

Executive Summary: Telecom Customer Churn Analysis

This analysis investigates patterns of customer churn using the Telco Customer dataset, with the aim of identifying key factors influencing customer retention and attrition. The dataset was carefully cleaned and preprocessed — missing values in the TotalCharges column were handled, and binary fields like SeniorCitizen were made interpretable by mapping numeric values to categorical labels.

Key Insights

1. Churn Rate Overview

- **26.54%** of the customer base has churned.
- This insight was visualized using a **pie chart**, highlighting the need for churn-reduction strategies.

2. Contract Type is a Strong Churn Predictor

- **Month-to-month** customers have a **churn rate of ~43%**, compared to **11%** for one-year and **3%** for two-year contracts.
- A **countplot with hue='Churn'** visualized the stark contrast, showing that customers with shorter commitments are more likely to leave.

3. Senior Citizens Churn More

- Senior citizens show a **churn rate of ~42%**, significantly higher than the **24%** for non-seniors.
- This was revealed through a **bar plot comparing churn vs. SeniorCitizen status** after converting it into a Yes/No category.

4. Gender is Not a Significant Factor

- Both male and female customers churn at nearly the same rate (approx. **26–27%**), as shown in a **countplot grouped by gender and churn**.

5. Add-On Services Matter

- Customers **without services like Online Security, Tech Support, or Backup** tend to churn at **35–40%**, compared to **less than 20%** for those with these services.
- **Nine individual countplots** were used to compare service presence vs. churn, revealing these crucial behavioral trends.

6. Internet Type Impacts Churn

- **Fiber Optic users** have the **highest churn (~42%)**, followed by DSL (~19%) and those with **no internet service (~8%)**.
- This indicates that high-speed users might have **higher expectations** or **more competitive options**.

7. Early Tenure = High Risk

- Churned customers are mostly clustered in the **0–12 months tenure** range and have **lower TotalCharges**.
- This insight came from **distributions and boxplots (if included)** showing tenure and billing patterns.

Visualizations Created

1. Pie Chart

- Showed overall churn percentage (26.54%).

2. Countplots (with hue='Churn')

- **Gender vs Churn**
- **Contract Type vs Churn**
- **Senior Citizen vs Churn**
- **Internet Service Type vs Churn**
- **Add-on Services (Online Security, Backup, Tech Support, etc.) vs Churn**

3. Service-wise Churn Comparison Grid

- 3x3 **subplot grid of countplots** for services like PhoneService, MultipleLines, InternetService, etc., showing churn patterns by service availability.