

Customer Churn Analysis (Telecom)

Summary and Recommendations

This report summarizes the key findings from an exploratory data analysis (EDA) of a telecom customer churn dataset, aiming to identify factors contributing to churn and provide actionable insights for retention strategies.

Objective: This analysis aims to understand and predict customer churn by exploring various customer attributes. The insights derived will help the telecom company to develop targeted interventions to minimize churn.

Tools & Technologies Used:

- Python
- Pandas (for data manipulation)
- Matplotlib (for data visualization)
- Seaborn (for enhanced data visualization)
- Jupyter Notebook (for analysis environment)

Data Overview

- The dataset has 7,043 customer records and 21 columns.
- Columns cover customer demographics (*gender*, *SeniorCitizen*), service details (*PhoneService*, *InternetService*), contract and billing information (*Contract*, *MonthlyCharges*), and the target variable *Churn*.
- Initial data cleaning involved converting *TotalCharges* to a numeric type and handling empty string values.
- No missing values were found across the dataset after preprocessing.

Key Findings from Churn Analysis

- **Overall Churn Rate:** The churn rate in the dataset is approximately **26.54%**, meaning roughly one in four customers have churned. Conversely, **73.46%** of customers have not churned.
- **Gender Distribution:** The customer base is nearly balanced by gender (**50.48% male**, **49.52% female**). Churn rates are very similar, with **27.00% of females** and **26.16% of males** having churned, suggesting gender is not a significant churn predictor.

- **Senior Citizen Status:** Senior citizens constitute **16.21%** of the customer base. They exhibit a significantly higher churn rate of **41.68%** compared to non-senior citizens at **23.61%**.
- **Partner and Dependent Status:**
 - Customers **without partners** have a higher churn rate (**32.96%**) than those **with partners** (**24.48%**).
 - Customers **without dependents** show a notably higher churn rate (**31.28%**) compared to those **with dependents** (**15.45%**).
- **Phone Service:** The vast majority of customers (**90.32%**) have phone service. The churn rate is similar for customers with phone service (**26.71%**) and those without (**24.93%**).
- **Internet Service:**
 - Fiber optic is the most common internet service (**43.96%**), followed by DSL (**34.37%**), with **21.66%** having no internet service.
 - Fiber optic users have the highest churn rate (**41.89%**), followed by DSL users (**18.95%**). Customers with no internet service have the lowest churn rate (**7.40%**).
- **Contract Type:**
 - **Month-to-month contracts** are the most prevalent (**55.04%**) and show the highest churn rate (**42.71%**).
 - **One-year contracts** account for **20.91%** of customers with a churn rate of **11.27%**.
 - **Two-year contracts** represent **24.05%** of customers and have the lowest churn rate (**2.83%**), indicating higher loyalty.
- **Payment Method:** Electronic check is the most common payment method (**33.58%**) and is strongly associated with a higher churn rate.

Recommendations

Based on the analysis, the following recommendations are proposed to mitigate customer churn:

1. **Target Senior Citizens:** Develop specific retention programs or personalized offers for senior citizens, as they show a significantly higher propensity to churn.
2. **Promote Longer Contracts:** Actively encourage customers on month-to-month contracts to switch to one-year or two-year plans through incentives (e.g., discounts, bundled services), given their much lower churn rates.
3. **Address Fiber Optic and Electronic Check Issues:** Investigate the underlying reasons for high churn among Fiber optic internet users and those paying via electronic check. This could involve improving service quality, addressing billing issues, or offering alternative payment incentives.
4. **Enhance Loyalty for Single/Independent Customers:** Implement loyalty programs or personalized communication strategies for customers without partners or dependents, as they tend to churn more frequently.

Conclusion & Next Steps

This exploratory analysis provides valuable insights into the characteristics of churning customers. By focusing on the identified high-risk segments and service attributes, the telecom company can develop targeted retention strategies. Future work could involve building a predictive churn model to identify at-risk customers proactively and evaluating the effectiveness of implemented retention initiatives.