

SyriaTel Telecommunication Customer Churn Prediction

Machine Learning Approach(ML)

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1. Introduction

- Telcom companies mostly face high risks of customer churn rate which are likely to lead to high revenue loss and high acquisition cost like advertisement and call/SMSs offers.
- Therefore its in the best interest for the SyriaTel company to retain its customers thus the motivation for this analysis is to find a way to predict churners and non-churners through ML.

2. Project Overview

Objective

The main objectives are as follows:

- Develop a model that can predict the churners and non-churners.
- Classify customers who are likely to churn or stay.
- Provide business insights
- Provide the measures to be undertaken to avoid churn which is costly to the Telcom Business.

Scope

This analysis focuses on communication company and relies on the SyriaTel communication data in Kaggle dataset.

Key Activities

- Import libraries and load dataset
- Preparing data for Machine Learning
- Selecting features and the target variable churn
- Split data for training and testing
- Model Evaluation using accuracy and confusion matrix
- Finding out which features influenced churn the most in ascending order
- parameter hypertuning using Gridsearchcv

Models applied for the Binary classification

Logistic regression

DecisionTreeClassifier

3. Data Overview

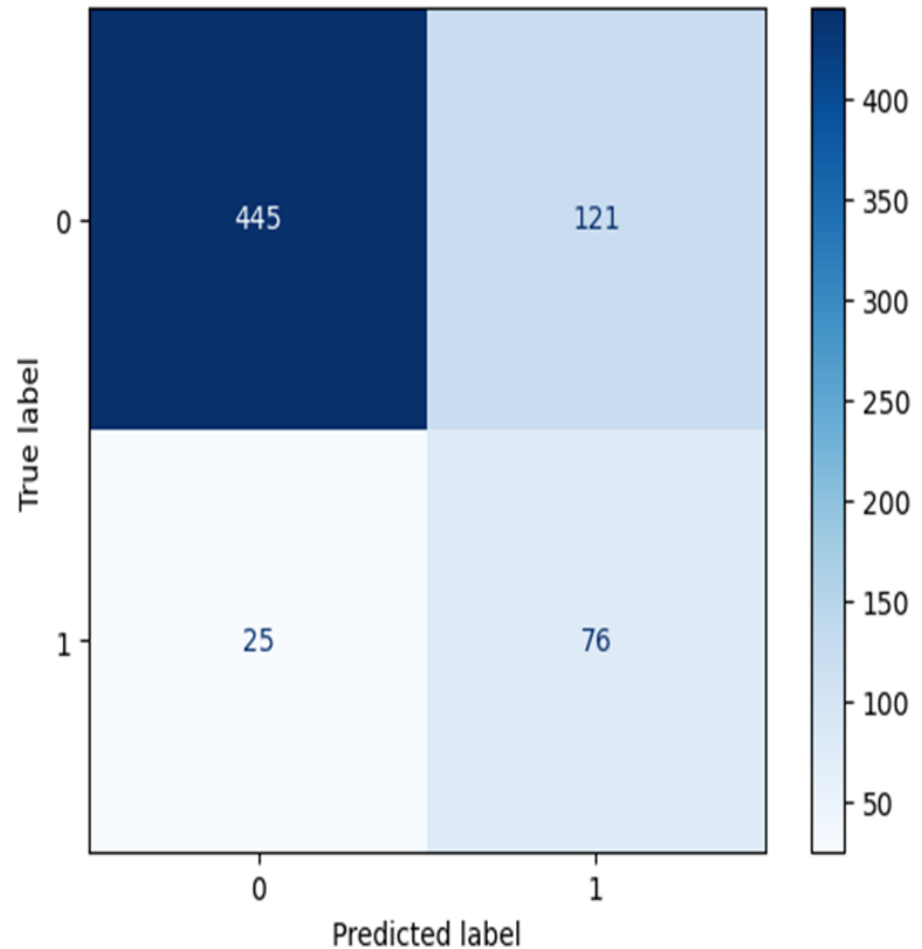
- Data has 19 features which include: account length, service calls, call charges, voice/international plans etc
- Phone number is the feature dropped since it has no much significance.
- Target variable: Churn (1 = True, 0 = False).
- In total the data has 3333 rows and 21 columns

