Improving Call Center Performance with Power BI Dashboard

Thanks for taking a look at my Power BI dashboard! this dashboard was created in order to demonstrate my skills in data analysis using call center data. The goal was to showcase my ability to provide valuable insights for an informed decision making for the policy/decision makers of a call center companies.

The data set used for this dashboard was sourced from Enterprise DNA, and the challenge was to create a report that met the requirements of EDNA's Call Centers. As part of those requirements, I had to delete a column named "Call Abandoned" from the Calls data files and create a new column called "SLA Compliance." This column includes a logical statement that determines whether a call was answered within the Service Level Agreement (SLA) or not. The results are shown as "Within SLA" or "Outside SLA."

This dashboard provides valuable insights to call center companies needed to optimize their operations and improve customer satisfaction. By meeting the specific requirements of EDNA's Call Centers, I was able to create a report that accurately explains the critical issues that needs to addressed in order to continuously improve company performance.

Below are the key steps that I took in preparing this dashboard.

Step 1: Data Collection

The first step in the process was to collect data from EDNA's Call Centers. EDNA's Call Centers provided a CSV file containing data from 2018 to 2021 of their calls. This dataset contained over 100,000 rows of data for exploration.

To ensure accuracy, the data was carefully reviewed and validated. Any inconsistencies or errors were identified and corrected. This step was crucial to ensure that the subsequent steps in the process were built on a solid foundation of reliable data.

Step 2: Data Cleaning and Transformation

After collecting the data, the next step was to clean and transform it. This involved removing any unnecessary or redundant data, dealing with missing or invalid values, and transforming the data into a format suitable for analysis.

As per the client's requirement, the "Call Abandoned" column was removed from the dataset. Additionally, a new column named "SLA Compliance" was added to the Calls data files, which included a logical statement to determine whether a call was "Within SLA" or "Outside SLA" based on the wait time criteria.

However, during the merging of data from the different years, we encountered an issue where the date columns had different formats. The 2018-2020 data was formatted as mm/dd/yyyy, while the 2021 data was in dd/mm/yyyy format. This resulted in an error when merging the data. After analyzing the datasets thoroughly, we were able to identify the issue and reformat the date column in the 2018-2020 data into dd/mm/yyyy format to resolve the problem.

The data was then further transformed using various Power Query Editor tools such as grouping, aggregating, and merging data from different sources to create a consolidated dataset. This step was crucial to ensure that the data was accurate, complete, and in a suitable format for analysis in the subsequent steps.

Step 3: Data Modeling

For the data modeling step, we used the Star Schema model to design our data model. The Fact table used in the model is the Call Logs table, while the Dimension tables are the Call Charge, Date, and Employees tables.

The Call Logs table is the center of the Star Schema and contains the measures that will be analyzed. The Dimension tables contain descriptive attributes and are linked to the Fact table through foreign keys.

We established a One-to-Many Relationship between the Fact and Dimension tables based on the common key fields. For instance, the Call Logs table is linked to the Call Charge table through the Call Charge ID field, while the Call Logs table is linked to the Date table through the Date ID field.

We created a separate table to hold all the DAX measures we developed in Step 4. This approach enhances the organization of the measures and makes them easier to manage.

To visually illustrate the Star Schema model and its relationships, we included a diagram of the model in our documentation.

