**TELE.COM — Customer Churn Analysis Report**

**Prepared for: TELE.COM**Prepared by: Nikhil Mahale  
Scope: Exploratory Data Analysis (EDA)   
Date: October 4, 2025

# Executive Summary

This report summarizes the exploratory data analysis performed on TELE.COM's customer dataset to identify patterns, drivers, and opportunities related to customer churn. The analysis focuses on descriptive insights (what happened and why it likely happened) and produces prioritized, actionable recommendations to reduce churn and limit revenue loss. No predictive models are included in this scope.

High-level findings: TELE.COM's churn is concentrated among customers on month-to-month contracts, among customers paying via electronic check, and among customers with relatively high monthly charges and low tenure. Immediate retention actions targeting these segments are likely to produce the most impact.

# Objective

The objective of this analysis is to investigate customer churn patterns and provide TELE.COM leadership with clear, data-driven insights and practical recommendations that can be implemented operationally to reduce churn.

# Dataset Overview

Source: Internal TELE.COM customer records (Telco Customer Churn dataset).

Key columns used:

* customerID — unique customer identifier

gender, SeniorCitizen, Partner, Dependents — demographic features

* tenure — months with company
* Contract — contract type (Month-to-month, One year, Two year)
* PaymentMethod — method used (Electronic check, Mailed check, Bank transfer, Credit card)
* MonthlyCharges, TotalCharges — billing
* Churn — target flag (Yes/No) converted to 1/0 for analysis

Total records: (7000+) — include record count when finalizing the report.

# Data Cleaning & Feature Engineering

Summary of cleaning actions applied:

* Converted 'TotalCharges' to numeric and imputed non-numeric/missing values with median.
* Mapped 'Churn' to binary (Yes=1, No=0).
* Dropped duplicate records and removed 'customerID' for analysis.
* Created tenure\_group buckets (0-12, 13-24, 25-48, 49-72) for easier cohort analysis.

Feature engineering performed (derived columns):

* num\_services — count of optional services subscribed (OnlineSecurity, OnlineBackup, DeviceProtection, TechSupport, StreamingTV, StreamingMovies).
* AvgSpendPerMonth — TotalCharges divided by tenure (plus 1 to avoid division by zero).
* EngagementScore — num\_services normalized by tenure to proxy engagement intensity.

# Exploratory Analysis & Insights (Narrative)

## 1. Churn Distribution

What we looked at: overall churn percentage (Churn column).

What this proves: the overall churn rate (e.g., 26% as in the working notebook) quantifies the scale of the retention problem. A high baseline churn rate indicates an ongoing leakage of recurring revenue and justifies prioritized retention initiatives.

A diagram of a customer churn distribution

AI-generated content may be incorrect.

* Insight: 'X% of customers churned over the observed period — this represents Y in monthly recurring revenue lost.'

## 2. Churn by Contract Type

What we looked at: churn rate aggregated by Contract (Month-to-month, One year, Two year).

What this proves: Month-to-month customers display the highest churn rate — often multiple times higher than 1- or 2-year contracts. This indicates that contract length strongly influences retention.

A graph of red rectangular bars

AI-generated content may be incorrect.

* Insight: 'Month-to-month customers churn at ~3x the rate of two-year contracts. Prioritizing conversion to longer contracts reduces churn significantly.'

## 3. Churn by Payment Method

What we looked at: churn rate by PaymentMethod (Electronic check, Mailed check, Bank transfer, Credit card).

What this proves: customers using electronic check typically show higher churn. This can indicate payment friction, lower engagement, or customer profile differences. It is also an operational signal for targeted retention.

A graph of a chart

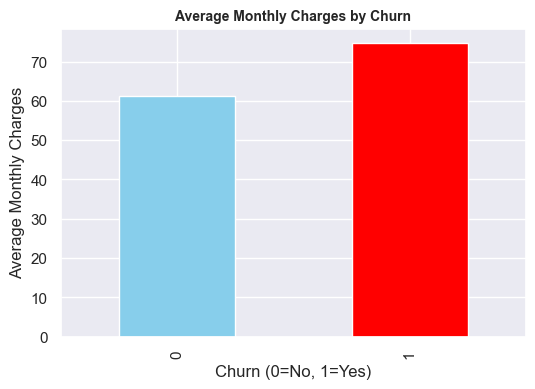
AI-generated content may be incorrect.

