ABC Call Volume Trend Analysis

Project Description:

This project focuses on analyzing Customer Experience (CX) within the inbound calling team of an insurance company, ABC. The primary objective is to assess call data over a 23-day period to derive insights on call volume, average call duration, and manpower planning, ultimately aiming to enhance customer satisfaction and reduce abandoned call rates. The approach involves cleaning and preprocessing the provided dataset, which includes information such as agent details, call queue times, call durations, and statuses. Using analytical methods, including descriptive statistics and data visualization, the project aims to calculate the average duration of calls for each time bucket, visualize call volume trends, and determine the minimum number of agents required to ensure that 90% of calls are answered, thereby reducing the abandon rate from 30% to 10%. Additionally, the project considers the distribution of calls during night shifts to create a comprehensive manpower plan. By leveraging insights from the data, the project seeks to improve overall CX by optimizing resource allocation and response times.

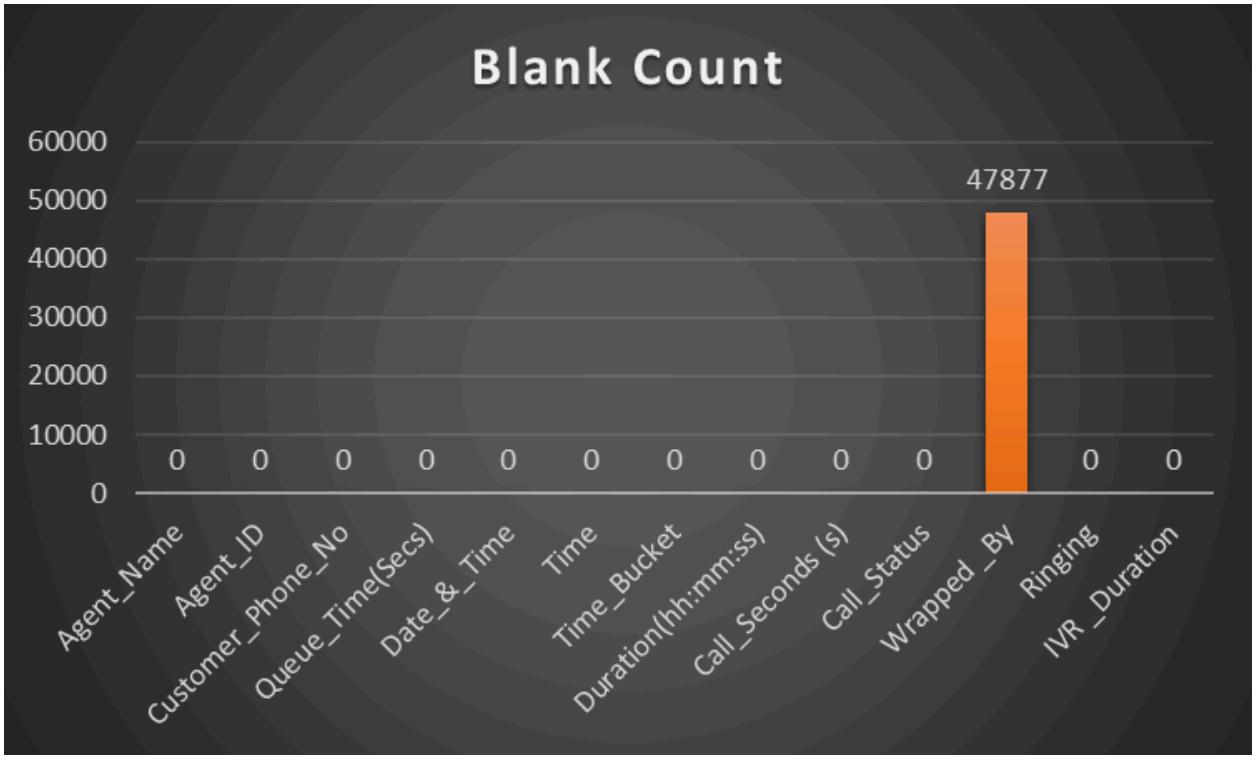
Approach:

The project involved analyzing inbound call data to optimize manpower allocation for the CX team. After cleaning and organizing the dataset, pivot tables and charts in Excel were used to visualize trends such as call volume and average call duration. Descriptive statistics calculated key metrics like average call duration per time bucket.
The main focus was manpower planning, aiming to reduce the call abandon rate from 30% to 10% by calculating the minimum number of agents required. This analysis factored in agent availability, break times, and working hours, leading to an optimal allocation strategy that ensures a 90% call answer rate.

