

CUSTOMER CHURN ANALYSIS

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1 TITLE PAGE

Customer Churn Analysis – Telecom Industry

Prepared by: **Priya**

Tools Used: Python, SQLite, Power BI

2 PROJECT OVERVIEW

Customer churn is a critical challenge in the telecom industry, where acquiring new customers is more expensive than retaining existing ones. This project analyzes customer behavior to identify patterns and factors contributing to churn.

An end-to-end analytics approach was used, combining Python for data preprocessing, SQLite for business analysis, and Power BI for interactive visualization. The goal is to generate actionable insights to support customer retention strategies.

3 DATASET DESCRIPTION

The dataset used in this project is the **Telco Customer Churn Dataset**, containing information about customer demographics, services subscribed, billing details, and churn status.

Key Details:

- Total Customers: 7,032
- Number of Features: 21
- Target Variable: Churn (Yes/No)

Important Columns:

- Customer tenure
- Contract type
- Payment method
- Monthly and total charges
- Churn status

TOOLS & TECHNOLOGIES

Tool	Purpose
Python (Pandas, NumPy)	Data cleaning and transformation
Matplotlib, Seaborn	Exploratory Data Analysis
SQLite	SQL-based business analysis
Power BI	Dashboard creation and reporting
VS Code	Development environment

DATA CLEANING & PREPARATION

The raw dataset required preprocessing before analysis:

- Converted TotalCharges column to numeric format
- Removed rows with missing or invalid values
- Encoded binary categorical variables (Yes/No → 1/0)
- Created customer tenure groups:

- 0–1 Year
 - 1–3 Years
 - 3–6 Years
- Stored cleaned data in a SQLite database for analysis

This ensured data accuracy and consistency across all tools.

6 KEY ANALYSIS & INSIGHTS

◆ Churn Rate

- Overall churn rate: **26.58%**
- Nearly 1 in 4 customers churned

◆ Contract Type Impact

- Month-to-month contracts show the **highest churn**
- Two-year contracts have **minimal churn**

◆ Tenure Analysis

- Customers in their first year are more likely to churn
- Long-tenure customers show higher retention

◆ Payment Method Risk

- Electronic check users have the **highest churn**
- Automatic payment methods reduce churn risk

◆ Revenue Impact

- Significant revenue is lost due to churned customers
- Retention improvements can directly increase profitability

7 DASHBOARD EXPLANATION

The Power BI dashboard provides an interactive view of customer churn behavior:

- KPI cards summarize total customers, churned customers, churn rate, and average monthly charges

- Bar and column charts show churn distribution by contract type and tenure group
- Donut chart highlights churn by payment method
- Slicers allow filtering by contract, payment method, tenure, and gender

This dashboard enables stakeholders to quickly identify high-risk customer segments.

8 BUSINESS RECOMMENDATIONS

Based on the analysis, the following actions are recommended:

1. Encourage customers to shift from month-to-month to long-term contracts
2. Promote automatic payment methods to reduce churn risk
3. Focus retention efforts on customers within their first year
4. Introduce loyalty benefits for high-value customers
5. Monitor churn-prone segments continuously using dashboards

9 CONCLUSION

This project demonstrates how data analytics can be used to understand customer behavior and reduce churn in the telecom industry. By integrating Python, SQL, and Power BI, meaningful insights were generated to support data-driven business decisions.

The approach used in this project can be applied to real-world customer retention problems across industries.