

Data Exploration:

- The dataset consists of 1 table, 5000 rows, and 11 columns, each row represents a single inbound call, along with its details; Call ID, Agent, Date, Time, Topic, Answered(Y/N), Resolved(Y/N), Average talk duration in seconds, Average speed of answer in seconds, and Satisfaction rating.
- The time range of the dataset is from 1st, Jan 2021 till 31st, Mar 2021. Operating daily from 9:00 a.m. to 6:00 p.m.
- There are 8 active agents and 5 different topics.
- Satisfaction rating is the received score from the customer which ranges from 1:5, where 1 is very dissatisfied, 5 is very satisfied, and 3 is neutral.
- 946 rows have missing values in Average talk duration, Speed of answer, and Satisfaction rating which are the abandoned calls.
- There are no duplicated values in our dataset.
- Speed of answer ranges from 10 seconds to 2 minutes and 5 seconds.
- Average talk duration ranges from 30 seconds to 7 minutes.

Data Preparation

- To use the Average talk duration and the Speed of answer in hh: mm: ss format, first we will divide them by 24 hours, 60 minutes, and 60 seconds to result in a decimal number that represents the amount of time.
- The next step is to import the data into Power BI, transforming the Average talk duration and the Speed of answer columns into duration Power Query, and
- In Power BI we will use Format function on the DAX measures that are used in the card visuals.
- To extract the hour and the weekday of each call and to allow date hierarchical drilling in our visuals, we will create a dedicated date table using CALENDAR function.
- We'll use SWITCH function to create two new columns, the first column classifies the Satisfaction ratings into three categories: positive, neutral, and negative ratings, the second column transforms the Speed of answer into duration brackets (10 seconds each).

Measures and KPIs: -

- Total number of calls.
- Total number of Answered calls - Total number of Abandoned calls.
- Total number of Resolved calls - Total number of Unresolved calls.
- Count of Positive Ratings - Count of Negative Ratings.
- Call Abandonment Rate = Total number of Abandoned calls / Total number of calls.
- Call Resolution = Total number of Resolved calls / Total number of Answered calls.
- % of Positive Ratings = Count of Positive Ratings / Total number of Answered.
- Average Call Duration.
- Average Speed of answer.
- Average calls per day.

- Average Satisfaction score.
- Service Limit: Calls answered in the first minute.
- Longest Call Duration - Shortest Call Duration.

Data Analysis and Visualizations:

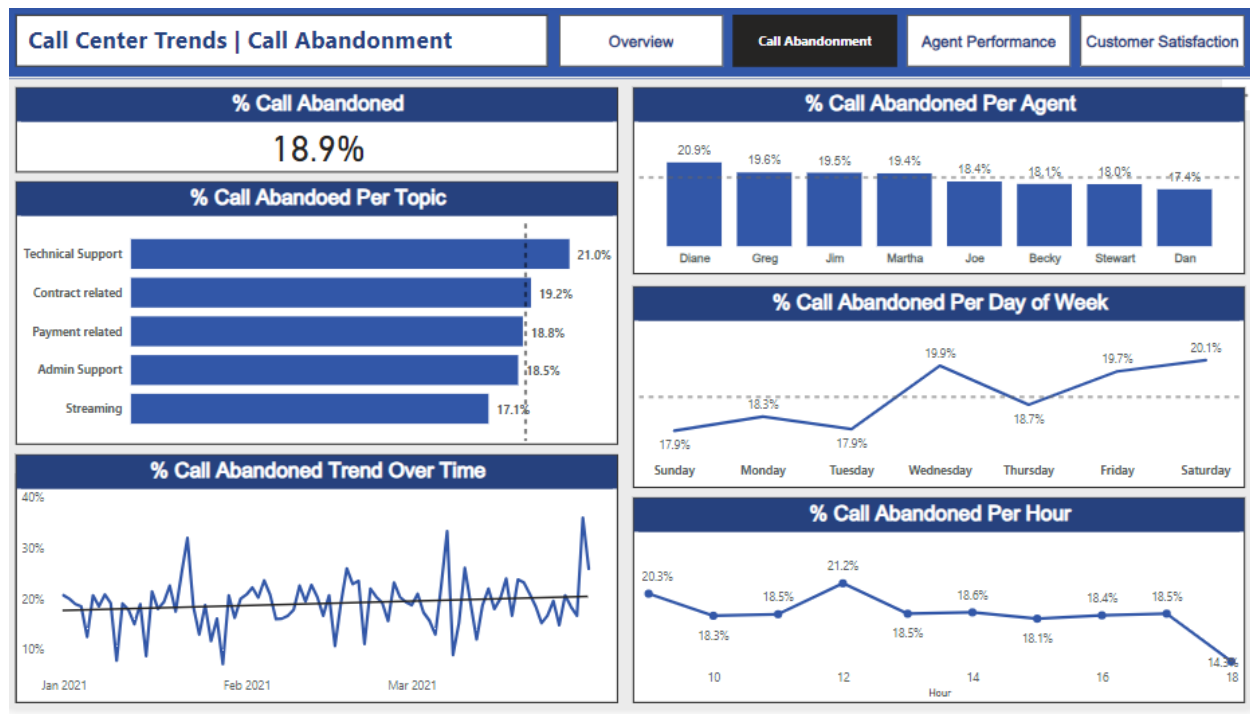
Overview:



