

Summary: Telco Customer Churn Analysis

This notebook delivers a structured and visual-driven analysis of churn within a telecom company, targeting key customer attributes and service features to uncover patterns that contribute to customer attrition.

1. Overview of Churn

- The overall churn rate is approximately **26.5%**, meaning more than one in four customers are leaving the company. This level of churn is a substantial concern and suggests the need for proactive engagement, especially among newly acquired or lower-tenure customers. The remaining **73.5%** of customers have not churned, but several among them show characteristics that align with higher-risk profiles.

2. Demographic Insights

- **Gender:** The churn rate is nearly equal between males and females. This suggests **gender is not a major factor** in predicting churn.
- **Senior Citizens:**
 - Roughly **16% of customers** are senior citizens.
 - Among them, a **higher churn percentage (~42%)** was observed compared to non-senior citizens.
 - This segment likely requires targeted engagement or better value-based offerings.

3. Tenure and Churn

- Customers with **lower tenure (0–12 months)** had significantly higher churn rates.
- A clear **negative correlation** between tenure and churn was observed, suggesting that customers are more likely to leave in the early stages of their service lifecycle.

4. Services and Their Influence on Churn

- **Internet Service:**
 - Customers without internet service show significantly **lower churn (~8%)**.
 - Those with **fiber optic connections show the highest churn**, indicating either service dissatisfaction or higher costs.
- **Online Security & Tech Support:**

- Customers **without online security or tech support churned at much higher rates (~35–45%)**.
- These optional services appear to increase customer retention—possibly due to perceived value or bundled pricing.
- **Streaming Services** (TV & Movies):
 - Surprisingly, these services had a **moderate impact** on churn.
 - Customers with **only one or no streaming services churned more** than those with both.

5. Contract & Payment Behavior

- **Contract Type:**
 - **Month-to-month customers make up ~55% of the base and churn at the highest rate (~43%)**.
 - **One-year and two-year contract customers churn less (~12% and ~5%),** indicating that commitment-based models support retention.
- **Paperless Billing:**
 - Customers using paperless billing had **higher churn (~35%)**, likely because it correlates with month-to-month contracts and online behaviors.
- **Payment Method:**
 - **Electronic check users churned the most (~40%),** compared to bank transfer or credit card users (both below 20%).

6. Data Preparation and Validation

- Empty values in **TotalCharges** were identified and handled by replacing blanks with 0 and converting to float.
- Dataset was verified for duplicates and nulls to ensure quality insights.

Conclusions & Recommendations

1. **Target Early-Stage Customers:** With new customers (low tenure) churning rapidly, onboarding programs, discounts, or loyalty incentives can help improve retention.

2. **Promote Annual Contracts:** Campaigns to shift customers from monthly to yearly plans could reduce churn significantly.
3. **Bundle Value-Add Services:** Online security, tech support, and bundled streaming appear to help in keeping customers.
4. **Senior Customer Care:** Dedicated support or custom packages for senior citizens could reduce attrition in that segment.
5. **Review Electronic Check Flow:** Since this payment method aligns with the highest churn, simplifying or incentivizing digital wallet/credit card use may help.