



Toward Decision Management in Robotic Process Automation

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10.08.2021 – FPF – Automation without AI?

Increased Capabilities of RPA

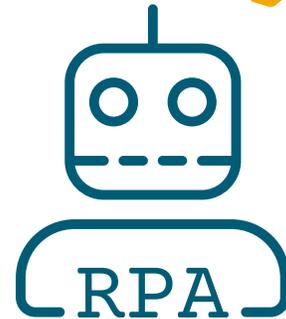
COMPUTER VISION

NATURAL LANGUAGE PROCESSING



MIMIC USER INTERACTION

ROBOTIC PROCESS MINING



START + STOP SOFTWARE

ARTIFICIAL INTELLIGENCE

TEXT UNDERSTANDING

E-MAIL CLASSIFICATION

TRANSFER DATA

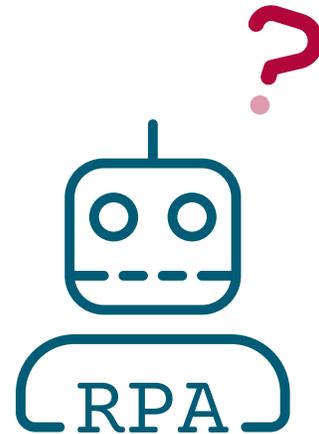
PROCESS UNSTRUCTURED DATA

Increased Capabilities of RPA

NATURAL LANGUAGE PROCESSING

COMPUTER VISION

ARTIFICIAL INTELLIGENCE



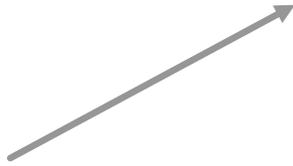
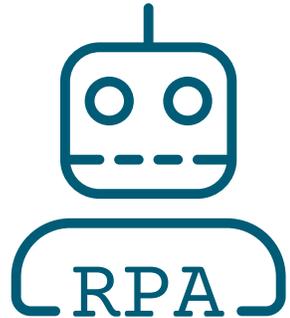
ROBOTIC PROCESS MINING

TEXT UNDERSTANDING

DECISION-MAKING

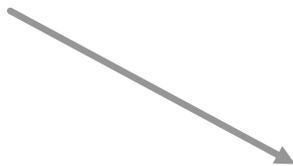
E-MAIL CLASSIFICATION

PROCESS UNSTRUCTURED DATA



Machine Learning

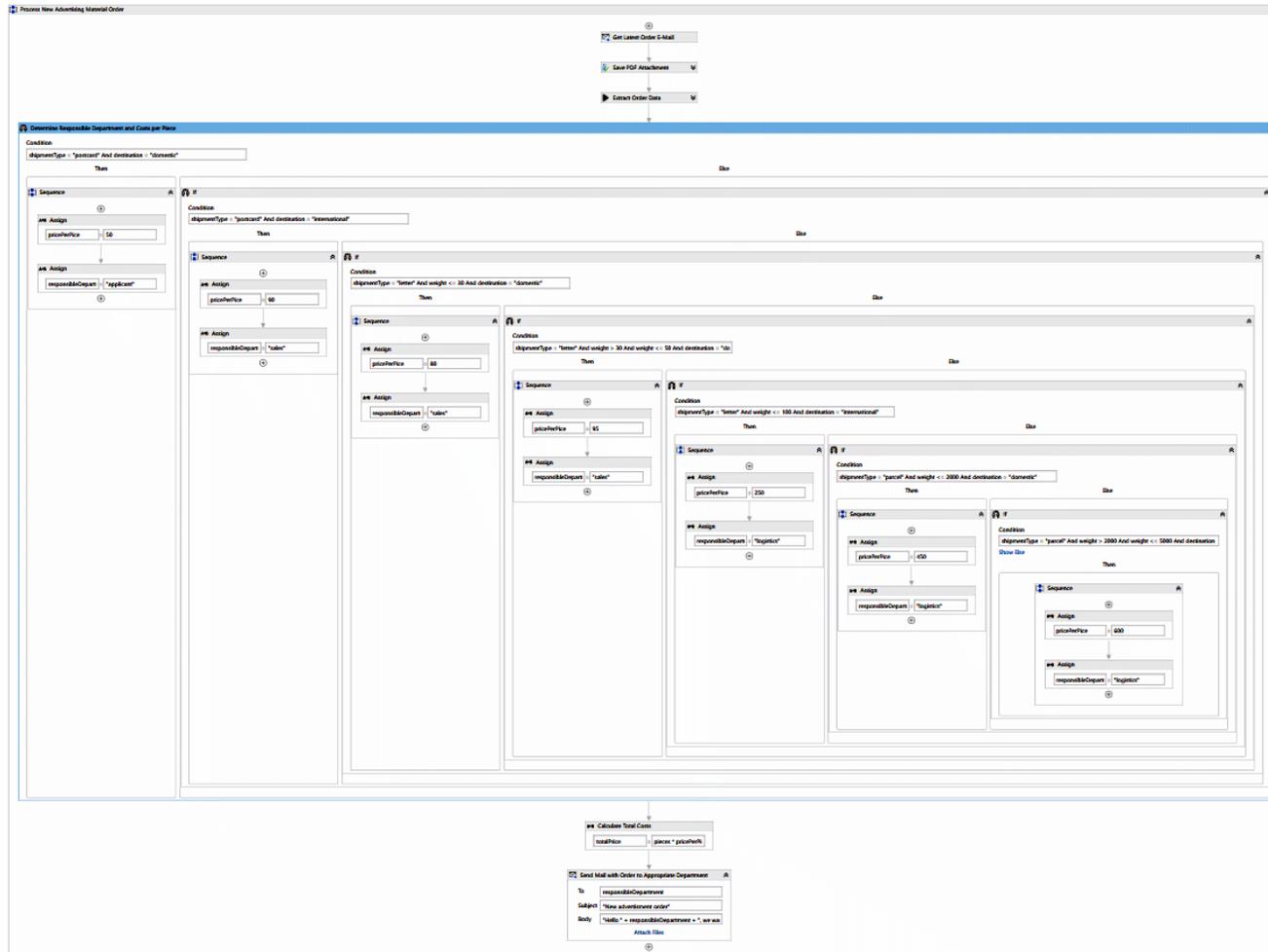
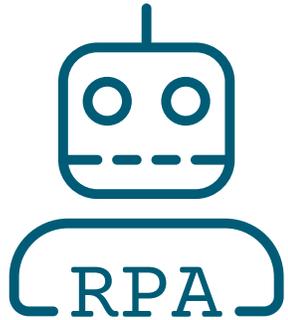
- Make decision based on observed behavior
- Requires a lot of data (past executions)
- Works with probabilities



