

# Predicting Customer Churn in the Telecom Industry

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# Business Understanding

- Companies lose millions due to customer churn. Understanding why customers leave can help businesses take action to retain customer.
- The goal is to predict churn and identify key factors driving customer exits.

# Problem Statement & Objectives

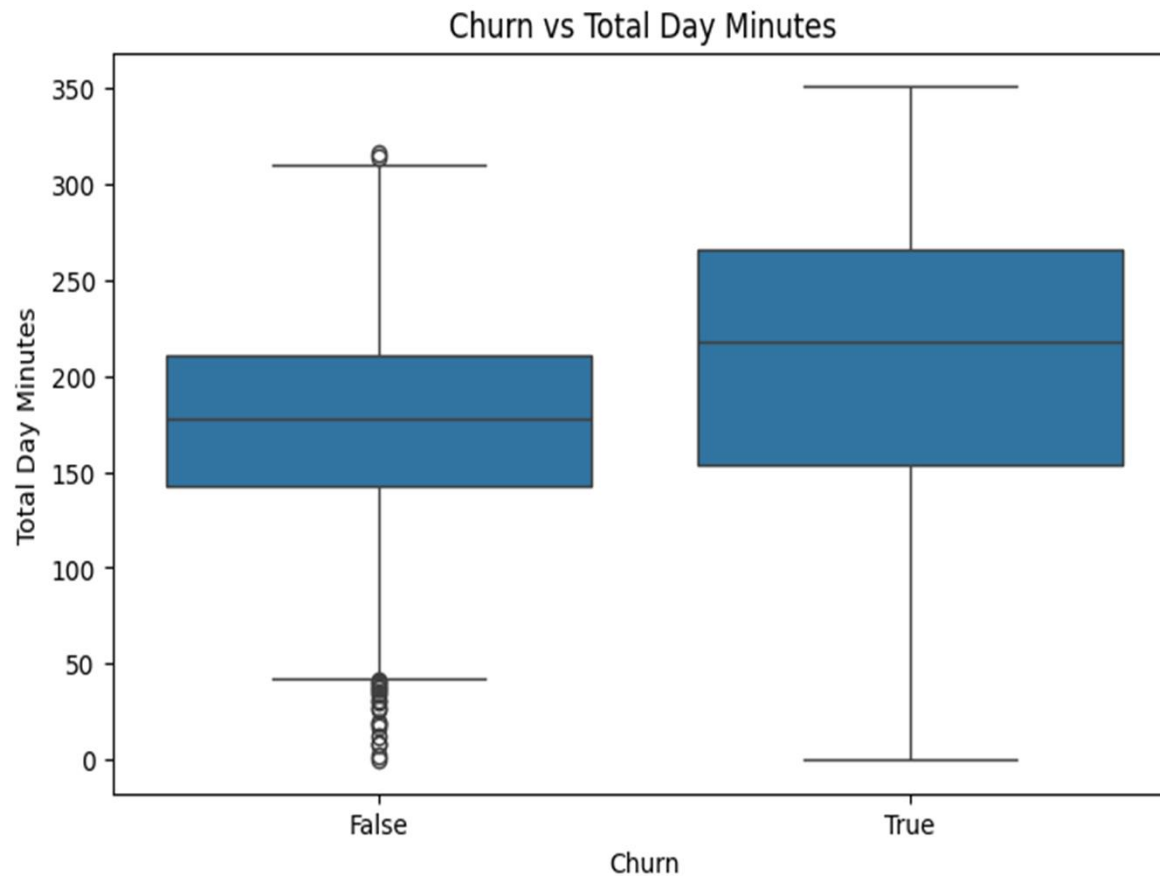
- **Problem:** How can we predict customer churn using historical data?

