

CLIENT CHURN RATE FOR SYRIA TELECOMUNICATIONS.

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Leveraging Data Science to Enhance
Customer Retention Strategies





ABSTRACT

- Customer churn is a significant challenge in the telecommunications industry, impacting revenue and customer satisfaction.
- Metrics related to customer churn are crucial for telecom companies to enhance customer retention strategies and maintain profitability..
- Customer churn in the telecommunications sector can be classified into different categories to better understand its underlying causes

Types of Customer Churn in Telecom

- **Voluntary Churn:** Happens when customers switch providers or cancel services voluntarily.
- **Contracual churn** :Occurs when customers do not renew their subscription contracts.



The Problem: Customer Churn

- **High Customer Churn Rate:** SyriaTel is experiencing severe customer churn, which can result in revenue loss and higher acquisition expenses.
- **Costly Customer Acquisition:** Getting new customers to take the place of those lost due to churn is costly and has an influence on the company's operational costs.
- **Lack of Retention plan:** The organization does not have a thorough retention plan, which is critical for long-term success.
- **Identifying At-Risk consumers:** Effective strategies for identifying consumers at risk of churn are required in order to undertake proactive retention efforts.
- **Understanding Contributing reasons:** To build successful targeted solutions, it is critical to understand the reasons that drive client turnover.



OBJECTIVE


- -Build a machine learning model that predicts customer churn
- -Identify factors that highly contribute to churn
- -Provide inferential statistics and visualisations based on this data.

METHODOLOGY

- Data Collection
- Data Visualization and Exploratory Data Analysis
- Data Processing
- Model Creation
- Model Evaluation

MODELS USED

- Decision Tree Classifier
- Logistic Regression Classifier
- Random Forest Classifier
- XGBoost Classifier
- KNN Classifier



The dataset contains a comprehensive record of client occasional details (state and area_code) and plan specifics such as call minutes, charges, and customer service calls

Data Pre-processing Steps

- ❑ Handling missing values.
- ❑ Encoding categorical data.
- ❑ Visualizing data sets behaviour.
- ❑ Handling call imbalances.

