



CHURN VOORSPELLEN MET ALTERYX

Monday, October 31, 2022





AGENDA

- Introductie
- Data science overzicht
- Alteryx
- Churn voorspellen
- Next steps

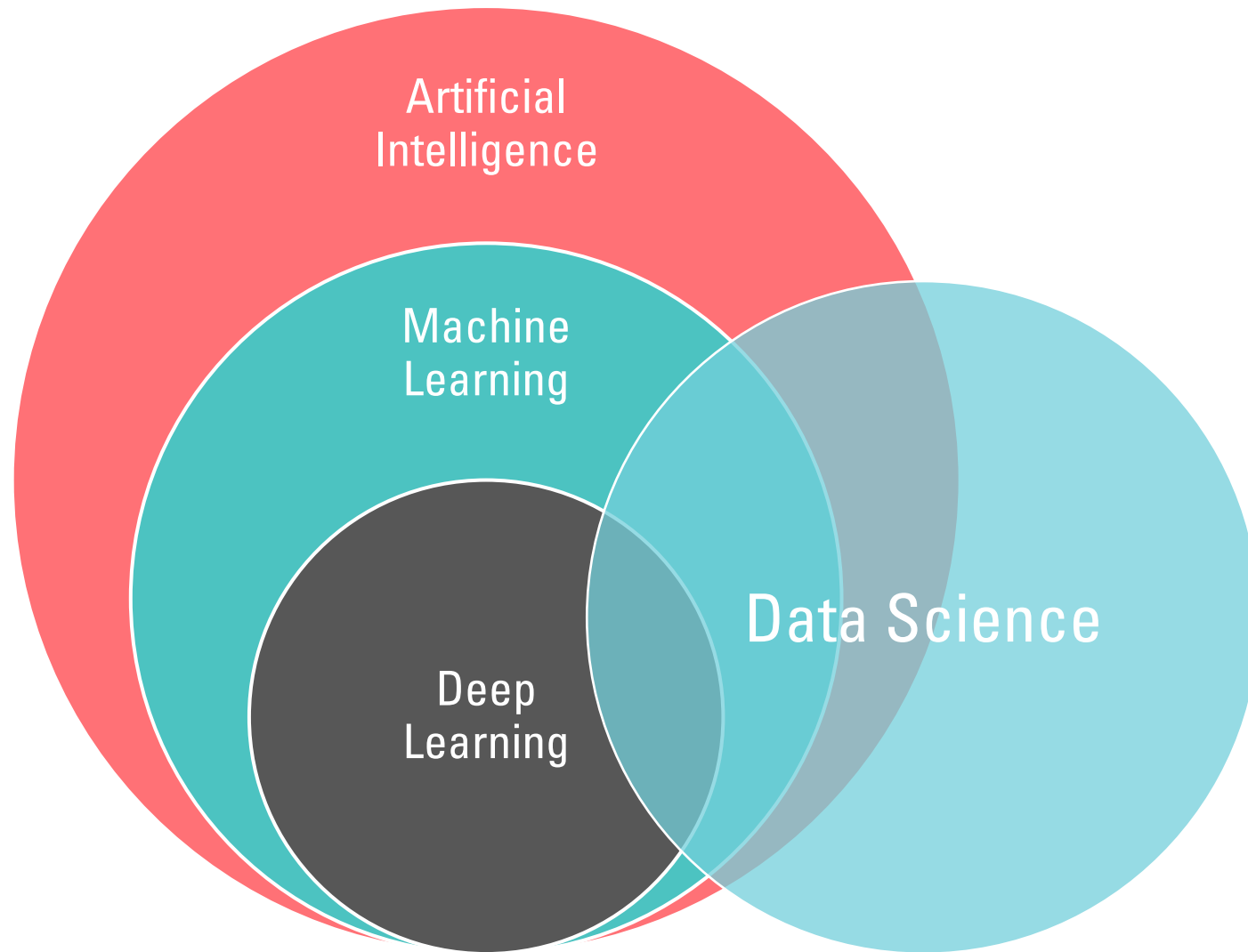
INTRODUCTIE



LAURENS CRUZ



DATA SCIENCE OVERVIEW



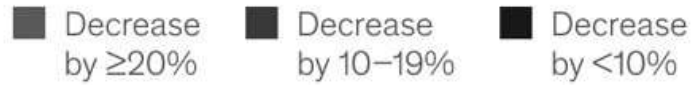
DOPPELGANGERS



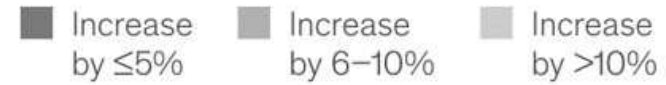
Revenue increases from adopting AI are reported most often in marketing and sales, and cost decreases most often in manufacturing.

Cost decrease and revenue increase from AI adoption, by function,¹ % of respondents²

Average cost decrease



Average revenue increase



HOREN WAT JE WIL MET AAVAA

Technology

Our primary strength is in translating brain and bio-signals directly into meaningful commands for devices. For the first time, operate your device without any physical or spoken commands.

