Optimise Business Performance

Case Study | Theunis J van Rensburg

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Optimising
Business
Performance
Statistical Analysis
Predictive Modelling
Machine Learning

“It is easy to lie with statistics.
It is hard to tell the truth without it.”

Andrejs Dunkels

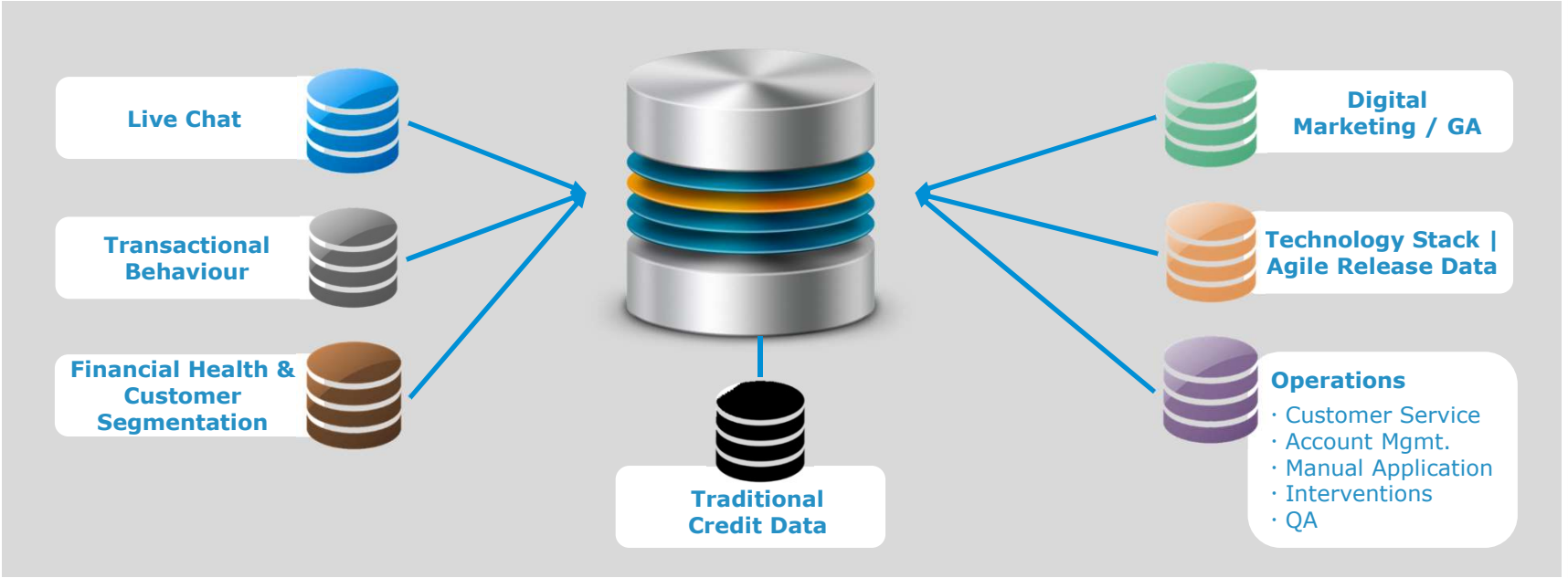
PROBLEMS WITH DATA

Big Data, and in particular massive aggregators like **Google**, have led us to believe that given enough data, anything could be predicted.

DATA INTEGRATION

- Biggest challenge → to get business buy-in for full data integration
- Most businesses have separate data repositories for different areas of business

DATA INTEGRATION



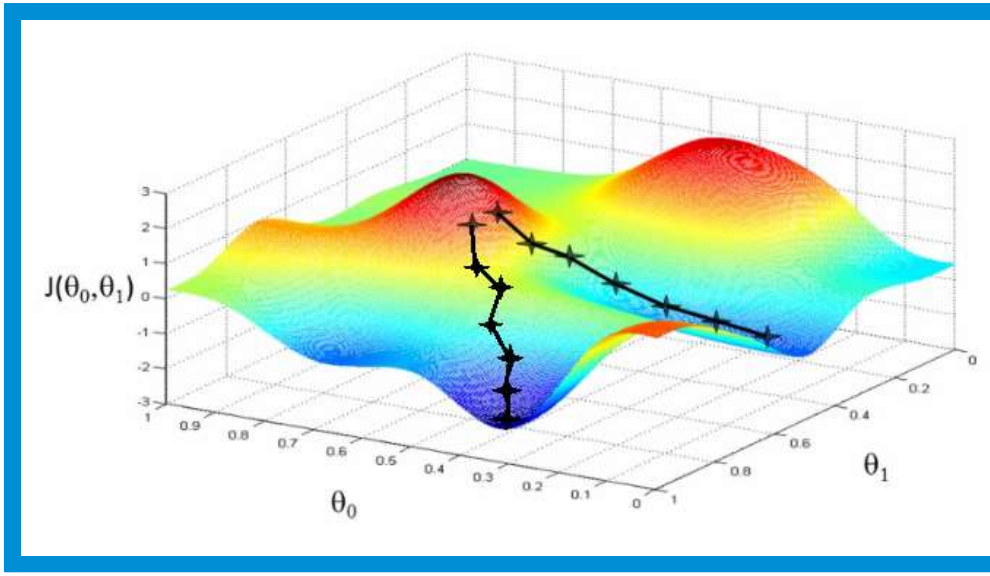
COLLECTIONS |Self-Cure Propensity Models

