Predicting Customer Churn for SyriaTel

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Overview

In the ever-evolving telecommunications industry, customer retention is paramount for sustained business success. Our data science project focuses on predicting customer churn for SyriaTel, a prominent telecom company. The key objective is to build a powerful classification model that can forecast customer terminations. This predictive tool equips businesses to proactively tackle retention challenges, reducing financial impact and fostering informed strategic decisions.

Problem Statement

In the highly competitive telecommunications industry, SyriaTel faces the critical challenge of predicting and mitigating customer churn. To navigate the complexities of customer interactions and address the evolving industry landscape, a proactive, data-driven strategy is imperative. Our goal is to develop a robust solution that enables SyriaTel to effectively tackle the challenges associated with customer churn.

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Objectives

01

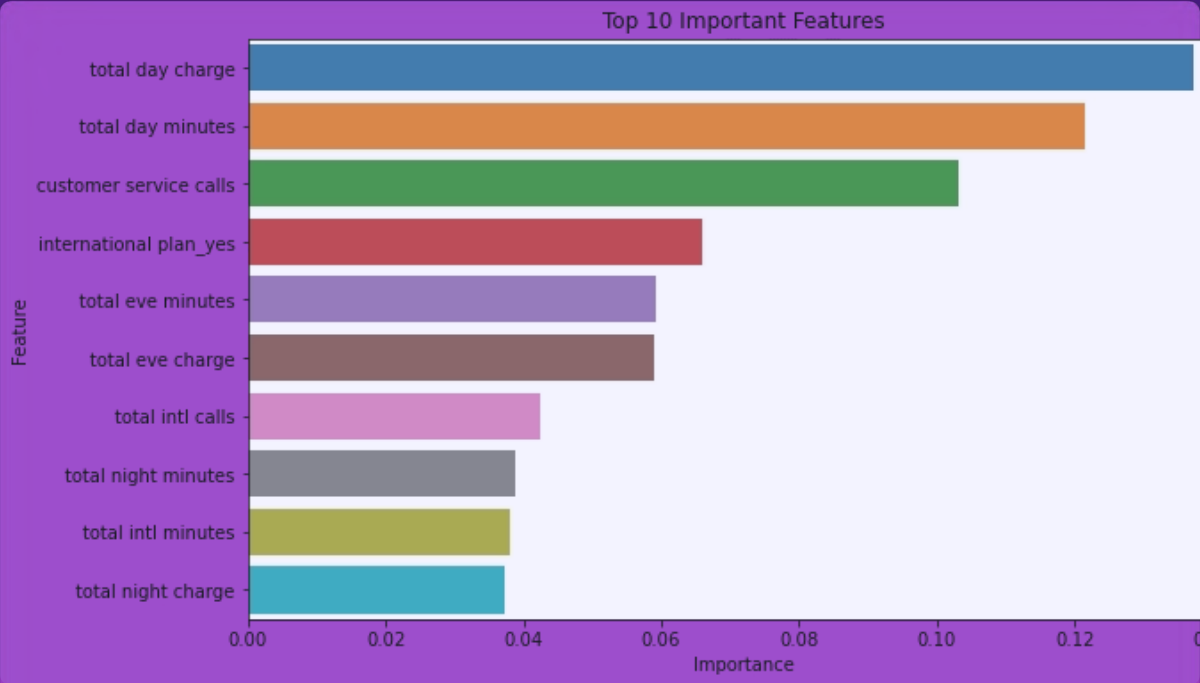**Identify and interpret key features influencing customer churn.**

02

Explore the factors that contribute to customer churn and understand their impact on SyriaTel's business.

03

Create a powerful machine learning model that accurately predicts and mitigates customer churn, ensuring the success and longevity of SyriaTel.

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Identify, Interpret, Explore

Features Influencing Churn

Key features impact churn

Identify & Interpret

Explore key feature relationships

Develop Classification Model
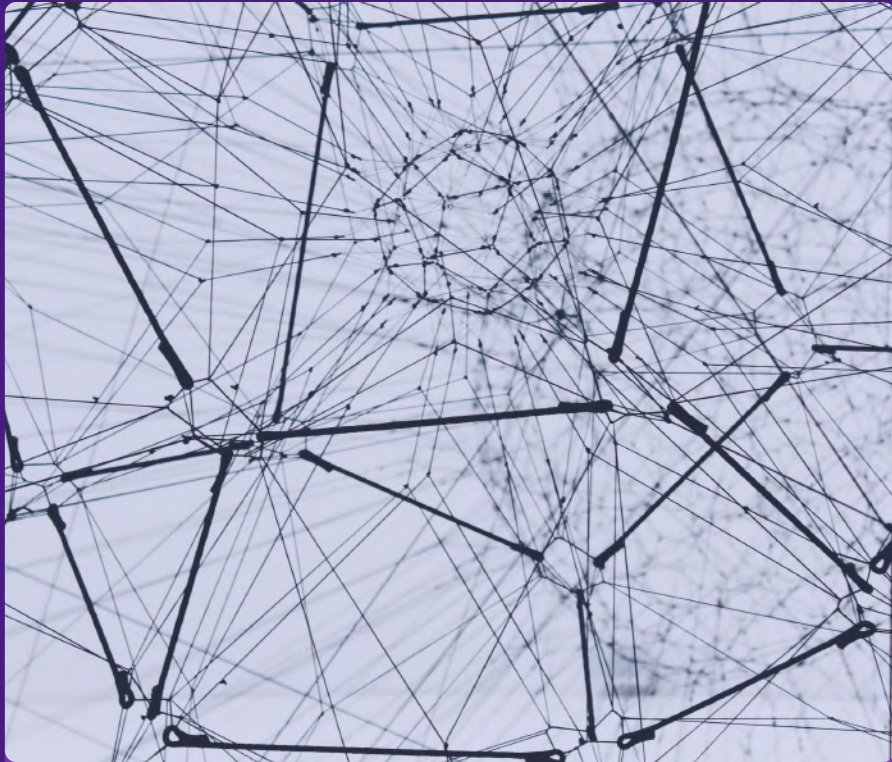
High accuracy churn prediction

