SyriaTel Customer Churn Prediction

BY NIGHTINGALE JEPTOO


CHURN

Introduction

- Objective: Predict which SyriaTel customers are likely to churn.
- Business Value: Helps retain customers through proactive engagement.

Data Overview

- • Total records: 3,333
- • Key features: international plan, voice mail plan, total day charge, etc.
- • Target: churn (Yes/No)

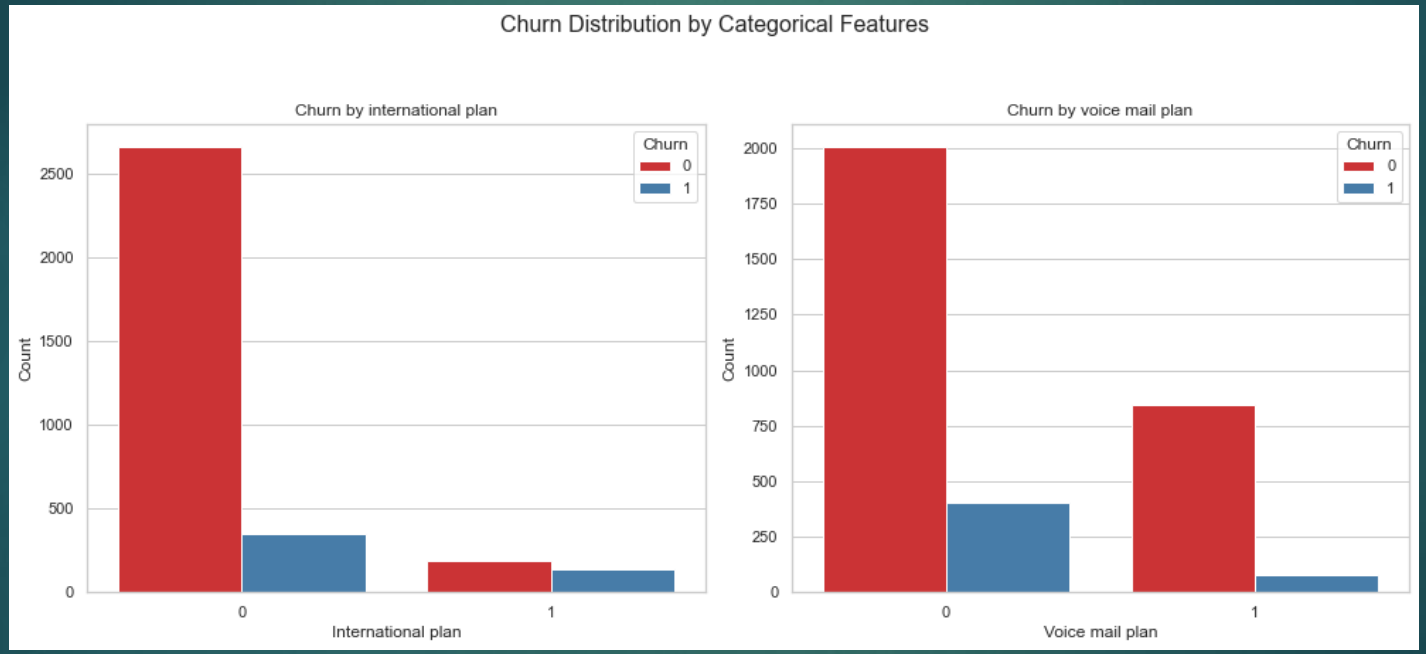
Exploratory Data Analysis

- • Churners tend to have higher total charges.
- • International plan is strongly associated with churn.
- • Class imbalance observed (14.5% churn).

Modeling Approach

- • Algorithms: Logistic Regression, Random Forest, XGBoost
- • Preprocessing: Encoding, Scaling, Balancing
- • Metrics: Accuracy, ROC-AUC, F1-Score

