

PREDICTIVE ANALYTICS FOR CUSTOMER CHURN MANAGEMENT

ENHANCING SYRIATEL'S
TELECOMMUNICATIONS
SERVICES

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INTRODUCTION

Project Goals: Develop an effective predictive model for customer churn in SyriaTel.

Overall Objective: Address revenue and reputation risks associated with churn.

Audience: Stakeholders in telecommunications industry.



BUSINESS UNDERSTANDING

Overview: SyriaTel faces customer churn challenges impacting revenue.

Specific Objectives: Identify churn patterns, predict customer behavior.

Stakeholders: Marketing, sales, customer service, management.



DATA UNDERSTANDING

**DATASET: OBTAINED FROM KAGGLE, INCLUDES CUSTOMER DEMOGRAPHICS,
USAGE, CHURN.**



Data Preparation:
EDA, visualization,
correlation analysis.



Attributes:
21 columns, 3333 rows,
target variable "churn".

DATA PREPARATION

EDA Techniques: Histograms, bar charts, correlation analysis.



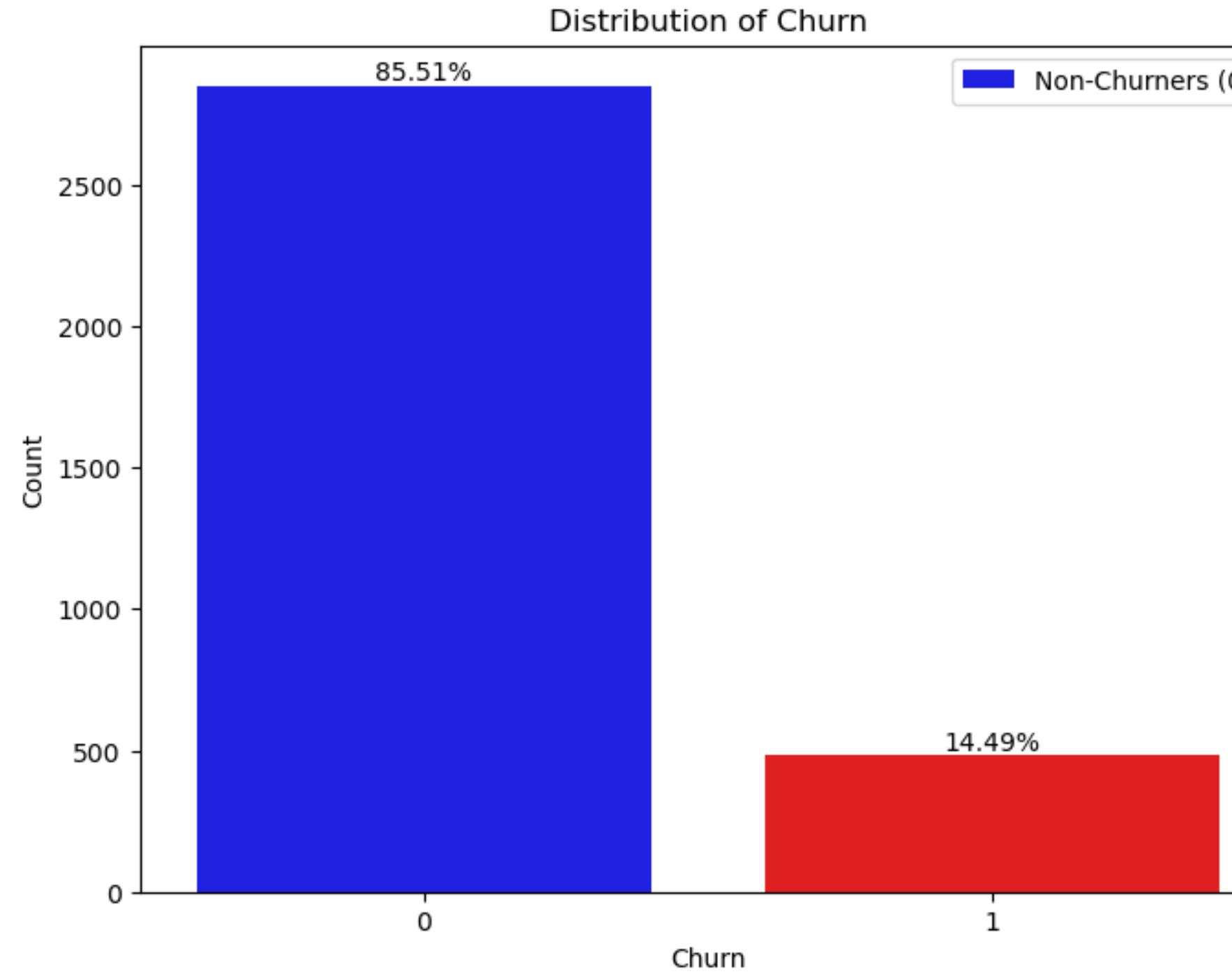
Data Visualization: Understanding variable distribution and relationships.