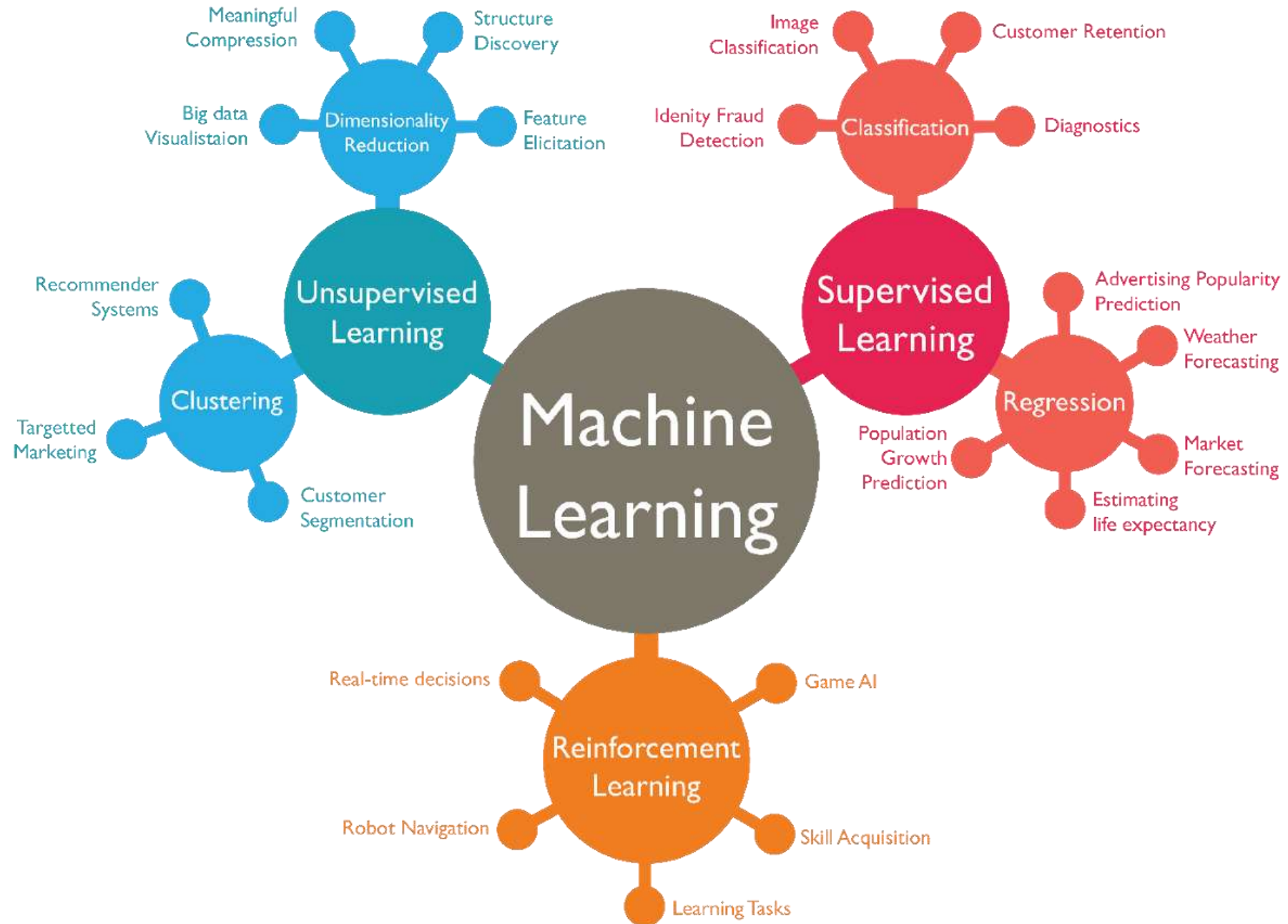
Our patented technology has global coverage and has been under development for several years.

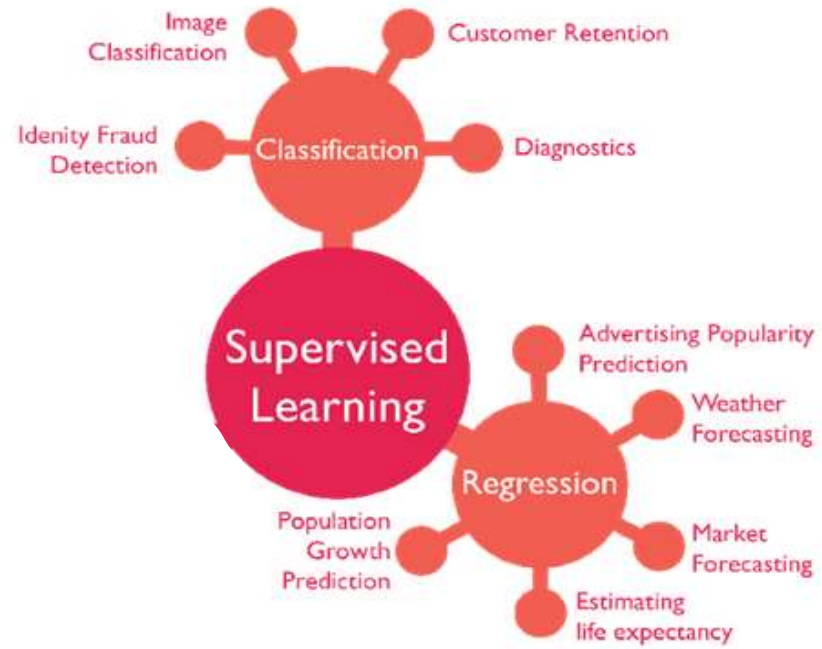


ROBOT GRASMAAIER



MACHINE LEARNING BASICS





TRAIN TEST SPLIT

VOLLEDIGE DATASET

Record	customerID	MonthlyCharges	TotalCharges	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	OnlineBackup	DeviceProtection	TechSupport	StreamingTV	StreamingMovies	Contract	PaperlessBilling	PaymentMethod	Churn
1	0002-CRFBQ	65.6	593.3	Female	0	Yes	Yes	9	Yes	No	DSL	No	Yes	No	Yes	Yes	No	One year	Yes	Mailed check	No
2	0004-TLHLJ	73.9	280.85	Male	0	No	No	4	Yes	No	Fiber optic	No	No	Yes	No	No	No	Month-to-month	Yes	Electronic check	Yes
3	0011-IGKFF	96	1237.85	Male	1	Yes	No	13	Yes	No	Fiber optic	No	Yes	Yes	No	Yes	Yes	Month-to-month	Yes	Electronic check	Yes
4	0013-MHZWF	69.4	571.45	Female	0	No	Yes	8	Yes	No	DSL	No	No	No	Yes	Yes	Yes	Month-to-month	Yes	Credit card (automatic)	No
5	0013-SMEOE	106.7	7904.25	Female	1	Yes	No	71	Yes	No	Fiber optic	Yes	Yes	Yes	Yes	Yes	Yes	Two year	Yes	Bank transfer (automatic)	No
6	0014-BMAGU	84.65	5377.8	Male	0	Yes	No	63	Yes	Yes	Fiber optic	Yes	No	No	Yes	No	No	Two year	Yes	Credit card (automatic)	No
7	0015-UOCCJ	48.1	340.35	Female	1	No	No	7	Yes	No	DSL	Yes	No	No	No	No	No	Month-to-month	Yes	Electronic check	No
8	0016-QLHS	90.45	5957.9	Female	0	Yes	Yes	65	Yes	Yes	DSL	Yes	Yes	Yes	Yes	Yes	Yes	Two year	Yes	Mailed check	No
9	0017-QINOC	45.2	2460.55	Male	0	No	No	54	No	No phone service	DSL	Yes	No	No	Yes	Yes	No	Two year	No	Credit card (automatic)	No
10	0017-UDNMW	116.8	8456.75	Female	0	Yes	Yes	72	Yes	Yes	Fiber optic	Yes	Yes	Yes	Yes	Yes	Yes	Two year	Yes	Credit card (automatic)	No
11	0019-EFAEP	101.3	7261.25	Female	0	No	No	72	Yes	Yes	Fiber optic	Yes	Yes	Yes	No	Yes	No	Two year	Yes	Bank transfer (automatic)	No
