Customer Churn Analysis for a Subscription Business

Executive Summary

Telecoms Subscription Ltd has experienced a steady decline in active users. This analysis examines customer behavior to identify the key drivers of churn and proposes data☐backed actions to improve retention. Using a dataset of 64,375 customers, the study finds that **payment delays, tenure stage, and customer support intensity** are the strongest predictors of churn. Customers with severe payment delays and long tenure exhibit significantly higher churn rates. Targeted payment interventions and proactive retention programs are recommended to reduce customer attrition.

1. Business Context

Telecoms Subscription Ltd operates a subscription☐based service model. Management seeks to understand why customers leave the service and which customer segments are most at risk of churning, in order to design effective retention strategies.

Business Questions

- What percentage of customers have churned?
- Which customer segments are most likely to churn?
- What factors are most strongly associated with churn?
- What actions can reduce customer churn?

2. Data Overview

- **Dataset size:** 64,375 customer records
- **Source:** Internal company database

- **Key variables:**
  - Customer ID
  - Age, Gender
  - Tenure
  - Usage Frequency
  - Support Calls
  - Payment Delays
  - Subscription Type
  - Contract Length
  - Total Paid
  - Churn Indicator

The dataset represents customer lifecycle and behavioral metrics relevant to churn analysis.

3. Data Cleaning & Feature Engineering

The dataset was reviewed and prepared for analysis using the following steps:

Data Cleaning

- No duplicate or missing records were detected.
- The churn indicator was converted from binary values (0/1) to categorical values (No/Yes) and renamed **Churn**.
- The *Last Interaction* column was removed as it was not relevant to churn drivers.

Feature Engineering

To improve interpretability and analysis: -

Age Brackets were created: - 18–29: Young Adults - 30–54: Middle☐Aged - 55–65: Older Customers –

Tenure Groups were created: - New Customers - Growing Customers - Established Customers –

Usage frequency, payment delay, and support calls were categorized into meaningful behavioral groups.

These transformations enabled clearer segmentation and comparison during exploratory analysis.

4. Exploratory Data Analysis (EDA)

Pivot tables and visualizations were used to explore churn patterns across customer segments.

Key Findings

- **Overall churn rate:** 47% of customers churned, while 53% remained active.
- **Tenure Group:** Established customers show the highest churn rate, indicating increased attrition among long⬚term users.
- **Payment Delays:** Customers with severe payment delays account for approximately **92% of churned customers**, making this the strongest churn indicator.
- **Contract Length:** Contract length shows minimal influence on churn compared to behavioral factors.

Visualizations
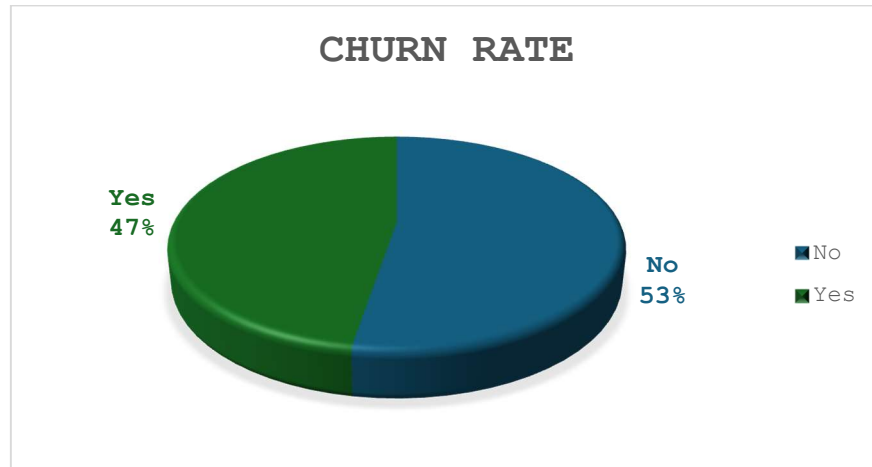
- Churn distribution (pie chart)