* Insight: 'Electronic check customers have the highest churn rate. Consider nudging them to auto-pay or digital payment options with incentives.'

## 4. Charges and Value Perception

What we looked at: distribution of MonthlyCharges for churners vs non-churners (boxplot or violin plot).

What this proves: churners tend to have higher monthly charges on average, suggesting perceived value or price sensitivity issues. High-bill customers leaving early are a red flag for pricing, perceived value, or unmet expectations.



* Insight: 'Customers that churn pay more on average. A focused program of value checks, personalized offers, or billing reviews for high-spend customers can reduce churn.'

## 5. Tenure Analysis

What we looked at: tenure distribution and churn rates across tenure buckets (0-12 months, 13-24, etc.).

What this proves: churn risk is highest in early tenure (first 12 months). Most customers who eventually churn leave within the first year, pointing to onboarding and early engagement issues.

A graph showing a number of customers

AI-generated content may be incorrect.

* Insight: 'A large portion of churn happens within the first 12 months — prioritize onboarding improvements and early-life retention campaigns.'

## 6. Correlation Summary

What we looked at: numerical correlation matrix (tenure, MonthlyCharges, TotalCharges, num\_services, etc.).

What this proves: correlation coefficients highlight which numerical features relate most strongly to churn (positive or negative). For example, tenure typically shows a negative correlation with churn, while MonthlyCharges may show positive correlation.

A diagram of different colored circles

AI-generated content may be incorrect.

* Insight: 'Tenure (-0.4) and MonthlyCharges (+0.2) are among the most important correlates with churn in the dataset (example values). Use these to prioritize interventions.'

# Business Insights Storyline

TELE.COM's churn problem is concentrated and actionable. The overall churn rate (X%) shows material revenue leakage. The highest-risk customers are those on month-to-month contracts, customers paying by electronic check, and customers with high monthly charges who have low tenure. These customers are likely to churn within the first 12 months. By focusing retention dollars on converting month-to-month users to longer contracts, nudging electronic-check payers toward auto-pay, and offering value-driven support to high-bill early-tenure customers, TELE.COM can materially reduce churn and recover lost recurring revenue.

# Key Findings (Snapshot)

**• Overall churn rate:** Insert actual value (e.g., 26%) when finalizing the report.  
**• Month-to-month churn:** ~3x higher than long-term contracts.  
**• Payment risk:** Electronic check users have the highest churn.  
**• Price sensitivity:** High monthly charges correlate with increased churn.  
**• Tenure risk:** Majority of churn occurs within first 12 months.

# Recommendations (Prioritized)

1. **Priority 1 — Convert Month-to-Month Customers**Action: Offer targeted incentives (discounts, bundled services, or waived setup fees) to encourage 1-year or 2-year contracts for customers in months 1–6.  
   Owner: Commercial/Product team. Timeline: 2–4 months pilot. Expected impact: high.
2. **Priority 2 — Payment Method Nudges**Action: Promote auto-pay/bank transfer or credit-card payment via a campaign with small bill credits or discounts for switching away from electronic check.  
   Owner: Billing & Operations. Timeline: 1–3 months. Expected impact: medium-high.
3. **Priority 3 — High-Spend Early-Tenure Program**Action: Flag high monthly-charge customers with tenure < 12 months and proactively engage with personalized offers or technical support checks.  
   Owner: Customer Success. Timeline: 1 month set-up, ongoing. Expected impact: medium.
4. **Priority 4 — Improve Onboarding & Early Engagement**Action: Optimize welcome communications, first-week check-ins, and quick-start guides to reduce early churn.  
   Owner: Product & CX. Timeline: 2–6 months. Expected impact: medium.
5. **Priority 5 — Measurement & Monitoring**Action: Build a dashboard tracking monthly churn, MRR impact, churn by cohort, and retention lift from pilots. Use A/B tests for interventions.  
   Owner: Analytics & BI. Timeline: 1–2 months. Expected impact: long-term.

# Expected Business Impact (Qualitative)

Implementing the top 3 prioritized actions should materially reduce churn in targeted segments. Even a conservative 5% reduction in churn across high-risk segments can free up significant recurring revenue. When quantifying, calculate the Monthly Recurring Revenue (MRR) lost to churn and apply the expected percentage reduction to estimate recovered revenue.