Telecom Churn Analysis and Recommendations

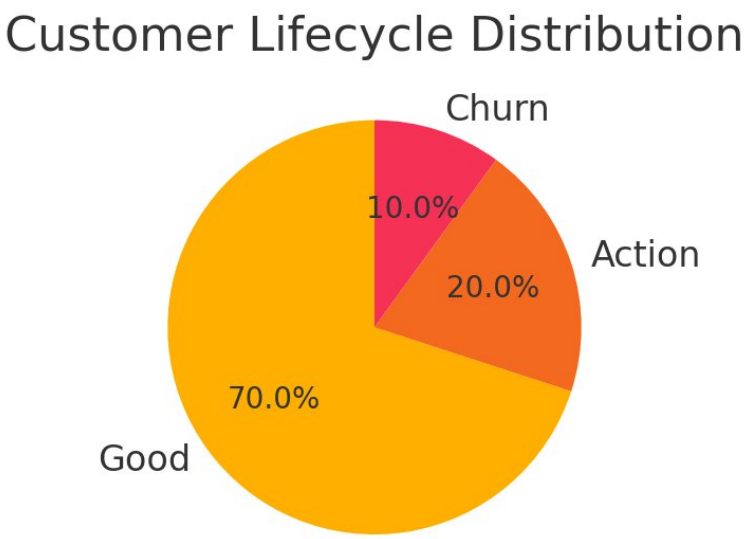
Predicting churn and ensuring customer retention

From : ***Manish Singh/Sanjay Poi/Syed Mohammad Raza***

Summary of Findings

1. Telecom industry faces a churn rate of 15-25% annually.
2. Retaining customers is 5-10 times more cost-effective than acquiring new ones.
3. Churn is defined as zero usage over a specific period.
4. Machine learning models predict churn with accuracy (85.63%).
5. Customer lifecycle: Good, Action, and Churn phases.

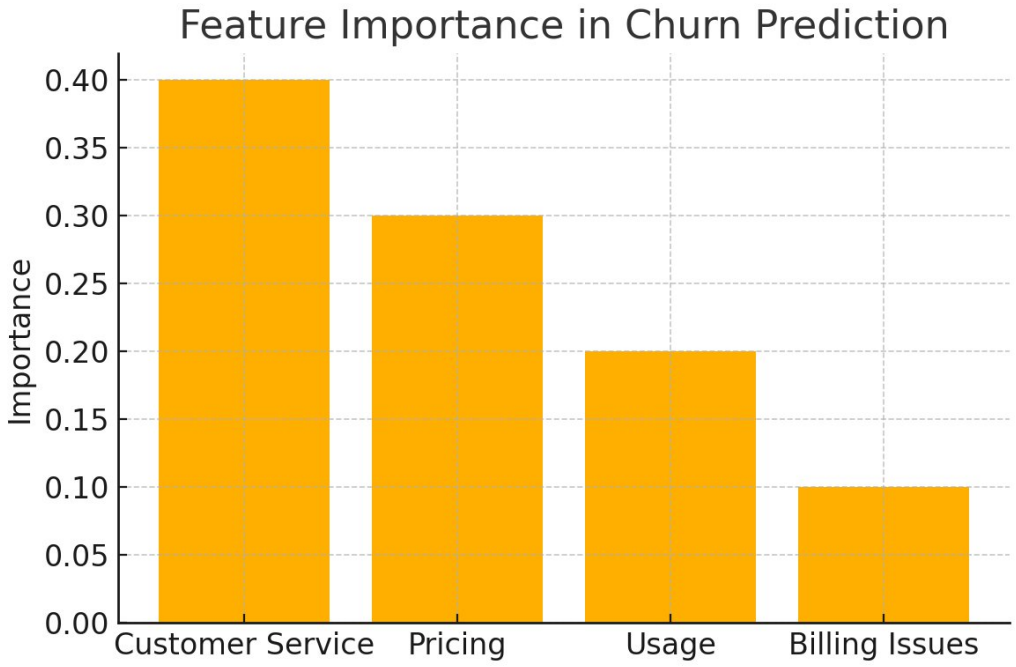
Customer Lifecycle Distribution



Recommendations

1. Focus on customers in the Action Phase for proactive retention.
2. Create personalized offers to match competitor pricing and enhance service.
3. Invest in infrastructure to improve service quality.
4. Use predictive analytics to guide retention strategies.

