predicting customer churn for SyriaTel

Leveraging Machine Learning to Improve Customer Retention

2025

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Project Overview,

- Goal: Predict customer churn using machine learning.
- Purpose: Reduce revenue loss and improve customer retention.
- Approach: Data analysis, model development, and actionable insights.

Business Understanding & Problem Statement

Why Customer Churn Matters

- Churn leads to revenue loss and increased costs.
- SyriaTel lacks a systematic approach to predict and address churn.
- Goal: Build a model to identify at-risk customers and reduce churn.

Problem Statement

- SyriaTel lacks a systematic approach to predict and address churn.
- Goal: Build a model to identify at-risk customers and reduce churn

Objectives

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- Develop a classification model to predict churn.
- Identify key drivers of churn.
- Provide actionable insights for retention strategies.

Dataset Overview

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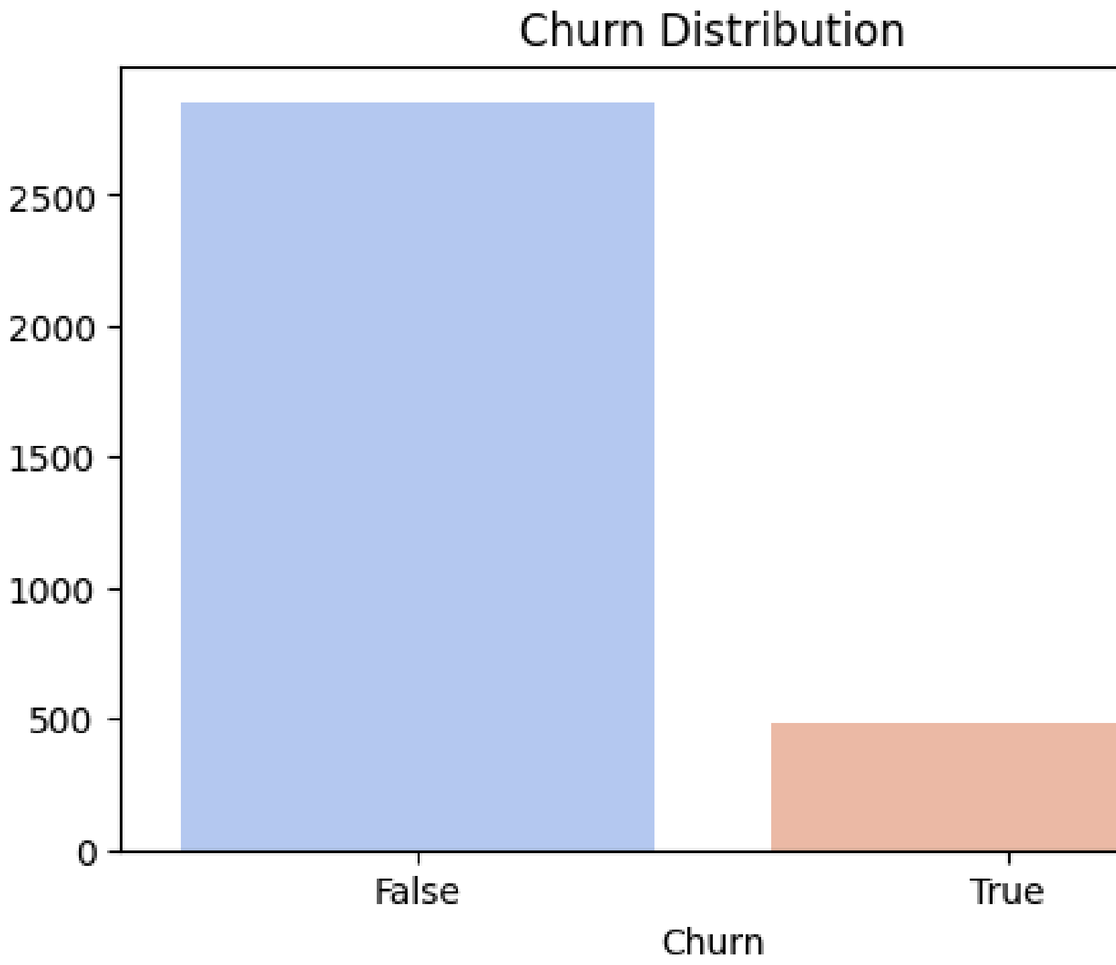
- Features: Demographics, service usage, subscription plans, billing details.
- Target Variable: Churn (1 = Churned, 0 = Retained).

