

Turning Data into Retention: Telco's Churn Prediction Model

Capstone Project Presentation

Elliot Gaynon

Business Problem

- Telco has seen a sharp rise in customer churn due to increased competition.
- Losing customers directly impacts revenue and customer lifetime value.
- Reactive retention strategies are costly and inefficient.

Project Objective

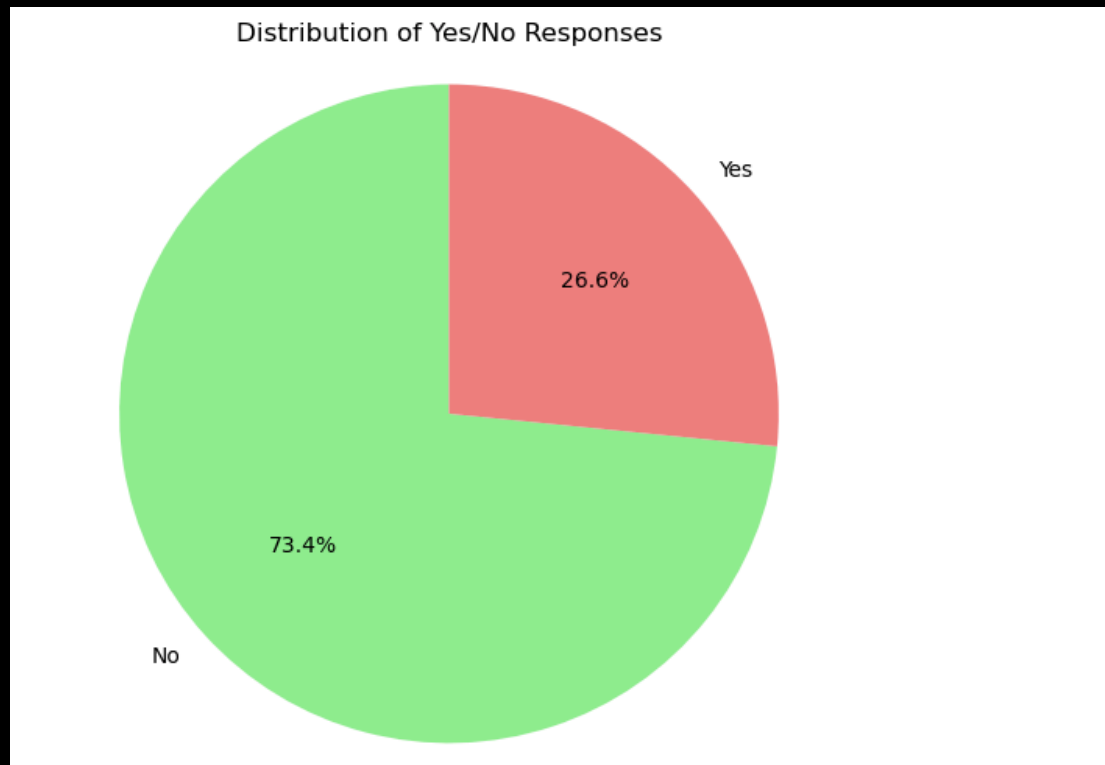
- Develop a predictive model to identify customers most likely to churn.
- Enable proactive, targeted retention efforts.
- Provide insights into the key drivers behind churn behavior.

Data Overview

- 7,032 customer records after cleaning.
- 21 features covering demographics, services, and account details.
- Target variable: Customer churn in the previous month.

