

Telco Customer Churn Analysis

Project Report



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Introduction

Telecommunication companies operate in a highly competitive market where customers can easily switch service providers. Pricing, contract flexibility, service quality, and payment convenience strongly influence customer loyalty. Since acquiring new customers is significantly more expensive than retaining existing ones, customer churn has become a critical business concern.

Customer churn refers to customers who discontinue their services within a given period. Even a moderate churn rate can lead to substantial revenue loss and reduced customer lifetime value. This project analyzes customer churn using historical telecom data and presents insights through a single page interactive Power BI dashboard to support informed retention decisions.

Problem Statement

The telecom company is experiencing customer churn, resulting in revenue loss and declining customer lifetime value. Management requires a clear analytical view to understand churn behavior, identify high risk customer segments, and prioritize retention strategies.

Project Objectives

The key objectives of this project are:

- To calculate and monitor the overall customer churn rate
- To analyze churn patterns based on contract type, tenure, internet type, and payment method
- To visualize customer behavior using intuitive and business-friendly visuals
- To support data-driven decisions aimed at reducing churn and improving retention

Dataset Overview

Dataset Name: Telco Customer Churn Dataset

Dataset Description:

The dataset contains information about a fictional telecommunications company providing home phone and internet services to 7,043 customers in California during Q3.

Each row represents a single customer and includes information on:

- Customer demographics
- Services subscribed
- Contract and tenure details
- Billing and payment information
- Customer churn status

Target Variable:

- Churn (Yes or No)

Key Data Categories:

- Customer Demographics: Gender, Senior Citizen, Dependents
- Services: Internet service type, phone service
- Contract Information: Tenure, contract type
- Billing Information: Monthly charges, total charges, payment method

Data Preparation and Cleaning

Data preparation was performed using Power Query in Power BI.

Cleaning Steps Performed

- Imported the CSV dataset into Power BI
- Corrected data types for numeric and categorical fields
- Standardized Yes/No values and replaced Yes = 1, No = 0
- Removed duplicate records based on Customer ID
- Removed unnecessary whitespace from categorical columns

These steps ensured data consistency, accuracy, and reliability for analysis.

Data Model

A single table data model was used, as all required attributes were present within one dataset. No relationships were required.

A separate Measures table was created to store all DAX measures. This improved report organization and made calculations easier to manage.

Key Measures (DAX)

The following measures were created to support analysis:

- Total Customers
- Churned Customers
- Retained Customers
- Churn Rate (%)
- Total Revenue

These KPIs provide a high-level summary of customer volume, churn impact, and revenue performance.

Dashboard Design

Layout and Design Principles

- Single page dashboard with a 16:9 layout
- KPI cards positioned at the top for quick executive insight
- Logical flow from high level metrics to detailed analysis
- Consistent color usage for churned and retained customers
- Minimal clutter to improve readability and focus

Visualizations Used

The dashboard includes the following visuals:

- 1. KPI Cards**
 - Total Customers: 7.043K
 - Churn Rate: 26.54%
 - Churned Customers: 1.869K
 - Total Revenue: 16.06M
- 2. Column Chart**
 - Churned Customers by Contract Type
 - Churned Customers by Internet Service
- 3. Bar Chart**
 - Churn Rate (%) by Payment Method
- 4. Donut Chart**
 - Churned vs Retained Customers
- 5. Line Chart**
 - Churn Rate (%) by Tenure in Months
- 6. Scatter Chart**
 - Monthly Charges vs Tenure with Churn Highlighted

Slicers were added for Contract Type, Internet Type, and Tenure Group to enable interactive analysis.

Dashboard Analysis and Insights

Overall Churn Overview

- Out of 7,043 customers, approximately 26.54% have churned
- This indicates that more than one in four customers leave the service

Contract Type Analysis

- Month-to-Month contracts show the highest churn
- Customers on one-year and two-year contracts churn significantly less
- Long-term contracts improve customer retention

Tenure Analysis

- Churn is highest among customers with low tenure
- Churn rate steadily declines as tenure increases
- Long-standing customers are more loyal

Internet Type Analysis

- Fiber optic customers show the highest churn
- DSL and cable users churn less compared to fiber users
- High-speed service alone does not guarantee retention

Payment Method Analysis

- Customers using mailed checks have the highest churn rate
- Automatic payment methods such as bank withdrawal and credit cards show lower churn
- Payment convenience plays a key role in retention

Pricing Behavior

- Customers with higher monthly charges are more likely to churn during early tenure
- Price sensitivity is strongest among new customers

Business Recommendations

Based on the analysis, the following actions are recommended:

1. Strengthen onboarding and customer support for new customers
2. Encourage long-term contracts through discounts or loyalty benefits
3. Promote automatic payment methods to reduce churn risk
4. Review pricing and service quality for high monthly charge plans
5. Investigate service experience issues among fiber optic customers

Conclusion

This project demonstrates how Power BI can be effectively used to analyze customer churn using structured data cleaning, basic DAX measures, and well-designed visuals. The dashboard provides clear insights into customer behavior and highlights critical churn drivers such as contract type, tenure, pricing, and payment methods.

The analysis enables decision makers to focus on targeted retention strategies and improve long-term customer value. This project also serves as a strong foundation for further advanced analytics such as churn prediction and customer segmentation.

Final Dashboard

