

Executive Summary: Customer Churn Analysis

1. Data Cleaning & Preparation

- The dataset contained missing values in **TotalCharges**, which were replaced with 0 to ensure consistency.
 - The **SeniorCitizen** column, originally encoded as 0 and 1, was converted into "Yes" and "No" for better readability.
 - No duplicate customer IDs were found, confirming data integrity.
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2. Key Insights from Visualizations

2.1. Overall Churn Distribution

- About **26.5% of customers have churned**, while **73.5% have stayed**.
 - This indicates a **moderate churn problem**, requiring attention to retention strategies.
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2.2. Demographic Analysis

Churn by Gender

- Churn rates for males and females are nearly identical, at approximately **26% for both groups**.
- This suggests that **gender does not significantly influence churn behavior**.

Churn by Senior Citizenship

- **41.7% of Senior Citizens churn**, compared to **24% of non-Senior Citizens**.

- **Senior Citizens are 74% more likely to churn** than younger customers, indicating a need for targeted retention programs.
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2.3. Service-Based Analysis

Impact of Internet Service on Churn

- **Fiber Optic users have the highest churn rate (42%)**, compared to **DSL users (23%)**.
- Customers with **no internet service have a very low churn rate (7%)**, likely because they rely on other bundled services.

Impact of Security & Support Services on Churn

- **Customers without Online Security churn at a rate of 42%**, while those with security churn at 15%.
 - **Similar trends are seen with Tech Support and Device Protection**, reinforcing the idea that **customers with these services are more loyal**.
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2.4. Contract Type & Tenure Impact

Churn by Contract Type

- **Month-to-month contract holders have the highest churn rate (60%)**, compared to:
 - **One-year contracts: 11% churn**
 - **Two-year contracts: 3% churn**
- Customers with **longer contracts are significantly less likely to leave**, highlighting the impact of commitment.

Churn by Tenure (Customer Lifetime)

- **New customers (tenure \leq 6 months) have a 60% churn rate**, while those with tenure \geq 2 years have a churn rate below 10%.

- Retaining customers in the **first few months is critical**, as churn probability decreases significantly with time.
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3. Recommendations

- ♦ **Encourage long-term contracts:** Offer discounts or loyalty incentives for 1-year and 2-year contracts to reduce churn from 60% (month-to-month) to below 10%.
- ♦ **Improve customer engagement in early months:** Since **60% of new customers churn**, focus on **personalized onboarding, customer support outreach, and promotions** during the first six months.
- ♦ **Enhance security, tech support, and backup services:** Customers without these services churn at **42% vs. 15% for those who have them**. Promoting these features could **reduce churn by at least 27 percentage points**.
- ♦ **Investigate Fiber Optic service churn:** Since **Fiber Optic users churn at 42% vs. 23% for DSL**, deeper analysis into pricing, performance, or customer satisfaction is needed.
- ♦ **Prioritize Senior Citizens for retention efforts:** Their **churn rate is 41.7%**, much higher than younger users. **Tailored support or incentives** can help lower this.