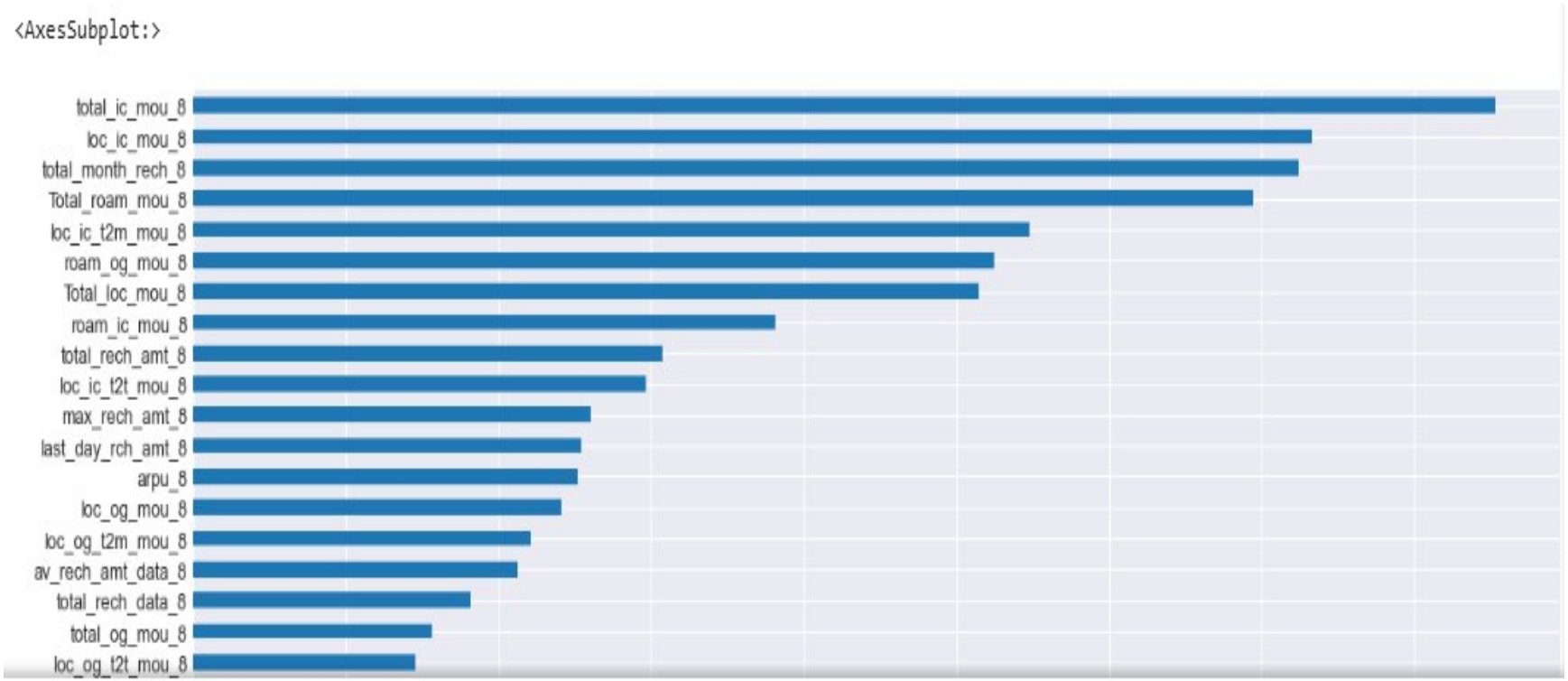
Feature Importance



Final Choice Model

Model/Metrics	Train	Test
Logistic Regression (cut-off = 0.45)		
Roc_auc_score	82.11%	81.21%
Sensitivity/Recall	86.48%	84.40%
Specificity	77.75%	78.02%
precision	79.54%	25.04%
DecisionTree (cut-off = 0.4)		
Roc_auc_score	82.41%	76.57%
Sensitivity/Recall	89.79%	78.13%
Specificity	75.03%	75%
precision	78.24%	21.38%
Random Forest (cut-off = 0.45)		
Roc_auc_score	85.60%	96.53%
Sensitivity/Recall	88.70%	77.57%
Specificity	82.50%	81.73%
precision	83.52%	26.97%
GBC		
Roc_auc_score	96.11%	80.84%
Sensitivity/Recall	100.00%	79.87%
Specificity	92.21%	81.81%
precision	92.78%	28.52%
XGB (cut-off = 0.2)		
Roc_auc_score	97.24%	80.76%
Sensitivity/Recall	99.99%	76.13%
Specificity	94.49%	85.38%
precision	94.78%	32.13%
SVM (linear C = 1000)		
Roc_auc_score	81.33%	82.62%
Sensitivity/Recall	79.91%	78.40%
Specificity	82.75%	86.85%
precision	82.25%	35.14%

Some of the top main predictors of churn are the monthly KPI features for the action phase (3rd month August).



