📊 Executive Summary: Telco Customer Churn Analysis

This report provides a deep dive into customer churn behavior based on demographic, service usage, and account information from a telecommunications dataset. It leverages descriptive statistics and visual analysis to identify the key drivers of churn and recommends strategies for improving customer retention.

🧾 Dataset Composition

The dataset consists of 7,043 customer records with 21 variables. These features span:

- **Demographics**: Gender, age (via senior citizen status), partner and dependent information.
- **Account Details**: Tenure (how long the customer has been with the company), contract type, billing method, monthly and total charges.
- **Service Information**: Phone service, internet service (DSL, fiber), online security, technical support, and more.
- **Churn**: A binary indicator of whether a customer has left the company.

🔍 Churn Overview

The churn rate in the dataset stands at approximately **26.5%**, which is substantial. More than one in every four customers has left the service, indicating notable opportunities for retention improvements.

This analysis identifies patterns in churn behavior by looking at who churns and why — providing clarity on high-risk segments and services most associated with customer attrition.

👥 Demographic Insights

🧓 Senior Citizens

- Senior citizens represent roughly **16%** of the customer base.
- They are overrepresented in the churned segment, accounting for **around 25%** of all churns.

- The churn rate for this group is nearly **42%**, compared to **23% for non-seniors**.

This suggests that senior citizens are significantly more likely to leave the service and may benefit from simplified offerings or proactive customer service.

👨‍👩‍👧 Partners & Dependents

- Customers **with partners or dependents** tend to have **lower churn rates**.
- This may reflect greater life stability or reliance on the service for household coordination.

📆 Tenure-Based Behavior

One of the strongest churn indicators is **tenure**:

- Churn rates are highest during the **first few months** of service — over **50% of customers** who leave do so in their first 6 months.
- Customers who have been with the company for **more than 2 years** are **extremely loyal**, with churn dropping below **5%**.

This clearly emphasizes the importance of the **early experience**: onboarding, support, and satisfaction in the first 3–6 months can make or break retention.

🧾 Contract Type Analysis

Contract length has a dramatic effect on churn behavior:

- **Month-to-month contracts** have a churn rate of approximately **43%**.
- **One-year contracts** drop to around **11%**.
- **Two-year contracts** show a very low churn rate of **under 3%**.

Customers on short-term contracts have little incentive to stay, making them a key retention challenge. Encouraging long-term plans with attractive offers could dramatically reduce churn.

💳 Payment & Billing Preferences

Billing preferences also impact churn:

- Customers paying via **electronic checks** are the most likely to churn (**~34%**).
- **Bank transfer** and **credit card users** show significantly better retention (**<16% churn**).
- **Paperless billing** is associated with higher churn — those opting for physical bills are more loyal, possibly reflecting older or less tech-savvy demographics.

These findings suggest that promoting automatic, reliable payment methods could help stabilize customer retention.

🌐 Service Usage Patterns

Customers who use additional support or protection services are far more likely to stay:

- **Tech support**, **online security**, and **device protection** are all associated with much lower churn.
- For instance, churn among customers with **Tech Support** is less than **15%**, compared to over **35%** for those without.
- Interestingly, customers with **Fiber Optic** internet are churning at higher rates (~42%), suggesting dissatisfaction or unmet expectations with the most advanced service tier.

This highlights a potential upselling opportunity: encourage customers to adopt value-added services to increase satisfaction and stickiness.

📈 Visualization Highlights

Your notebook includes several strong visualizations:

- **Count plots** and **pie charts** clearly show the distribution of churn across categories.
- **Histograms** emphasize the correlation between tenure and churn.
- **Heatmaps** give insights into how features interrelate and how strongly they associate with churn.

These visualizations powerfully support the narrative and provide a foundation for data-driven decision-making.

📌 Strategic Recommendations

To reduce churn and increase customer lifetime value, we recommend the following:

1. **Early-stage Engagement**
   Target customers in their first 6 months with loyalty rewards, discounts, and check-in calls to build a strong relationship early.

2. **Senior Customer Support**
   Offer simplified plans, dedicated helplines, or in-home assistance to reduce churn among senior citizens.

3. **Contract Incentivization**
   Promote longer contracts with added benefits like extra data, free support, or reduced rates.

4. **Switch Payment Preferences**
   Transition customers away from electronic check payments with tailored discounts for setting up auto-pay.

5. **Value-Added Bundles**
   Package tech support and security features with internet plans to increase retention and customer satisfaction.

6. **Improve Fiber Internet Satisfaction**
   Investigate complaints or service issues related to fiber connections, which show an unexpectedly high churn rate.