



# Telecom Churn Case Study

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# PROBLEM STATEMENT

- In the telecom industry, customers are able to choose from multiple service providers and actively switch from one operator to another. In this highly competitive market, the telecommunications industry experiences an average of 15-25% annual churn rate. Given the fact that it costs 5-10 times more to acquire a new customer than to retain an existing one, customer retention has now become even more important than customer acquisition.
- For many incumbent operators, retaining high profitable customers is the number one business goal.
- To reduce customer churn, telecom companies need to predict which customers are at high risk of churn.



# BUSINESS GOAL

- Analyse customer-level data of a leading telecom firm
- Build predictive models to identify customers at high risk of churn
- Identify the main indicators of churn.

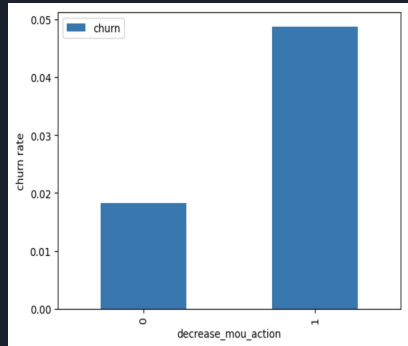


# STRATEGY

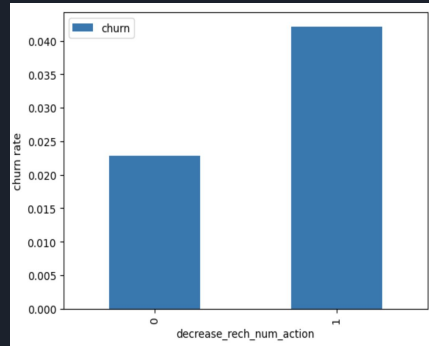
- Reading and Understanding the Data
- Handle Missing Values
- Filter High Value Customers
- Handling missing values in rows
- Check Churn Percentage
- Treat Outliers
- Derive new features
- EDA
- Train test split
- Class Imbalance - Check and handle
- Feature Scaling
- Model Building for selection - Logistic Regression, SVM, Decision tree
- Model Building for interpretation
- Evaluation on train set
- Evaluation on test set
- Recommendations

# EXPLORATORY DATA ANALYSIS (EDA)

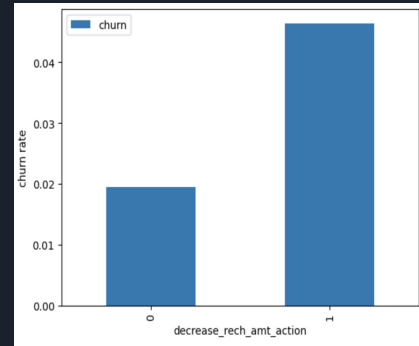
## Univariate analysis



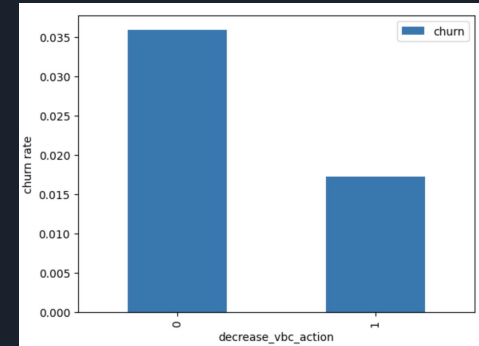
The churn rate is more for the customers, whose minutes of usage(mou) decreased in the action phase than the good phase.



The churn rate is more for the customers, whose number of recharge in the action phase is lesser than the number in good phase.



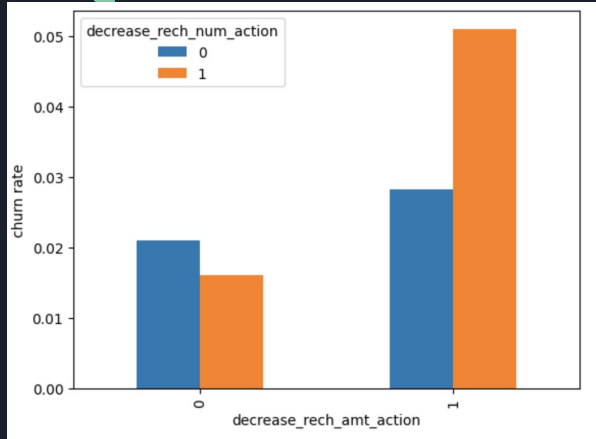
The churn rate is more for the customers, whose amount of recharge in the action phase is lesser than the amount in good phase.



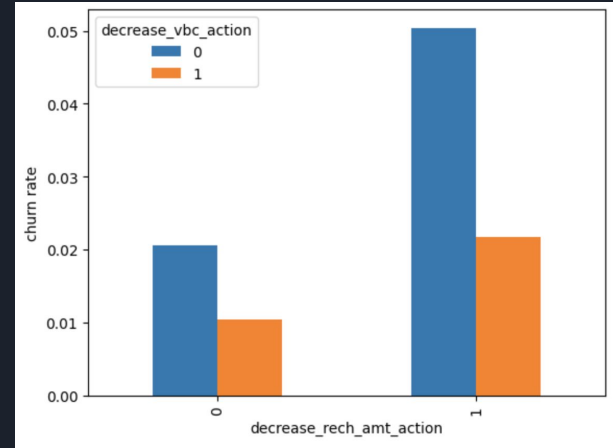
The churn rate is more for the customers, whose volume based cost in action month is increased. That means the customers do not do the monthly recharge more when they are in the action phase.

# EXPLORATORY DATA ANALYSIS (EDA)

## Bivariate analysis



The churn rate is more for the customers, whose recharge amount as well as number of recharge have decreased in the action phase than the good phase.



The churn rate is more for the customers, whose recharge amount is decreased along with the volume based cost is increased in the action month.



# MODEL BUILDING FOR SELECTION

## Logistic Regression

### Train set

- Accuracy = 0.86
- Sensitivity = 0.89
- Specificity = 0.83

### Test set

- Accuracy = 0.83
- Sensitivity = 0.81
- Specificity = 0.83

## Support Vector Mechanism

### Train set

- Accuracy = 0.99
- Sensitivity = 1
- Specificity = 0.99

### Test set

- Accuracy = 0.94
- Sensitivity = 0.31
- Specificity = 0.96

## Decision Tree

### Train set

- Accuracy = 0.90
- Sensitivity = 0.91
- Specificity = 0.88

### Test set

- Accuracy = 0.86
- Sensitivity = 0.70
- Specificity = 0.87

Logistic Regression model is selected and interpreted



# Recommendations

- Customers having decreasing incoming minutes of usage for operators T to fixed lines of T for August are more likely to churn.
- Customers having decreasing STD incoming minutes of usage for operators T to fixed lines of T for the month of August are more likely to churn.
- Target the customers, whose minutes of usage of the incoming local calls and outgoing ISD calls are less in the action phase (mostly in the month of August).
- Target the customers, whose outgoing others charge in July and incoming others on August are less.
- Customers, whose monthly 3G recharge in August is more, are likely to be churned.
- roam\_og\_mou\_8 variables have positive coefficients (0.7135). That means for the customers, whose roaming outgoing minutes of usage is increasing are more likely to churn
- Also, the customers having value based cost in the action phase increased are more likely to churn than the other customers. Hence, these customers may be a good target to provide offer.
- Customers decreasing monthly 2g usage for August are most probable to churn.