

# Customer Churn Analysis Project Report

## Introduction

The Customer Churn Analysis project aims to identify the key factors that influence customer attrition in a telecommunications company. By leveraging data analytics and visualization tools, this project helps understand customer behavior and retention trends to support data-driven decision-making.

## Abstract

This project focuses on analyzing customer churn using the Telco Customer Churn dataset. The process involves data extraction, cleaning, and analysis using MySQL, Python, and Power BI. Insights were derived through data visualization and model-based prediction. The final outcome highlights the main drivers of churn, such as contract type, tenure, and payment method, enabling strategic actions to reduce churn rates.

## Tools Used

1. **MySQL Workbench:** For data storage, cleaning, and performing SQL queries on churn data.
2. **Python:** For data preprocessing, exploratory analysis, and churn prediction modeling.
3. **Power BI:** For interactive dashboards and data visualization, showcasing churn patterns and key metrics.

## Steps Involved in Building the Project

1. **Data Import & Database Creation:** The Telco churn dataset was imported into MySQL, and the *customer\_churn* table was created to store the records.
2. **Data Cleaning & Preprocessing:** Missing and inconsistent values were handled in Python using Pandas, and data types were standardized.
3. **Exploratory Data Analysis (EDA):** SQL queries and Python visualizations were used to study churn distribution, tenure averages, and payment preferences.
4. **Model Building:** A machine learning model (Logistic Regression) was trained to predict churn probability and interpret results using SHAP explainability.
5. **Dashboard Visualization:** Power BI dashboards were created to visualize churn by gender, internet service type, contract duration, and payment methods.
6. **Insights & Interpretation:** Key churn drivers were identified, aiding in customer retention strategies.

## Conclusion

The Customer Churn Analysis project successfully uncovered patterns and factors contributing to customer attrition. By integrating MySQL for data handling, Python for analytics, and Power BI for visualization, this project provided a comprehensive overview of customer behavior. The insights can help organizations design targeted retention strategies, reduce churn rate, and improve customer satisfaction.