PROBLEM

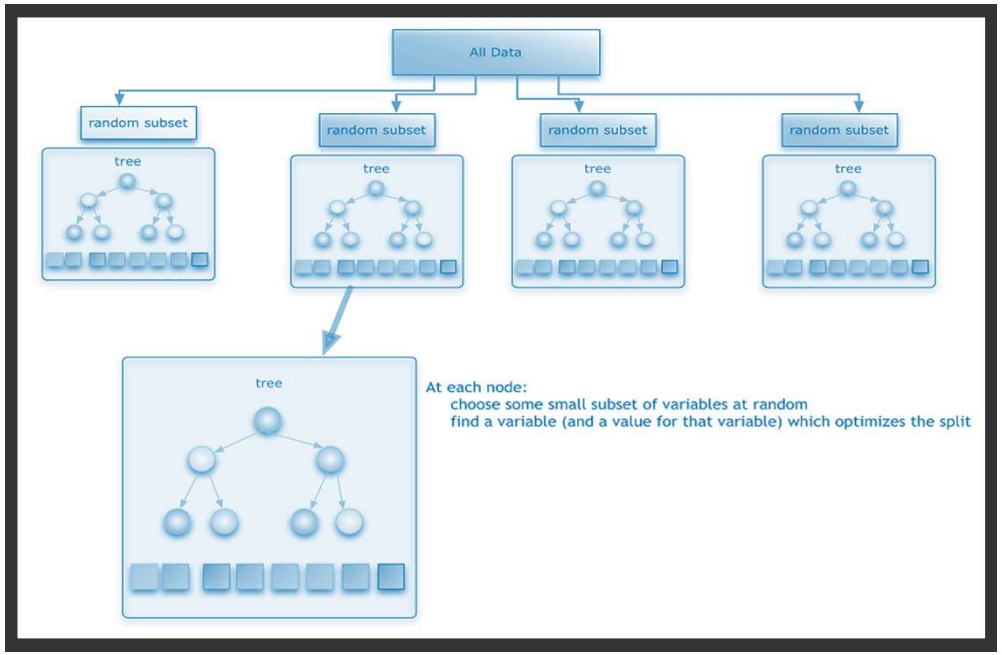
External **collection costs** aren't being utilised optimally

Customer experience is suffering due to unwanted contact

Collection rates negatively impacted due to external collectors not focusing on the right accounts



COLLECTIONS |Self-Cure Propensity Models



SOLUTION

Build a **Propensity Model** to predict which customers that go into arrears will **naturally cure** without needing to be contacted by collections activity

Random Forests Propensity Model

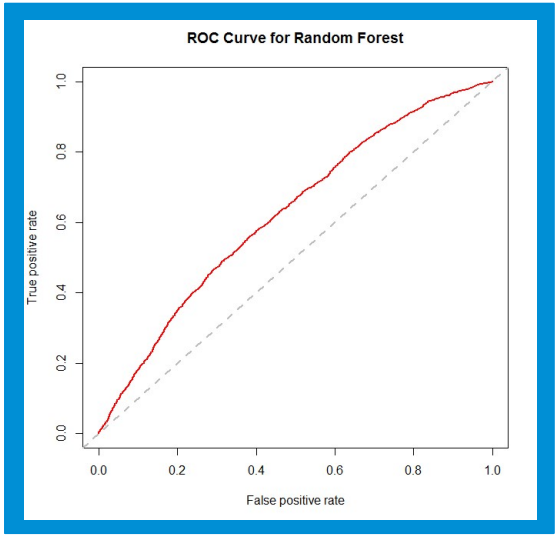
- It's a versatile machine learning method capable of performing both regression & classification tasks
- Consists of an arbitrary number of simple decision trees