Top 25 Features Affecting High-Value Customer Churn Action Month (Month 8) Insights:

Top Features:

1. **1. Total_ic_mou_8**: Total incoming minutes of usage.
2. **Loc_ic_mou_8**: Local incoming minutes of usage.
3. **Total_month_rech_8**: Total recharge amount.
4. **Total_roam_mou_8**: Total roaming minutes (incoming + outgoing).
5. **Loc_ic_t2m_mou_8**: Local incoming minutes to other operators.
6. **Roam_og_mou_8**: Outgoing roaming calls.
7. **Total_loc_mou_8**: Total local minutes of usage.
8. **Roam_ic_mou_8**: Incoming roaming calls.
9. **Total_rech_amt_8**: Total recharge amount.
10. **Loc_ic_t2t_mou_8**: Local incoming calls from same operator.
11. **Max_rech_amt_8**: Maximum recharge amount.
12. **Last_day_rch_amt_8**: Most recent recharge amount.
13. **Arpu_8**: Average revenue per user.
14. **Loc_og_mou_8**: Local outgoing calls minutes.
15. **Loc_og_t2n_mou_8**: Local outgoing to other operators.
16. **Av_rech_amt_data_8**: Average data recharge amount.
17. **Total_rech_data_8**: Total data recharge (MB).
18. **Total_og_t2t_mou_8**: Outgoing calls to same operator.
19. **Total_rech_num_8**: Total number of recharges.
20. **Total_rech_amt_data_8**: Total data recharge amount.
21. **Max_rech_data_8**: Maximum data recharge (MB).
22. **Avg_rech_amt_8**: Average recharge amount.
23. **Fb_user_8**: Usage of Facebook-like services.
24. **Vol_data_mb_8**: Data volume consumed (MB).
25. **Count_rech_2g_8**: Number of 2G recharges.

-> Additional Insight: Loc_og_to_ic_mou_8 (Outgoing to Incoming ratio).

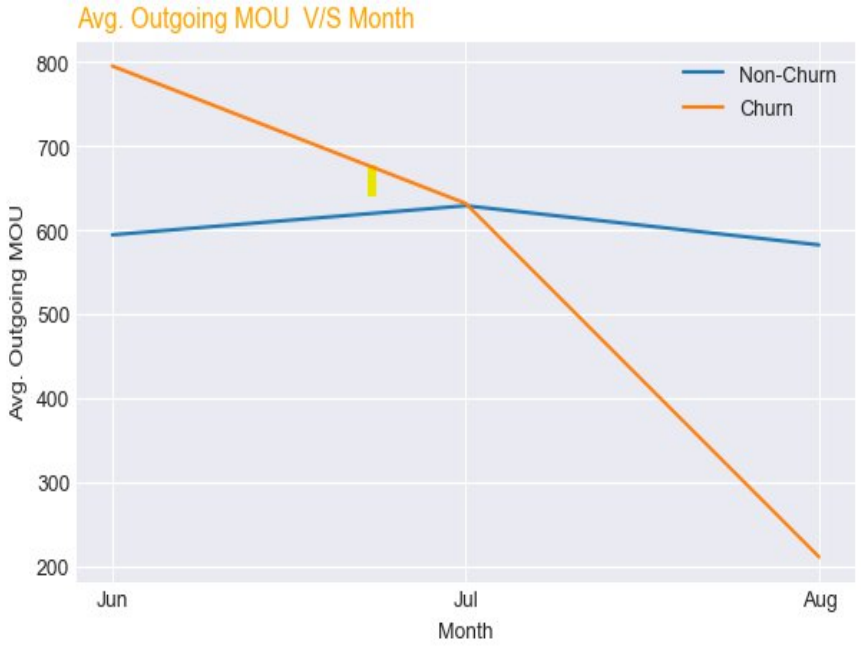
Strategies to manage customer churn :

1.It is a 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.
2. For many incumbent operators, retaining high profitable customers is the number one business goal.

