Red Hat
Process Automation

Software and Services for Business Automation

PV207 BPM

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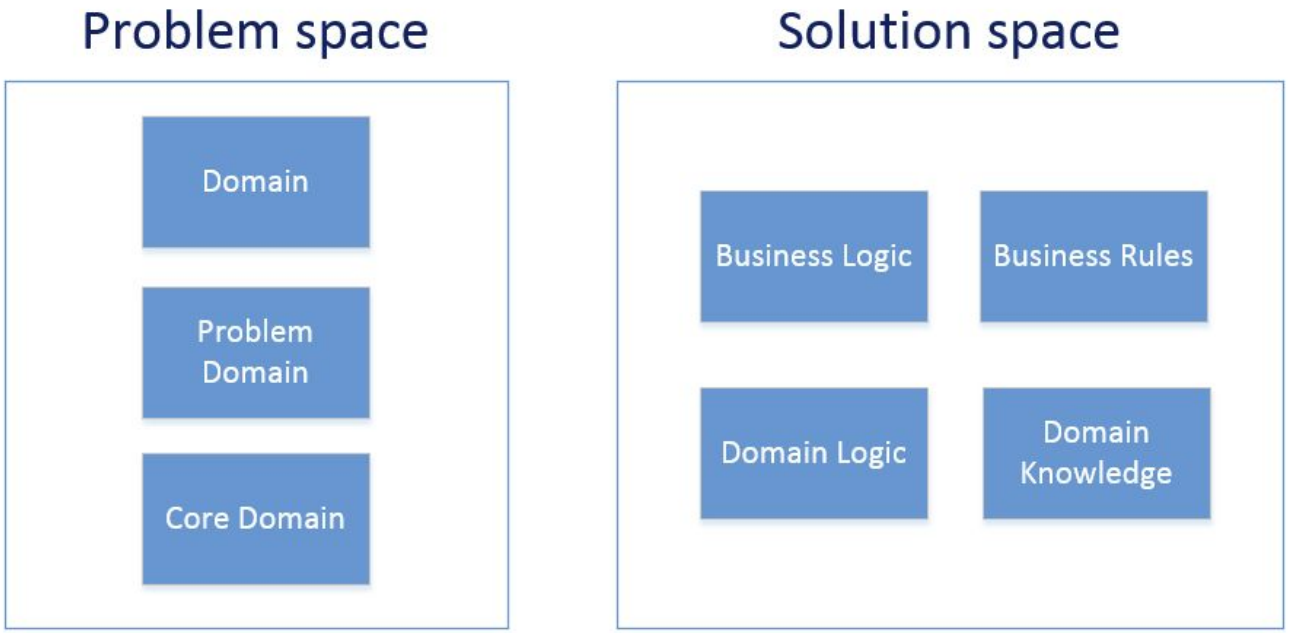
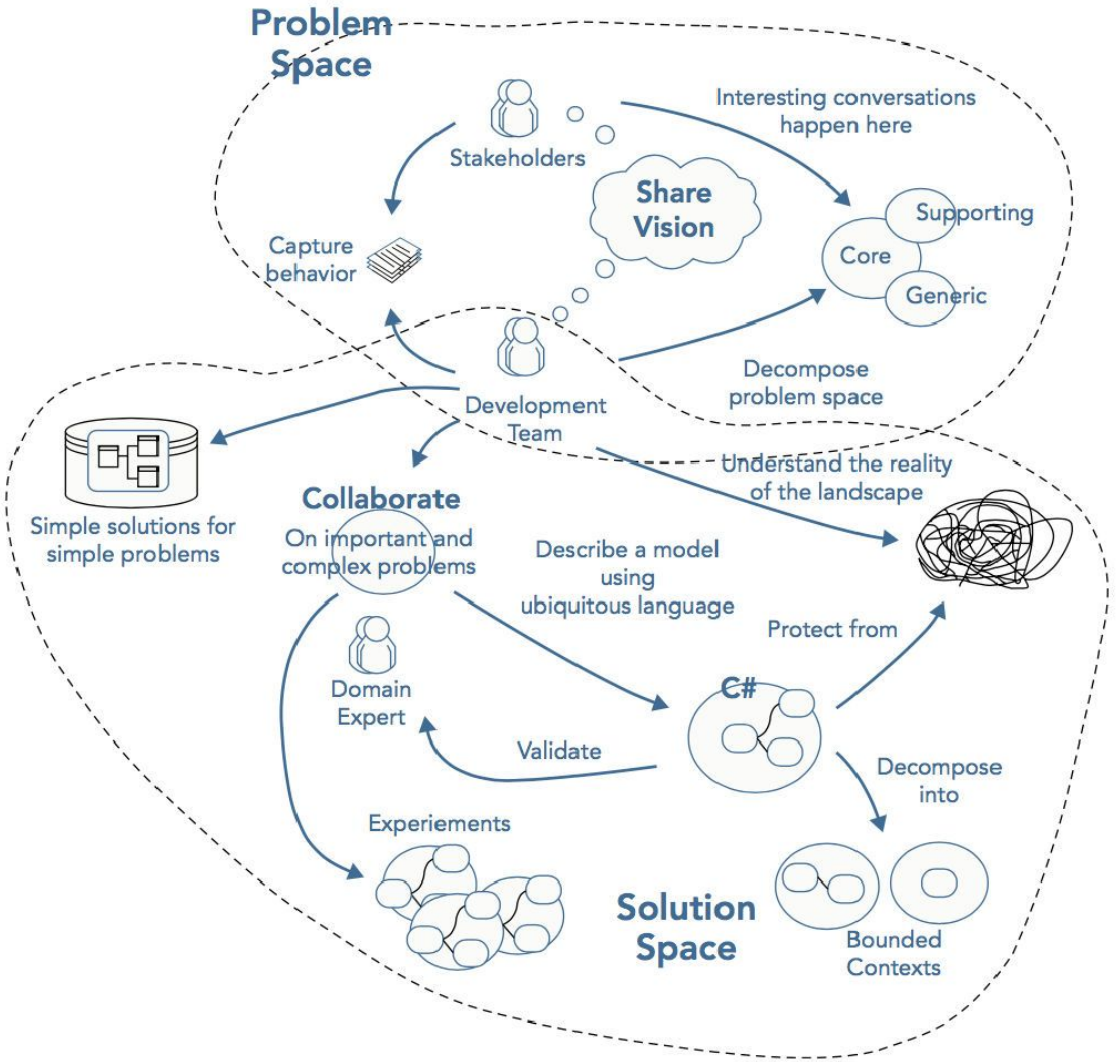
DOMAIN-DRIVEN DESIGN (DDD)

Domain-driven design is a concept that the structure and language of software code should match the business domain.



- Eases communication
- Improves flexibility
- Emphasizes domain over interface
- Requires robust domain expertise
- Encourages iterative practices
- Ill-suited for highly technical projects

DOMAIN-DRIVEN DESIGN (DDD)



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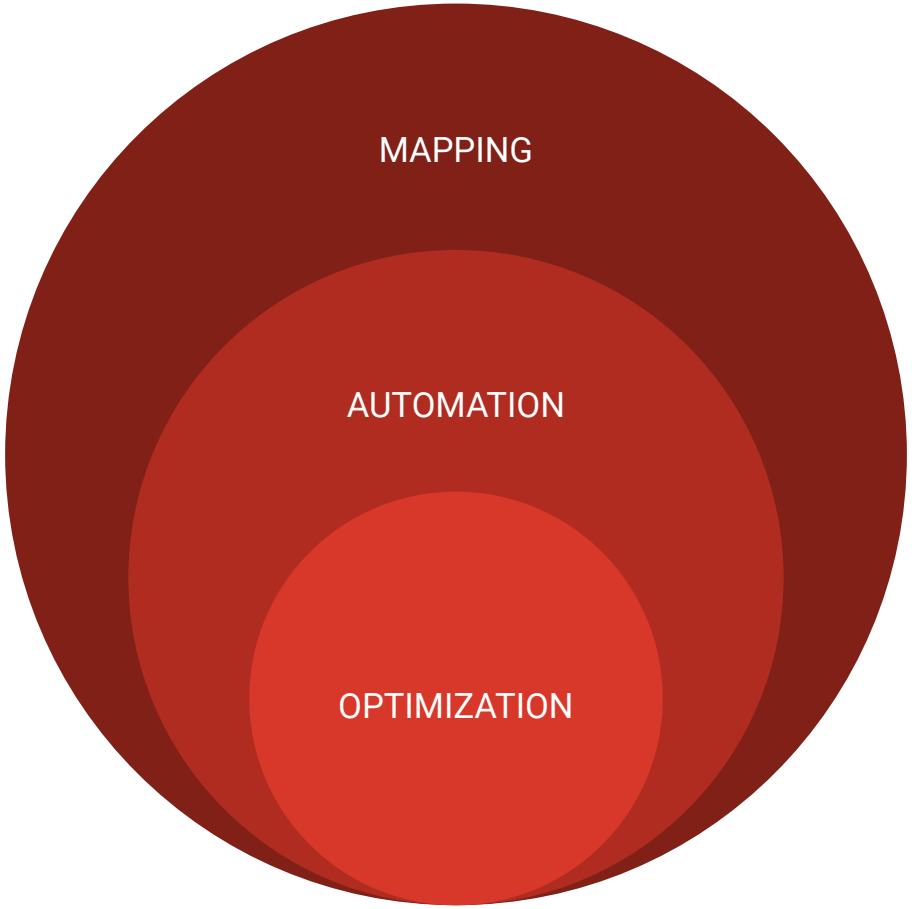
BUSINESS AUTOMATION



