



# Predictive Modeling for Customer Churn

Presented By;

Kelvin Sila Muia

A decorative graphic on the left side of the image, consisting of a network of light blue lines and small circles, resembling a circuit board or a data network. The lines are vertical and horizontal, with some diagonal connections, and the circles are small and white, acting as nodes or junctions.

*“As Data Piles Up, We Have Ourselves A Genuine Gold Rush. But Data Isn’t The Gold. I Repeat, Data In Its Raw Form Is Boring Crud. The Gold Is What’s Discovered Therein.”*

— ERIC SIEGEL

# BUSINESS UNDERSTANDING

- In the telecom sector, user acquisition and retention are the main issues.
- Every business's marketplace is expanding quickly, which is leading to a rise in the number of subscribers.
- As a result, businesses now understand how important it is to keep their current clientele.
- Service providers now need to lower their client turnover rate because neglecting to do so could hurt their business's profitability..

# BUSINESS UNDERSTANDING

- Churn prediction helps to determine which customers are most likely to move from one organization to another.
- The issue of the telecom industry's constantly rising churn rate persists. In light of this, the current study uses a big-data platform's machine learning technique.
- These telecom companies can be protected with effective strategies for reducing the rate of attrition thanks to machine learning algorithm techniques



# BUSINESS OBJECTIVES

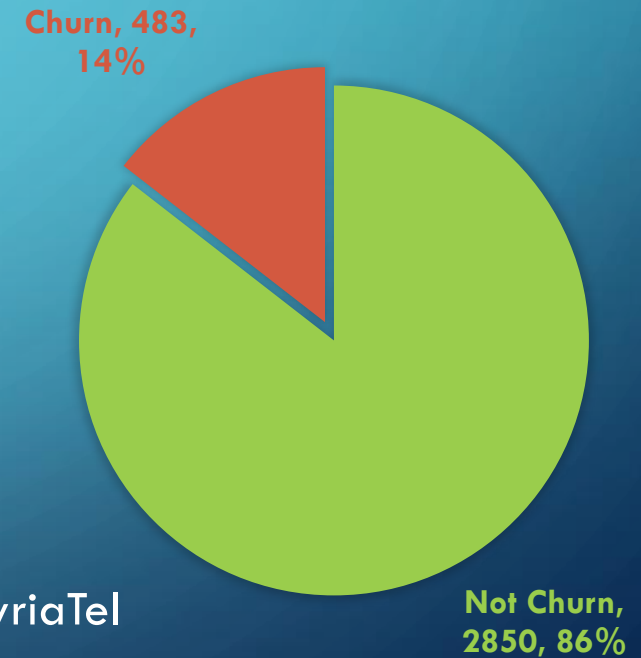
- Build a classifier model to determine whether a customer will soon churn from Syria Tell
- Establish the modeling with the best performance
- Determine features that influence customers churn decisions
- Evaluate any predicable patterns
- Select the best model for classification

# DATA UNDERSTANDING

- The dataset provided information on the following features for each customer:

- US State
- Length of account
- Area code + phone numbers
- If the customer has an international plan
- If the customer has a voicemail plan
- No. of voicemail messages
- Breakdown of call minutes for day, evening, night, and international
- Breakdown of call charges for day, evening, night, and international
- Breakdown of no. of calls for day, evening, night, and international
- No. of calls to customer service

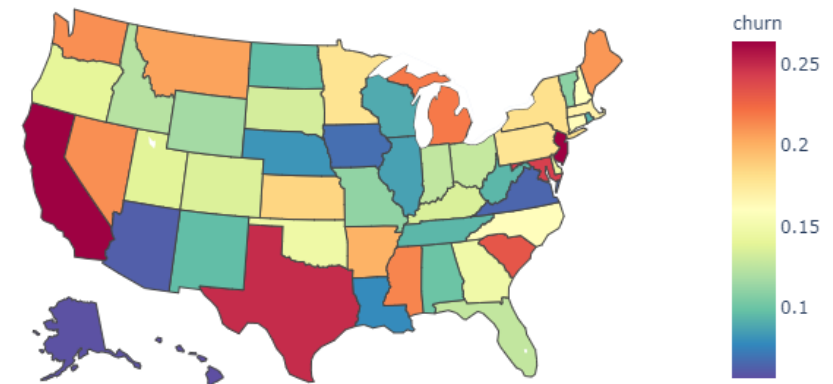
- 14% of the customers churn while 86% kept their contracts with SyriaTel



