

A vertical decorative graphic on the left side of the slide, rendered in various shades of red. It features a collage of icons: a cloud with a keyhole, a database cylinder, a server rack, a person silhouette, and various arrows and geometric shapes, suggesting a complex system or architecture.

# Rules and Decision Engines

The past, the present and the future

Edson Tirelli

Engineering Manager & Sr Principal Software Engineer

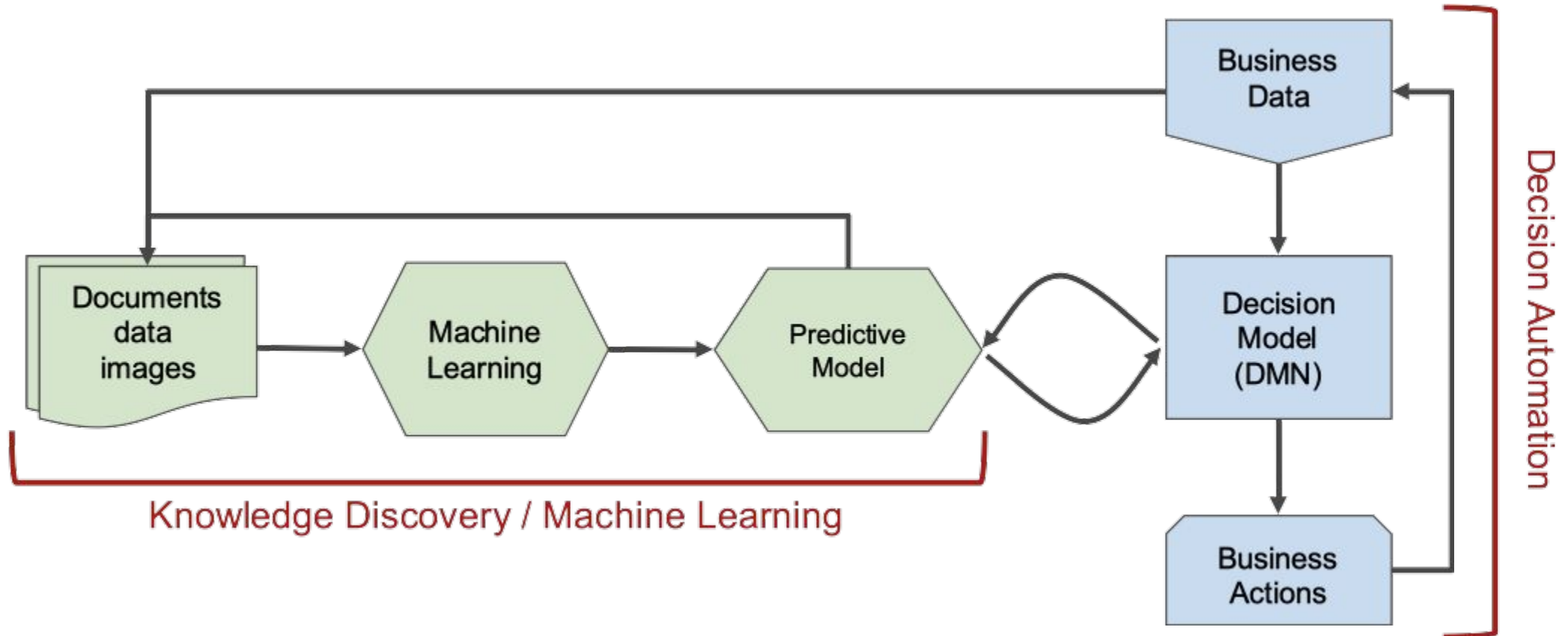
Red Hat Decision Manager Team



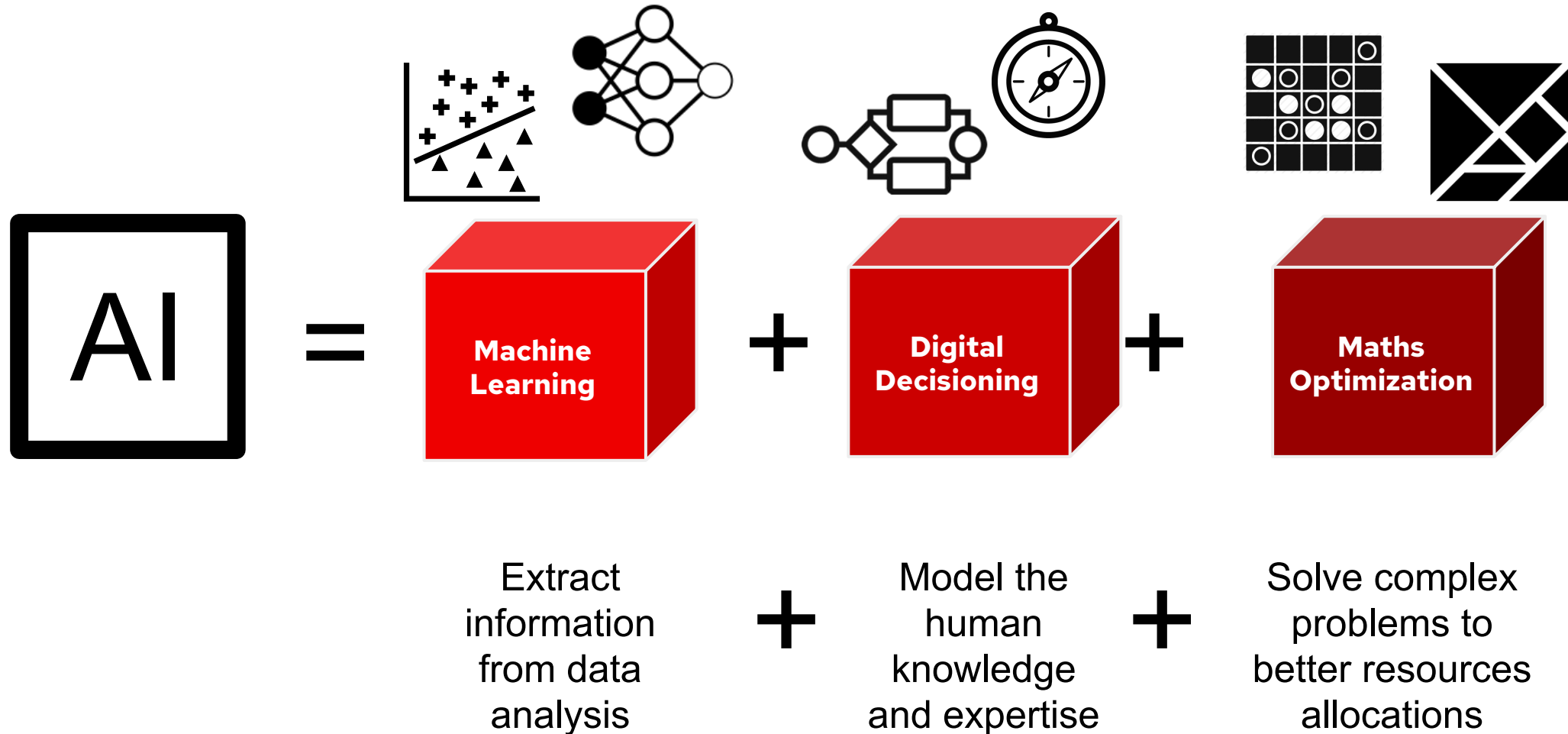
## Use cases

- ❑ Efficient Customer Service Management - best next action for representatives
- ❑ Predictive Customer Retention
- ❑ Upsell appropriate new products
- ❑ Fraud detection
- ❑ Customer loyalty scoring
- ❑ Optimized workforce management
- ❑ Personalized experience
- ❑ ...

