



{Propulsion}

# Telcom Churn Prediction

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# Client Background | Why



Telecom Sector

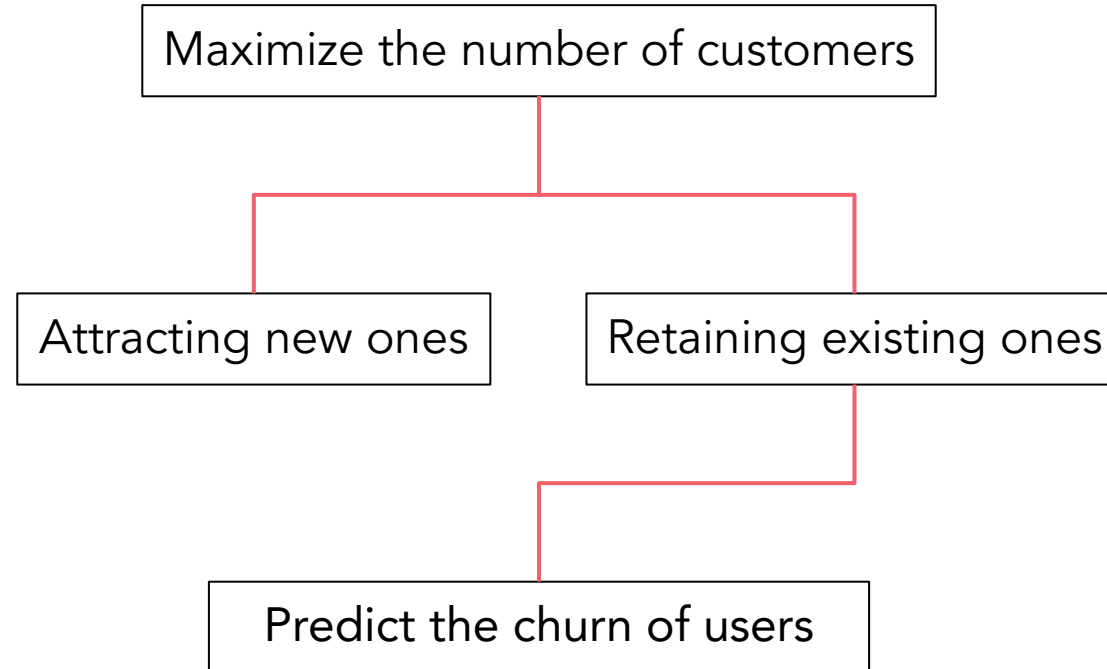
- The average churn rate 1.9% per month (67% annually prepaid services)
- Cost of acquiring new customers 25 times higher -> cost of retaining them



