Customer Churn Analysis & Retention Dashboard

1. Project Introduction

Customer churn refers to customers leaving a service or subscription. In subscription-based businesses like telecom, reducing churn is critical. This project simulates a real-world data analyst task: analyzing churn data and presenting insights through a professional BI dashboard.

2. Business Objective

- Measure overall churn rate
- Identify high-risk customers
- Understand churn drivers (contract, payment, tenure)
- Support data-driven retention decisions

3. Dataset Understanding

The Telco Customer Churn dataset contains customer demographics, subscription details, payment information, and churn status. Each row represents one customer.

4. Data Modeling (Star Schema)

The raw CSV data was transformed into a star schema for analysis:

Fact Table: churn_fact (churn_flag)

Dimension Tables: customer_dim, subscription_dim

This structure improves performance, scalability, and analytical clarity.

5. Data Cleaning & Preparation

- Created surrogate keys for dimension tables
- Handled inconsistency data values
- Converted data types for numerical analysis
- Ensured referential integrity between fact and dimension tables

6. SQL Exploratory Data Analysis (EDA)

SQL was used to analyze churn patterns and validate results:

- Overall churn rate calculation
- Churn by contract type
- Churn by payment method
- Churn by tenure groups
- High-risk customer segmentation

7. Power BI Dashboard Development

An interactive dashboard was built in Power BI featuring:

- KPI cards for churn rate
- Charts by contract, payment method, and tenure
- High-risk segment table
- Interactive slicers for demographics

8. Validation & Quality Checks

All Power BI metrics were validated using SQL queries in MySQL Workbench to ensure accuracy and professional data quality standards.

9. Key Business Insights

- Month-to-month contracts show the highest churn
- Electronic check users are more likely to churn
- New customers (0–6 months) are highest risk
- Combined factors identify clear retention targets