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MARKET

Low Code Platforms

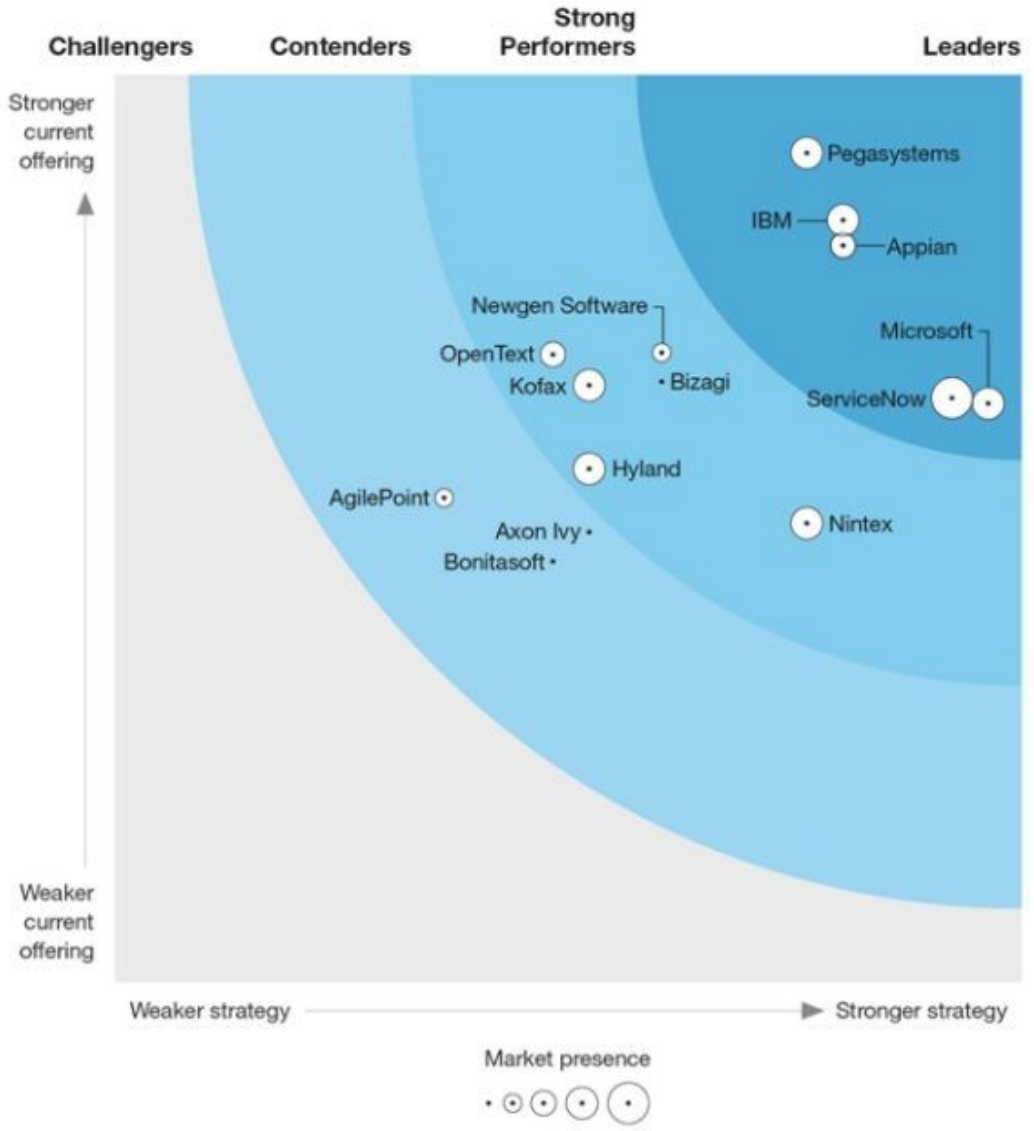
DPA Platforms

Cloud Services

Communities

(Object Management Group, Cloud Native Computing Foundation, Kubernetes, Knative, KIE, Kogito)

DPA SOFTWARE FROM FORRESTER ANALYST REPORT ‘21



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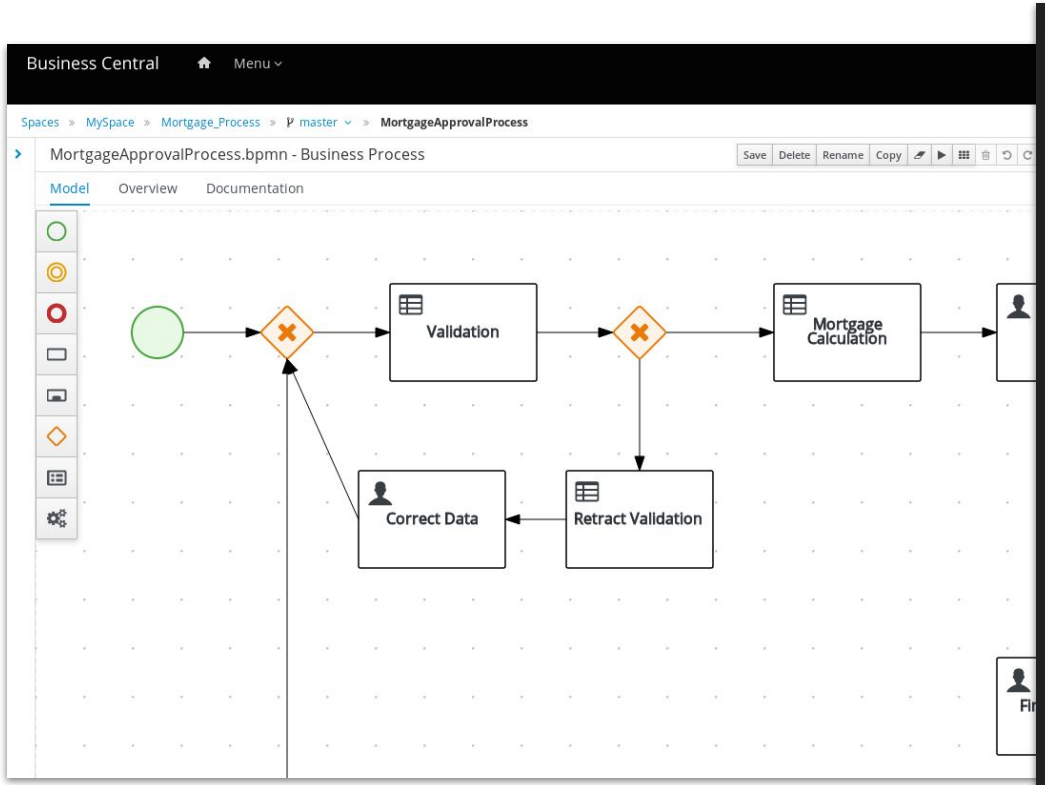
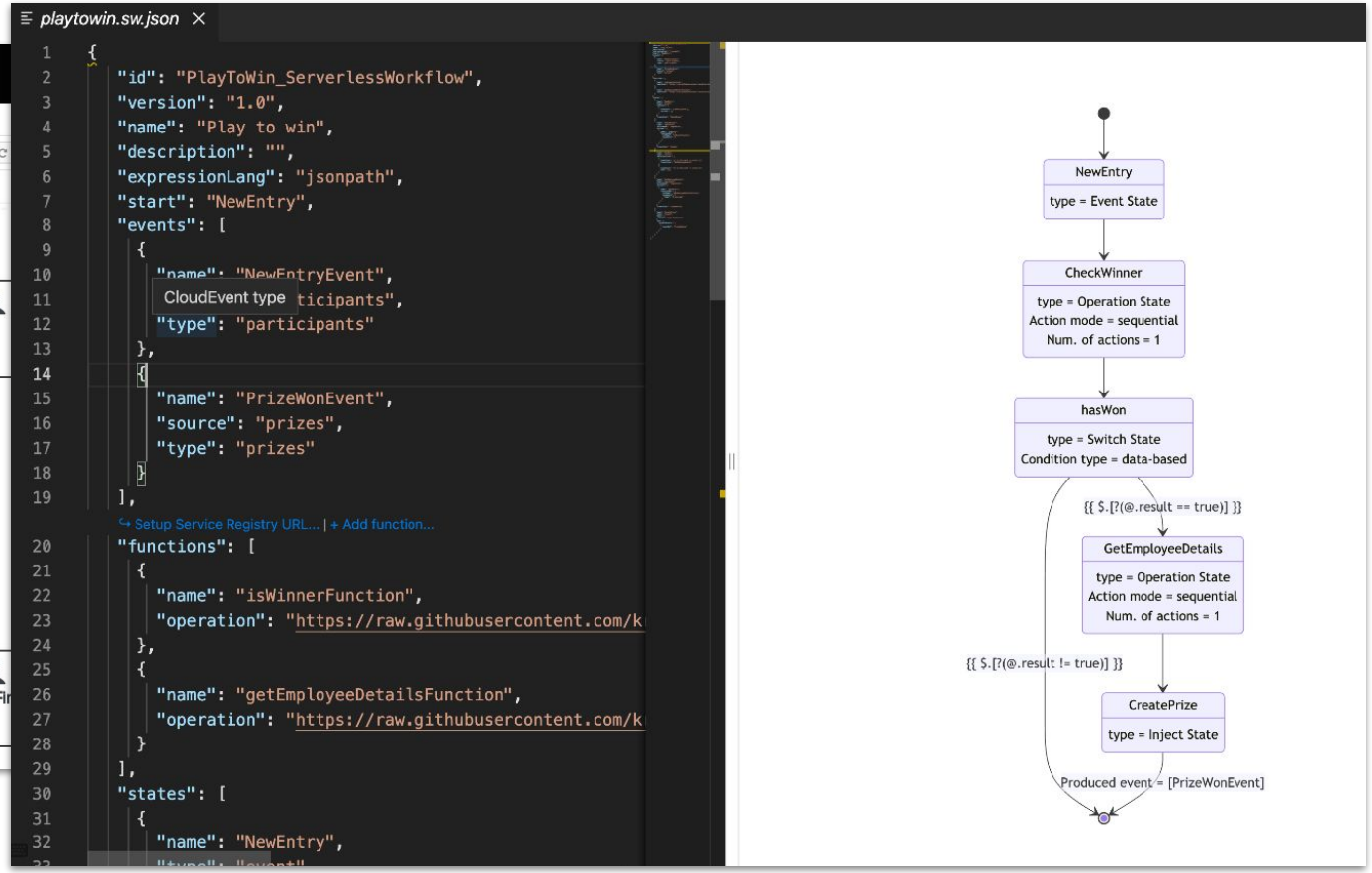
AUTOMATION OF WORKFLOWS