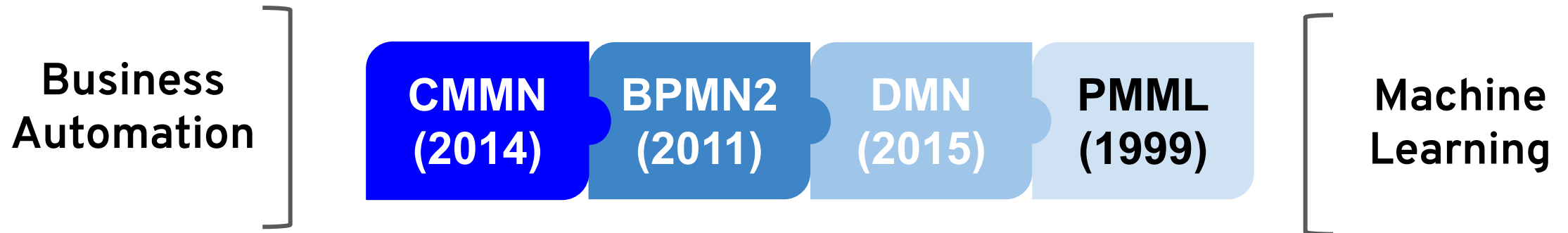
# Predictive Decision Automation - Overview



# Pragmatic Approach to Predictive Decision Automation



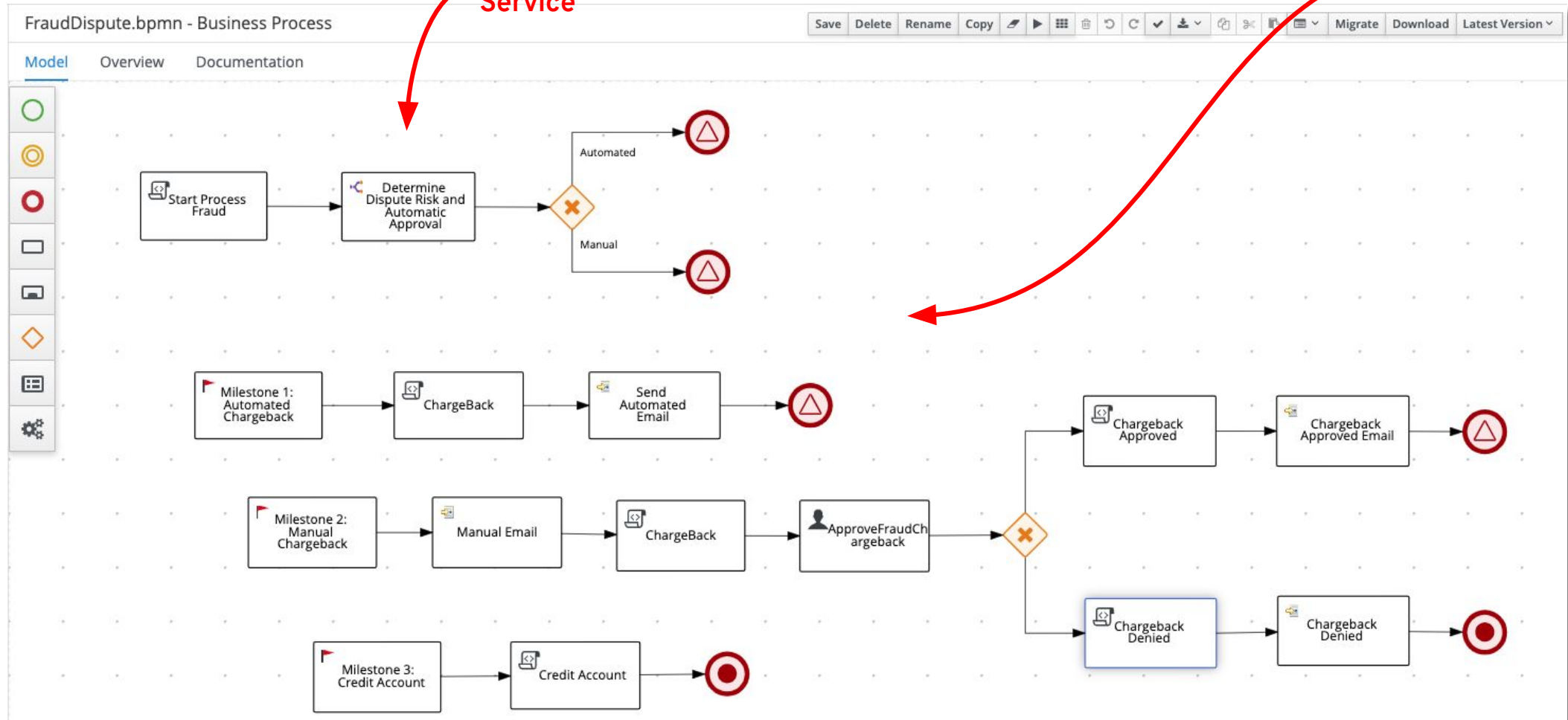
# Connecting Business Automation and Machine Learning



