ABC Call Volume Trend Analysis

Final Project-4

Project Description :
 In ABC call volume Trend Analysis project we have a dataset of a Customer Experience (CX) Inbound calling team for 23 days. Data includes Agent_Name, Agent_ID, Queue_Time [duration for which customer have to wait before they get connected to an agent], Time [time at which call was made by customer in a day], Time_Bucket , Duration [duration for which a customer and executives are on call, Call_, call status (Abandon, answered, transferred). I used my statistical knowledge and founded several type of insights from the data which helped the hiring team.

Approach :
I carefully understood the requirements and looked what actual data the team needs and then performed data cleaning in excel and use some excel command to derive meaningful insights. Also used some business analytical perspective mentioned in the project description.

Tech-stack Used :
Excel by Microsoft Corporation – For carrying out EDA on the datasets & Visualisation.

WordPad by Microsoft Corporation – For creating the project report.

Insights :
Performed several excel formulas to get the insights from the data and able to understood that how to perform a real time data analysis in Excel.

Case Study Objectives :

A. Calculate the average call time duration for all incoming calls received by agents (in each Time_Bucket).

Solution : The average call time is calculated using a pivot table where we view the average call duration in seconds segmented by the time bucket. The result is calculated for call answered only using a filter .The result can be seen in image where the total average call duration is 198.6 seconds.

Call_Status	answered	▼

Row Labels ▼	Average of Call_Seconds (s)
10_11	203
11_12	199
12_13	193
13_14	195
14_15	194
15_16	199
16_17	201
17_18	200
18_19	203
19_20	203
20_21	203
9_10	199
Grand Total	**198.6227745**

2. Show the total volume/ number of calls coming in via charts/ graphs [Number of calls v/s Time]. You can select time in a bucket form (i.e. 1-2, 2-3, ...)

Solution : I used pivot charts for this problem to solve. I added Time buckets in row labels and Count of customer phone no in Values section to find No of calls vs time chart.

Sum of Call_Seconds (s)
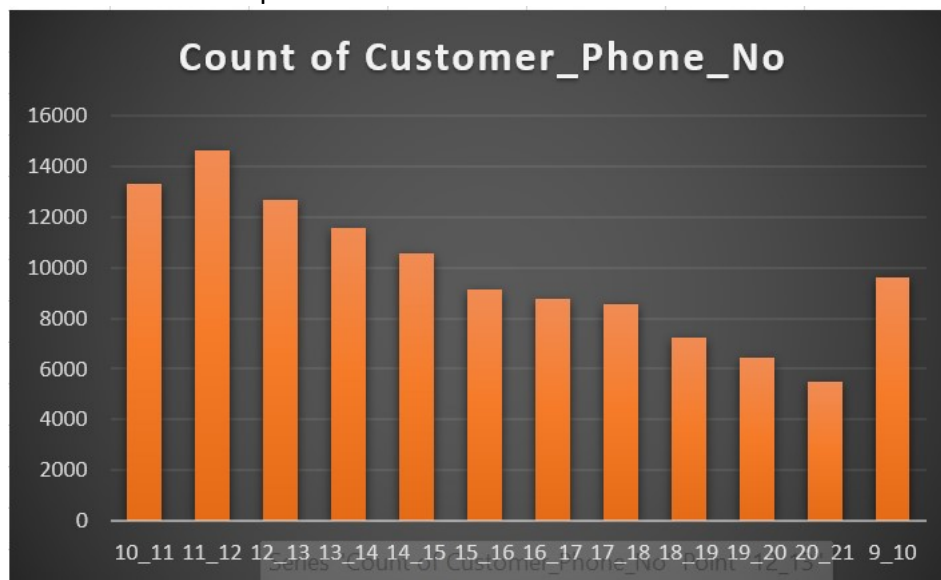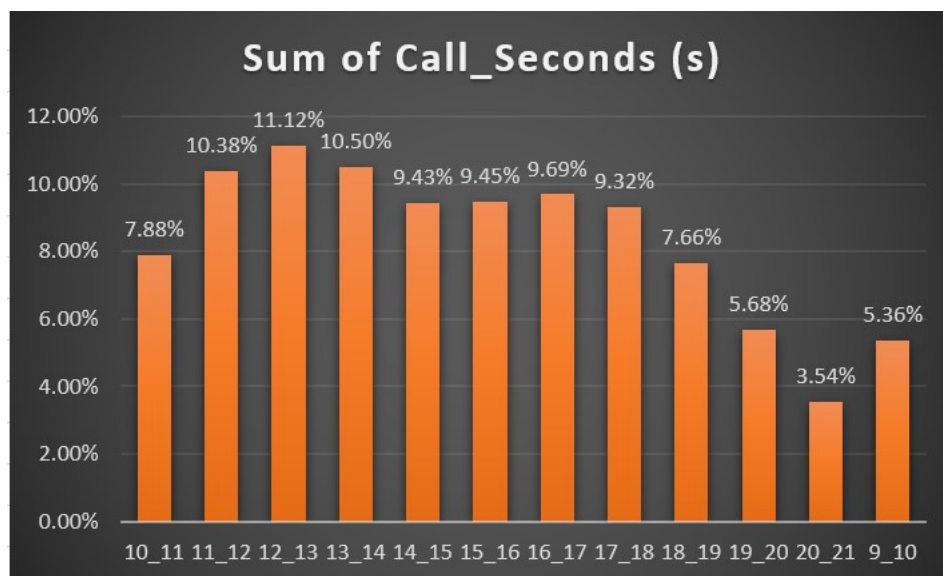
Time bucket	Count of Customer_Phone_N	Sum of Call_Seconds (s)
10_11	13313	7.88%
11_12	14626	10.38%
12_13	12652	11.12%
13_14	11561	10.50%
14_15	10561	9.43%
15_16	9159	9.45%
16_17	8788	9.69%
17_18	8534	9.32%
18_19	7238	7.66%
19_20	6463	5.68%
20_21	5505	3.54%
9_10	9588	5.36%