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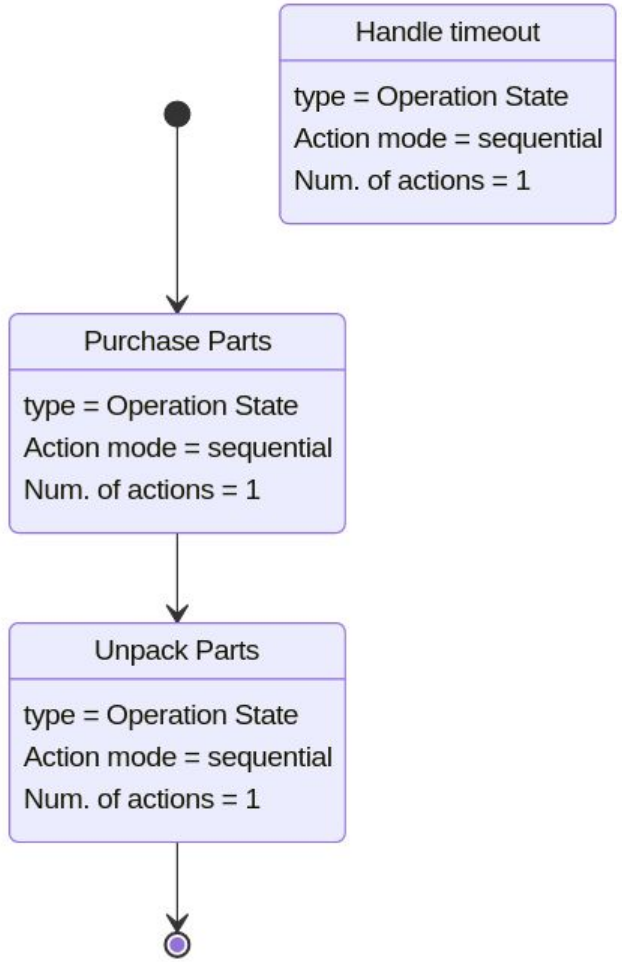
SERVERLESS WORKFLOW

- Similar specification to BPMN but aimed more at developers
- More lightweight, no human tasks, targeted at machine interaction
- Workflow is “modelled” directly by writing the code (JSON/YAML), currently doesn’t define graphical notation
- Higher level than BPM, focuses more on orchestration of services or infrastructure in the cloud, self-healing infrastructure
- Background service, end users don’t interact directly with it (as with BPM in loan approval, order processing…)
- https://serverlessworkflow.io/
- BPMN vs. SWF

```yaml
id: executiontimeout
name: Execution Timeout Workflow
version: '1.0.0'
specVersion: '0.8'
start: Purchase Parts
timeouts:
  workflowExecTimeout:
    duration: PT7D
    interrupt: true
    runBefore: Handle timeout
states:
- name: Purchase Parts
  type: operation
  actions:
  - functionRef: purchasePartsFunction
  transition: Unpack Parts
- name: Unpack Parts
  type: operation
  actions:
  - functionRef: unpackPartsFunction
  end: true
- name: Handle timeout
  type: operation
  actions:
  - functionRef: handleTimeoutFunction
functions:
- name: purchasePartsFunction
  operation: file://myservice.json#purchase
- name: unpackPartsFunction
  operation: file://myservice.json#unpack
- name: handleTimeoutFunction
  operation: file://myservice.json#handle
```



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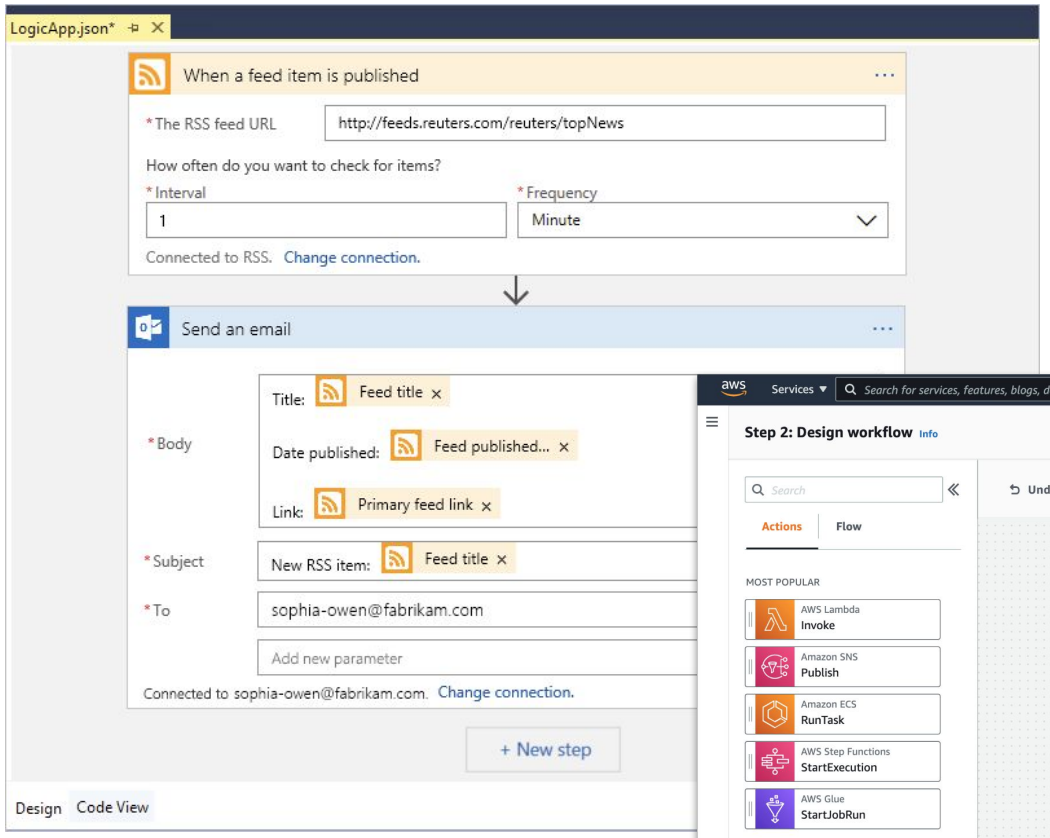

