

TELECOM_CHURN ANALYSIS

By - Aishwarya Gosavi

BUSINESS PROBLEM

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- In the telecommunications industry, intense competition results in an annual customer churn rate of 15-25%. Retaining existing customers has become increasingly critical, as the cost of acquiring new customers is 5-10 times higher than the cost of retention. For many incumbent operators, the primary objective is to retain highly profitable customers.
 - To effectively reduce customer churn, telecom companies must predict which valuable customers are at risk. This project will involve analyzing customer-level data from a leading telecom firm to develop predictive models that identify at-risk customers and elucidate the key indicators of churn.

OBJECTIVE

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- **Analyze Customer-Level Data:** Conduct a comprehensive analysis of customer-level data from a leading telecom firm to uncover patterns and trends related to churn.
 - **Develop Predictive Models:** Create robust predictive models to identify customers at high risk of churn, enabling proactive retention strategies.
 - **Identify Key Churn Indicators:** Determine the primary factors contributing to customer churn, providing actionable insights for targeted retention efforts.

Definitions of Churn

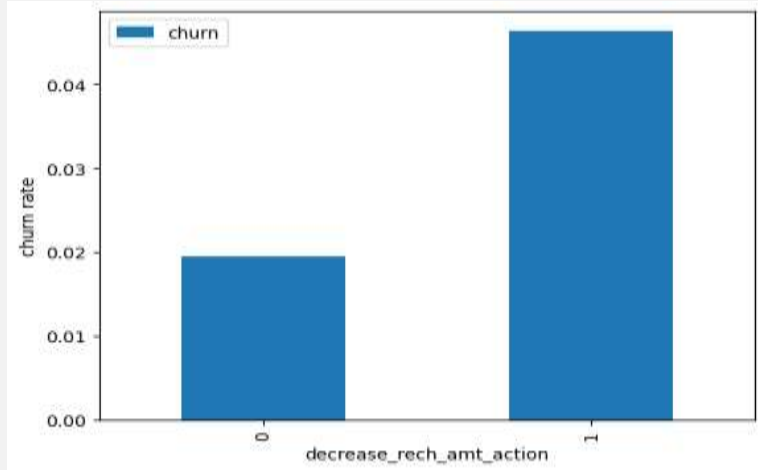
1. **Revenue-Based Churn:** Defined as customers who have not utilized any revenue-generating services (e.g., mobile internet, outgoing calls, SMS) over a specified period. A common metric is customers generating less than INR 4 in revenue monthly.

Limitation: This excludes users who primarily receive calls, such as those in rural areas.

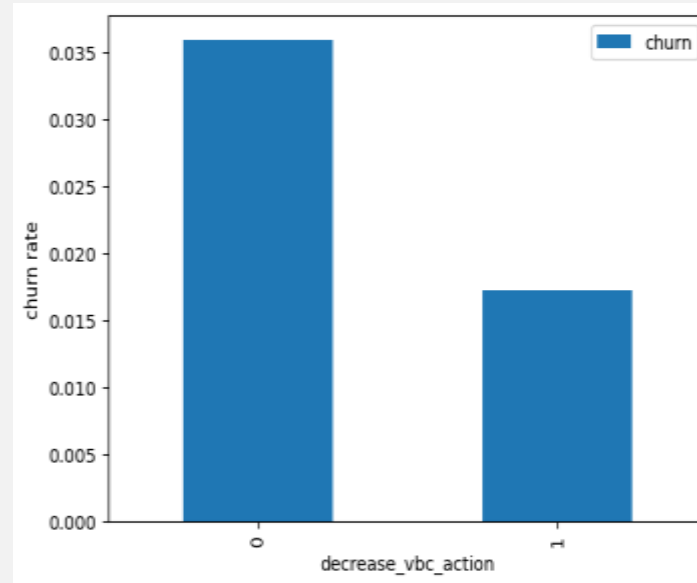
2. **Usage-Based Churn:** Defined as customers with no usage (incoming or outgoing) of services over a designated time frame.

Limitation: Identifying churn after a significant period of inactivity may be too late for intervention.

