Telecom Customer Churn Analysis — Report

1. Introduction

This analysis explores the factors influencing customer churn in a telecom company. The objective is to identify the key attributes that drive customers to discontinue their services and provide data-driven insights to reduce churn.

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2. Dataset Overview

The dataset contains customer demographic information, account details, and service usage variables such as internet services, payment methods, and contract types.
Key columns include:

- **Demographic:** `gender`, `SeniorCitizen`, `Partner`, `Dependents`
- **Account:** `tenure`, `Contract`, `PaperlessBilling`, `PaymentMethod`, `MonthlyCharges`, `TotalCharges`
- **Services:** `PhoneService`, `MultipleLines`, `InternetService`, `OnlineSecurity`, `OnlineBackup`, `DeviceProtection`, `TechSupport`, `StreamingTV`, `StreamingMovies`
- **Target Variable:** `Churn` (Yes/No)

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3. Exploratory Data Analysis (EDA)

3.1 Overall Churn Rate

- Approximately **26.5%** of total customers have churned, indicating a significant retention challenge.

3.2 Demographic Insights

- **Senior Citizens** exhibit a higher churn rate compared to non-seniors.
- **Gender** appears to have minimal impact on churn.
- Customers **without dependents or partners** show higher churn, suggesting that single customers may be less loyal.

3.3 Contract and Tenure Analysis

- **Month-to-month contracts** have the highest churn, followed by one-year contracts.
- Customers with **longer tenure** show much lower churn, implying that loyalty increases over time.
- **Automatic renewal** and **discount programs** could help retain short-tenure users.

3.4 Internet and Service-Related Findings

- **Fiber optic users** have a noticeably higher churn rate than **DSL** users.
- Customers **without add-on services** such as OnlineSecurity, TechSupport, DeviceProtection, and OnlineBackup are more likely to churn.
- Streaming services (TV, Movies) have a smaller effect on churn.

3.5 Payment and Billing

- Customers paying through **Electronic check** show the highest churn percentage.
- Those using **Bank transfer** or **Credit card (automatic)** are more stable, likely due to automatic payments reducing the chance of missed bills.

3.6 Monthly and Total Charges

- Churn increases as **Monthly Charges** rise, showing price sensitivity.
- However, customers with **higher TotalCharges** (due to longer tenure) tend to stay longer.

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4. Visual Insights Summary

The following visualizations were created in the notebook:

- **Countplots** comparing Churn vs categorical features (services, payment method, contract, etc.).
- **Stacked bar charts** for churn percentages by SeniorCitizen and contract type.
- **Distribution plots** for tenure, monthly charges, and total charges showing clear separation between churned and retained customers.

These visuals collectively highlight that **contract type, add-on services, payment method, and tenure** are strong predictors of churn.

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5. Key Findings & Insights

Factor	Observation	Impact on Churn
Contract Type	Month-to-month contracts dominate churners	▲ High
Internet Type	Fiber optic users churn more than DSL	▲ High
Add-on Services	Lack of OnlineSecurity/TechSupport increases churn	▲ High
Payment Method	Electronic check users churn most	▲ Moderate
Senior Citizen	Higher churn compared to non-seniors	▲ Moderate
Tenure	Lower tenure = higher churn	▼ Low
Monthly Charges	Higher charges = higher churn	▲ Moderate

6. Recommendations

1. **Targeted Retention Campaigns:** Offer loyalty rewards or discounts for month-to-month customers to convert them into annual contracts.
2. **Bundle Add-On Services:** Encourage customers to subscribe to OnlineSecurity, TechSupport, and Backup services.
3. **Customer Education:** Promote awareness on how additional services enhance value to reduce service cancellations.
4. **Billing Strategy:** Incentivize auto-pay methods (bank or credit card) to minimize churn due to payment issues.
5. **Price Sensitivity Programs:** Offer tailored discounts to high-charge customers at risk of leaving.

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7. Conclusion

The analysis reveals that **contract type**, **internet service**, **add-on services**, and **payment method** play a pivotal role in customer retention.
By focusing on improving long-term contracts, encouraging auto-pay options, and promoting value-added services, the telecom company can significantly reduce churn and improve customer lifetime value.