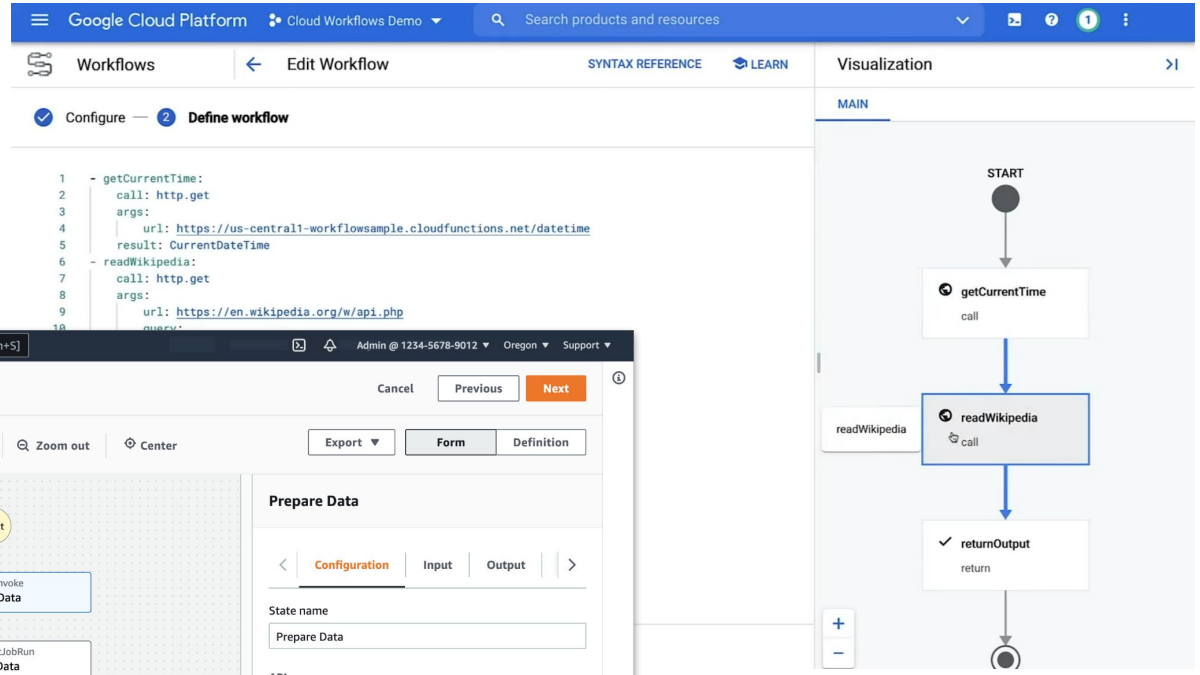

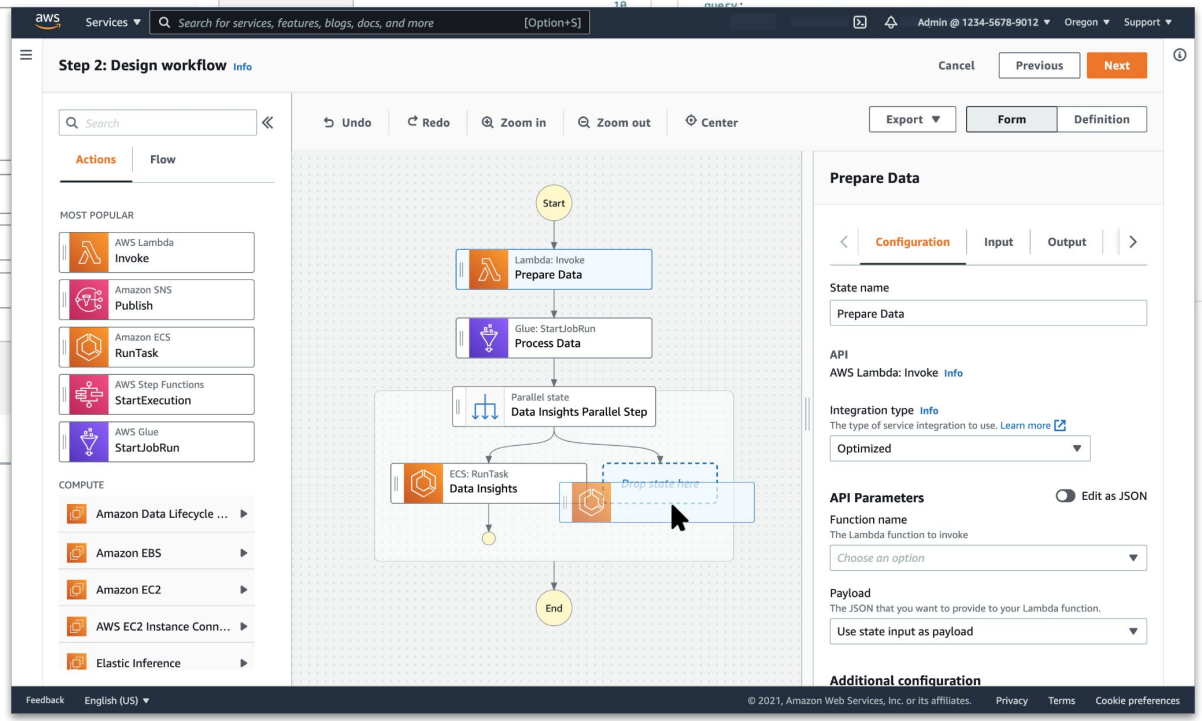

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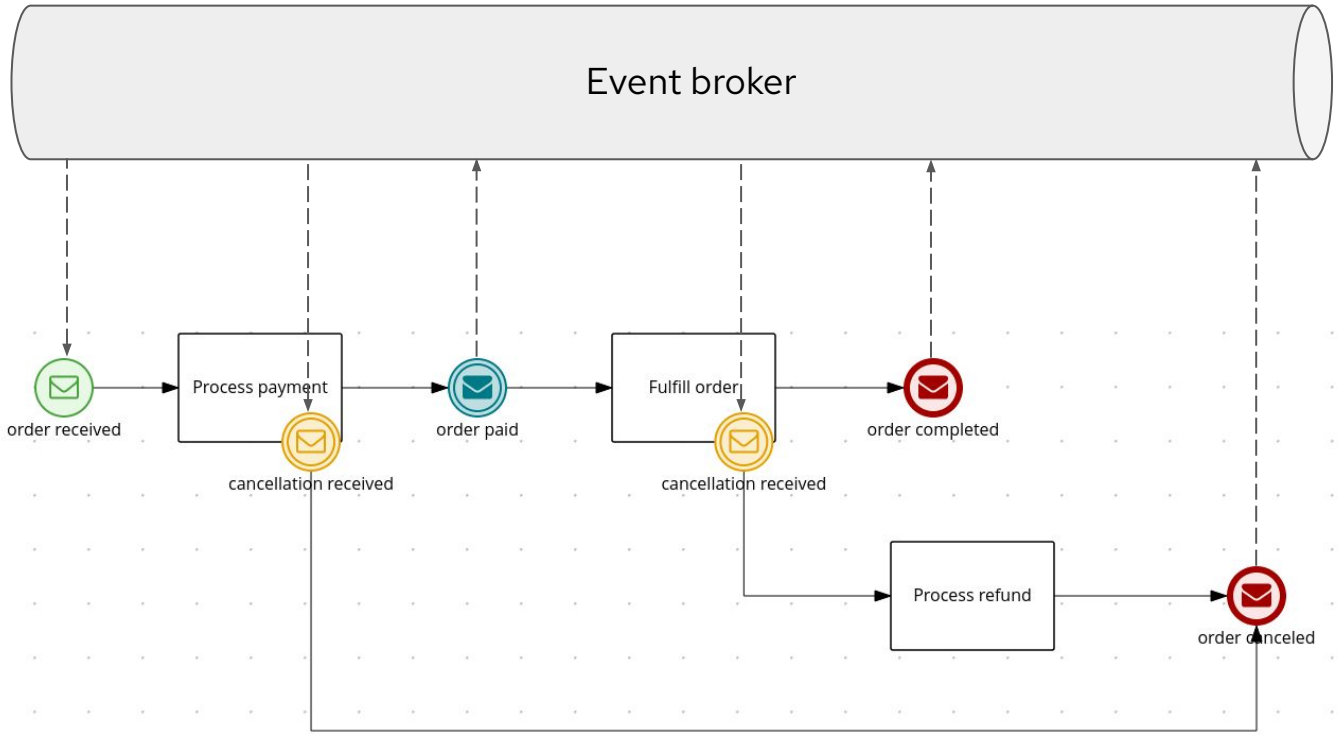
AUTOMATION OF EVENT-DRIVEN WORKFLOWS



