ABC Call Volume Trend Analysis

PROJECT DESCRIPTION

Here we are trying to build a system through which we will be able to analyse customer feedback and data. Through this Call volume trade analytics we will measure certain parameters which in turn will help us grow as a company and also most certainly help in understanding our flaws. By this way the ABC Company will get to know about the customers feedback. These analytics are the foundation pillar of the success of any organisation. Trends such as- Time_Bucket, Duration, Call_Seconds, Call Status etc. are important for a company to analyse before producing a movie.

I have been given a dataset of a company various columns of different ABC call volume trend is given. Knowledge in statistics and different formulas in excel are used to draw necessary conclusions about the company.

APPROACH

I have tried to understand the dataset before trying to execute any of the requirements. I related each given data with what exactly I require to derive e.g. If I have been given the dataset and asked to find out the most relevant columns, so I segregated the significant columns from the total number of given columns by first listing all the columns then visualising the necessity of a column in deriving a conclusion and then at last deleting the non significant column. So over in all my approach was quite simple I just kept on connecting the dots to build these graphs and charts.

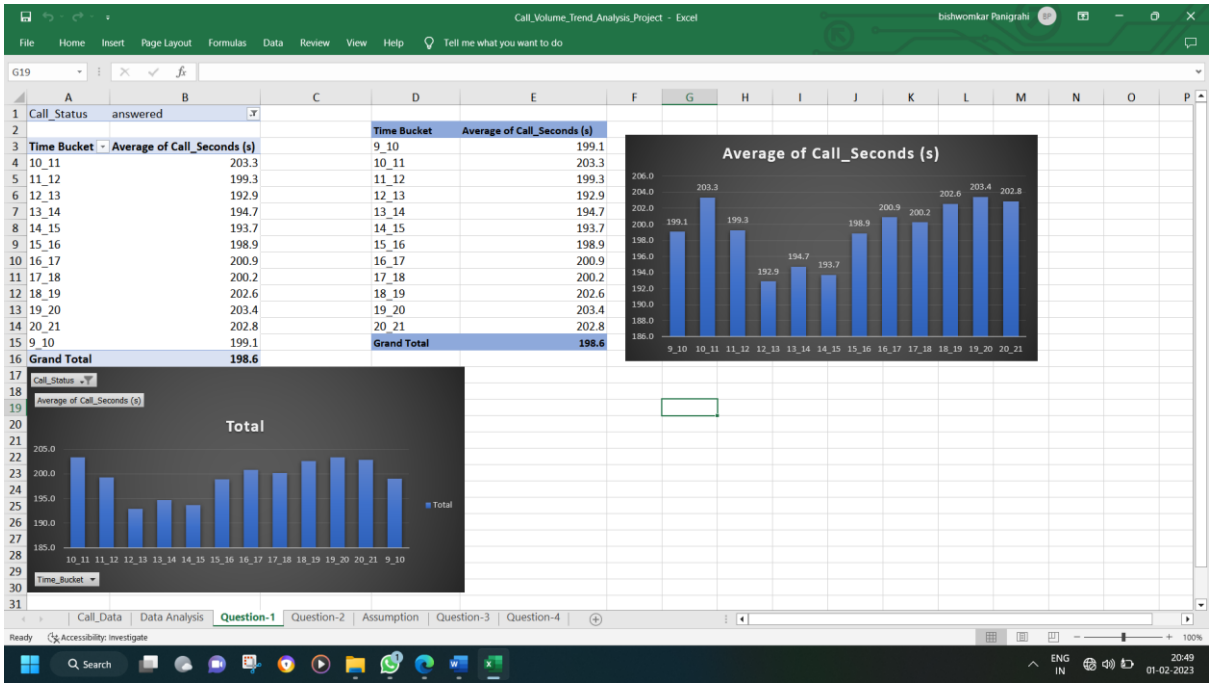
TECH-STACK

I had used MS-Excel provide by Microsoft. I have used the office home and student version of 2019.