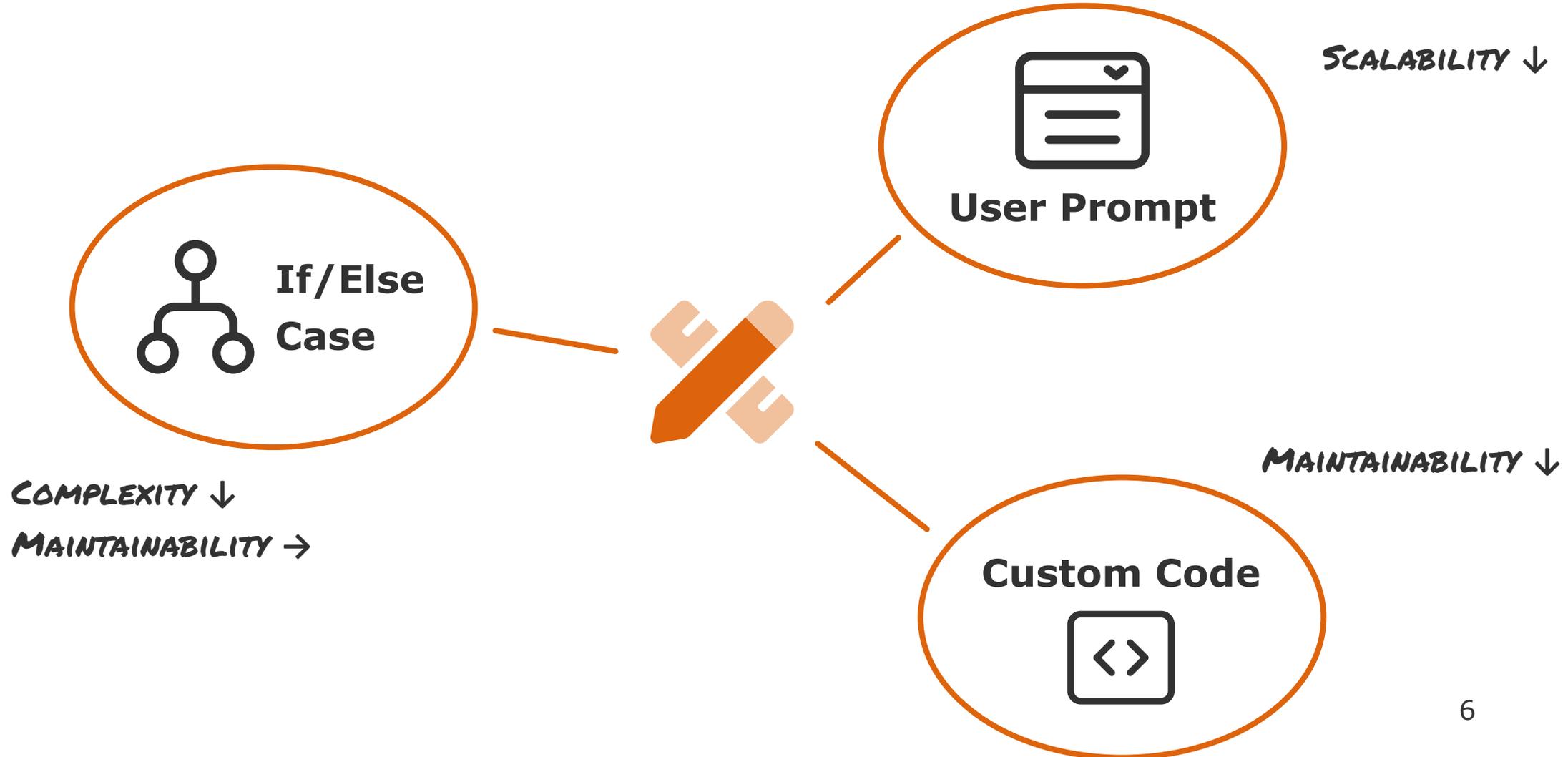
Modeling

- Traditional approach
- Requires in-depth knowledge of decision logic
- Based on defined set of rules

