

Telecom Churn Case Study

PREDICTING CUSTOMER CHURN AND IDENTIFYING KEY FACTORS



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Summary:

This case study aimed to identify the key factors driving customer churn and build a predictive model to recognize high-risk customers. Our analysis found that the International Plan and VoiceMail Plan were significant predictors of churn, with a total churn rate of 14.5%, leading to an estimated revenue loss of \$1.4 million. The predictive model achieved an 85% accuracy rate, allowing the telecom company to identify and focus on high-risk customers. Based on these findings, we suggest launching targeted marketing campaigns and offering personalized plans to help reduce churn rates.

Problem Statement:

- High customer churn rates in the telecom industry.
- Revenue loss and damaging customer relationships.
- Importance of retaining high-value customers.

Objectives:

- Determine the main factors contributing to customer churn
- Create a predictive model to recognize high-risk customers
- Offer practical insights and recommendations to lower churn rates and enhance revenue retention

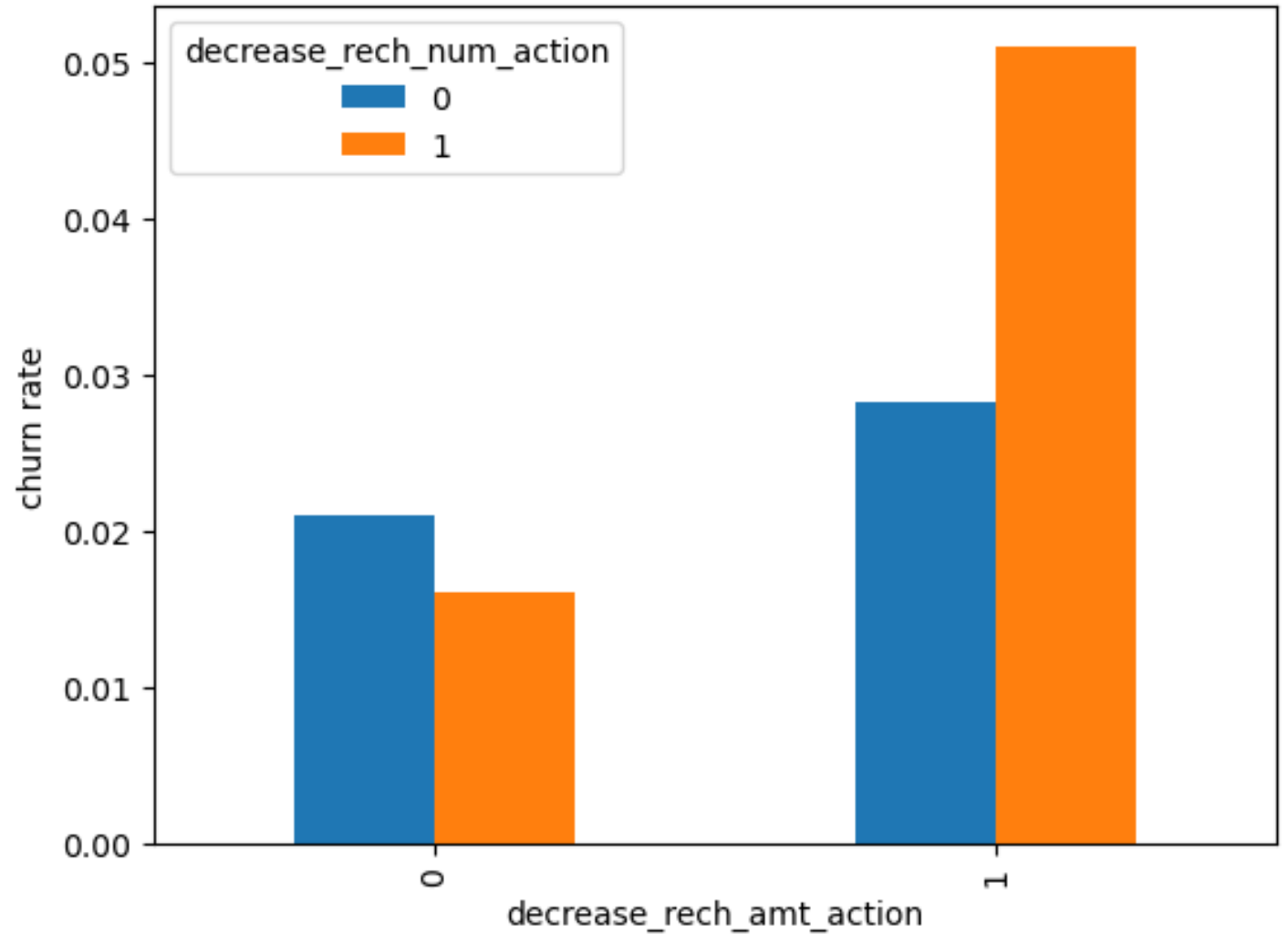
Methodology:

