How AI is bringing VHV into the future

Bernd Scharrer, COO

VHV Holding AG
Hannover / Istanbul, May 2022

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WHAT WE MEAN WHEN VHV TALKS ABOUT AI

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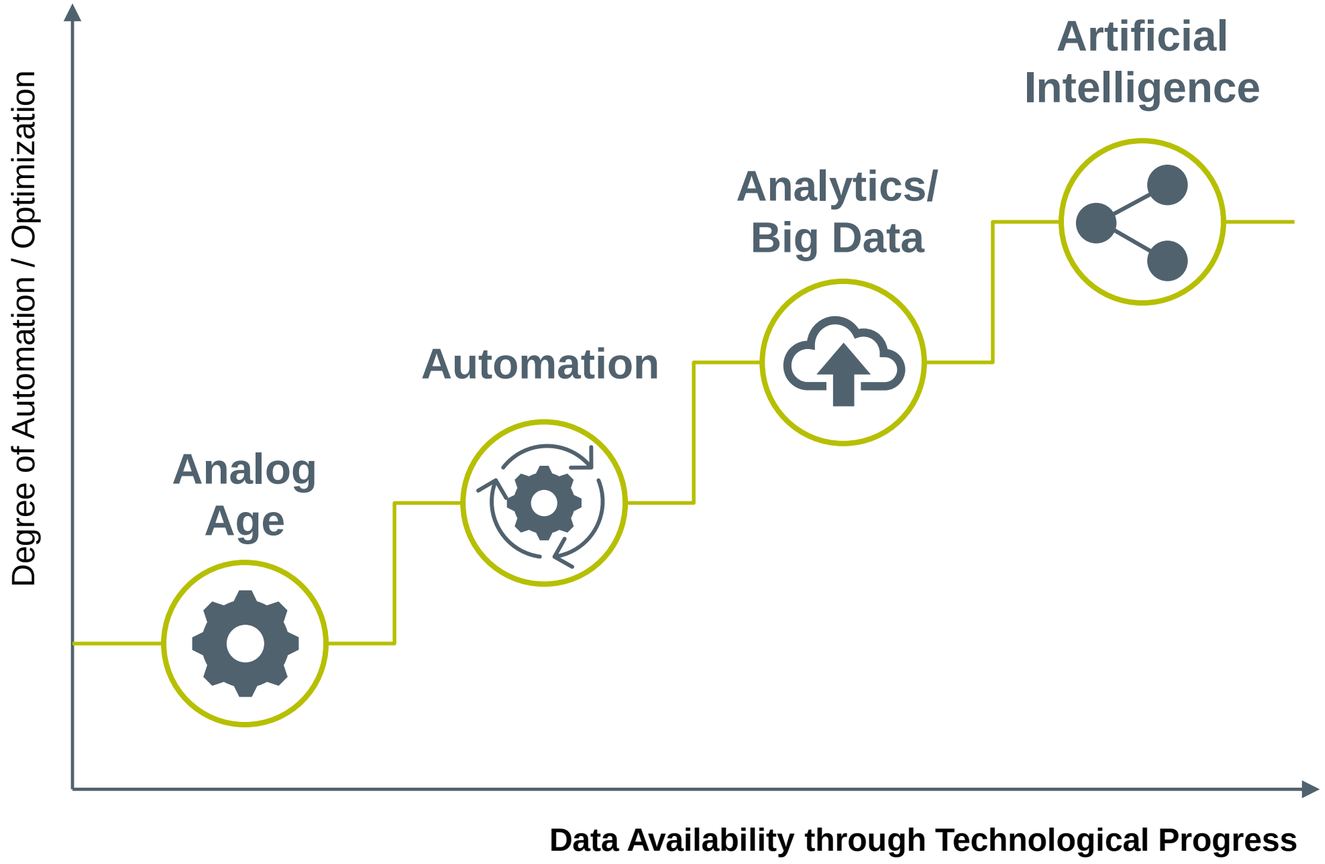
We use AI to enable and make data-driven decisions
Our Understanding of AI



- EXTENDS DATA ANALYTICS WITH **SELF-LEARNING ALGORITHMS**
- ENABLES **INDEPENDENT DECISIONS** & LEARNING PROGESS
- EVEN **LARGE AMOUNTS OF DATA** CAN BE PROCESSED