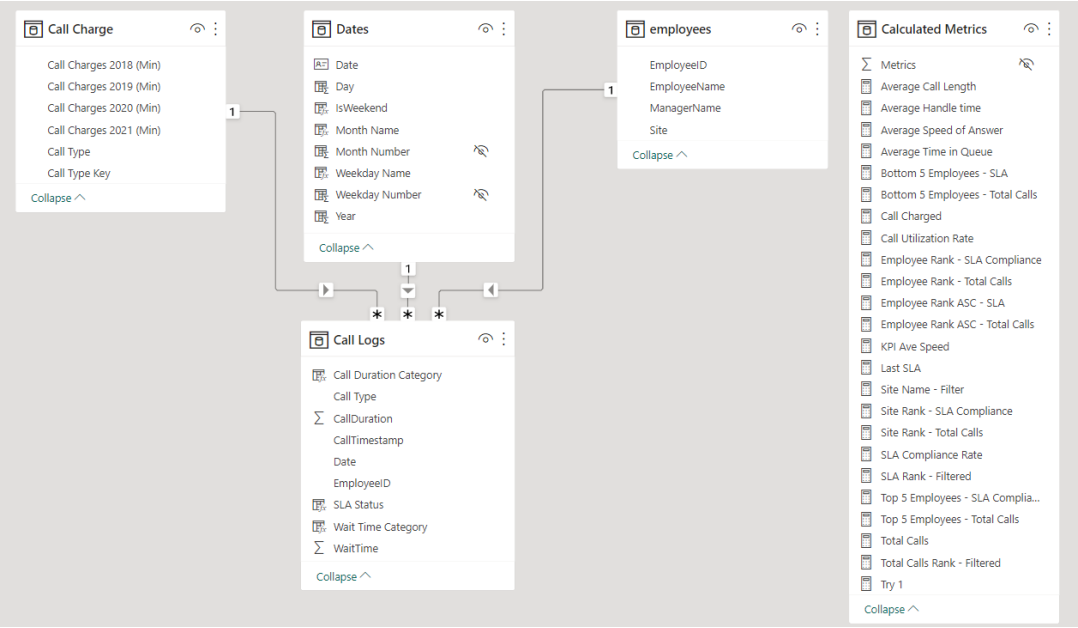

Figure 1. Data Model

Step 4: Dashboard Design

After creating the data model and defining the KPIs and metrics, the next step is to design the dashboard. The dashboard layout should be easy to navigate, visually appealing, and provide insights that can help call center managers make data-driven decisions.

The dashboard should start with three KPIs at the top, providing an overview of the call center's performance:

- SLA Compliance Rate: This KPI measures the center's ability to meet customer expectations and deliver a high level of service. It should be presented as a percentage.
- Average Speed of Answer: This KPI measures the amount of time it takes for a call center to answer a call. It should be presented as an average in seconds.
- Call Utilization Rate: This KPI measures the percentage of time agents are on calls, including waiting time. It should be presented as a percentage.
- Total Cost This KPI measures the total cost of the centers based on the call charge.

Below the KPIs, the dashboard should be divided into three sections:

1. Call Center Performance Overview: This section should provide insights into the overall performance of the call center. It should include the following metrics:
    - SLA Compliance Rate by year: This metric is presented as a line chart, showing the trend over time.
    - Cost by year: This metric is presented as a bar chart, showing the cost per year.
    - Call Types and Site: This metric is as a table, showing the number of calls, Average Time in Queue, Average Handle time and Call Charge by call type and site.

Figure 2. Call Center Performance Overview

2. Employee Performance: This section should provide insights into the performance of individual agents. It should include the following metrics:
    - Top 5 and Bottom 5 for Call Volume and SLA Compliance Rate: This metric should be presented as a bar chart, showing the top and bottom 5 agents for call volume and SLA compliance rate.
    - Call Duration Category: This metric should be presented as a bar chart, showing the duration categories for calls.
    - Wait time Duration Category: This metric should be presented as a bar chart, showing the duration categories for wait time.

Figure 3. Employee Performance

3. Site Performance: This section should provide insights into the performance of specific locations and managers. It should include the following metrics:
    - Total Calls by Site: This metric should be presented as a tree map chart, showing the number of calls by site.
    - SLA Compliance Rate by Year and Site: This metric should be presented as a waterfall chart, showing the SLA compliance rate by year and site.
    - Top Performing Managers: This metric should be presented as a table, showing the top performing managers.