Customer churn



# Objectives | How







Data

## Data | Features

Partner

Tenure

Multiple Lines

Internet Service

Contract

Payment Method

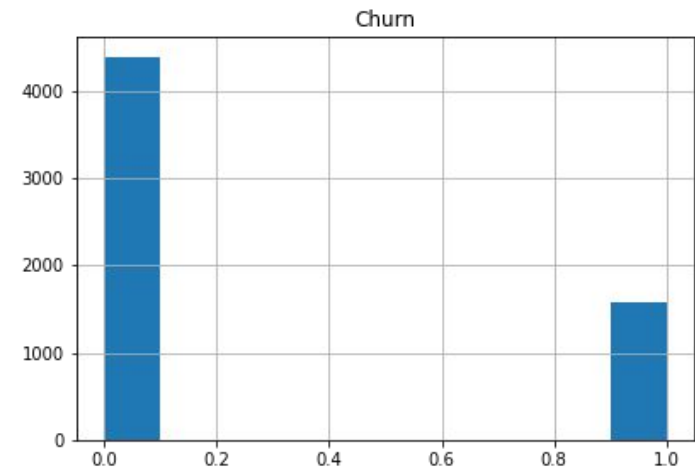
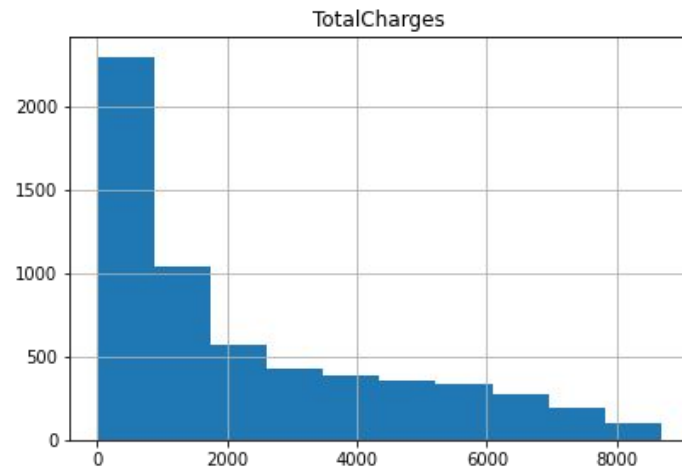
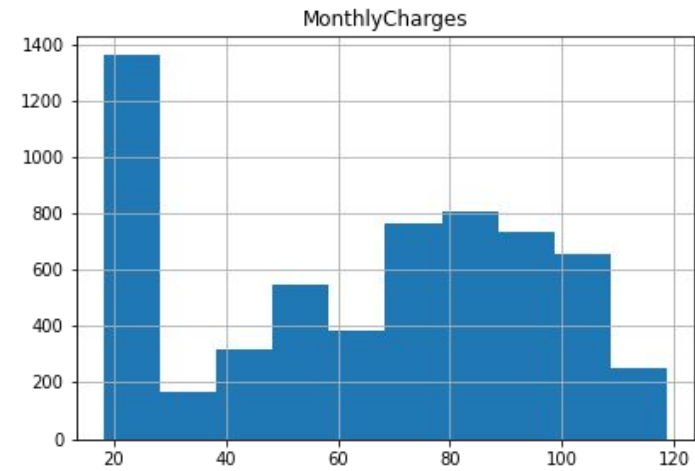
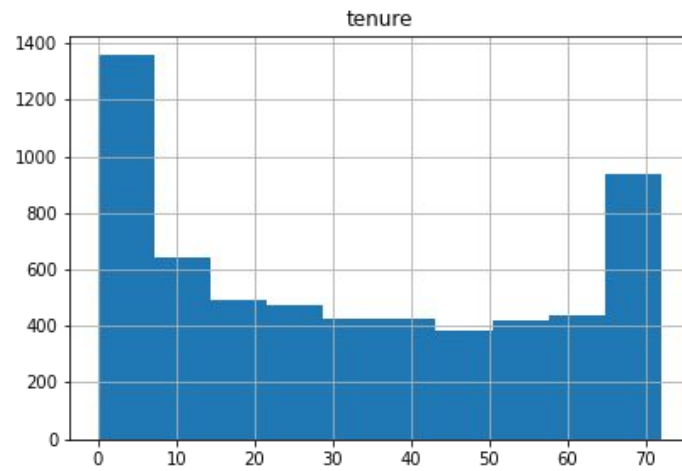
Monthly Charges

Total Charges

Senior Citizen, Gender, Phone Service, Online Security, Online Backup, Device Protection,  
TechSupport, Streaming TV, Streaming Movies, Paperless Billing