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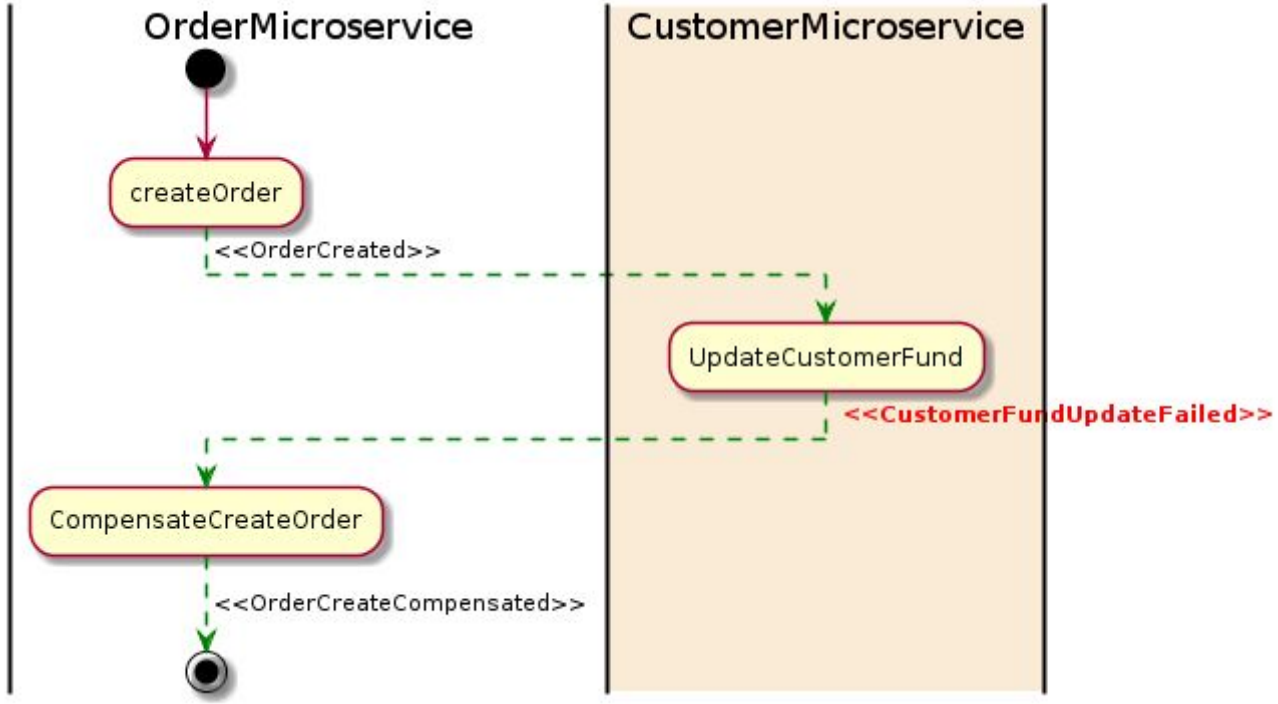
AUTOMATION OF LONG-LIVED TRANSACTIONS

Saga pattern for microservice architectures



If any microservice fails to complete its local transaction, the other microservices will run **compensation** transactions to rollback the changes.

Advantages

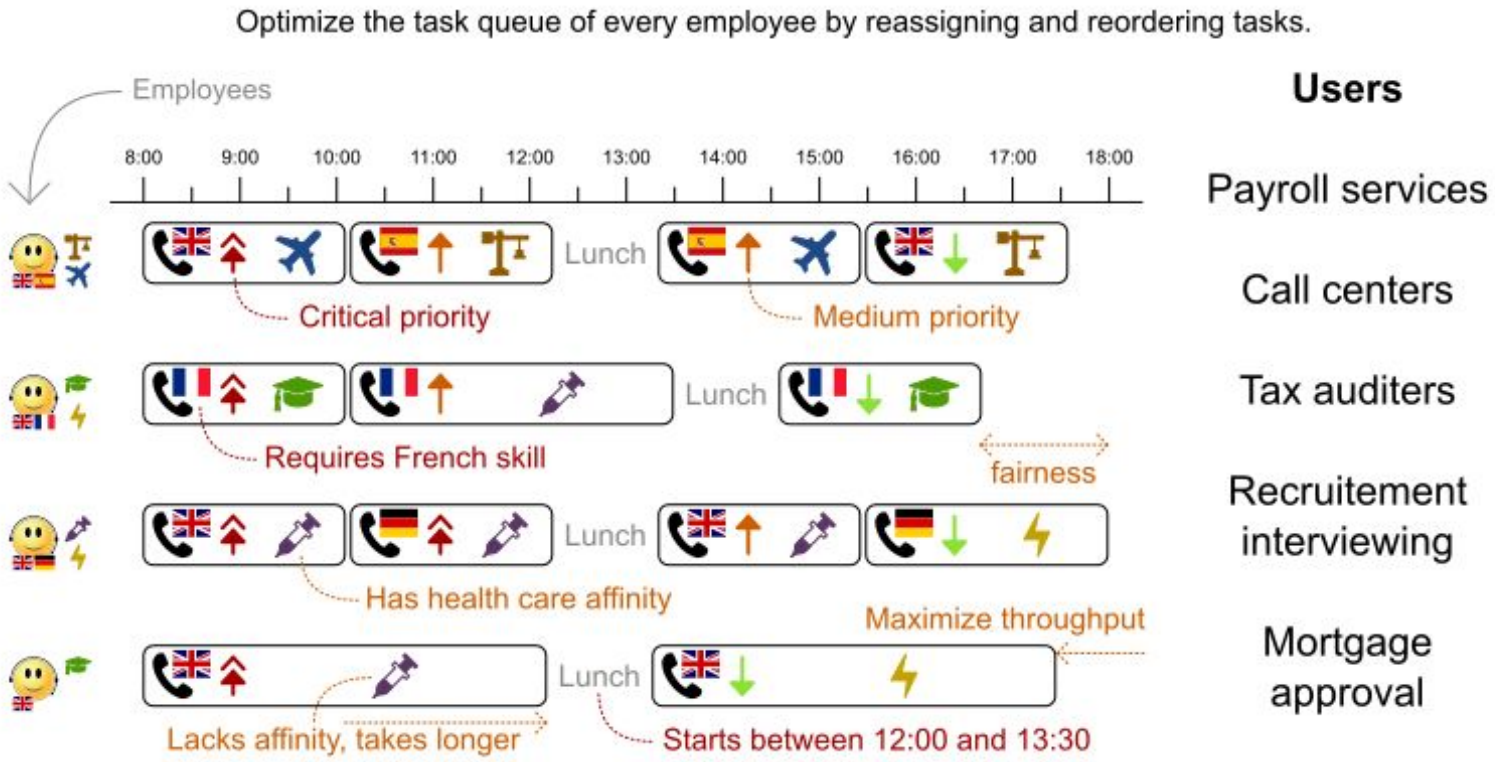
- support for long-lived transactions
- other microservices are not blocked if a microservice is running for a long time
- there is no lock on any object

Disadvantages

- difficult to debug
- difficult to maintain if the system gets complex
- does not have read isolation

Adding a **process manager** addresses the complexity issue of the Saga pattern when it becomes responsible for listening to events and triggering endpoints.

AUTOMATION OF TASK ASSIGNMENTS



[KIELive#45] Optimizing user tasks assignment in business processes with Kogito and OptaPlanner

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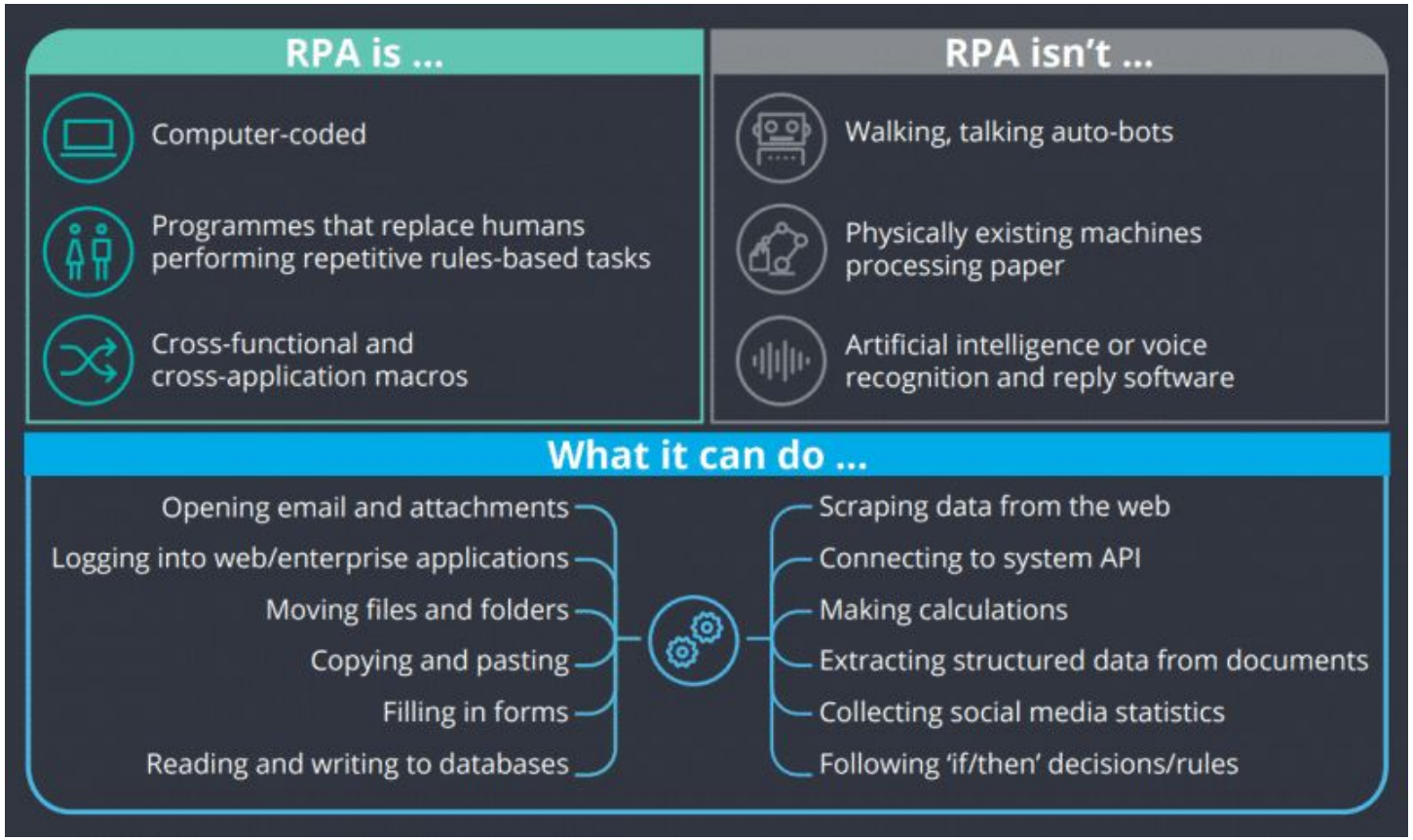
AUTOMATION OF HUMAN ACTIONS INTERACTING WITH SW

Robotic Process Automation (RPA)



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AUTOMATION OF BUSINESS RULES

Kogito DRL Rules language

IBM Action rules express business policy statements using a predefined business vocabulary that can be interpreted by a computer.