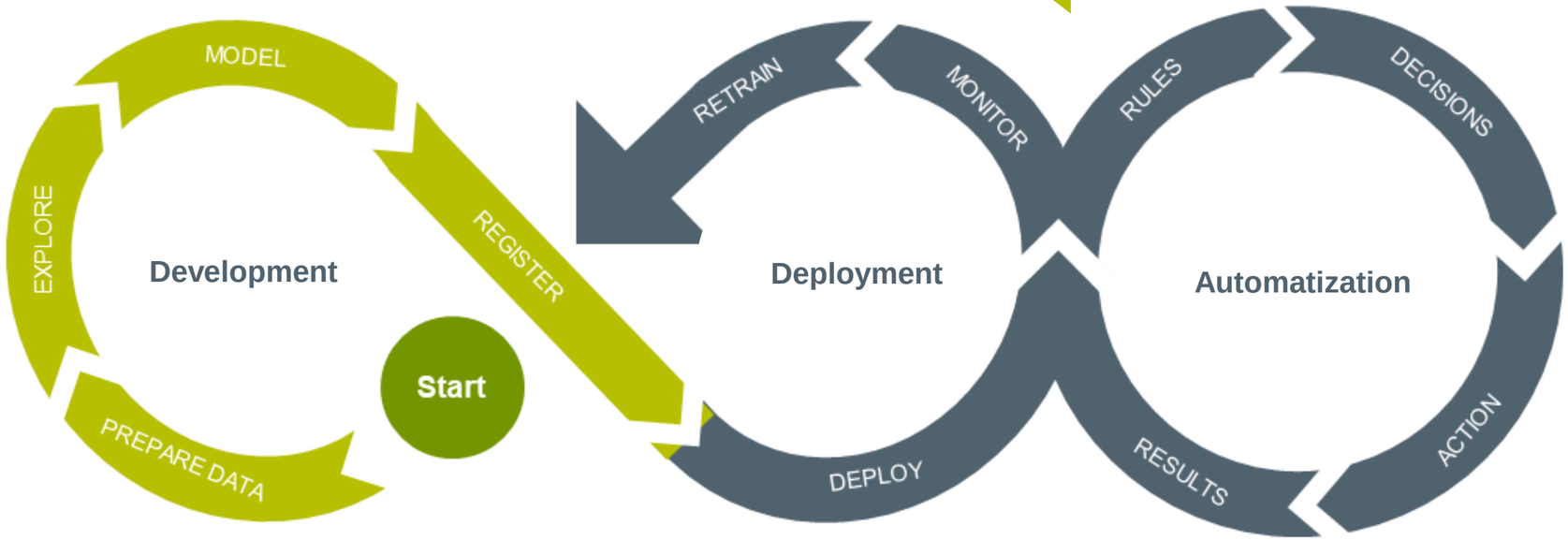
➢ **VHV‘S GOAL TO OPTIMIZE PROCESSES AND PROFITABILITY**

Moving from simple analytics to automated solutions

Our Understanding of AI

From **Insights** (Data Analytics) to **Decisions** (AI)

Data Analytics enables us to gain new business insights that were previously not possible due to the complexity



Artificial Intelligence takes place through independent training of **Data Analytics** models, finds its own decision-making rules and can automate them