- For the first quarter of 2021, our call center department received 5000 calls with 4054 answered, and 946 abandoned which represents 18.9% of the total received calls.
- During these three months, our agents solved 89.94% of the total answered calls, with 408 calls received but unresolved.
- The average daily received calls is 56 calls for 8 agents, with 7 calls on average per agent.
- The speed of the answer ranges between 10 seconds up to 2 minutes and 5 seconds, with an overall average being 1 minute and 8 seconds.
- The overall average talk duration is 3 minutes and 45 seconds while the longest call duration is 7 minutes and the shortest call duration is 30 seconds.
- The overall average Satisfaction score is 3.4 out of 5 with almost 50% of the received ratings from customers being positive ratings.
- Over our time span, the call volume fluctuates each day, however, it shows a slight decrease trend from month to month.
- To compare call volume by weekdays, we received the highest number of calls on Mondays with 770, followed by Saturdays with 768, while Tuesdays and Wednesdays are the least weekdays in terms of call volume with 675 and 679 received calls respectively.
- During operating hours, we received the highest number of calls from 1:00 P.M to 1:59 P.M with 594 received calls, followed by the period from 11:00 P.M to 11:59 P.M with 590 received calls.

- The period with the least number of received calls was from 2:00 P.M. to 2:59 P.M. with 499 calls received, however, the call volume gradually increased from 2:00 P.M. to 583 calls from 5:00 P.M. to 5:59 p.m.
- After our operating hours (9:00 A.M to 6:00 P.M) the total number of received calls was 14 calls received after 6:00 P.M.
- The streaming topic is the highest in terms of call volume with 1022 calls received, followed by the technical support topic with 1019 received calls, while admin support and contract-related topics were the least with 976 calls for each.

