Syria Tel Customer Churn Prediction

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Project Overview

- In today's competitive telecommunications industry, retaining customers and minimizing churn is of paramount importance. SyriaTel, a prominent telecommunications company, faces a common challenge: customer churn. Churn, which refers to customers discontinuing their services, can have a significant impact on a company's bottom line. The objective of this project is to build a classifier that predicts customer churn, enabling SyriaTel to take proactive measures to retain customers and boost long-term profitability.

Problem Statement

- Telco, a telecommunications company, is facing challenges with customer churn. Customer churn, or the rate at which customers switch to other providers or terminate their services, is a significant concern for Telco. High customer churn rates can lead to revenue loss and increased customer acquisition costs. The objective of this project is to develop predictive models and actionable strategies to effectively identify customers at risk of churning and implement retention initiatives to reduce churn rates. By analyzing historical customer data and leveraging machine learning techniques, this project aims to predict customer churn and provide insights to help Telco retain valuable customers, ultimately improving business performance.

Methodology

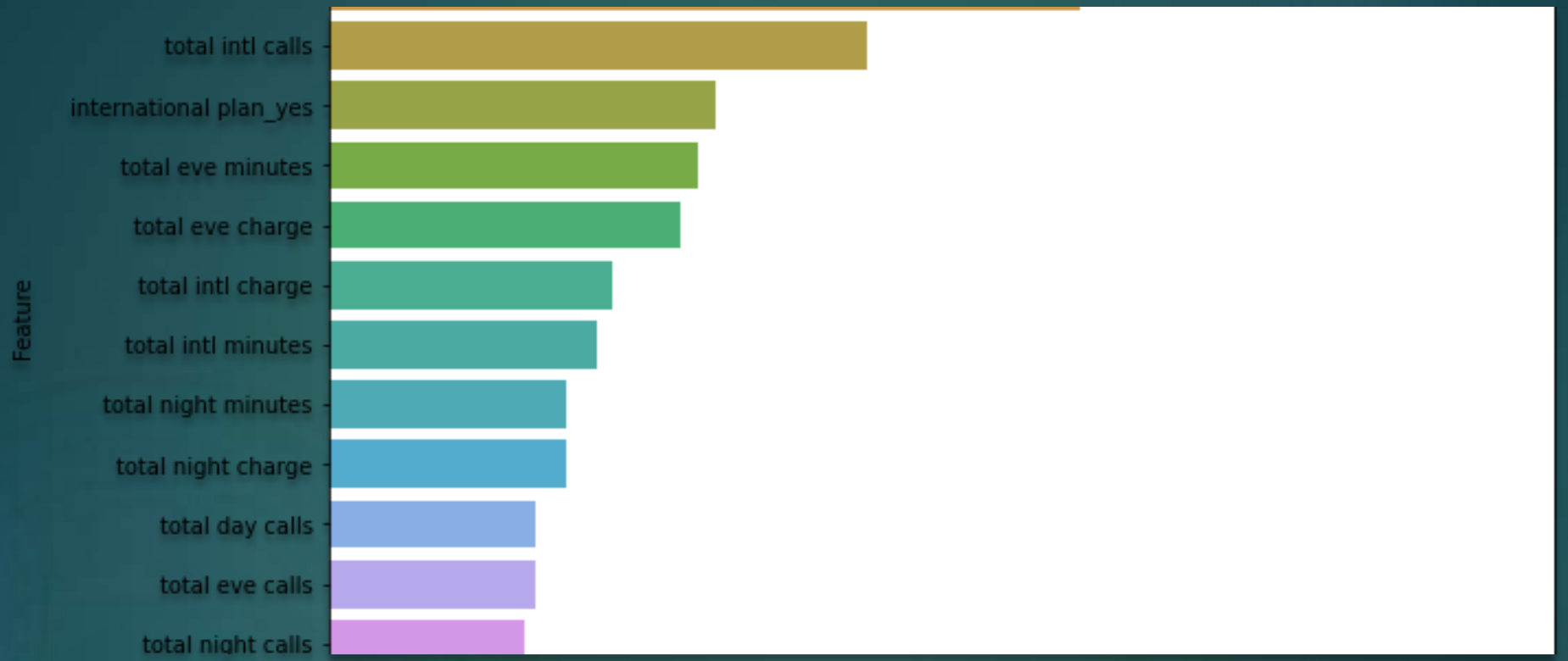
- I used a number of models as shown in the notebook, and finally settled on Random Forest Classifier as it produced the best results.
- The project utilizes data obtained from Kaggle; available at https://www.kaggle.com/datasets/becksddf/churn-in-telecoms-dataset.
- Key Steps included:
  1. Business Understanding
- 2. Data Preparation
- 3. Modelling
- 4. Hyper-parameter Tuning
- 5. Model Evaluation
- 6. Model Deployment

```
plt.title("Churn Distribution")

# Display the plot
plt.axis('equal')
plt.show()
```

Churn Rate

The initial
data showed a turn rate of 14.5%



Key Findings

The analysis indentified customer service calls, total day minutes and total day charge as the most important features contributing to customer churn..

Limitations

- Some of the limitations to this analysis include;
  1. Limited Data: The data set used in this analysis may not encompass all the customers or factors that contribute to churn.
- 2. Complexity of Random Forests: These models are complex and time-consuming to train and optimize. This may affect the practical implementation of the model.
- Imperfect Scores: There is a possibility of incorrect predictions or misclassifications.