12	0019-GRNTW	45.05	2560.1	Female	0	No	No	56	No	No phone service	DSL	Yes	Yes	Yes	Yes	No	No	Two year	No	Bank transfer (automatic)	No
13	0020-INWCK	95.75	6849.4	Female	0	Yes	Yes	71	Yes	Yes	Fiber optic	No	Yes	Yes	No	No	Yes	Two year	Yes	Credit card (automatic)	No
14	0020-IDNKP	61.35	1993.2	Female	0	Yes	Yes	34	No	No phone service	DSL	Yes	No	Yes	Yes	Yes	Yes	One year	No	Mailed check	No
15	0021-NOXGC	72.1	72.1	Female	1	No	No	1	Yes	Yes	Fiber optic	No	No	No	No	No	No	Month-to-month	Yes	Electronic check	No
16	0022-TCICI	62.7	2791.5	Male	1	No	No	45	Yes	No	DSL	Yes	No	Yes	No	No	Yes	One year	No	Credit card (automatic)	Yes
17	0023-HGHWL	25.1	25.1	Male	1	No	No	1	No	No phone service	DSL	No	No	No	No	No	No	Month-to-month	Yes	Electronic check	Yes
18	0023-UUUPN	25.2	1306.3	Female	1	Yes	No	50	Yes	Yes	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	One year	No	Electronic check	No
19	0023-XUOPT	94.1	1215.6	Female	0	Yes	No	13	Yes	Yes	Fiber optic	No	Yes	Yes	No	Yes	No	Month-to-month	No	Electronic check	Yes
20	0027-KWYXW	83.75	1849.95	Female	0	Yes	Yes	23	Yes	Yes	Fiber optic	No	No	No	No	Yes	No	Month-to-month	Yes	Electronic check	No
21	0030-FKCPF	19.85	57.2	Female	0	No	No	3	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	Month-to-month	No	Mailed check	No
22	0031-PVLDI	20.35	76.35	Female	0	Yes	Yes	4	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	Month-to-month	No	Mailed check	Yes
23	0032-PGELS	30.5	30.5	Female	0	Yes	Yes	1	No	No phone service	DSL	Yes	No	No	No	No	No	Month-to-month	No	Bank transfer (automatic)	Yes
24	0036-INMOT	103.7	5656.75	Female	0	Yes	Yes	55	Yes	No	Fiber optic	No	Yes	Yes	Yes	Yes	Yes	One year	Yes	Bank transfer (automatic)	No
25	0040-HALCW	20.4	1090.6	Male	0	Yes	Yes	54	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	Two year	No	Credit card (automatic)	No

