

Summary and Recommendations : Exploratory Data Analysis on Customer Churn

Objective:

To uncover key drivers of customer churn in a telecom dataset using exploratory data analysis (EDA), enabling the business to retain customers more effectively and optimize service delivery.

Dataset Overview:

- **Dataset:** `Customer-Churn.csv`
 - **Rows:** ~7,043 customers
 - **Columns:** 21 customer attributes including services used, demographic data, tenure, billing method, and churn status.
 - Cleaned and pre-processed:
 - Replaced blanks in `TotalCharges` and converted to numeric.
 - Binary columns (e.g., `SeniorCitizen`) converted from 0/1 to Yes/No for readability.
 - No null values or duplicates after cleanup.
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Key Churn Insights:

1. Overall Churn Rate

- Out of all customers, **26.54%** have churned, while **73.46%** stayed.
- Visualized using a **pie chart** and **bar chart**, clearly highlighting the imbalance.

2. Gender-Based Churn

- Churn distribution is almost **even between genders**.

- Male churn: ~26.1%
- Female churn: ~26.9%
- Insight: **Gender is not a strong predictor of churn.**

3. Senior Citizens & Churn

- **Yes (Senior Citizens):**
 - Churned: **41.7%**
 - Stayed: **58.3%**
- **No (Non-Senior Citizens):**
 - Churned: **24.7%**
 - Stayed: **75.3%**
- Conclusion: Senior citizens are **~17% more likely** to churn than younger customers.

4. Tenure Analysis

- Customers with **tenure ≤ 2 months** have the **highest churn rate**.
- Those with tenure over **20 months** are **significantly more loyal**.
- Retention efforts should **prioritize customers within their first 3 months**.

5. Contract Type

- Churn rate by contract:
 - **Month-to-Month: 42.1% churn**
 - **One Year: 11.5% churn**
 - **Two Year: 2.8% churn**
 - Customers with **longer contracts** are **far less likely to churn**.
 - Suggestion: Offer **incentives for long-term contracts** to improve retention.
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Service Usage Insights:

Analysis of 9 key service columns (e.g., InternetService, OnlineSecurity, TechSupport) shows:

- **Churn is higher** when services are **not subscribed or unavailable**.
 - For example:
 - Customers **without OnlineSecurity** churned at **~40%**, vs **~15%** with it.
 - Those **without TechSupport** churned at **~38%**, vs **~16%** with it.
- Having **PhoneService, InternetService (especially DSL), and security-related services significantly reduces churn**.

Billing & Charges

Monthly Charges:

- Customers paying **higher monthly charges (₹80+)** are more likely to churn.
- This could reflect dissatisfaction with value or services at premium tiers.

Total Charges:

- Customers with **low total charges** churn more frequently, likely due to **short tenure**.

Paperless Billing:

- Churn rate among paperless billing users is **~33%**, vs **~16%** for others.
- Digital billers might be **less engaged**, suggesting need for better digital onboarding.

Summary of Actionable Insights:

Key Factor	Impact on Churn	Recommendation
Senior Citizen Status	+17%	Personalized support for older users

Low Tenure (<3 months)	Highest churn	Improve onboarding, engagement early
Month-to-Month Plan	+40% churn	Offer rewards for long-term plans
Online Services Absent	High churn	Upsell key services like TechSupport & Security
High Monthly Charges	Moderate churn	Improve perceived value for higher-paying users
Paperless Billing	+33% churn	Increase touchpoints for digital users

Final Thought:

Your visualizations — stacked bar charts, histograms, pie charts, and subplots — clearly capture the churn behavior. This analysis provides a solid foundation to build customer retention strategies targeting the right segments.