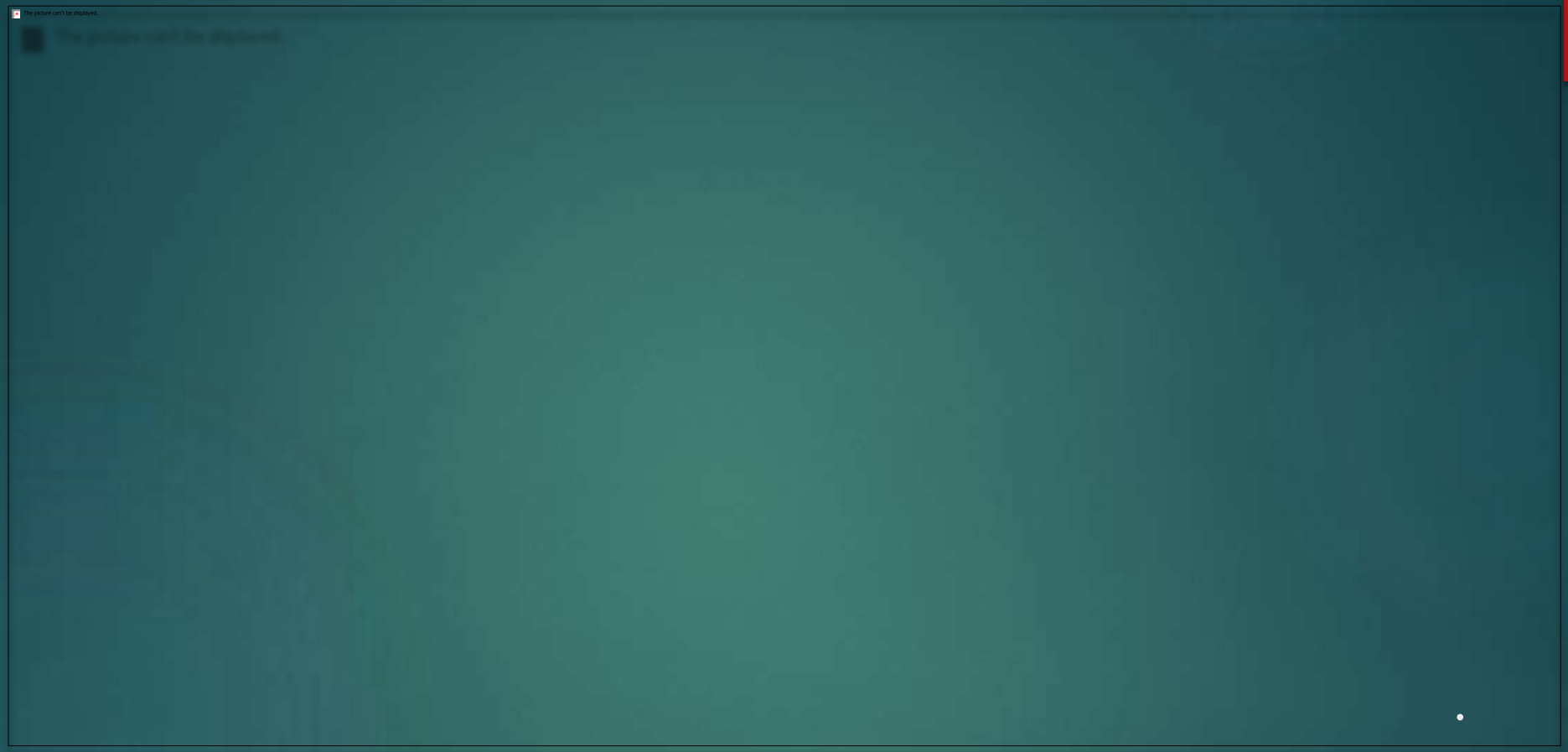
- Further research and analysis could be done to validate and/or enhance the findings.

Conclusions

- The analysis of customer churn, spanning from exploratory data analysis, model development, hyperparameter tuning, and threshold optimization, has offered significant insights for your business. Through an extensive evaluation of different machine learning models, it is evident that the Random Forest Classifier, equipped with an adjusted threshold of 0.4, stands out as the optimal choice for predicting customer churn. This model presents an admirable balance between precision, recall, and accuracy, with an F1 score of approximately 0.832 and an accuracy rate of 95.3%.
- The analysis has unearthed the factors most influential in predicting customer churn, notably 'customer service calls,' 'total day minutes,' and 'total day charge.' To effectively reduce churn rates, it is recommended to direct your efforts towards these critical aspects of customer interactions.
- By deploying the Random Forest model and its associated threshold, your business will be well-equipped to identify potential churn risks, take timely action, and, consequently, retain valuable customers. This predictive model, tuned to your specific business needs, will serve as an invaluable tool in your customer retention strategy.
- To ensure the model's continued success, it is essential to maintain data quality, monitor its performance, collaborate across departments, and adhere to data privacy regulations.

Recommendations

- In light of this analysis, Telco can focus its efforts on bolstering customer satisfaction by enhancing the overall customer experience, improving the quality of its services, and implementing strategies to reduce daytime charges. Furthermore, closely monitoring the frequency of customer service calls is imperative, as a high volume of such calls may signal underlying customer dissatisfaction. Armed with these insights, Telco can tailor retention and engagement initiatives to effectively curb churn rates while simultaneously elevating overall customer satisfaction levels.
- The organization now possesses the tools and insights needed to tackle customer churn effectively. With the right strategies, Telco can enhance customer satisfaction, reduce churn, and ultimately improve the business's performance. It is recommended to take these findings as the foundation for customer churn management efforts, continually refining and adapting strategies to the ever-evolving customer landscape.



THE END.