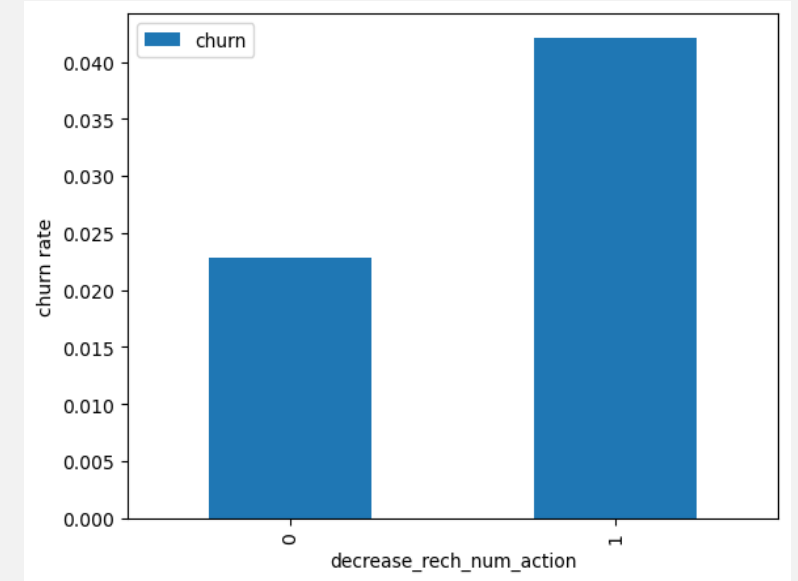
EDA - Univariate analysis



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

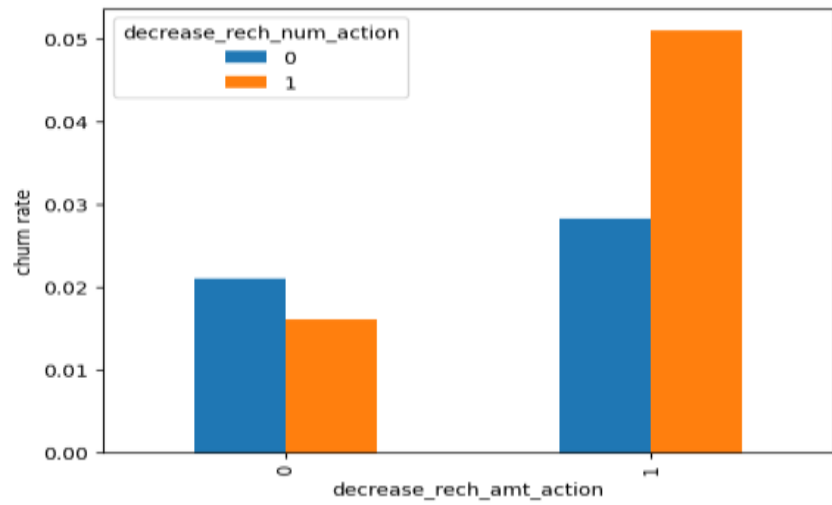


where the churn rate is higher among customers whose recharge amount during the action phase is lower than that in the good phase the amount in good phase.

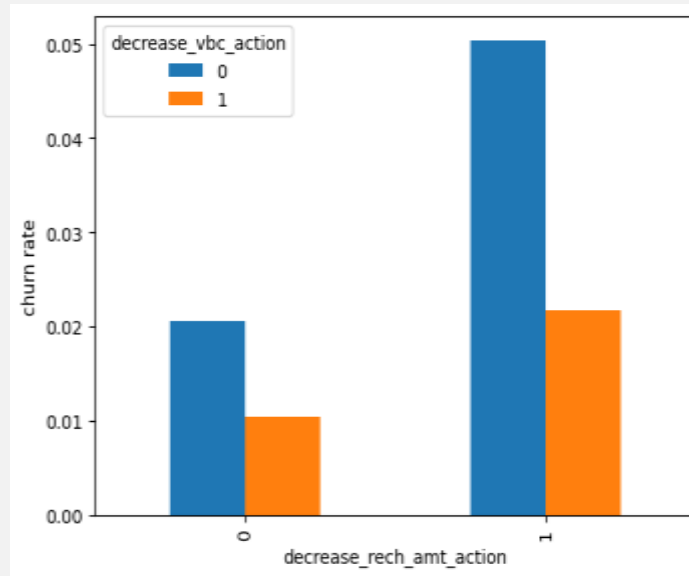


Customers with higher volume-based costs in the action month have a higher churn rate, indicating they recharge less during this phase

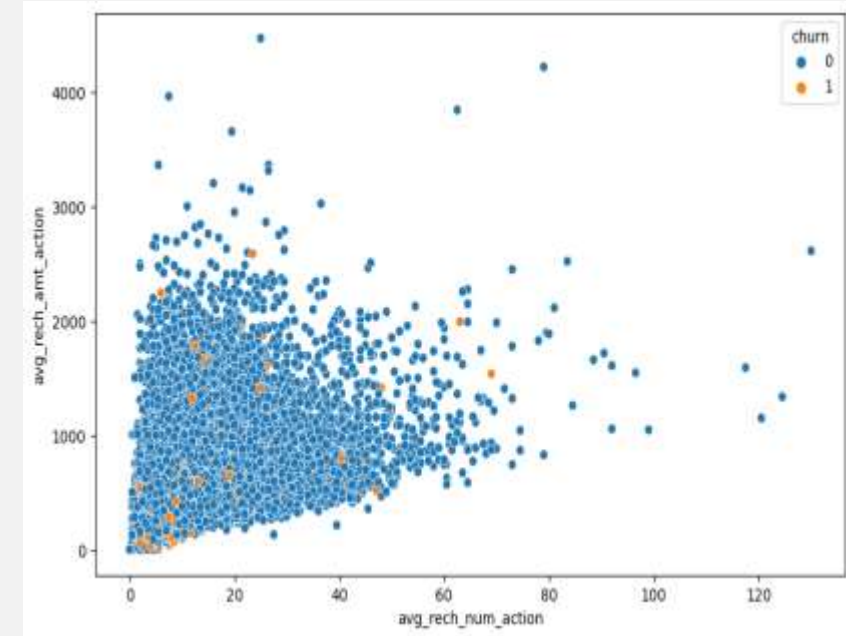
EDA - Bivariate analysis



The plot shows that churn rate is higher for customers whose recharge amount and frequency decreased during the action phase compared to the good phase.



