

Subject: PowerCo Churn Analysis - Data Needs and Methodology Outline

Dear AD,

As discussed in today's meeting, we understand that PowerCo is concerned about customer churn due to increased competition in the energy market. Our initial approach will involve systematically understanding and framing the problem, exploring the data, and conducting rigorous analysis. Below, we've outlined the key steps we'll take in line with the 5-step data science methodology.

Step 1: Business Understanding & Problem Framing

The primary question PowerCo faces is: *What factors influence customer churn, and to what extent does price sensitivity drive customers to leave for competitors?* To diagnose this, we need to understand various potential reasons for churn, such as:

- **Price sensitivity:** Are customers leaving due to higher rates compared to competitors?
- **Service quality:** Factors like customer service responsiveness, billing transparency, and service reliability.
- **Product offerings:** Availability of clean or renewable energy options.
- **Geographic factors:** Influence of location on service costs or availability.

Based on this problem framing, our goal is to identify actionable insights that can help PowerCo retain customers by understanding and addressing these factors.

Step 2: Data Requirements

To explore these drivers of churn, we'll need the following data from PowerCo:

Customer Demographics:

- Business size and type (e.g., SME industry classification)
- Geographic location (e.g., region, urban/rural distinctions)

Contract & Pricing Details:

- Contract type and duration
- Monthly energy rates and any special pricing plans (e.g., fixed-rate, variable)
- Renewal history and price changes over time

Customer Engagement Data:

- Frequency and nature of customer service interactions
- Service ratings or complaints (if available)

Usage and Billing Information:

- Monthly energy consumption patterns over recent years
- Billing amount and payment consistency

Churn Information:

- Labels indicating which customers have churned, along with churn dates

Market Data (if accessible):

- Competitor pricing in regions served by PowerCo
- Availability of renewable options by competitors

Step 3: Exploratory Data Analysis & Data Cleaning

Upon receiving the data, we will conduct EDA to uncover patterns, trends, and correlations. Some specific analyses we'll perform include:

- **Descriptive analysis** to understand customer characteristics by region, industry, and energy usage levels.
- **Correlation analysis** to identify relationships between price sensitivity, contract type, and churn.
- **Trend analysis** to assess changes in customer retention over time.

Visualizations, such as heatmaps of churn rates by pricing plan and usage levels, can help us understand the key factors at a glance.

Step 4: Feature Engineering

To strengthen the analysis, we can create new features based on PowerCo's data and external sources:

- **Price sensitivity indicators:** Calculate price change frequency and percentage increase over contract periods.
- **Customer lifetime value (CLV) estimates:** Assess long-term value based on usage and contract duration.
- **Competitor data:** Benchmark PowerCo's pricing against competitors in various locations.

Step 5: Modeling and Evaluation

Using the processed and enriched dataset, we'll build a predictive churn model to quantify the likelihood of churn for different customer segments. Suitable techniques include:

- **Logistic Regression and Decision Trees** to interpret key drivers.
- **Random Forests and Gradient Boosting** for more robust predictions.

We'll use cross-validation to test model reliability and focus on model interpretability, enabling PowerCo to understand which factors most impact churn risk.

Step 6: Insights & Recommendations

Our final step will be to synthesize these findings into actionable insights for PowerCo. By focusing on the model's outputs, we can provide targeted recommendations, such as:

- **Pricing adjustments** based on customer segment sensitivities.
- **Service improvements** for segments with high churn likelihood due to customer service issues.
- **Renewable energy offerings** where market data shows increased demand.

We look forward to receiving the necessary data from PowerCo so we can begin our analysis. Please let us know if you need any further clarification on this plan.