Feature Selection: Identifying influential predictors for churn.



EXPLORATORY DATA ANALYSIS (EDA)

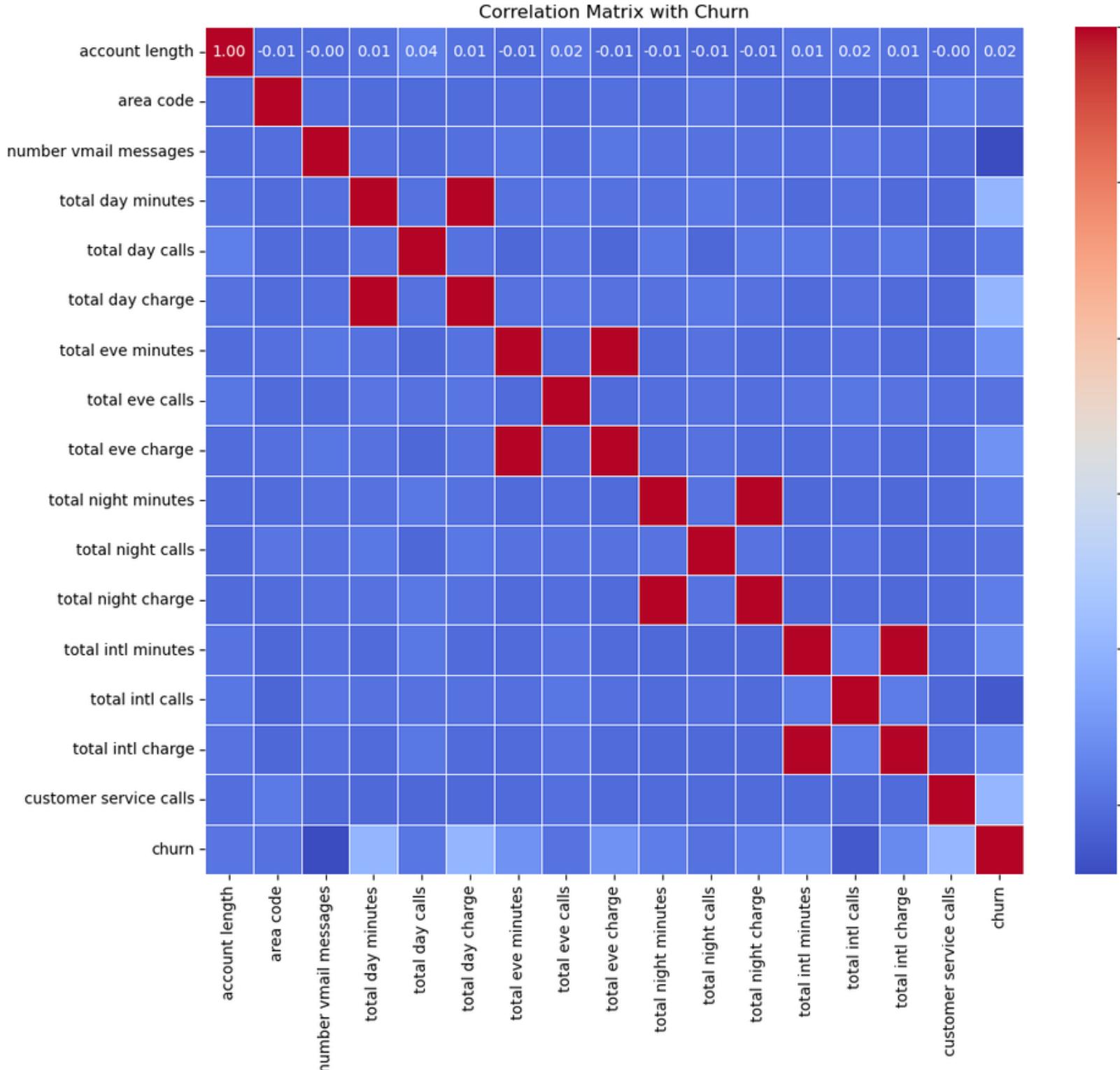
The graph represents the distribution of the target variable 'Churn'