# DATA PREPARATION

- Some states churn more than others, but greater analysis is needed.
- State data was used in the following models by assigning regions to each state to minimize categories.
- The Census Bureau uses Northeast, Midwest, South, and West regions.
- So I eliminated the state feature and added region information.
- Area code was captured in the region, and phone number is just a customer identifier, so they were eliminated.
- California and New Jersey reports highest number of customers terminanting their contracts with the company while those with lowest churn are Alaska and Hawaii

Churn by State



# CLASSIFICATION MODELS

Base Model: Logistic Regression

K Nearest Neighbors (KNN)

Decision Tree

XGBOOST



# EVALUATION

- I applied SMOTE for unbalanced datasets
- I performed GridSearchCV and VIF score in model tuning
- I reduced regulation in the modeling

# BEST MODEL

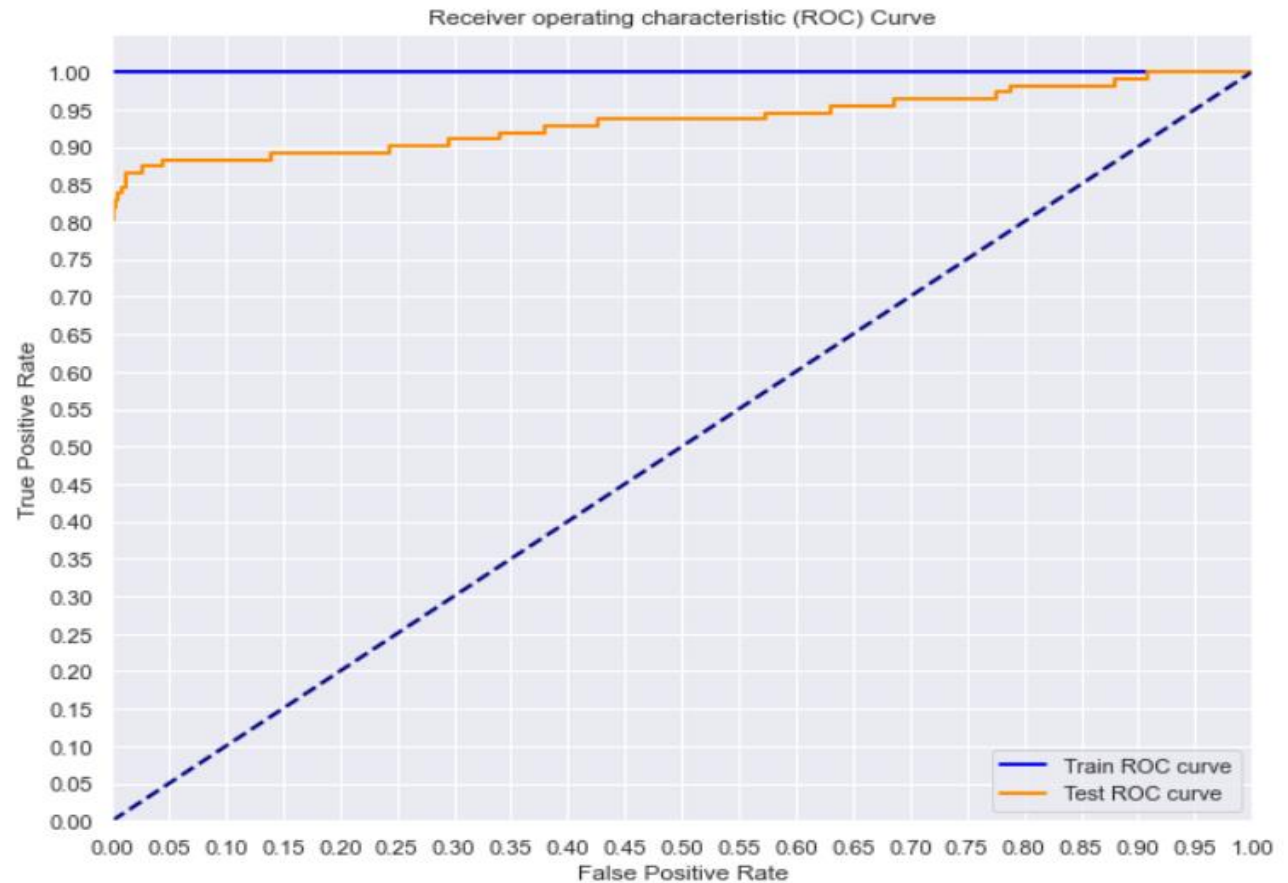
Accuracy Score  
= 97.36%

Precision Score  
= 99%

Recall Score =  
81%

F1 Score = 89%

AUC = 93.5