COLLECTIONS |Self-Cure Propensity Models

Initial Results - Predictive Accuracy

Multiple propensity cut-off options due to scores between 0 and 1 (make target variable continuous)

Call Reason	Sensitivity	Specificity
Cut-off 1	78%	94%
Cut-off 2	92%	93%



IMPACT ON CUSTOMERS & COLLECTIONS

· Cost saving – less accounts handed over to external collectors therefore lower costs (fixed and variable)

· ↑ post-due collections – external collectors focussing on correct accounts

· Customers with willingness to pay that missed payment, due to extraneous circumstances, have a better experience

OPERATIONS | Call Reason Predictions

PROBLEM

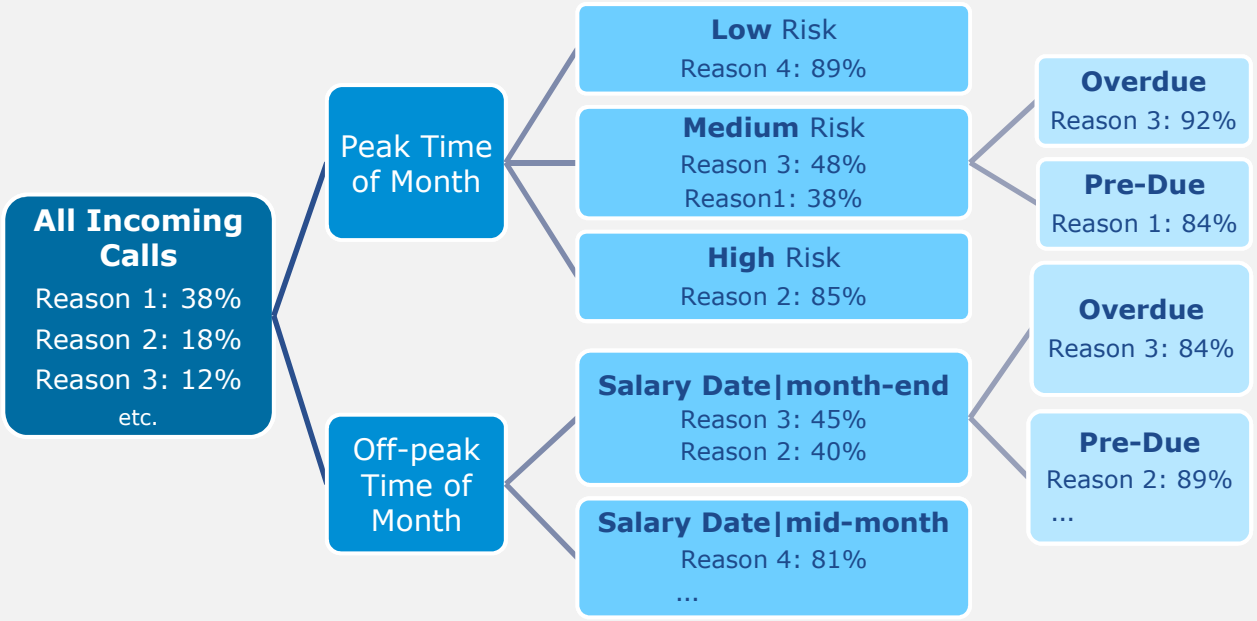
Inefficient service during certain times of month due to call routing to different departments & volume fluctuations

CUSTOMER IMPACT

- Longer wait times
- Wrong departments contacted
- Drop-off of calls

→ resulting in higher call volumes

OPERATIONS | Call Reason Predictions



SOLUTION

Predicting **why** a customer is calling **at the time of calling** and directing them to the right call centre agent based on **their needs**

CHAID (Chi-squared Automatic Interaction Detector) **Model**

- Algorithm used for discovering relationships between a categorical response variable & other categorical predictor variables
- Easy to integrate into telephony systems

OPERATIONS | Call Reason Predictions

Initial Results – Predictive Accuracy of First Iteration Model

Call Reason	Predicted Distribution	Actual Distribution	True Positive Rate
Reason 1	48%	45%	94%
Reason 2	18%	20%	95%
Reason 3	15%	13%	84%
Reason 4	9%	10%	79%

IMPACT ON CALL CENTRE

- Wait Times ↓ by 33%
- Call Volumes ↓ by 16%
- Customer Satisfaction Score (CSAT) ↑ by 20%

Thank You