4. Model Outcomes and Solutions

Logistic Regression

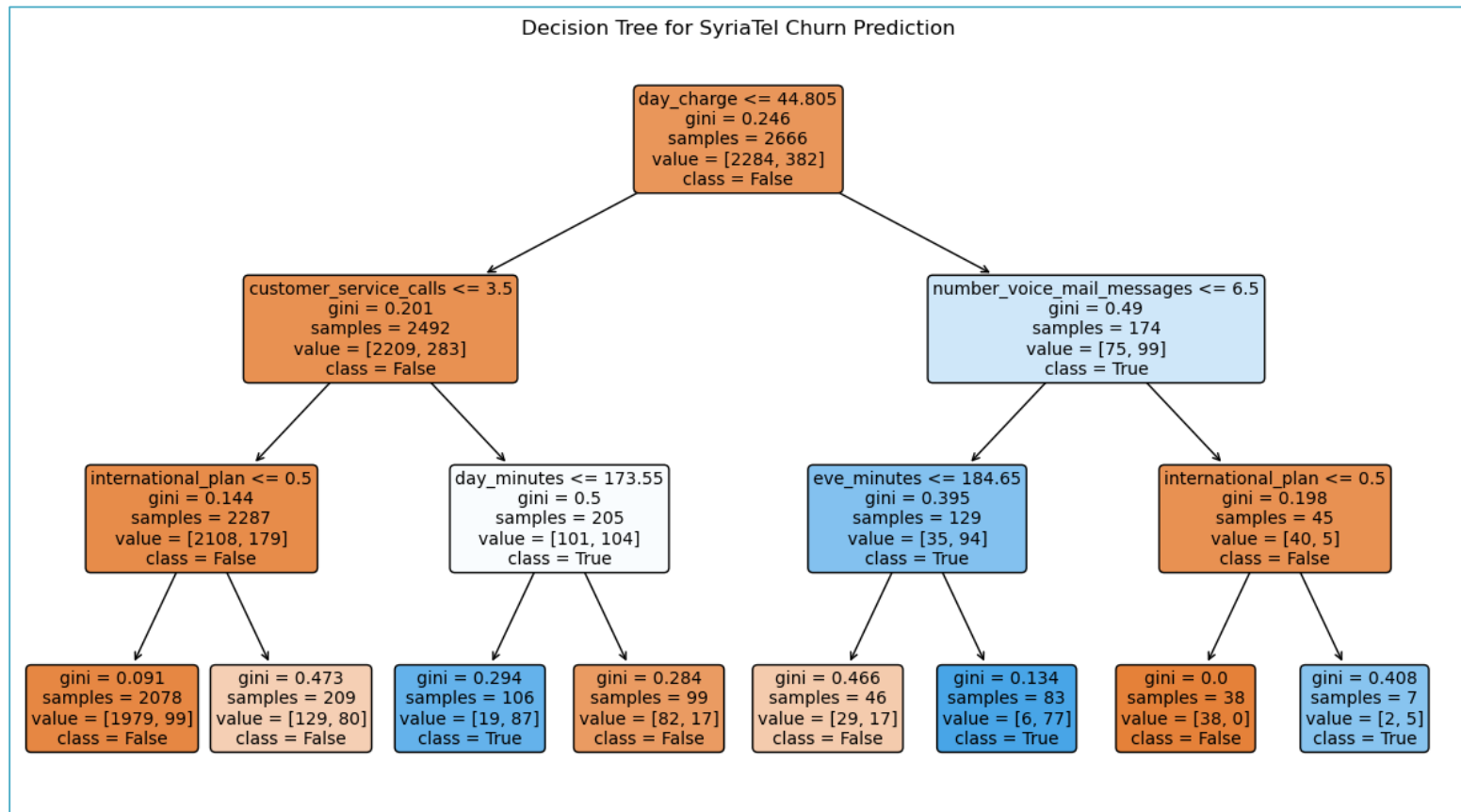
- Accuracy: 78%
- Recall (churn class): 75%
- Precision (churn class): 39%
- F1-Score (churn class): 51%
- High recall = good detection of churners; precision needs improvement

Based on the above outcome in comparison to the DecisionTreeClassifier we adopt the later which has an accuracy of 89.4%



DecisionTreeClassifier

Accuracy: 89.4% meaning the model got 89.4% of the predictions correct



5. DecisionTreeClassifier Findings

Root Node

The dataset has 2,666 customers.

- 2,284 did not churn, 382 did churn.
- The first decision point is whether day charge is ≤ 44.805 .
- Since most customers didn't churn, the predicted class is False (no churn)
- Left Branch: Customers with day charge ≤ 44.805

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- Most customers in this group had ≤ 3.5 service calls and these customers are less likely to churn.

Sub-Branch A: International plan ≤ 0.5

- Customers with: Low day charge, few service calls and no international plan (0.5 means "No") have Very low churn rate (only 99 out of 2078)

Sub-Branch A: International plan > 0.5

- Customers with: Few service calls but have international plan have Higher churn rate (38.2%)

Sub-Branch c: customers _service _calls > 0.5

There are 2 more splits:

- One group has 87 out of 106 churned (82%)
- Other group has 17 out of 99 churned (17%)

Therefore, Customers who make many service calls and have high day minutes are very likely to churn.

Right Branch: Customers with day charge > 44.805

- These customers are more likely to churn especially those who don't use voicemail much (≤ 6.5), use international plan and spend more in the evening

Business Insights

- If customer service call > 3.5 there is high churn rate especially if day minutes are high
- If a customer has an international plan it is associated with high churn rate
- If day minutes are > 173.5 there is a high likelihood of churning
- If customer voice mail messages > 6.5 there is a less likelihood of churning
- If customer day charge > 44.8 high spending customers are more likely to churn

6. Business Recommendation

Following the intensive data analysis the recommendation are as follows:

- Identify customers with frequent service calls or high usage for proactive retention.
- Improve customer support for high-touch customers.
- Target international plan users with loyalty offers.
- Encourage voicemail plan usage to improve retention.
- Offer waiver packages for frequent callers so as to retain them

7.Conclusion

- For SyriaTel communications to reduce the churn rate and improve retention of their customer base they need to concentrate on features with the highest impact that is customers with international plan, Voice mail messages, day charges and service calls.

Thank you