WHERE AND HOW WE USE AI AT VHV

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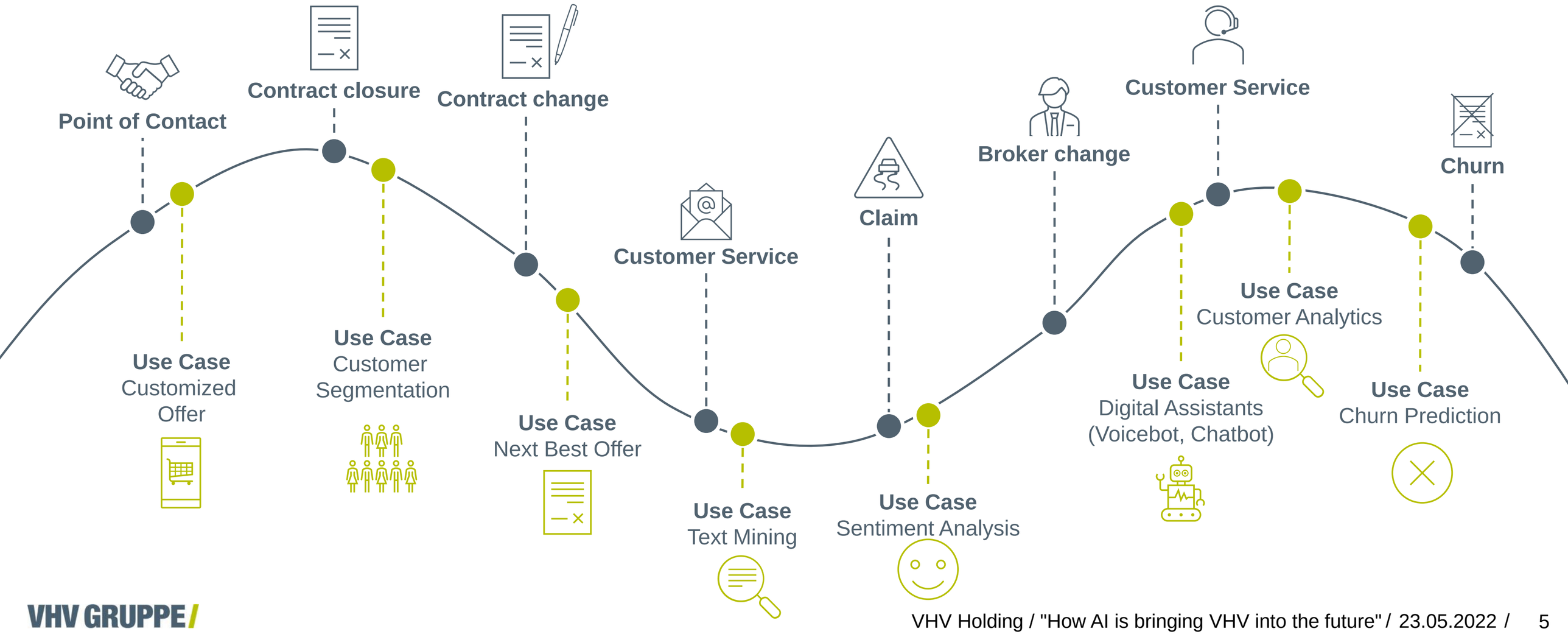
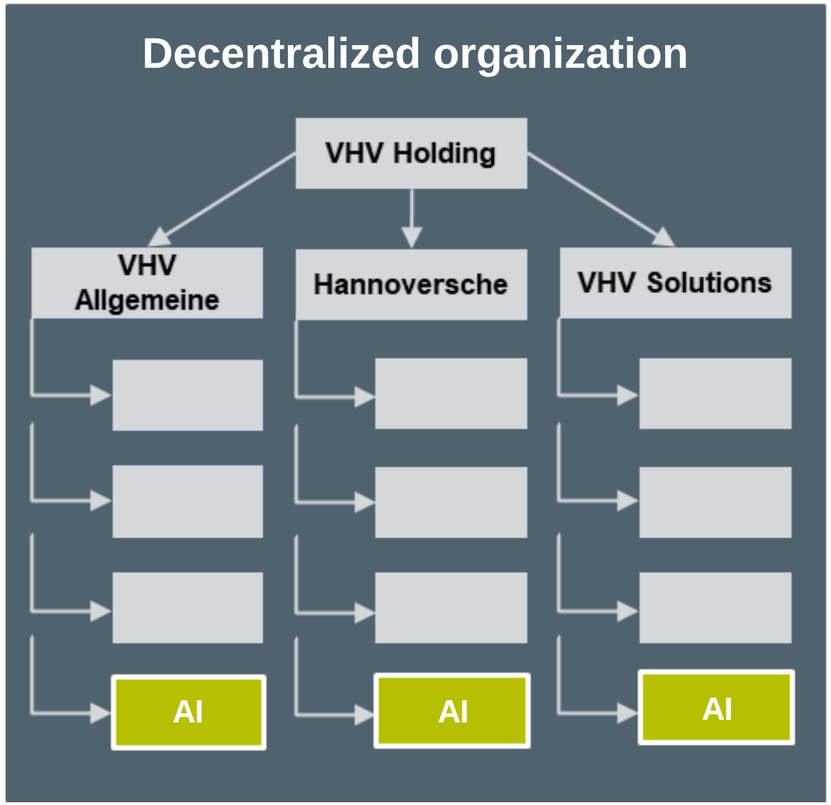
We see areas of application of AI over the entire customer life cycle

