

Summary and Recommendations :

Objective: The primary objective of this analysis is to explore and understand the factors influencing customer churn within the telecom industry. The findings aim to provide actionable insights to help reduce churn rates and improve customer retention strategies.

Key Insights:

1. Data Cleaning and Preparation:

- The dataset contained some missing or invalid values, particularly in the TotalCharges column, where empty cells were replaced with 0. After conversion to a numeric format, the data was made ready for further analysis.
- There were **no duplicate values** based on the customerID column, ensuring the dataset's integrity.

2. Descriptive Statistics:

- The dataset was thoroughly explored to understand the general distribution of variables. For instance:
 - The average tenure (time spent with the company) for customers is **32.37 months**, with a maximum tenure of **72 months**.
 - The average monthly charges for customers amount to **\$64.76**, and the total charges range from **\$18.80** to **\$8,684**.
- The data covers a wide range of customer attributes, including demographic details, service subscriptions, and billing information.

3. Churn Overview:

- Approximately **26.54%** of the customer base has churned, as visualized by a pie chart. This highlights the substantial portion of the customer base that has left the company.
- A count plot visualization showed the exact breakdown of churned versus non-churned customers, reinforcing the need for churn prevention strategies.

4. Demographic Analysis:

- **Senior Citizens:** Around **16.2%** of the customer base consists of senior citizens. Of these, a higher proportion tends to churn, with **42%** of senior citizens discontinuing their service compared to **22.5%** of non-senior customers.
- **Gender:** Churn rates between male and female customers are relatively even. **27% of male customers** and **25.6% of female customers** have churned, indicating that gender alone may not be a significant factor.
- **Dependents:** Customers without dependents show a higher likelihood of churn (**30.5%**) compared to those with dependents (**15.6%**).

5. Service Usage Patterns:

- **Internet Service:** Customers without internet services have lower churn rates (**7%**), while customers using DSL or Fiber optic services experience churn rates of **24%** and **41%**, respectively. Fiber optic users in particular represent a high-risk group.
- **Phone Service:** Only **9.6%** of customers with a single phone line churned, compared to **29.1%** of customers with multiple lines.
- **Additional Features:** The analysis highlighted key service features like **Online Security, Device Protection, and Tech Support:**
 - **42.5%** of customers who do not use online security services churned, whereas only **22%** of customers with online security left.
 - A similar pattern is seen with **Tech Support:** customers without tech support are far more likely to churn (**45%**) compared to those with it (**15.5%**).

6. Payment Method Analysis:

- Payment method has a significant impact on churn behavior. The analysis shows that customers paying via **electronic check** have the highest churn rate at **44.5%**, while those paying by **bank transfer** or **credit card** churn at significantly lower rates of **16.1%** and **15.3%**, respectively.
 - This indicates that customers paying by electronic check may feel less satisfied or face barriers in using the payment system, suggesting the need for improvements in payment flexibility or incentives.
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Visualization Insights:

● Churn by Demographics:

- A set of bar plots and pie charts illustrated churn behavior across various demographics like gender, age, and senior citizen status. This helped pinpoint that **senior citizens and customers without dependents** are at a higher risk of leaving the service.

● Churn by Service Types:

- A comprehensive set of count plots demonstrated churn behavior across different telecom services like internet service, phone service, and features like online backup, streaming TV, and tech support. Services such as **fiber optic internet** and lack of **tech support** emerged as key factors influencing churn.
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Recommendations:

1. Targeted Retention Programs:

- Focus on customers who are identified as at high risk of churn, particularly **senior citizens** (with a **42%** churn rate) and customers without dependents (**30.5% churn rate**). Tailored offers or personalized service might help retain these segments.
- Consider offering better support services or discounts to customers using **fiber optic** services and multiple phone lines, as these groups also show high churn rates.

2. Enhance Service Offerings:

- A lack of support services like **online security** and **tech support** leads to significantly higher churn rates. Providing these services at lower or no extra cost could reduce churn by up to **20-25%** in these categories.
- Consider bundling key features like device protection and streaming services to incentivize customers to remain with the company.

3. Payment Method Optimization:

- Customers using **electronic check** payments are churning at a much higher rate (**44.5%**) than those using other payment methods. Offering alternative, more user-friendly payment options (like bank transfers or credit cards) or providing discounts for switching payment methods could significantly improve retention rates.

4. Customer Experience Enhancements:

- Customers who lack **online backup**, **streaming TV**, or **device protection** services show higher churn. Offering these services as part of a loyalty program or at a discounted rate can help retain customers and increase satisfaction.

This detailed analysis highlights crucial factors influencing customer churn, providing clear direction for retention strategies. By addressing key areas like senior citizen churn, payment method flexibility, and service enhancements, the company can significantly reduce its churn rate and improve overall customer satisfaction.