TELECOM CUSTOMER CHURN CLASSIFICATION PROJECT

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BUSINESS UNDERSTANDING

- A telecommunications company has compiled data on their customers and whether or not they have stopped doing business, or "churned"

- Since it is costly to lose customers, the goal is to use this data to identify customers that are likely to churn, and take measures to keep them from doing so.

DATA UNDERSTANDING

The data collected provided information on the following features for each customer:

➢ Length of the account

➢ If the customer has an international and/or voicemail plan

➢ No. of voicemail messages

➢ Breakdown of call minutes, charges, and no. of calls for day, evening, night, and international

➢ No. of calls to customer service

➢ US State

➢ If they have churned

DATA UNDERSTANDING: LOCATION

- Investigate if there is a trend in the certain areas churning more than others

- Map shows the no. of churns per state.

- For use in the model, a region was assigned to each state. The regions used were Northeast, Midwest, South, and West.
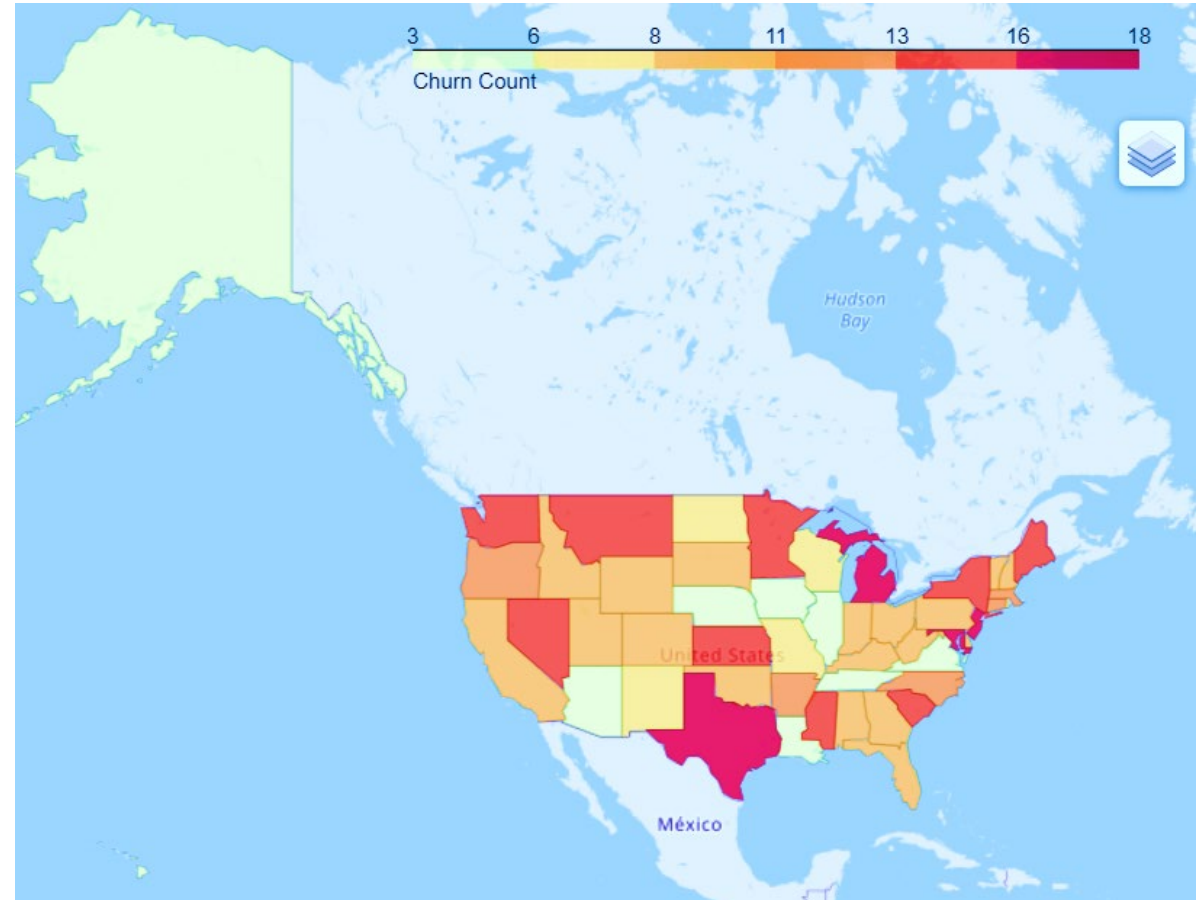
MODEL

