Customer Churn in Telco Industry

Stephen Mwangi Thuo

February 10, 2023

Problem Statement

Customer churn is the loss of clients by a company. This is a major problem for businesses since **retaining customers is cheaper than acquiring new ones.**

Impact on Business:

- **High customer churn** rates can result in **decreased** revenues and consequently **profits**.
- The cost of acquiring new customers is high with high budgets going into marketing and sales.
- Additionally, lost customers can portray a bad image of a company.

Need for a Solution:

- For a company to remain competitive it is necessary to understand the reason behind customers leaving and take necessary steps to mitigate this.
- An effective solution to customer churn can help businesses improve customer satisfaction, increase retention, and ultimately drive growth and success.

Methodology

- The analysis used a Random Forest Classifier as the final model that produced the best results.
- The data source was a telecom customer churn dataset, obtained from:
  https://www.kaggle.com/datasets/becksddf/churn-in-telecoms-dataset.
- The key steps in our methodology were:
  - Business Understanding
  - Data Understanding,
  - Data Preparation,
  - Modeling,
  - Hyper-parameter tuning
  - Model Evaluation,
  - Deployment.

By following these steps, we were able to build a robust model to predict customer churn and draw meaningful insights to help the telco improve customer retention.

Key Findings

- Our analysis showed that we can predict customer churn with an accuracy of 0.9376.
- The precision of our model is 0.7588, meaning that **out of all the customers our model predicted as churners, 75.88% of them actually churned**.
- The recall of our model is 0.856, meaning that **out of all the customers that actually churned, our model was able to correctly predict 85.6% of them.**
- The F1 score of our model is 0.804, which is a measure of the balance between precision and recall.
- The most important features that determine customer churn were **customer service calls** (0.188038), **total day minutes** (0.125113), **total day charge** (0.12004), total intl calls (0.091361), and **total eve charg**e (0.058763).

Feature Importance
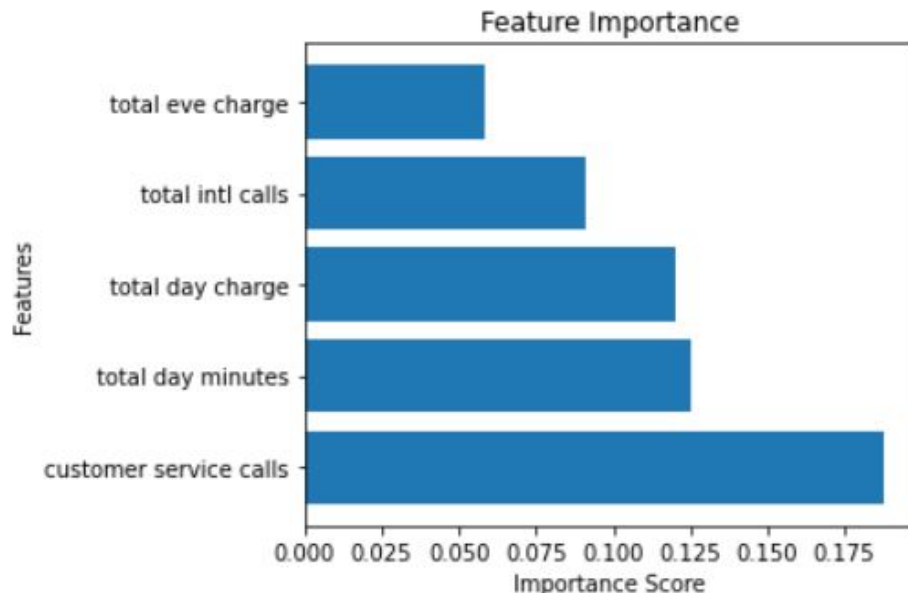
Recommendations

Based on our key findings, the below recommendations can help to reduce customer churn:

- **Improving customer service:** Given that customer service calls and total day minutes are the most important factors contributing to customer churn, the telco should focus on better customer support, training agents, and continuously monitoring and evaluating the customer service process.
- **Offer more tailored plans:** The telco can consider offering more customized plans to customers based on their usage patterns, preferences, and budgets. This can help retain customers and reduce churn.
- **Monitor usage patterns:** Keeping track of customers' usage patterns, such as total day charge and total international charge, can help identify customers at risk of churning. The telco can then take proactive steps to retain them.
- **Evaluate pricing strategies:** The telco can review their pricing strategies and see if they are competitive. By adjusting prices, offering discounts, or bundling services, the telco can reduce the risk of customers switching to other providers.

These recommendations, if implemented, can benefit the business by retaining existing customers, reducing customer churn, and attracting new customers. Additionally, retaining customers is often more cost-effective than acquiring new ones, so reducing churn can have a significant impact on the bottom line.

Limitations

This analysis has limitations that must be considered when interpreting the results. Some of these limitations include:

- **Limited data:** The dataset used in this analysis may not be a complete representation of all customers, which may affect the validity of the findings.
- **Complexity of Random Forests:** The use of Random Forests, although a powerful tool for classification, can be complex and time-consuming to train and tune.
- **Imperfect scores:** Despite achieving high accuracy, precision, recall and F1 scores, the model is not perfect and may still make incorrect predictions.

These limitations may affect the findings and the actionable recommendations derived from the analysis. Further research and analysis should be conducted to validate and improve upon these results.

Conclusion

The analysis of customer churn and its impact on telco business using a random forest classifier showed that customer service calls, total day minutes, and total day charge were the most important factors contributing to customer churn.

Based on these findings, we made actionable recommendations to reduce customer churn, including improving customer experience, reducing call wait times, and offering personalized promotions.

Despite some limitations in our analysis, including limited data and the complexity of random forests, the analysis was able to predict customer churn with an **accuracy of 0.937, a precision of 0.758, a recall of 0.856, and an F1 score of 0.80.**

Thank You!

Email: stephen.thuo@student.moringaschool.com