ABC CALL VOLUME TREND ANALYSIS

MIRRA. G

PROJECT DESCRIPTION:

This Customer Experience (CX) Analytics project focuses on analyzing inbound call data for ABC Insurance Company, which operates in the insurance sector. The primary objectives are to enhance customer satisfaction and operational efficiency by addressing various aspects of call handling. The project involves calculating the average duration of incoming calls for each time bucket, visualizing call volume trends throughout the day, and proposing a strategic manpower plan to significantly reduce the current 30% call abandonment rate to 10%. Additionally, it includes devising a night shift manpower plan to ensure customer calls are answered promptly even outside regular business hours. The analysis will consider various operational constraints such as agent availability, working hours, and unplanned leaves to optimize resource allocation and improve overall customer service experience.

TECH STACK USED: Microsoft Excel

WHY EXCEL?

Excel is an excellent tech stack choice for this project due to its versatility, accessibility, and robust analytical capabilities. With its built-in functions and statistical tools, Excel enables precise calculations of call durations and abandonment rates. Additionally, its powerful visualization features allow for the creation of detailed charts and graphs to effectively illustrate call volume trends and manpower planning needs, facilitating data-driven decision-making.

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.

DATA ANALYTICS TASKS:

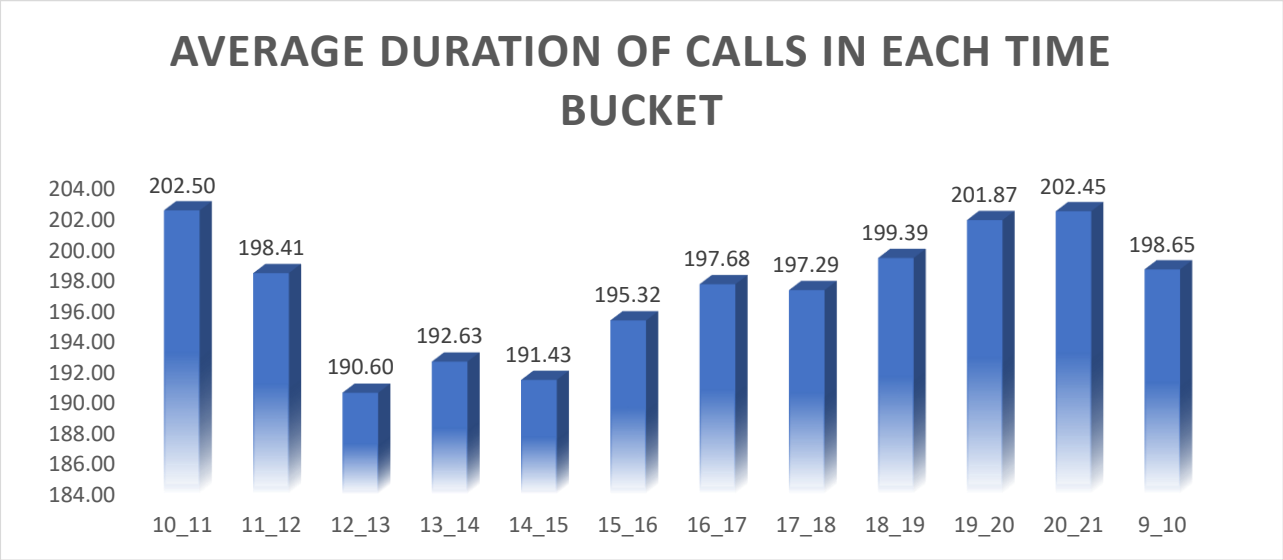
1. ***Average Call Duration:*** **Determine the average duration of all incoming calls received by agents. This should be calculated for each time bucket.**
   Your Task: **What is the average duration of calls for each time bucket?**

   <u>Approach:</u>

   We create a pivot table with the average of call seconds in each time bucket and plot them on a bar chart.

   <u>Output and Insights:</u>

Time bucket	Average of Call_Seconds (s)
10_11	202.50
11_12	198.41
12_13	190.60
13_14	192.63
14_15	191.43
15_16	195.32
16_17	197.68
17_18	197.29
18_19	199.39
19_20	201.87
20_21	202.45
9_10	198.65
Grand Total	**196.48**



We can see that the 10 AM – 11 AM slot and 8 PM – 9 PM slot have the longest calls of about 202.5 seconds.