- **CMMN** : Case Management Model and Notation
- **BPMN** : Business Process Model and Notation
- **DMN** : Decision Model and Notation
- **PMML** : Predictive Model Markup Language

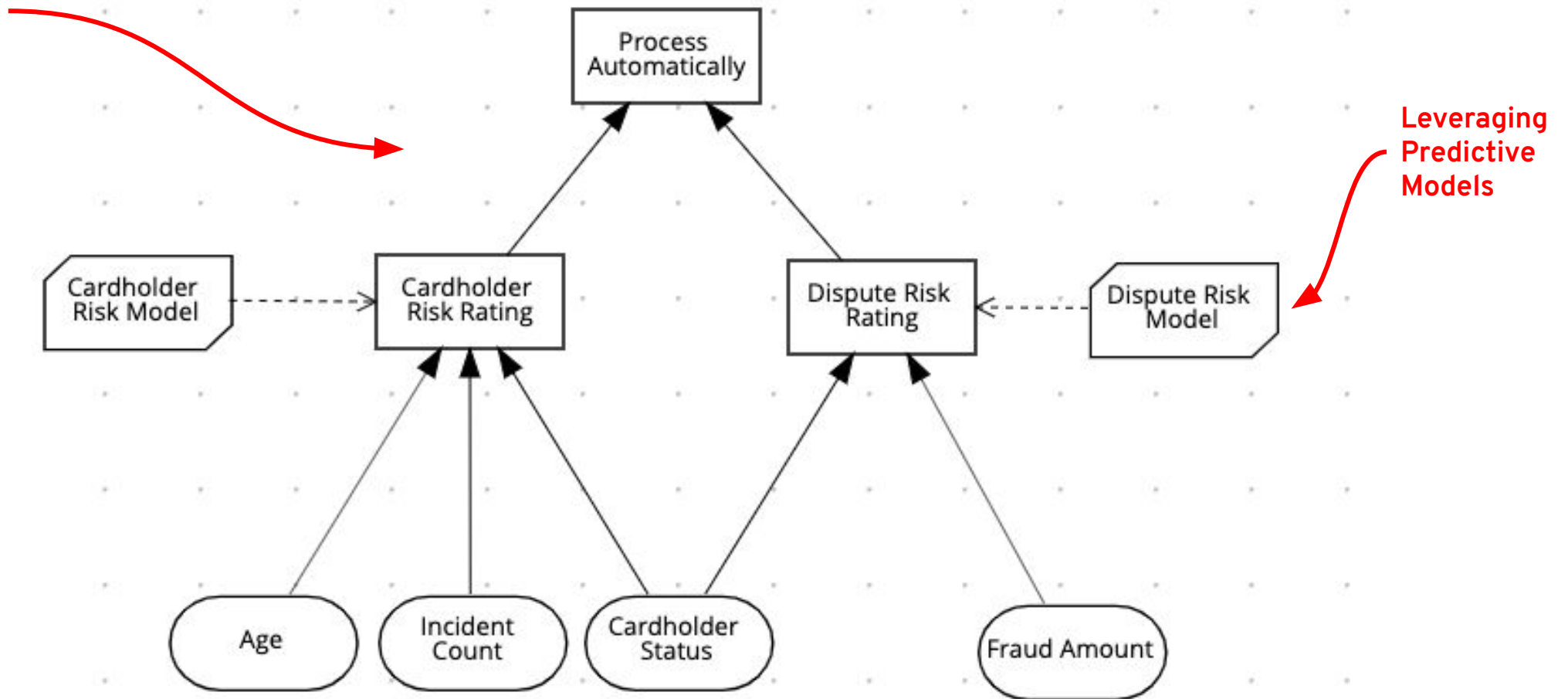
# A case to manage disputes

BPMN Model



# A Decision Service to automate low risk disputes

DMN Model