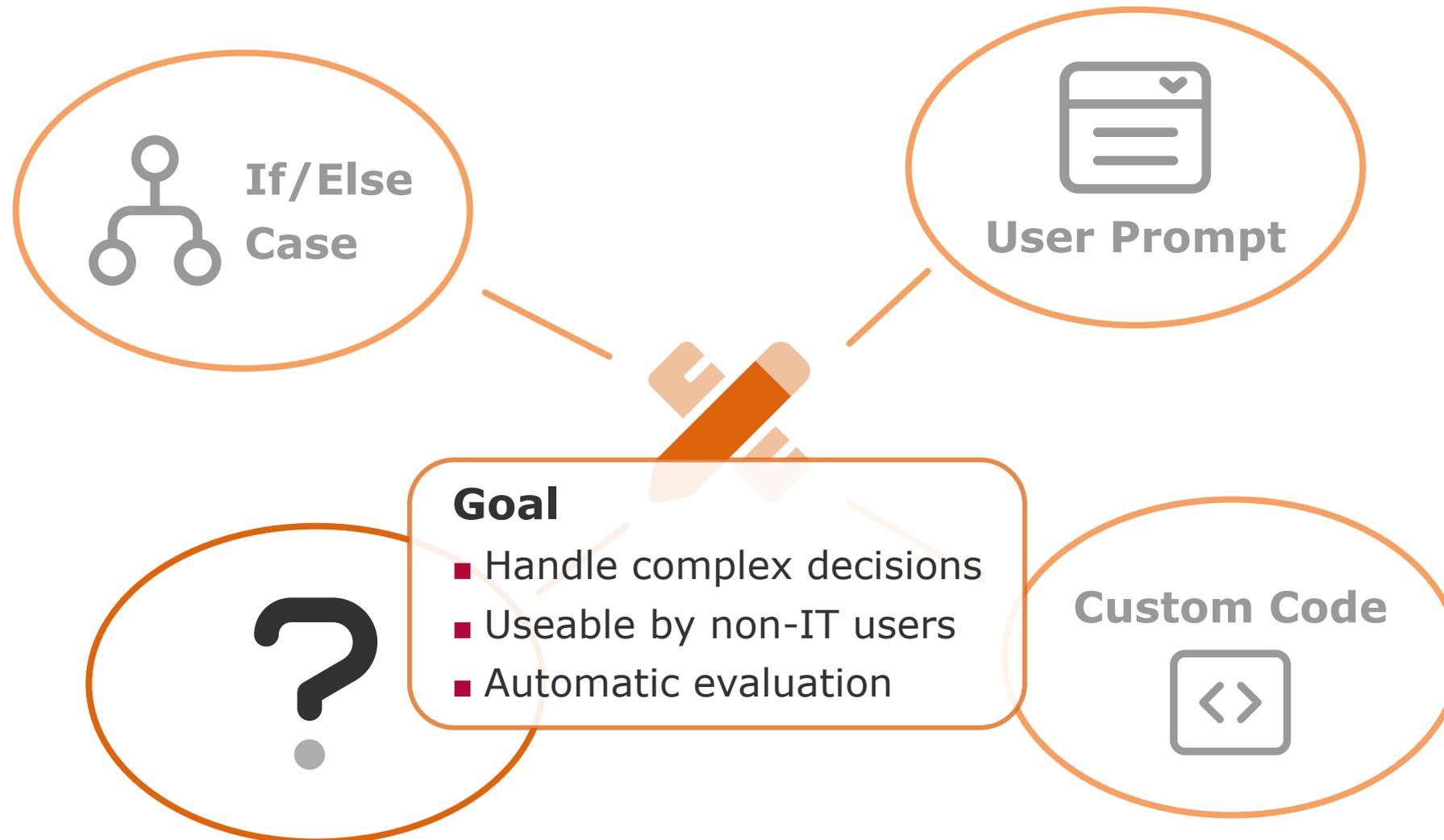
RPA Bots With Complex Decision Logic



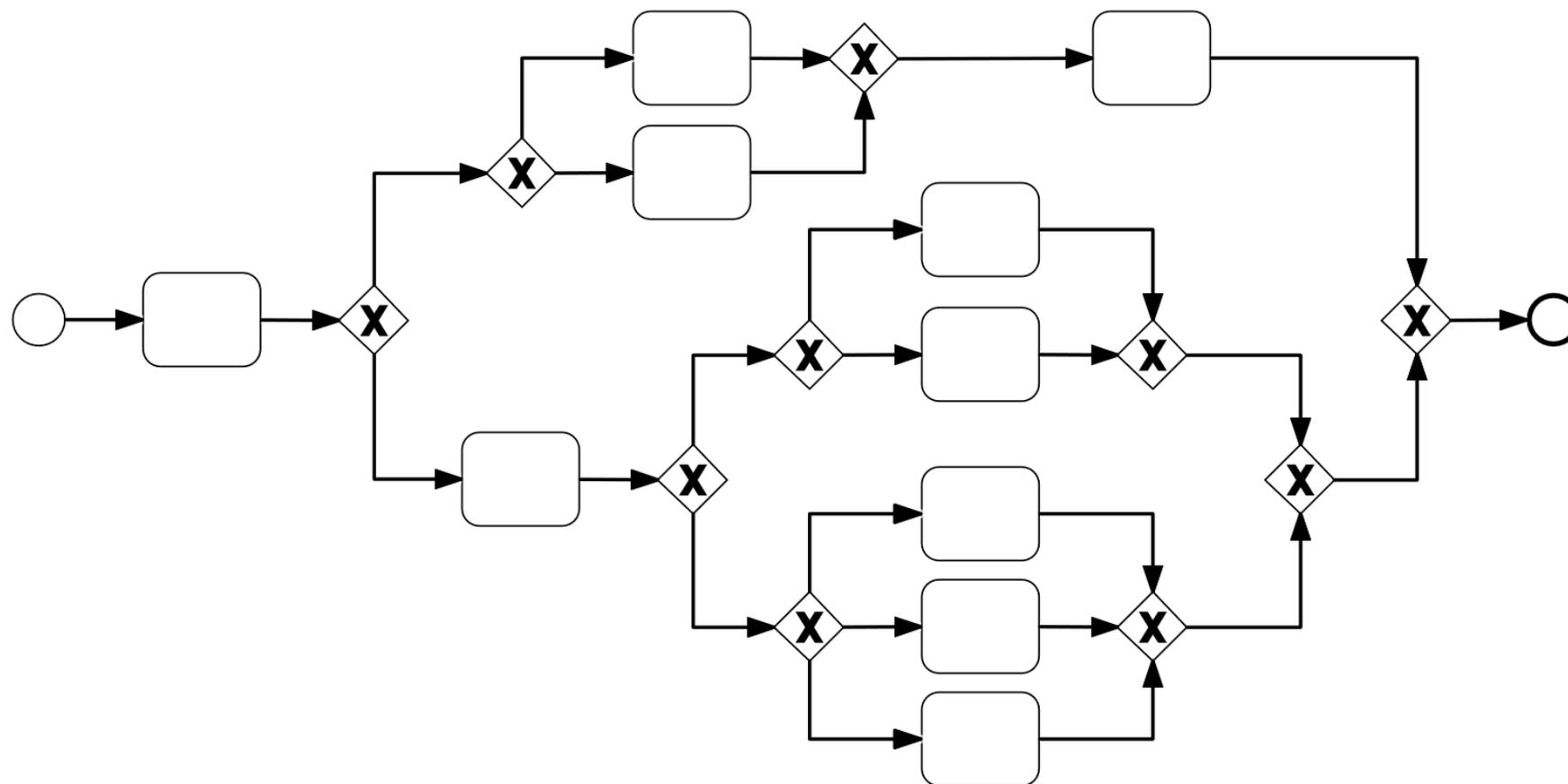