TRAIN DATA



Record	customerID	MonthlyCharges	TotalCharges	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	OnlineBackup	DeviceProtection	TechSupport	StreamingTV	StreamingMovies	Contract	PaperlessBilling	PaymentMethod	Churn
1	0001-CRFB0	63.6	993.3	Female	0	Yes	Yes	9	Yes	No	DSL	No	Yes	No	Yes	Yes	No	One year	Yes	Mailed check	No
2	0004-TLHLJ	73.9	280.85	Male	0	No	No	4	Yes	No	Fiber optic	No	No	Yes	No	No	No	Month-to-month	Yes	Electronic check	Yes
3	0011-JSXP	98	1237.85	Male	1	Yes	No	13	Yes	No	Fiber optic	No	Yes	Yes	No	Yes	Yes	Month-to-month	Yes	Electronic check	Yes
4	0013-AH2WF	69.4	571.45	Female	0	No	Yes	9	Yes	No	DSL	No	No	No	Yes	Yes	Yes	Month-to-month	Yes	Credit card (automatic)	No
5	0013-SMECE	109.7	7904.25	Female	1	Yes	No	71	Yes	No	Fiber optic	Yes	Yes	Yes	Yes	Yes	Yes	Two year	Yes	Bank transfer (automatic)	No
6	0014-BMAGU	84.65	5377.8	Male	0	Yes	No	63	Yes	Yes	Fiber optic	Yes	No	No	Yes	No	No	Two year	Yes	Credit card (automatic)	No
7	0015-UOCQJ	48.2	340.35	Female	1	No	No	7	Yes	No	DSL	Yes	No	No	No	No	No	Month-to-month	Yes	Electronic check	No
8	0016-QLJHS	90.45	5957.9	Female	0	Yes	Yes	63	Yes	Yes	DSL	Yes	Yes	Yes	Yes	Yes	Yes	Two year	Yes	Mailed check	No
9	0017-DHDC	45.2	2460.55	Male	0	No	No	54	No	No phone service	DSL	Yes	No	No	Yes	Yes	No	Two year	No	Credit card (automatic)	No
10	0017-JUDMW	116.8	8456.75	Female	0	Yes	Yes	72	Yes	Yes	Fiber optic	Yes	Yes	Yes	Yes	Yes	Yes	Two year	Yes	Credit card (automatic)	No
11	0019-EFAEP	101.3	7261.25	Female	0	No	No	72	Yes	Yes	Fiber optic	Yes	Yes	Yes	No	Yes	No	Two year	Yes	Bank transfer (automatic)	No
12	0019-GRHFW	43.05	2560.1	Female	0	No	No	56	No	No phone service	DSL	Yes	Yes	Yes	Yes	No	No	Two year	No	Bank transfer (automatic)	No
13	0020-IHWCK	95.75	6849.4	Female	0	Yes	Yes	71	Yes	Yes	Fiber optic	No	Yes	Yes	Yes	No	Yes	Two year	Yes	Credit card (automatic)	No
14	0020-JDNXP	61.25	1993.2	Female	0	Yes	Yes	34	No	No phone service	DSL	Yes	No	Yes	Yes	Yes	Yes	One year	No	Mailed check	No
15	0021-HXGJC	72.1	72.1	Female	1	No	No	1	Yes	Yes	Fiber optic	No	No	No	No	No	No	Month-to-month	Yes	Electronic check	No
16	0022-TGJCI	62.7	2791.5	Male	1	No	No	45	Yes	No	DSL	Yes	No	Yes	No	No	Yes	One year	No	Credit card (automatic)	Yes
17	0023-HGHWS	25.1	25.1	Male	1	No	No	1	No	No phone service	DSL	No	No	No	No	No	No	Month-to-month	Yes	Electronic check	Yes
18	0023-JYUPN	25.2	1306.3	Female	1	Yes	No	50	Yes	Yes	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	One year	No	Electronic check	No
19	0023-XUOPT	94.1	1215.6	Female	0	Yes	No	13	Yes	Yes	Fiber optic	No	Yes	Yes	No	Yes	No	Month-to-month	No	Electronic check	Yes
20	0027-KWYKW	83.75	1848.95	Female	0	Yes	Yes	23	Yes	Yes	Fiber optic	No	No	No	No	Yes	No	Month-to-month	Yes	Electronic check	No

21	0030-FHXPP	19.85	57.2	Female	0	No	No	3	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	Month-to-month	No	Mailed check	No
22	0031-PVLDJ	20.35	76.35	Female	0	Yes	Yes	4	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	Month-to-month	No	Mailed check	Yes
23	0032-PGELS	30.5	30.5	Female	0	Yes	Yes	1	No	No phone service	DSL	Yes	No	No	No	No	No	Month-to-month	No	Bank transfer (automatic)	Yes
24	0036-IHMOT	103.7	5656.75	Female	0	Yes	Yes	55	Yes	No	Fiber optic	No	Yes	Yes	Yes	Yes	Yes	One year	Yes	Bank transfer (automatic)	No
25	0040-HALCW	20.4	1090.6	Male	0	Yes	Yes	54	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	Two year	No	Credit card (automatic)	No