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Methodology

Identify

Key features

Explore

Relationships

Develop

Classification models

Settle

Hypertuned random forest

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Developing a classification

1.Identify and interpret

key features influencing customer churn.

2. Explore Relationships Between

Key Features Influencing Customer Churn.

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Baseline Model

1.

Evaluating the performance of the baseline model, which has been carefully crafted to identify and interpret key features influencing customer churn at SyriaTel. By exploring the relationships between these features, we aim to develop a classification model with high accuracy.

SMOTE Model Accuracy: 0.6882

Classification Report:

	precision	recall	f1-score	support
False	0.91	0.70	0.79	566
True	0.27	0.63	0.38	101
accuracy			0.69	667
macro avg	0.59	0.67	0.59	667
weighted avg	0.82	0.69	0.73	667

Confusion Matrix:
[[395 171]
 [37 64]]

ROC-AUC Score: 0.7558

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Random Forest Model

Model Accuracy

Measuring the predictive power of the random forest model.

Random Forest Model Accuracy: 0.9482

Classification Report:

	precision	recall	f1-score	support
False	0.94	0.97	0.95	585
True	0.96	0.93	0.95	555
accuracy			0.95	1140
macro avg	0.95	0.95	0.95	1140
weighted avg	0.95	0.95	0.95	1140

Confusion Matrix:
[[565 20]
 [39 516]]

ROC-AUC Score: 0.9895

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Optimizing the random forest model

01

Identify Key Features

Uncover the factors that drive customer churn in SyriaTel

02

Explore Relationships

Discover the connections between key features influencing customer churn

03

Develop Classification Model

Create an accurate prediction model for customer churn using random forest

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Assessing the performance of the hypertuned random forest model

Model Accuracy

We measured the predictive power of the hypertuned random forest model and after considering various models, we settled on the hypertuned random forest model for its robustness and predictive power.

Random Forest Model Accuracy: 0.9526

Classification Report:

	precision	recall	f1-score	support
False	0.94	0.97	0.95	585
True	0.97	0.94	0.95	555
accuracy			0.95	1140
macro avg	0.95	0.95	0.95	1140
weighted avg	0.95	0.95	0.95	1140

Confusion Matrix:
[[567 18]
 [36 519]]

ROC-AUC Score: 0.9907137907137906

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Recommendations

01

IMPLEMENT TARGETED MARKETING CAMPAIGNS

Leverage insights into key features influencing churn to design targeted marketing campaigns. Addressing customer pain points identified in the analysis can enhance the effectiveness of these campaigns

02

ENHANCE CUSTOMER SERVICE INITIATIVES

Andrew Evans Focus on improving customer service experiences, especially for segments identified as having a higher likelihood of churn. Proactive measures, such as personalized support, can significantly impact customer satisfaction

03

CONTINUOUS MONITORING AND MODEL REFINEMENT

Establish a system for continuous monitoring of customer churn patterns. Periodically update the model with fresh data and refine it to adapt to evolving customer behaviors.

Future Improvements

01

FEATURE ENGINEERING

Explore additional features or derive new variables that might contribute to better predictive performance.

02

ENSEMBLE MODELS

Experiment with ensemble models combining different algorithms to harness the strengths of each, potentially improving overall model accuracy.

03

CUSTOMER FEEDBACK INTERGRATION

Integrate direct customer feedback into the model training process to capture subjective aspects influencing churn.

Next Steps

01

Deploy the tuned Random Forest model into a production environment, integrating it into SyriaTel's operational systems for real-time predictions.

02

Establish a feedback loop for continuous improvement, incorporating insights from the model predictions into business strategies and assessing the impact on customer retention.

03

Encourage collaboration between data science, marketing, and customer service teams to ensure a holistic approach to customer retention, aligning strategies with the model's insights.

04

Andrew Evans
Conduct educational initiatives to familiarize relevant stakeholders with the model's capabilities and limitations, fostering a data-driven culture within SyriaTel.

THANK YOU