Current Options for Modeling Decisions



Current Options for Modeling Decisions



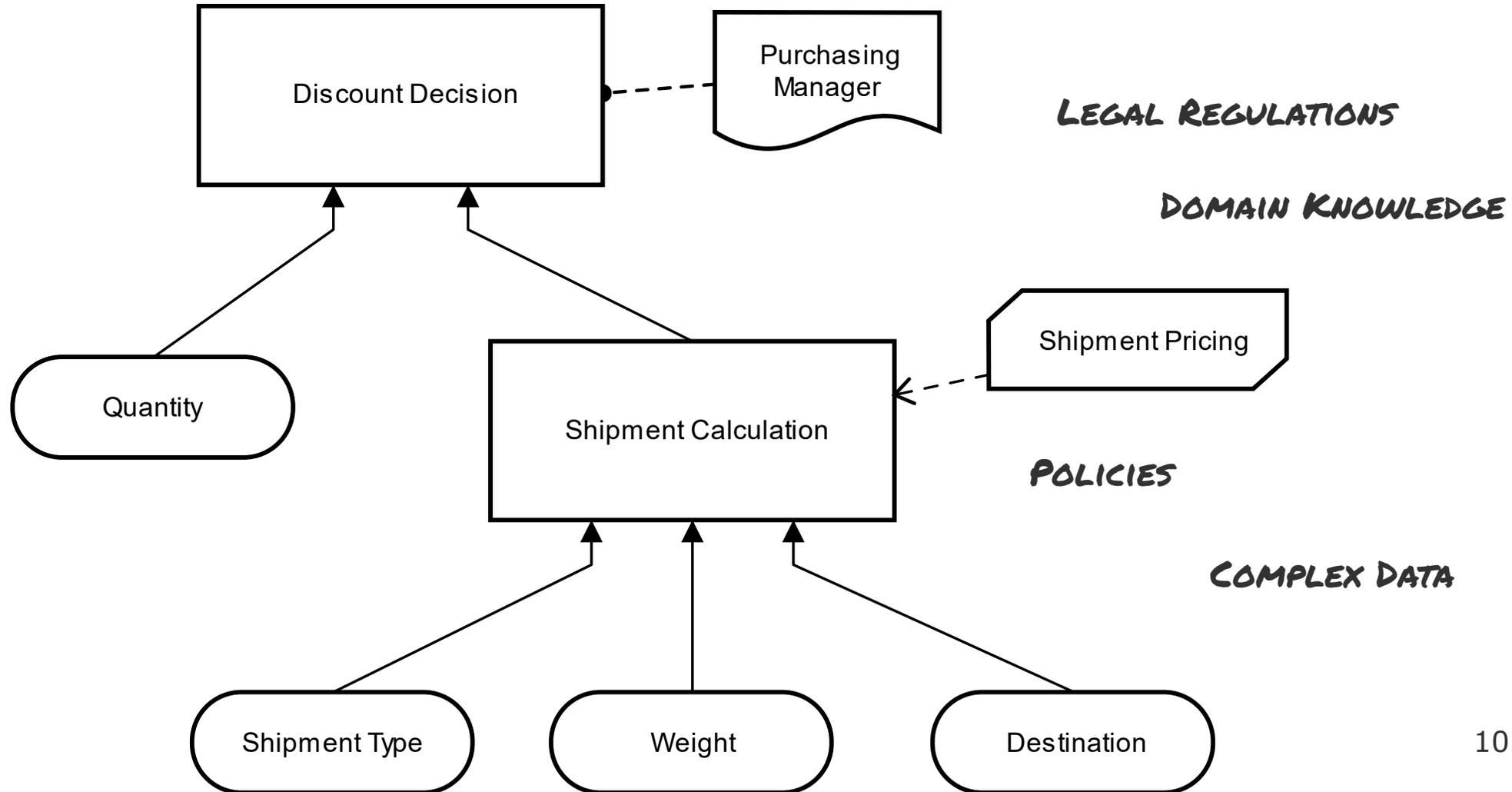
Related: BPMN and Decisions



Decision Model and Notation (DMN)

“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.”

