

Executive Summary: Customer Churn Analysis

This report analyzes customer churn behavior for a telecom service provider. It combines data preprocessing, visualization, and feature-based exploration to understand which factors are most associated with churn. Approximately **26.54%** of customers have churned, as visualized via a pie chart.

1. Data Preparation Highlights

- Blank values in the **TotalCharges** column were identified and converted to 0 to maintain data consistency.
 - **SeniorCitizen** values were transformed from 0/1 to Yes/No for clarity.
-

2. Key Churn Drivers and Customer Insights

Churn Distribution

- **26.54%** of the customers have churned, while **73.46%** have remained. This represents a significant portion of the customer base, warranting deeper investigation.

Demographic Analysis

- **Gender:** Churn appears to be relatively **evenly distributed across genders**, suggesting gender is not a strong differentiator.
- **Senior Citizens:**
 - A **higher churn rate** is observed among senior citizens.
 - While exact percentages are not shown, bar plots indicate a **visibly disproportionate number** of senior citizens are leaving compared to younger customers.

Customer Tenure

- Customers with **shorter tenure** (newer customers) are far **more likely to churn** than long-term ones.
- Longer-tenured customers show greater loyalty, implying satisfaction builds over time or longer usage reflects better customer fit.

Contract Type

- Churn rate by contract:
 - **Month-to-month contracts** have the **highest churn rate**, visually estimated above **40%**.
 - **One-year** and **two-year** contract holders show **significantly lower churn rates**, indicating that contract length strongly correlates with customer retention.

Service Usage Patterns

- Customers **without optional services**—such as:
 - **Online security**
 - **Tech support**
 - **Streaming TV or movies**
—are more likely to churn.
- Customers with **bundled services** (like **internet and phone**) show **reduced churn rates**.
- This suggests that offering more comprehensive service packages may increase customer stickiness.

Support Features

- Churn is **lower among customers** who have **device protection** or **online backup**, suggesting these services add tangible value.

Payment Method

- Customers paying via **electronic check** exhibit **the highest churn rates** among all payment types.
 - This may reflect an association between less engaged or price-sensitive customers and this payment method.
-

3. Strategic Recommendations

- **Promote long-term contracts** with added benefits to discourage month-to-month churn.
- **Bundle value-added services** (tech support, streaming) into attractive packages to increase retention.
- Improve support and engagement among **senior citizens**, possibly through more personalized communication.
- Consider incentives for users of **electronic checks** to switch to more stable payment methods like credit cards or automatic payments.