A hybrid implementation of multi-channel, multi-modal, high volume financial risk monitoring

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A hybrid implementation of multi-channel, multi-modal, high volume financial risk monitoring

- Real live case
- Hybrid solution: it involves both ML and rules
- Multi-channel: the same rules are enforced across multiple channels
- Multi-modal: the rules can be run on production in different modes
- High volume: tens of millions of customers are processed in hours
Challenge

• All customers must have a personal dossier proving the bank knows that customer with a correct risk classification
  ▫ Investigating millions of customers personally is too time-intensive, too expensive and undesirable for the customer
  ▫ The bank does not have all, the by law obligatory, data
  ▫ Rules are evolving
  ▫ The law gives room for interpretation, new policies emerge exploring the boundaries of the law
Contents

• Context
  ▫ Wwft/CDD/KYC
  ▫ Process
• Risk model
• Risk model implementation

• Technology
• Evolution
  ▫ Challenges
  ▫ Best Practices
  ▫ Results
  ▫ Innovations
Wwft: the Act on the prevention of money laundering and the financing of terrorism

- Related:
  - Customer Due Diligence (CDD)
  - Know Your Customer (KYC)

- Every bank must adhere to the Wwft
  - The bank needs to know each client through a survey
  - Each client needs to get a correct risk classification
  - When a client poses a potential risk, there must be procedures and measures to mitigate them
Risk Detection check

Consists of

• Basic investigation
  ▫ Should provide insight into the relevant background and intentions of the customer
  ▫ Determining specific integrity risks based on risk indicators

• Follow-up investigation
  ▫ Focused on the risk indicators where risks were identified
  ▫ To determine whether the risk indicator actually applies (materiality)
Sources of the Riskmodel and its execution

• People
  ▫ expert employees are still needed
    ▪ when relevant data is missing
    ▪ to do final specific risk classifications
    ▪ as a source for ML

• Policies
  ▫ external and internal written policies with predefined rules

• Data
  ▫ patterns in static and behavioral data contain risk indications.
  ▫ For relevant patterns to be found expert knowledge needs to be elicited
Risk indicators

- Geographical risk
- Structural risk
- Legal entity type risk
- Industry risk
- Products- and services risk
- PEP-risk
- Transaction risk
- Channel risk
- Third party risico
Model Implementation

- External data
- Data warehouse
- Siebel DB
- PowerCenter
- Siebel UI (Bank Employee)
- Oracle Fusion Middleware
- Online (WEB & App)

**BRE & BRMS**
- OPA Batch
- Rules Repository in OPA Hub
- OPA Web determinations

Weekly batch of an automated Risk detection check on all existing customers

Interview by bank employee for on-boarding new customer, customer review (EDR & PDR)

STP Risk detection check for online on-boarding new customer
Monitoring - Change in Circumstances

• On the basis of Riskmodel result:
  ▫ a new event driven review needs to be done for a customer when
    • the calculated risk category is higher then the current customer’s risk category and
    • the calculated risk category is higher then the previously calculated risk category and
    • the customer doesn’t currently have an ongoing event driven review
Technology

- Infrastructure
- Rule architecture
- Development process
- Traceability
- Modes of operation
Oracle Policy Automation (OPA)

- OPA is a BRE & BRMS
- Rules are executable
- Each decision has an explanation
  - With orderly outcomes for each underlying rule
  - The decision report is configurable
- Rules are reusable across channels
  - Using embedded interviews, web services or batch
  - On-premise or in the cloud
Oracle Policy Automation (OPA)

- Rules are written in natural language
  - Microsoft Word and Excel
  - Accessible to the Business
  - Structural equivalence with DMN

The follow-up questions of Geographical risk NP wrt Money Laundering are relevant if

the assessment customer is a person and

either

the assessment customer is stateless or

ExistsScope(all countries)

the AML/TF-questionscore of the country = 1 and

the country has been selected under Geographical risk NP
Rule architecture

Technology

- Risk classifications
- Scoring rules
- Model answers
- Answer rules
- Business facts
- Data rules

Screen

Database
Rule architecture - Reuse

• Every rulebase can have a data mapping to one external system
  ▫ Every channel requires a separate rule base
    (Oracle Integration cloud solves this constraint)
  ▫ Rules can be reused by using Inclusions

• CDD Rule repository has 3 layers
  1. Generic rulebases that translate domain specific objects to business language
  2. Application rulebases that apply business rules using the business language from the generic rulebases
  3. Integration rulebases that map the application rulebases' input and output onto external systems.
Rule architecture - Reuse

Basic
- Styling
- Risk model
- Model initialisation
- Countries
- Service requests and activities

Applications
- Interview
- Recalculation
- Batch

Integrations
- Risk detection NP
- Risk detection ORG
- Simulator NP
- Simulator ORG
- Recalculation NP
- Recalculation ORG
- PreexistingScan
Development environment - rule authoring

- In OPA Hub a rulebase repository with version control is maintained
- The repository is divided in one or more collections
- Users are authorized on collection level
- Good practices for collaboration and rule authoring have been defined in the form of guidelines
- These guidelines have been improved over time based on experience.
Traceability

• A primary aspect of compliance is transparency
  ▫ Internal audits are used to ensure the process leads to externally auditable results
• Natural language rules demonstrably reflect policy
  ▫ the rules also have tags that refer to specific articles in the policy
  ▫ Audit questions could be answered by showing the actual rules
• Explanations, timestamps and rulebase versions are stored with each risk classification
Evolution - Development process

- Teamwork conforming to general scrum principles
- SME's, productowner and rule authors have biweekly review sessions
  - Production incidents
  - Delivery review (demo) for PO approval
  - Rules and requirements review for PO approval
  - Impediments, open questions
  - Backlog refinement and new backlog items
- Productowner, business analyst and solution architect have design sessions as part of backlog refinement
Process driven to data driven

- New data, internal and external
- Machine learning
- Feedback
Evolution - Innovations

- Context driven rules enable specific channel related behavior
- Policy changes in industrially or geographically related risks can be deployed within two business days
- Situationally aware instructions in the web-interviews help employees in complex assessments, improve quality and speed up operations
- New datastreams can be added incrementally without disruptive architectural changes
- The generic risk model and decision structure allows for improvement and enrichment of risk classifications by incremental expansion of rules
- Impact predictions of policy changes