High Level Design (HLD)

NoMoreChurn – Telco Risk Intelligence

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Document Version Control

Date Issued	Version	Description	Author
25/5/2025	1.0	First Version of Complete HLD	Soumen Baidya
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Contain

Abstract

The telecommunication industry is highly competitive, with companies continuously seeking ways to retain their customers. One of the significant challenges faced by telecom providers is *customer churn*, where customers discontinue their service subscriptions. Identifying customers likely to churn, understanding the reasons behind their decisions, and taking strategic actions can reduce revenue loss significantly.

This project, titled "NoMoreChurn – Telco Risk Intelligence,"aims to predict customer churn using machine learning techniques and visualize insights through a comprehensive Power BI dashboard. The insights derived from the analysis help business stakeholders develop proactive strategies for customer retention.

To analyze telecom customer data to identify factors influencing churn.

* To build a machine learning-based prediction model to forecast customer churn probability.

* To evaluate and compare various ML algorithms for optimal performance.

* To present key insights through an interactive and user-friendly Power BI dashboard.

* To support data-driven decisions for reducing customer churn and improving business strategies.

Introduction

Why this High-Level Design Document?

- Purpose of HLD: to outline architectural and functional overview for non-technical and semi-technical audiences.

Scope

- What the system will and won't cover.
- Only test dataset in Power BI.
- Focus on customer churn modelling, predictions, insights.

General Description

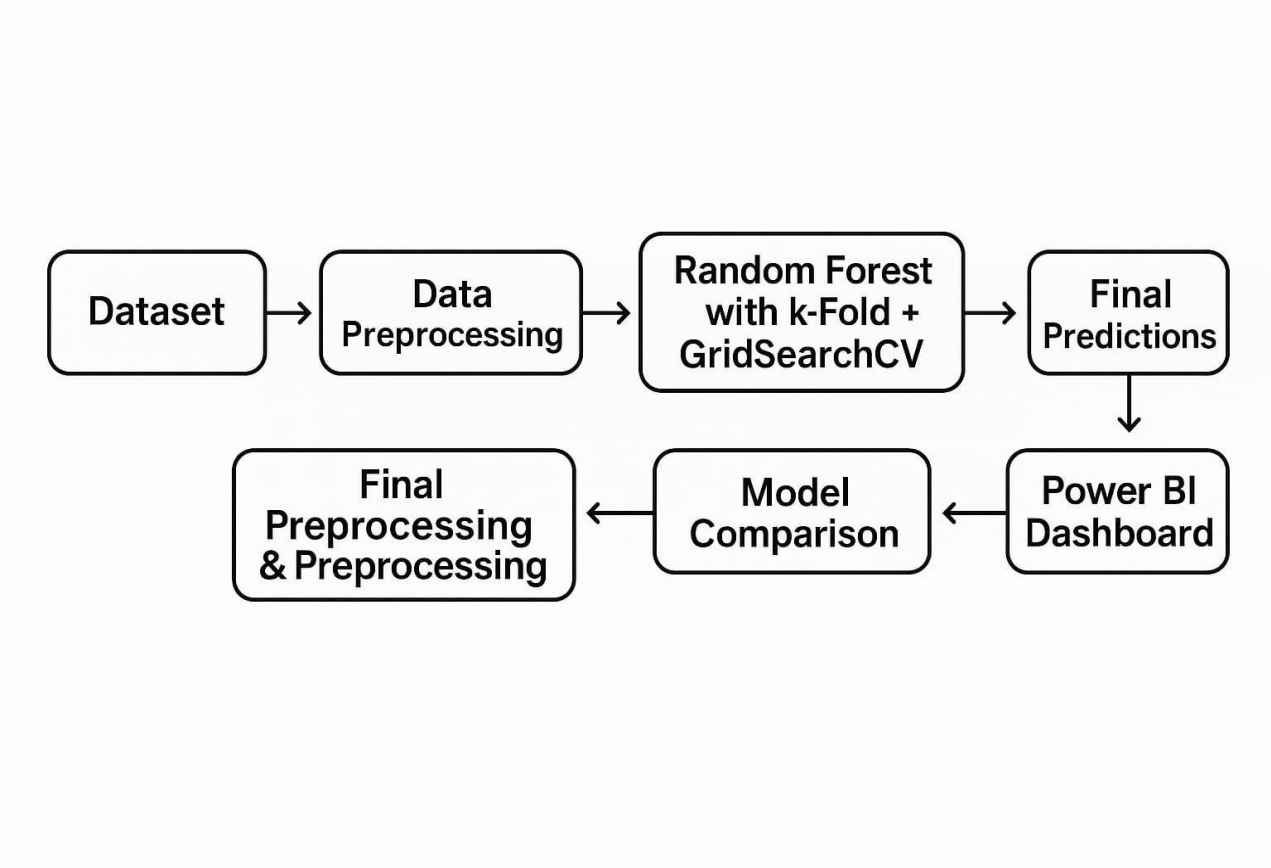
Product Perspective & Problem Statement

- Overview of the solution in business context.
- Problem: High customer churn in telecom.
- Solution: Use ML to predict churn, analyze causes, and visualize it via Power BI.

- **Tools Used**
- Python (EDA, modelling)
- XG Boost, scikit-learn
- Power BI (dashboard visualization)
- pandas, seaborn, matplotlib,

Design Details

Functional Architecture



Optimization

- Feature engineering (e.g., binning, encoding)
- Hyperparameter tuning using GridSearchCV
- Stratified sampling for test split
- Churn probability included for deeper analysis

KPIs

Key Performance Indicators

- Model Accuracy (from Python)
- Precision, Recall (shown in Power BI)
- Actual Churn Rate vs Predicted
- Risk Bands and high-risk customer identification
- Prediction vs Actual Confusion Matrix

Deployment

- Final CSV exported from Python
- Power BI dashboard built on top of it
- Local Power BI file, future plan for Power BI Cloud or embedding into web app (optional mention)