



Customer Churn Analysis & Prediction


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Project Overview

- **The Problem:** Customer attrition reduces revenue and increases acquisition costs.
- **The Solution:** A three-pillar approach:
 - 1.Descriptive:** Analyze historical patterns.
 - 2.Diagnostic:** Identify "High-Risk" demographics and behaviors.
 - 3.Predictive:** Use Machine Learning to flag churners before they leave.
- **Goal:** Protect the **\$19.47M** in revenue currently at risk
 - Include a simple infographic showing **data → analysis → prediction.**

Data & ETL Process

- **Tools:** SQL Server, Python, Power BI.
- **The Process:**
 - **Extraction:** Sourcing raw customer data from CSV/Databases.
 - **Transformation:** Data cleaning, handling missing values, and normalization in SQL.
 - **Loading:** Creating optimized SQL Views to feed the Power BI dashboard and ML models.

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- **Demographic Findings:** * Significant churn among **Females (64.8%)**.
 - Age concentration: Customers **over 35** represent the majority of churn.
 - **Geographic Hotspots:** High churn rates in Uttar Pradesh, Maharashtra, and Tamil Nadu.
 - **Behavioral Red Flags:** Credit Card users show higher instability compared to other payment methods.

Exploratory Data Analysis (EDA)

- **Dashboard Highlights:**
- **KPIs:** Total Customers, Churn Rate, and New Joiners.
- **Interactivity:** Show how filters allow deep dives into specific states or service types.
- **Visual:** *Insert a high-quality screenshot of your main Power BI overview page.*

Power BI Executive Dashboard

Machine Learning Methodology

- **Algorithm:** Random Forest Classifier.
- **Features Used:** Tenure, Contract Type, Monthly Charges, and Demographics.
- **Why Random Forest?** Excellent at handling non-linear relationships and providing "Feature Importance" (identifying which factors drive churn most).

Prediction Results

- **Key Outcome:** 372 Customers predicted to churn.
- **Segment Breakdown:**
- **Top Age Group:** > 50 (34.7% of predicted churners).
- **Top Payment Method:** Credit Card.
- **Financial Risk:** These 372 customers account for ~\$19.47M in total revenue.

Thank you