Policy

"change customers in the `Gold` category to the `Platinum` category when they spend more than `$1,500` in a single transaction"

Action Rule

If All of the following conditions are true:

- the customer category is `Gold`
- the value of the shopping cart is more than `$ 1,500`

Then Change the customer category to `Platinum`

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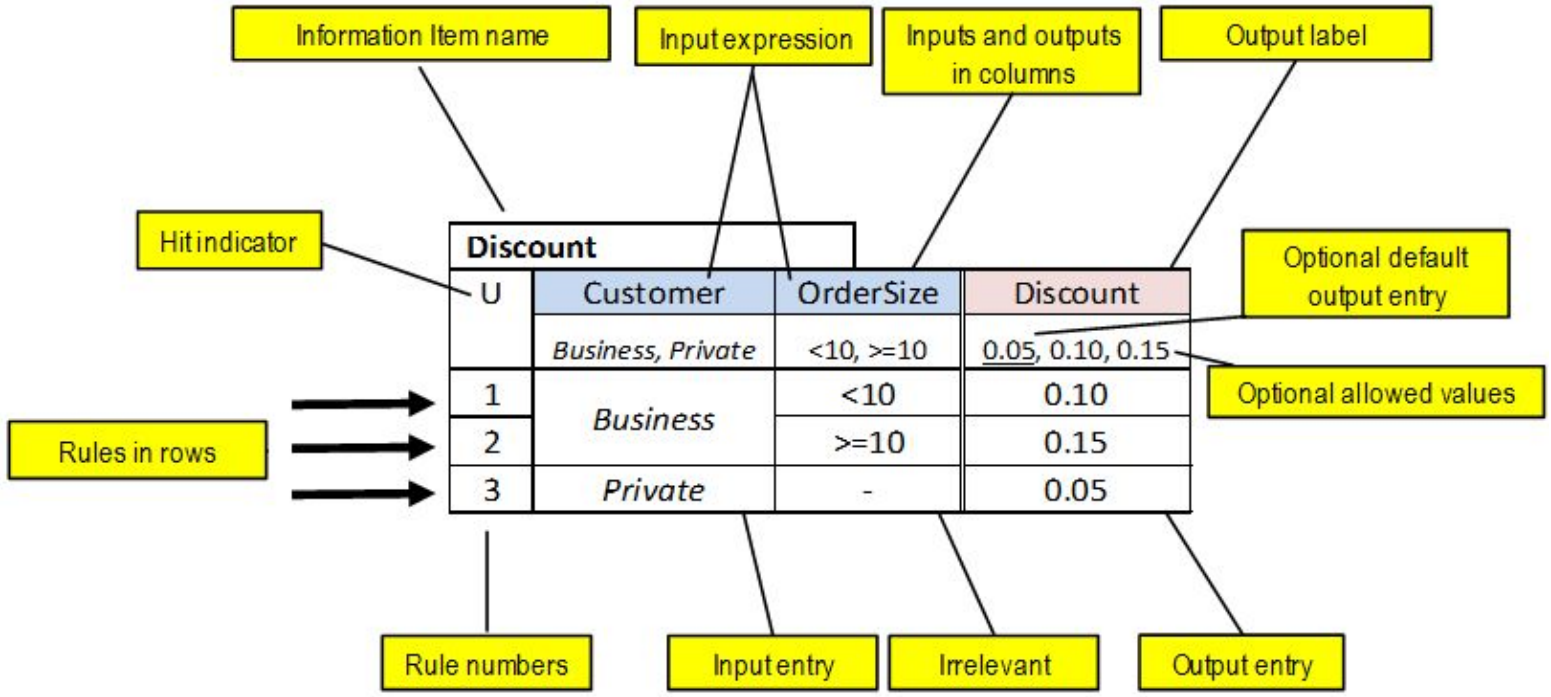
AUTOMATION OF DECISION TABLES



Types of decisions

- Selection (routing)
- Scoring
- Categorizing

The decision doesn't take an action (no side effect), just determines a data value

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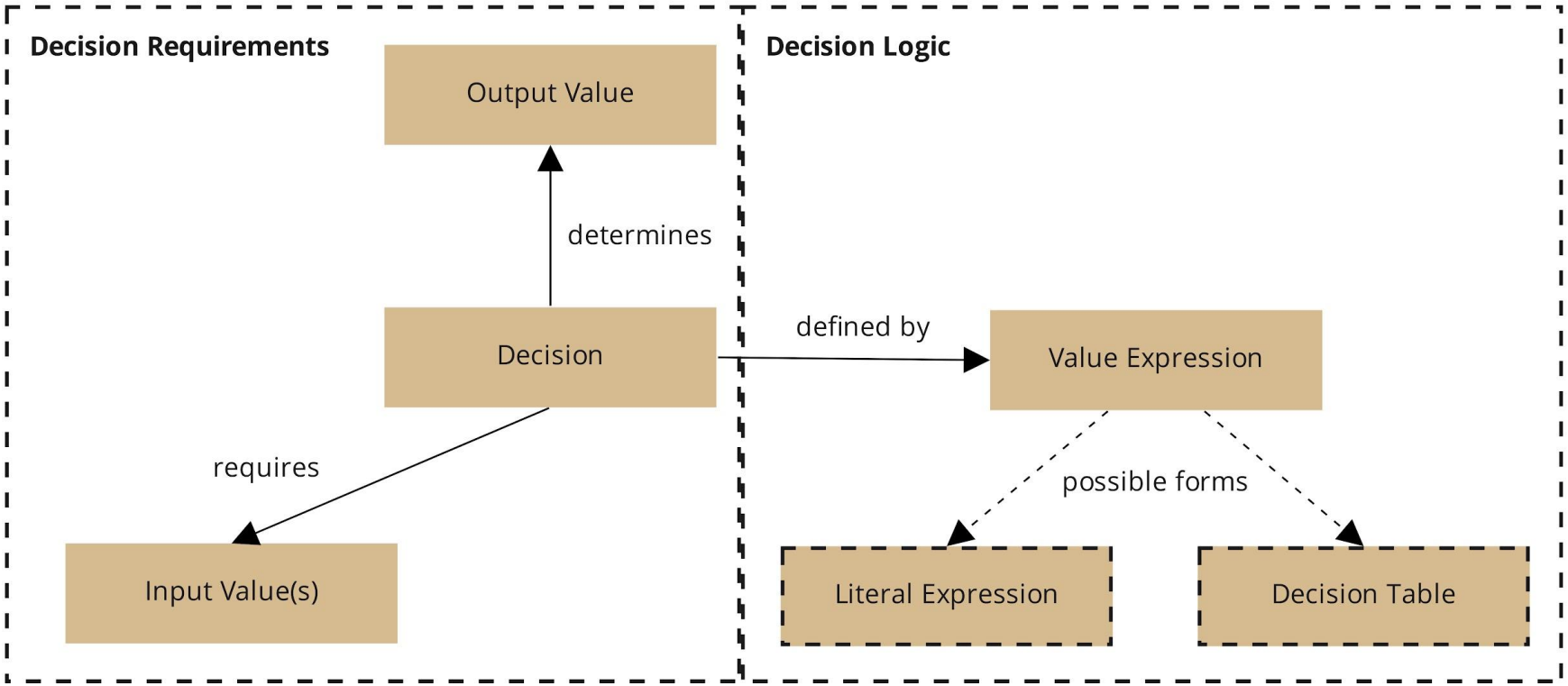
AUTOMATION OF DECISION MODELS



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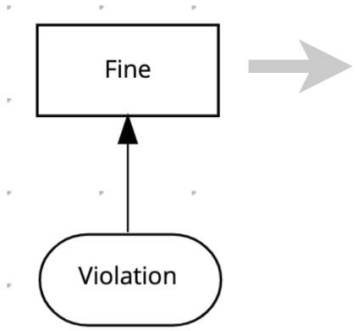
AUTOMATION OF DECISION MODELS

Executing decision logic in DMN models



Fine *(Decision Table)*

U	Violation.Type *(string)*	Violation.Actual Speed - Violation.Speed Limit *(number)*	Fine *(tFine)*		Description
			Amount *(number)*	Points *(number)*	
1	"speed"	[10..30)	500	3	
2	"speed"	>= 30	1000	7	
3	"parking"	-	100	1	
4	"driving under the influence"	-	1000	5	