Use Case Overview

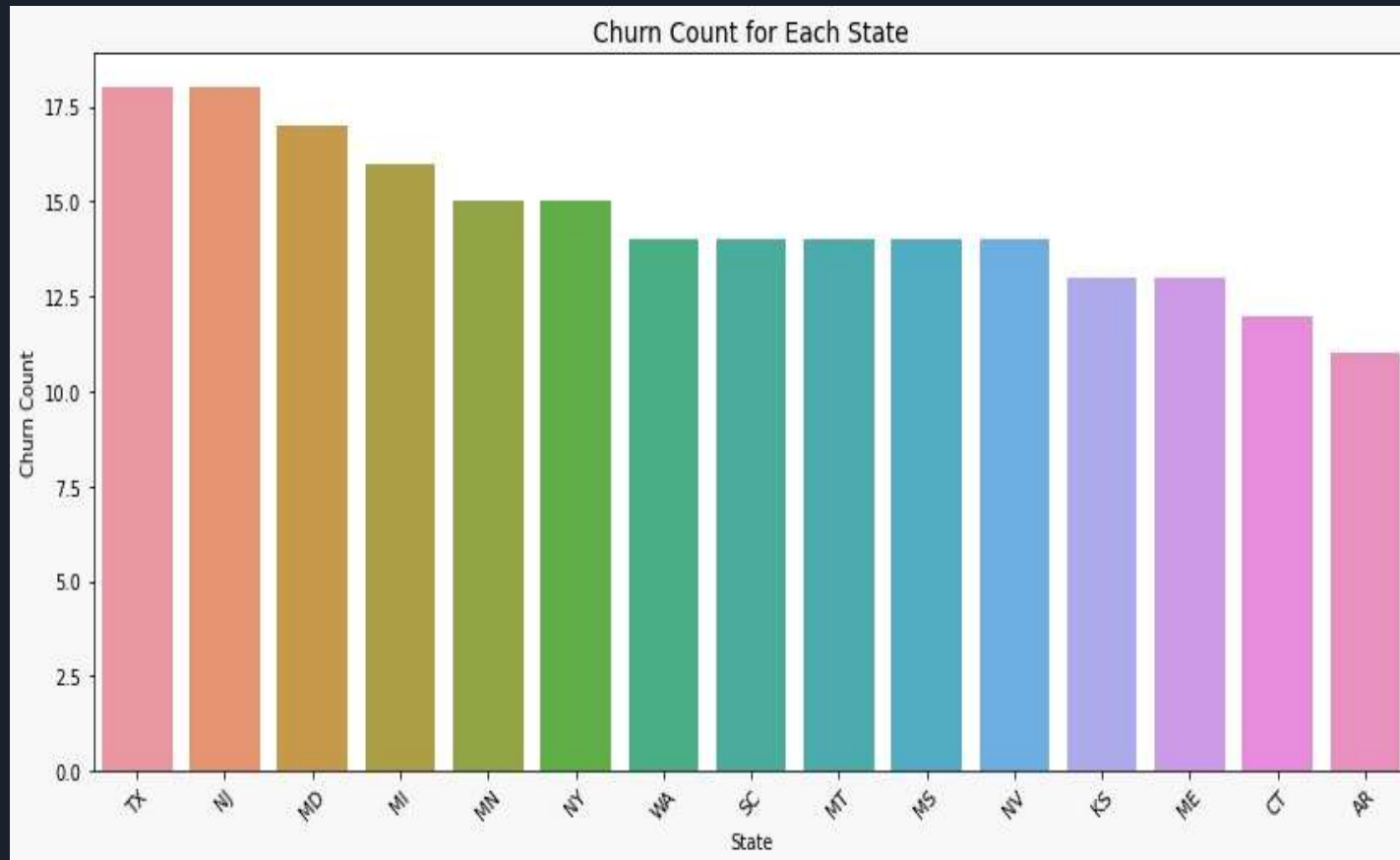
Value from knowing customer churn

Customer retention cost < Customer acquisition cost

Customer retention programs & customer service



Churn rate status for Texas has the highest churn rate followed by New Jersey



TELECOM CUSTOMER CHURN PREDICTION



MODELS USED AND SUMMARY

Multiple models within each type are built and Optimal model is selected for comparison

- Logistic Regression:** Created and compared multiple logistic regression models.
- Decision Tree:** Developed and evaluated various decision tree models.
- KNN model:** Constructed and assessed different K-nearest neighbours models.
- Random Forest:** Built and compared several random forest classifiers.
- Support Vector Machine:** Trained and evaluated various support vector machine models.
- XGBoost:** Developed and compared multiple XGBoost models.

MODELS BUILT

K-Nearest Model.

Test Accuracy: 0.8600000000
Precision: 0.8600000000
Recall: 0.8600000000
F1 Score: 0.8600000000

	precision	recall	F1 score	support
0	0.86	0.75	0.75	56
1	0.86	0.86	0.86	35

Classification Report:

	precision	recall	F1 score	support
0	0.86	0.75	0.75	56
1	0.86	0.86	0.86	35

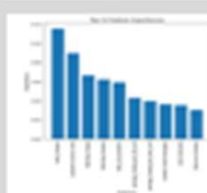
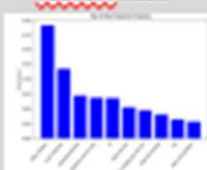
Accuracy: 0.8600000000
Confusion Matrix:
[[56 0]
[0 35]]

Classification Report:

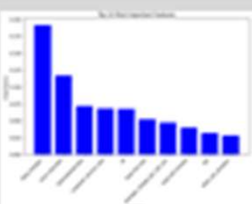
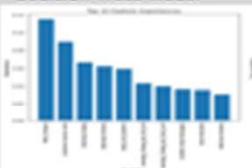
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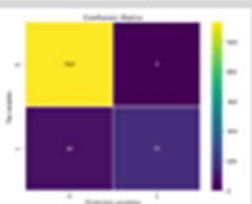
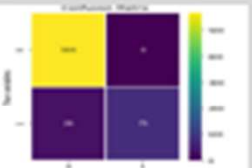
XGBoost model