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?**

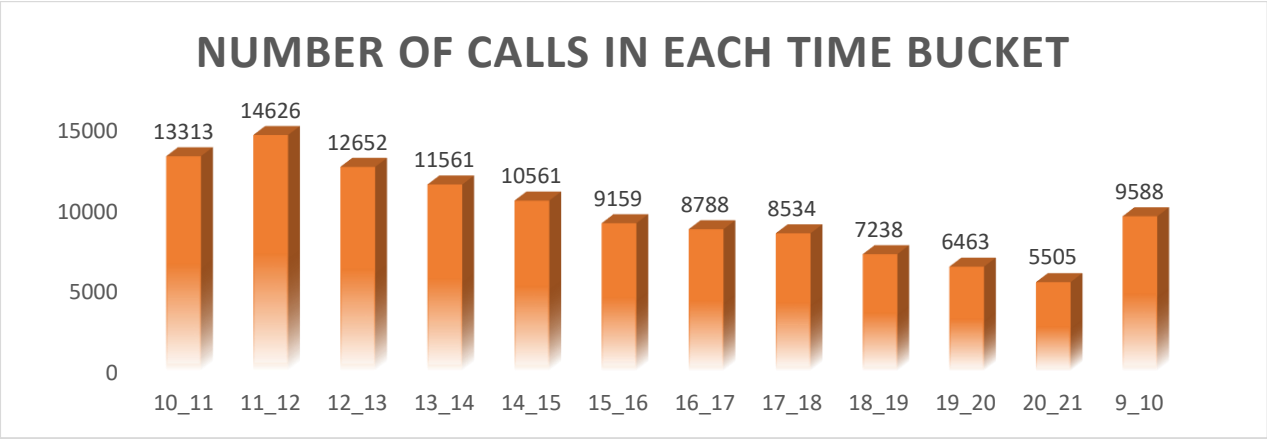
Approach:

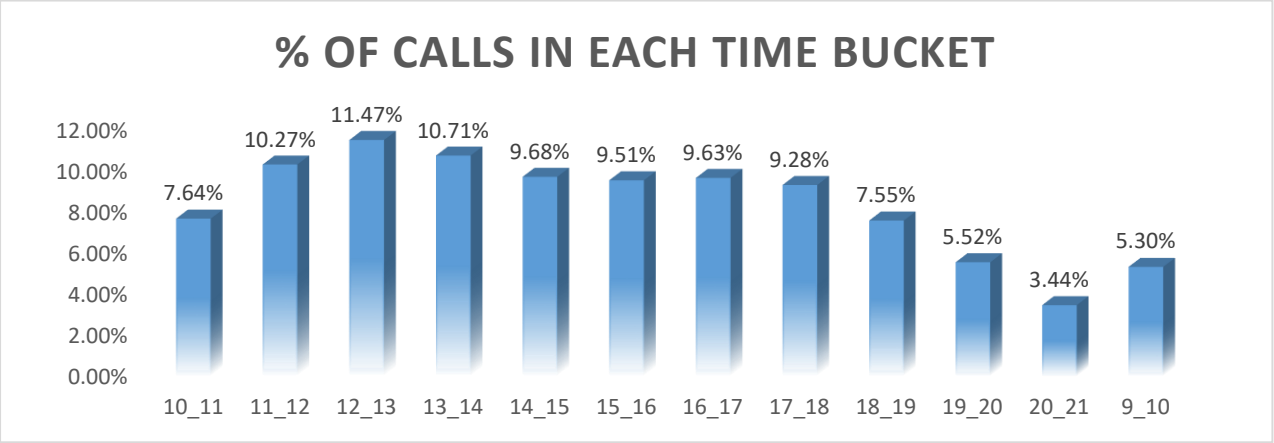
We create pivot table to calculate number of calls in each time bucket and plot them in a bar chart.