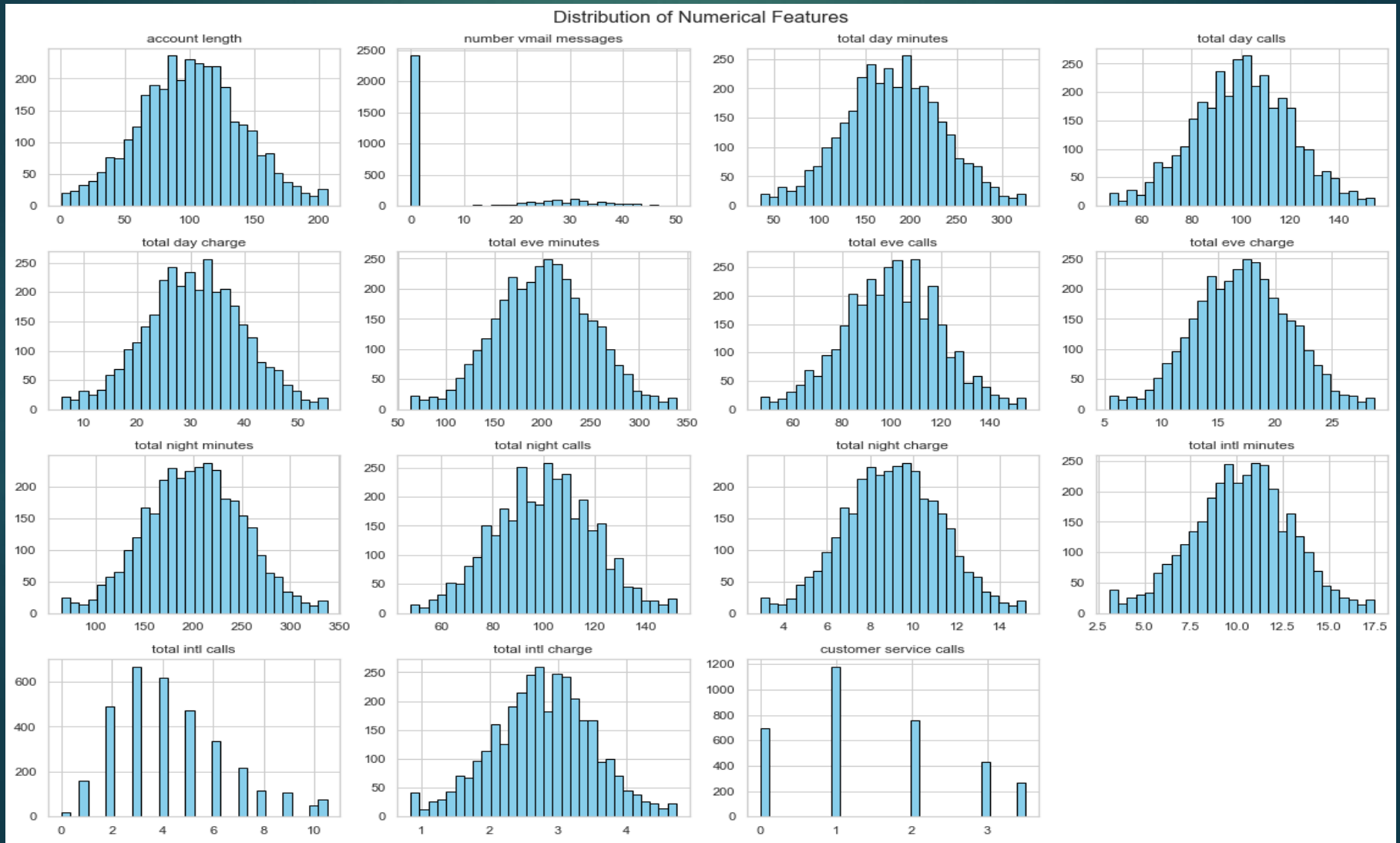
Churn Distribution by Categorical features



Interpretation

- International Plan: Customers with an international plan have a relatively higher churn rate compared to those without one.
- Voice Mail Plan: Customers with a voice mail plan have a lower churn rate compared to those without one.

Distribution of Numerical Features



Interpretation

- - ****Normal Distributions****: Most usage-related features (minutes, calls, charges) are bell-shaped, indicating balanced behavior across the customer base.
- - ****Skewed Features****: `number vmail messages`, `total intl calls`, and `customer service calls` are highly skewed. These features may offer strong predictive power for churn.
- - ****Actionable Insight****: Features like high `customer service calls` are worth investigating in churn analysis as they may correlate with customer dissatisfaction.