Tech-Stack Used:

Microsoft Excel 2021 was the primary tool used for data analysis and visualization. It was chosen for its powerful features, such as pivot tables and charting capabilities, to efficiently process and explore large datasets. Excel also facilitated calculations for key metrics like average call duration and agent allocation. Additionally, it was used for creating graphs and dashboards to visually represent trends in call volume and manpower requirements.

Null Values:

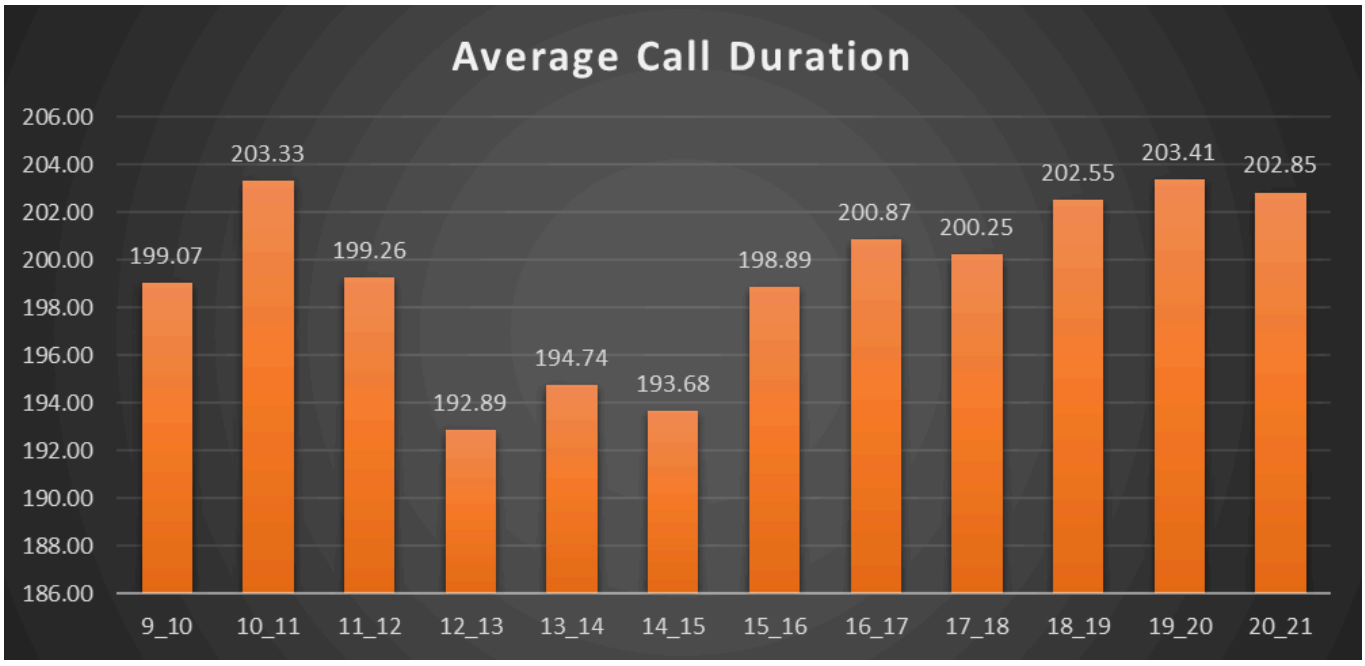


The "Wrapped_By" column had no relevance to the analysis and was therefore excluded from the dataset to streamline the process.

1. **Average Call Duration:** Determine the average duration of all incoming calls received by agents. This should be calculated for each time bucket.

   Your Task: What is the average duration of calls for each time bucket?

Row Labels	Average of Call_Seconds (s)
9_10	199.07
10_11	203.33
11_12	199.26
12_13	192.89
13_14	194.74
14_15	193.68
15_16	198.89
16_17	200.87
17_18	200.25
18_19	202.55
19_20	203.41
20_21	202.85



Insights:

- The average call duration remains fairly consistent throughout the day, ranging between 192.89 seconds and 203.41 seconds.

- The highest average call duration occurs between 10 am to 11 am (203.33 seconds), indicating potentially higher engagement or more complex calls during that time.

- There is a slight dip in average call duration during the lunchtime period (12 pm to 1 pm), suggesting quicker resolutions or fewer complex calls during that hour.