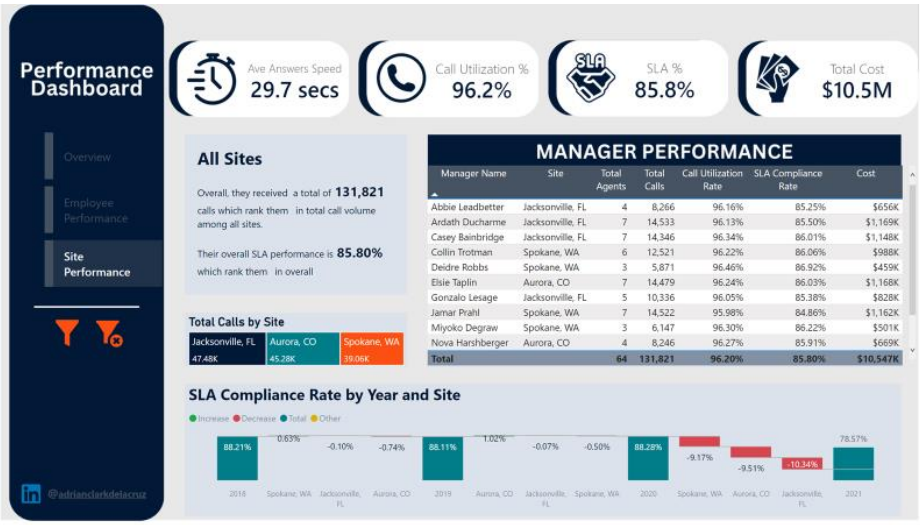

Figure 3. Site Performance

Overall, the dashboard design should be simple, easy to navigate, and provide the most relevant information to call center managers. With this dashboard, call center managers can quickly identify areas for improvement, optimize resources, and enhance the customer experience.

Step 5: Understanding the Impact of the Dashboard on Call Center Operations

The dashboard provides the client with valuable insights into the call center's performance and helps identify areas for improvement. The KPIs and metrics highlighted in the dashboard allow the client to monitor and optimize call center operations to enhance the customer experience and improve profitability.

Specifically, the dashboard revealed two critical findings that have significant implications for the call center's operations and bottom line:

1. SLA Compliance: The drop in SLA Compliance from 88.28% in 2020 to 78.57% in 2021 across all three sites indicates a decline in meeting customer expectations and delivering high-quality service. This can lead to dissatisfied customers, decreased loyalty, and negative reviews, impacting the call center's reputation and bottom line.
2. Cost: The continued increase in cost suggests inefficiencies in call center operations, such as underutilized technology or excessive staffing costs. Addressing these cost drivers can optimize resources, improve profitability, and create opportunities for growth.

Overall, the dashboard provides the client with critical insights into the call center's performance and enables them to take data-driven actions to optimize call center operations, enhance the customer experience, and improve profitability.

Conclusion

In summary, the analysis of call center data using the Power BI dashboard has provided valuable insights into the performance of the call center. By using the Star Schema data modeling approach, we were able to develop meaningful KPIs and metrics that enabled call center managers to monitor key metrics such as SLA compliance rate, call volume, and cost. The dashboard's user-friendly interface and visual representations of data allow managers to quickly identify areas for improvement and make data-driven decisions. The identified drop in SLA compliance rate and increase in cost suggest that there are underlying issues that need to be addressed to improve call center performance. By addressing these issues, call center companies can optimize their operations and improve customer satisfaction.

As a data analyst, this project has been a valuable learning experience, allowing me to apply my skills in a real-world scenario and gain insights into call center performance analysis. By leveraging these insights and taking appropriate actions, the call center can enhance its operations, meet customer expectations, and deliver an exceptional level of service. I have also learned a lot in the process, gaining practical knowledge and skills that will be beneficial in future data analysis projects.

Overall, this project has demonstrated the power of data analysis in providing valuable insights to improve business performance.