Executive Summary

This exploratory data analysis (EDA) focuses on customer churn in a telecom dataset, identifying key factors influencing retention and attrition. The dataset consists of **7,043 customer records** with **21 attributes**, including demographics, service subscriptions, tenure, contract type, and payment methods. The analysis provides deep insights into patterns affecting customer churn, supported by visual representations.

Key Findings:

1. Churn Distribution & Overall Trend

- **Churn Rate:** Approximately **26.5%** of customers have churned, while **73.5%** remain active.
- A majority of the churned customers belong to **month-to-month contracts**, indicating contractual flexibility plays a significant role in retention.
- Early-tenure customers (less than 12 months) show a **high churn rate of over 45%**, emphasizing the need for early engagement strategies.

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2. Service Subscription & Churn Patterns

- Customers with **Fiber Optic Internet** exhibit a churn rate of **42%**, significantly higher than DSL users (**18%**), indicating potential dissatisfaction with service quality or pricing.
- Customers without **Phone Service (14%)** or **Internet Service (10%)** show lower churn rates, possibly due to lower engagement.
- Churn is higher for customers who **do not subscribe to OnlineSecurity or TechSupport services**.
    - Customers **without OnlineSecurity** have a **churn rate of 48%**, while those **with OnlineSecurity** have a **churn rate of only 15%**.
    - Similarly, customers **without TechSupport churn at 45%**, whereas those **with TechSupport churn at just 14%**.
    - These findings suggest that customers with added security and support services are more likely to stay.

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3. Demographic & Contractual Insights

- **Senior Citizens (aged 60+)** have a churn rate of **41%**, compared to **20% for younger customers**.

- Customers **with dependents churn at 16%**, while those **without dependents churn at 32%**—indicating family-oriented customers tend to be more loyal.
- **Contract type significantly impacts churn:**
  - **Month-to-month contracts**: **60% churn rate** (very high)
  - **One-year contracts**: **11% churn rate**
  - **Two-year contracts**: **3% churn rate** (very low)
  - Customers with long-term contracts are far more likely to stay, suggesting that encouraging multi-year contracts could reduce churn.

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4. Tenure & Payment Behavior

- Customers with **tenure below 12 months churn at 45%**, while those with over **24 months have a churn rate below 10%**.
- Payment methods strongly influence churn:
  - **Electronic check payments: 50% churn rate** (highest)
  - **Mailed check payments: 22% churn rate**
  - **Bank transfers & credit card autopay: only 15% churn rate**
  - Encouraging auto-payment options could help reduce churn.

Key Recommendations:

1. Improve Fiber Optic Internet Service

- Since **42% of Fiber Optic users churn**, addressing potential service quality or pricing issues could reduce attrition.
- Consider offering **loyalty rewards or discounts** to retain high-risk Fiber Optic customers.

2. Strengthen Early Engagement Strategies

- With **45% of customers churning within their first year**, targeted retention efforts such as **welcome offers, onboarding programs, and customer support check-ins** can improve retention.

3. Promote Value-Added Services

- Since customers with **OnlineSecurity and TechSupport churn significantly less**, bundling these services with existing plans or offering them at a discount could improve retention.

4. Encourage Long-Term Contracts

- Customers on **month-to-month contracts churn at 60%**, while **two-year contracts have a churn rate of just 3%**.
- Offering **incentives for annual or multi-year plans**, such as discounted rates or free add-ons, could increase retention.

5. Push for Secure Payment Methods

- Since **50% of customers using electronic checks churn**, encourage **autopay adoption via credit cards or bank transfers** to reduce involuntary churn.

Conclusion

This analysis provides actionable insights into customer behavior and churn patterns. Key drivers of churn include **short tenure, month-to-month contracts, lack of support services, and electronic check payments**. Addressing these areas through targeted strategies, service improvements, and customer engagement efforts can significantly enhance retention and revenue stability.