POP103
Business Rules and Decision Service Management with SAP Software
Carsten Ziegler, Dr. Harsh Jegadeesan
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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

**Competitors change**
Change the discount to remain competitive

**Markets change**
Change the assessment to manage risk

**Policies change**
Change validation to track new data requirements

**Consumer behavior changes**
Change to keep selecting the right deal terms

**Regulations change**
Change to keep eligibility decisions compliant

Source: Inspired by James Taylor of Decision Management Solutions
Agility vs. Automation
… or Business vs. IT

<table>
<thead>
<tr>
<th>Automation: Full</th>
<th>Semi</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code/DB</td>
<td>Documents</td>
<td>Tacit knowledge</td>
</tr>
<tr>
<td>Agility: Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>• No transparency</td>
<td>• No compliance, no consistent operations</td>
<td>• High costs for operations (no scale effects)</td>
</tr>
<tr>
<td>• Changes expensive</td>
<td></td>
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</tr>
</tbody>
</table>
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

**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..)

**Software Application**
- SAP Application
- Code Exit BADI
- Custom Application

**Decision Service Flow**
- Call
- Use

**Business Rules/Rulesets Example**
- Rule: Check Decision Table for Promotions when Order > 5 - Unlimited Validity
  - If Order is greater than 5
  - Then Change Promotion after processing Determine Promotion

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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
- Completeness check
- Data validation
- No-go criteria

Credit Score
- Calculation of credit score
- Enable/disable contract terms

Approval
- Automatic/manual approval
- Compliance rules
- Risk management

All banks run same processes…
… differentiation happens in the decisions
Overview SAP Product Portfolio
Better, Consistent, and Transparent Decision-Making

NetWeaver Decision Services Management
ABAP

NetWeaver Business Rules Management
JAVA

Business Rules on SAP HANA
(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

<table>
<thead>
<tr>
<th>Time from request to implementation</th>
<th>Traditional approach</th>
<th>New approach: With SAP NetWeaver DSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weeks to months</td>
<td></td>
<td>Instantly</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality of implemented decision-making logic</th>
<th>Traditional approach</th>
<th>New approach: High - no translation, no details lost!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low as details lost in translation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost to implement, e.g. due to involved staff and system downtimes</th>
<th>Traditional approach</th>
<th>New approach: Low, no IT involvement, no downtimes!</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transparency of decision-making logic applied across applications</th>
<th>Traditional approach</th>
<th>New approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited</td>
<td></td>
<td>Full</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ability to leverage latest innovations through release upgrades</th>
<th>Traditional approach</th>
<th>New approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult</td>
<td></td>
<td>Easy</td>
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</tbody>
</table>
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, …)

**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**

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
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**
- 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

Decision Tables
- 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

- Business Rule Authoring
- Deploy & Manage
- Business User Rule Authoring & Management

Rules Composer
Rules Engine
Rules Manager

Authoring, deploying, and managing business rules
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
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

**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
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

HANA Studio

1. Decision Table Editor

App developer, Data Architect, Information Modeler (power user)

2. Rules Compiler

SQL Script compiler

SQL Engine

3. HANA XS

Rules Web-editor

APIs

Business User

Browser

SAP HANA

HANA Repository

App developer, Data Architect, Information Modeler (power user)

Business User

Browser

SAP HANA

HANA Repository
Demo

Scenario: Procurement Rules
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
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

### Database Object: View or Table

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
</tr>
</tbody>
</table>

### Decision Table

<table>
<thead>
<tr>
<th>Condition Col 1</th>
<th>Condition Col 2</th>
<th>Result Column 3</th>
<th>Result Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>100</td>
<td>1000</td>
</tr>
<tr>
<td>B 0..10</td>
<td></td>
<td>200</td>
<td>2000</td>
</tr>
<tr>
<td>B &gt;10</td>
<td></td>
<td>300</td>
<td>3000</td>
</tr>
</tbody>
</table>

### Result View

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
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<tbody>
<tr>
<td>A</td>
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<td>B</td>
<td>20</td>
<td>300</td>
<td>3000</td>
</tr>
</tbody>
</table>
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 involvement 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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Carsten Ziegler
Development Architect, Chief Product Owner
SAP NW Decision Service Management
SAP AG
Dietmar-Hopp-Allee 16
69190 Walldorf
Germany
c.ziegler@sap.com

Harsh Jegadeesan, PhD
Product Manager
Integration & Orchestration
SAP AG
Dietmar-Hopp-Allee 16
69190 Walldorf
Germany
harshavardhan.jegadeesan@sap.com