Figure 1: Churn rate
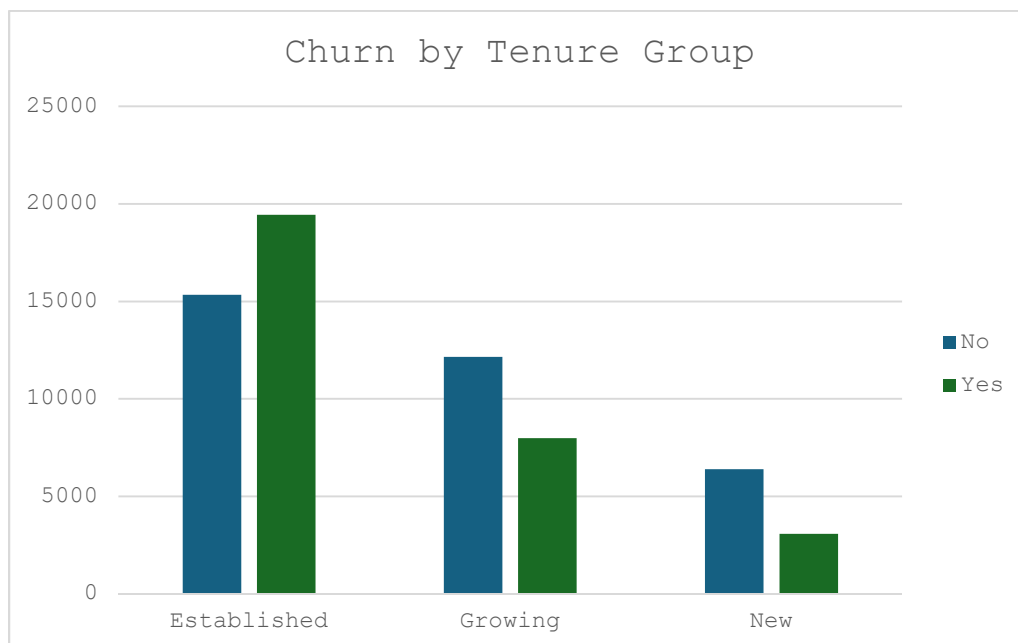
- Churn by tenure group (bar chart)

Figure 2: Churn by Tenure group
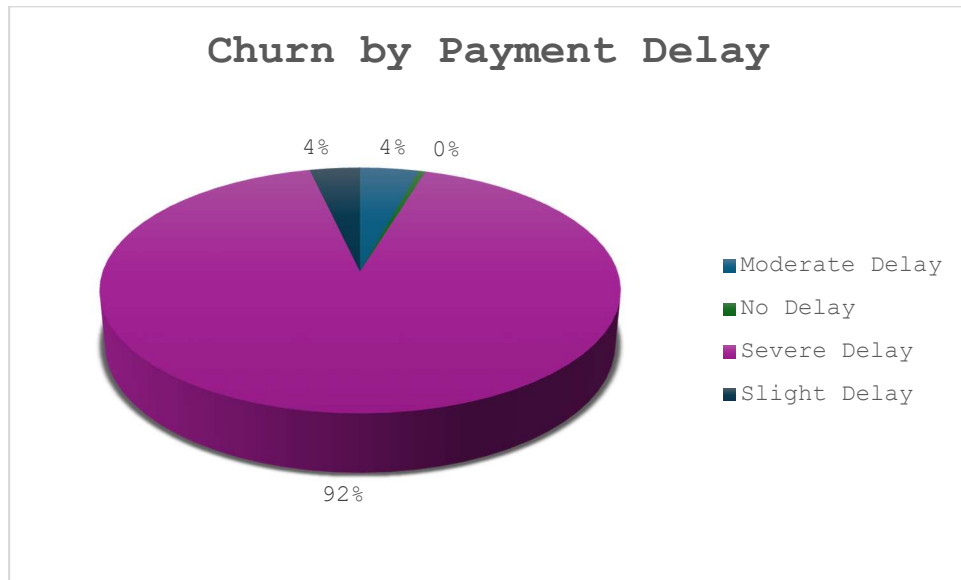
- Churn by payment delay category (bar chart)

Figure 3: Churn by Payment Delay

5. Insights

The analysis identifies three primary drivers of customer churn:

1. **Payment Delays:** Customers with frequent or severe delays are significantly more likely to churn.

2. **Tenure Stage:** Long☐tenured (established) customers exhibit higher churn than new or growing customers.

3. **Customer Engagement Signals:** Usage behavior and support interactions contribute to churn risk.

Contract length was found to have little to no impact on churn when compared with payment and behavioral factors.

6. Recommendations

Based on the findings, the following actions are recommended:

1. **Implement Payment Support Interventions**

   Introduce automated reminders, flexible payment plans, and incentives for early or on‑time payments to reduce churn driven by payment delays.

2. **Proactive Retention for Established Customers**

   Launch loyalty programs, personalized offers, and periodic engagement campaigns targeted at long‑tenured customers.

3. **Early Warning Churn Monitoring**

   Flag customers with increasing payment delays or declining usage for proactive outreach.

4. **Customer Engagement Improvements**

   Introduce value‑added services and feature enhancements to maintain relevance and dependency on the service.

5. **Data‑Driven Retention Strategy**

   Regularly monitor churn metrics and segment‑level performance to refine retention initiatives.

7. Conclusion

This analysis demonstrates that customer churn at Telecoms Subscription Ltd is primarily driven by payment behavior and customer lifecycle stage rather than contract structure. By addressing payment friction and strengthening engagement with long‑term customers, the organization can significantly reduce churn and improve customer lifetime value.

This project demonstrates end‑to‑end data analysis skills, including data cleaning, feature engineering, exploratory analysis, insight generation, and business‑focused recommendations.