# Data | Distribution

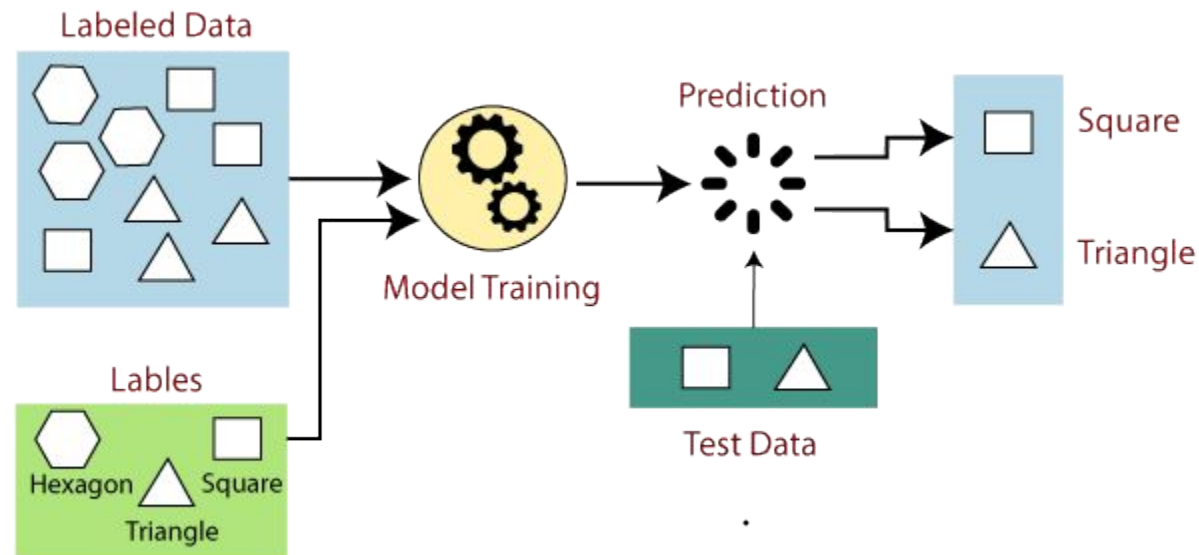


The background features a complex network of white dots and thin white lines, resembling a molecular structure or a data network, set against a black background. A horizontal grey band runs across the middle of the image, providing a backdrop for the title text.

# Methodology

# Methodology | Supervised Machine Learning Algorithm

- Supervised Machine Learning Algorithm: we had historical data about the churn
- Binary classification model: churn Yes/ No
- Training of different classification models





# Methodology | Metric

- Model Selection based on the highest performance
- Performance Measure F1: combination of Recall and Precision
- Confusion Matrix: Recall vs. Prediction

		PREDICTIVE VALUES		
		POSITIVE (1)	NEGATIVE (0)	
ACTUAL VALUES	POSITIVE (1)	TP = 3 FN = 1		4
	NEGATIVE (0)	FP = 2 TN = 4		6
		5	5	

Diagram illustrating a Confusion Matrix with annotations for Precision and Recall.

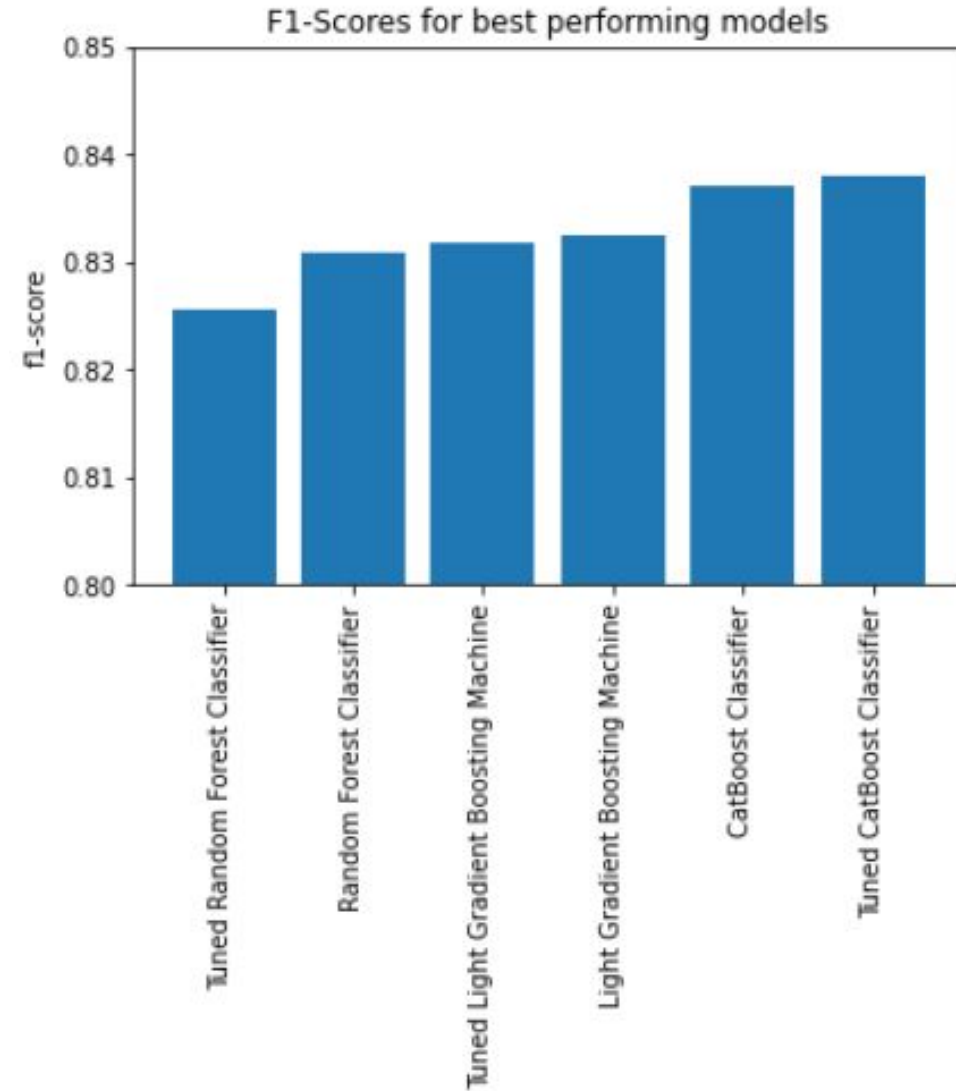
**Precision:** Indicated by a green box around the TP (3) and FP (2) cells, with a callout labeled "PRECISION".