C . As you can see current abandon rate is approximately 30%. Propose a manpower plan required during each time bucket [between 9am to 9pm] to reduce the abandon rate to 10%. (i.e. You have to calculate minimum number of agents required in each time bucket so that at least 90 calls should be answered out of 100.)

Solution : First I calculated the average time for answered calls using pivot tables It came as 198.6 seconds which is 70% answered.To make it 90% answered, then the time requirement will be (=90/70*198.6) which is approximately 255 seconds.

Man power required = 255/4.5 which is 57 because 4.5 is the no of hours each worker actually work per day in the company.

therefore **57** more men needed.

Total no. of working days	24
Days actually worked with leave	20
Total working hours of each agent	7.5
Actual hours utilized for working	4.5

Average Time Call duration	198.6	
Total number of possible calls	82	
Hours required to ans 90% calls	255	
No. of workers required for 90%	57	

Time buck	% of calls	No. of calls		No. of hou	Extra workers
9_10	8		410	23	5
10_11	9		462	25	6
11_12	9		462	25	6
12_1	7		359	20	4
1_2	7		359	20	4
2_3	7		359	20	4
3_4	8		410	23	5
4_5	8		410	23	5
5_6	6		308	17	4
6_7	8		410	23	5
7_8	6		308	17	4
8_9	7		359	20	4
Total	90		4617	255	57

D. Let's say customers also call this ABC insurance company in night but didn't get answer as there are no agents to answer, this creates a bad customer experience for this Insurance company. Suppose every 100 calls that customer made during 9 Am to 9 Pm, customer also made 30 calls in night between interval [9 Pm to 9 Am] and distribution of those 30 calls are as follows:

Time_Bucket	9_10	10_11	11_12	12_13	13_14	14_15	15_16	16_17	17_18	18_19	19_20	20_21
Calls In Night	2876	3994	4388	3796	3468	3168	2748	2636	2560	2171	1939	1652

Now propose a manpower plan required during each time bucket in a day. Maximum Abandon rate assumption would be same 10%.

Solution : Call volume during 9AM to 9PM is 5130. It is said that 30% of day time calls come during night, therefore 0.3*5130 =1539.

We have to make the calls answered by 90%, therefore (0.9*1539*198.6/3600) gives 76.4 hours.

198.6 is the average time taken for answered calls.

So, 76.4/4.5 is approximately 17

therefore **17** more men needed at night to answer 90% of customer calls.

Calls made during (9am - 9pm)	5130
Calls made during (9pm - 9am)	1539
Additional hours required for 10% abandon rate	76
No. of Extra workers for night	17
Total no. of workers	74

Time bucket	% of calls	No. of calls	No. of hours	Extra workers
9_10	3	154	7.6	2
10_11	3	154	7.6	2
11_12	2	103	5.1	1
12_1	2	103	5.1	1
1_2	1	51	2.5	1
2_3	1	51	2.5	1
3_4	1	51	2.5	1
4_5	1	51	2.5	1
5_6	3	154	7.6	2
6_7	4	205	10.2	2
7_8	4	205	10.2	2
8_9	5	256	12.7	3
Total	30	1539	76.4	17

Result :

Performed all the analysis in Microsoft Excel using pivot tables and charts to create actionable insights to make data driven decision.

Please refer all sheets in Call_Volume_Trend_Analysis.xlsx for all pivot tables and analysis in Drive folder.