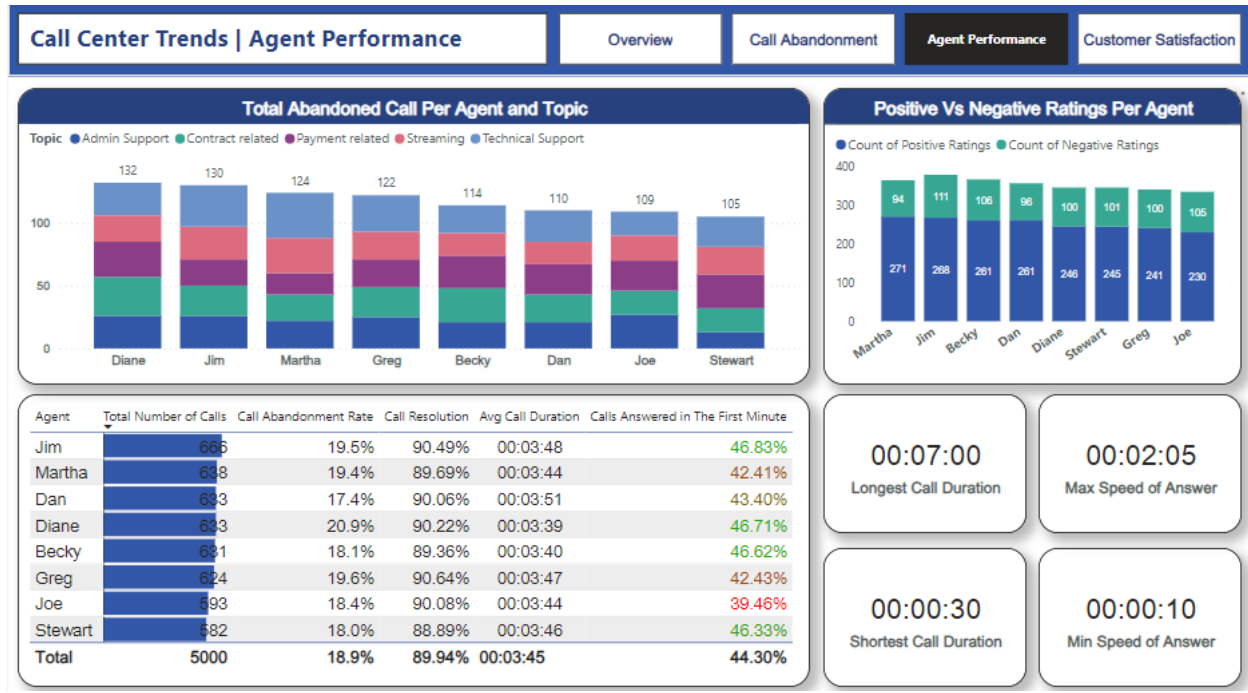
Call Abandonment Rate Analysis



- While the overall call abandonment rate for the three months is 18.9 %, it goes up and down over time and shows a slightly increasing trend from month to month.
- The only topics that have a call abandonment rate higher than the overall rate are the technical support and contract-related topics, which have the highest call abandonment rates amongst all other topics with 21% and 19.2% respectively.
- The streaming topic has the lowest call abandonment rate of 17.1 %., followed by the admin support topic with a call abandonment rate of 18.5%.
- Diane has the highest call abandonment rate at 20.9% followed by Greg at 19.6%, while Dan has the lowest call abandonment rate of 17.4% followed by Stewart at 18 %.
- The call abandonment rate increases through the weekdays from Sunday at 17.9 % to Saturday at 20.1%.
- Through operating hours, at the beginning of the day from 9:00 A.M. to 9:59 P.M., the call abandonment rate recorded was 20.3%. It decreases slightly until noon, from 12:00 P.M. to 1:00

P.M. call abandonment rate reaches its peak at 21.2% before it slides down again to reach approximately 18.5% till the end of operating hours.

Agent Performance:



Diane:

- Diane was assigned to 633 (third-highest equally with Dan), she has the highest call abandonment rate at 20.9%, as well as the highest total number of abandoned calls, and the highest number of abandoned calls in the contract-related topic, however, she has the second highest service level score in terms of percentage of answered calls within the first minute (46.71 %).
- With an average call duration of 3 minutes and 39 seconds and a call resolution of 90.22 %, Diane was able to receive 246 positive ratings and 100 negative ratings.

Jim:

- Jim received the highest number of calls with 666 calls, with a call abandonment rate of 19.5%, he has the second-highest total abandoned calls.
- Jim performs better in the payment-related topic rather than the streaming and the admin support topics, as he has the second lowest total abandoned calls in the payment-related topic with 21 calls, and the second highest total abandoned calls in the streaming and the admin support topics with 26 and 33 total abandoned calls respectively.
- The best service limit score was achieved by Jim, as he was able to receive 46.83 % of his calls within the first minute, and he has the highest Negative ratings and the second-highest positive ratings.

Martha:

- Martha has the second-highest total calls and the third-highest total abandoned calls.
- Martha has the lowest total abandoned calls in the payment-related topic and the highest total abandoned calls in the streaming and technical support topics.
- Although Martha has exceptional customer ratings, as she has the highest total positive ratings and the lowest total negative ratings amongst all other agents, She has the second-lowest service limit score with 42.41% answered calls within the first minute.

Greg:

- Greg was assigned to 624 calls; he has abandoned 122 out of all calls and he has the second-highest call abandonment rate after Diane at 19.6%. and the third lowest service limit score of 42.43 % of calls answered in the first minute.

Becky:

- While he received 631 calls, Becky achieved the third-lowest call abandonment rate at 18.1%, and the third-highest service limit score with 46.62% of calls answered within the first minute.
- Becky has the third-highest total positive ratings (equally with Dan) with 261 positive ratings against 108 negative ratings (second-highest)

Dan:

- Dan has the third-highest total number of calls (equally with Diane) the lowest call abandonment rate at 17.4 % and the lowest number of total abandoned calls in the streaming topic.
- Dan has the highest average call duration amongst all other agents with 3 minutes and 51 seconds.
- Dan has the second-lowest total number of negative ratings with a service level score of 43.3 %.