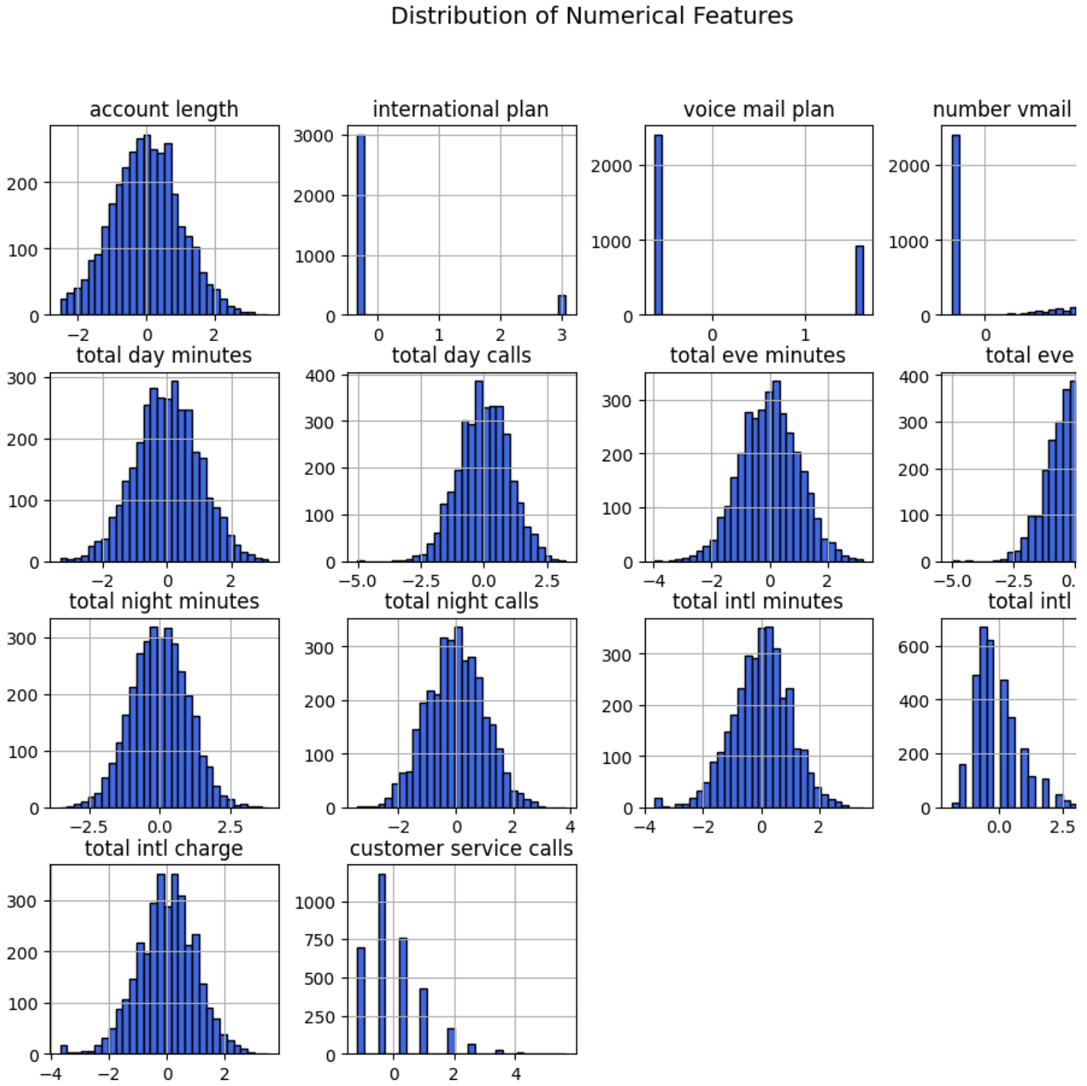
Churn Distribution

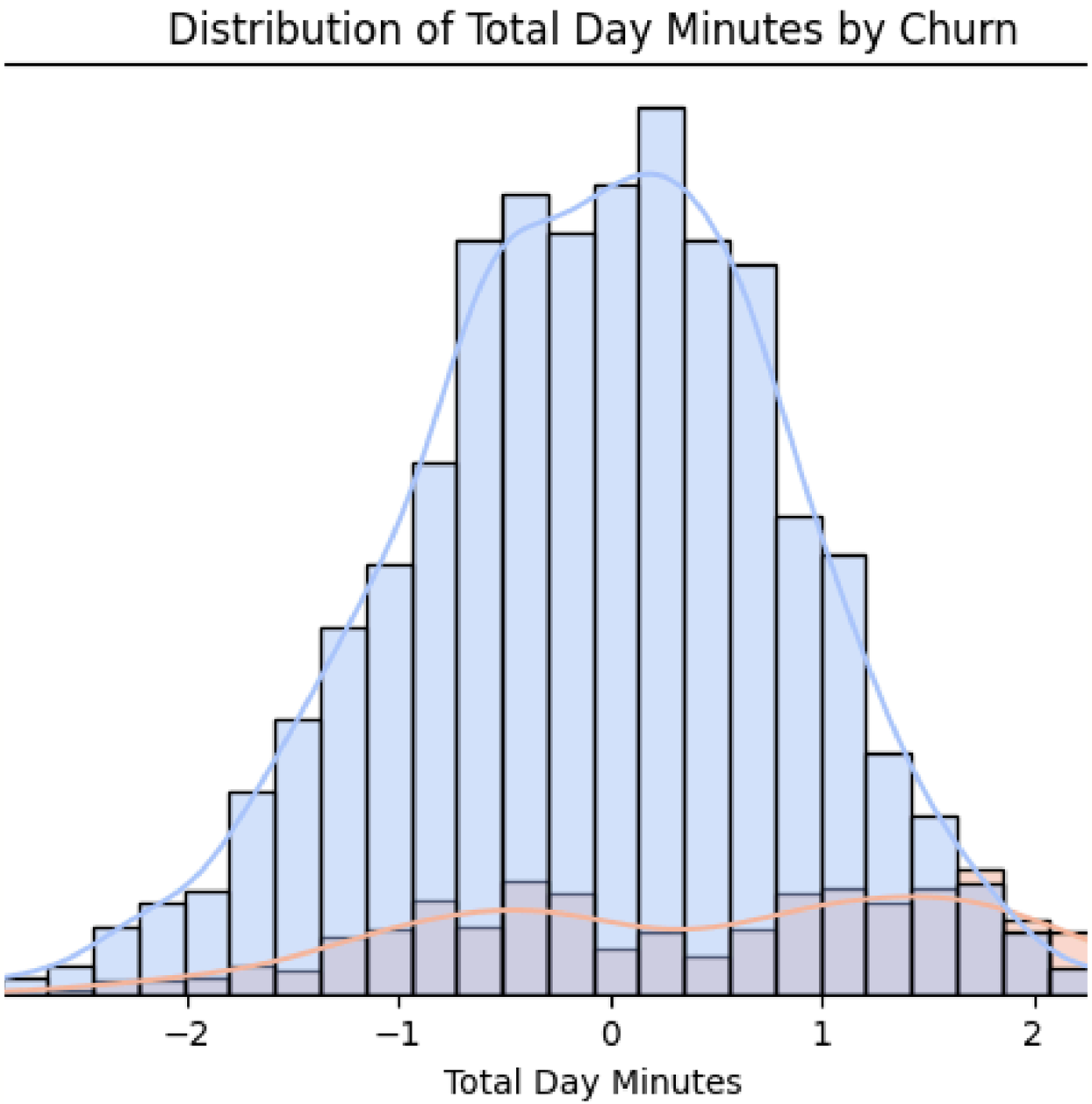
- Dataset is imbalanced: Fewer churned customers (1) than retained (0).
- Proactive measures are needed to prevent escalation.



Distribution of Numerical Features

- Total day minutes, total eve minutes, and total night minutes are normally distributed.
- Customer service calls are right-skewed.