**Recall:** Indicated by a red box around the TP (3) and FN (1) cells, with a callout labeled "RECALL".



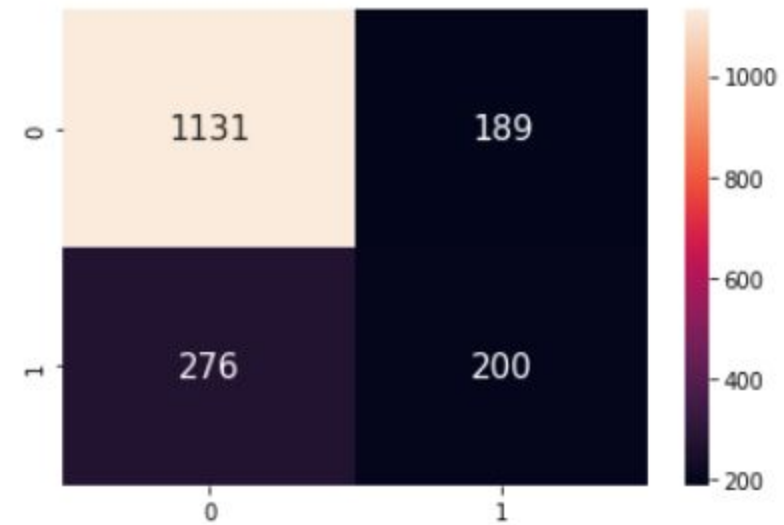
# Methodology | Models

- Classification models: Cat Boost Classifier, Light Gradient Boost Machine, Random Forest Classifier
- Technical information about the models and tuning process: see GitHub repository [Telecom Churn Prediction](#)
- Comparison of the model performances