Output and Insights:

Time Bucket	Count of Customer_Phone_No
10_11	13313
11_12	14626
12_13	12652
13_14	11561
14_15	10561
15_16	9159
16_17	8788
17_18	8534
18_19	7238
19_20	6463
20_21	5505
9_10	9588
Grand Total	**117988**

Time Bucket	Count of Time
10_11	7.64%
11_12	10.27%
12_13	11.47%
13_14	10.71%
14_15	9.68%
15_16	9.51%
16_17	9.63%
17_18	9.28%
18_19	7.55%
19_20	5.52%
20_21	3.44%
9_10	5.30%
Grand Total	**100.00%**





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%?**

<u>Approach:</u>

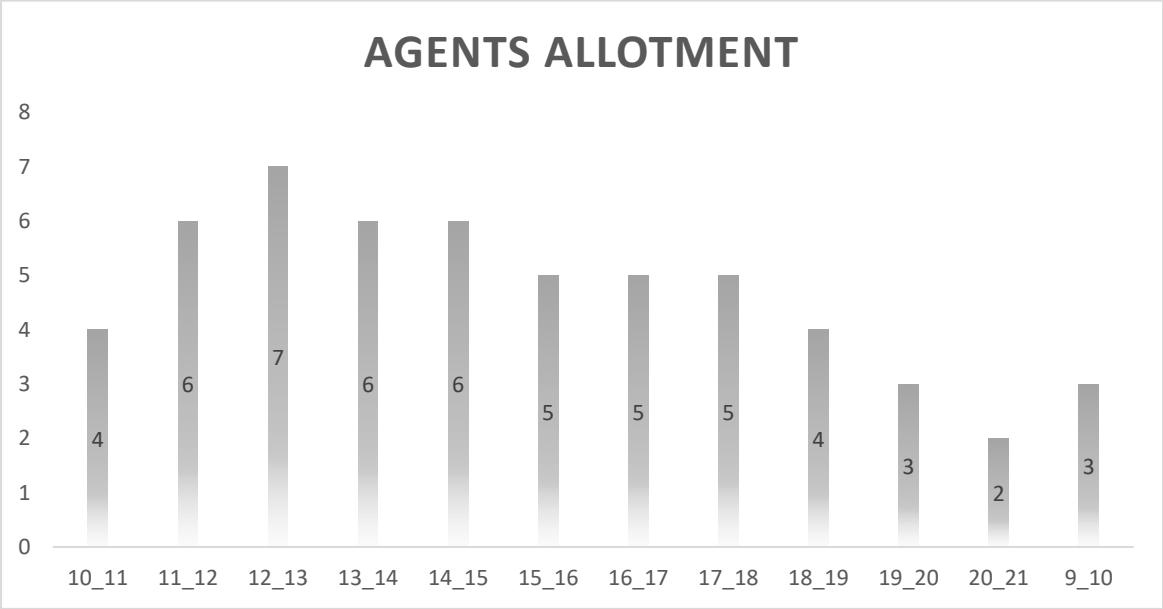
Count of Call_Status	Column Labels			
Row Labels	abandon	answered	transfer	Grand Total
01-Jan	684	3883	77	4644
02-Jan	356	2935	60	3351
03-Jan	599	4079	111	4789
04-Jan	595	4404	114	5113
05-Jan	536	4140	114	4790
06-Jan	991	3875	85	4951
07-Jan	1319	3587	42	4948
08-Jan	1103	3519	50	4672
09-Jan	962	2628	62	3652
10-Jan	1212	3699	72	4983
11-Jan	856	3695	86	4637
12-Jan	1299	3297	47	4643
13-Jan	738	3326	59	4123
14-Jan	291	2832	32	3155
15-Jan	304	2730	24	3058
16-Jan	1191	3910	41	5142
17-Jan	16636	5706	5	22347
18-Jan	1738	4024	12	5774
19-Jan	974	3717	12	4703
20-Jan	833	3485	4	4322
21-Jan	566	3104	5	3675
22-Jan	239	3045	7	3291
23-Jan	381	2832	12	3225
Grand Total	34403	82452	1133	117988
Average calls on daily basis	1496	3585	49	5130
% of avg calls on daily basis	29	70	1	

- From the above table, we can see that the current abandon rate is 29%. So, to reduce the abandon rate to 10%, we need a change of 29 – 10 = 19%, i.e., we need to increase the current answered rate which is 70% to 70 + 19 = 89% ≈ 90%.
- With the total average calls incoming per day being 5130, average calls answered per second being 198.6, answered rate being 90% and the total seconds in an hour being 3600, the time required to answer 90% of the incoming calls would be 5130 * 198.6 * 0.9 / 3600 = 254.73 ≈ 255 hours.
- With the given assumptions, we can say that an agent works for about 4.5 hours a day and so the number of agents needed such that the abandon rate would be 10% is 255 / 4.5 = 57.
- We then build a table allotting agents to each time buckets based on the number of calls being received in each of them.