- Winning Method: XGBoost and Grid Search, based on recall

- Recall measure of correct positive predictions

$$\text{Recall} = \frac{\text{True Positives}}{\text{True Positives} + \text{False Negatives}}$$

$$= \frac{468}{468 + 15} = 96.9\%$$

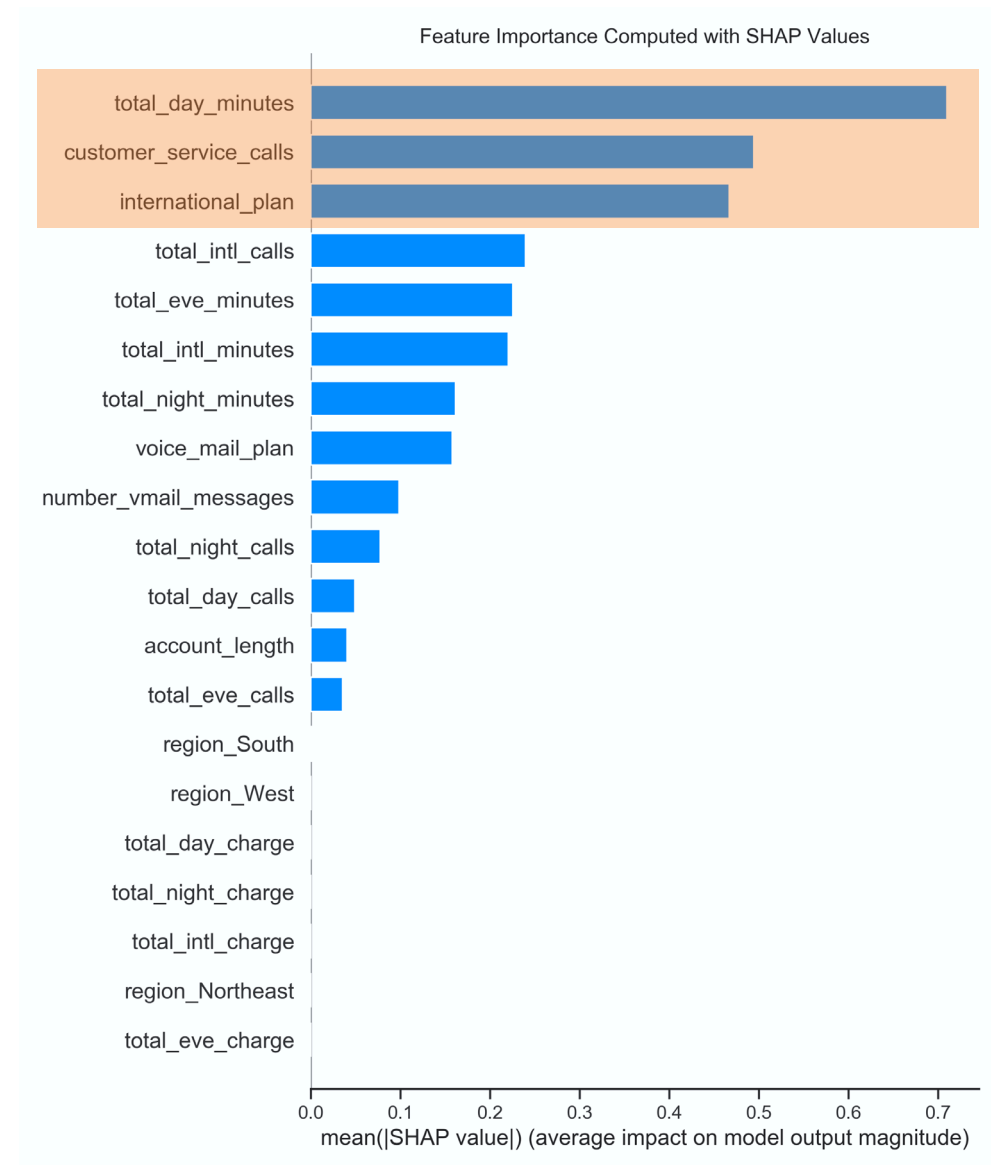Confusion Matrix – Grid Search
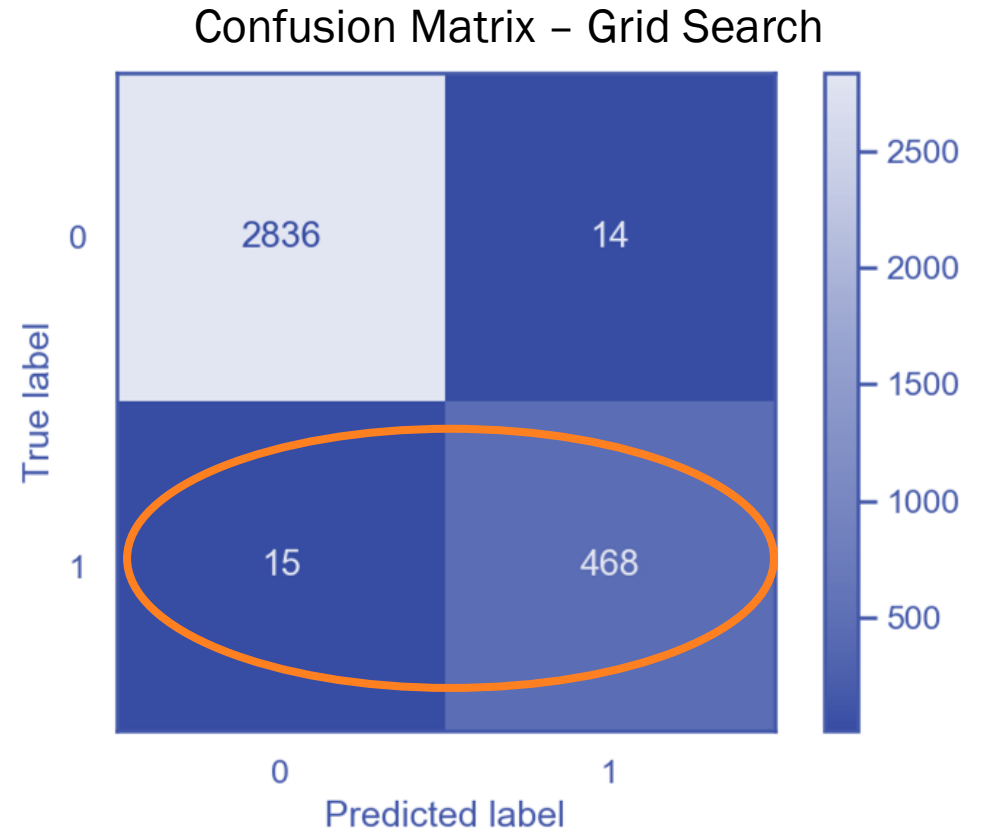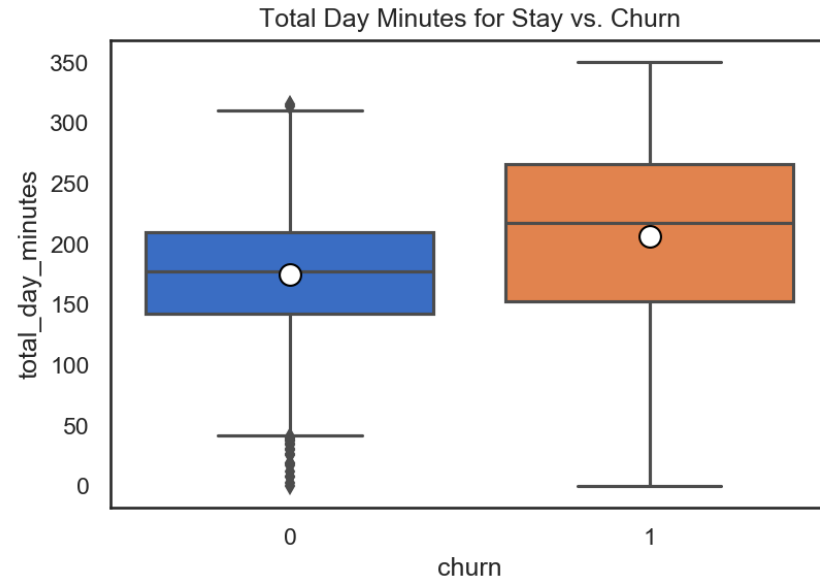
EVALUATION – FEATURE IMPORTANCE

Used SHAP to identify most influential features.