# Methodology | Final Model

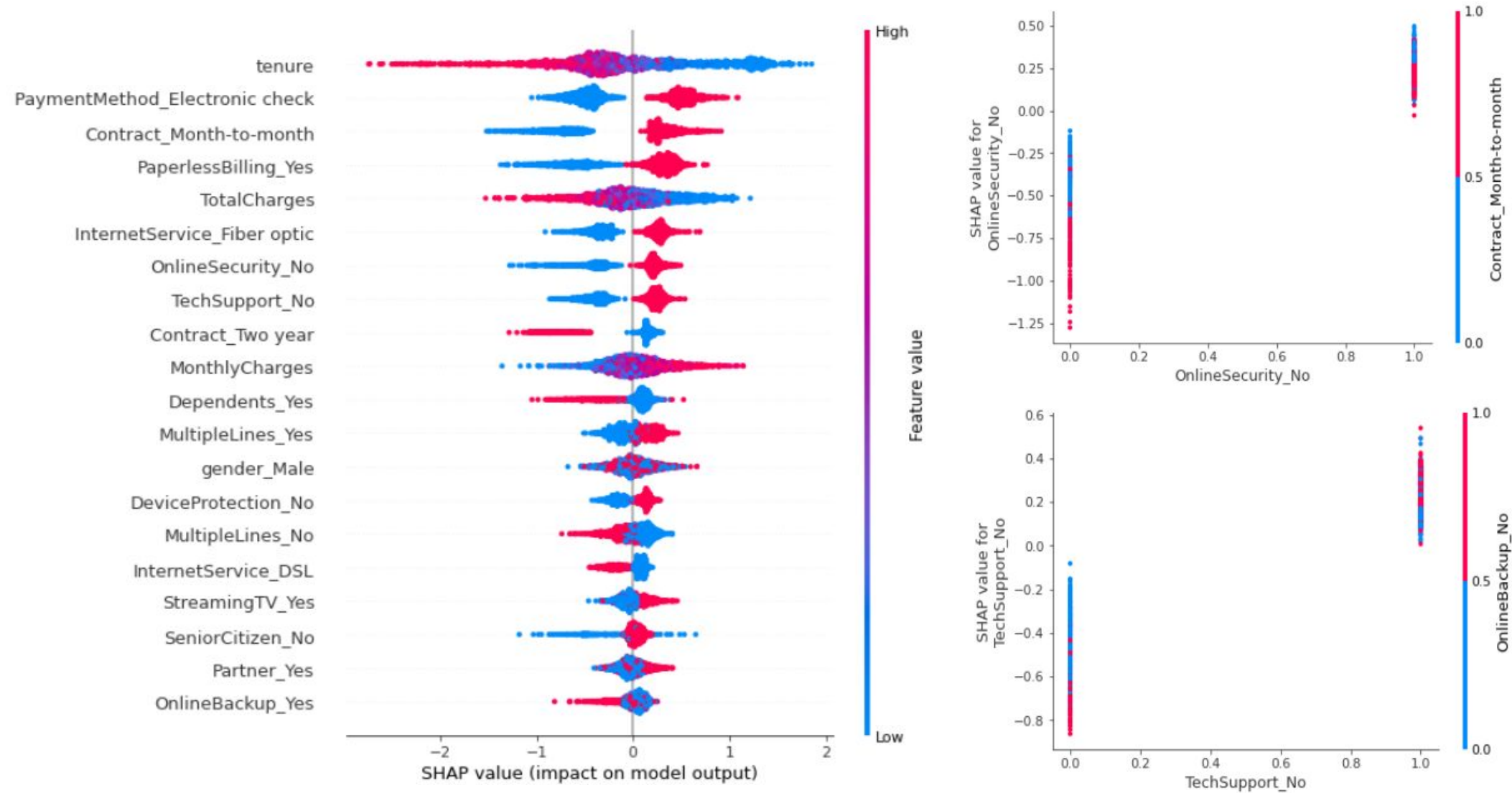
- Best performing model: Tuned Cat Boost Classifier Model
- F1: 0.8380
- Recall: 0.8568
- Precision: 0.8038



The image shows a close-up, top-down view of a light-colored brick wall. Numerous black and silver security cameras are mounted on the wall, arranged in a grid-like pattern. Each camera is angled slightly differently, and they all cast long, dark shadows onto the bricks. A semi-transparent horizontal band across the middle of the image contains the word "Predictions" in a red, sans-serif font.