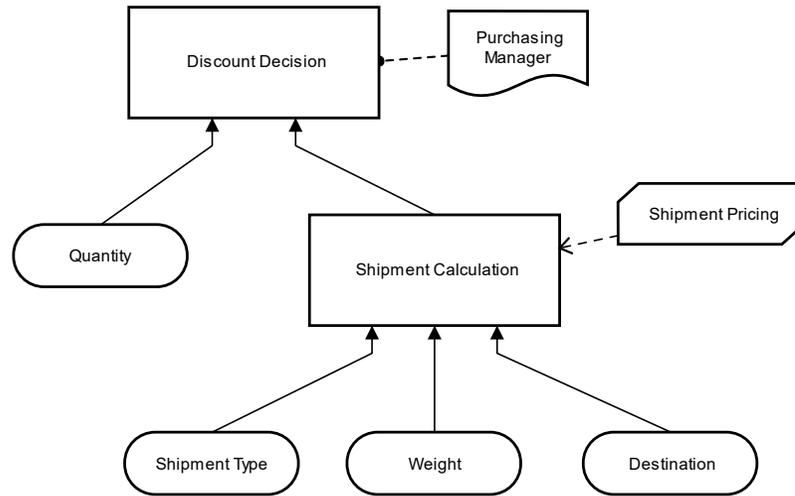
DMN – Decision Requirements Graph



DMN – Decision Table

Shipment Calculation Hit Policy: <input type="text" value="Unique"/>					
	When	And	And	Then	And
	shipment type	weight	destination	price	responsibility
	"parcel","letter","postcard"	integer	"domestic","international"	integer	"logistics","sales","applicant"
1	"postcard"	-	"domestic"	50	"applicant"
2	"postcard"	-	"international"	90	"sales"
3	"letter"	<= 30	"domestic"	80	"sales"
4	"letter"]30..50]	"domestic"	95	"sales"
5	"letter"	<= 100	"international"	250	"logistics"
6	"parcel"	<= 2000	"domestic"	450	"logistics"
7	"parcel"]2000..5000]	"domestic"	600	"logistics"

DMN – Applications



CALCULATION



CLASSIFICATION

ELIGIBILITY CHECK

RISK ASSESSMENT

MEDICAL DOMAIN

FINANCE +

INSURANCE



MANUFACTURING

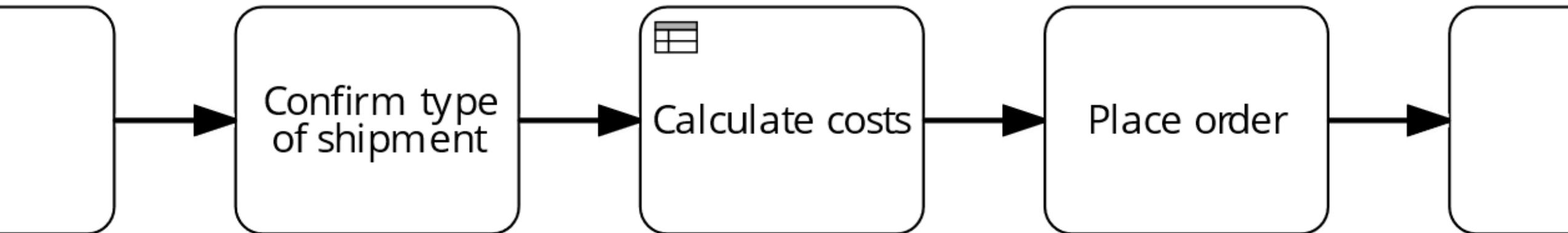
PUBLIC ADMINISTRATION

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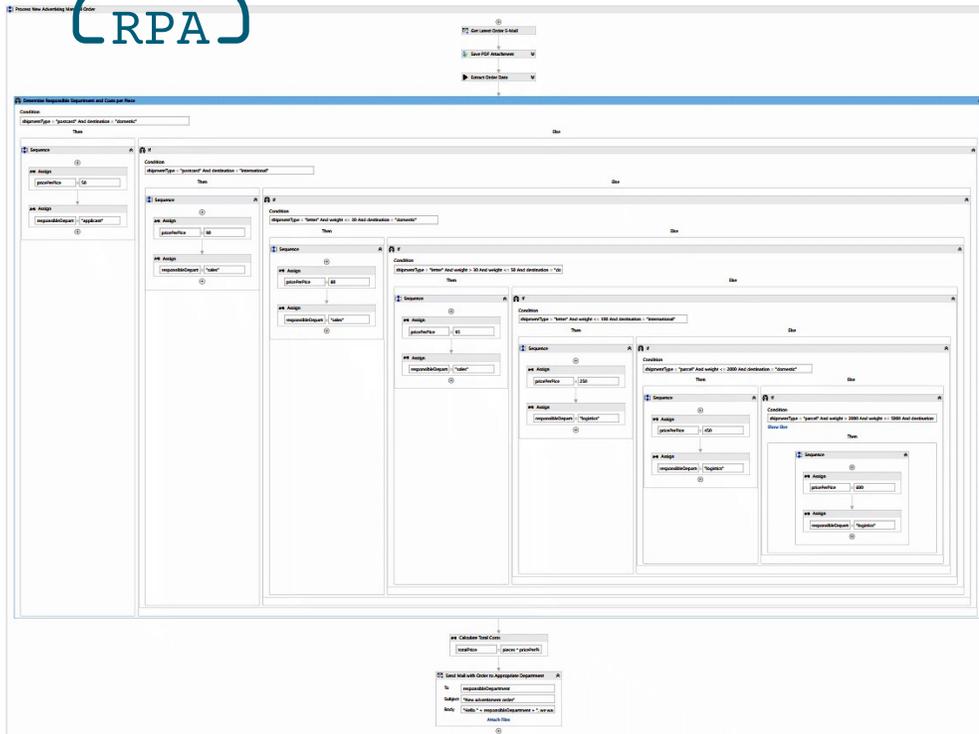
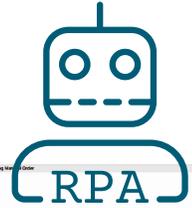
DMN – Integration in BPMN