## Objectives:

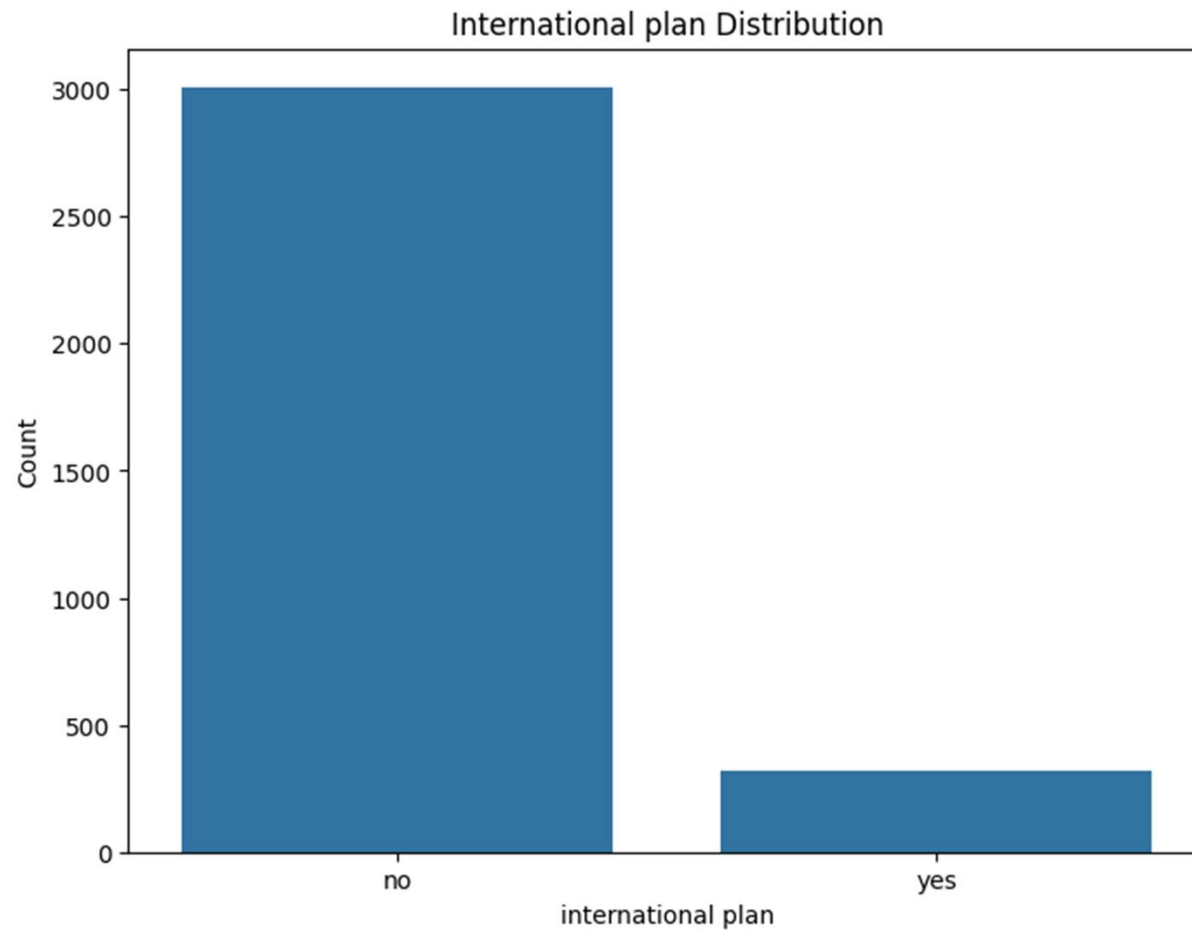
- Build a classification model to predict churn.
- Compare multiple models to find the best performer.
- Provide actionable recommendations to reduce churn.

# Exploratory Data Analysis (EDA)

- Customers with higher total day minutes tend to churn more.



# International Plan users show a higher churn rate.



# Data Preprocessing

- **Encoding** - Converted categorical features e.g. international plan to numeric values.
- **Scaling** - Standardized numerical features.
- **Feature Selection** - Dropped highly correlated and irrelevant features using VIF.
- **Train-Test Split: 80% training, 20% testing.**

