

# Predicting Customer Churn at SyriaTel

Leveraging Data Insights  
for Business Success

A PRESENTATION BY:  
SAMMY WARAH



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# Introduction

Welcome to our presentation on predicting customer churn at SyriaTel.

Objective: Our objective is to leverage data analytics to help SyriaTel reduce customer churn and retain valuable customers.

Agenda: Today, we will delve into our analysis process, model development, evaluation, and recommendations for SyriaTel's customer retention strategy.





# Overview

This project aims to build a classifier to predict whether a customer will soon stop doing business with SyriaTel, a telecommunications company. By identifying potential churners in advance, SyriaTel can take proactive measures to retain these customers, thereby reducing revenue loss and improving customer satisfaction.



# Business And Data Understanding



ANNUAL  
REVENUE  
GROWTH

- ✓ Business Problem
- ✓ Data Overview
- ✓ Key Insights



# Business Problem

SyriaTel faces the challenge of retaining customers in a competitive telecommunications market. This has significant financial implications and affects the overall customer experience.

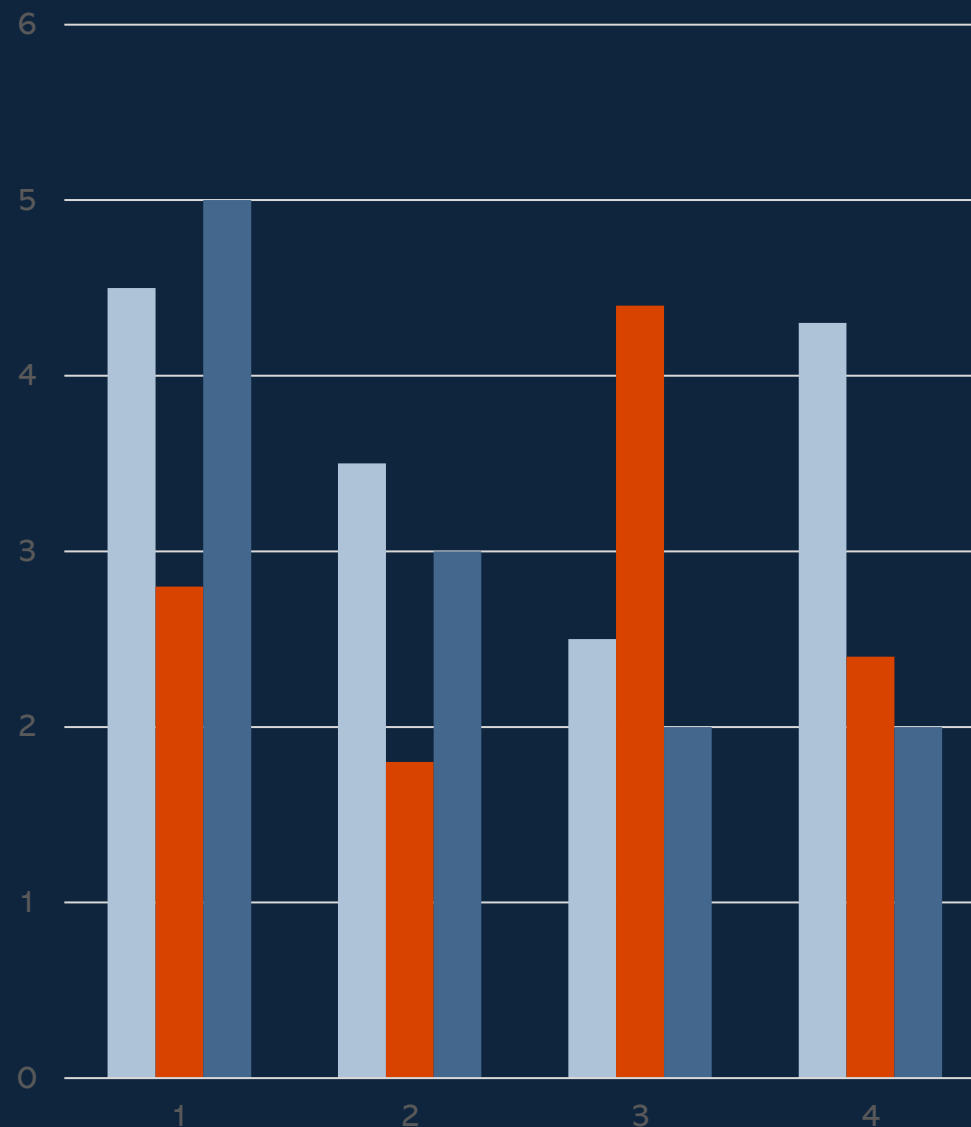
The telecom business is interested in reducing revenue loss caused by customers who don't stick around very long.

High customer churn rates not only impact revenue but also reflect on service quality and customer satisfaction.

