Call Centre Trend – Power BI Dashboard development

Project Description:

The objective is to develop a comprehensive Power BI dashboard to provide an insightful analysis of call centre performance. The dashboard will aggregate and visualize key metrics and KPIs, offering a clear view of customer satisfaction, call handling efficiency, agent performance, and operational trends. The goal is to enable data-driven decision-making and improve overall call centre operations.

Methodology:

Data Collection and Preparation:

Gather and clean the dataset to ensure accuracy and completeness. Transform the data into a suitable format for Power BI.

KPI Identification and Calculation:

Define the KPIs and calculate their values from the dataset. Use DAX formulas in Power BI to create necessary measures.

Dashboard Design:

Design an intuitive and interactive Power BI dashboard. Use visual elements like charts, graphs, and tables to represent the data effectively.

Implementation:

Build the dashboard in Power BI. Ensure all visualizations are linked and can be filtered dynamically.

Tech Stack used:

Power Bi- Business Intelligence tool to visualize and analyse data to create interactive and insightful visualizations.

Dataset link –

https://docs.google.com/spreadsheets/d/1tNm8qR1_DA1vsnEEFdNnTpcQjxebbN2W/edit?usp=sharing&ouid=102608840953909106553&rtpof=true&sd=true

The dataset is provided in the excel format. it consists of 5000 rows and the dataset includes the following fields:

- Call ID

- Agent
- Date
- Answered(Y/N)
- Resolved
- Speed of answer in seconds
- Average talk duration
- Satisfaction rating

Insights:

Initial Cleaning:

Check all the column data types and correct them before visualising, here in the dataset all the columns are of right datatypes. Check for duplicate rows and delete them.

There null values in the satisfaction rating column corresponds to the "Answered(Y/N)" column being "NO" hence we replace null values with 0.

	Resolved	1.2 Speed of answer in seconds	AvgTalkDuration	1²₃ Satisfaction rating
1		0	00:00:00	null
2		86	00:05:37	1
3		0	00:00:00	null
4		0	00:00:00	null
5		122	00:02:48	1
6		0	00:00:00	null
7		104	00:01:44	3
8		0	00:00:00	null
9		112	00:03:34	4
10		0	00:00:00	null
11		10	00:02:26	4
12		53	00:01:44	2
13		0	00:00:00	null
14		0	00:00:00	null

Formula bar: `= Table.Sort(#"Replaced Value1",{{"Resolved", Order.Ascending}})`

Derive required KPI'S using DAX measures:

To determine some of the key metrices, we use DAX to calculate measures

KPS's measured:
Avg call time(s)) = AVERAGE(Sheet1[call duration in sec])

Calls Answered = CALCULATE(count(Sheet1[Answered (Y/N)]), Sheet1[Answered (Y/N)]="Y")
Call answer rate% = DIVIDE(Sheet1[Calls Answered],COUNT(Sheet1[Call Id]),0)

Calls Resolved = CALCULATE(COUNT(Sheet1[Resolved]),Sheet1[Resolved]="Y")
Call resolve rate% = DIVIDE(Sheet1[Calls Resolved],COUNT(Sheet1[Call Id]),0)

Speed of ans(S) = AVERAGE(Sheet1[Speed of answer in seconds])

Satisfaction rate% = DIVIDE(AVERAGE(Sheet1[Satisfaction rating]),Sheet1[max rating],0)

Avg call time(s) = AVERAGE(Sheet1[call duration in sec])

Calls Abandoned = CALCULATE(COUNT(Sheet1[Answered (Y/N)]),Sheet1[Answered (Y/N)]="N")
Call abandon rate% = DIVIDE(Sheet1[Calls Abandoned],COUNT(Sheet1[Call Id]),0)

Calls Unresolved = CALCULATE(COUNT(Sheet1[Resolved]),Sheet1[Resolved]="N")

Call unresolve rate% = DIVIDE(Sheet1[Calls Unresolved],COUNT(Sheet1[Call Id]),0)

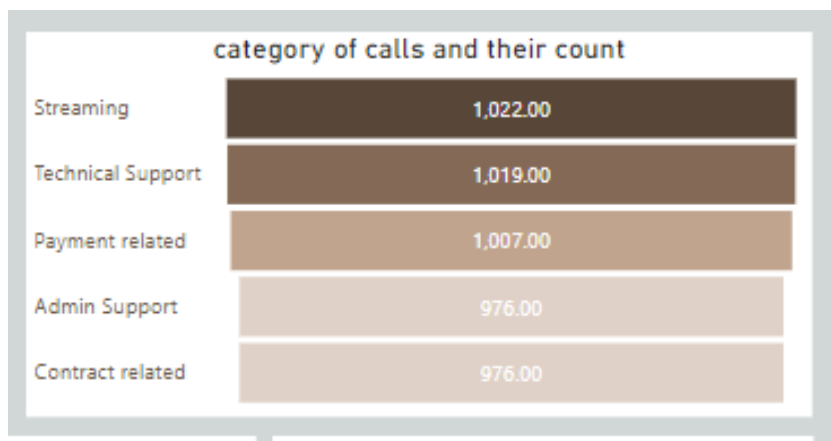| 5000	81.08%	72.92%	54.75	55.19%	182	18.92%	27.08%
Count of Call Id	Call answer rate%	Call resolve rate%	Speed of ans(S)	Satisfaction rate%	Avg call time(s)	Call abandon rate%	Call unresolve rate%