Top 3 influencers:
- Total daytime minutes
- Number of calls to customer service
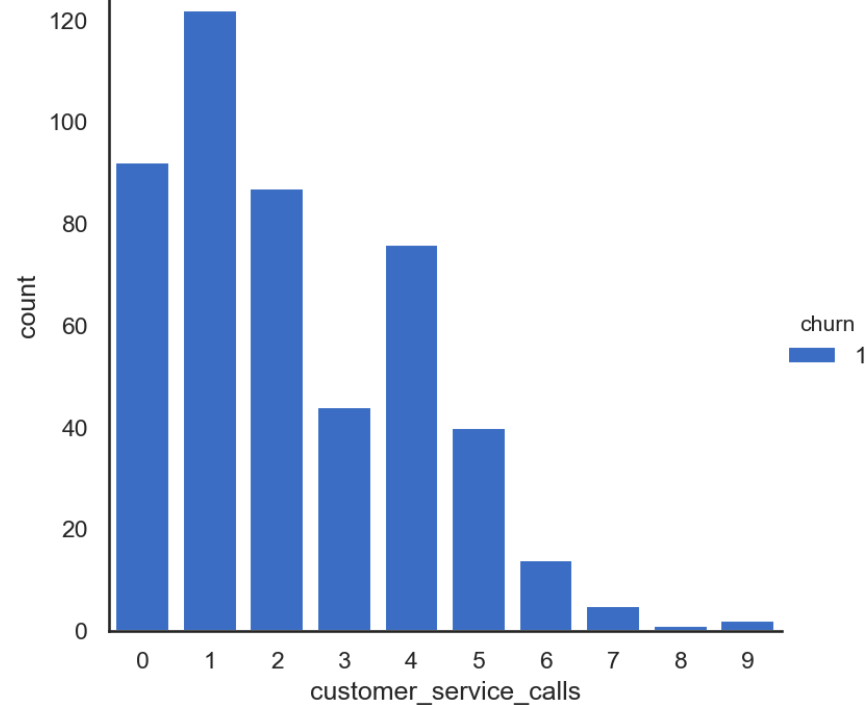- Having an international plan

Feature Importance Computed with SHAP Values

EVALUATION – TOTAL DAY MINUTES

Total Day Minutes for Stay vs. Churn

Metric	No Churn	Churned
Median	177.2 mins	217.6 mins
Mean	175.2 mins	206.9 mins

Customers who spent more time on the phone during the day are more likely to churn. Churners tended to average more daytime minutes, specifically over 200 minutes

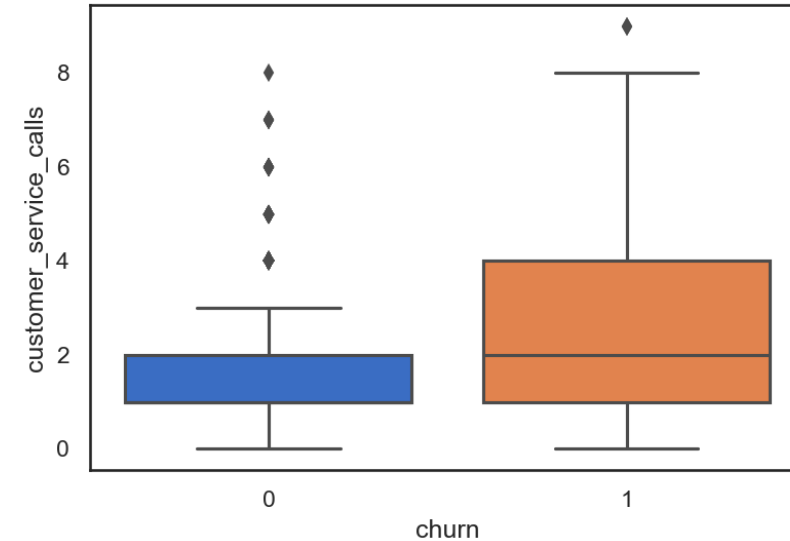✓ **Prioritize research on needs of heavy daytime minutes users**

