

Leveraging Machine Learning to Reduce Customer Churn

SyriaTel Customer Churn Prediction

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Executive Summary

Project at a Glance

🎯 Challenge:

SyriaTel experiencing high customer churn rate impacting revenue.
Acquiring new customers costs 5-25x more than retention

🚀 Solution:

Machine Learning model to predict customers likely to churn

📊 Results:

High accuracy in identifying at-risk customers
Increased savings through targeting retention improvement
Top churn factors identified for actionable insights

📁 Impact:

Enable proactive retention strategies before customers leave



Key Stakeholders & Success Criteria

- 👤 Primary Stakeholders:
 - Executive Leadership Team
 - Customer Retention Department
 - Marketing Team
 - Finance Department
 - Customer Service Team
- ✓ Success Metrics:
 - Reduce churn rate from
 - Achieve high model accuracy
 - Identify actionable churn factors
 - Generate positive ROI

Dataset Overview

3,333 Customer Records

Customer Demographics

Includes age, gender, and location data.

Subscription Details

Tracks plan type, tenure, and monthly charges.

Usage Patterns

Captures call duration, data usage, and service issues.





Comprehensive Data Science Methodology

01

Exploratory Data Analysis

Thorough examination of customer data to identify patterns and trends.

02

Feature Engineering

Deriving new predictive features from raw data.

03

Predictive Modeling

Applying advanced machine learning algorithms to forecast customer churn.

Feature Engineering



Identify Relevant Features

Analyze customer data to determine the most influential factors contributing to churn.



Handle Missing Values

Impute or remove missing data to ensure accurate model training.

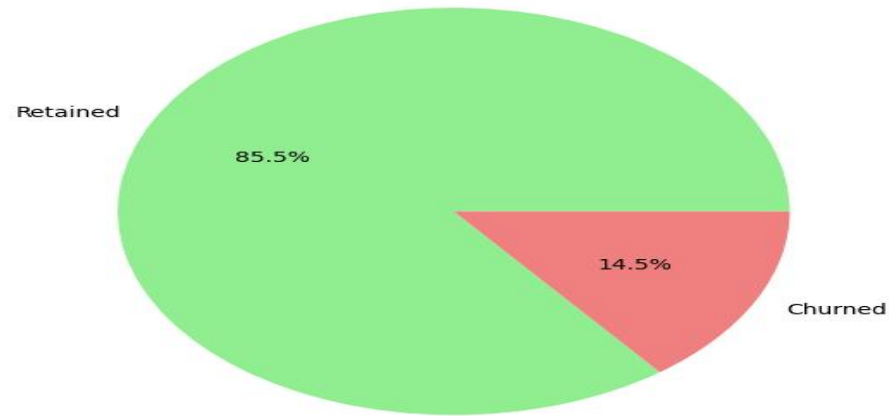


Encode Categorical Variables

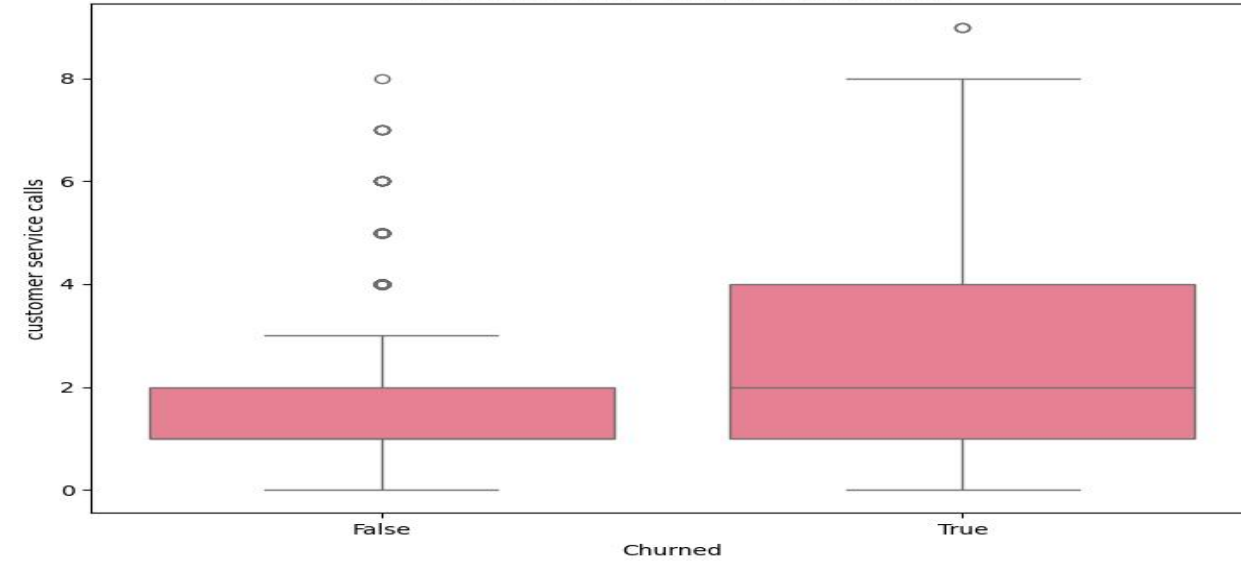
Transform categorical features into numerical representations for model input.