Imbalanced Dataset: The dataset has a class imbalance, with churners comprising only 14% of the total records.

EXPLORATORY DATA ANALYSIS (EDA)

The graph represents the Correlation Matrix of the numerical variables and the target variable 'Churn'



Based on the correlation analysis,
the most influential features in predicting churn:

- * Customer service calls.
- * Total day minutes.
- * Total day charge.
- * Total eve minutes.

MODELING

MODEL DEVELOPMENT: 4 MODELS WERE DEVELOPED

01



Baseline Logistic
regression Model.

02



Random Forest
Model

03



Tuned Random
Forest Model.

04



XGBoost Model.

MODELING

BASELINE LOGISTIC REGRESSION MODEL.

- * Accuracy: The accuracy of the model was approximately 82.91%.
- * Precision: The precision of the model was approximately 46.45%, it means that out of all the customers the model predicted to churn, around 46.45% actually churned.
- * Recall: The recall of the model was approximately 84.16%, it means that out of all the customers who actually churned, around 84.16% were correctly identified by the model.
- * F1 Score: The F1 score, was approximately 59.86%. A higher F1 score indicates better performance, considering both false positives and false negatives.

MODELING

MORE-COMPLEX MODEL - RANDOM FOREST MODEL

The performance metrics for the Random Forest Model were better than those of the Baseline Model

- Accuracy: The accuracy of the model was 96.10%.
- Precision: The precision of the model was 93.10%.
- Recall: The recall of the model was 80.20%.
- F1 Score: The F1 score, was 86.17%.

MODELING

TUNED RANDOM FOREST MODEL

The Tuned Random Forest Model did not perform as any better than the original Random Forest Model but it was still better than Baseline Logistic Regression model.

- Accuracy: The accuracy of the model was 95.20%.
- Precision: The precision of the model was 86.30%.
- Recall: The recall of the model was 81.20%.
- F1 Score: The F1 score, was 83.70%.

MODELING

THE XGBOOST MODEL

The XGBoost model performed the best out of all the models in terms of performance metrics such as accuracy, precision, recall, F1 score.

- Accuracy: The accuracy of the model was 96.40%.
- Precision: The precision of the model was 95.30%.
- Recall: The recall of the model was 84.20%.
- F1 Score: The F1 score, was 87.1%.