# Data Overview

Our analysis is based on a comprehensive dataset encompassing various customer attributes, including account information, usage statistics, and customer service interactions.

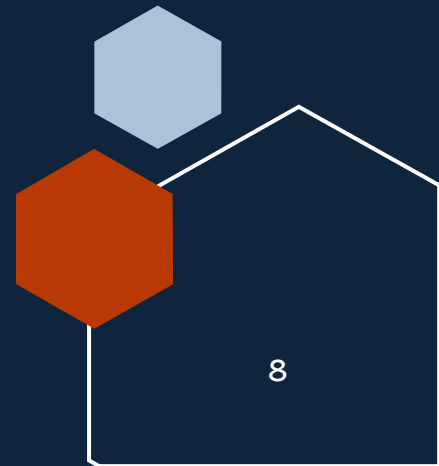
Features include customer state, account length, international plan status, number of customer service calls, and more. The target variable is a binary indicator of whether the customer churned.



# Key Insights

Understanding customer behavior and identifying factors influencing churn are crucial for SyriaTel's decision-making process.

By analyzing historical data, we aim to uncover actionable insights to mitigate churn and enhance customer retention efforts.



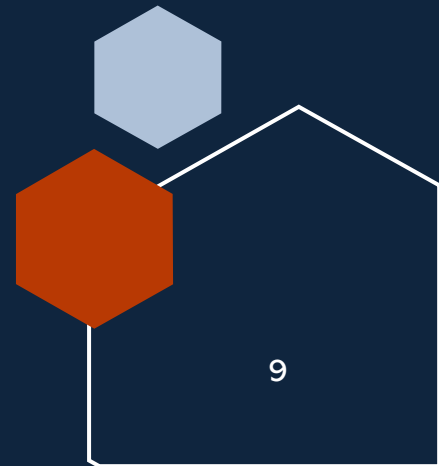


# Modeling

**Approach:** Our approach involves using classification modeling techniques to predict customer churn. Classification allows us to categorize customers into groups based on their likelihood of churn, enabling targeted interventions.

**Why Classification?:** Classification modeling is particularly useful in this context as it enables SyriaTel to proactively identify customers at risk of churning and implement tailored retention strategies.

**Model Selection:** We explored multiple classification algorithms, including **logistic regression**, **decision trees**, and **gradient boosting**, to identify the most effective model for predicting churn.



# Evaluation

**Performance Metrics:** To evaluate our models, we employed key performance metrics such as **precision**, **recall**, and **F1-score**. These metrics provide insights into the model's ability to accurately identify churners and non-churners.

**Results:** Our models demonstrated promising performance, achieving **accuracies** ranging from 84% to 86%. While no model is perfect, our analysis indicates that our models can effectively identify potential churners with high accuracy and reliability.



# Definition of Terms

## Precision

Definition: **Precision measures the accuracy of the positive predictions.**

Explanation: **Out of all the customers predicted to churn, how many actually did?**

## Recall

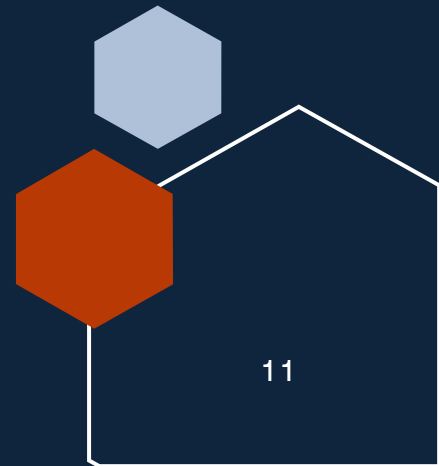
Definition: **Recall measures the ability to find all the relevant cases (true positives).**

Explanation: **Out of all the customers who actually churned, how many were correctly predicted to churn?**

## F1-Score

Definition: **The F1-Score is the harmonic mean of precision and recall.**

Explanation: **A balance between precision and recall. It is useful when you need to find an optimal balance between false positives and false negatives.**



# Definition of Terms

## Accuracy

Definition: **Accuracy measures the overall correctness of the model.**

Explanation: **The proportion of all correctly predicted cases (both churners and non-churners) out of the total predictions.**

## Confusion Matrix

Definition: **A confusion matrix is a table used to evaluate the performance of a classification model.**

Explanation: **It shows the counts of true positives, true negatives, false positives, and false negatives. This helps understand where the model is making errors.**

- True Negative (TN): Correctly predicted non-churners.
- False Positive (FP): Incorrectly predicted churners.
- False Negative (FN): Incorrectly predicted non-churners.
- True Positive (TP): Correctly predicted churners.

This matrix helps in visualizing the performance and types of errors the model is making.