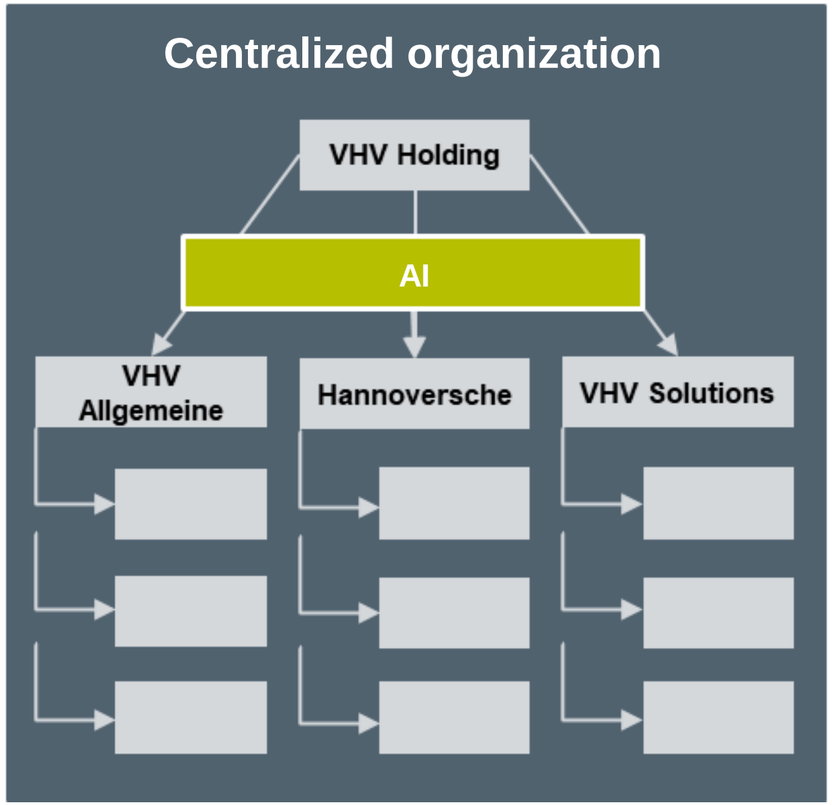
AI along the customer lifecycle

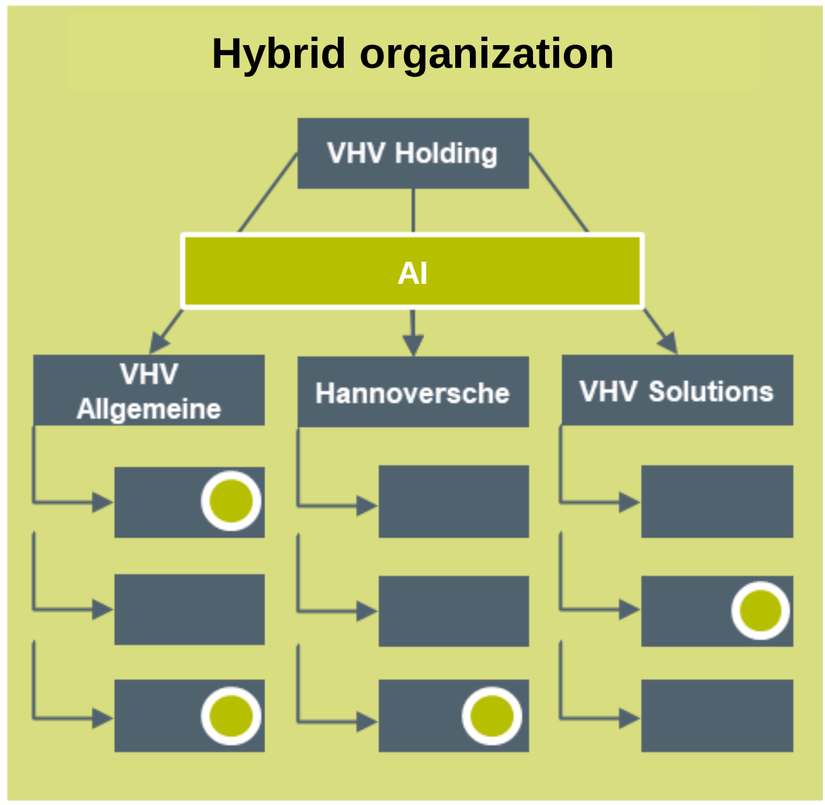


We see a hybrid model as the most promising way to organize and execute AI projects in the next years

Organizational model

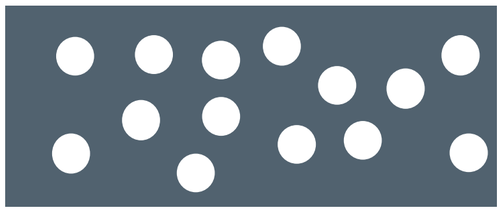
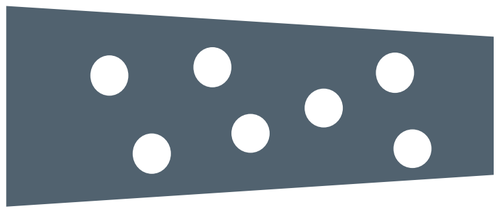
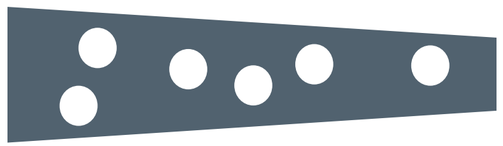






