# **Case Study: Call Centre Data Analysis for Outsourcing Evaluation**

## **Project Overview**

As Data Analysts working for a Call Centre Outsourcing firm, our task is to analyze data provided by a potential client that has been running its own call center for several years. The client operates two distinct business divisions with call center operations in multiple locations. Our analysis will help the management decide if it's worthwhile to quote on providing services to these call centers.

Additionally, the client has shared a second dataset from a call center in a different country that operates under similar technology and staffing/operation principles. We need to perform a similar analysis on this dataset to determine whether it makes sense for us to provide outsourcing services to both call centers.

## **Key Issues and Requirements**

**1. Possible Contracting to Provide Call Centre Services**

* The client has been running its own call center and is considering outsourcing to an external provider.
* We are tasked with analyzing data from two different call center operations in different countries with similar business principles.
* The management team requires further analysis of the data to assess whether it's worthwhile for our firm to quote on providing services to both call centers.

**2. Analyzing Data from a Second Call Centre**

* The potential client operates a second call center in a different country, and it has provided a similar dataset.
* The management needs further analysis of this second dataset to determine if it’s feasible to quote on providing services to both call centres.

**2.1 Review of Data Sources and Relationships**

* Review the provided data source tables for relationships and data quality.
* Identify any anomalies, inconsistencies, or issues within the dataset that may affect the accuracy of the analysis.
* Prepare a report to present findings in a meeting with the management team.

**3. Re-using Analytical Templates**

* Since the two datasets appear to be similar, we are expected to reuse parts of the analytical templates created for Dataset 1 to analyze Dataset 2.
* However, Dataset 2 has additional requirements that need to be addressed, including calculating work hours and agent busyness.

**4. Dataset 2: How Busy is Each Agent Type?**

* The second dataset does not have embedded metrics that specify how busy the workers are. We need to calculate how many hours each agent type spends on the phone during each shift.
* Required outputs include pivot tables showing the number of hours worked by each agent type across different shifts, categorized by year, season/quarter, and month.

**5. Cluster Analysis**

* Perform a Cluster Analysis to analyze the data and provide counts, averages, minimums, and maximums.
* From this, we will identify and compare clusters within the data, focusing on busyness patterns.

**5.1 Dataset 2: Are Any of the Seasons Busier?**

* Determine whether certain seasons (spring, summer, fall, or winter) experience higher call centre busyness.
* Create pivot tables and generate statistics for agent types, shifts, and time periods (quarter of the year, years, and months).
* Prepare a brief written opinion on the busyness patterns, possibly in a table format.

## **Project Methodology**

**1. Data Discovery and Cleaning:**

* Review the provided datasets for missing or incorrect data.
* Apply data cleaning techniques to standardize and format the data for analysis, such as handling null values and correcting data discrepancies.

**2. Data Transformation and Modeling:**

* Create new calculated fields to measure agent busyness, including total hours spent on calls for each agent type per shift.
* Develop pivot tables and statistical models to compare performance across different agent types, shifts, and time periods.

**3. Analysis and Visualization:**

* Perform exploratory data analysis (EDA) to identify trends and patterns in the dataset.
* Create visualizations to support the analysis, including bar charts, line graphs, and pivot tables that show the performance of agent types over time.

**4. Cluster Analysis:**

* Perform a cluster analysis to categorize call centre data into meaningful clusters based on agent busyness and other performance metrics.
* Analyze seasonality and time-of-year effects on agent performance.

**5. Reporting and Recommendations:**

* Summarize the findings in a detailed report that includes insights, visualizations, and recommendations for the management team.
* Provide a written opinion on which seasons are busiest, the effectiveness of different agent types, and any other notable patterns in the data.

## **Key Deliverables**

* **Data Discovery Report**: A review of the dataset, including quality issues, data relationships, and identified anomalies.
* **Pivot Tables and Statistical Models**: Tables summarizing the work hours and busyness of agent types across different shifts and time periods.
* **Cluster Analysis Report**: A detailed analysis comparing different clusters of data, including insights into which seasons have higher busyness.
* **Written Opinion on Seasonal Busyness**: A summary report of the seasonal variations in call center busyness, highlighting the busiest times of the year for agent types and shifts.

## **Conclusion**

This case study presents the analysis of two call center datasets to determine whether it is beneficial for the outsourcing firm to quote on providing services to both centers. The project involves data discovery, cleaning, transformation, cluster analysis, and providing actionable insights that will inform decision-making for the management team.