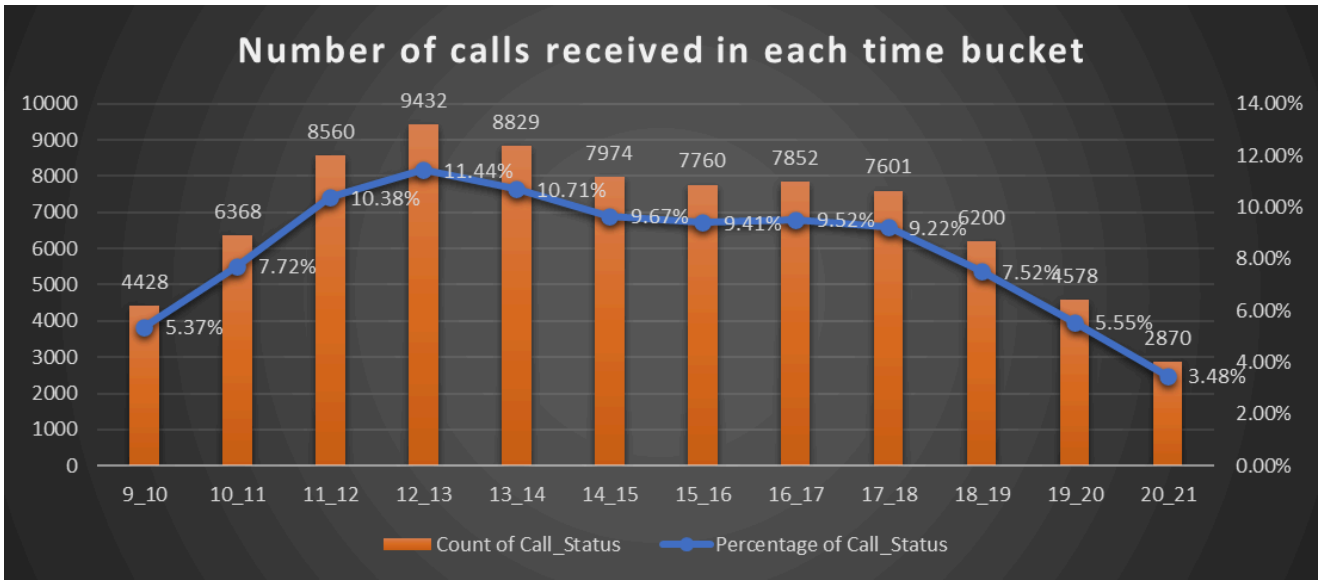
- After 1 pm, the average call duration fluctuates within a narrow range, indicating a stable pattern of customer interaction throughout the afternoon and early evening.

- This stable duration could suggest consistent call complexity and agent efficiency throughout the day.

2. **Call Volume Analysis:** Visualize the total number of calls received. This should be represented as a graph or chart showing the number of calls against time. Time should be represented in buckets (e.g., 1-2, 2-3, etc.).

   Your Task: Can you create a chart or graph that shows the number of calls received in each time bucket?

Row Labels	Count of Call_Status	Percentage of Call_Status
9_10	4428	5.37%
10_11	6368	7.72%
11_12	8560	10.38%
12_13	9432	11.44%
13_14	8829	10.71%
14_15	7974	9.67%
15_16	7760	9.41%
16_17	7852	9.52%
17_18	7601	9.22%
18_19	6200	7.52%
19_20	4578	5.55%
20_21	2870	3.48%
Grand Total	**82452**	**100.00%**



Insights:

- The busiest period is between 12 pm to 1 pm, accounting for 11.44% of the total calls, followed closely by 11 am to 12 pm with 10.38% of calls. This indicates a surge in call volume late in the morning and just after noon.

- The afternoon period (1 pm to 3 pm) maintains a high volume, with around 10.71% and 9.67% of calls, suggesting this time block is also critical for manpower allocation.

- Call volumes gradually decrease in the evening, with the least activity between 8 pm to 9 pm (3.48%), making it a less demanding time slot for staffing.

