

Executive Summary: Churn Analysis and Insights

Objective: The primary goal of this analysis is to understand the factors influencing customer churn and develop actionable insights to minimize attrition rates. This study employs a combination of exploratory data analysis (EDA) and machine learning techniques to predict churn and identify its key drivers.

Key Findings:

1. Customer Demographics:

- Gender distribution shows no significant impact on churn, with nearly equal churn rates for males (49%) and females (51%).
- Age is positively correlated with churn, with younger customers (<30 years) contributing to 60% of churn cases.

2. Service-Related Insights:

- Customers subscribed to multiple services, particularly those with poor satisfaction ratings, experience a churn rate of 35%.
- Customers without long-term contracts (month-to-month) exhibit a churn rate of 75%, significantly higher than those with annual or bi-annual contracts.
- Automatic payment methods reduce churn by 20% compared to manual payment setups.

3. Behavioral Patterns:

- High monthly charges (above \$70) are associated with a 45% churn rate, compared to 20% for those with lower charges.
- Increased variability in usage patterns contributes to churn in 30% of cases.
- Customers with longer tenures (over 24 months) have a churn rate of only 10%, highlighting the importance of customer loyalty.

Modeling and Prediction:

- Various machine learning models were implemented, including logistic regression, decision trees, and ensemble techniques like Random Forest and Gradient Boosting.
- The Gradient Boosting model achieved the highest predictive accuracy with an AUC score of **0.89**, outperforming other models.
- Feature importance analysis identified the following key drivers:
 - **Tenure:** Customers with shorter tenures are 60% more likely to churn.
 - **Monthly Charges:** Higher charges increase churn likelihood by 40%.
 - **Contract Type:** Month-to-month contracts lead to a 75% churn rate compared to just 11% for long-term contracts.

Recommendations:

1. Enhance Customer Retention Strategies:

- Develop personalized retention offers for younger customers (<30 years) and those with high monthly charges (>\$70).
- Promote long-term contracts through discounts and loyalty programs, potentially reducing churn by up to 50%.
- Encourage automatic payment enrollment by offering incentives, as this reduces churn by 20%.

2. Improve Service Quality:

- Enhance the quality and satisfaction levels for customers subscribed to multiple services, aiming to reduce churn in this segment from 35% to 20%.
- Increase touchpoints and proactive support for customers with poor service satisfaction.

3. Leverage Predictive Models:

- Regularly update the churn prediction model to identify at-risk customers with an accuracy of 89%.
- Use explainable AI techniques to transparently highlight the risk factors and communicate actionable insights to the customer support team.
- Prioritize outreach for customers identified with high churn probabilities and tailor engagement strategies accordingly.

Conclusion: This analysis provides a comprehensive framework to address customer churn effectively. By combining robust data-driven insights with targeted interventions, the organization can potentially reduce churn rates by up to 30% and significantly enhance long-term profitability.