# Decision Logic modeled as Decision Tables

Cardholder Risk Rating (*Decision Table*)

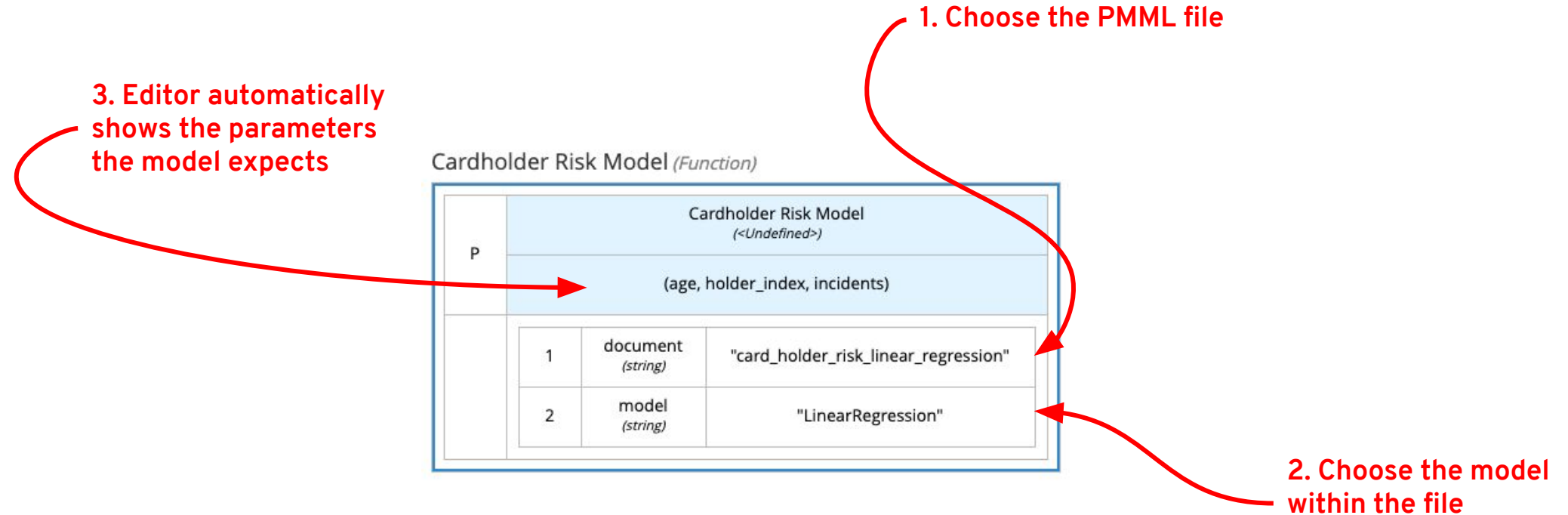
C+	Incident Count (number)	Cardholder Status (string)	Age (number)	Cardholder Risk Rating (number)
1	> 3	"PLATINUM"	-	1
2	> 2	"GOLD"	-	1
3	> 2	"SILVER"	-	2
4	> 2	"STANDARD"	-	3
5	-	"SILVER"	< 25	1
6	-	"STANDARD"	< 25	2
7	-	"STANDARD"	>= 25	1
8	-	-	-	0

