Business Problem Approach

(powerCo)

1.Problem Statement

- A major gas and electricity utility company (PowerCo), is facing a significant churn problem, primarily in the Small and Medium-sized Enterprise (SME) segment. This churn problem is driven by the liberalization of the energy market in Europe, which has likely led to increased competition and price sensitivity among customers.

- To address this issue, the client has engaged BCG (Boston Consulting Group) to assist with the SME segment's churn problem. The hypothesis is that customer churn is linked to price sensitivity, meaning customers are leaving due to the cost of their energy services.

2.Approach

Understanding the Customer Compostion :

- Understanding the composition of the customer base is a crucial aspect of addressing the churn problem.

- Determining the major customer segment in terms of customer distribution (e.g., SMEs, individual residential customers, or corporate clients) is essential for tailoring your retention strategies

Problem Root:

- The significant churn problem in the context of power-liberalization in the European energy market, especially in the SME segment.

- suggests that the company is experiencing high rates of customer turnover primarily among small and medium-sized enterprises.

Certainly, framing the problem in the context of a hypothesis helps to clarify the research question and guide the data analysis. In this case, the central hypothesis could be:

Hypothesis:

"The likelihood of customer churn in the SME segment of the gas and electricity utility company is significantly influenced by price sensitivity, and offering a 20% discount to high-propensity churn customers will reduce churn rates."

This hypothesis breaks down into two main components:

1. Hypothesis 1: " *Price Sensitivity Influence on Churn* "

   - **Null Hypothesis (H0):** Price sensitivity has no significant impact on customer churn in the SME segment.

   - **Alternative Hypothesis (H1):** Price sensitivity significantly influences customer churn in the SME segment.

   This hypothesis aims to determine if there is a relationship between price sensitivity and churn. If the p-value from statistical tests is less than a chosen significance level , it would indicate whether price sensitivity plays a role in churn.

2. Hypothesis 2: " *Discount Strategy Effectiveness* "

   - **Null Hypothesis (H0):** Offering a 20% discount to high-propensity churn customers does not significantly reduce churn rates in the SME segment.

   - **Alternative Hypothesis (H1):** Offering a 20% discount to high-propensity churn customers significantly reduces churn rates in the SME segment.

   This hypothesis examines the impact of the proposed discount strategy on customer churn. It helps determine whether the discount strategy is effective in retaining high-risk customers.

The data analysis and exploration would involve testing these hypotheses. Various statistical tests, machine learning models, and exploratory data analysis techniques would be employed to gather evidence and draw conclusions. The results would inform the company whether the hypotheses hold true and guide decision-making regarding customer retention strategies.

Key Factors:

1. **Price Sensitivity:** Customers may churn due to better offers from competitors.

2. **Contract Length:** Longer-term contracts may reduce churn.

3. **Customer Satisfaction:** Unhappy customers are more likely to switch.

4. **Customer Demographics:** Factors like age, income, and location can play a role.

5. **Usage Patterns:** Understanding how customers consume energy.

6. **Billing and Payment History:** Consistency in payments may indicate loyalty.

7. **Customer Support Interactions:** Frequent issues or poor support can lead to churn

Potential Data Sources:

1. **Billing and Invoicing Data:** Includes billing amounts, payment history, and frequency of billing issues.
2. **Customer Surveys:** Feedback on satisfaction and reasons for considering a switch.
3. **Usage Data:** Historical energy consumption patterns.
4. **Demographic Information:** Customer age, income, location, and more.
5. **Customer Support Logs:** Records of customer interactions and issue resolution.

Data Frame Structure:

Each row - represents an individual customer.

Columns - could include the following:

- Customer ID
- Churn Status (1 for churned, 0 for retained)
- Price Sensitivity (e.g., a score or category)
- Contract Length (in months)
- Customer Satisfaction Score
- Demographic Information (age, income, location)
- Average Monthly Energy Consumption
- Billing History (e.g., number of late payments, billing complaints)
- Customer Support Interactions (e.g., number of support calls, issue resolution time)

Model Framing :

➢ **Descriptive Statistics:** Calculate summary statistics for each column to understand the distribution of data.

➢ **Correlation Analysis:** Examine correlations between variables to identify relationships (e.g., does customer satisfaction correlate with churn?).

➢ **Customer Segmentation:** Segment customers based on key factors (e.g., price sensitivity, contract length) and analyze churn rates within these segments.

➢ **Data Visualization:** Create visualizations like histograms, scatter plots, and bar charts to visualize patterns and trends.

➢ **Hypothesis Testing:** Conduct hypothesis tests to determine if certain factors significantly impact churn (e.g., t-tests for price sensitivity).

➢ **Machine Learning Models:** Build predictive models (e.g., logistic regression) to predict churn and identify the most influential features.

➢ **Survival Analysis:** For contract-related churn, survival analysis can estimate the probability of customers staying with the company over time.

➢ **Text Analysis:** Analyze customer support logs or survey comments to extract insights about specific reasons for churn.

➢ **Customer Journey Mapping:** Map the customer journey to identify pain points and potential opportunities for intervention.