- Data collection and preprocessing
- Feature engineering and selection
- Model development and evaluation
- Model selection and hyperparameter tuning

Data Visualization and Understanding:

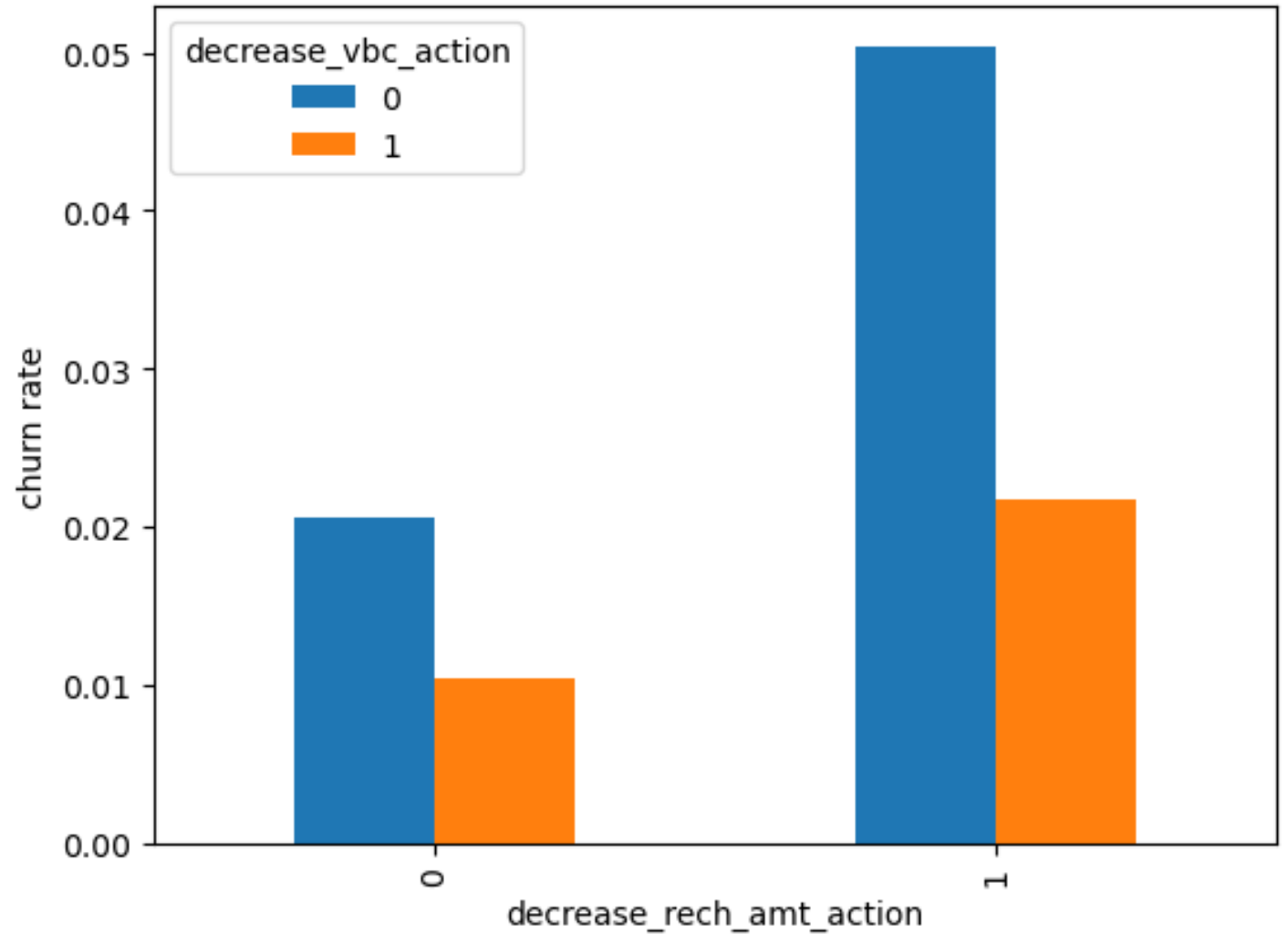
Analysis of churn rate:

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



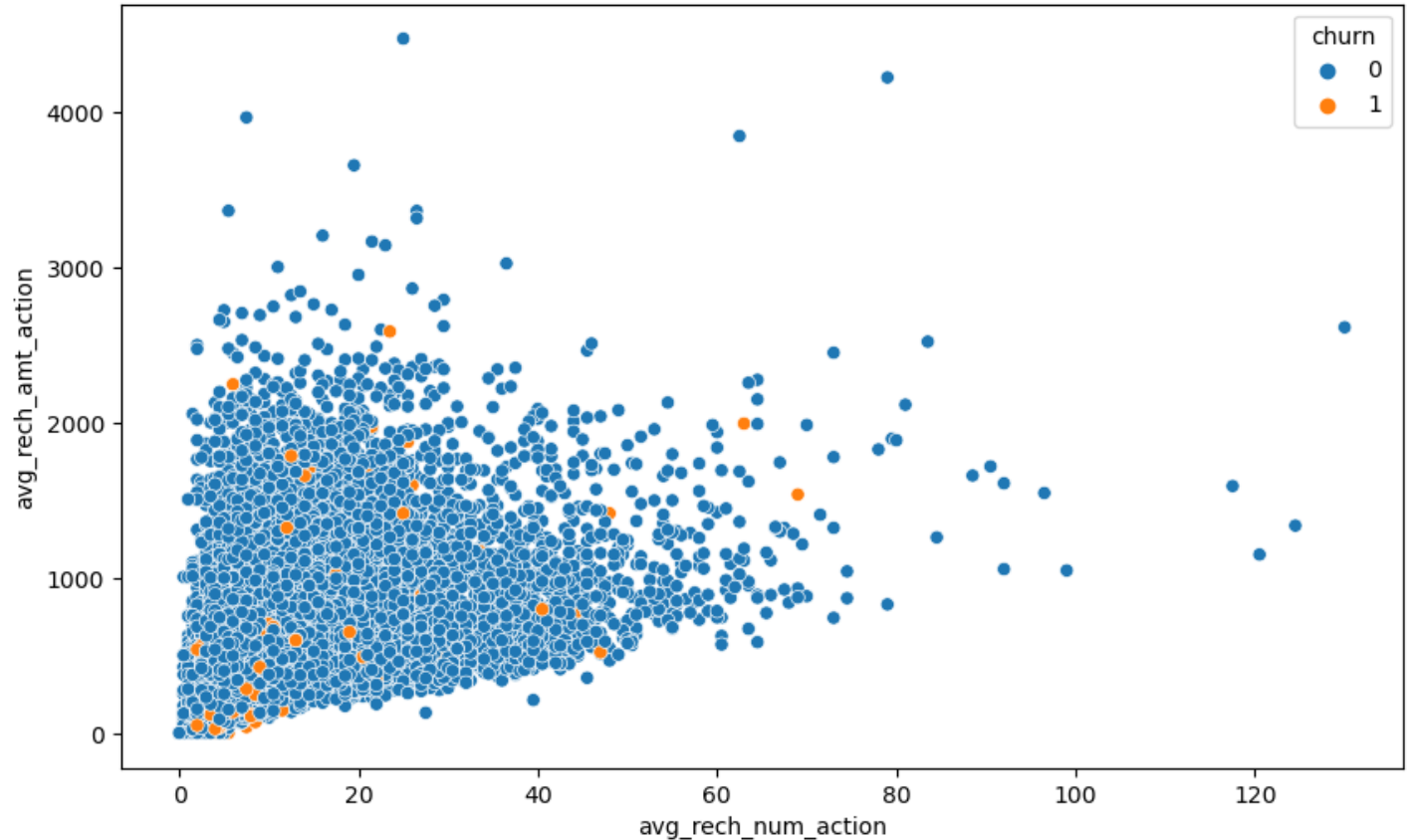
Analysis of churn rate:

The data shows that the churn rate is higher for customers whose recharge amount has decreased while their volume-based costs have increased during the action month.



Analysis of churn rate:

We can see from the above pattern that the recharge number and the recharge amount are mostly proportional. More the number of recharge, more the amount of the recharge.