# Model Evaluation Summary

## Logistic Regression

- **Precision:** 87% (Non-churners), 58% (Churners)
- **Recall:** 97% (Non-churners), 21% (Churners)
- **F1-Score:** 92% (Non-churners), 31% (Churners)
- **Accuracy:** 86%
- **Confusion Matrix:** 551 True Negatives, 15 False Positives, 80 False Negatives, 21 True Positives
- **Summary:** Best overall balance between precision and recall. High accuracy and good identification of non-churners. Moderate at detecting churners but better than other models.

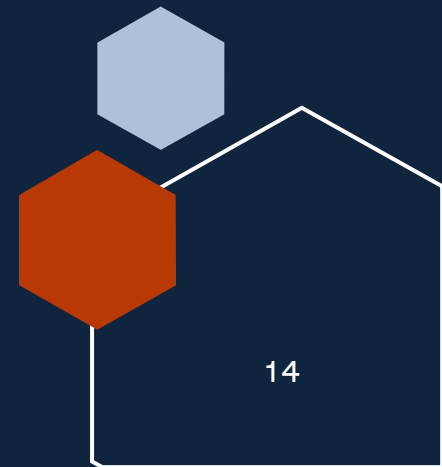




# Model Evaluation Summary

## Decision Tree

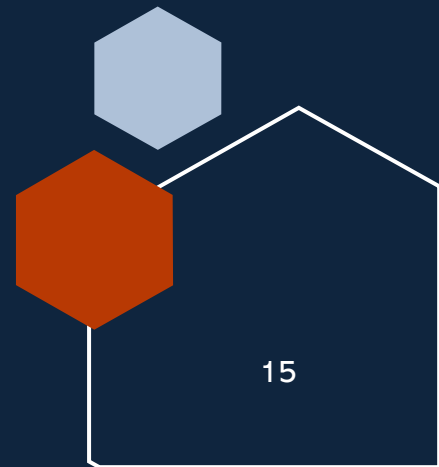
- **Precision:** 86% (Non-churners), 36% (Churners)
- **Recall:** 98% (Non-churners), 8% (Churners)
- **F1-Score:** 92% (Non-churners), 13% (Churners)
- **Accuracy:** 85%
- **Confusion Matrix:** 556 True Negatives, 14 False Positives, 89 False Negatives, 8 True Positives
- **Summary:** Excellent at identifying non-churners but significantly struggles with churners. High precision for non-churners but very low recall for churners.



# Model Evaluation Summary

## Gradient Boosting

- **Precision:** 86% (Non-churners), 36% (Churners)
- **Recall:** 97% (Non-churners), 9% (Churners)
- **F1-Score:** 91% (Non-churners), 15% (Churners)
- **Accuracy:** 84%
- **Confusion Matrix:** 554 True Negatives, 16 False Positives, 88 False Negatives, 9 True Positives
- **Summary:** Similar performance to Decision Tree with slightly better recall for churners but still not ideal.





## Best Model: Logistic Regression Model

**Why?:** Provides the best balance between precision and recall, making it the most effective for identifying both churners and non-churners. This enables more targeted and effective customer retention strategies.

# Recommendations



## Targeted Interventions

Based on our analysis, we recommend SyriaTel to implement targeted interventions aimed at high-risk customers. These interventions may include personalized offers, loyalty programs, or proactive customer service outreach.



## Improving Customer Experience

Addressing pain points identified through our analysis, such as service quality issues or billing discrepancies, can significantly enhance the overall customer experience and reduce churn rates.



## Continuous Monitoring

It is essential for SyriaTel to continuously monitor churn indicators and refine its strategies based on ongoing analysis. By staying proactive and adaptive, SyriaTel can effectively mitigate churn and foster long-term customer relationships.

# Next Steps

## Further Analysis

As customer preferences and market dynamics evolve, SyriaTel should continue to explore additional factors influencing churn, such as customer sentiment analysis or competitor analysis.

## Model Refinement

Continuous refinement of our predictive models with updated data and feedback will enhance their accuracy and effectiveness over time.

## Stakeholder Engagement

Collaborative efforts between SyriaTel's business and analytics teams are essential for translating insights into actionable strategies. By fostering cross-functional collaboration, SyriaTel can leverage data-driven decision-making to drive business success.



# Thank you

- **Questions:** We invite any questions or feedback from our stakeholders. Your insights are invaluable in shaping our approach to addressing the challenge of customer churn at SyriaTel.
- **Contact Information:** For further discussions or assistance, please feel free to reach out. We are committed to supporting SyriaTel's efforts in customer retention and business growth.

Thank you for your attention and collaboration in tackling the issue of customer churn at SyriaTel. Together, we can build a more resilient and customer-centric telecommunications service.

Sammy Warah

[sammywarah@gmail.com](mailto:sammywarah@gmail.com)

[www.SryiaTel.com](http://www.SryiaTel.com)