EVALUATION – CALLS TO CUSTOMER SERVICE

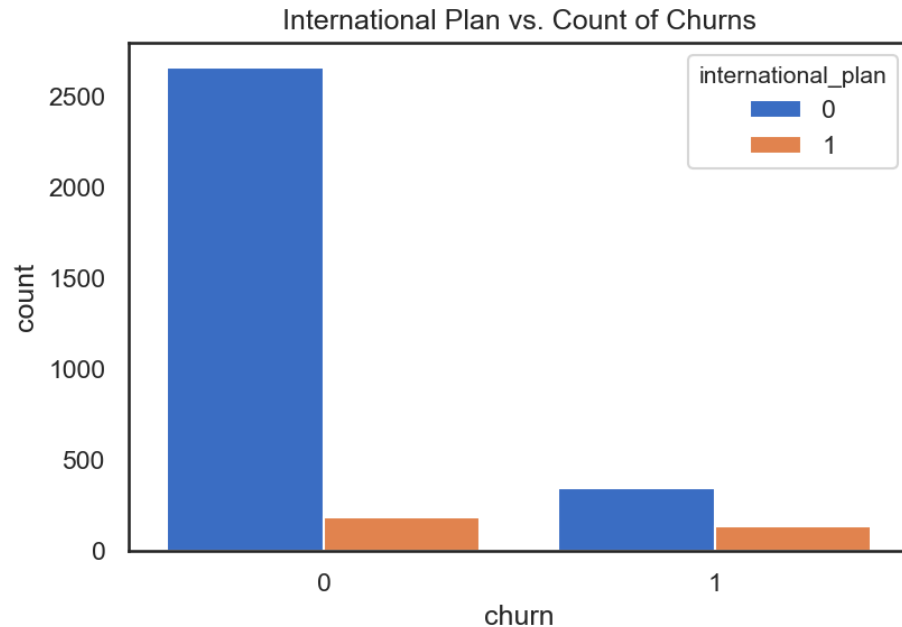Count of No. of Customer Service Calls for Churned Customers

Churn vs. No. Customer Service Calls
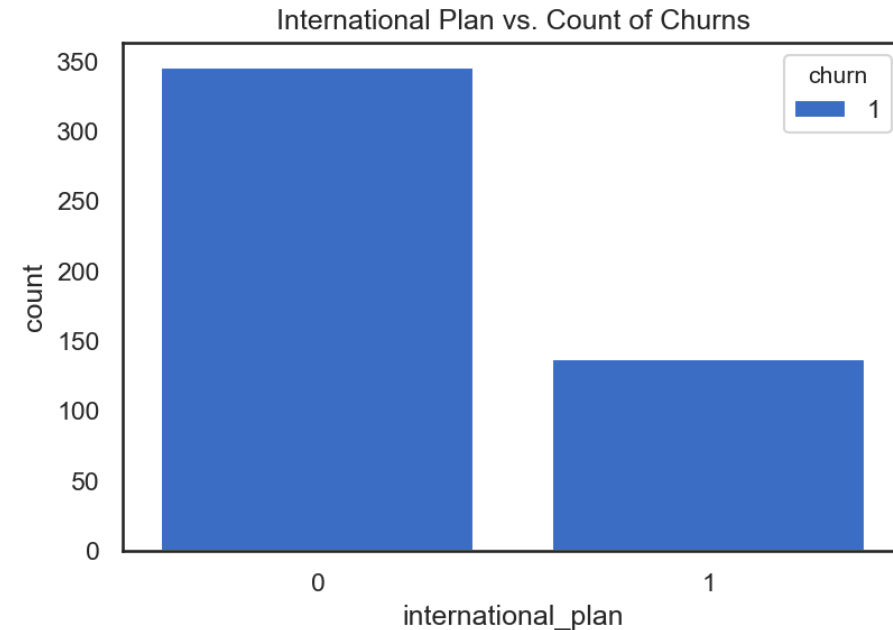
Most churners called customer service at least once.

✓ **Treat all calls to customer service as an opportunity for improving customer satisfaction**

EVALUATION – HAVING AN INTERNATION PLAN

International Plan vs. Count of Churns

International Plan vs. Count of Churns

32% of churners have an international plan, compared to about 7% of non-churners

✓ Determine if international plans are meetings customers needs.

CONCLUSION

- While region did not appear to have much influence on customer churn, several other factors did.

- Determine opportunities to improve satisfaction for customers who:
  - Are heavy daytime minute users
  - Are international plan users
  - Call customer service

FUTURE WORK

1. Explore more types of classification algorithms

2. Further investigation into the different methods of determining feature importance

3. Investigate features beyond the top 3

THANK YOU

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ADDITIONAL INFORMATION CAN BE FOUND AT

HTTPS://GITHUB.COM/CMFRITZ/TELECOM_CHURN_PROJECT