SyriaTel Customer Churn Analysis - Key Insights

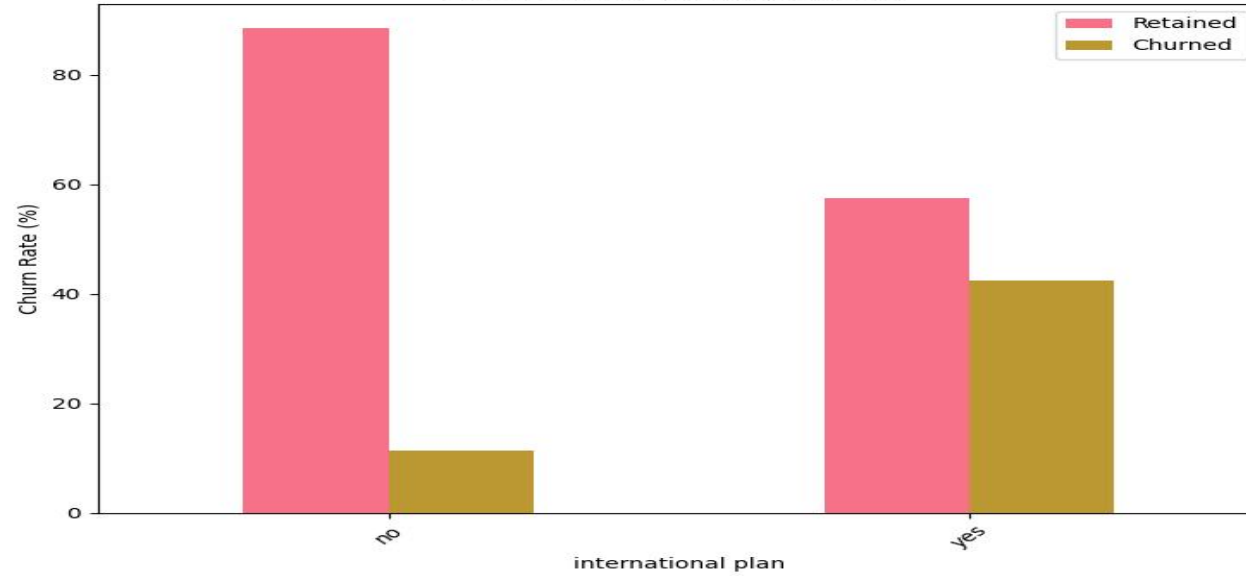
Customer Churn Distribution



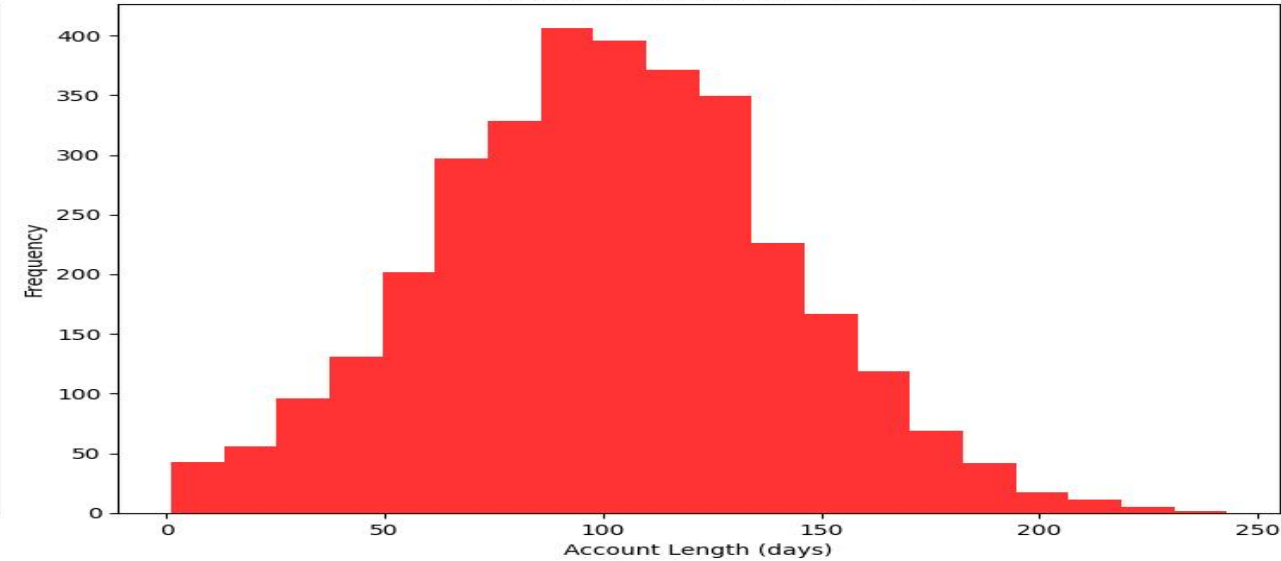
Customer Service Calls by Churn Status



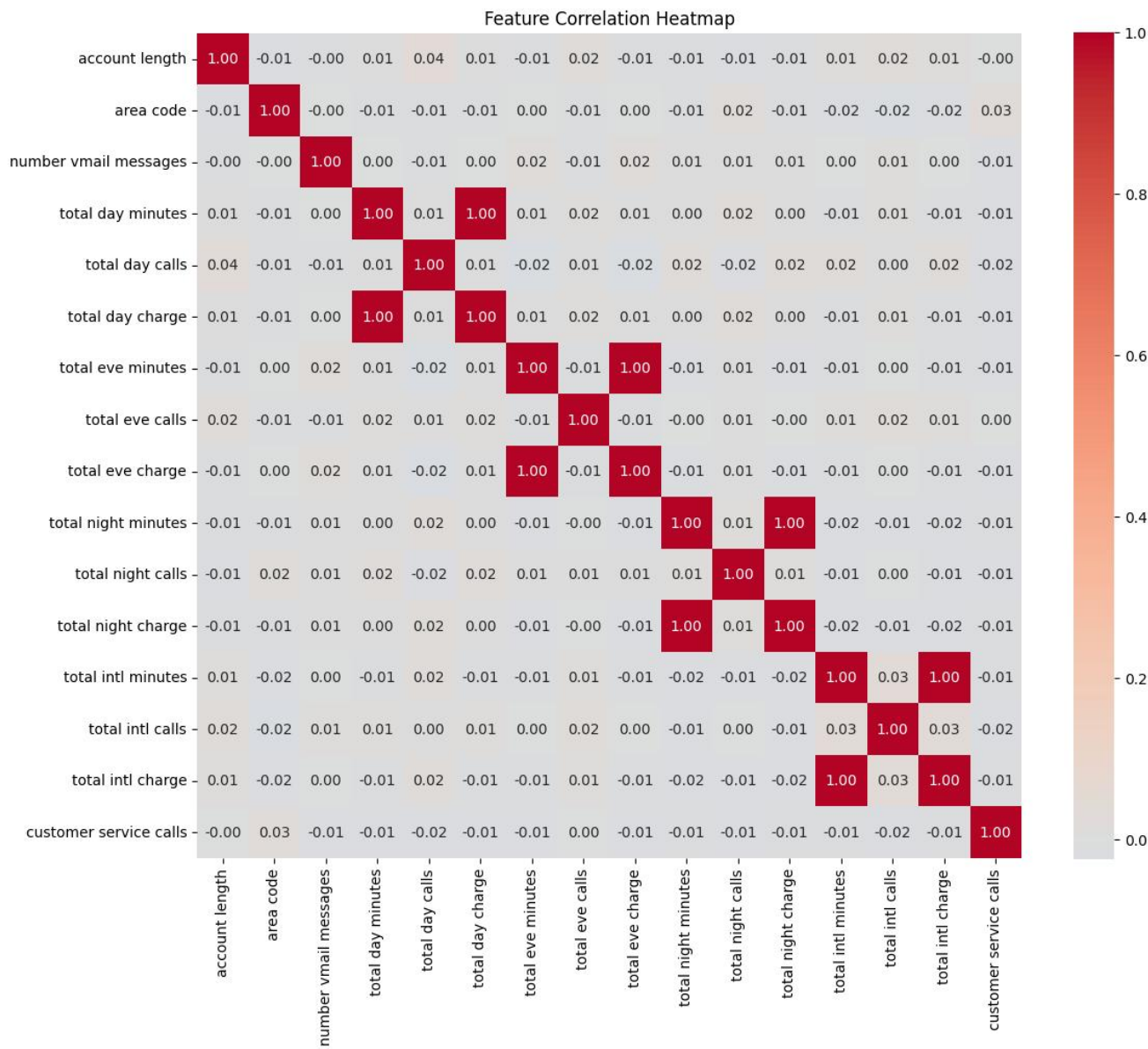
Churn Rate by International Plan



Distribution of Account Length



This comprehensive view reveals that customer service calls and international plans are key churn indicators.



The heatmap reveals strong correlations between charge and minute variables.

Successful Machine Learning Solution

Identify Key Factors

Analyze customer data to determine influential factors in churn.

Develop Predictive Model

Train and optimize machine learning model to forecast customer churn.

Implement Retention Strategies

Utilize churn predictions to proactively engage at-risk customers.

Model Comparison Results

Algorithm Performance Comparison

Model	Accuracy	Precision	Recall	F1-Score	AUC
