

# Summary

This project presents an in-depth exploratory analysis of customer churn to identify the key drivers influencing customer retention and attrition. After cleaning and preprocessing the dataset—handling missing values, converting categorical variables into readable formats, and validating data consistency—the analysis was conducted using multiple visualizations to uncover meaningful trends and business insights.

## Overall Churn Overview

The dataset shows that **26.54% of customers have churned**, while **73.46% remain active**, indicating that nearly **1 in 4 customers leave the service**. This churn rate is substantial and signals the need for targeted retention strategies, especially for high-risk customer segments.

## Demographic Insights

Senior citizens represent a smaller portion of the customer base but demonstrate a **disproportionately higher churn rate** compared to non-senior customers. The charts clearly show that senior citizens churn at a noticeably higher percentage, suggesting that service usability, pricing sensitivity, or support expectations may not be fully aligned with this demographic's needs.

Gender-based analysis, however, indicates **no significant difference in churn percentages between male and female customers**, implying that gender is not a strong predictor of churn in this dataset.

## Tenure-Based Churn Behavior

Customer tenure emerges as one of the **strongest indicators of churn**. Customers with a tenure of **1–2 months show the highest churn percentage**, accounting for a large share of total churned users. As tenure increases, churn percentage consistently declines.

Customers who have stayed for **more than 24 months exhibit the lowest churn rates**, reinforcing the idea that long-term customers are significantly more loyal.

This trend highlights that **early-stage customer experience is critical**, and the first few months are a decisive period for retention.

## Contract Type Impact

Contract duration has a major influence on churn behavior:

- Customers on **month-to-month contracts contribute the highest churn percentage**, forming the majority of churned customers.
- In contrast, customers with **one-year and two-year contracts show substantially lower churn rates**, with two-year contract customers having the **lowest churn percentage overall**.

This suggests that longer contracts act as a strong retention mechanism and provide business stability.

## Service Usage and Add-On Features

The analysis of service-related features reveals that customers **without value-added services** such as:

- Online Security
- Online Backup
- Device Protection
- Tech Support

show **significantly higher churn percentages** compared to those who have subscribed to these services. Customers using multiple services are more engaged and less likely to churn, indicating that **service bundling increases customer stickiness and perceived value**.

Internet service type also plays a role—customers using **Fiber Optic services exhibit a higher churn percentage** compared to DSL users, which may point toward pricing, service quality expectations, or competitive alternatives.

## Payment Method and Billing Preferences

Payment behavior analysis shows a clear pattern:

- Customers using **Electronic Check have the highest churn percentage**
- Customers using **credit cards, bank transfers, or automated payment methods show lower churn rates**

Additionally, customers who opt for **paperless billing demonstrate a higher churn tendency**, possibly due to their higher exposure to competitive digital offerings.

## Business Implications

The insights derived from the charts and percentage distributions indicate that churn is primarily driven by:

- Short tenure (early-stage customers)
- Month-to-month contracts
- Lack of bundled or support services
- Electronic check payment method
- Senior citizen segment

## Key Recommendations

To reduce churn, the business should:

- Focus on **strong onboarding programs** during the first 2–3 months
- Encourage migration from **month-to-month to long-term contracts**
- Promote **value-added service bundles**
- Incentivize customers to switch to **automated payment methods**
- Design tailored support and pricing plans for **senior citizens**