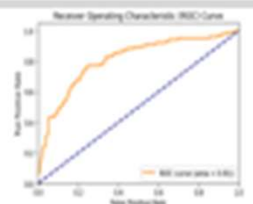
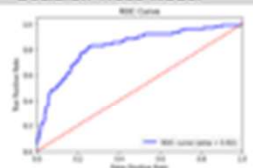
Decision Tree Model



Decision Tree Model



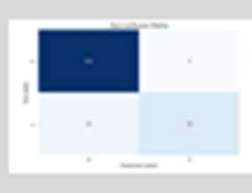
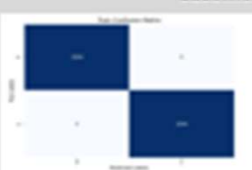
Decision Tree Model



Before tuning

After tuning

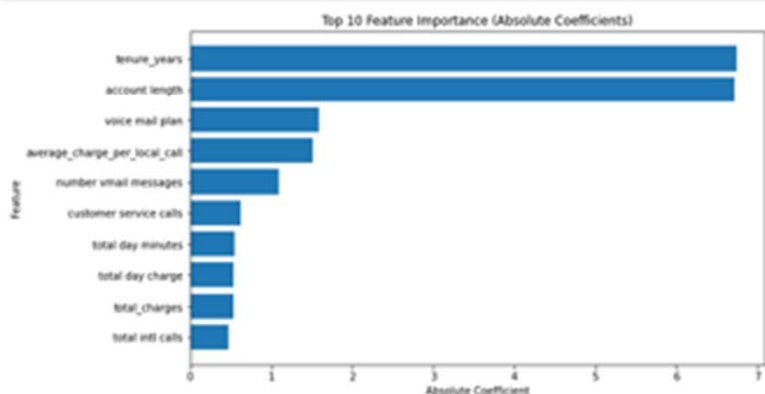
baseline model accuracy



TELECOM CUSTOMER CHURN PREDICTION

MODEL COMPARISON & ANALYSIS

- **XGBoost Classifier:** High accuracy, recall, precision, and F1 score on both training and test datasets.
- **Decision Tree Classifier:** Strong performance with high accuracy and recall on training and test datasets.
- **Other models' performance** not provided for direct comparison.



SUMMARY

The BEST model showed significant enhancements in performance metrics, with tenure years, account length, and voice mail plan emerging as the most influential features

CONCLUSION

Significant Variables Impacting Churn:

- *Type & Tenure of Contract

Factors Contributing to High Churn:

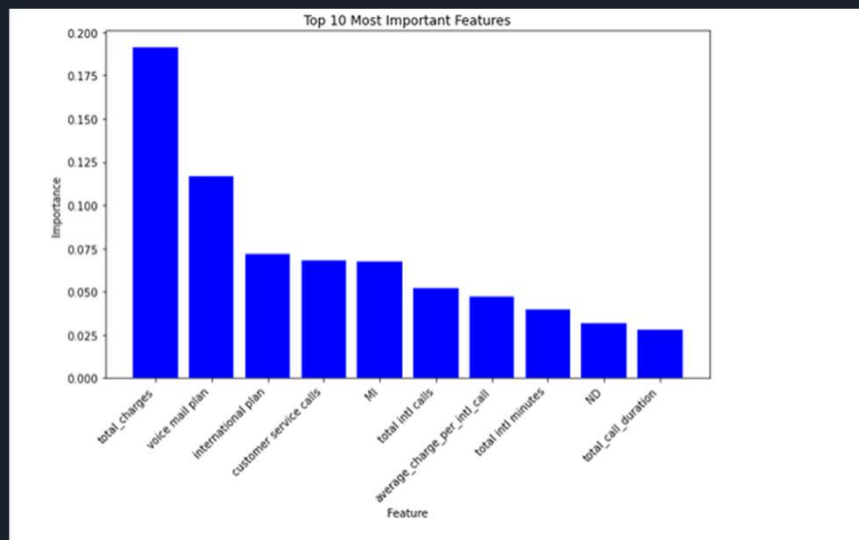
- *Lack of Dependents
- *Expensive phone services are more likely to churn.
- *Customers with single line services.

Recommendations for Retaining Customers:

- *Targeted Customer Promotion
- *Promote Long-Term Contracts
- * Market Combo (Multi-Service) Offerings.

