



Executive Summary: Customer Churn Analysis

Project Overview

This analysis investigates customer churn behavior using telecom data to uncover insights that can help reduce attrition and improve customer retention. The project involved data preprocessing, exploratory data analysis, and visualization using Python libraries such as Pandas, Seaborn, and Matplotlib.

Data Preprocessing

- **Missing Values:**
The TotalCharges column contained blanks, which were replaced with 0 and converted to float for numerical analysis.
 - **Categorical Transformation:**
The SeniorCitizen field was converted from binary (0/1) to readable categories "Yes"/"No".
 - **Duplicate Check:**
No duplicate values in the customerID field were found.
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Churn Rate Overview

- **Overall Churn Rate:**
About **26.5%** of customers have churned.
 - **Visuals Used:**
Pie charts and count plots to highlight churn distribution.
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Demographic Impact on Churn

- **Gender:**
Churn is evenly distributed among male and female customers.
 - **Senior Citizens:**
Churn rate is significantly higher among senior citizens compared to others.
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Tenure and Contract Type

- **Tenure:**
Customers with only **1–2 months** of tenure show the highest churn.
Longer-tenured users exhibit more loyalty.
 - **Contract Type:**
Month-to-month contracts are associated with the highest churn rate.
Annual and two-year contracts have lower churn.
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Service Usage Patterns and Churn

Service Feature	Insight
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Phone Service	No strong pattern. Most churners used it.
Internet Service	Fiber optic users churn more than DSL users.
Online Security	Customers without security churn more.
Tech Support	Lack of tech support increases churn likelihood.
Streaming Services	Customers not using TV/movie streaming churn more.
Device Protection	No protection plan = higher churn.
Online Backup	No backup service linked with higher churn.

Key Insights

- Short-term users and senior citizens are high churn-risk groups.
 - Churn is linked with lack of value-added services.
 - Long-term contracts significantly reduce churn.
 - Fiber optic dissatisfaction may be a contributor to churn.
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Recommendations

1. **Targeted Retention:**
Engage new users and seniors with onboarding support and loyalty offers.
2. **Promote Long-Term Contracts:**
Offer discounts and incentives for yearly plans.
3. **Upsell & Bundle:**
Create bundles with Online Security, Tech Support, and Streaming services.
4. **Investigate Fiber Optic Issues:**
Assess customer satisfaction and pricing for fiber optic services.