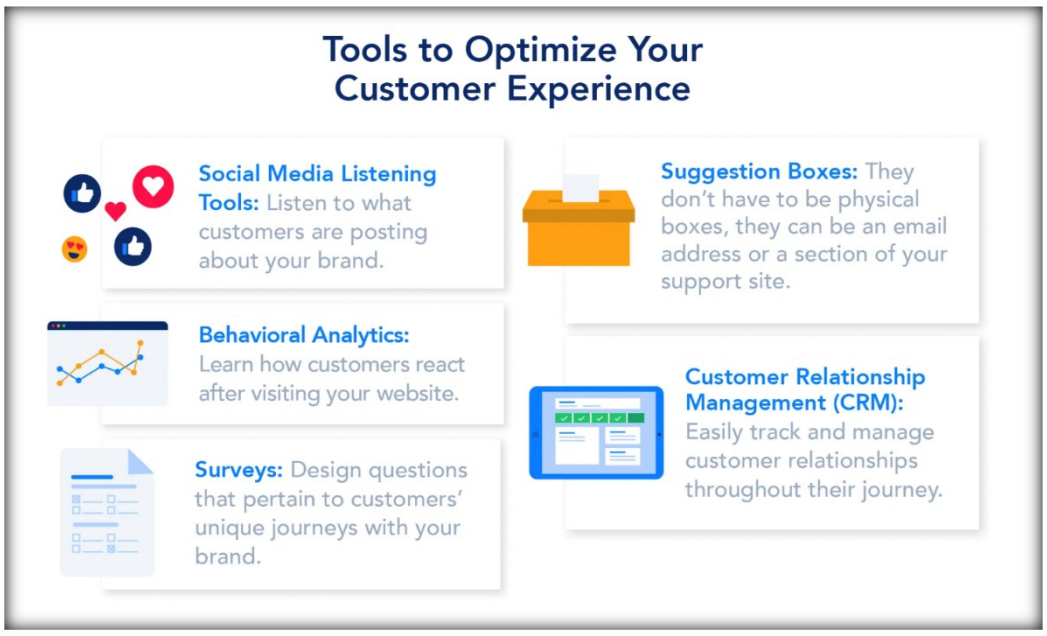
A

Live- Project Report

ABC Call Volume Analysis



Presented to – Trainity

Submitted by-

Anirudh Chaudhary

ABC Call Volume Trend Analysis

DATASET LINK:

https://docs.google.com/spreadsheets/d/1CyUST5ipYXEZxnja7OyJeqobmqpZ5uSO/edit?usp=sharing&ouid=103428047773693985368&rtpof=true&sd=true

Project Description:

The report presents a comprehensive analysis of inbound call data for ABC Insurance Company, focusing on optimizing call handling efficiency and improving customer service. It begins by detailing the average call duration for each time bucket, providing insights into the efficiency of call handling processes throughout the day. Subsequently, a thorough call volume analysis is presented, accompanied by visualizations illustrating the trends in call volume over time. The report then proposes a detailed manpower planning strategy, aiming to reduce the abandon rate to 10% by calculating the minimum number of agents required in each time bucket. Additionally, a dedicated section addresses the issue of unanswered calls during the night shift, proposing a manpower plan to ensure satisfactory customer experiences round the clock. Assumptions, methodologies, and recommendations are thoroughly outlined, providing actionable insights for ABC Insurance
Company's management team to optimize call center operations and enhance customer satisfaction.

APPROACH:

Data Preparation:

- Begin by importing and preprocessing the inbound call dataset.
- Ensure that the dataset is cleaned, with any missing or erroneous data handled appropriately.
- Extract relevant features such as call timestamps, durations, and any other necessary attributes.

Average Call Duration Analysis:

- Segment the call data into time buckets based on specified intervals (e.g., hourly).
- Calculate the average call duration for each time bucket, providing insights into call handling efficiency throughout the day.
- Utilize descriptive statistics and visualizations to present the findings effectively.

Call Volume Analysis:

- Segment the call data into time buckets, similar to the previous step.
- Calculate the total number of calls received in each time bucket to understand call volume trends.
- Create visualizations such as line charts or bar graphs to illustrate the temporal distribution of call volume.

Manpower Planning:

- Utilize the provided assumptions to formulate a manpower planning model.
- Calculate the minimum number of agents required in each time bucket to achieve the target abandon rate of 10%.
- Consider factors such as agent availability, working hours, breaks, and unplanned leaves.
- Present the manpower allocation plan for each time bucket, ensuring adequate coverage to meet service level targets.