Dispute Risk Rating (*Decision Table*)

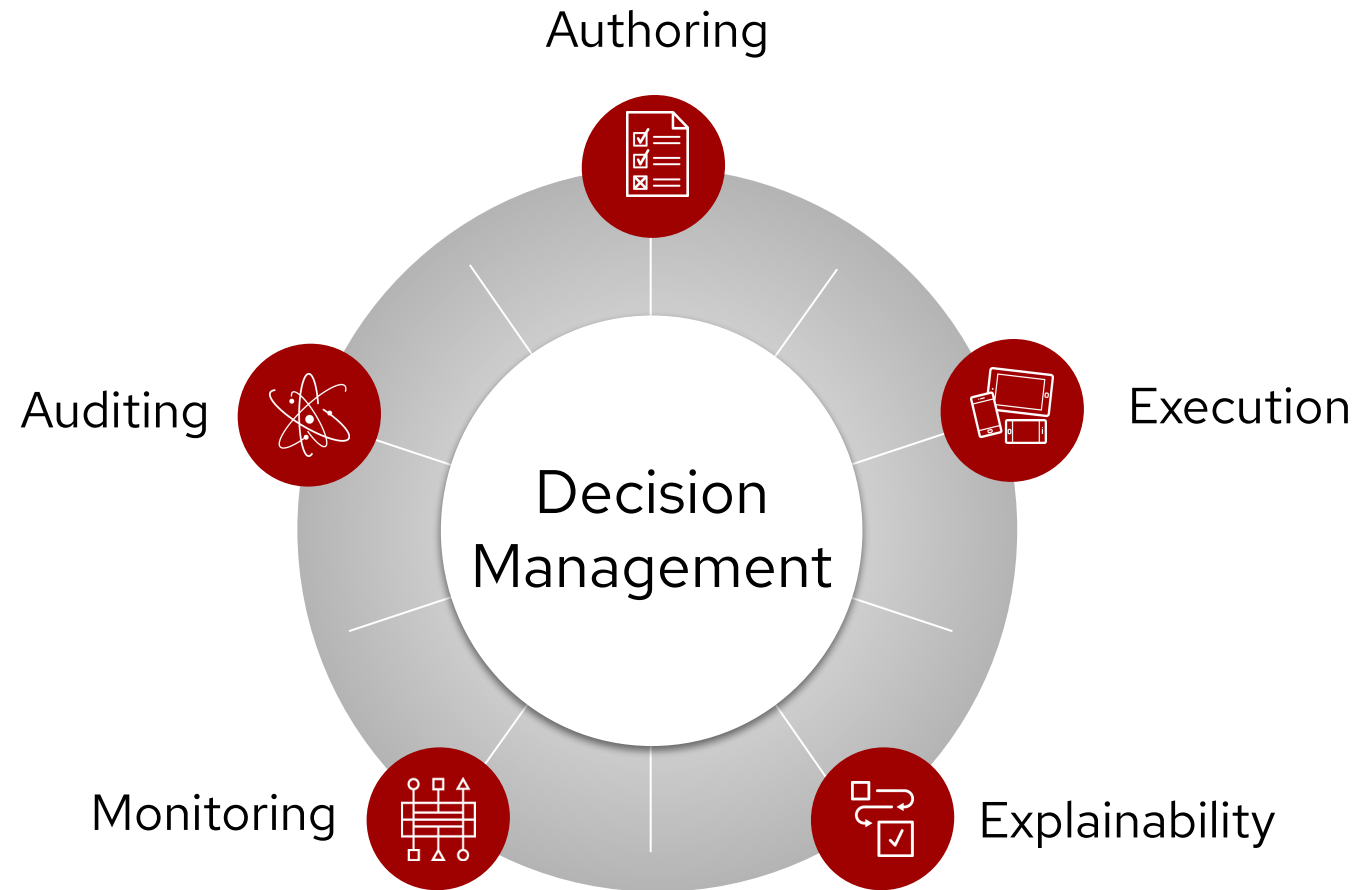
U	Cardholder Status (string)	Fraud Amount (number)	Dispute Risk Rating (number)	Description
1	"STANDARD"	< 25	1	
2	"SILVER"	< 50	1	
3	"GOLD"	< 75	1	
4	"PLATINUM"	< 100	1	
5	"STANDARD"	[25..150)	3	
6	"SILVER"	[50..150)	2	
7	"GOLD"	[75..150)	2	
8	"PLATINUM"	[100..150)	2	
9	"STANDARD"	[150..200)	4	
10	"SILVER"	[150..200)	3	
11	"GOLD"	[150..200)	2	
12	-	>= 200	5	