# FACTORS AFFECTING CUSTOMER CHURNS

## PRIMARY DETERMINANTS



International Plan and  
Voice Mail Plan

Customer Service Calls

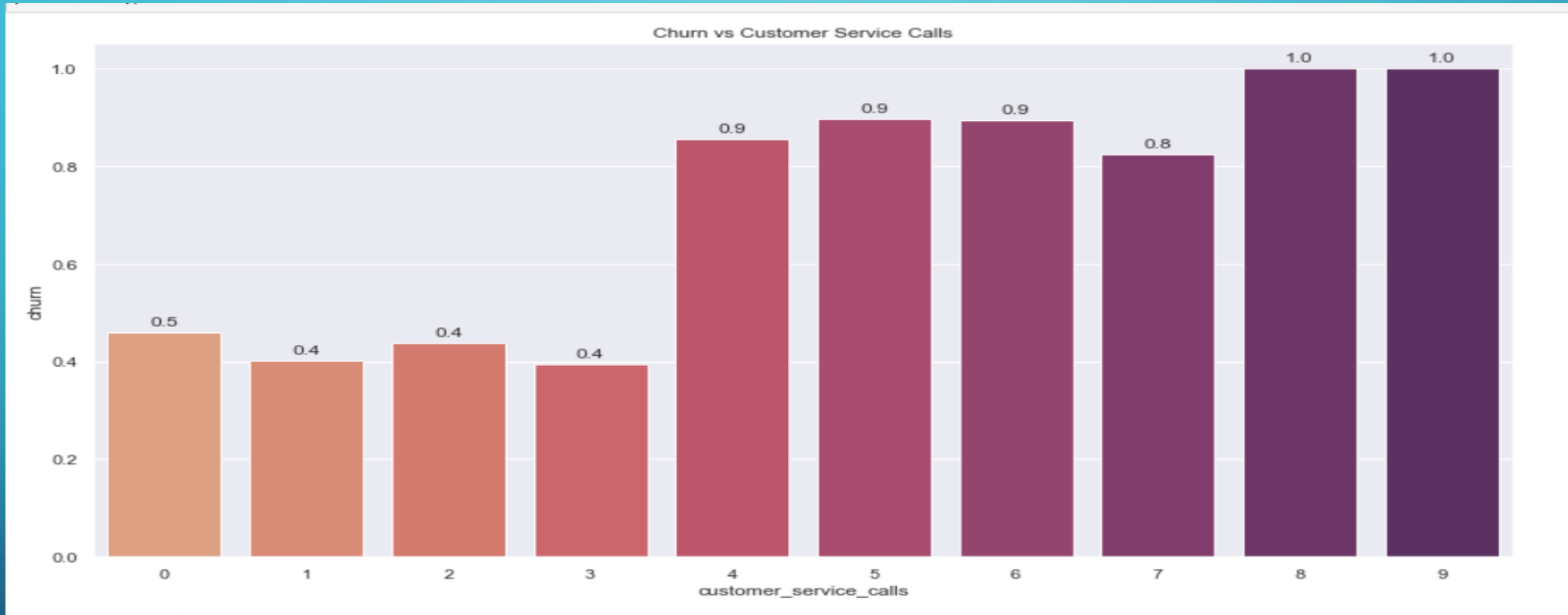


Monthly Charges

Total Day Minutes

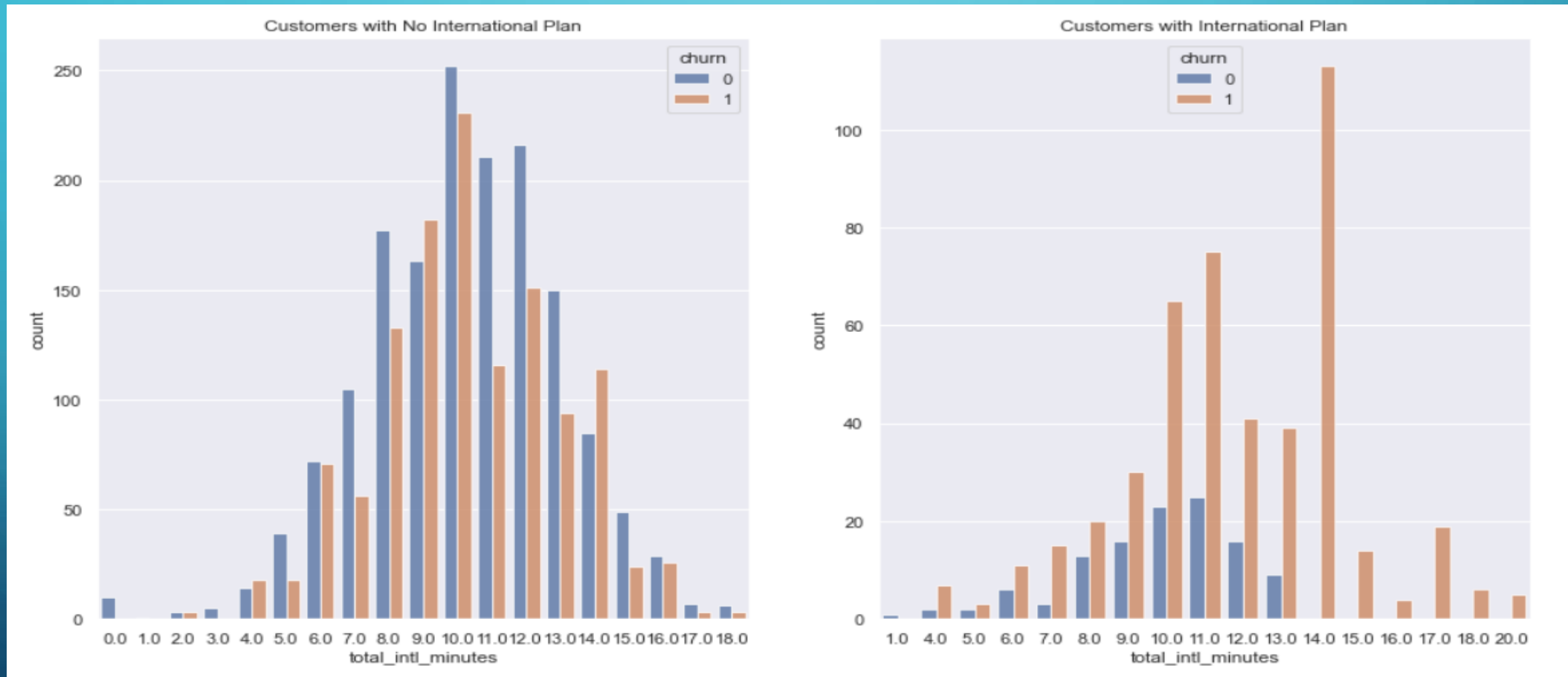


# CHURN VS CUSTOMER SERVICE CALLS



- From the graph above, customers receive more than 8 calls from customer service churn
- Customers who receive more than 4 calls churn at high rate
- Customers who receive less than 3 calls tend to churn when other factors are put into consideration such as total charge

# INTERNATIONAL PLAN AND VOICE MAIL



- Customers with international plan tend to follow a normal distribution with majority of class 0 for total international calls



# RECOMMENDATIONS

- Customer service: Prioritizing client satisfaction is necessary. Better customer service assistance is therefore essential.
- The company must give its representatives better training in customer service. Aim for an average customer service resolution of no more than three calls, as consumers tend to churn at a higher rate after three.
- It is possible to classify customer complaints and offer default remedies for technical issues to deter future calls from other clients.
- Offer incentives to clients who haven't enrolled in a voicemail plan to encourage them to do so.

## CONTINUED..

- International Plan:
- Adjustments must be made to the international plan in order to benefit service subscribers. For instance, a reduced international charge per minute with an international plan fee.
- There is a strong association between total international minutes and total international charge.
- More international charges are incurred by customers who use more international minutes. These clients typically leave more frequently. Customers with overseas plans may receive benefits, in this example reduced costs.

The background is a blue gradient with faint concentric circles. White circuit-like lines with circular nodes are positioned in the corners: top-left, top-right, bottom-left, and bottom-right.

Thank You !