#### ## Problem Statement

In the highly competitive telecom industry, customers frequently switch between service providers, leading to an annual churn rate of 15-25%. With customer acquisition costing 5-10 times more than retention, retaining existing customers is crucial for sustaining profitability. For many telecom operators, keeping high-value customers is a top priority.

To address this challenge, telecom companies must predict which customers are at high risk of churning, enabling proactive retention strategies.

#### ## OBEJCTIVE

- Churn Prediction: To forecast whether a high-value customer is likely to churn in the near future. This allows the company to take proactive measures, such as offering special plans or discounts, to retain those customers.
- **Key Driver Identification**: To identify the most important variables that strongly predict churn. Understanding these factors helps reveal why customers are switching to other networks, guiding targeted retention strategies.

### General Overview

## Dataset Reduction:

- ► The original dataset comprised **226 variables**. Through comprehensive feature engineering and exploratory data analysis (EDA), this was streamlined to **130 variables**.
- ▶ **Dependent Variable**: The target variable indicating potential customer churn was defined based on the 70th percentile of the average recharge amounts in the 6th and 7th months. This segmentation helps in identifying customers likely to churn.

- Recommendations
- Service Usage Patterns:
  - ▶ Action Phase vs. Good Phase: Customers who significantly reduce their service usage during the action phase, compared to the good phase, are at a higher risk of churning.
- STD\_OG Service Usage:
  - ▶ High usage of STD\_OG services during the good phase could be a churn indicator, potentially due to competitive pricing or network-related issues.

# •Revenue Monitoring:

- •Track the average revenue per user. A noticeable decline in consumption may signal potential churn.
- •Recharge Behavior:
- •Set up alerts for customers whose recharge amounts decrease in the action phase compared to the good phase. This behavior is a potential churn indicator.
- •Age on Network (AON):
- •Newer customers (with a lower AON) are more susceptible to churn, possibly due to adaptation challenges or service dissatisfaction.
- •Recharge Frequency: Customers who fail to recharge on time, despite overdue notifications, are more likely to churn during the churning phase.

#### **Model Performance**

- Minimizing False Negatives:
  - •Our focus is on reducing False Negative errors by enhancing the recall metric to ensure we correctly identify customers at risk of churning.
- Principal Component Analysis (PCA):
  - •PCA was applied to reduce the dataset dimensions, enhancing computational efficiency. Models were tested on both the PCA-reduced dataset and the original dataset.
  - PCA-Revised Data:
    - Random Forest Classifier: Achieved 85.40% accuracy on the training set and 84.77% on the test set. Recall rates were 81.21% (train) and 76.61% (test).
    - •Logistic Regression: Combined with PCA, this model showed high recall rates of 82.59% (train) and 92.54% (test), but with lower accuracy of 84.08% (train) and 58.99% (test).
- Original Dataset Models:
  - XGB-Classifier:
    - •Demonstrated exceptional performance with 95.45% accuracy and 99.61% recall on the training set, and 92.09% accuracy with 78.66% recall on the test set.
  - Logistic Regression:
    - Maintained consistent performance with 81.34% accuracy (train) and 80.45% (test), and recall scores of 82.64% (train) and 80.72% (test).

# CONCLUSION

Based on the analysis, several actionable steps can be recommended to the company to enhance customer retention and reduce churn. First, the company should implement a proactive monitoring system to detect changes in service usage patterns. Specifically, customers who exhibit a significant reduction in service usage during the action phase compared to the good phase should be flagged for targeted interventions. Additionally, the company should investigate high usage of STD\_OG services during the good phase, as this may indicate potential churn due to competitive pricing or network issues. To further mitigate churn risk, the organization should closely monitor average revenue per user and establish alerts for decreases in recharge amounts. Implementing a customer retention strategy focused on newly joined customers, who are more prone to churn, could also be beneficial. Lastly, the company should prioritize customers who fail to recharge on time despite overdue notifications, as these individuals are likely to churn. By taking these steps, the company can better identify at-risk customers, tailor retention strategies, and ultimately improve customer loyalty and business performance.