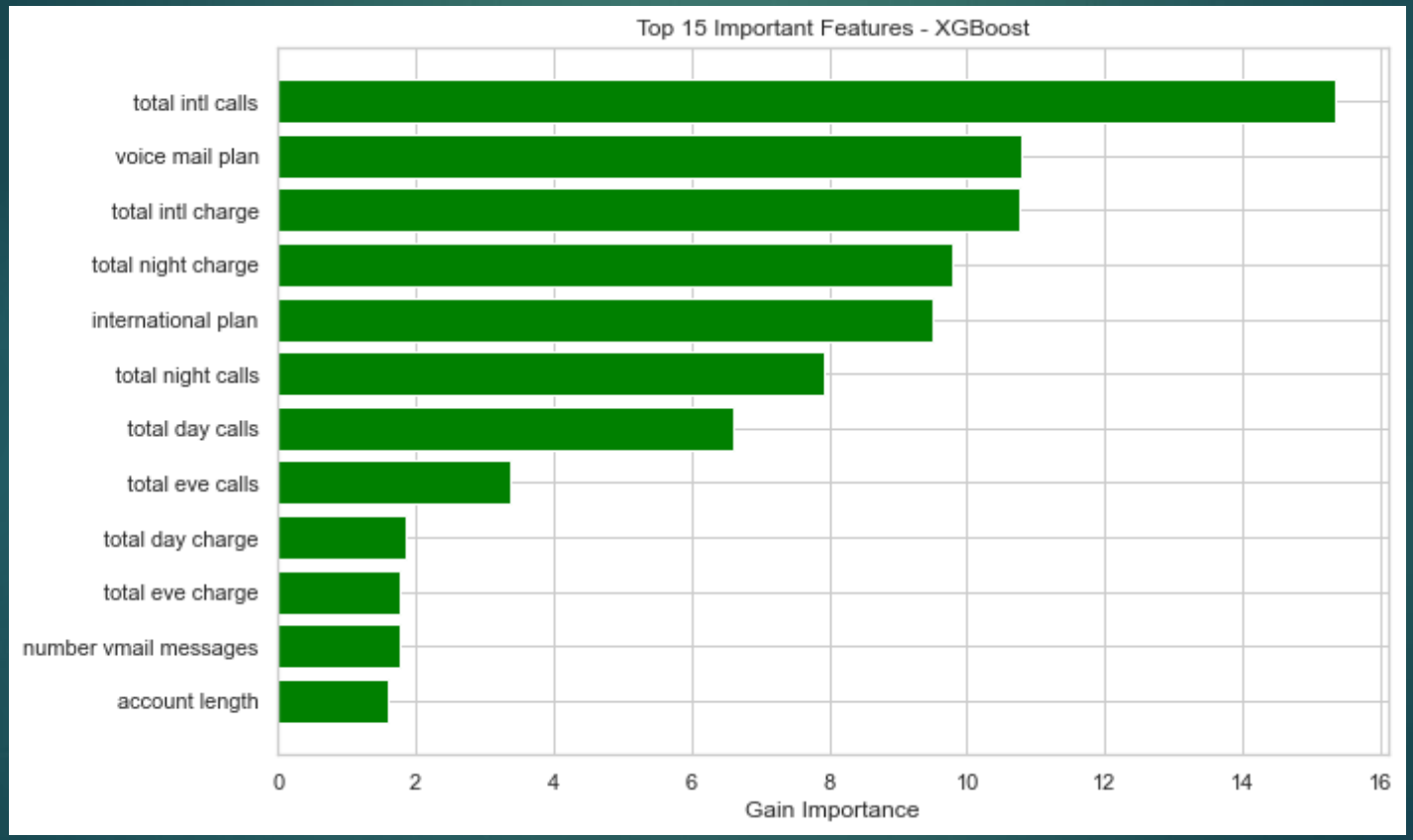
Key Results

- • XGBoost ROC-AUC: 0.96
- • Top Features: international plan, day charge, customer service calls