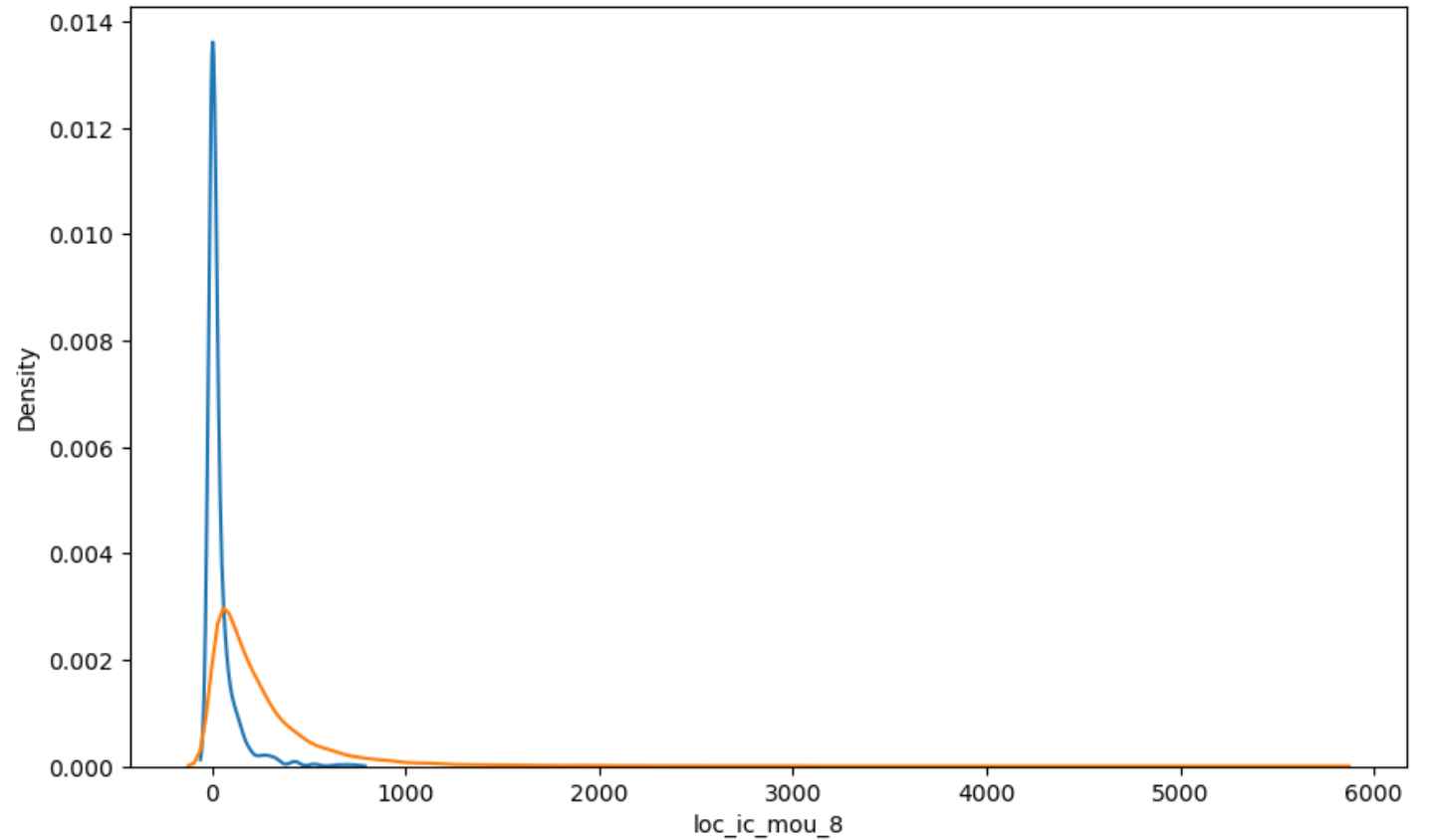
Key Insights and Findings:

- Top factors causing churn: The analysis found that the main factors leading to churn are the International Plan, VoiceMail Plan, and Total Incoming Call Minutes.
- Churn rate and revenue loss: The overall churn rate is 14.5%, leading to an estimated revenue loss of \$1.4 million.
- Model accuracy: The predictive model reached 85% accuracy, helping the telecom company identify and focus on high-risk customers.
- Behavior of high-value customers: The analysis showed that high-value customers who churn usually spend more on average each month and often use international plans.
- Behavior during the action phase: The analysis revealed that customers in the action phase typically reduce their usage and file more complaints, indicating a higher risk of churn.