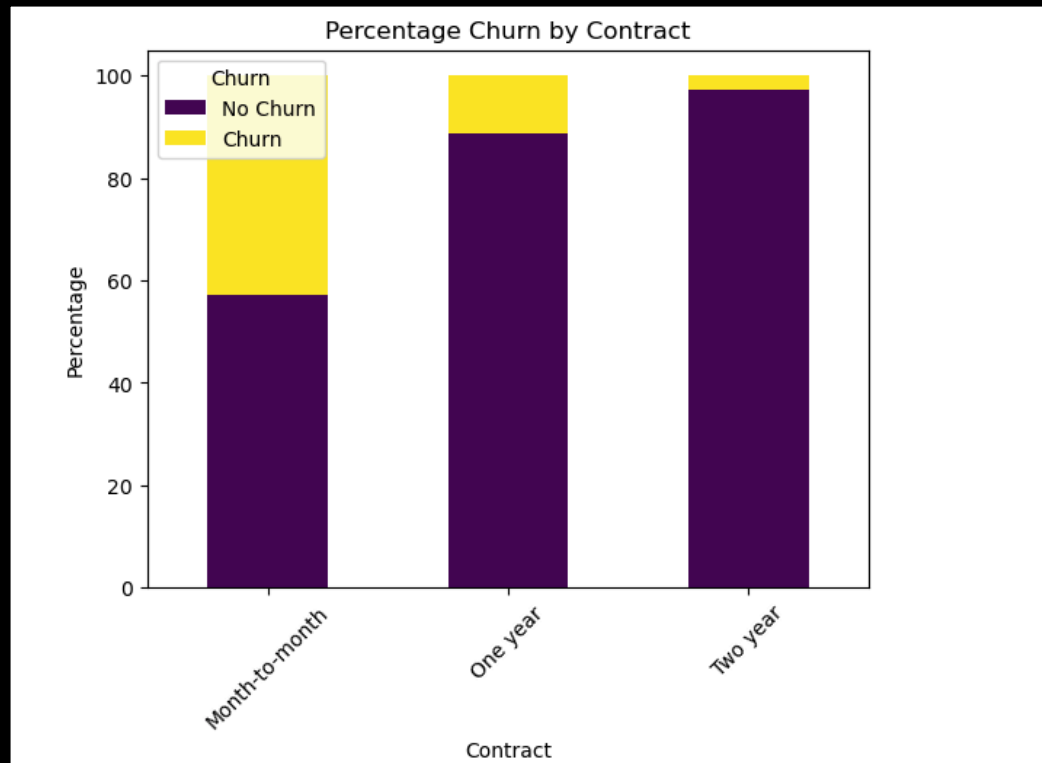
Key Insights from EDA

- Overall churn rate: 26.6%.