Calculated columns using DAX

To display metrices along a time range we create calculated columns

week day = FORMAT(Sheet1[Date],"dddd")
month = format(Sheet1[Date],"MMM")

Call volume of each category:

category of calls and their count

Streaming	1,022.00
Technical Support	1,019.00
Payment related	1,007.00
Admin Support	976.00
Contract related	976.00

The waterfall chart visualizes the distribution of call volumes across various categories of calls, providing a clear breakdown of how different types of customer interactions contribute to the overall call volume. This helps the telecom company identify key areas of customer concerns and prioritize resources accordingly. Streaming related queries are high in number indicating improvements to be made in the quality of the internet service. Collect feedback from customers to understand the root causes and address them proactively. Provide targeted training related to major issues to agents handling specific kind of calls in order to serve better and increase call resolve rate.

Volume of calls on each day of the week:
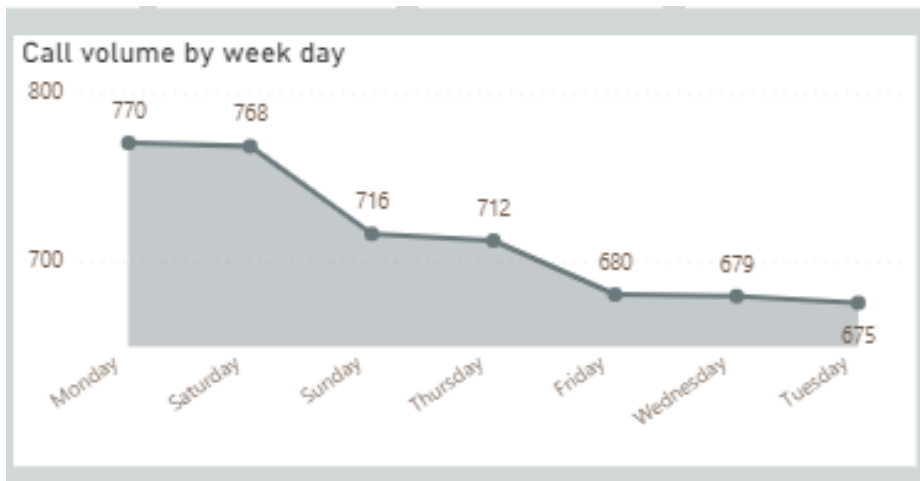
The line chart visualizes the call volume across different weekdays, highlighting trends and variations in customer interactions throughout the week. This analysis helps the telecom company understand the distribution of call traffic and allocate resources efficiently to meet customer demands. The line chart will show a clear peak at Monday, followed by a steep decline to Tuesday. The line will then show moderate fluctuations for the rest of the week, with Thursday and Sunday having similar mid-range call volumes.

By leveraging the insights from the line chart displaying call volume by weekday, the telecom company can enhance its operational efficiency, improve forecasting and planning, ensuring that the telecom company is always prepared to meet customer needs effectively. Plan effectively on deploying agents depending on the call volumes, increase or decrease the workforce according to weekday requirement.

No of calls answered vs abandoned and Resolved vs Not resolved:
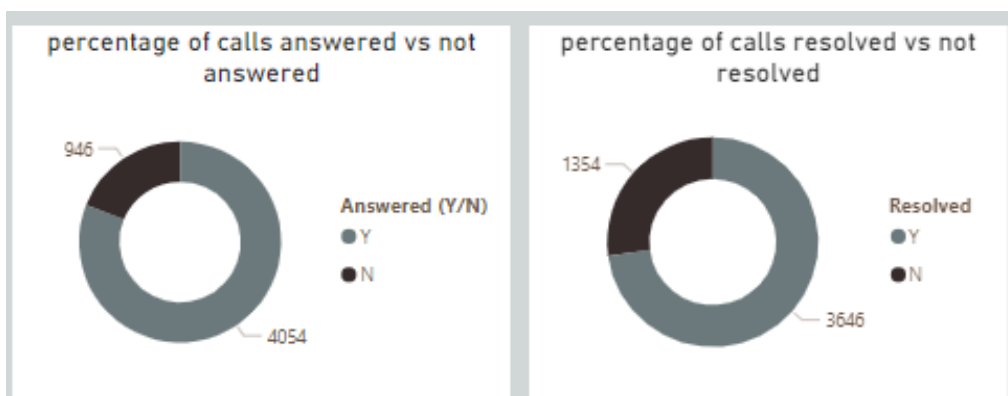

With 81% (4055/5000) of calls answered, the telecom company demonstrates a strong ability to manage incoming call volumes effectively.