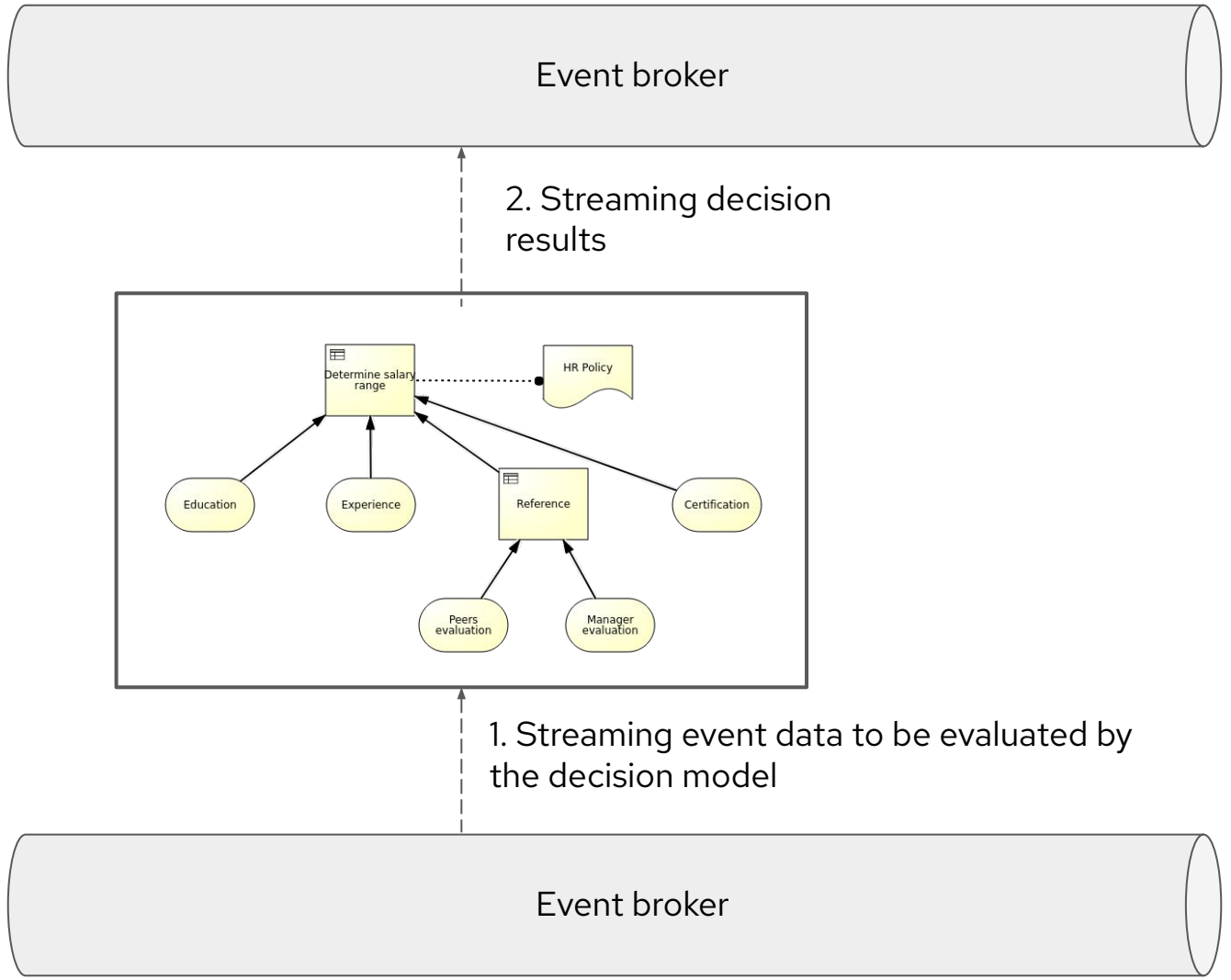
```
/* = Actual input data = */
"Violation": {
  "Type": "speed",
  "Speed Limit": 60,
  "Actual Speed": 100
}
```

```
/* = Expected output data = */
"Fine": {
  "Points": 7,
  "Amount": 1000
}
```

DMN with Kogito on Quarkus

DMN FEEL Cheatsheet

AUTOMATION OF DECISION MAKING IN STREAMS



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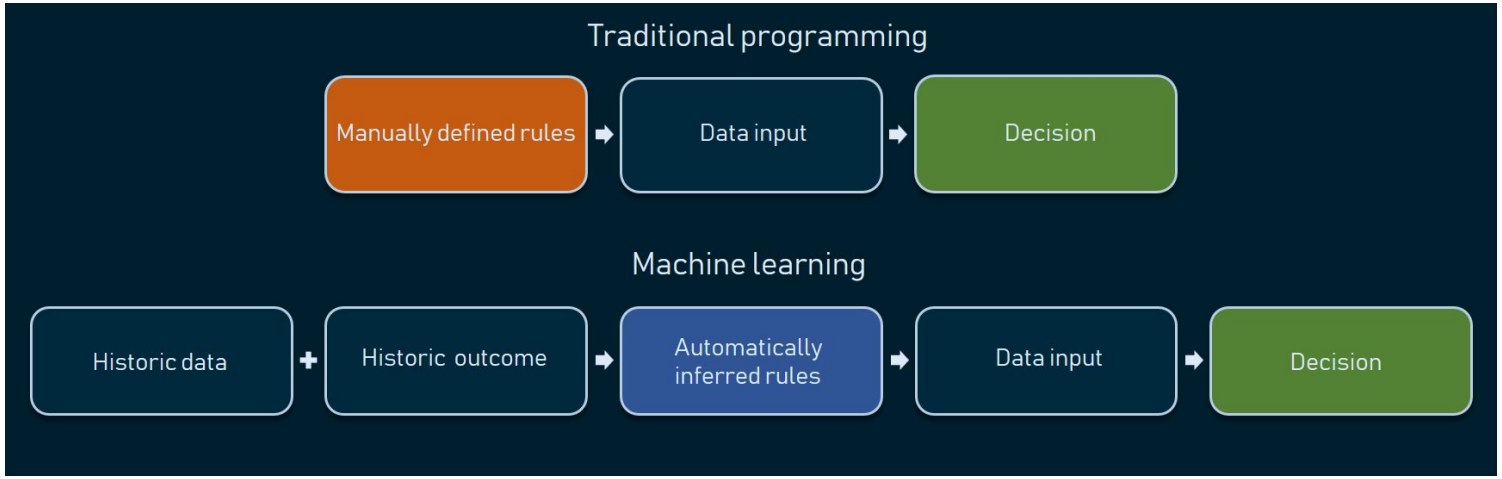
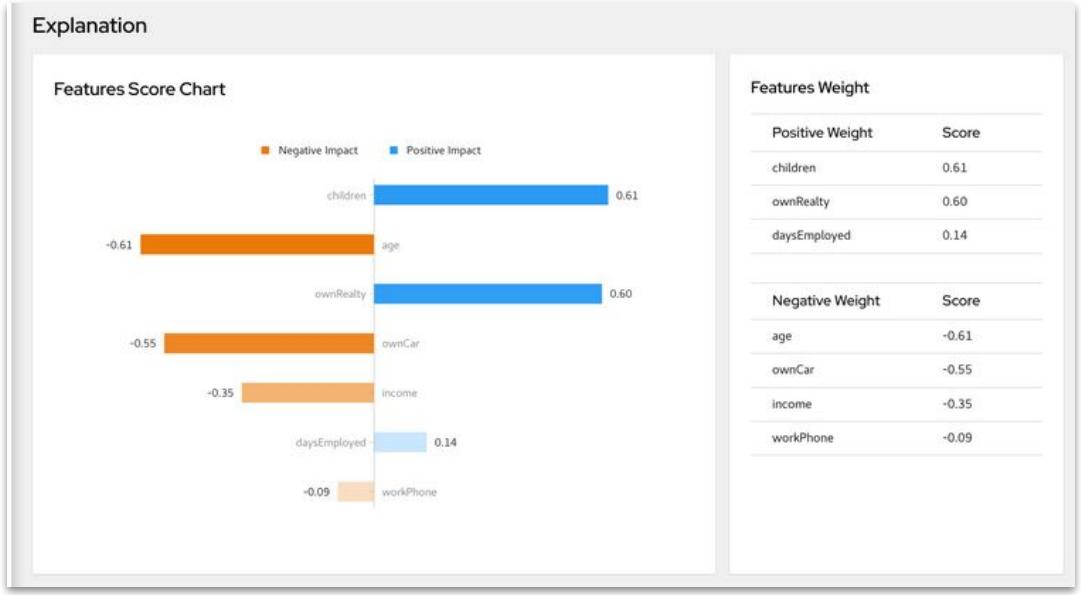
AUTOMATION OF DECISION MAKING WITH AI





[TrustyAI]

[Can you trust AI? - presentation]