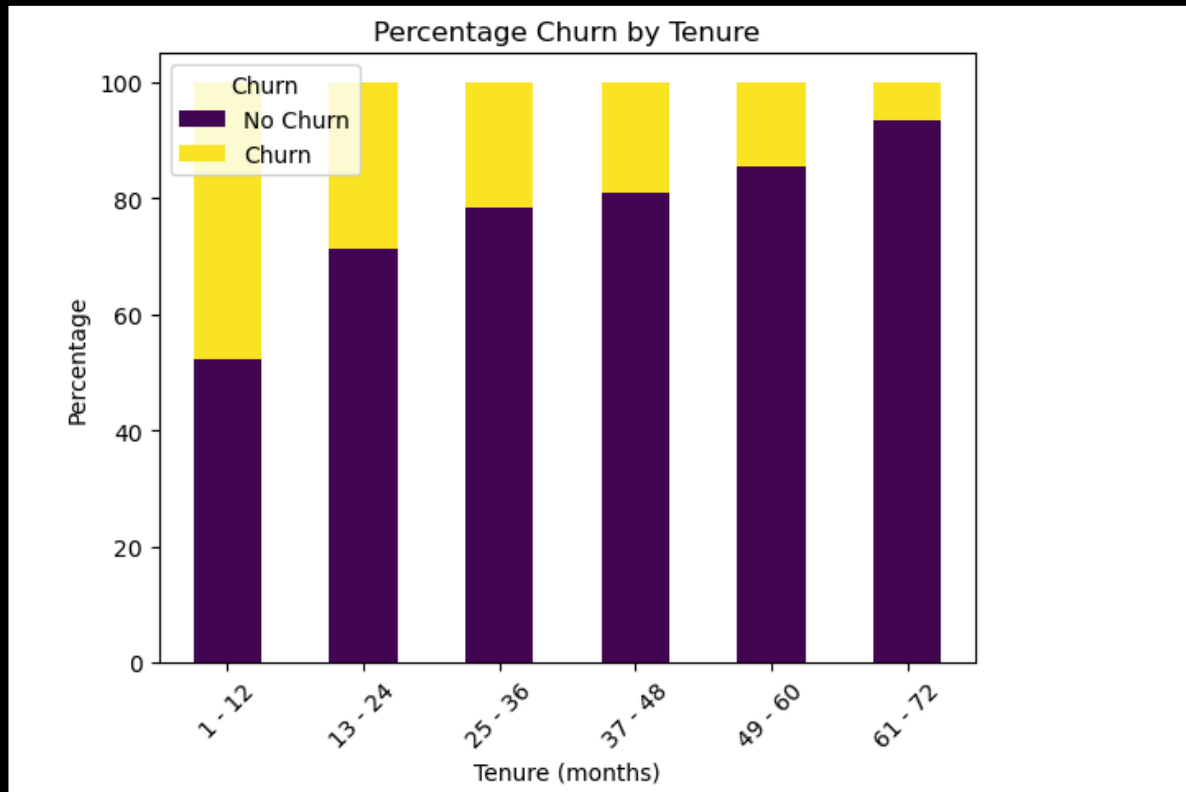
Key Insights from EDA

- Customers on month-to-month contracts churn significantly more.



Key Insights from EDA

- Longer tenure strongly correlates with lower churn.

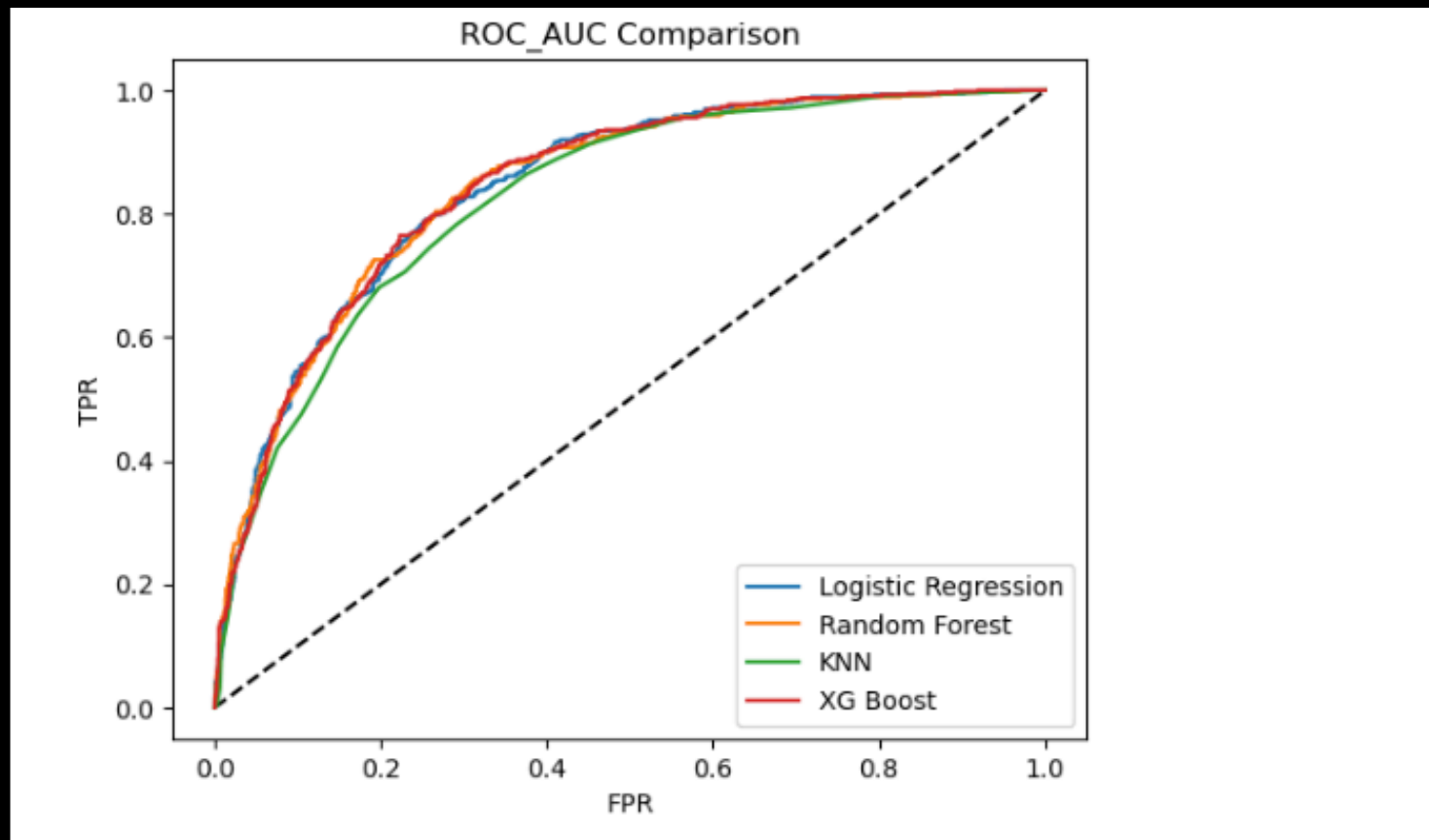


Modeling Approach

- Tested Logistic Regression, Random Forest, KNN, and XGBoost.
- Handled class imbalance (~3:1 non-churn to churn).

