Toward Decision Management in Robotic Process Automation

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10.08.2021 – FPF – Automation without AI?
Increased Capabilities of RPA

- Natural Language Processing
- Mimic User Interaction
- Artificial Intelligence
- E-Mail Classification

RPA

- Computer Vision
- Robotic Process Mining
- Start & Stop Software
- Text Understanding
- Transfer Data
- Process Unstructured Data
Increased Capabilities of RPA

- Natural Language Processing
- Artificial Intelligence
- E-Mail Classification
- Decision-Making
- Robotic Process Mining
- Text Understanding
- Process Unstructured Data
- Computer Vision
Decision-Making and RPA

**Machine Learning**
- Make decision based on observed behavior
- Requires a lot of data (past executions)
- Works with probabilities

**Modeling**
- Traditional approach
- Requires in-depth knowledge of decision logic
- Based on defined set of rules
Current Options for Modeling Decisions

- **If/Else**
- **Case**
- **User Prompt**
- **Custom Code**

Relationships:
- Complexity ↓
- Maintainability →
- Scalability ↓
- Maintainability ↓
Current Options for Modeling Decisions

Goal
- Handle complex decisions
- Useable by non-IT users
- Automatic evaluation

If/Else
Case
User Prompt
Custom Code
Related: BPMN and Decisions
“DMN is a modeling language and notation for the **precise specification of business decisions and business rules**. DMN is **easily readable** by the different types of people involved in decision management. **These include: business people** who specify the rules and monitor their application; **business analysts.**”
DMN – Decision Requirements Graph

Discount Decision

- Quantity

Purchasing Manager

Shipment Calculation

- Shipment Type
- Weight
- Destination

Legal Regulations

Domain Knowledge

Policies

Complex Data
## DMN – Decision Table

### Shipment Calculation

<table>
<thead>
<tr>
<th>When</th>
<th>And</th>
<th>Then</th>
<th>And</th>
<th>And</th>
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</thead>
<tbody>
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<td>shipment type</td>
<td>weight</td>
<td>price</td>
<td>destination</td>
<td>responsibility</td>
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DMN – Applications

- Discount Decision
- Purchasing Manager
- Shipment Pricing
- Shipment Type
- Weight
- Destination

Medical Domain
Finance & Insurance
Manufacturing
Public Administration

**Eligibility Check**

**Calculation**

**Classification**

**Risk Assessment**

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DMN – Integration in BPMN

Integration of DMN in RPA

Integration of DMN in RPA
Effects of the Integration of DMN in RPA

Effects – Design Time

- Increased applicability of RPA, as decision-intensive processes can be modeled easier using DMN
- Decision captured independent of RPA bot
- Requires proficiency of another modeling language (DMN)
Effects – Run Time

- Deployment
  - Decision made by decision service not by RPA bot

- Testing
  - Decision tables enable some preliminary checks at design time

- Operation
  - Track and analyze decisions
  - Decision logic can be updated without modifying RPA bot
  - New performance indicators can be collected
Central storage of decisions enables reuse in bots and processes

Can be modified and reviewed easily

Decision-making processes are logged

Decision logic not exposed to bot
Conclusion

- RPA becomes more and more intelligent
- Integration of DMN enables
  - Visual modeling of complex decision logic
  - Decoupling decision logic from bot model
  - Traceability of decisions

Contact


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