MODEL EVALUATION

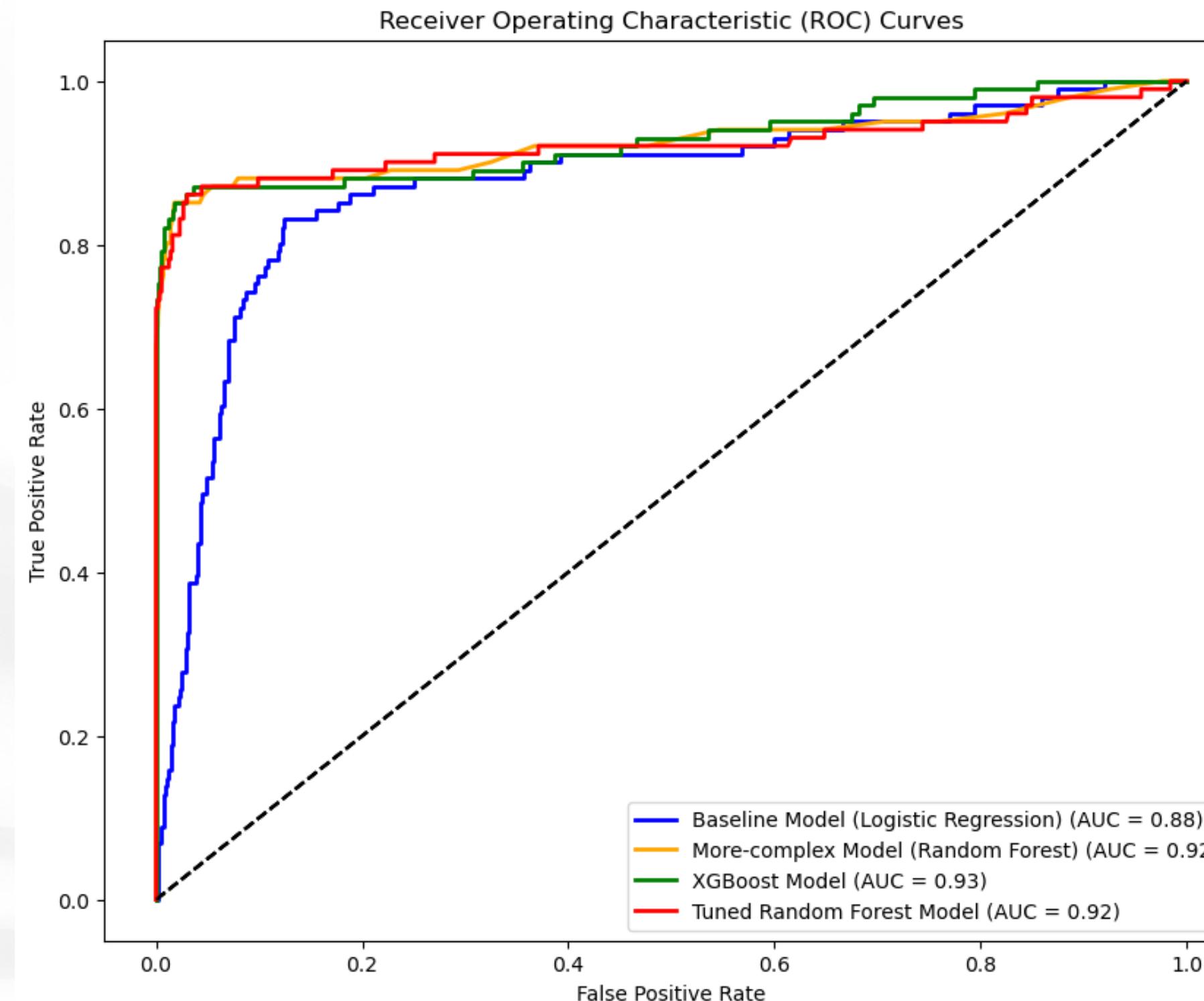
EVALUATING THE MODELS BASED ON THE PERFORMANCE METRICS

1. General performance metrics of accuracy, precision, recall, and F1 score.
2. The ROC AUC (Receiver Operating Characteristic – Area Under the Curve) metric



MODEL EVALUATION

A HIGHER ROC AUC SCORE SUGGESTS THAT THE MODEL IS BETTER AT DISTINGUISHING BETWEEN CHURNED AND NON-CHURNED CUSTOMERS.