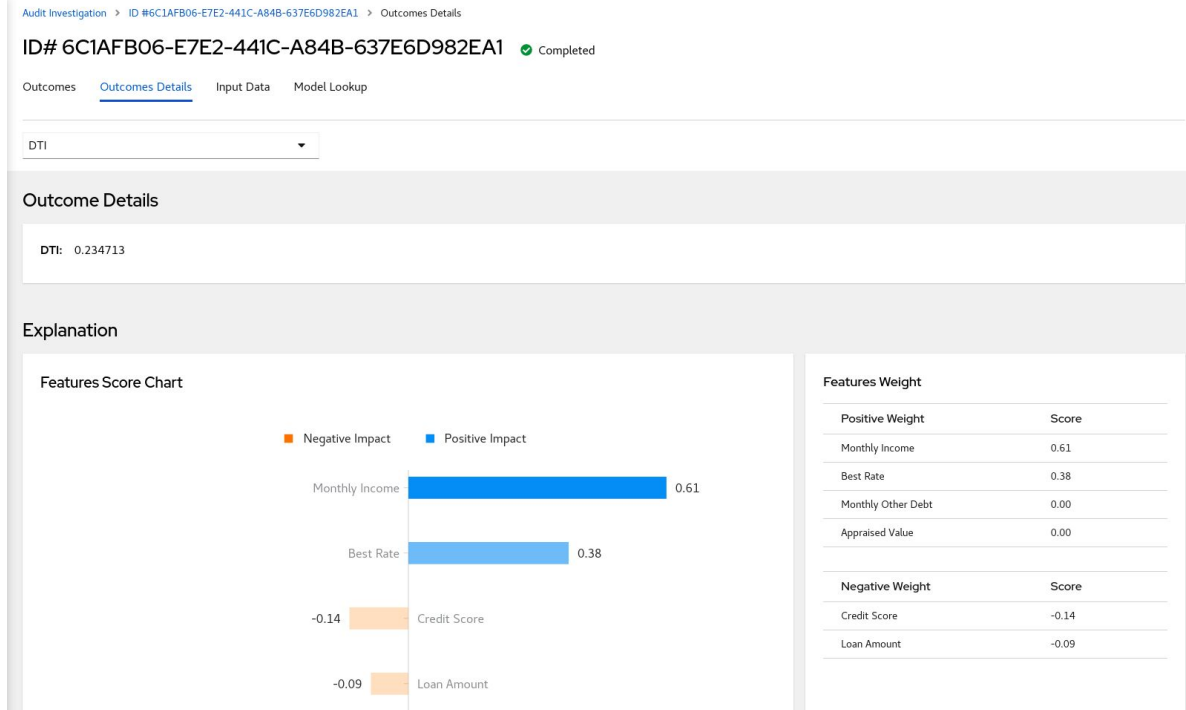
# Using Predictive Models in DMN



# Valued added features on Decision Management



# XAI : eXplanable AI



- Explainability is presented for each of the decisions
- Being able to say *why* a decision was made helps with the accountability of the system

# Thank you

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