

Telecom Customer Churn Analysis

Problem Statement

Customer churn is a major concern for telecom companies, directly impacting revenue and long-term growth. The goal of this analysis is to:

- Identify key drivers of churn among telecom customers.
- Quantify churn distribution across customer demographics and service attributes.
- Provide insights to inform customer retention strategies.

Methods and Exploratory Data Analysis (EDA) Techniques

The following methods and techniques were used to explore and analyze the churn dataset:

1. Data Cleaning and Preprocessing:

- Loaded dataset and replaced blank values in 'TotalCharges' with zero.
- Converted 'TotalCharges' to float to ensure correct numerical analysis.
- Checked and confirmed absence of null and duplicate records.
- Converted 'SeniorCitizen' from numerical to categorical labels (Yes/No).

2. Descriptive Analysis:

- Used `'info()'` and `'describe()'` to understand data types and statistical distributions.

3. Univariate and Bivariate Analysis:

- Count plots for categorical variables to understand the distribution of churn across different features like gender, contract type, and senior citizen status.
- Histogram of tenure to see the distribution and relationship with churn.

4. Grouped Aggregation:

- Grouped data by 'Churn' and calculated counts to derive churn percentage.
- Computed proportions of churn within specific subgroups like Senior Citizens.

5. Visualizations:

- Pie chart to represent churn vs non-churn proportion.
- Stacked bar plots to highlight churn rate differences by groups (e.g., Senior Citizen).
- Count plots with `hue='Churn'` to compare distributions within categories.
- Multiple subplots for different services to reveal potential patterns.

Key Findings and Churn Insights

- Overall Churn Rate: 26.54%, based on pie chart visualization.
- Senior Citizen Impact:

- 42.1% of senior citizens churned compared to 24.6% of non-senior citizens.
- Contract Type:
 - Month-to-month contracts had the highest churn (~43%).
 - Two-year contracts saw significantly lower churn rates.
- Tenure:
 - Most churners had a tenure of less than 12 months.
- Online Services:
 - Lack of services such as Tech Support and Online Security correlated with higher churn rates.

Conclusion

The analysis highlights that tenure, contract type, and value-added services are strong indicators of churn risk. Retention strategies should focus on:

- Incentivizing longer-term contracts.
- Offering personalized support packages for new users.
- Engaging senior customers with tailored value offerings.