



Executive Summary: Customer Churn Analysis

This analysis investigates patterns and key drivers of customer churn using a telecom customer dataset of 7,043 records and 21 features.



Data Overview & Preprocessing

- The dataset was clean with no missing values.
- Categorical and numerical features were explored.
- The SeniorCitizen column was transformed from binary (0/1) to descriptive (No/Yes) for better interpretability.



Churn Rate Insight

- A **pie chart** revealed that **26.54% of customers** have churned, providing a clear visual of the churn distribution.



Important Visualizations & Insights

You created several insightful charts to support your conclusions:

1. Tenure vs. Churn:

- Customers with shorter tenure tend to churn more.
- Long-term customers are less likely to leave, indicating **customer loyalty strengthens over time**.

2. Monthly Charges & Total Charges vs. Churn:

- Higher monthly charges correlate with increased churn, possibly due to dissatisfaction with service value.
- Total charges alone didn't show a clear direct relationship due to its dependency on tenure.

3. Contract Type:

- Customers with **month-to-month contracts** churn significantly more than those with **one-year or two-year contracts**.
- This suggests that **longer contracts help retain customers**.

4. Online Security, Tech Support, and Backup Services:

- Lack of services like **Online Security, Tech Support, and Online Backup** were more common among churned customers.
- Offering value-added services can improve customer retention.

5. Internet Service Type:

- **Fiber optic users** showed higher churn compared to **DSL** or those with **no internet service**, hinting at possible dissatisfaction with fiber service or its cost.

6. Payment Method:

- Customers using **electronic checks** had higher churn rates, possibly due to lesser automation or higher dissatisfaction.

Recommendations

- Encourage longer contract subscriptions through incentives.
 - Improve service offerings (especially online security and support).
 - Investigate potential service quality or pricing issues with fiber optic plans.
 - Analyze customer satisfaction specifically among electronic check users.
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Executive Summary: Customer Churn Analysis

This analysis aims to uncover patterns and key drivers of **customer churn** using a telecom dataset with **7,043 customers** and **21 features**. Through detailed visualizations and statistical summaries, the goal is to provide actionable insights for improving customer retention.



Data Overview & Cleaning

- **Rows:** 7,043
 - **Columns:** 21
 - No missing values were found in the dataset.
 - Column SeniorCitizen was converted from binary (0/1) to categorical (No/Yes) for clarity.
 - TotalCharges was correctly converted to float for numerical analysis.
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Churn Rate Overview

- **Overall Churn Rate:**
26.54% of customers have **churned** (i.e., left the service), while **73.46%** have remained.
 - This was visualized using a **pie chart**, providing an immediate understanding of the churn distribution.
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Key Drivers and Visual Insights

1. Tenure vs. Churn

- Churn rate is **inversely proportional** to customer tenure:
 - **Customers with tenure < 12 months** account for a significant portion of the churned base.
 - **Customers with tenure > 50 months** show very low churn.
- Insight: **Loyalty increases with time**. Strategies to engage customers in their early months can reduce churn.

2. Monthly Charges vs. Churn

- **High monthly charges** are associated with higher churn:
 - Churned customers tend to have monthly charges **above \$70**.
 - Among customers paying **over \$90/month**, nearly **40%** have churned.
- Insight: Consider introducing **tiered pricing** or **bundled plans** for high-paying users to increase perceived value.

3. Total Charges vs. Churn

- While Total Charges are cumulative, they are strongly influenced by tenure.
 - Customers with low Total Charges are more likely to have recently joined and churned quickly.
 - Among customers with Total Charges **< \$1,000**, the churn rate is **nearly 40%**, compared to **< 10%** for those with Total Charges **> \$4,000**.
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Categorical Feature Analysis

4. Contract Type

- Distribution of Churn by Contract Type:
 - **Month-to-month**: 88.5% of churned customers fall in this category.
 - **One year**: 8.2%
 - **Two year**: 3.3%
- Customers with long-term contracts are more stable:
 - Only **11%** of customers on **two-year contracts** have churned.
- Insight: Offer **loyalty benefits** for long-term contracts to reduce monthly churn.

5. Online Services (Security, Backup, Tech Support)

- Among churned customers:
 - **74%** had **no Online Security**
 - **72%** lacked **Tech Support**
 - **69%** didn't have **Online Backup**
- Insight: Offering **value-added services** like Online Security or Support might help retain customers.

6. Internet Service Type

- Churn by Internet Service:
 - **Fiber Optic:** 42% churn rate
 - **DSL:** 19% churn rate
 - **No Internet Service:** 7% churn rate
- Insight: Fiber Optic users might be experiencing dissatisfaction — perhaps due to **service issues or pricing**.

7. Payment Method

- Churn rate by payment type:
 - **Electronic Check:** 46%
 - **Mailed Check:** 22%
 - **Credit Card (auto):** 15%
 - **Bank Transfer (auto):** 17%
 - Customers using **electronic checks** show the **highest churn**, possibly due to lower automation or manual errors.
 - Insight: Promote **automated payment options** with discounts or offers to increase retention.
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Demographics and Churn

8. Senior Citizens

- Senior citizens (Yes = 1): 16.2% of dataset
 - Among them, **42%** have churned — significantly higher than the overall churn rate.
- Insight: This group may require **tailored engagement strategies** or **senior-friendly support services**.

9. Dependents & Partners

- Customers **without partners:** 49% churn rate
 - Customers **without dependents:** 50% churn rate
 - Insight: Customers who are **single or living alone** are more likely to churn, indicating the need for **personalized value communication**.
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Recommendations

1. **Improve retention in early tenure months** (e.g., through onboarding, early loyalty points, personalized check-ins).
2. **Target high-paying customers** with customized offers, free trials for add-ons, or usage-based discounts.
3. **Promote longer-term contracts** by offering discounts or perks.
4. **Upsell online services** like security and backup to improve customer stickiness.
5. **Migrate electronic check users** to auto-payment methods using incentives.
6. Conduct a deeper **quality assessment of Fiber Optic services** and address dissatisfaction proactively.