The reason for using it is that it has very user friendly interface and it is also hassle free with all the provided services such as creating visual illustrations, administering it, modifying it etc. I have particularly used it to create several required charts and graphs to perfectly understand the data then I have used multiple pivot tables to derive the outcome I required out of the given dataset.

RESULT

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



Call_Status	answered

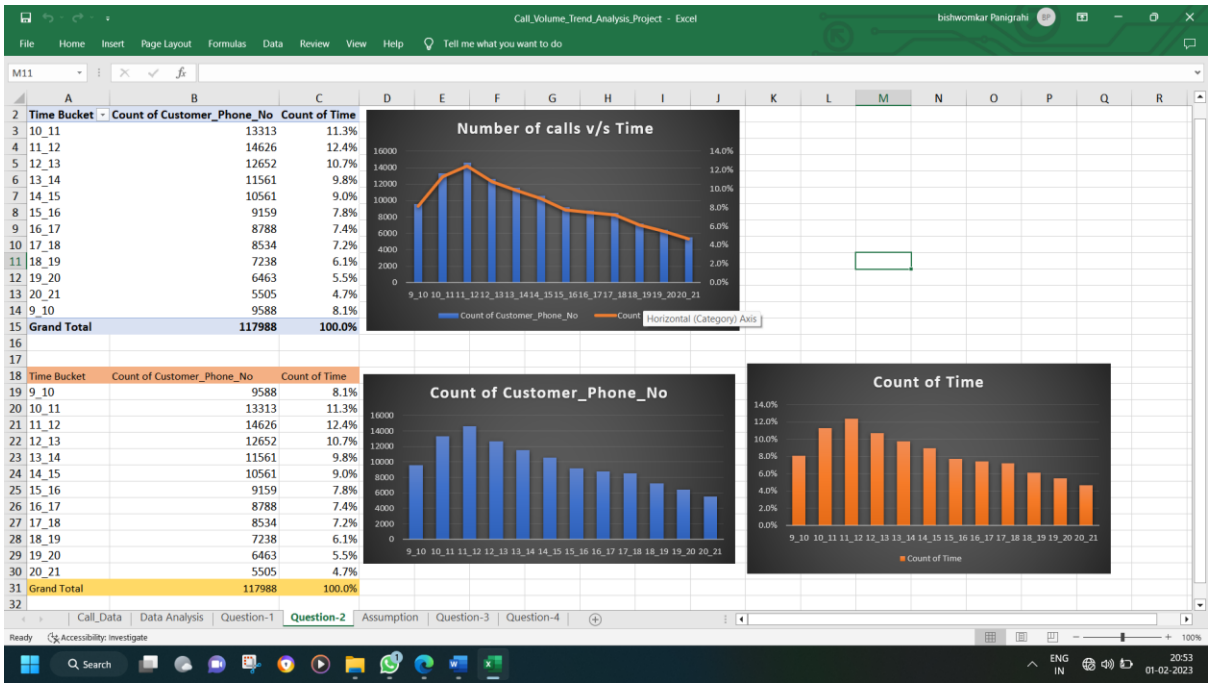
Time Bucket	Average of Call_Seconds (s)
10_11	203.3
11_12	199.3
12_13	192.9
13_14	194.7
14_15	193.7
15_16	198.9
16_17	200.9
17_18	200.2
18_19	202.6
19_20	203.4
20_21	202.8
9_10	199.1
Grand Total	198.6

Time Bucket	Average of Call_Seconds (s)
9_10	199.1
10_11	203.3
11_12	199.3
12_13	192.9
13_14	194.7
14_15	193.7
15_16	198.9
16_17	200.9
17_18	200.2
18_19	202.6
19_20	203.4
20_21	202.8
Grand Total	198.6

INSIGHT:-

1. Pivot Table is used to answer this question.
2. Time_Bucket is measured in the Rows and average of Call_Seconds is measured in the Values section. And we put Call_Status in the Filters section.
3. The total average of call time duration which are answered by the agents is 198.6 seconds.
4. The average call time duration for all incoming calls received by agents is the highest in between 10 am to 11 am and from 7 pm to 8 pm
5. The average call time duration for all incoming calls received by agents is the least in between 12 noon to 1 pm.