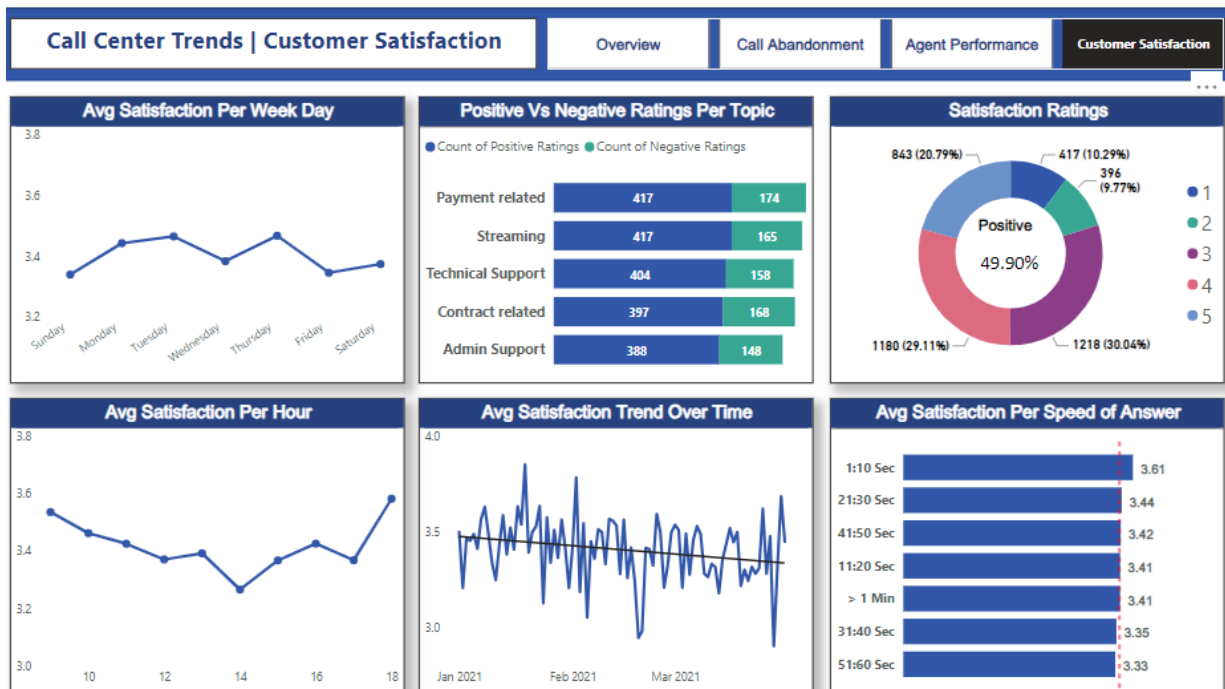
Joe:

- Joe has the Second-Lowest total number of calls with 593 total calls, as well as the second-lowest total abandoned calls, and the lowest number of abandoned calls in the technical support topic.
- Joe has the lowest service limit score with 39.46 % of calls answered within the first minute and the lowest number of positive ratings.

Stewart:

- Stewart has the lowest number of calls compared to all other agents with 582 calls, the lowest number of total abandoned calls with 105 calls, and the second lowest call abandonment rate at 18 %.
- Stewart received 46.33 % of his calls within the first minute, and he was able to resolve 88.89 % of answered calls, which makes him the lowest call resolution score against all other agents.
- Stewart performs better in the admin support topic rather than the payment-related topic, as he has the lowest number of abandoned calls in the admin support topic with 13 calls, and the second-highest total number of abandoned calls in the payment-related topic with 27 calls.

Customer Satisfaction:



- The average satisfaction score has a decreasing trend over time.
- The average satisfaction score differs based on the weekday, the lowest score was on Sundays with a score of 3.34, and the highest was on Thursdays with a score of 3.43.
- The average satisfaction score gradually declines from 3.54 for the first working hour, until it reaches a score of 3.27 at 2:00 P.M., and then it increases gradually to reach 3.58 at the end of the shift.
- The payment-related and streaming topics have the highest number of positive ratings with 417 ratings for each, while the admin support topic received the lowest number of positive and negative ratings.
- 49.9% of our total received ratings were positive, with almost 30% of ratings scored 4 and ~ 20% of ratings were 5.
- 30 % of received ratings were neutral, and almost 20% of ratings were negative.
- We receive the highest average satisfaction score when the speed of answer ranges from 1 to 10 seconds.

Recommendations:

- Despite the average calls per day for each agent being almost 7:8 calls, and the call volume decreasing over time, the call abandonment rate increases, which means our agents need to improve their daily occupancy rate. Improving the occupancy rate per agent will reduce the overall call abandonment rate.
- We should focus our efforts on answering more of the technical support topic calls, as it has the highest call abandonment rate and the second-highest call volume amongst all other topics.
- To improve the call abandonment rate, we should focus on the weekdays from Wednesday to Saturday which have a higher call abandonment rate compared to the rest of the weekdays.
- To enhance the average satisfaction score we should encourage our agents to pick up the calls within the first 10 seconds which will result in a better service limit score.
- We need to investigate why the average satisfaction score is declining through the time from 9:00 a.m. to 2:00 p.m.
- To achieve optimal results that will improve the call abandonment rate, and the customer satisfaction rating score, we can reassign the calls to each agent based on their performance in each topic, for instance, Martha has the lowest total abandoned calls in the payment-related topic compared to all other agents, and the highest total abandoned calls in the streaming topic, accordingly, we can assign her more payment-related calls and less streaming calls.