

# Executive Summary

This analysis investigates customer churn behavior in a telecommunications company using the "Telco Customer Churn" dataset. The goal was to identify key factors contributing to churn and provide actionable insights to improve customer retention.

The analysis involved data cleaning, transformation, exploratory data analysis (EDA), and visualizations to extract meaningful patterns.

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## 1. Dataset Overview

- Total Customers: 7,043.
- Churned Customers: 1,869 (26.6% of total).
- Non-Churned Customers: 5,174 (73.4% of total).

The churn rate (26.6%) highlights a significant retention challenge for the business, necessitating targeted interventions.

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## 2. Data Cleaning and Preprocessing

- The dataset contained blank entries in the **TotalCharges** column for 11 customers, which were replaced with 0 and converted to a numeric type.
  - The binary **SeniorCitizen** column (0 or 1) was transformed into categorical values (**Yes** and **No**) to improve interpretability.
  - No duplicate customer IDs or major null values were found after preprocessing.
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## 3. Key Findings and Percentages

### 3.1. Overall Churn Distribution:

- Churned Customers: 26.6%.
  - Retained Customers: 73.4%. This indicates that roughly 1 in 4 customers leaves the service.
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### 3.2. Churn by Gender:

Gender	Churned (%)	Retained (%)
Male	27.3%	72.7%
Female	25.9%	74.1%

- Observation: Female customers have slightly better retention rates compared to male customers. Gender-targeted retention programs could focus on improving male customer retention.
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### 3. Churn by Senior Citizen Status:

Senior Citizen Status	Churned (%)	Retained (%)
Yes (Senior Citizen)	41.3%	58.7%
No (Non-Senior Citizen)	24.0%	76.0%

- Observation: Senior citizens have a much higher churn rate (41.3%), nearly double that of non-senior citizens (24.0%). This indicates a critical need for age-specific retention strategies, such as improved support services or incentives for senior citizens.
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### 3.4. Churn by Contract Type:

Contract Type	Churned (%)	Retained (%)
Month-to-Month Contract	42.0%	58.0%
One-Year Contract	11.0%	89.0%
Two-Year Contract	3.0%	97.0%

- Observation: Customers on month-to-month contracts are far more likely to churn compared to those on longer-term contracts. This indicates that offering

incentives to shift customers to long-term contracts could significantly reduce churn.

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### 3.5. Churn by Internet Service Type:

Internet Service Type	Churned (%)	Retained (%)
Fiber Optic	39.9%	60.1%
DSL	19.3%	80.7%
No Internet Service	7.0%	93.0%

- Observation: Fiber optic users have the highest churn rate (39.9%), potentially due to dissatisfaction with costs or service quality. Customers without internet service have the lowest churn rate, as they are less likely to be reliant on ancillary services.
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## 4. Visualization Highlights:

- Pie Chart: A clear depiction of the 26.6% churn rate compared to retention.
  - Bar Plots:
    - Show significant churn among senior citizens, month-to-month contract users, and fiber optic service users.
  - Count Plots: Gender-based churn and retention trends are evident, with male customers showing slightly higher churn.
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## 5. Recommendations

1. Focus on Month-to-Month Contract Users:
  - Since 42% of these customers churn, offer discounts or benefits for switching to longer-term contracts.
  - Provide better customer support and loyalty programs to enhance satisfaction.
2. Senior Citizen Retention Strategies:
  - Address specific needs of senior citizens, such as simplified service plans, enhanced customer support, or age-specific incentives.
  - Conduct surveys to understand pain points among senior citizens and resolve them proactively.

3. Investigate Fiber Optic Service Complaints:
    - The 39.9% churn rate among fiber optic users suggests dissatisfaction, potentially related to cost, speed, or reliability.
    - Conduct an audit of fiber optic services and address identified issues through improved service quality or competitive pricing.
  4. Gender-Specific Retention Programs:
    - Male customers churn slightly more often than females. Target male customers with campaigns emphasizing reliability, value for money, or personalized offers.
  5. Strengthen Support for High-Risk Customers:
    - Use predictive analytics to identify high-risk customers based on churn patterns (e.g., senior citizens, month-to-month contracts, fiber optic users).
    - Proactively engage with these customers through personalized offers, improved service quality, or direct communication to address dissatisfaction.
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## Conclusion

This analysis highlights the critical factors influencing customer churn, including contract type, senior citizen status, and internet service type. The findings underscore the importance of focusing on high-risk groups, improving service quality, and offering incentives for long-term contracts. By implementing these strategies, the company can significantly reduce its churn rate and improve customer loyalty.