Churn rate is higher for customers whose recharge amount decreased while volume-based costs increased during the action month



The pattern shows that recharge number and amount are largely proportional: more recharges lead to higher amounts

MODEL BUILDING

1. LOGICAL REGRESSION -

Train set

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

Test set

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

2- DECISION TREE -

Train set

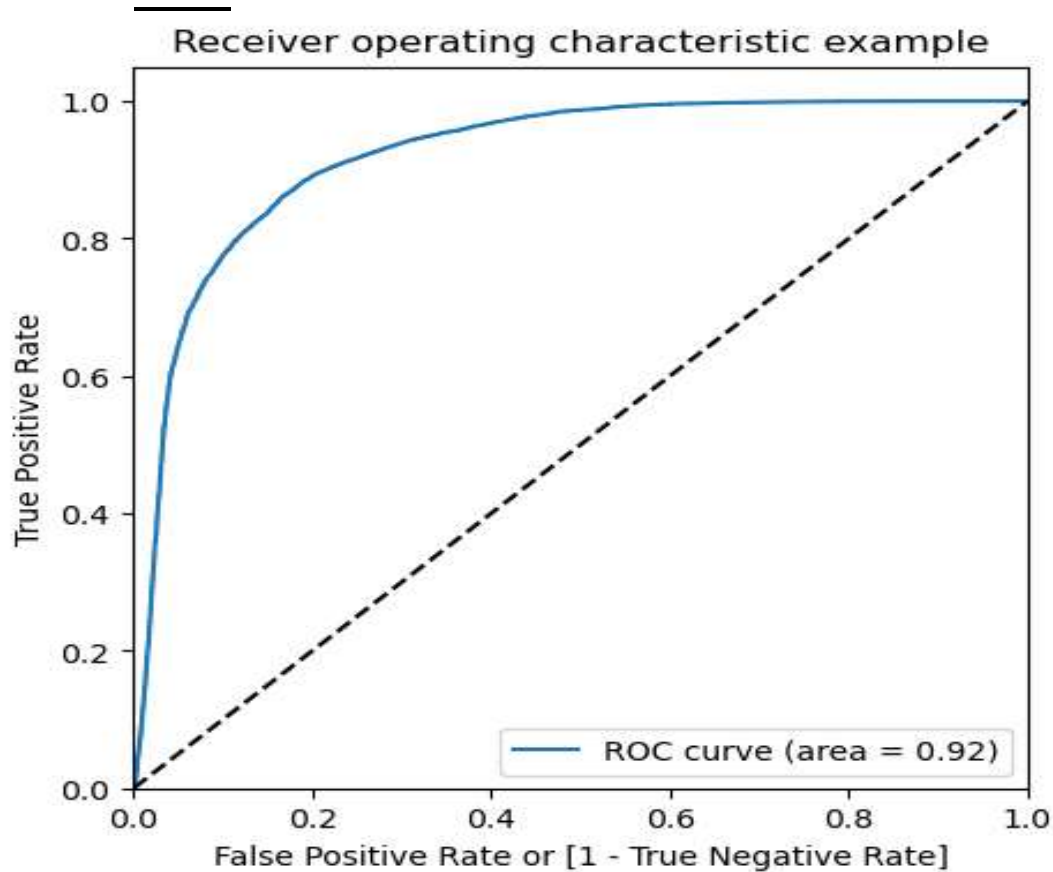
- Accuracy = 0.90
- Sensitivity = 0.91
- Specificity = 0.88

Test set

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

LOGICAL REGRESSION MODEL SELECTED AND INTERPRETED

ROC CURVE



- ROC curve shows 92 percent area under the curve.
- We achieved accuracy approx. 84 percent

RECOMMENDATIONS

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- Customers exhibiting a reduction in incoming minutes of usage from operator T to fixed lines during August are more susceptible to churn.
 - A decline in STD incoming minutes for operator T to fixed lines in August also correlates with an increased likelihood of churn.
 - It is advisable to focus on customers who demonstrate lower usage of incoming local calls and outgoing ISD calls during the action phase, particularly in August.
 - Customers with diminished outgoing charges in July and incoming charges in August should be specifically targeted.
 - Customers with increased monthly 3G recharge amounts in August are likely to be at a higher risk of churn.
 - The variable `roam_og_mou_8` indicates a positive coefficient (0.7135), suggesting that customers with rising roaming outgoing minutes are more likely to churn.
 - Customers whose value-based costs have increased during the action phase are at a higher risk of churn and may be suitable candidates for targeted offers.
 - Customers showing a decrease in monthly 2G usage in August are particularly likely to churn.