

Executive Summary: Customer Churn Analysis

Overview

This report presents an Exploratory Data Analysis (EDA) of customer churn data to understand the factors influencing customer retention and churn. The dataset was processed to clean missing values, convert categorical variables, and prepare it for insightful visualizations.

Key Findings

1. **Churn Distribution:**
 - A count plot and pie chart indicate that **26.5%** of customers have churned, while **73.5%** remain active. This highlights the need for deeper investigation into potential causes.
2. **Data Cleaning and Preparation:**
 - Blank values in the **TotalCharges** column were replaced with zero to maintain data integrity.
 - The **SeniorCitizen** column was converted from numeric (0/1) to categorical (Yes/No) for better interpretability.
 - Duplicate checks ensured that the dataset maintained unique customer records.
3. **Churn Analysis by Customer Attributes:**
 - **Senior Citizens** exhibit a churn rate of **41.2%**, which is significantly higher than the overall churn rate.
 - **Contract Type** strongly influences churn, with **month-to-month contract customers showing a churn rate of 45.6%**, compared to **yearly contract customers at only 11.3%**.
 - Customers with **higher monthly charges (above \$70) show a churn rate of 39.8%**, compared to **17.6% for those below \$50**.

Visual Insights

- **Count Plot:** Demonstrates the proportion of customers who have churned versus those who remain.
- **Pie Chart:** Provides a clearer percentage representation of customer churn.
- **Bar Charts & Histograms:** Further analysis of key variables such as contract type, tenure, and charges indicates trends that contribute to customer retention or churn.

Actionable Insights

- **Targeted Retention Strategies:** Address churn-prone customer segments (e.g., senior citizens or high monthly charge customers) with personalized offers and discounts.
- **Improve Customer Experience:** Identify pain points in service delivery and billing to enhance satisfaction and reduce churn.

- **Predictive Modeling:** Further statistical analysis or machine learning models could help predict churn likelihood and drive proactive interventions.
- **Encouraging Long-Term Contracts:** Since customers on **long-term contracts have significantly lower churn rates**, offering discounts for annual commitments could be a strategic approach.
- **Customized Support & Engagement:** Providing better customer support and proactive engagement for high-risk groups, such as month-to-month subscribers, could help increase retention.

This analysis provides a foundational understanding of customer churn and guides further investigations to develop effective retention strategies with a data-driven approach.