The remaining 19%(946/5000) of calls that go unanswered could be due to high call volumes, insufficient staffing, or system inefficiencies. Addressing these issues could further improve the call answered rate.

With a 73%(3646/5000) resolve rate, the telecom company shows a good level of competence in addressing and resolving customer issues during the first contact.
The 27%(1354/5000) of calls that are not resolved during the initial contact could indicate complex issues, insufficient agent training, or procedural inefficiencies. Improving these areas can enhance the first-call resolution rate.

Satisfaction Rating against the target:
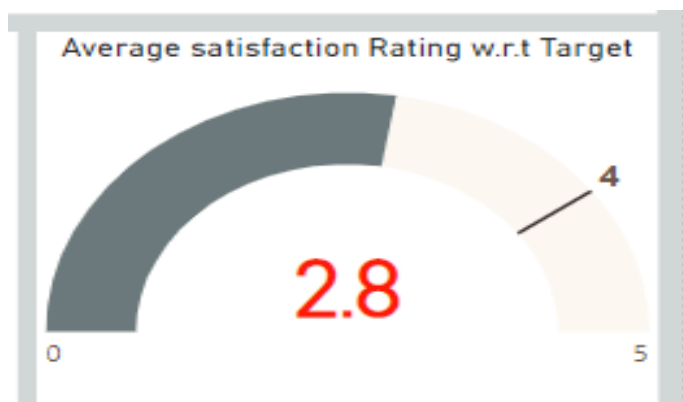
The average satisfaction rating of 2.8 indicates that customers' current level of satisfaction with the telecom company's services is below the desired target of 4.

With a rating scale where 0 represents the least satisfaction and 5 represents the highest, a rating of 2.8 falls slightly above the midpoint (2.5) but still reflects a significant gap from the target rating of 4.

Gap Analysis:

Gap from Target: The current rating is 1.2 points below the target rating. This indicates there is considerable room for improvement.

Percentage Achievement: The current rating of 2.8 out of 5 represents 56% of the maximum possible rating.

Slicers:

Slicers in Power BI are powerful tools for achieving ad-hoc results, enabling users to filter and analyze data dynamically based on their specific needs at any given time. They enhance the usability of the dashboard by providing intuitive ways to drill down into specific subsets of data.

Interactive Filtering: Slicers provide an interactive way to filter data on the fly, allowing users to customize their views based on different criteria such as date ranges, call categories, agent performance, and more.

Multiple Selections: Users can select one or multiple values within a slicer to refine their analysis further.

**EX : Evaluating Individual Agent Performance**:

Scenario: A supervisor needs to evaluate the performance of a specific agent over the last quarter.

Action: Use the Agent Slicer to filter data for the specific agent and adjust the Date Range Slicer to the last quarter.