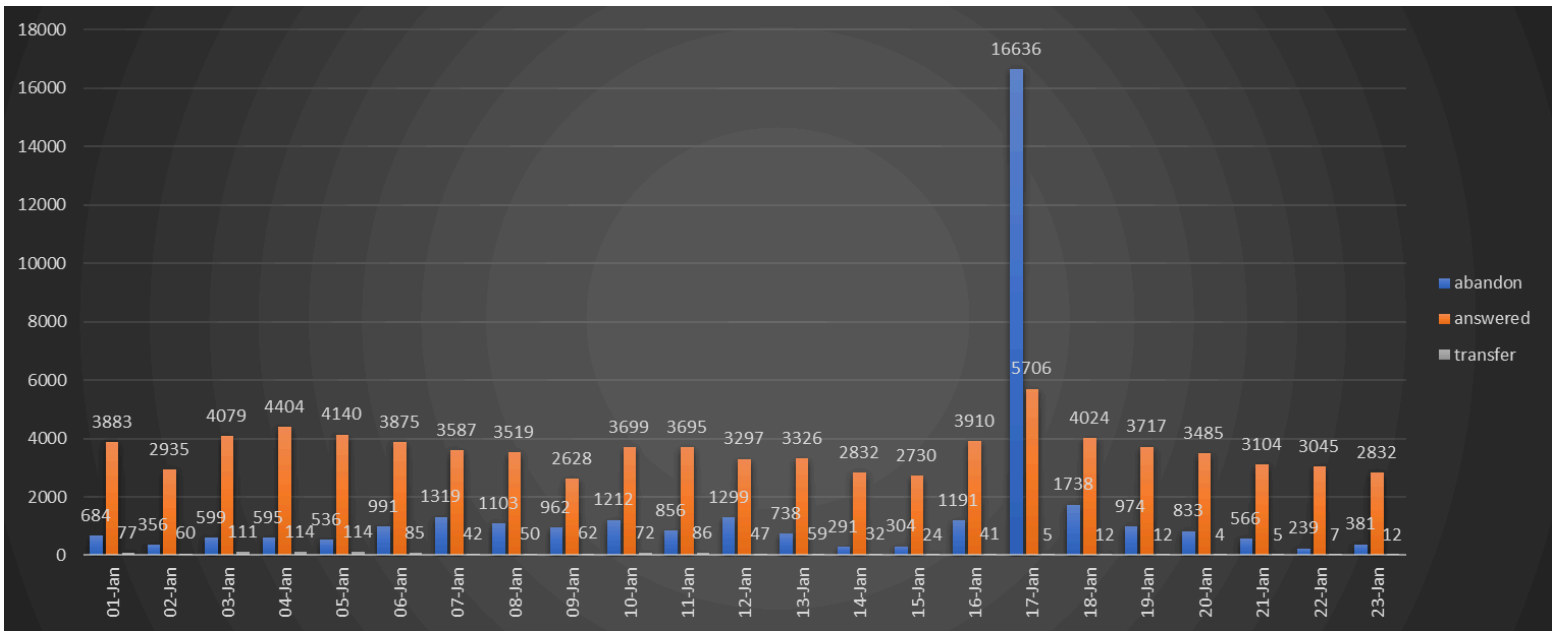
- The time slots 9 am to 10 am and 10 am to 11 am show moderate activity with 5.37% and 7.72%, respectively, suggesting a growing call trend as the day progresses.

- These patterns highlight peak hours around noon to early afternoon, requiring higher agent availability during these times to meet demand efficiently.

3. **Manpower Planning:** The current rate of abandoned calls is approximately 30%. Propose a plan for manpower allocation during each time bucket (from 9 am to 9 pm) to reduce the abandon rate to 10%. In other words, you need to calculate the minimum number of agents required in each time bucket to ensure that at least 90 out of 100 calls are answered.

   Your Task: What is the minimum number of agents required in each time bucket to reduce the abandon rate to 10%?