TEST DATA

PERFORMANCE METRICS CLASSIFICATION

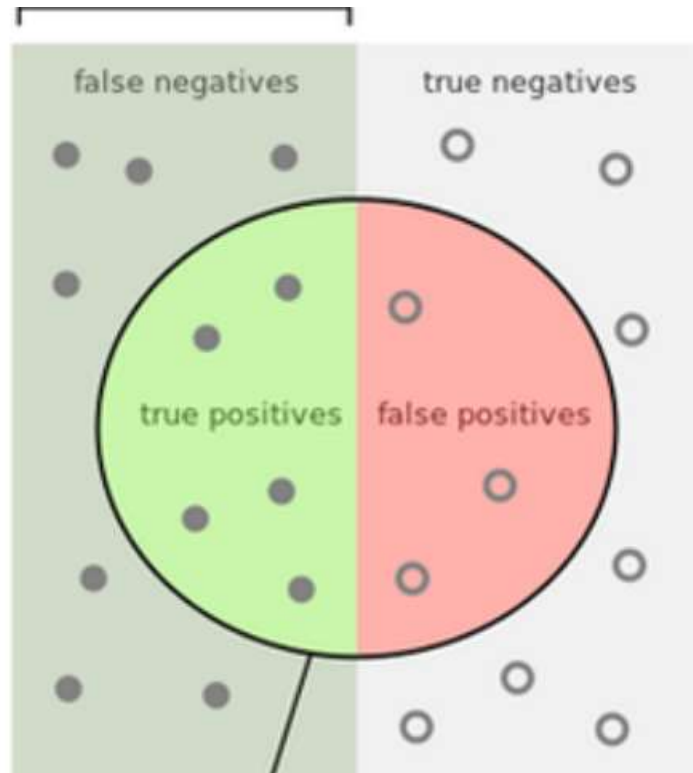
PERFORMANCE METRICS CLASSIFICATION | ACCURACY

		True Class	
		Positive	Negative
Predicted Class	Positive	TP	FP
	Negative	FN	TN

Key Metrics:

$$\text{Accuracy} = \frac{TP + TN}{TP + TN + FP + FN}$$

PERFORMANCE METRICS CLASSIFICATION | PRECISION & RECALL



How many selected items are relevant?

$$\text{Precision} = \frac{\text{true positives}}{\text{true positives} + \text{false positives}}$$

How many relevant items are selected?

$$\text{Recall} = \frac{\text{true positives}}{\text{true positives} + \text{false negatives}}$$

EXAMPLE

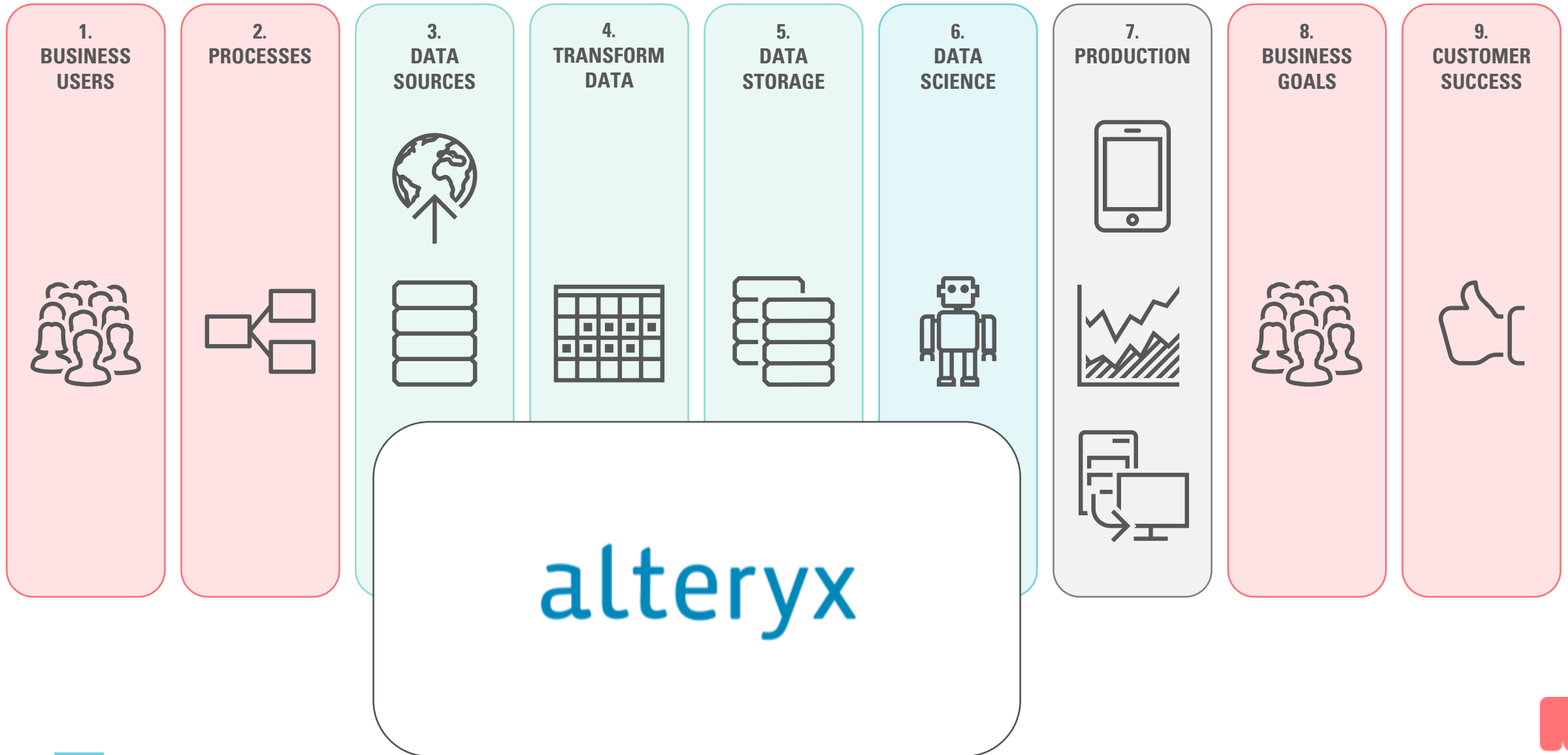
- Wat is de accuracy?
- = 91%
 $(50 + 100)/165$
- Wat is de precision?
- = 91%
 $100/(100+10)$
- Wat is de recall?
- = 95%
 $100/(100+5)$