Our goal is to deploy models into operational processes within weeks – not months

From ideation to operationalization

1. IDEATON	2. ANALYSIS	3. MODELLING	4. EVALUATION	5. OPERATIONALIZATION
				
• Definition of goals & KPIs • Exploration and ideation of possible use cases different departments along value chain • Initial assessment based on data quantity, possible implementations, modelling)	• Evaluation of specific requirements and data quality • Data preparation for further analysis • Definition of project deliverables	• Training and evaluation of relevant models for specific use case • Development “proof of concept”	• Evaluation of results: – performance – interpretability of results – operationalization for multiple departments • Development of prototypes for deployment	• Deployment into resilient software for model version • Report implementation

WHAT WE ACHIEVED (SO FAR) WITH AI

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Several use cases were deployed by VHV data scientists

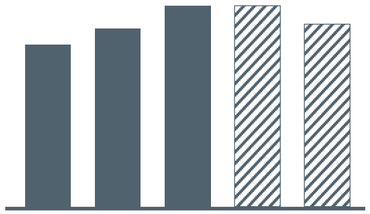
Overview of projects

CHURN PREDICTION

The identification of customer segments and specific traits/triggers signaling contract cancellation. These findings are used to design customer-specific prevention measures.

FORECASTING

The processing, evaluation and structuring of existing internal data from the past in order to use it to create and train models that predict future levels.



Samples

Using structured information, automated decisions are made by technical means in the claims process without human intervention.

CLAIMS PROCESSING

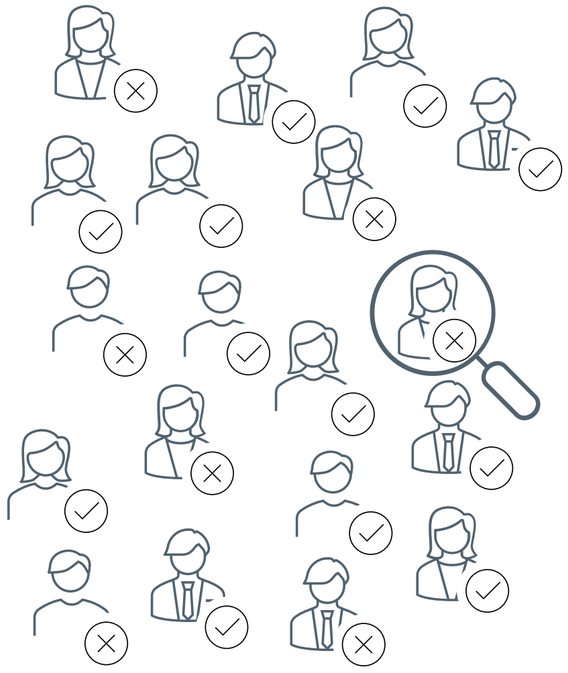
Recognize anomalies and patterns in potential fraudulent cases and use this to classify new incoming cases based on fraud risk.

FRAUD DETECTION

We analyze and predict churn to understand the reasons of churn and apply measures to prevent it

