
- Business User authoring improvements

NetWeaver Decision Service Management

HANA Optimizations

Dynamic Database Views

- Deployment to the HANA database generates **a result view** based on database (tables, views) and decision table content
  - DB table or view as the data source
  - Decision table for calculated columns
  - Result view to combine data source with calculated columns
- Decision Table processed on HANA database by **SELECT** on result view
  - Can be used directly in ABAP and in DB Lookup expressions

DB Object: View or Table

Column 1	Column 2
A	10
B	20

Decision Table

Condition Col 1	Condition Col 2	Result Column 3	Result Column 4
A		100	1000
B	0..10	200	2000
B	>10	300	3000

Result View

Column 1	Column 2	Column 3	Column 4
A	10	100	1000
B	20	300	3000

Key Takeaways

**SAP products allow organizations to…**
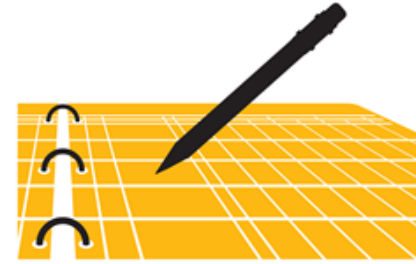
1. **Increase the speed and quality of operational decisions** – by automating complex decision via business-user maintained decision services and business rules

2. **Become more agile** – by adapting decision-making logic with your applications super fast

3. **Decrease IT cost** – by empowering business experts to control decision-making logic without IT involvment and system downtimes
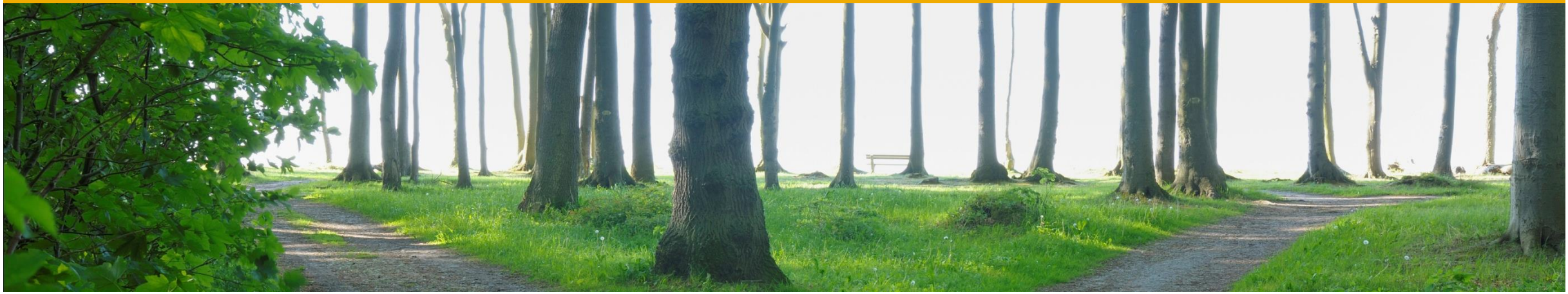
Q&A

Further Information

SAP Public Web

Business Rule in SDN   http://scn.sap.com/community/brm

Decision Service Management in SDN   http://scn.sap.com/docs/DOC-29158

SAP Education and Certification Opportunities

www.sap.com/education

Watch SAP TechEd Online

www.sapteched.com/online

Related Workshops/Lectures at SAP TechEd 2013

CD160   SAP NetWeaver Decision Service Management – A Paradigm Shift

SPK9683   Preview of New Features in SAP NetWeaver Decision Service Management

SPK9684   SAP NetWeaver Decision Service Management - Impact on Custom Development

POP102   SAP Operational Process Intelligence, Powered by SAP HANA
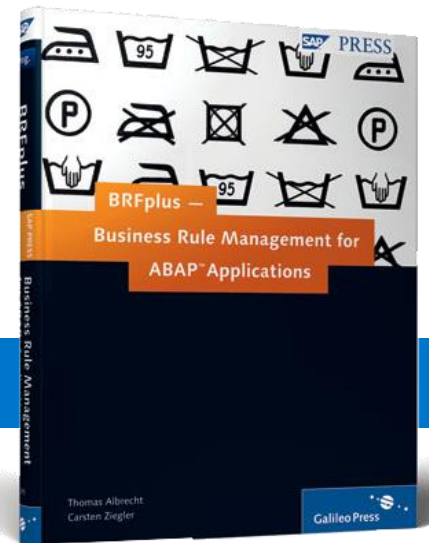
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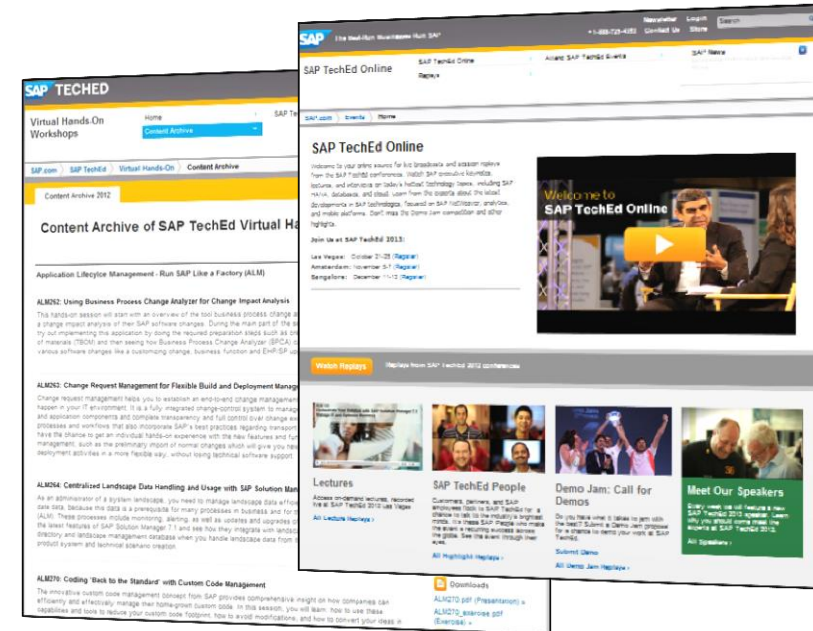- Complementary with your SAP TechEd registration

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- Access replays of keynotes, Demo Jam, SAP TechEd LIVE interviews, select lecture sessions, and more!
- View content <u>only</u> available online

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Feedback

Please complete your session evaluation for POP103.

Thanks for attending this SAP TechEd session.

Thank You!

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