n=165	Predicted: NO	Predicted: YES
	Actual: NO	Actual: YES
	50	10
	5	100

—

ALTERYX

OUR APPROACH



ALTERYX PLATFORM

alteryx

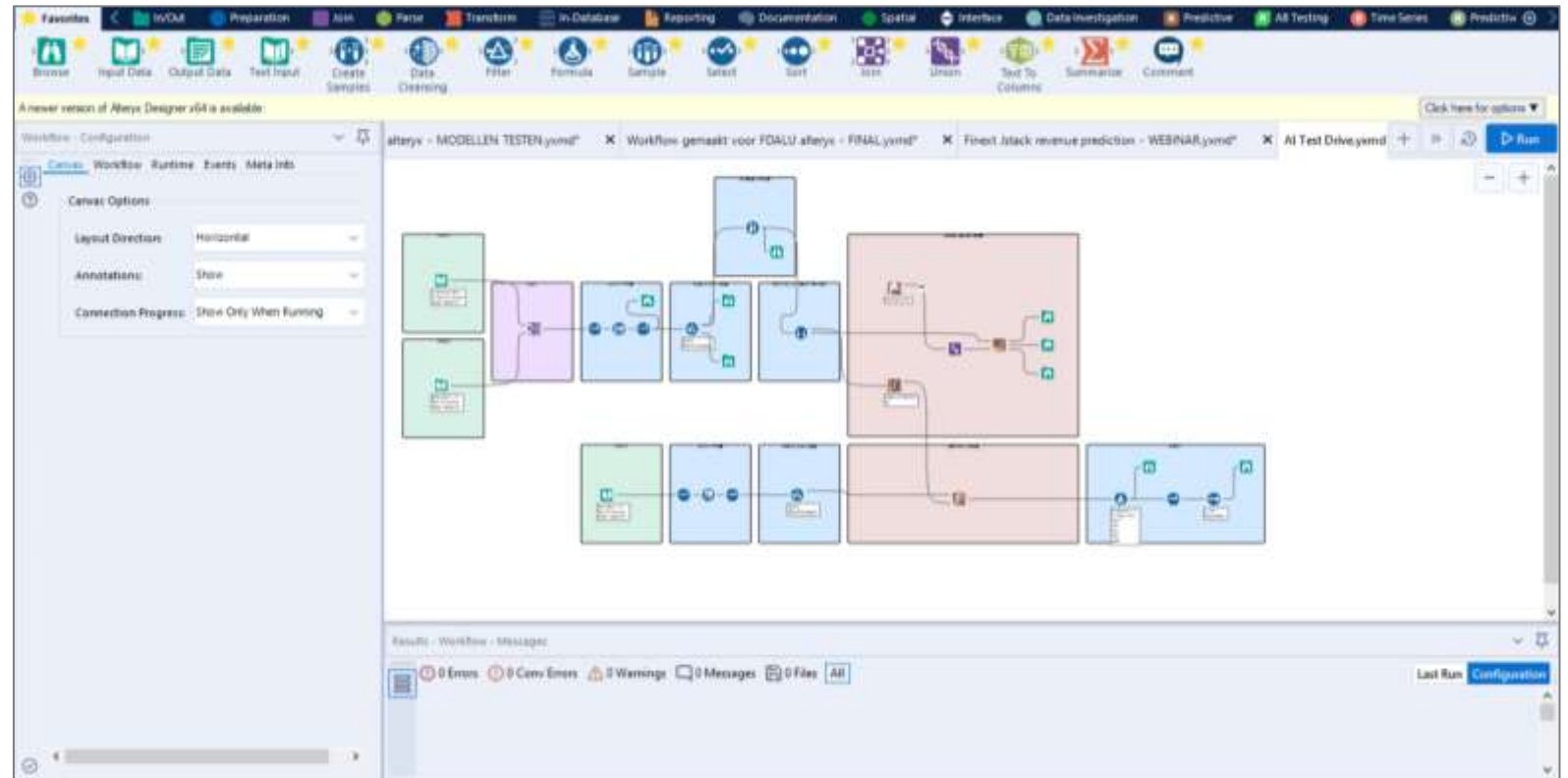
- User friendly



ALTERYX PLATFORM

alteryx

- User friendly
- Transferability

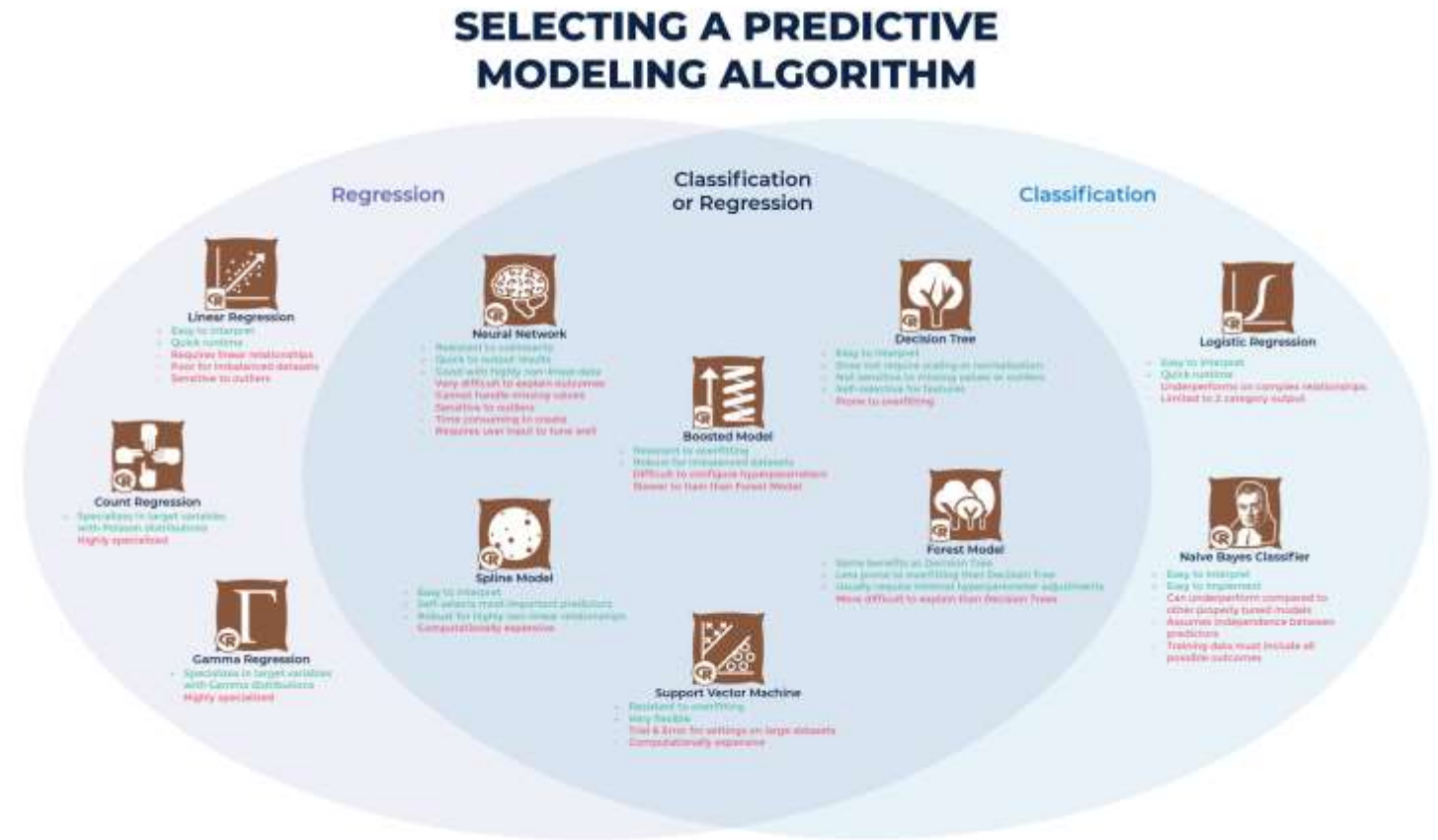


ALTERYX PLATFORM

alteryx

- User friendly
- Transferability
- **Automation**

- User friendly
- Transferability
- Automation
- **Accessibility DS & ML**



- BI / Data Analyst
- Financial Controller
- Business Controller
- Citizen Data Scientist
- Expert Data Scientist
- Data Engineer
- Machine Learning Engineer

Churn voorspellen



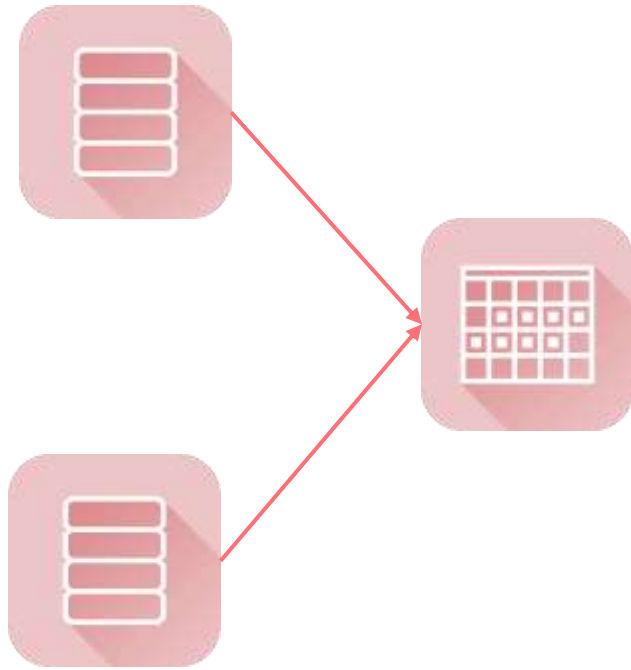
CASE

- Telco dataset (Kaggle)
- Identificeren welke klanten weg gaan
- Check data
- Variabelen selecteren
- Model trainen
- Model scoren
- Voorspellen welke klanten mogelijk weggaan

