Analysis of SyriaTel performance in the Telecommunication Industry

BY

SYLVANUS RARING'O

Project Overview

- Analyzing **SyriaTel performance in the Telecommunication Industry with relation to** the cost of calls and messages, the duration of calls and whether the costs should vary between days and nights. This is with reference to other choices available in the industry

Project Overview

- The telecommunication industry is faced with one of the fiercest competitions globally

- Customers are in need of the cheapest, reliable and safe communication platforms. This study focuses on SyriaTel, a telecommunications company in Syria

- Among the challenges facing this company include; Intense Competition, Service Quality Issues (Network Coverage and Reliability), Economic and Political Instability, Changing Customer Expectations, Pricing and Plan Flexibility, Customer Satisfaction and Perception, Regulatory Environment (Government Regulations), Inability to Predict Churn Patterns

- This study attempts to guide the management of SyriaTel on what areas to improve on in order to bring the company back to profitability

Goals and Research Questions

- Syria Tel intends to turnaround their profitability. The management wants to establish root causes of the challenges and how to address them

- The business environment is competitive and the country is rocked with civil wars. The company is hopeful to navigate all these with a proper data analysis and recommendation

- This study therefore focusses on customer behavior with relation to the cost of call and messages, the duration of call and whether the costs should vary between days and nights

Importance to Stakeholders

- This study offers actionable insights to the stakeholders and informs them on how to handle the volatile customer behaviors on handling call and message charges

- Visualization is included to illustrate key findings and patterns

RESEARCH QUESTIONS

- What factors inform customer loyalty in the telecommunication industry?

Data source and Understanding

- SyriaTel Customer Churn Provides detailed data on various aspects of analysis including; account length, area code, phone number, international plan, voice mail plan

- It also includes number of vmail messages, total day minutes, total day calls, total day charge, total eve calls, total eve charge, total night minutes, total night calls, total night charge and so on

Modeling and Model Evaluation

- **Random Forest**

- Random Forest is the best performing model in terms of accuracy, precision, recall, and F1-score. Accuracy: 93.70% - High accuracy, suggesting the model is making correct predictions overall. Precision: 98.36% - Extremely high precision, indicating that when it predicts positives, it is very likely to be correct. However, its recall (59.41%) needs be improved

Modeling and Model Evaluation

- **Decision Tree**

- Is the second best with: Accuracy 91.60% - High accuracy and overall good performance. Precision: 71.03% - It predicts positives correctly with a good precision. Recall: 75.25% - It successfully identifies a large proportion of the positive cases Making it a good option if identifying positive cases is crucial

Modeling and Model Evaluation

- **Logistic Regression**

- Logistic Regression has good accuracy but struggles with low recall and F1-score, so it may not be ideal if identifying positives is important. Accuracy: 85.76% - It has a decent accuracy but struggles with identifying positive cases, as reflected in its low recall (18.81%). Precision: 59.38% - It predicts positives correctly 59.38% of the time. Recall: 18.81% - It misses many positive instances

Recommendations

- Based on the evaluation metrics, Random Forest stands out as the most effective model. It has the highest accuracy, excellent precision, recall, and F1-score. Its ROC AUC score of 0.80 confirms that it is good at distinguishing between churned and non-churned customers.

- This model should be the primary choice for predicting customer churn. It strikes a good balance between performance and interpretability.

- Additionally, Random Forest provides feature importance, which can offer valuable insights into the factors driving customer churn. Alternative Model: Logistic Regression

Next Steps

- 1.Focus on Model Improvement

- 2.Address Class Imbalance

- 3.Model Evaluation and Validation

- 4.Customer Retention Strategies

- 5.Continuous Improvement & Feedback Loop Model Drift

- 6.Business Collaboration and Insights