Night Shift Manpower Planning:

- Analyze the distribution of calls during the night shift period.
- Determine the manpower requirements for handling these calls to maintain a maximum abandon rate of 10%.
- Propose a manpower plan for the night shift, considering agent availability and scheduling constraints.
- Ensure seamless coverage to address customer inquiries and improve overall customer experience.

Documentation and Recommendations:

- Document the entire analysis process, including assumptions, methodologies, and key findings.
- Provide actionable recommendations based on the analysis results to optimize call center operations and enhance customer satisfaction.
- Summarize the proposed strategies for average call duration analysis, call volume analysis, manpower planning, and night shift operations.
- Conclude the report with insights on potential areas for improvement and future considerations.

TECH STACK USED:

1. **Microsoft Excel 2016:** Utilized as the primary software for data analysis, visualization, and dashboard creation.

2. **Pivot Table:** Leveraged for summarizing and aggregating data to generate insights, such as counting car models by market category and calculating average prices by manufacturer.

3. **Charts:** Employed to visualize relationships between variables, including combo charts, scatter charts with trendlines, and bar charts.

Reasoning Behind the Choice of Tech Stack:

1. **Microsoft Excel:** Widely accessible and familiar software, making it suitable for collaboration and communication with stakeholders who may not have specialized data analysis skills.

2. **Pivot Table:** Provides a powerful and intuitive tool for summarizing and analyzing large datasets, facilitating quick insights generation.

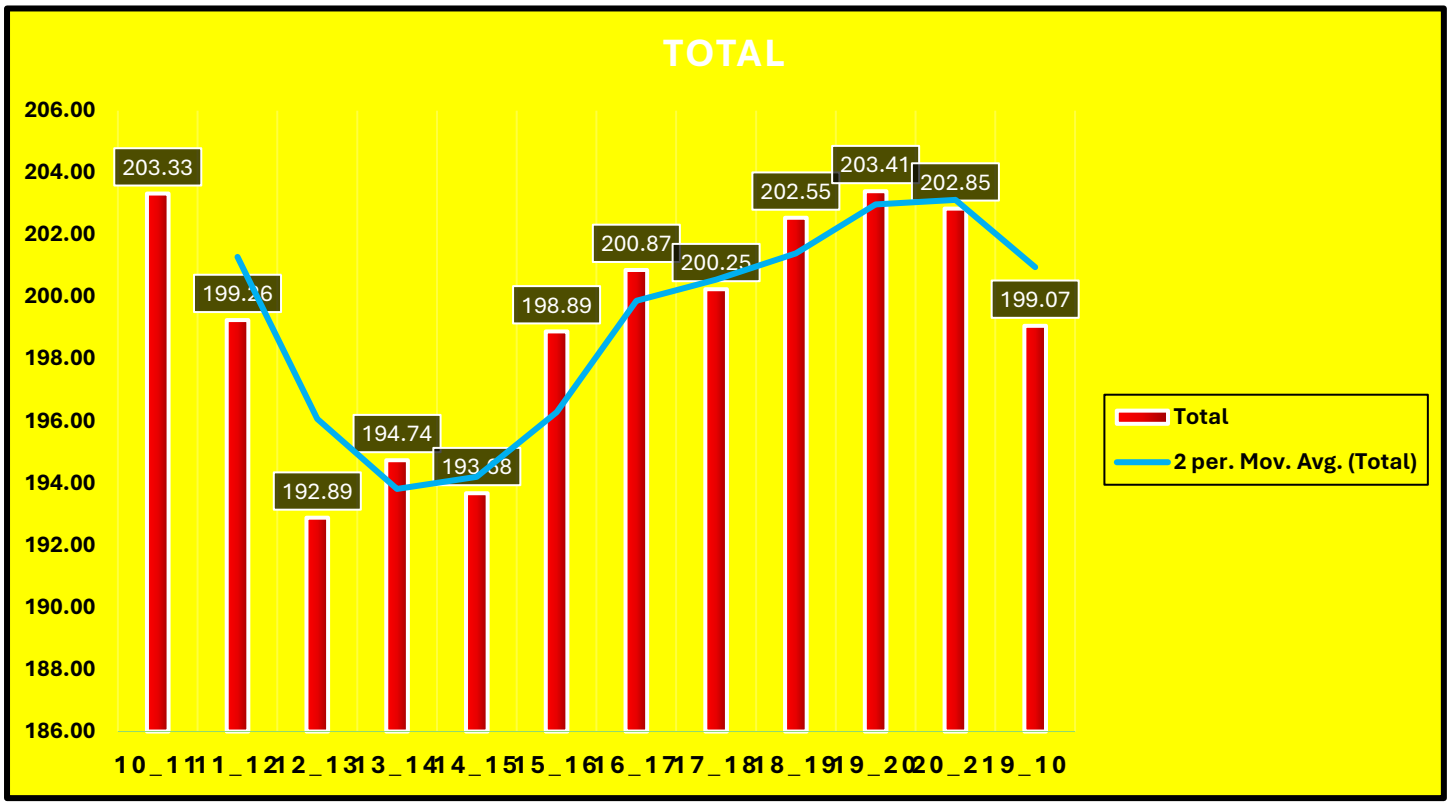
3. **Charts and Functions:** Excel offers a diverse range of chart types and functions, allowing for flexible visualization and analysis of data.