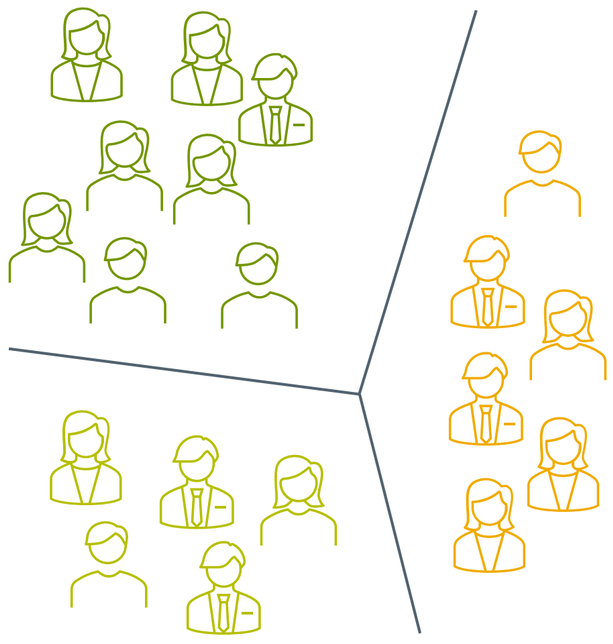
Classification and Prediction

Analysis of Car Insurance Customers



✓ did not churn ✗ did churn

Segmentation of Car Insurance Customers



The Loyal Ones

- Stick to the tried and tested partner

Loves the Wind of Change

- Are satisfied if they receive improved conditions/prices overtime

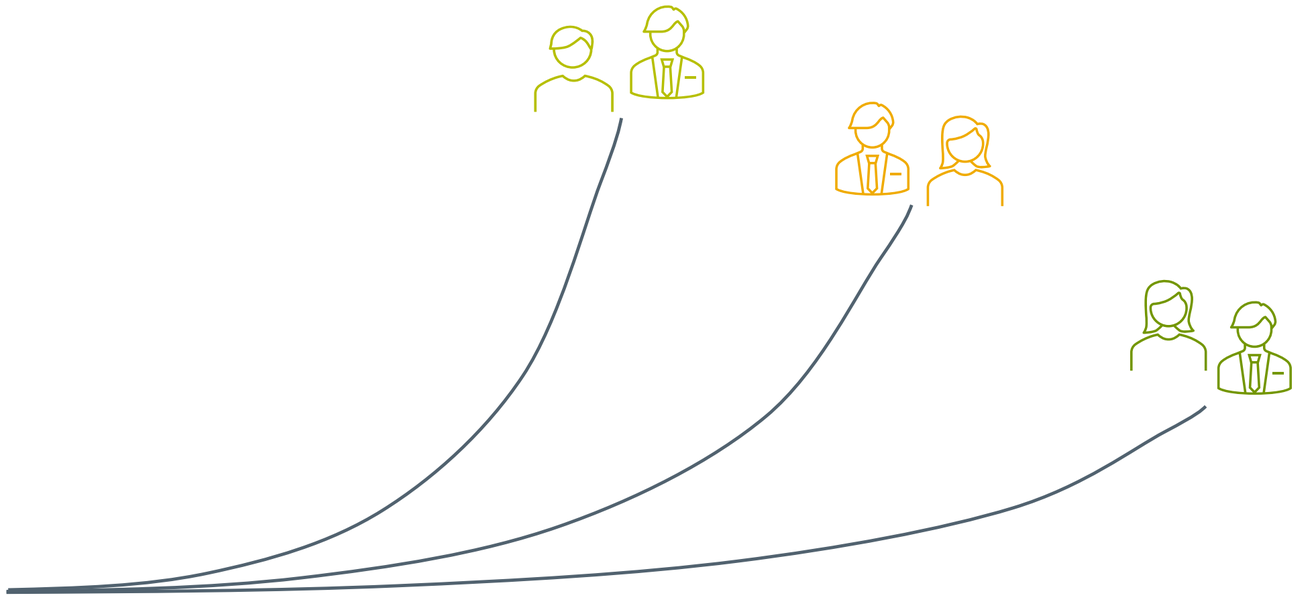
Where are You now

- „Insurance nomads“ often price sensitive moving from insurance to insurance year by year

We analyze and predict churn to understand the reasons of churn and apply measures to prevent it

Classification and Prediction

Predicted Churn Risk over time



Possible Preventive Measures

- Personalized communication plan for different customer segments
- Establish a program with incentives for „true“ customers
- Offer differentiated premium adjustments to annual contracts
- Offer brokers segment-based provisions or rebates

We forecast incoming customer calls to allocate our staff more intelligently

Forecasting

Doesn‘t know how to handle all incoming calls

TWO EXTREMES

Doesn‘t know how to handle the boredom

Seasonality and Holidays

Daytime

The number of incoming calls is driven by predictable events and circumstances

Weather Events

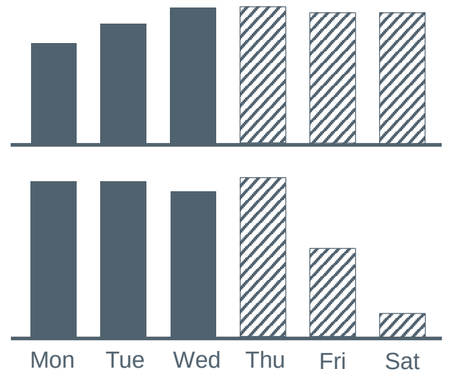
Internal Contact Points (Letters, Billing)

