**Subject: Approach to Testing the Churn Hypothesis and Retention Strategy for PowerCo**

Dear Jane,

I hope this email finds you well. I have thoroughly analysed the situation with our client, PowerCo, and have devised an approach to test the hypothesis regarding churn and the proposed discounting strategy. Based on the information provided, here is the outline of the major steps needed to evaluate the hypothesis and develop an effective retention strategy:

1. Data Collection:

a. Obtain historical customer data from PowerCo, including information such as customer demographics, usage patterns, billing data, contract details, and churn indicators.

b. Gather data on pricing, discounts, and promotions offered by PowerCo and its competitors in the market.

c. It would also be helpful to collect external market data, such as energy market trends, regulatory changes, and competitor analysis.

Data Pre-processing and Feature Engineering:

a. Cleanse and pre-process the collected data to handle missing values, outliers, and data inconsistencies.

b. Perform feature engineering to extract relevant features that could influence churn, such as customer tenure, average energy consumption, payment history, contract type, price changes, and customer interaction patterns.

2. Exploratory Data Analysis (EDA):

a. Conduct comprehensive EDA to gain insights into the data and understand the relationships between variables.

b. Identify any patterns, correlations, or anomalies that could provide initial indications of the factors driving churn.

3. Model Development:

a. Split the data into training and testing sets, ensuring temporal consistency to reflect real-world scenarios.

b. Build a predictive model, such as a binary classification model (e.g., logistic regression, decision trees, random forests, or gradient boosting), to predict churn probability for individual customers.

c. Utilize appropriate techniques, such as regularization, feature selection, or ensemble methods, to improve model performance and interpretability.

4. Model Evaluation and Interpretation:

a. Evaluate the model's performance using appropriate evaluation metrics, such as accuracy, precision, recall, and F1 score.

b. Assess the model's ability to predict churn and identify customers with a high propensity to churn.

c. Interpret the model to understand the significant features driving churn, such as price sensitivity, contract type, or customer characteristics.

5. Retention Strategy Testing:

a. Identify customers with a high predicted churn probability from the model.

b. Design an A/B test to evaluate the effectiveness of the proposed discounting strategy. Randomly divide the selected customer group into two segments:

Treatment Group: Offer a 20% discount to customers.

Control Group: Do not offer any discounts.

c. Monitor the churn rates for both groups over a defined period, compare the results, and analyse the impact of the discounting strategy on customer retention.

6. Model Deployment and Monitoring:

a. Develop a user-friendly interface to apply the churn prediction model to new customer data in real-time.

b. Continuously monitor and evaluate the model's performance and recalibrate it periodically to ensure its accuracy and relevance.

To proceed with this approach, we will require the following data from PowerCo:

1. Historical customer data including demographics, usage, billing, contracts, and churn indicators.
2. Pricing, discount, and promotional data from PowerCo and competitors, Market data, including energy market trends, regulatory changes, and competitor analysis.

In terms of analytical models, we will employ predictive modelling techniques, specifically binary classification models such as logistic regression, decision trees, random forests, or gradient boosting. These models will allow us to predict the probability of churn for individual customers and identify the key factors driving churn.

I believe this approach will enable us to rigorously test the hypothesis regarding price sensitivity and assess the model performance.

Regards,

Rajeev