Visual Highlights

- • Feature Importance Plot
- • Confusion Matrix

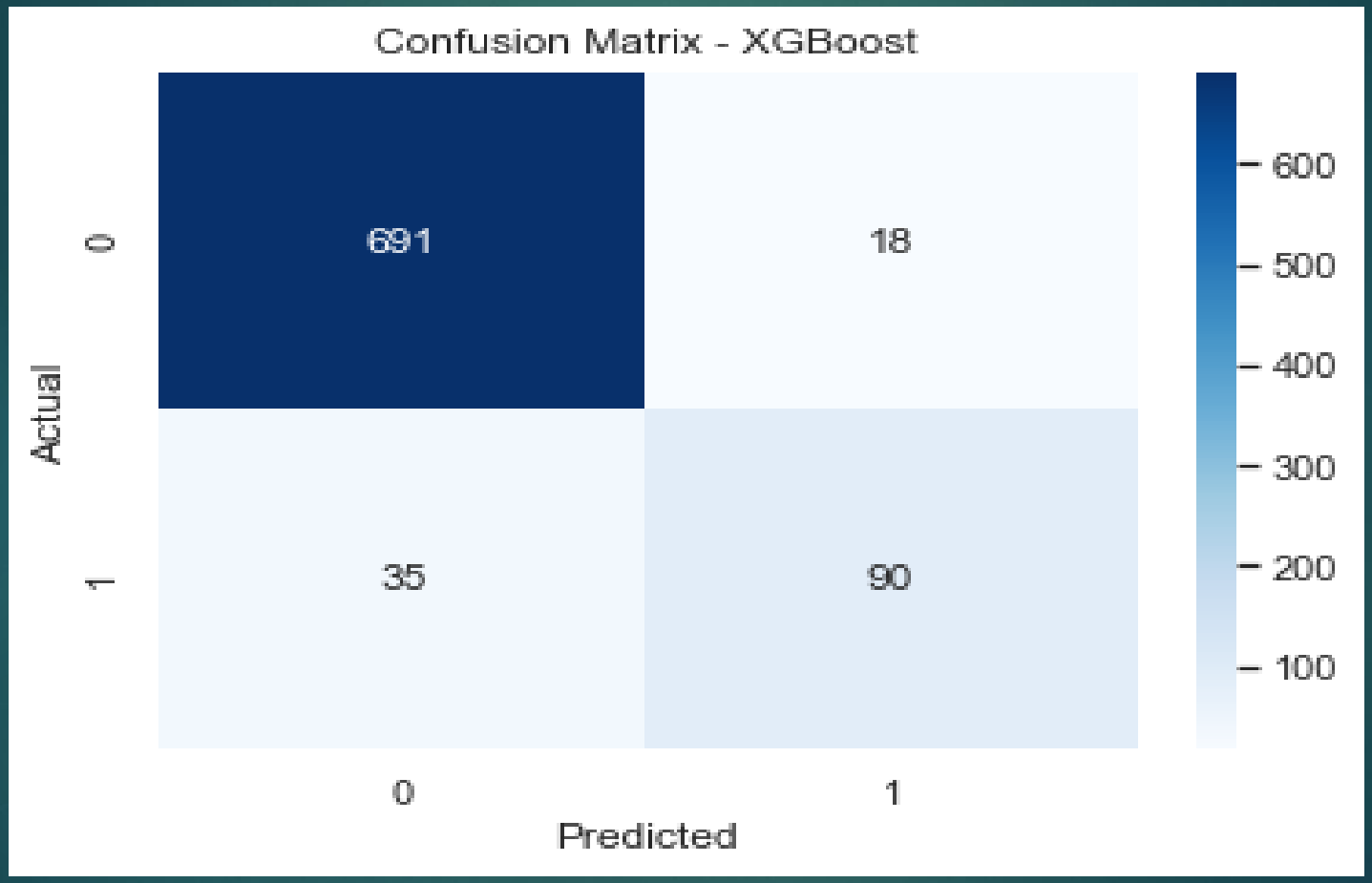
Feature Importances-XG Boost



Interpretation

- Our model suggests that issues around **international calling costs and quality**, and a lack of engagement with basic features like **voicemail**, are key areas where SyriaTel can intervene to prevent churn.

Confusion Matrix



Interpretation

- Our XG Boost model is highly effective at identifying non-churners and has a very low rate of false alarms. While it correctly catches a good number of churners, there are still 35 that it missed, which is our primary area for future improvement.

Recommendations

- • Focus on customers with international plans
- • Engage users with high usage
- • Follow up after 3+ support calls

Conclusion

- This project developed and evaluated machine learning models to predict customer churn for **Syria Tel**. Among the models tested, **XG Boost** showed the strongest predictive performance.
- Through statistical analysis and feature importance insights, the project identified key drivers of churn behavior.
- By applying these insights, Syria Tel can:
- **Proactively reduce churn**
- **Enhance customer satisfaction**
- **Improve overall business performance**

Questions & Discussion

- Thank you! We welcome your questions and feedback.