Telco Customer Churn — Exploratory Data Analysis Report

1. Introduction

The purpose of this report is to present a detailed exploratory data analysis (EDA) of the Telco Customer Churn Dataset. This dataset contains demographic information, account details, services subscribed, billing data, and the churn status of approximately 7,000 telecom customers. The objective is to identify key patterns, relationships, and insights that help understand customer churn behavior and provide actionable directions for retention strategies.

2. Data Overview and Preparation

The dataset comprises 7,043 customer records with 21 variables. Data types were examined and cleaned. Specifically, the TotalCharges field contained blank spaces, which were replaced with zero and converted to a numeric type. A check for duplicate customer IDs confirmed that there are no duplicates. There are no missing values in the dataset after cleaning, ensuring data integrity for reliable analysis.

3. General Churn Statistics

Approximately 26.5% of customers (about 1,869 customers) have churned. Around 73.5% (approximately 5,174 customers) have stayed with the service. This indicates that roughly one in every four customers has left, highlighting churn as a significant issue for the company.

4. Demographic Analysis

- **Gender:** The gender distribution is nearly even, with 50.5% male and 49.5% female customers. Churn rates are consistent across genders, with 26–27% of both male and female customers having churned.
- **Senior Citizens:** About 16% of the customer base are senior citizens. Notably, senior citizens have a much higher churn rate (about 41%) compared to non-senior citizens (~24%).

5. Tenure Insights

Customer tenure ranges from 0 to 72 months. A clear pattern emerges: customers with shorter tenure are more likely to churn, indicating that the first few months of a customer's lifecycle are critical. Longer-tenured customers tend to stay, which suggests that improving early customer experiences could lower churn.

6. Contract Type Impact

Most customers (~55%) are on month-to-month contracts, which have the highest churn rate at around 43%. In contrast, customers on one-year contracts have a churn rate of about 11%, and

those on two-year contracts churn at just 3%. This shows that longer-term contracts greatly enhance customer retention and may serve as a strong lever to reduce churn.

7. Services Subscribed

The majority of customers use phone services (~90%). Regarding internet services: 35% use DSL, 44% use fiber optic, and 21% have no internet service. Customers with fiber optic internet tend to churn at higher rates than DSL users, possibly due to higher charges or service issues. Lack of Online Security, Online Backup, Device Protection, or Technical Support is more common among churned customers, suggesting bundled services could increase loyalty.

8. Payment Methods

The Electronic Check payment method is strongly associated with higher churn. Other methods, such as Mailed Check, Bank Transfer, and Credit Card (automatic), show relatively lower churn rates. This indicates that encouraging customers to use automated or more stable payment methods may help reduce churn.

9. Billing Insights

The average monthly charge is about $64.76, with amounts ranging from $18.25 to $118.75. Total charges range widely, with an average of about $2,279.73. Customers with higher monthly charges, especially those on flexible contracts, are more likely to churn, suggesting a potential link between billing perceptions and retention.

10. Conclusion and Recommendations

This exploratory data analysis has revealed valuable insights into the factors that influence customer churn for the telecom company:

- Contract type and tenure are critical churn indicators. Customers on month-to-month plans with low tenure are the most likely to churn.
- Senior citizens represent a vulnerable group with higher churn risk.
- Fiber optic internet users and those without added services like security or backup are more churn-prone.
- Electronic check payments are linked with increased churn likelihood.

To address these findings, it is recommended that the company:

- Develop strategies to convert month-to-month customers to longer-term contracts.
- Offer tailored retention benefits for senior citizens.
- Promote bundled service packages that include security and support.
- Encourage customers to switch to automated payment methods.
- Focus on onboarding processes and early engagement to reduce churn within the first year.