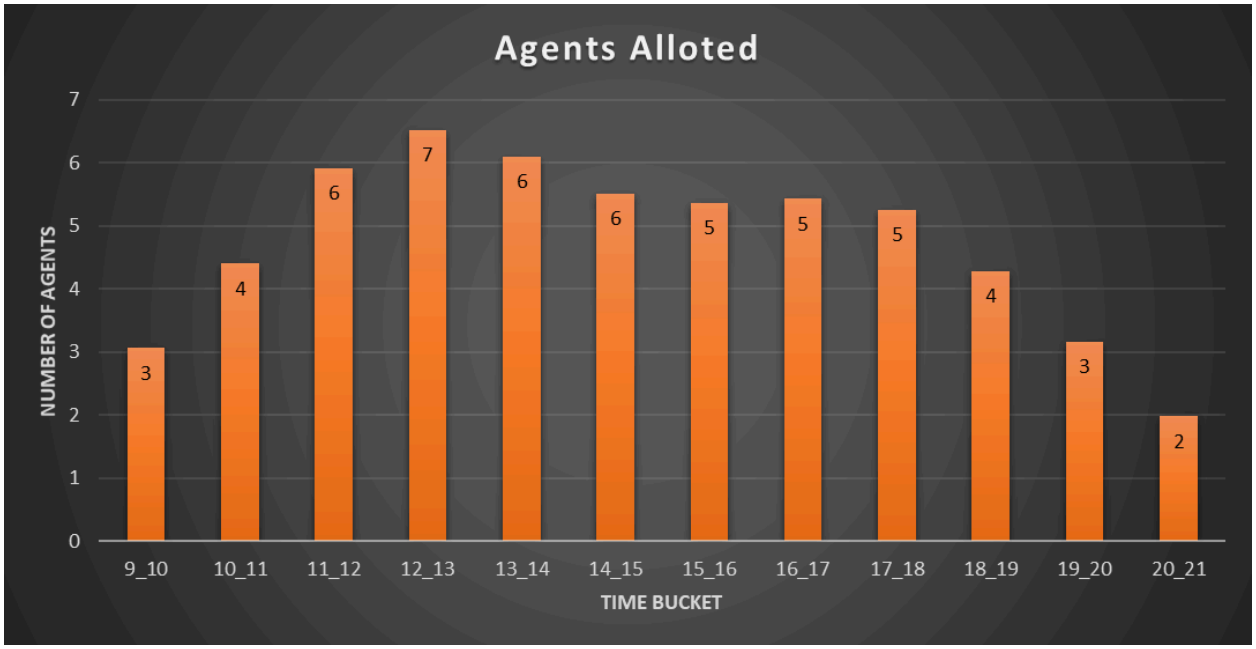
Row Labe	Count of Call_Status	Percentage of Call_Status
abandon	34403	29.16%
answered	82452	69.88%
transfer	1133	0.96%
Grand Total	**117988**	**100.00%**



Working Hour	9
Lunch & Snack time	1.5
Actual working hours	7.5
% of actual working hr spent on call with customer	60%
Total working time (hours)	4.5

Total average calls incoming per day	5130
Average calls answered per second	198.62
Required answered rate (90%)	0.9
Seconds per hour	3600
Time required to answer 90% of the calls	254.73
Total agents required per day	57

Time_Bucket	Count of answered calls	Agents Alloted
9_10	4428	3
10_11	6368	4
11_12	8560	6
12_13	9432	7
13_14	8829	6
14_15	7974	6
15_16	7760	5
16_17	7852	5
17_18	7601	5
18_19	6200	4
19_20	4578	3
20_21	2870	2
Grand Total	**82452**	**57**



Insights:

- Average Calls per Agent: Each agent is estimated to handle about 198.6 calls within each time bucket.

- Desired Abandon Rate: Our objective is to decrease the abandonment rate from 30% to a target of 10%. This requires enhancing the call answered rate from 70% to 90%.

- Daily Incoming Calls: On average, the total number of incoming calls per day is 5,130.

- Calculation of Required Agents: To find the time needed to respond to 90% of incoming calls, we calculate:

- Time needed = 5130 (total no. of incoming calls per day) × 198.6 (average calls per agent) × 0.9 (required answered rate) / 3600 (seconds per hour)

- Subsequently, to determine the new total number of agents necessary per day, we divide this result by the number of hours each agent spends on consumer calls (4.5 hours):

  Total Agents = 255 / 4.5 = 56.67 ≈ 57

- Agents allotted: Count of answered calls for each time bucket / Total count of answered calls × Total agents.

- For eg:- (9_10) :