# Models Tested

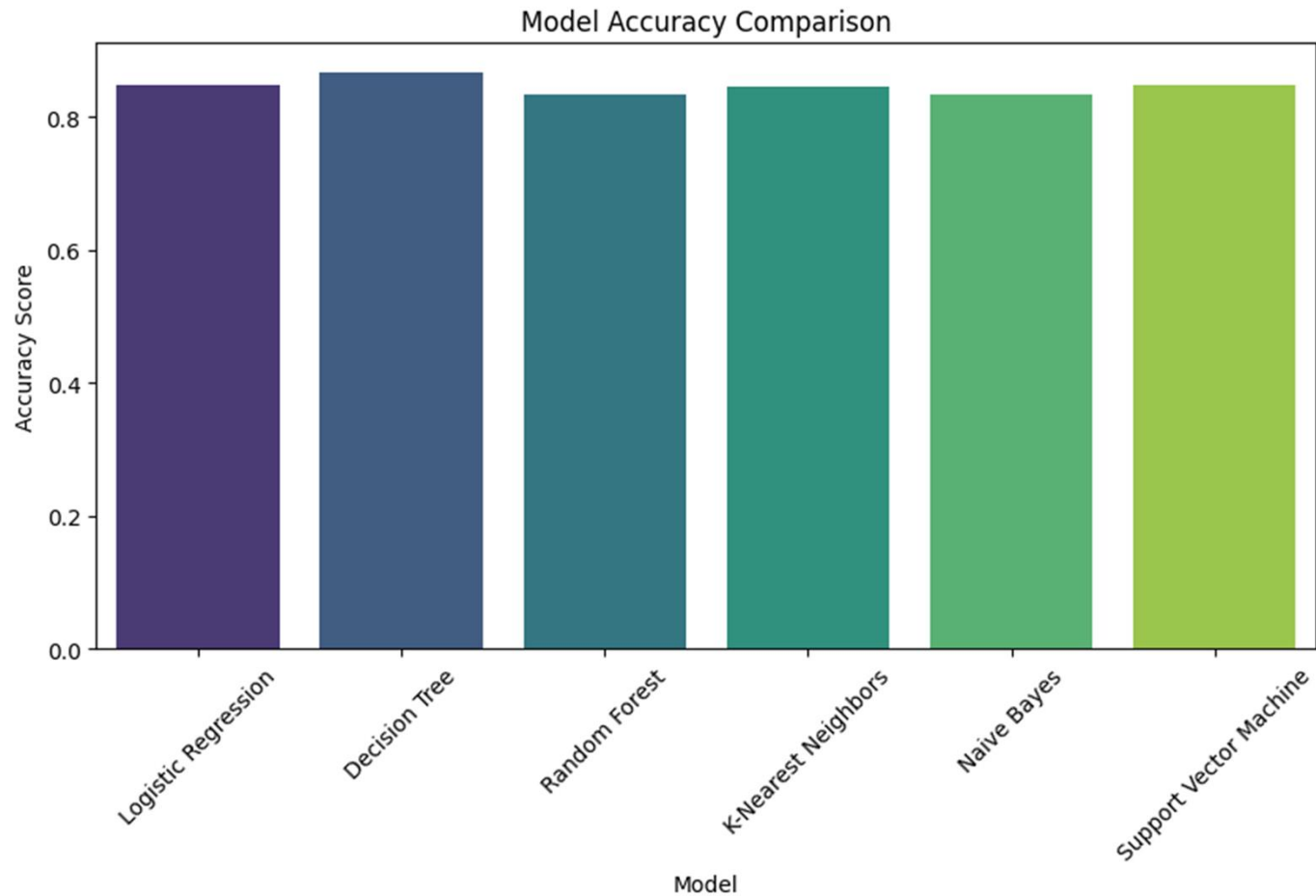
- Logistic Regression
- Decision Tree
- Random Forest (Best Model)
- K-Nearest Neighbors (KNN)
- Naïve Bayes
- Support Vector Machine (SVM)

# Model Performance Comparison

- Decision tree achieved the highest accuracy 87%.
- Decision Tree had competitive accuracy but lower recall.
- SVM failed to predict any churn cases.
- Recall for churners was low, indicating difficulty in identifying churners.



# Model Accuracy Comparison



# Hyperparameter Tuning

- Optimized decision tree and random forest models.
- Best model-Random forest with an accuracy of 88 and recall churn of 29%.
- Churners are difficult to detect - Model recall needs improvement.

# Recommendations

- 1. Fix Customer Service Issues-**Customers who frequently contact customer service seem more likely to churn. The company should analyze complaints, do follow ups and improve support quality to reduce frustration.
- 2. Give customers a reason to stay-** The company should offer targeted discounts, loyalty rewards, or better service packages to high risk customers.
- 3. Make International Plans more appealing- Provide** competitive pricing or exclusive benefits to international plan users as they are likely to churn.
- 4. Improve Churn Prediction-The** model misses many customers who leave. Refining data, exploring new techniques, and continuously updating it can help identify more at-risk customers.

# Conclusion

- Random Forest model performs best, with 88% accuracy. However, its recall for predicting churners is only 29%, meaning it struggles to identify many customers who are about to leave. We need to take extra steps beyond just relying on predictions.
- At the end of the day, happy customers stay longer. By addressing frustrations early, offering real value, and improving prediction accuracy, the company can build lasting customer relationships.

# Thank you!

- **QUESTIONS?**
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