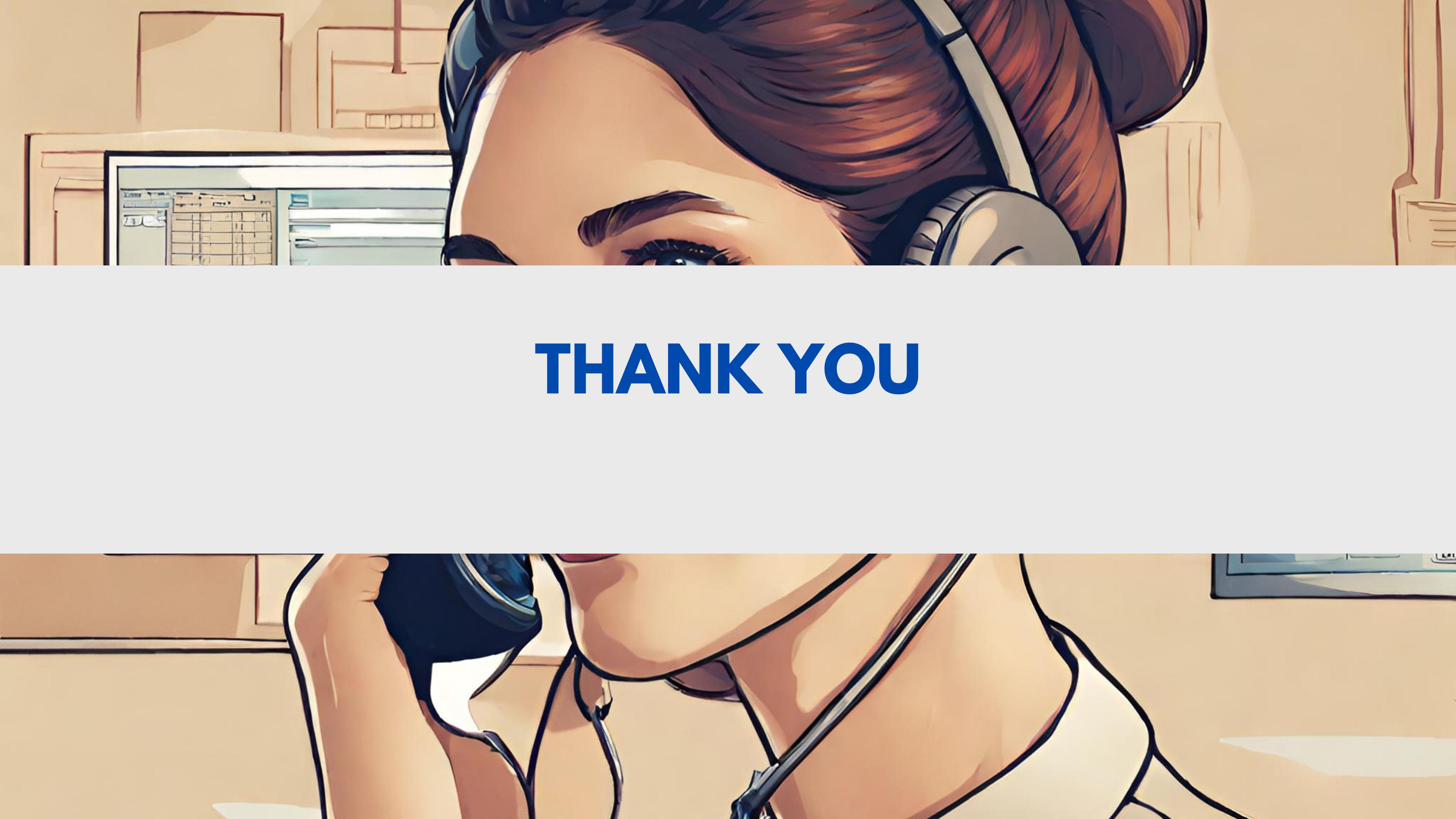


Performance Rank:

1. The XGBoost Model: ROC AUC Score of 0.93
2. The Random Forest Models: 0.924
3. The Tuned Random Forest: 0.922
4. The Baseline Model: 0.88.

RECOMMENDATIONS

- TARGETED RETENTION STRATEGIES: PERSONALIZED OFFERS, PROACTIVE INTERVENTIONS.
- CUSTOMER EXPERIENCE ENHANCEMENT: SERVICE QUALITY IMPROVEMENTS, ADDRESSING PAIN POINTS.
- CONTINUOUS MONITORING: MODEL PERFORMANCE ASSESSMENT, ADAPTATION.



THANK YOU