RESULT

XGBOOST MODEL



CONCLUSION

Feature importance

From the feature importance plot **total charges**, **voice mail plan** and **international plan** were the top three features that highly impact churn. And for state Michigan also came out as an important feature.



CONCLUSION

- Based on the two predictive models we created, the one we created with Random Forest Classifier would be a better choice as it has better performance.
- With the existing consumer insights through data, companies can predict customers' possible needs and issues, define proper strategies and solutions against them, meet their expectations and retain their business.
- Based on the predictive analysis and modelling, businesses can focus their attention with targeted approach by segmenting and offering them customized solutions.
- Analysing how and when the churn is happening in customer's lifecycle with the services will allow the company to come up with more preemptive measures.



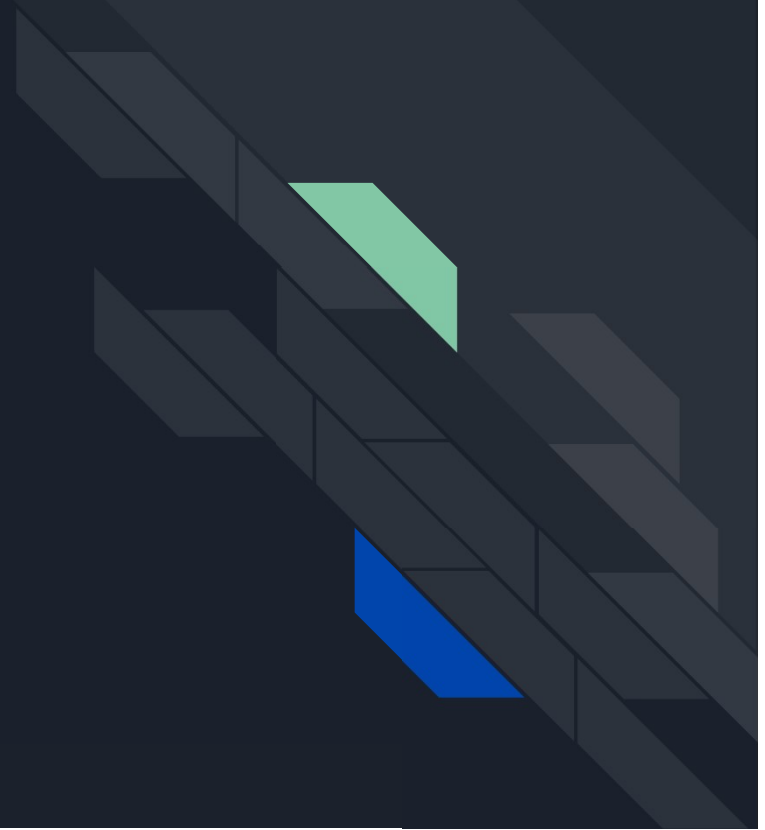
Recommendations

- Enhance Service Quality:
 - Improve service quality for key features like total charges, voice mail plans, and international plans to meet or exceed customer expectations.
- Personalized Offerings:
 - Tailor personalized offerings or promotions targeting at-risk customers, such as discounts on international plans or voice mail services, to encourage customer retention.
- Customer Engagement:
 - Implement strategies to increase engagement and satisfaction through personalized communication, prompt feedback addressing, and timely customer support.

Takeaways

- Addressing identified features can help mitigate churn and improve overall customer satisfaction.
- Personalized offerings and enhanced customer engagement are crucial for fostering loyalty and reducing churn rates.

THANK YOU



Dataset Overview

Churn

Customer products

Customer account
info

Customer
demographic

Supervised
learning

Classification
model

Phone service (flag)

- Total day charge total day minutes
- total eve minutes
- total eve calls
- total eve charge
- total night minutes
- total night calls
- total night charge
- total intl minutes
- total intl calls
- total intl charge

- Total charges
- Number vmail message
- Voice mail plan
- International plan

- State of the customer
- Account active days
- Area code
- Phone number



Problem:

Customer churn and its impact on businesses

Objectives of the Study

- Build a machine learning model that predicts customer churn.
- Identify factors that highly contribute to churn.
- Provide inferential statistics and visualizations based on this data.
- Understand Customer Behaviour
- Conduct Feature Importance Analysis

MODEL COMPAR

MODELS USED AND SU

Multiple models within each type are b