Output and Insights:

new total agents working per day	57

AGENT ALLOTMENT PLAN		
Call_Status	**answered**	
Time Bucket	**Count of Customer_Phone_No**	**Agents allotment**
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
9_10	4428	3
Grand Total	**82452**	**57**



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%.**

Approach :

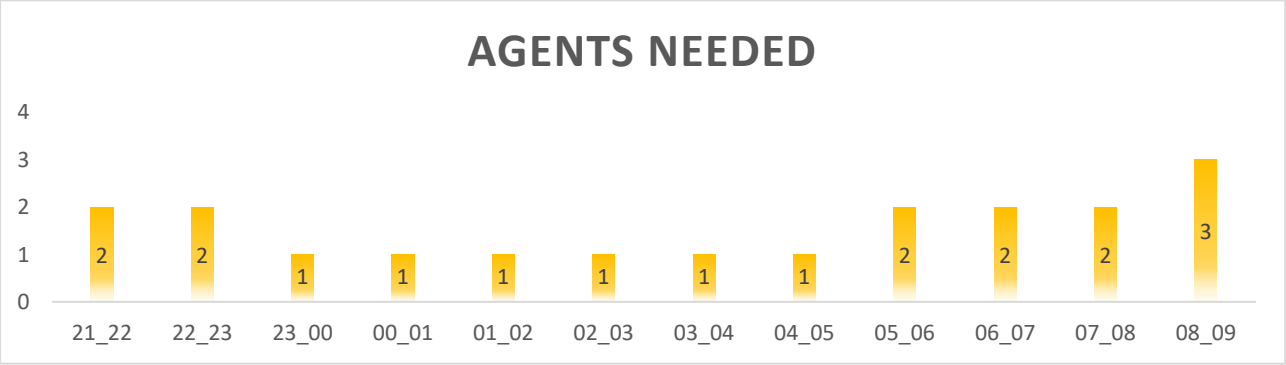
DATA FROM PREV TASKS	
avg calls answered per sec	198.62
time required to answer 90% calls	254.73
total avg calls from 9 am to 9 pm	5130

total avg calls from 9 pm to 9 am	1539
additional hours	76.42
agents required for night shift	17

- The distribution of calls from 9 PM to 9AM out of 30 is given to us. Now if there are 30 calls at night for every 100 calls in the day, for the 5130 calls in the day, we have 5130 * 30 / 100 = 1539 calls in average at night.
- So, the total hours to be worked at night keeping the abandon rate at 10% would be 1539 * 198.62 * 0.9 / 3600 = 76.42.
- The number of agents needed to cover 76.42 hours at night would be 76.42 / 4.5 ≈ 17.
- We then build a table allotting agents to each time buckets based on the number of calls being received in each of them.

Output and Insights:

AGENT ALLOTMENT PLAN (9 PM - 9 AM)			
time bucket (night)	calls as a part of 30	total hours needed	agents needed
21_22	3	7.64	2
22_23	3	7.64	2
23_00	2	5.09	1
00_01	2	5.09	1
01_02	1	2.55	1
02_03	1	2.55	1
03_04	1	2.55	1
04_05	1	2.55	1
05_06	3	7.64	2
06_07	4	10.19	2
07_08	4	10.19	2
08_09	5	12.74	3
total	**30**	**76.42**	**19**



Since we have only 17 agents out of the required 19, the distribution can be handled non-analytically by keeping agents to work multiple time buckets.

ANALYSIS FILES:
https://docs.google.com/spreadsheets/d/16EN80AlWjPzFlDwa8AMLvlm-ZJvnPQSY/edit?usp=drive_link&ouid=101623027215720977577&rtpof=true&sd=true

RESULT:

Hence, we have completed all the tasks given as a part of the ABC Call Volume Trend Analysis project.