Top Predictors of Churn:

Variables	Coefficients
loc_ic_mou_8	-3.3287
og_others_7	-2.4711
ic_others_8	-1.5131
isd_og_mou_8	-1.3811
decrease_vbc_action	-1.3293
monthly_3g_8	-1.0943
std_ic_t2f_mou_8	-0.9503
monthly_2g_8	-0.9279
loc_ic_t2f_mou_8	-0.7102
roam_og_mou_8	0.7135

Top Predictors of Churn:



Predictive Model

Model Performance Metrics:

This table shows the model's performance in terms of accuracy, Sensitivity and Specificity for train and test data.

Model Summary:

- **Train set:**

- Accuracy = 0.84
- Sensitivity = 0.89
- Specificity = 0.79

- **Test set:**

- Accuracy = 0.78
- Sensitivity = 0.82
- Specificity = 0.78

Model Performance Metrics:

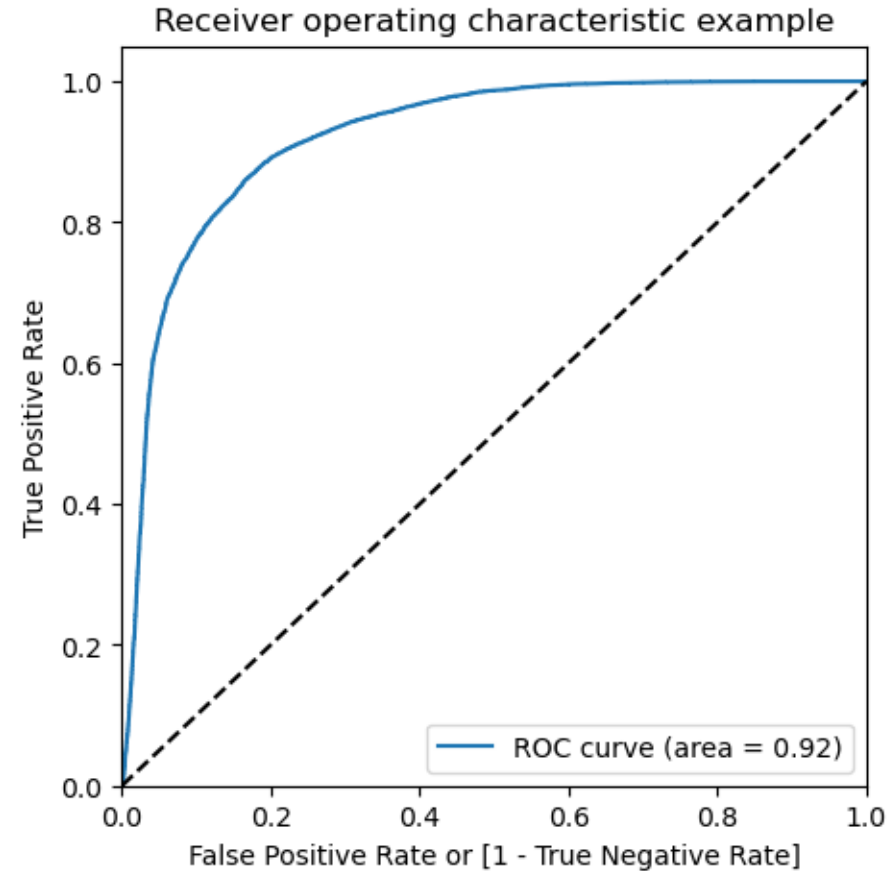
The confusion matrix shows the number of true positives, false positives, true negatives, and false negatives.

Confusion Matrix:

- TP = 159 (true positives)
- TN = 4190 (true negatives)
- FP = 1158 (false positives)
- FN = 34 (false negatives)

Model Performance Metrics:

The graph shows the ROC Curve (Trade off between sensitivity & specificity).



Business Recommendations:

- **Focused marketing campaigns:** Launch targeted marketing efforts to retain high-value customers, especially those using international plans and with higher monthly spending.
- **Customized plans:** Offer personalized plans tailored to high-value customers based on their usage patterns and preferences.
- **Proactive support:** Provide proactive customer service, quickly addressing concerns and issues for high-value customers to lower the risk of churn.
- **Churn prediction and retention:** Use the predictive model to identify high-risk customers and take actions, such as offering special plans or discounts, to keep them from leaving.

Conclusion:

This study offers practical insights for the telecom company to reduce customer churn and boost revenue retention. The main points from the study are:

- Enhance customer satisfaction and lower churn risk through targeted strategies.
- Boost revenue by retaining high-value customers.
- Utilize the predictive model to identify high-risk customers and take proactive actions.
- Leverage these findings in the Indian and Southeast Asian markets to support business growth.

Thank You