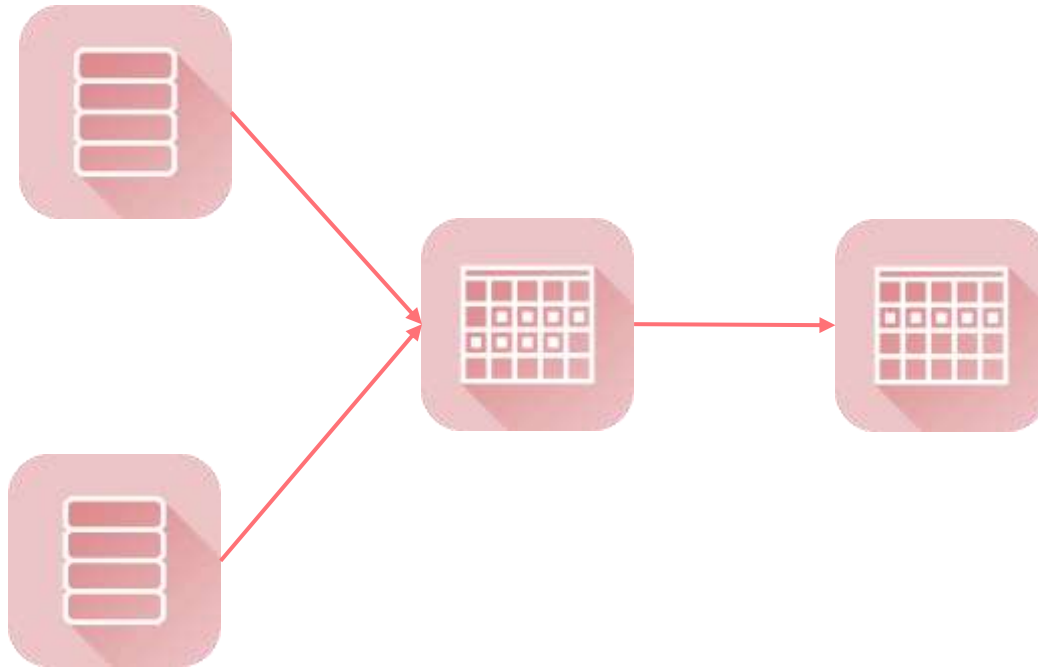
CASE



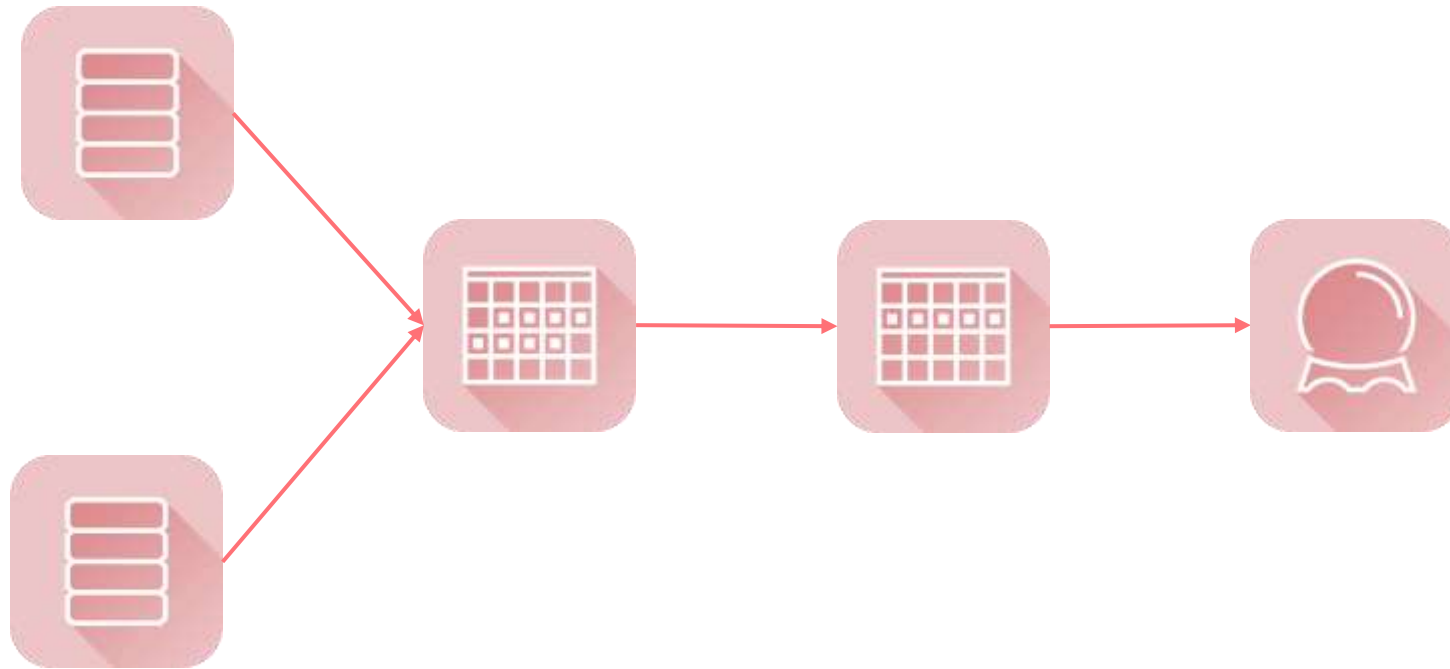
CASE



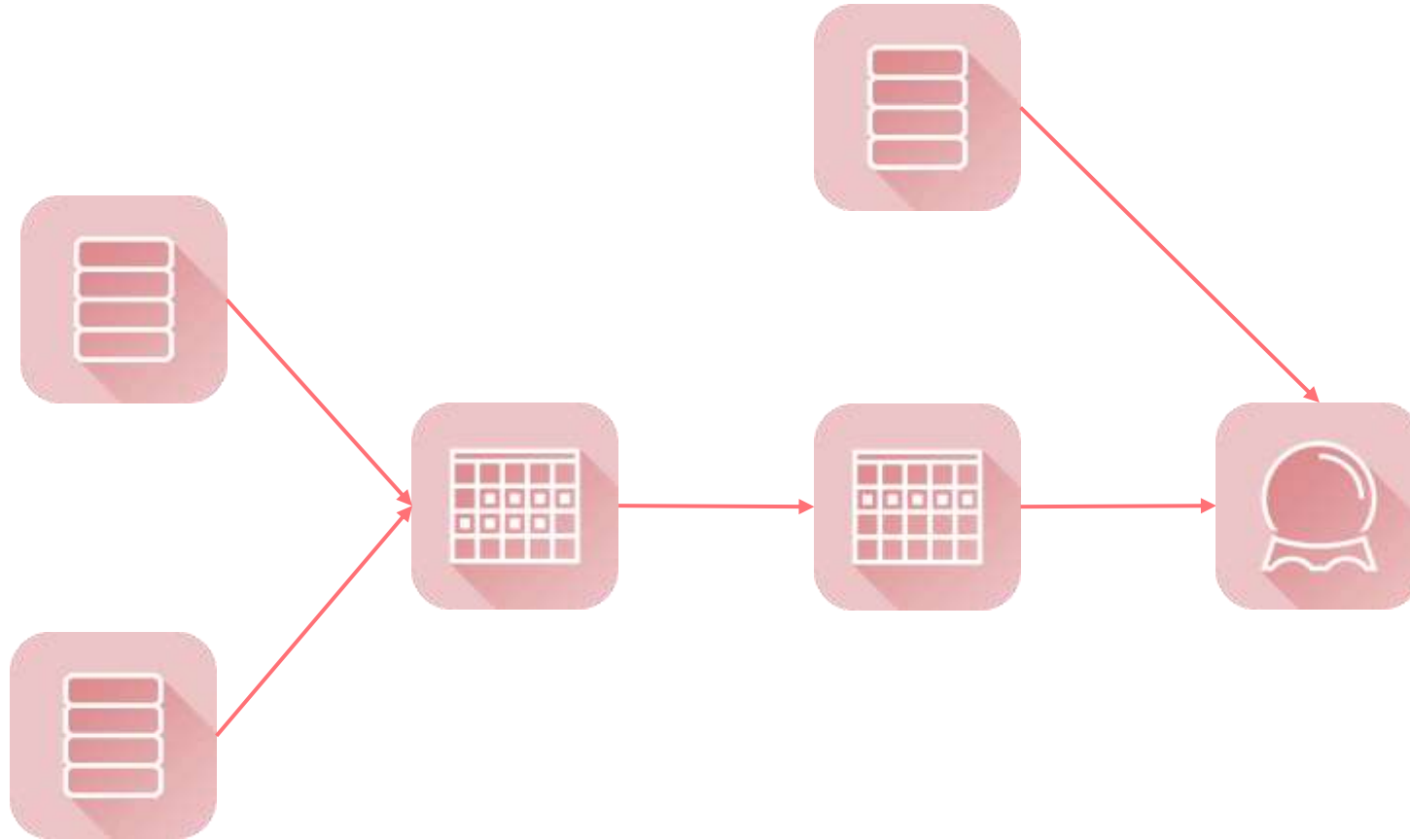
CASE



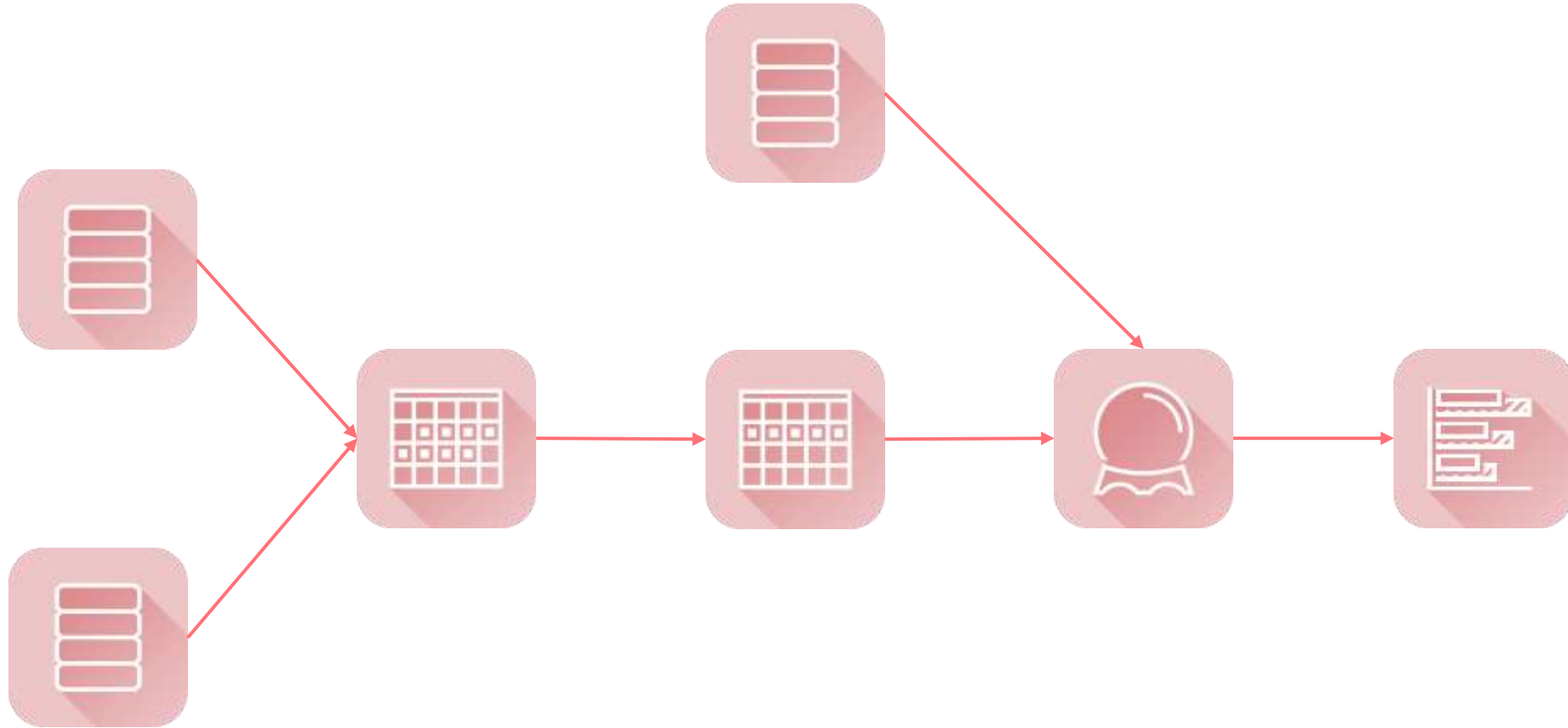
CASE



CASE



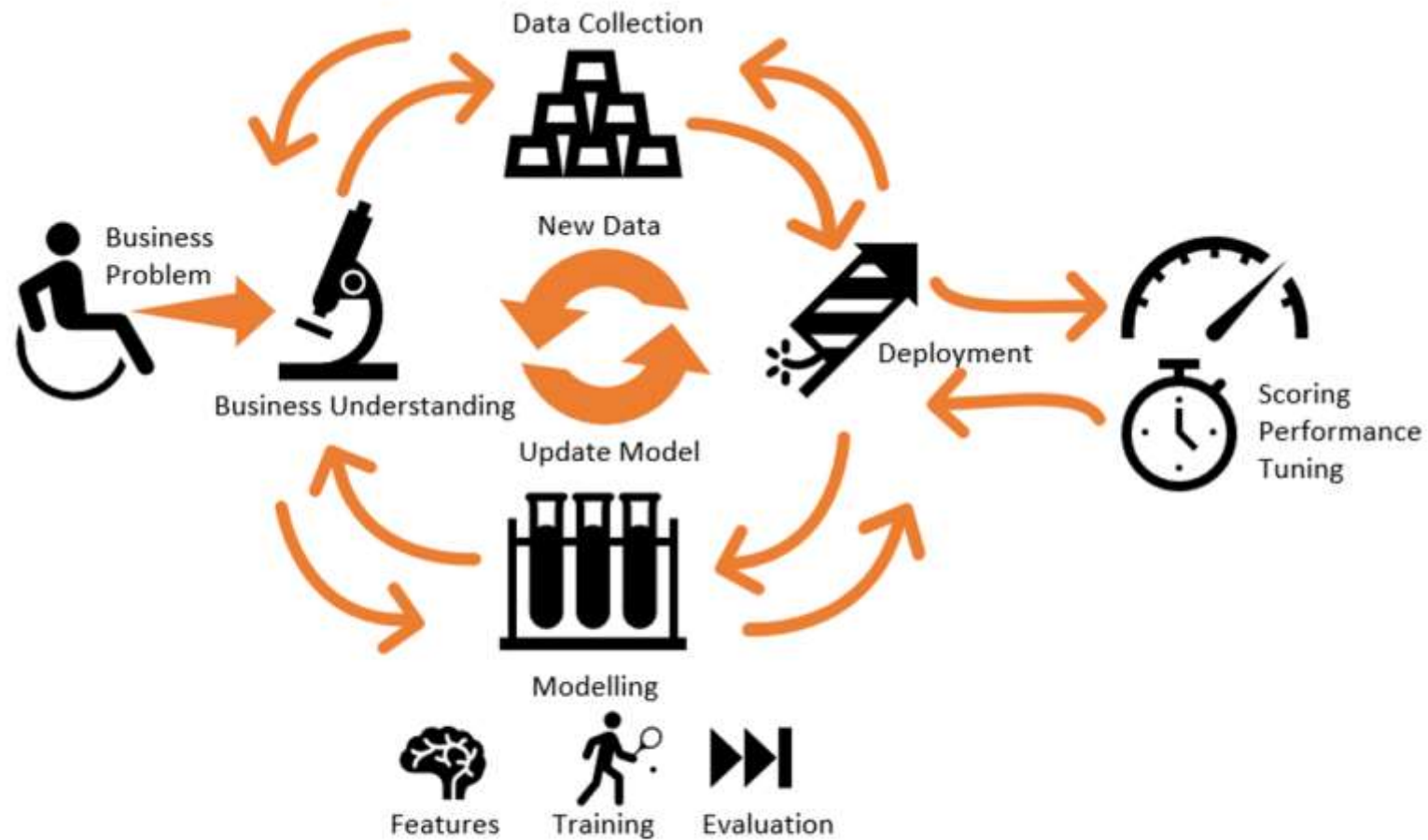
CASE



A person wearing a blue denim shirt is shown from the chest down to the waist. They are rolling up the sleeve of their right arm with their left hand. The background is a blurred, light-colored wall. A vertical red line is positioned on the left side of the image, to the left of the text.

DEMO | Alteryx

PROJECT CYCLE



Artificial Intelligence / Machine Learning – CoE Project Life Cycle

USE CASES



ADO DEN HAAG



NEXT STEPS

1. Lees onze data science blogs op **rockfeather.com**
2. Schrijf je gratis in voor een Data Science Discovery Session
3. Kijk de volgende data science webinars terug op Rockfeather.com:
 - Webinar: Predictive Maintenance
 - Webinar: Predict Churn with Artificial Intelligence





Laurens Cruz

+31 6 19667058

Laurens.cruz@rockfeather.com

<https://www.linkedin.com/in/laurencruz/>

