Customer Churn Prediction – Business Insight Report

1. Business Problem

Customer churn is a critical challenge for telecom companies, as losing existing customers directly impacts revenue and increases acquisition costs. The objective of this project is to identify customers who are likely to churn so that proactive retention strategies can be applied in advance.

2. Data Overview

The dataset contains customer behavioral information such as call usage patterns, international and voicemail plans, and customer service interaction frequency. The target variable indicates whether a customer churned or not. Approximately 15% of customers in the dataset have churned, making this an imbalanced classification problem.

3. Key Insights from Exploratory Data Analysis

- Customers with frequent customer service calls show a significantly higher likelihood of churn.
- Customers subscribed to international plans churn at a higher rate compared to others.
- Higher international call charges and higher daytime usage are associated with increased churn risk.

4. Model Strategy & Selection

Multiple machine learning models were evaluated. Logistic Regression was used as a baseline model with threshold tuning to improve churn recall. A Random Forest model was then trained to capture non-linear relationships and feature interactions. The Random Forest model achieved superior overall performance with a ROC–AUC score of 0.88.

5. Final Model & Business Impact

The final model chosen is a Random Forest classifier with a tuned decision threshold of 0.35. This model achieved a churn recall of 79% while keeping false positives at a manageable level. This balance allows the business to identify most churn-risk customers while controlling the cost of retention campaigns.

6. Recommendations

- Prioritize retention efforts for customers with frequent customer service interactions.
- Review pricing and service quality for international plan users.
- Use churn probability scores to segment customers and design cost-effective retention strategies.