and many more…

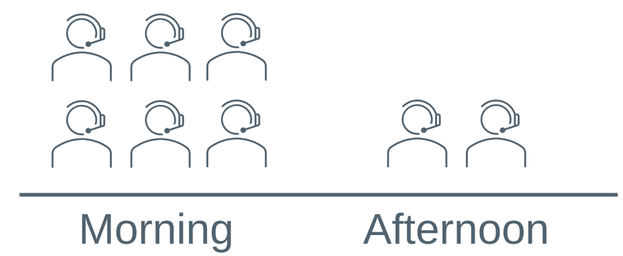
Morning

Week 25

Afternoon



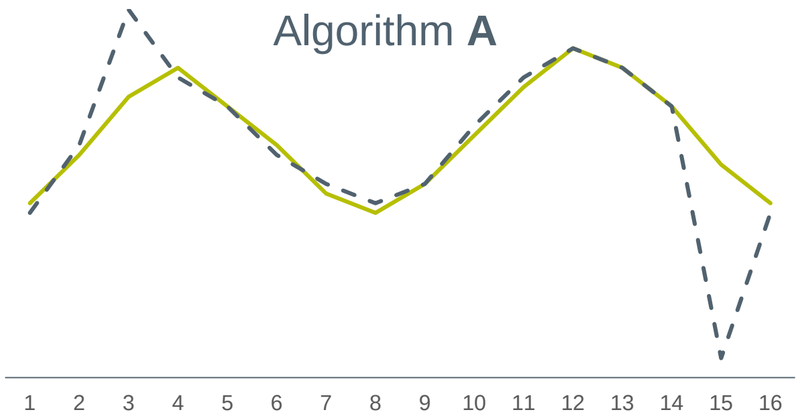
We predict the number of incoming calls with sophisticated algorithms to optimise staffing and response times



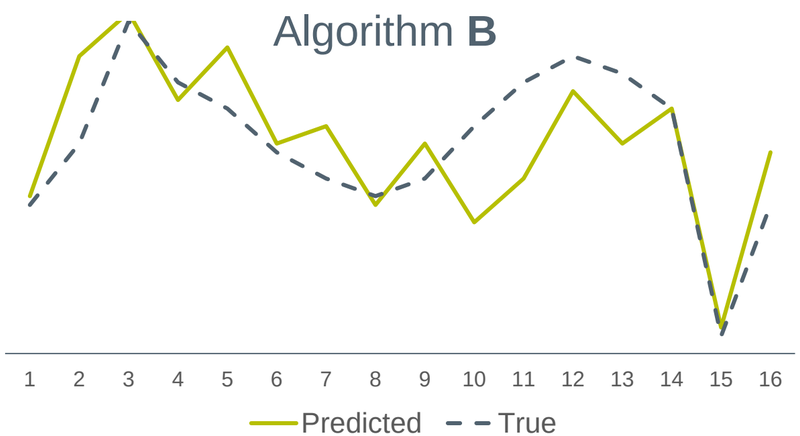
Shift Schedule Saturday 21st of May

The challenge of forcasting incoming calls was combining both seasonality, other factors and outliers

Forecasting

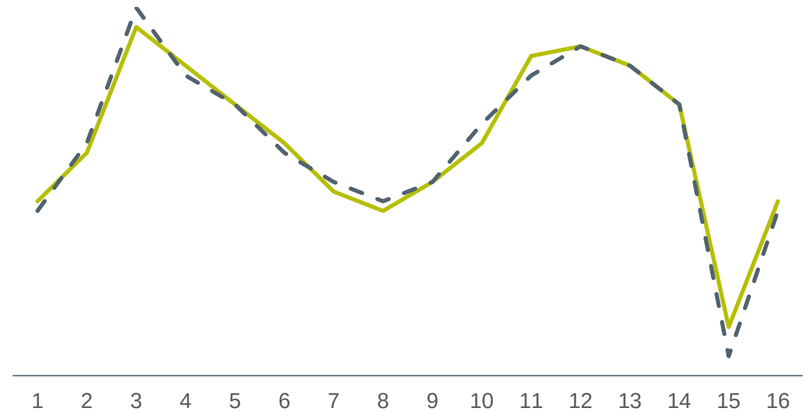


- Capable to predict the seasonality
- But fails when predicting the outliers



- Capable to predict the outliers
- But significantly worse at predicting seasonality effects

Stacked Ensemble Results
(i.e. combining the results of two different algorithms)



We experiment with and evaluate Chatbots and Voicebots to improve our customer‘s experience

Smart Assistants

Identify intentions
What is the customers issue?
here: change of adress

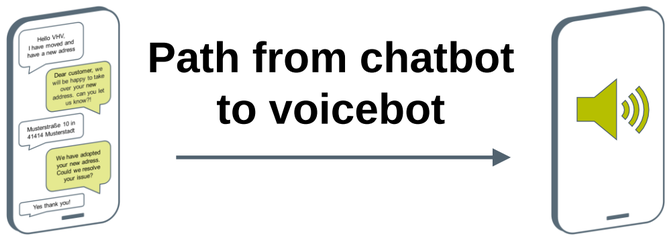
Predefined actions
Reaction to the request
here: tell us your new adress