Shipment Calculation | Hit Policy: Unique

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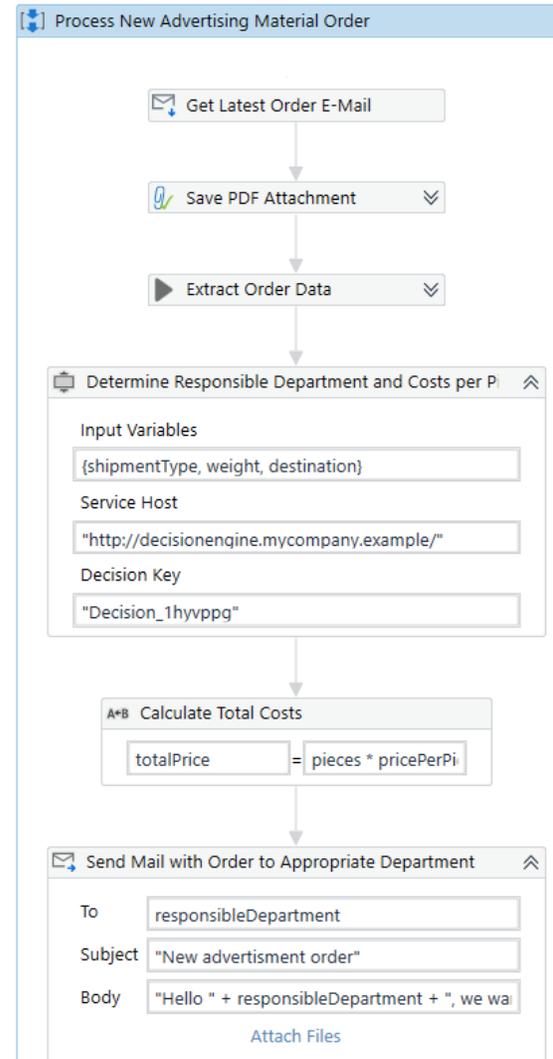
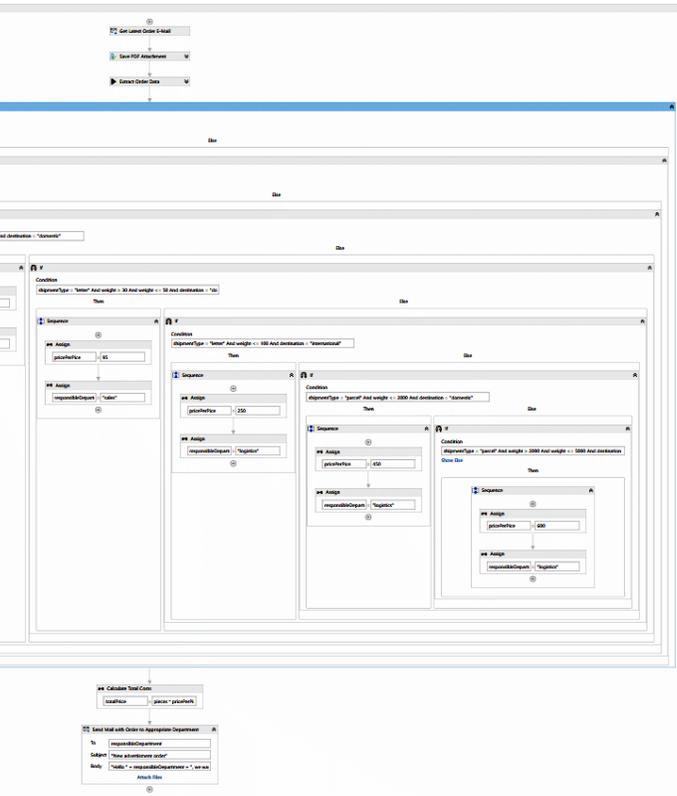