TASKS:

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)
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
9_10	199.07
Grand Total	**198.62**



Highest Average Call Duration: 19_20

Lowest Average Call Duration: 12_13

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?

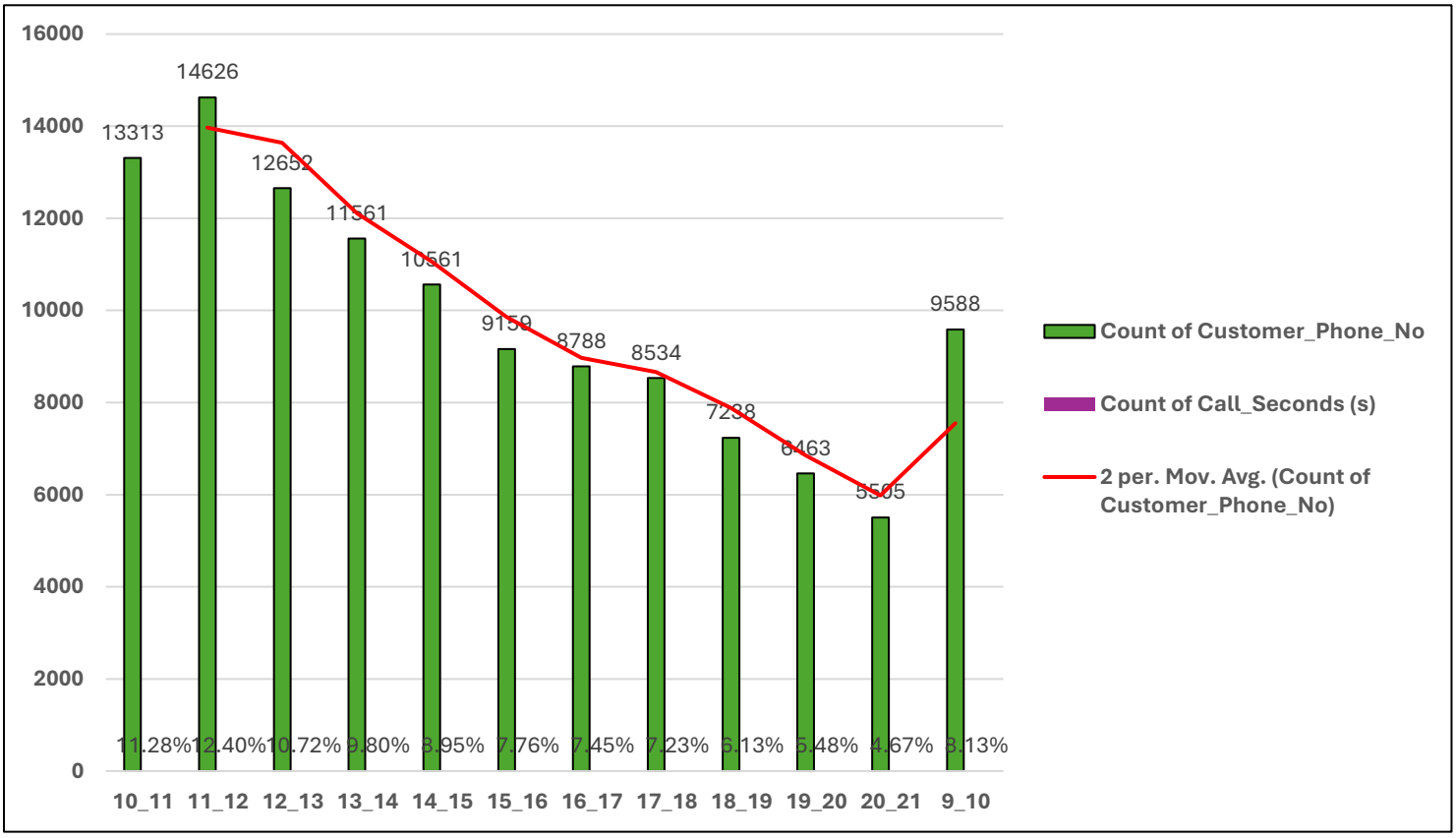
Number of calls received(answered) in each time-bucket