Monitoring Drop in Usage :

1. Customer churn seems to be well predicted by drop in usage.
2. Aside from using the Machine Learning model for predicting churn, the telecom company should pay close attention to drop in MoU, ARPU and data usage (2g and 3g) month over month. If feasible, the company should track these numbers week over week. Since billing cycles are typically monthly, a drop in usage numbers will give the company time to react when tracked at weekly level.
3. Contact these customers proactively to find out what's affecting their experience. Perhaps, offer them coupons or other incentives to continue to use the services, while the company fixes the issues reported.
4. Marketing team must come up with campaigns which targets these high-value to-be churner.

Churners initially had higher outgoing usage, but it dropped over time, possibly due to dissatisfaction with tariffs, call quality, or network coverage—an area for further investigation by the provider.



Strategy Suggestions:

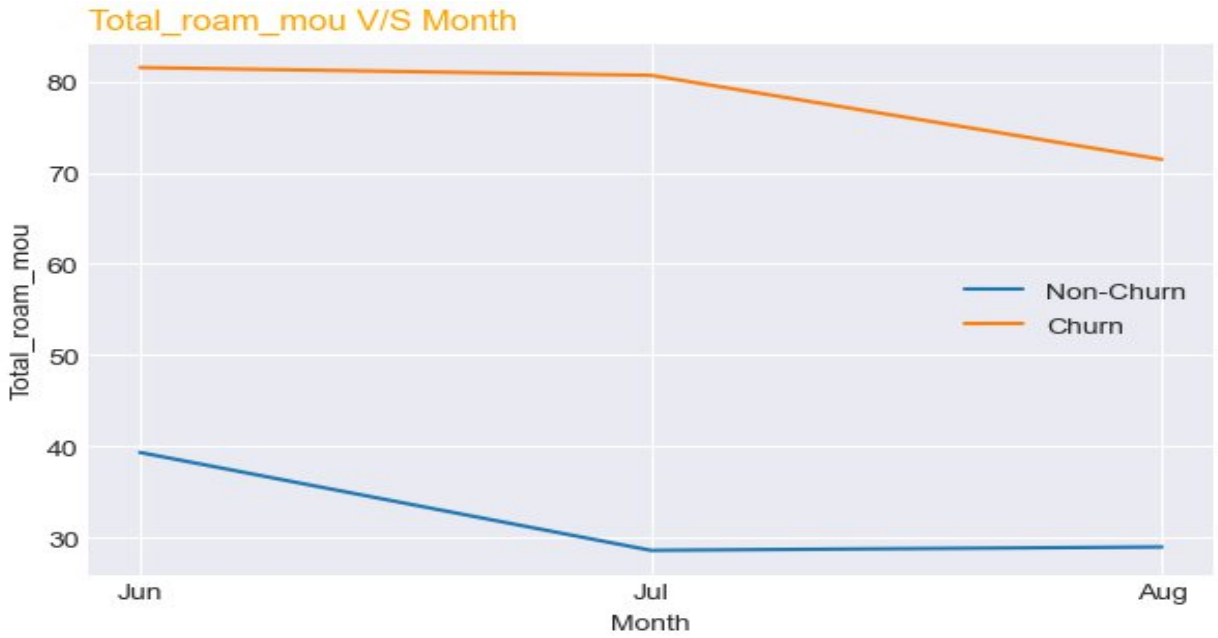
1.Investigate and revise outgoing tariffs to stay competitive.

2.Launch campaigns targeting high outgoing users, e.g., discounted rates during specific hours or free minutes for X MOU usage.

3.Offer free monthly outgoing minutes based on past roaming usage.

Strategy Suggestions:

1. Investigate and optimize roaming tariffs and service quality.
2. Ensure quality guarantees with roaming partners.
3. Launch targeted campaigns, e.g., discounted roaming rates during specific hours or free monthly roaming minutes based on past usage.



:

churn	Total_roam_mou_6	Total_roam_mou_7	Total_roam_mou_8
0	39.360033	28.643301	29.016734
1	81.504156	80.651973	71.443623

Business Implications

1. Improved customer retention increases revenue.
2. Proactive retention strengthens competitive positioning.
3. Focused spending on high-value customers optimizes costs.
4. Predictive analytics ensures long-term strategy effectiveness.