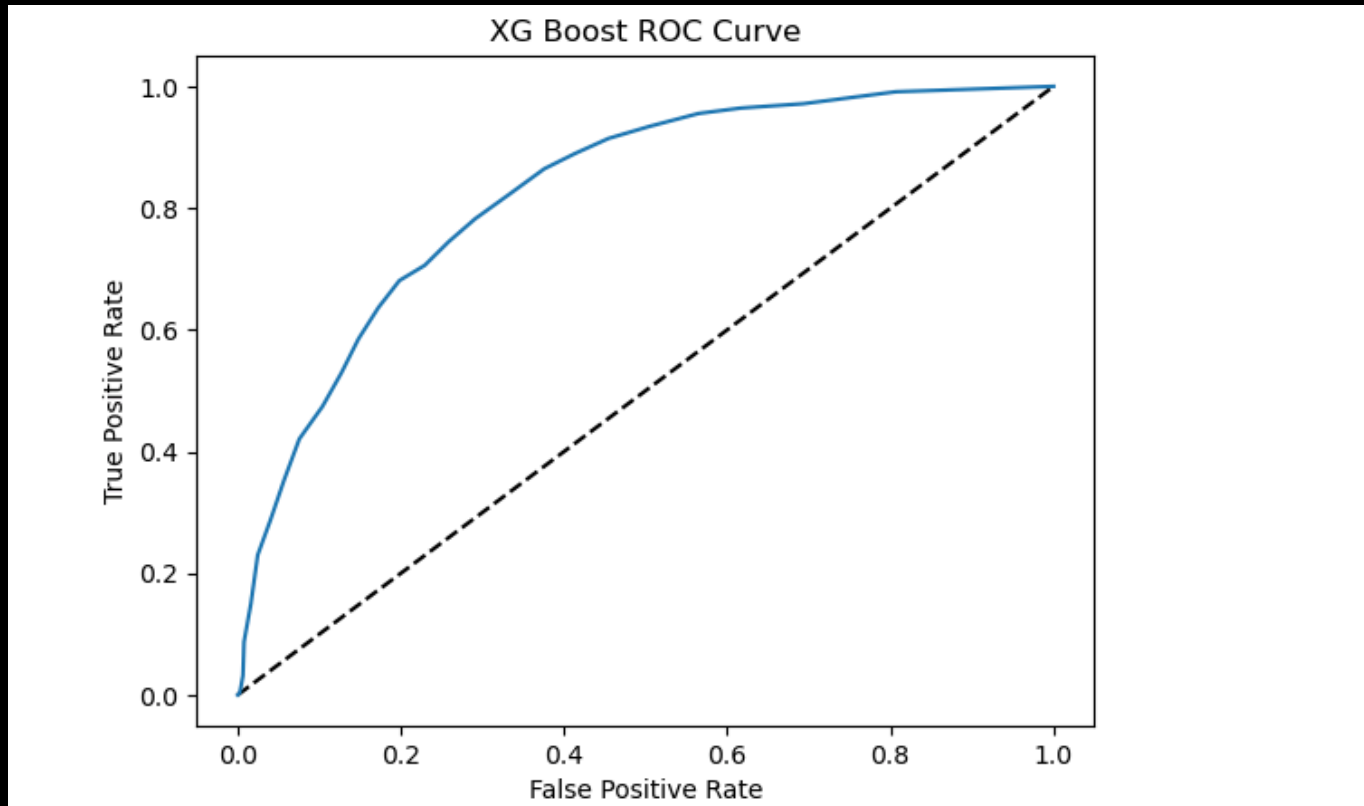
Modeling Approach

- Selected best model using ROC-AUC.



Best Model Performance (XGBoost)

- ROC-AUC: 84.5% (best among all models).