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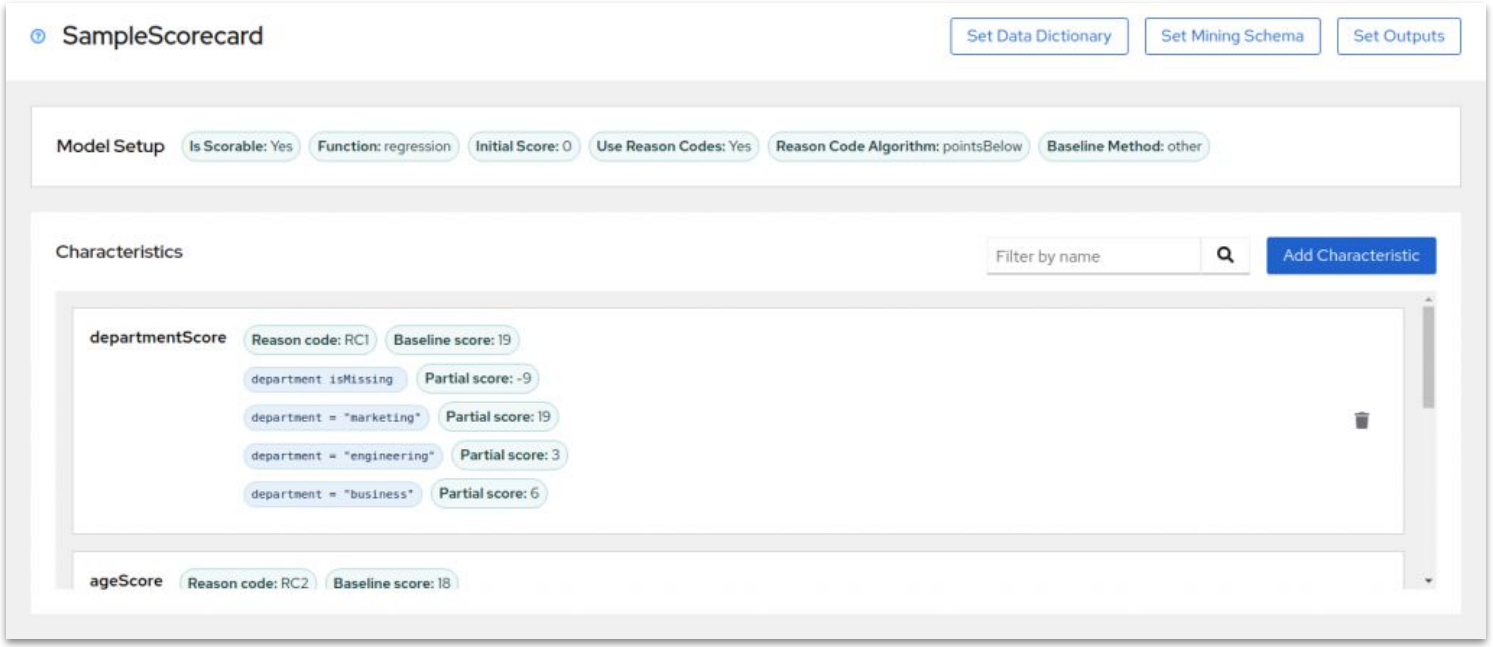
AUTOMATION OF SCORING

Scorecard is a risk management tool used mostly by banks to calculate the risk they take by selling you one of their products.

How risky is a customer?
What are the changes the customer might default on payment?

Based on the customer score we may adapt the product offer - a better interest rate, a higher credit limit, etc.

PMML Scorecard Editor in VS Code



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AUTOMATION OF HUMAN-LIKE CONVERSATIONS

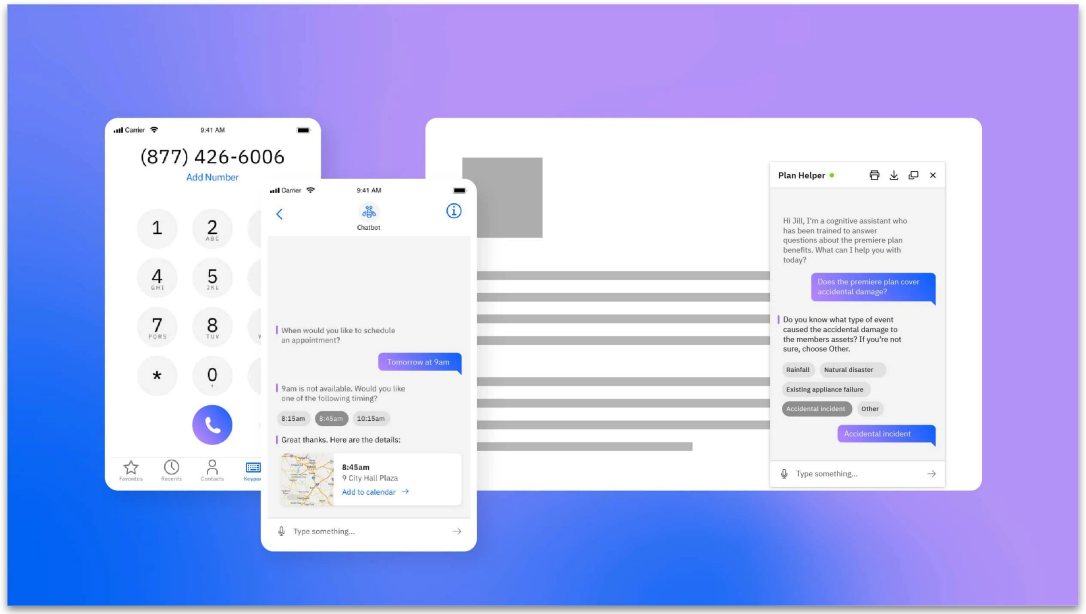
Chatbots

A chatbot is software that simulates human-like conversations with users via text messages on chat or text-to-speech.

- Customer self-service - call centres, scheduling doctor appointments
- Employee self-service - HR assistants, meeting and scheduling, expenses, people finder

Omnichannel - communication is done on all kinds of channels - phone calls, chat and email on computers, sms messages, ...

Watson Assistant - COVID-19 response automation



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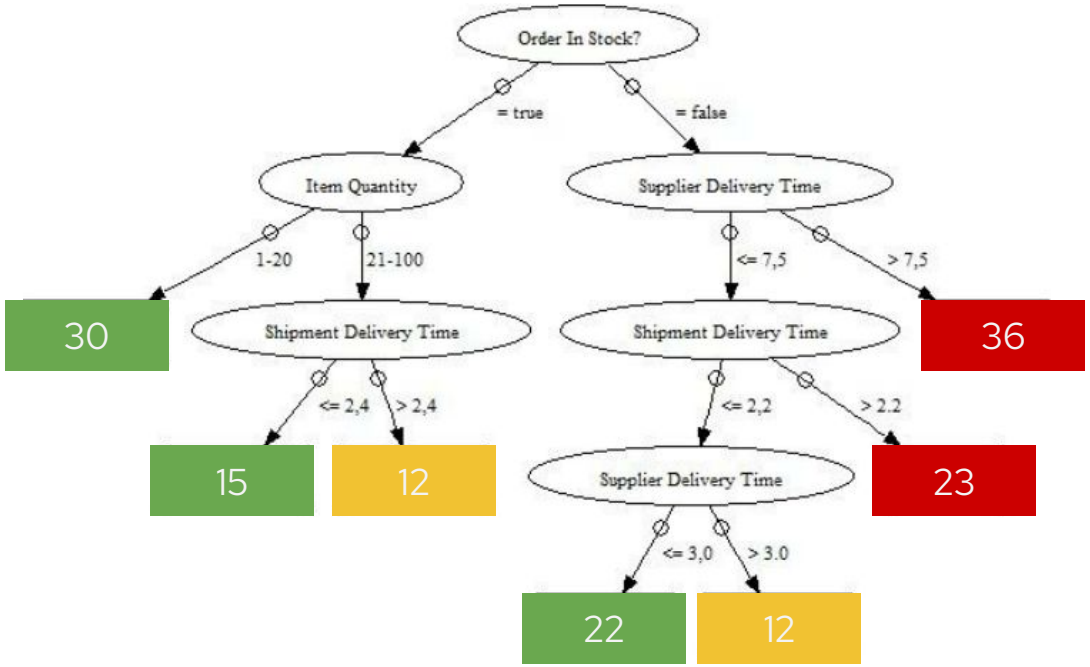
AUTOMATION OF BUSINESS MONITORING

KPI Dependency Tree



Alerts, triggers, ...

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Choose the right software and services to fit your needs

Kogito

Cloud-native business automation for building intelligent applications, backed by battle-tested capabilities.

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KOGITO

https://kogito.kie.org/

- Domain-Driven Development
- Generated Domain-specific APIs from your BPMN and DMN models
- Lightweight orchestration microservices
- Event-driven business logic
- Dev-mode hot reload
- Distributed sagas for microservices
- Serverless workflows
- Polyglot programming

More info at

- Blogs
- Youtube

KOGITO DEMO

- Available on GitHub
  - git clone https://github.com/MarianMacik/kogito-intro.git
  - cd kogito-intro-quarkus
- Contains BPMN and DMN integration
- Development mode with hot reload
  - mvn clean compile quarkus:dev
- Compile
  - mvn clean install
- Domain-specific API available at http://localhost:8080/q/swagger-ui/
  - OpenAPI specification

Thank you, questions?