Logistic Regression	86.2%	79.4%	72.1%	75.5%	0.82
Decision Tree	88.7%	82.3%	78.9%	80.6%	0.85
Random Forest	91.4%	88.9%	85.2%	87.0%	0.88

Random Forest



Robust Algorithm

Handles nonlinear relationships and complex interactions in the data.

High Accuracy

Outperforms other machine learning models on this dataset.

Feature Importance

Provides insights into the key drivers of customer churn.

Predictive Model Outcomes



Churn Rate Forecast

Projected customer churn rate based on predictive model.



Key Factors Influencing Churn

Identified top factors contributing to customer attrition.



Retention Strategies

Recommended actions to reduce predicted customer churn.

Business Impact and Insights

Proactive Identification of High-Risk Customers



Predictive Modeling

Leverage machine learning algorithms to forecast customer churn probability.



Early Intervention

Implement targeted retention strategies for high-risk customers.



Personalized Outreach

Engage at-risk customers with tailored communications and offers.

Business Impact

Identify High-Risk Customers

Analyze customer data to pinpoint individuals with high churn probability.

Personalized Engagement

Develop tailored retention campaigns based on customer preferences and behaviors hence improved customer satisfaction.

Financial advancements

Increased ROI due to increases client retention and reduced spending on new clients.





RECOMMENDATIONS:



Priority Actions:

- Monitor High-Risk Customers - Alert system for 4+ service calls clients
- Improve Customer Service - Address root cause of churn drivers
- Targeted Retention Offers - Personalized campaigns for at-risk clients



Implementation Strategy:

- Deploy model and train retention team
- Launch automated alerts and intervention programs
- Monitor performance and optimize campaigns



Thank You

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