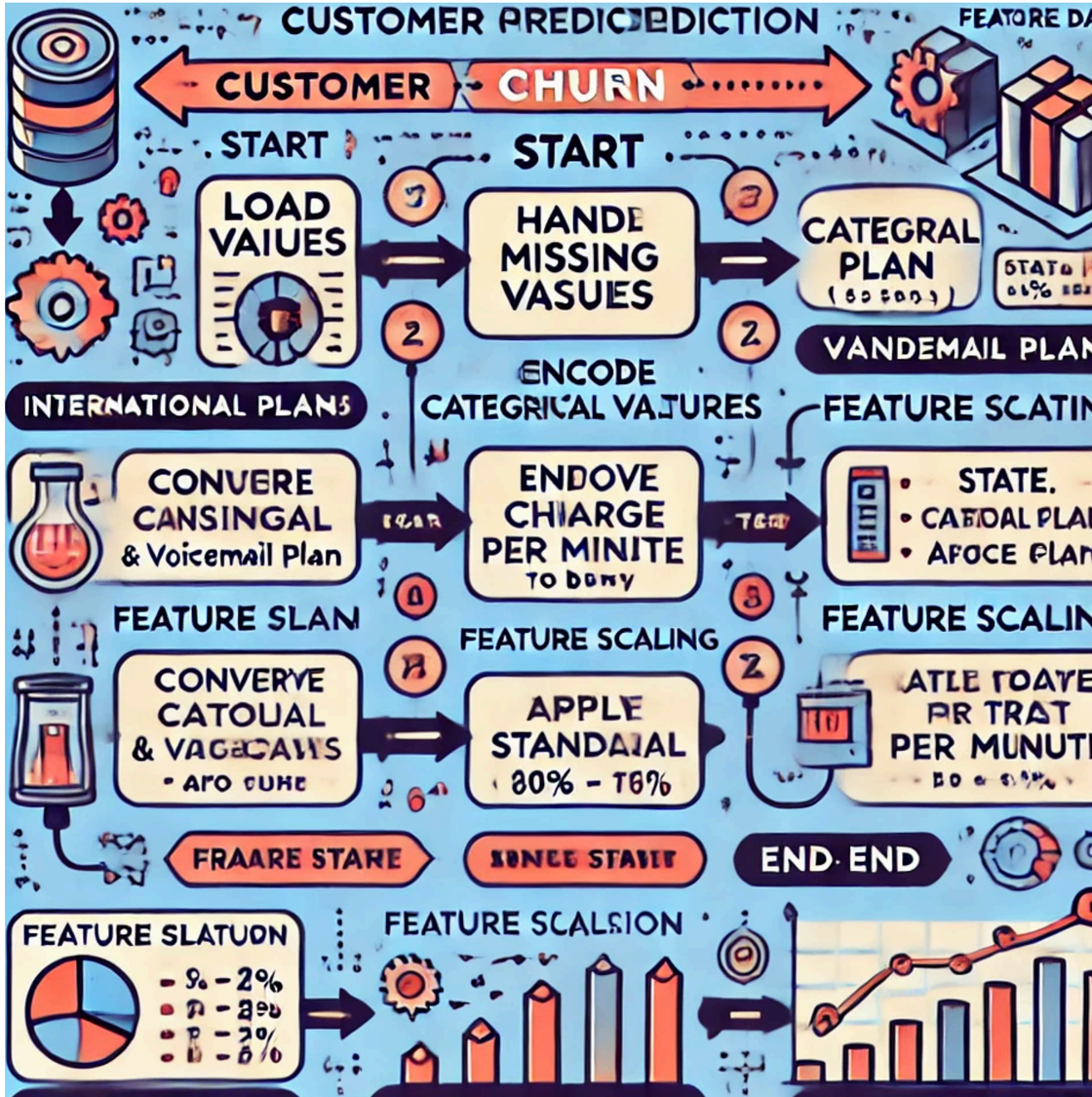


Total Day Minutes vs. Churn

- High-usage customers (more day minutes) are more likely to churn.
- Suggests sensitivity to pricing or service quality.

Data Preprocessing

- Handled missing values (e.g., converted plans to binary).
- Encoded categorical variables (e.g., one-hot encoding).
- Scaled numerical features using StandardScaler.



Model Training & Evaluation.

- Tested multiple models: Logistic Regression, Decision Trees, Random Forest, K-NN, SVM.
- Best Model: Random Forest (high accuracy and recall).

Model	Accuracy	Precision	Recall	F1-Score
Logistic Regression	87.5	85	72	78
Decision Tree	91.2	89	74	81
Random Forest	95.95	96	76	85
Support Vector Machine	89.7	88	70	77

Conclusion

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- Predictive churn model helps SyriaTel retain customers and reduce revenue loss.
- Actionable insights enable targeted retention strategies.
- Continuous improvement ensures long-term success.

Recommendations

- Improve customer support quality.
- Offer personalized retention offers (e.g., discounts, loyalty rewards).
- Optimize pricing strategies for high-usage customers.
- Enhance international and voicemail plans.

Thank you

Questions?

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