Identity entities
What is the intentions entity
here: street, postal code, city

Predefined actions
Reaction to the request
here: feedback and farewell

Feedback
Did the chatbot act correctly
here: yes (no need for revision)

BENEFITS
✓ Our customers can reach to us 24 hours per day
✓ We are more attractive to digital natives
✓ Efficiency gains, esp. for standard requests
✓ We collect data for further AI applications

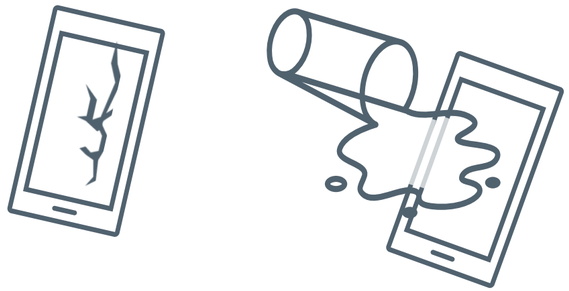


Path from chatbot to voicebot

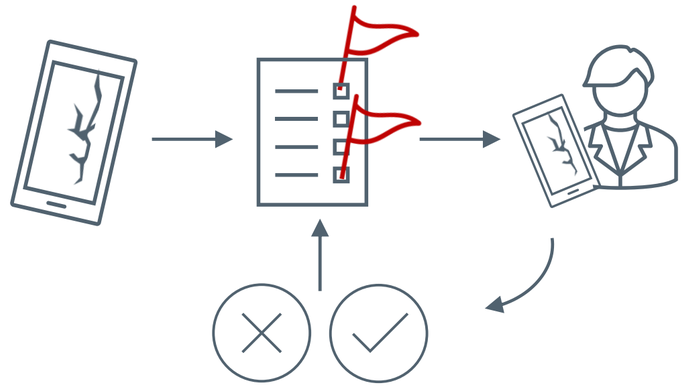
Voicebots are basically built upon the same tech-stack as chatbots. The added need is a speech-to-text application to transcribe the spoken word in text and a text-to-speech application and vice versa.

Using AI we are able to identify Red Flags that can detect fraudulent mobile phone claims in our liability insurance division

Fraud Detection



- A pilot was set up to review all incoming claims over a defined period of time
- A specialized service provider evaluated all claims for plausibility
- Using this data, we trained an AI model to detect fraudulent claims and identify common features



Underestimated the number of fraudulent cellphone claims

- Experienced agents check the validity of incoming claims
- We have been able to detect a large amount of fraudulent claims, but this was below the insurance sector average

Experimental setup to generate a training data set

Red Flags to detect potential Fraud + Continous Training

- Our AI model was able to identify several red flags which greatly increase the risk of fraud
- If a new claim is marked with a combination of these red flags, the claim is evaluated by a fraud specialist
- The results of the evaluation and test data are tracked and used to retrain the model for further refinement

WHAT WE HAVE TO CONSIDER WORKING WITH AI

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Ethics and Regulation of Artificial Intelligence in the European Insurance Sector

Ethics and Regulation of AI

> On Artificial Intelligence, trust is a must, not a nice to have. (…) the EU is spearheading the development of new global norms to make sure AI can be trusted. By setting the standards, we can pave the way to ethical technology worldwide and ensure that the EU remains competitive along the way. Future-proof and innovation-friendly, our rules will intervene where strictly needed: when the safety and fundamental rights of EU citizens are at stake.

Margrethe Vestager
Executive Vice-President of the European Commission for A Europe Fit for the Digital Age, April 21st 2021

How do we implement the Governance Principles for the European Insurance Sector

Ethics and Regulation of AI at VHV Group

Fairness and Non-Discrimination

We evaluate whether potential model variables can discriminate a customer directly or indirectly

Our tech-stack is capable to evaluate models by fairness metrics (e.g., disparate impact) continuously

Transparency and Explainability

We employ Explainable AI (XAI) methods, that allow our staff to interpret and trust the results and output created by AI

For example, we use e.g., LIME, SHAP and Anchors to evaluate model results

Human Oversight

We proceed according to the principle „putting and keeping the human in the loop“.

AI models are not deployed or updated without human oversight.

Robustness and Performance

We evaluate the risk of AI deployments

We use numerous performance metrics to evaluate our models continously. Together with XAI methods we assess the deployment of our AI applications

Data Governance and Record Keeping

Both our Legal and Compliance departments are involved in each AI project undertaken. They provide guidance on data selection and model implementation. (e.g. data scarcity)

THANK YOU

ÇOK TEŞEKKÜRLER

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