Result: View detailed performance metrics for the selected agent, including calls answered, resolution rates, and customer feedback, allowing for a thorough performance review.
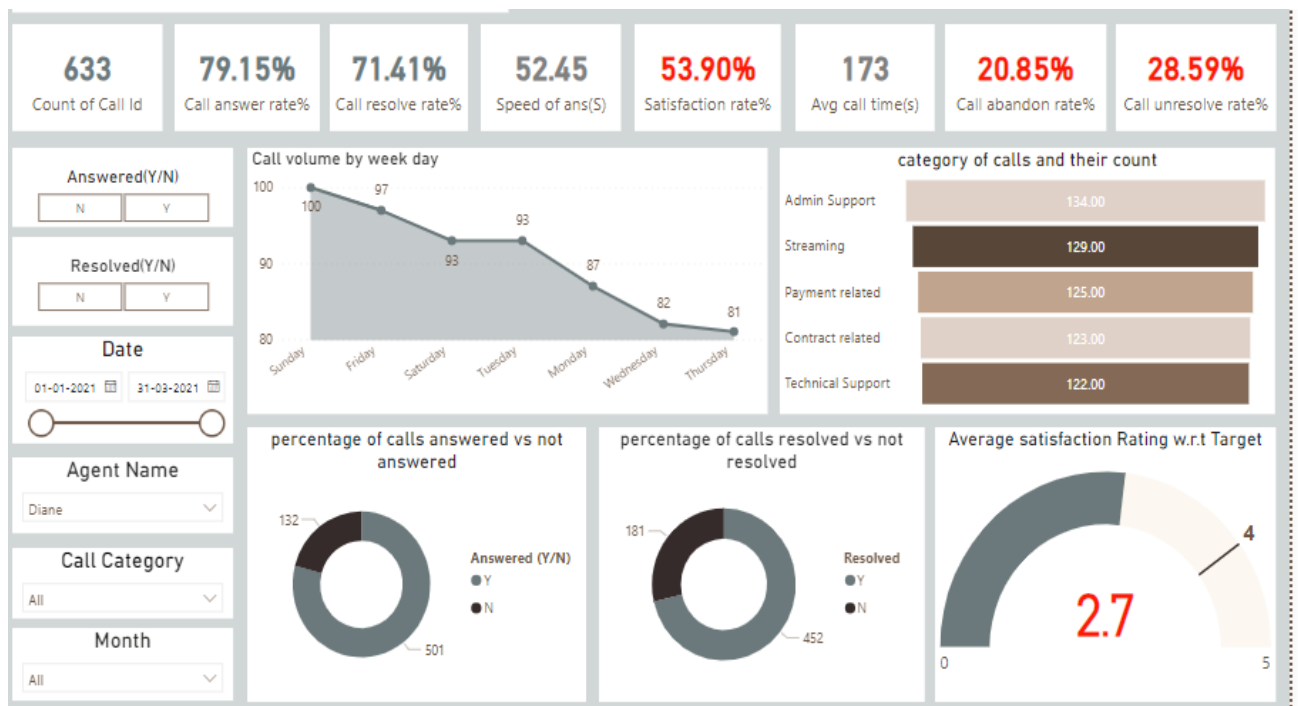
We can see agent Diane's performance, how many calls he received, how many he answered, abandoned, resolved and the satisfaction rating can give a idea about this performance.

Based on the above insights the management can plan specific training to the agent to improve his performance and likewise the management can find out its best employee, underperforming agent and so on.

Agent Analytics

Agent-specific analytics involve the detailed examination of performance metrics for individual customer service agents. These analytics help the telecom company understand how each agent is performing, identify strengths and weaknesses, and implement targeted improvements.

Agent Dan is a top performer with high customer satisfaction and high speed of answer, while agent Diane has lowest customer satisfaction rate, and needs improvement, particularly in call resolution and handle time, and may benefit from additional training and support.

With slicers we can detect agents' performance for particular month or a particular category of calls and deliver training accordingly to drive operational efficiency.

By leveraging agent-specific analytics, the telecom company can enhance its operational efficiency, improve customer satisfaction, and foster a culture of continuous improvement. These insights enable targeted interventions that lead to better overall performance and service quality.

Results:

Improved Customer Satisfaction: By analyzing the overall customer satisfaction scores and related metrics, the telecom company can identify areas for service improvement and implement targeted strategies to enhance customer experience.

Optimized Call Handling: Insights into calls answered versus abandoned, average speed of answer, and agent performance can help in optimizing call handling processes, reducing wait times, and improving efficiency.

Enhanced Agent Performance: By identifying top-performing agents and areas where others can improve, the company can tailor training programs and performance incentives to boost overall productivity.

Data-Driven Decision Making: The dashboard will provide a data-driven foundation for strategic decisions, enabling the company to allocate resources effectively and respond to customer needs proactively.

Github
https://github.com/radhikanagaraj/Data-analyst-projects/tree/PWC-PowerBI-Dashboard

User Guide
Accessing the Dashboard

Open Power BI Desktop or Power BI Service. Navigate to the dashboard by selecting it from the list of available dashboards.

Navigating the Dashboard

KPIs Cards: Displays key metrics such as overall customer satisfaction, total calls answered, and total calls abandoned.

Interactive Elements: Hover over the KPI cards to see tooltips with additional information.

Line/Bar Chart: Shows the distribution of calls over time (hour, day, week, month).

Interactive Elements: Use the date range filter to adjust the time period displayed in the chart. Click on data points to filter and see detailed information about individual agents.

Date Filter: Select a date range to filter the data displayed in the dashboard.

Agent Filter: Select specific agents to view their performance metrics.

Call Outcome Filter: Filter by call outcome (answered/abandoned) to see specific data points.

Export Data: Right-click on any visualization and select "Export data" to download the underlying data.

Export Reports: Use the "Export" option in Power BI to save the dashboard as a PDF or PowerPoint report.

5. Getting Help

Tooltips: Hover over elements to see tooltips with additional information.

Help Menu: Access the help menu in Power BI for tutorials and support.