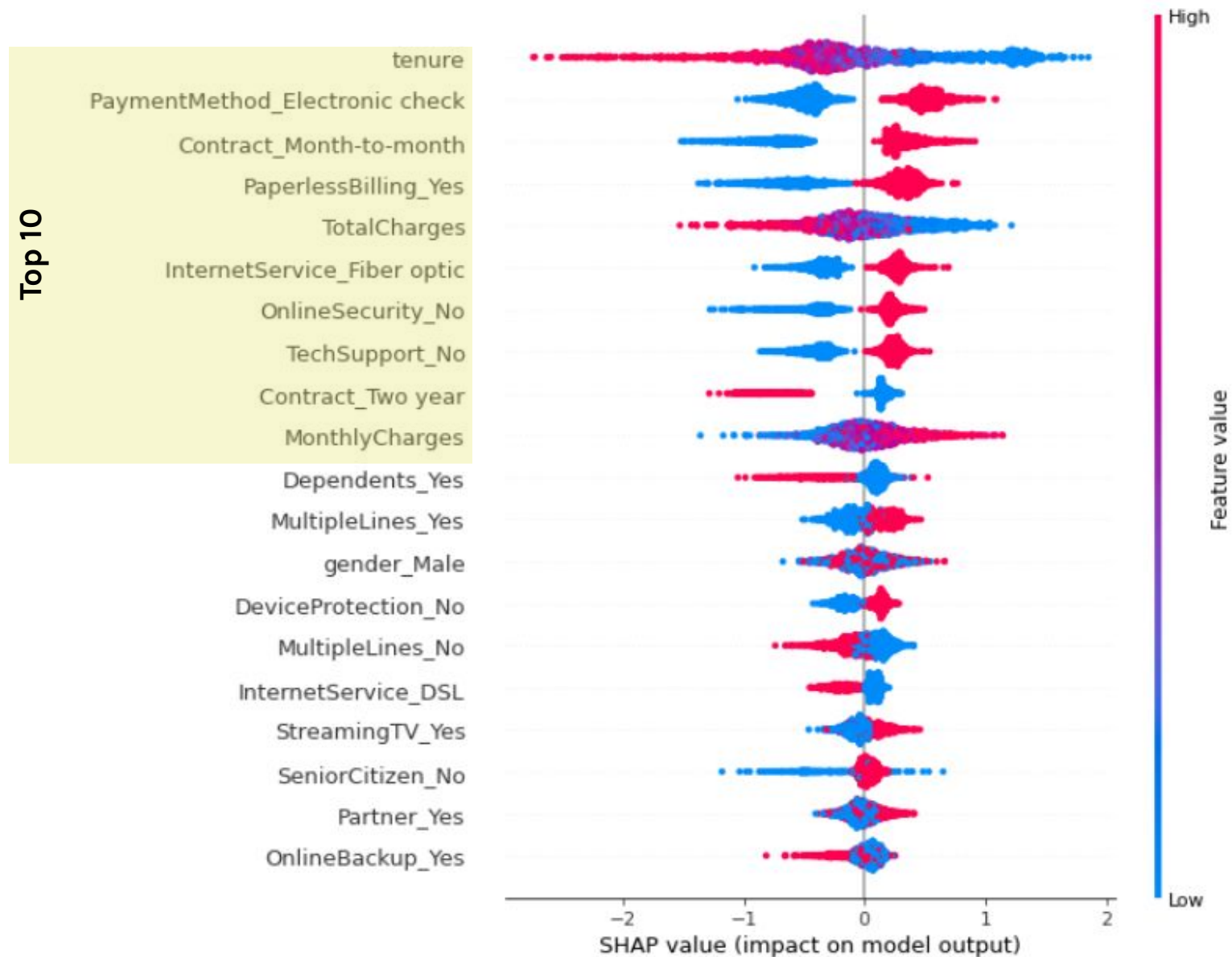
Predictions

# Predictions





# Predictions | Top Factors



# Predictions | Top Factors

Insights from our Model:

- The clients that have been subscribed for the longest are less likely to unsubscribe.
- The clients with longer contract durations are less likely to unsubscribe.
- The clients that do not subscribe to additional services, such as Online Security and Tech Support, are more likely to unsubscribe.
- The clients that pay their bills electronically are more likely to unsubscribe compared to clients with other payment type.
- The clients with the highest monthly payment are more likely to unsubscribe.



A close-up photograph of a blue and silver robotic hand holding a fan of US dollar bills. The hand is positioned on the left side of the frame, with its fingers gripping the edges of the bills. The bills are fanned out towards the right, showing various denominations including \$1, \$5, \$10, and \$20. The background is a plain, light-colored surface. A semi-transparent yellow banner is overlaid across the middle of the image, containing the word "Recommendations" in red text.

# Recommendations

## Recommendations | Reducing the churn

The cost of acquiring new customers is significantly higher than retaining existing new ones. However, telecom companies should not reach out to all existing customers.

- Increase attractiveness of long-term contracts: discounts and/or additional offerings
- Offer trial premium services for clients with monthly contracts
- Improving communication regarding additional services (Security, Tech Support)



## Recommendations | Future Work

- Clustering customer segments
- Re-run compiled model for each segment
- Outline strategies to tackle highest churn rate segments







Thank you for the attention

Questions?