Row Labels	Count of Customer_Phone_No	Count of Call_Seconds (s)
10_11	13313	11.28%
11_12	14626	12.40%
12_13	12652	10.72%
13_14	11561	9.80%
14_15	10561	8.95%
15_16	9159	7.76%
16_17	8788	7.45%
17_18	8534	7.23%
18_19	7238	6.13%
19_20	6463	5.48%
20_21	5505	4.67%
9_10	9588	8.13%
Grand Total	117988	100.00%

Max number of calls answered in duration: 11_12

Min number of calls answered in duration: 20_21

In This task we need to Visualize the total number of calls received(answered) against time bucket	
Result	Maximum calls received(answered) against time bucket 11 - 12
	Minimum calls received(answered) against time bucket 8 pm - 9 pm

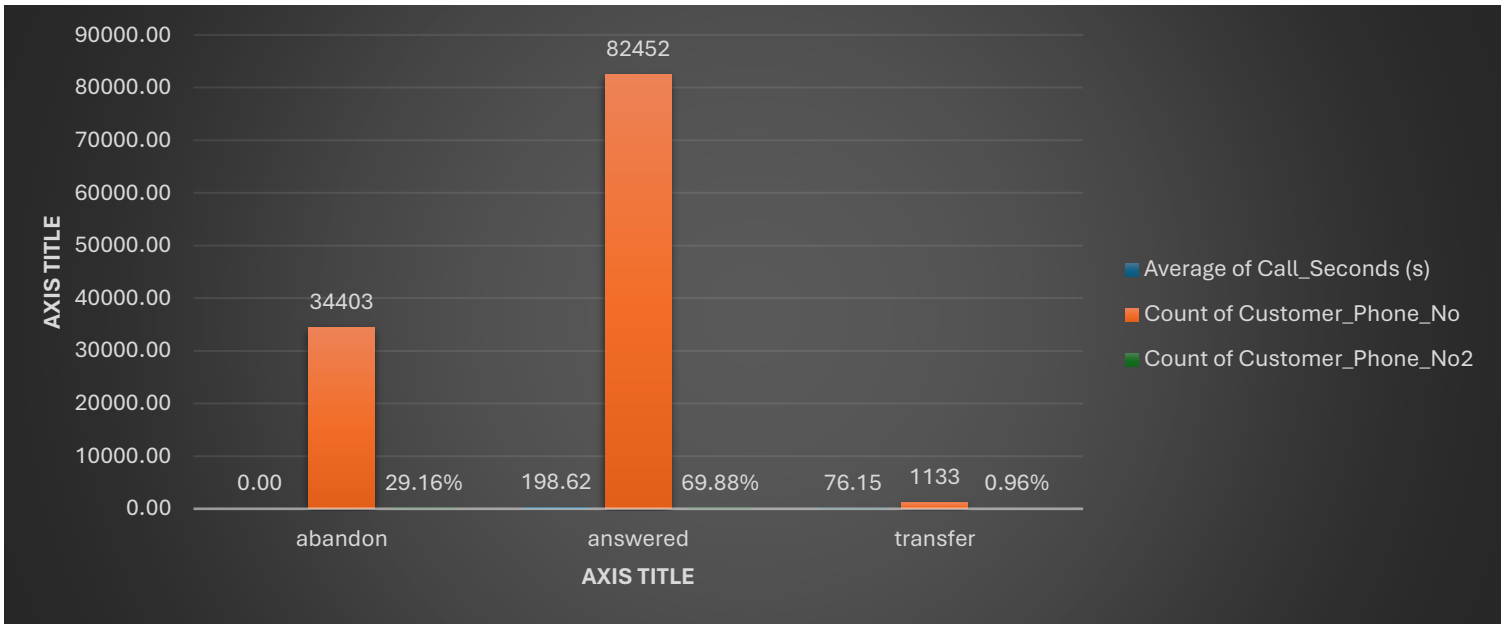


3) Manpower Planning: The current rate of abandoned calls is approximately 30%. Propose a plan for manpower allocation during each time bucket (from 9 am to 9 pm) to reduce the abandon rate to 10%. In other words, you need to calculate the minimum number of agents required in each time bucket to ensure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