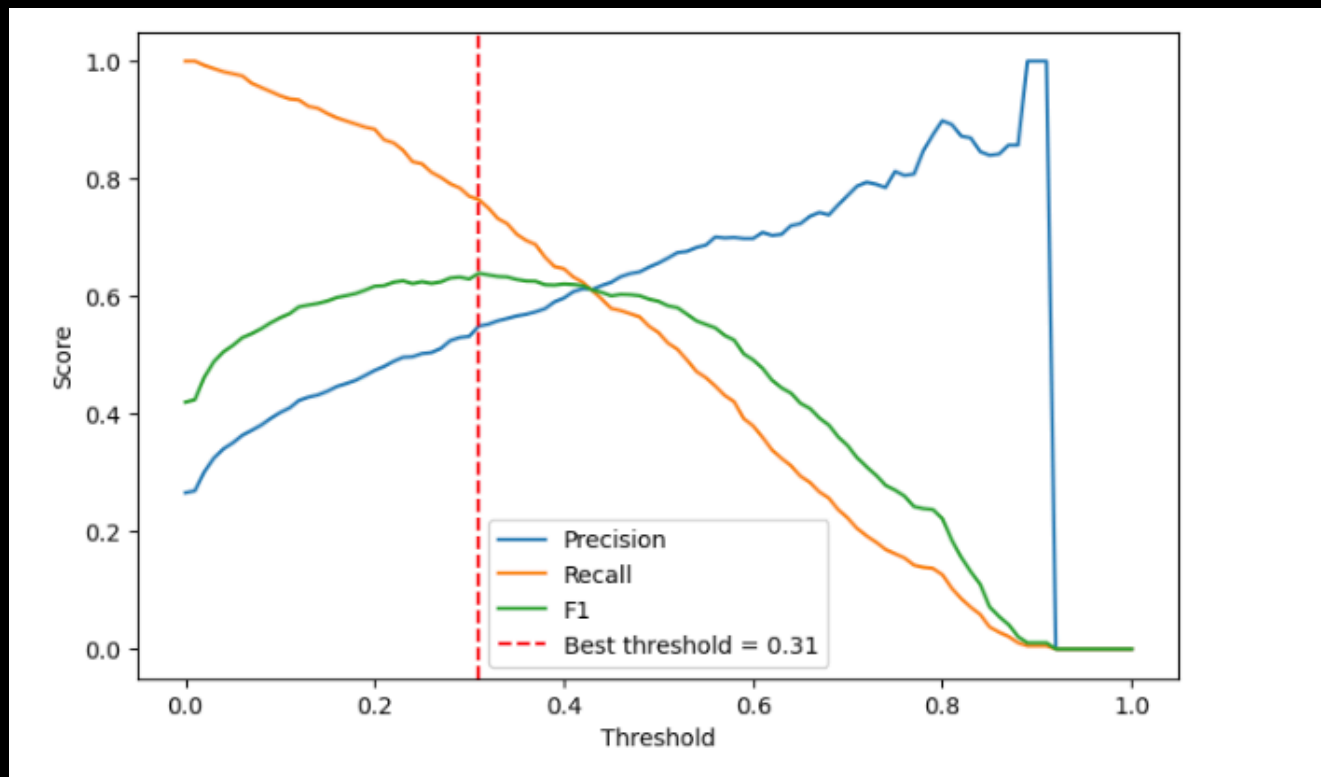
Best Model Performance (XGBoost)

- While accuracy was 80%, recall for Churn class 54%.

	precision	<u>recall</u>	f1-score	support
0	0.84	0.90	0.87	1549
1	0.66	<u>0.54</u>	0.59	561
accuracy			0.80	2110
macro avg	0.75	0.72	0.73	2110
weighted avg	0.79	0.80	0.80	2110

Best Model Performance (XGBoost)

- Optimized decision threshold to prioritize recall without sacrificing too much precision.



Best Model Performance (XGBoost)

- Recall for churners improved to 76%.

	precision	<u>recall</u>	f1-score	support
0	0.90	0.77	0.83	1549
1	0.55	<u>0.76</u>	0.64	561
accuracy			0.77	2110
macro avg	0.72	0.77	0.74	2110
weighted avg	0.81	0.77	0.78	2110

Conclusion & Business Impact

- Model accurately identifies high-risk customers before churn occurs.
- Supports targeted retention campaigns and better budget allocation.
- Prioritizing recall reduces missed churn opportunities.