Integration of DMN in RPA



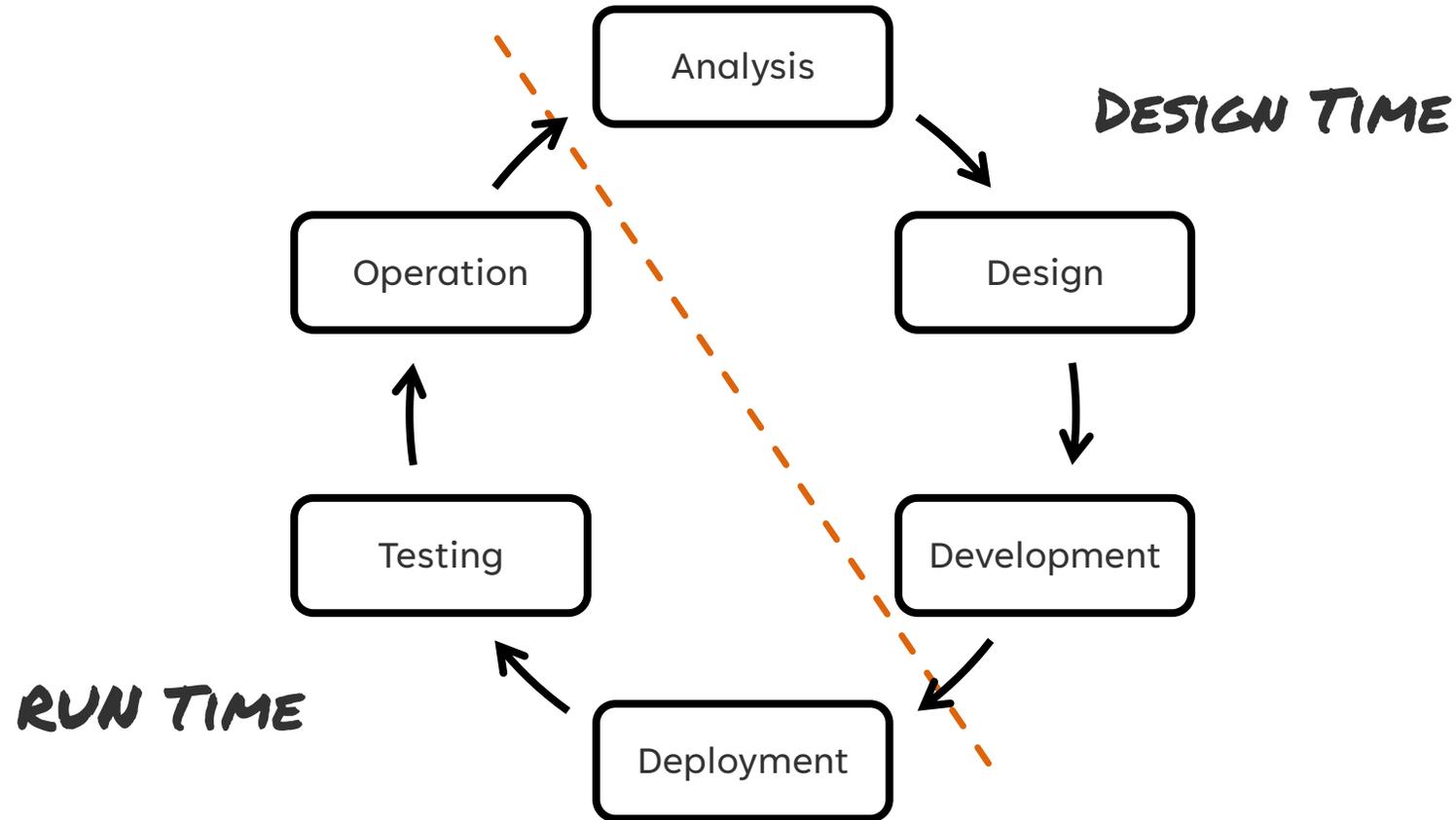
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Integration of DMN in RPA



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Effects of the Integration of DMN in RPA



Effects – Design Time

Analysis

- Increased applicability of RPA, as decision-intensive processes can be modeled easier using DMN

Design

- Decision captured independent of RPA bot

Development

- 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

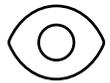
Operation

- Track and analyze decisions
- Decision logic can be updated without modifying RPA bot
- New performance indicators can be collected

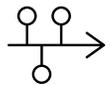
Effects of the Integration of DMN in RPA



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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[https://github.com/bptlab/
rpa-dmn-operation/](https://github.com/bptlab/rpa-dmn-operation/)



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