29.16% is the **abandon** count of customer phone number

Row Label	Average of Call_Seconds (s)	Count of Customer_Phone_No	Count of Customer_Phone_No2
abandon	0.00	34403	29.16%
answered	198.62	82452	69.88%
transfer	76.15	1133	0.96%
Grand Total	**139.53**	**117988**	**100.00%**



Row Labels	Count of Call_Seconds (s)	Count of Call_Seconds (s)2	Agents Req.
10_11	11.28%	0.11	6
11_12	12.40%	0.12	7
12_13	10.72%	0.11	6
13_14	9.80%	0.10	5
14_15	8.95%	0.09	6
15_16	7.76%	0.08	4
16_17	7.45%	0.07	4
17_18	7.23%	0.07	4
18_19	6.13%	0.06	3
19_20	5.48%	0.05	3
20_21	4.67%	0.05	3
9_10	8.13%	0.08	5
Grand Total	100.00%	100.00%	56

Sum of All CallRecords 1-January	676664.00	Seconds
	187.96	Hours
total agent for 60%	37.59	
agent required for 90%	55.50	56.00

Agents Required for 90% Answered Calls : 56

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%.

Assumptions: An agent works for 6 days a week; On average, each agent takes 4 unplanned leaves per month; An agent's total working hours are 9 hours, out of which 1.5 hours are spent on lunch and snacks in the office. On average, an agent spends 60% of their total actual working hours (i.e., 60% of 7.5 hours) on calls with customers/users. The total number of days in a month is 30.

Distribution of 30 calls coming in night for every 100 calls coming in between 9am - 9pm (i.e. 12 hrs slot)											
9pm- 10pm	10pm - 11pm	11pm- 12am	12am- 1am	1am - 2am	2am - 3am	3am - 4am	4am - 5am	5am - 6am	6am - 7am	7am - 8am	8am - 9am
3	3	2	2	1	1	1	1	3	4	4	5

Time_bucke	Call distributi	Time distributi	No. of agents required
9_10	3	0.10	2
10_11	3	0.10	2
11_12	2	0.07	1
12_1	2	0.07	1
1_2	1	0.03	1
2_3	1	0.03	1
3_4	1	0.03	1
4_5	1	0.03	1
5_6	3	0.10	2
6_7	4	0.13	2
7_8	4	0.13	2
8_9	5	0.17	3
Total	**30**	**1.00**	**15**

Average incoming calls	5130
Average incoming calls at night between 9 pm - 9 am (30% of 5130)	1539
Average seconds required to answer the calls (Avg incoming calls at night * Avg calls answered)	305680.4499
Average hours required to answer the calls	84.91123608
keeping the maximum abandon rate at 10%	
Actual average hours required to answer the calls	76.42011247
We know from the previous task that Actual working hrs is 5 hrs	
No. of agents required to answer the call	15.28402249
Total number of agents required is 15	

Total number of additional agents required is 15.

Discrete number of agents required for each time interval from 9PM to 9AM is given in the table (agent required) column.

RESULT:

In analyzing the inbound call data for ABC Insurance Company, we found that the average call duration varies across different time buckets throughout the day. Call volume follows a distinct pattern, with peaks and troughs corresponding to different hours. To reduce the abandon rate from 30% to 10%, we determined the minimum number of agents required during each time bucket, ensuring that at least 90 out of 100 calls are answered. Additionally, to address nighttime calls and provide a better customer experience, we proposed a manpower plan for each time bucket, maintaining the abandon rate at or below 10%. These solutions are based on specific calculations and assumptions regarding agent availability and call distribution patterns.

DRIVE LINK:

https://docs.google.com/spreadsheets/d/1CyUST5ipYXEZxnja7OyJeqobmqpZ5uSO/edit?usp=sharing&ouid=103428047773693985368&rtpof=true&sd=true