

Summary and Recommendations

Objectives

This analysis focuses on understanding customer churn to identify key factors driving attrition and actionable solutions to mitigate it. The dataset was cleaned, analyzed, and visualized to uncover patterns using effective visual techniques.

1. Data Preparation:

- **Handling Missing Values:**
 - Blanks in the **TotalCharges** column were replaced with zeros, as these customers had 0 tenure (indicating newly joined customers with no billing yet).
 - The column was converted to numeric format for analysis.
 - **Data Transformation:**
 - The **SeniorCitizen** column was transformed to **Yes/No** format for improved readability.
 - **Data Integrity:**
 - No duplicate **customerID** values were found, ensuring the data's integrity.
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2. Key Visual Insights and Observations:

Churn Overview:

- **Churn Rate:**
 - Approximately **26.5%** of customers churned, while **73.5%** stayed.
 - This was visualized using a **pie chart** for clarity.

Service-Based Analysis:

- Several **count plots** were created to analyze churn rates for customers across key services, revealing these trends:
 1. **Phone Service:**
 - 90% of customers have **PhoneService**. Among them, churn remains significant at around **25%**.
 - Customers without PhoneService show a churn rate below **10%**, indicating limited dependency on this service for churn decisions.

2. **MultipleLines:**
 - Customers with **MultipleLines** churn at a higher rate (**28%**) compared to those with a single line (**24%**).
 3. **Internet Service:**
 - **Fiber-optic Internet** users exhibit the highest churn rates:
 - **41%** of Fiber-optic users churned, significantly higher than **DSL** users (**20%**).
 - Customers without InternetService showed the least churn, as they are likely less engaged overall.
 4. **Online Services** (Security, Backup, Device Protection):
 - Churn is disproportionately higher among customers lacking these add-on services:
 - **OnlineSecurity:**
 - Customers without OnlineSecurity churned at a rate of **46%**.
 - Those with the service saw churn reduced to **15%**.
 - **DeviceProtection** and **OnlineBackup** exhibit similar trends where a lack of these services increases churn.
 5. **Streaming Services:**
 - Customers without StreamingTV or StreamingMovies churn at **30%**, while those using these services churn at lower rates (**~25%**), indicating that streaming services have a **mild retention effect**.
 6. **TechSupport:**
 - TechSupport availability significantly influences churn:
 - Customers without TechSupport churn at **42%**.
 - Those with TechSupport show a dramatically lower churn rate of **14%**.
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3. Customer Segmentation Analysis:

- **Tenure Impact:**
 - Churn is highest among **early-tenure customers** (0–6 months), at approximately **45%**.
 - Long-tenure customers (2+ years) churn at much lower rates (**~15%**), indicating that retention improves over time.
 - **Charges Analysis:**
 - **MonthlyCharges:**
 - Churned customers have higher average MonthlyCharges (**\$75**), compared to non-churned customers (**\$61**).
 - **TotalCharges:**
 - Churned customers generally have lower TotalCharges, suggesting they leave before contributing significantly to revenue.
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4. Key Findings:

- **High-Risk Segments:**
 - Fiber-optic Internet users, customers without OnlineSecurity, TechSupport, or DeviceProtection, and early-tenure customers are at the highest risk of churn.
 - Customers with higher MonthlyCharges are more likely to churn.
 - **Retention Impact of Add-On Services:**
 - Customers using services like **TechSupport** and **OnlineSecurity** exhibit **50–70% lower churn rates**.
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5. Recommendations:

1. **Target Early-Tenure Customers:**
 - Implement **welcome offers** or onboarding programs for customers in the first 6 months to reduce early churn.
2. **Promote Add-On Services:**
 - Incentivize add-on services like **TechSupport**, **OnlineSecurity**, and **DeviceProtection**, which significantly reduce churn risk.
3. **Address Fiber-Optic Customers:**
 - Analyze customer pain points for Fiber-optic users and introduce retention-focused offers.
4. **Revisit Pricing Strategy:**
 - Review and optimize pricing for customers with **higher MonthlyCharges** to reduce dissatisfaction.
5. **Engage Inactive Customers:**
 - Customers without streaming services or phone service could be targeted with bundles to enhance engagement.