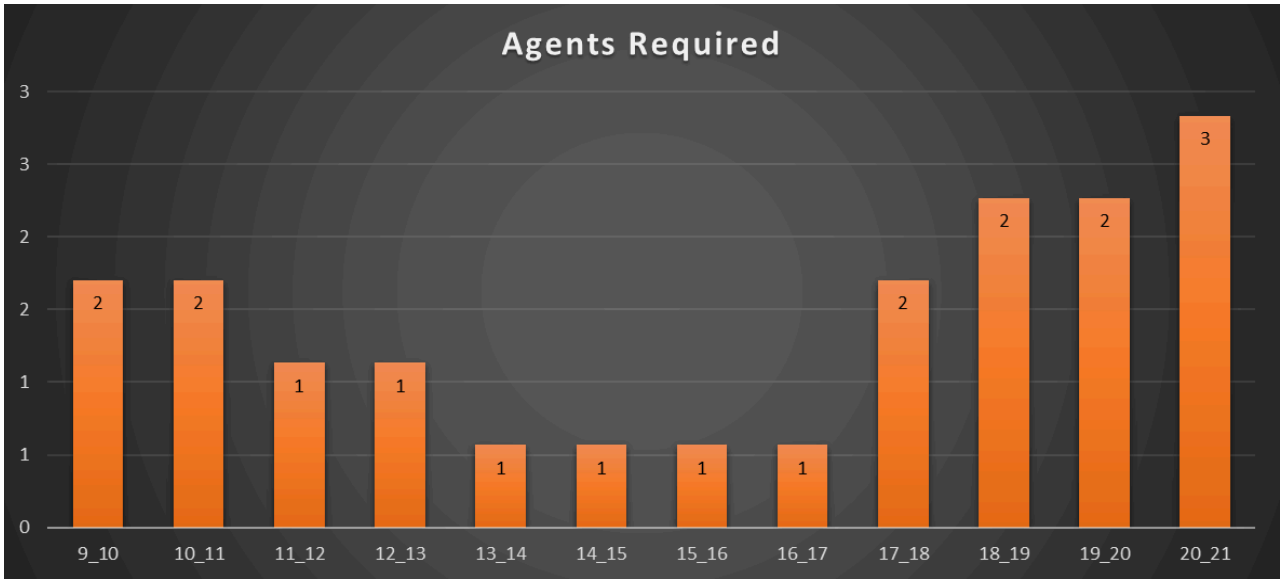
  4428 / 82452 × 57 = 3

4. **Night Shift Manpower Planning:** Customers also call ABC Insurance Company at night but don't get an answer because there are no agents available. This creates a poor customer experience. Assume that for every 100 calls that customers make between 9 am and 9 pm, they also make 30 calls at night between 9 pm and 9 am. The distribution of these 30 calls is as follows:

   Your Task: Propose a manpower plan for each time bucket throughout the day, keeping the maximum abandon rate at 10%.

Total average calls incoming per day	5130
Average calls answered per second	198.62
Average incoming calls at night (30% of 5130)	1539
Average hours required to answer the calls	84.91
Average hours required to answer 90% of the calls	76.41881711
Additional agents required	17

Time_Bucket	Call Distribution	Time Distribution	Agents Required
9_10	3	0.10	2
10_11	3	0.10	2
11_12	2	0.07	1
12_13	2	0.07	1
13_14	1	0.03	1
14_15	1	0.03	1
15_16	1	0.03	1
16_17	1	0.03	1
17_18	3	0.10	2
18_19	4	0.13	2
19_20	4	0.13	2
20_21	5	0.17	3
Total	**30**	**1.00**	**17**



Insights:

We need to outline the distribution of the total workforce for each time slot from 9 AM to 9 PM and then from 9 PM to 9 AM, ensuring that the abandon rate remains at 10% and the answered rate at 90%.

- For every 100 calls received during the day, there are 30 calls that come in at night. Therefore, with 5,130 day calls, the corresponding number of night calls is calculated as follows:

  5,130 × 30 / 100 = 1,539 night calls

  This means there are 1,539 night calls in addition to the daytime volume of 5,130 calls.

- To maintain a 90% answered rate for these night calls, the additional working hours required can be computed as:
  1,539 × 198.6 (average calls answered per second) × 0.9 / 3,600 (total seconds in an hour) ≈ 76.42 hours

- Consequently, the number of extra agents necessary to handle these night calls will be:

  76.42 / 4.5 ≈ 17 agents

- Therefore, to cover both day and night calls with a 90% answered rate, the total number of agents needed is:

  57 (agents for day calls) + 17 (agents for night calls) = 74 agents

- In conclusion, a total of 74 agents are required daily to effectively manage consumer calls during both day and night shifts while ensuring that the answered rate is maintained at 90% (with an abandon rate of 10%).

Result:

Through this project, I analyzed the inbound call volume trends for ABC Insurance Company, focusing on customer experience (CX) analytics. I identified peak call periods and proposed strategies to reduce the current 30% abandon rate to 10% by determining that 74 agents are required daily to maintain a 90% answered rate. This analysis not only provided insights into average call durations and agent performance metrics but also led to actionable recommendations for effective manpower allocation across various time buckets. Overall, the project enhanced my understanding of the critical role that data-driven decision-making plays in optimizing staffing levels and improving customer satisfaction in the call center environment.

Excel File Link: project_8_excel.xlsx