B.) 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, …..)



Time Bucket	Count of Customer_Phone_No	Count of Time
10_11	13313	11.3%
11_12	14626	12.4%
12_13	12652	10.7%
13_14	11561	9.8%
14_15	10561	9.0%
15_16	9159	7.8%
16_17	8788	7.4%
17_18	8534	7.2%
18_19	7238	6.1%
19_20	6463	5.5%
20_21	5505	4.7%
9_10	9588	8.1%
Grand Total	117988	100.0%

Time Bucket	Count of Customer_Phone_No	Count of Time
9_10	9588	8.1%
10_11	13313	11.3%
11_12	14626	12.4%
12_13	12652	10.7%
13_14	11561	9.8%
14_15	10561	9.0%
15_16	9159	7.8%
16_17	8788	7.4%
17_18	8534	7.2%
18_19	7238	6.1%
19_20	6463	5.5%
20_21	5505	4.7%
Grand Total	117988	100.0%

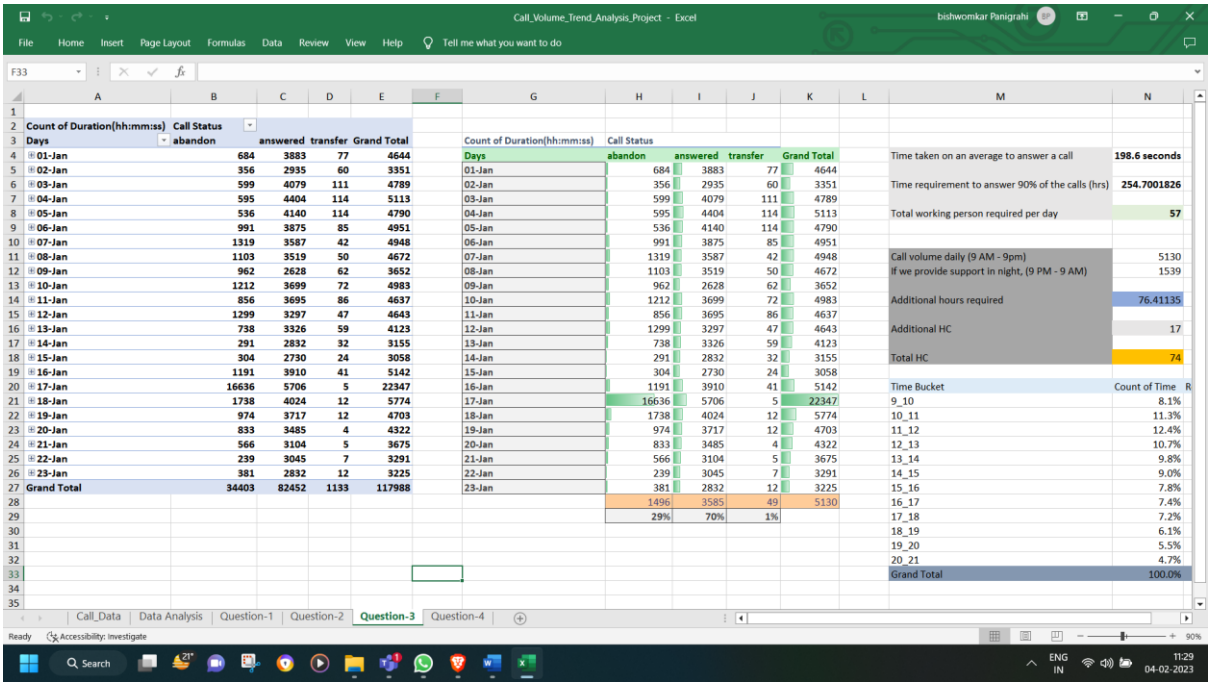
INSIGHT:-

1. We plotted Time_Bucket in the rows and took Count of Customer_Phone_No and Count of Time in the Values section.
2. We measured Count of Time as the percentage of Column Total.
3. The customers call the most in between 11 am to 12 noon.
4. The customers call the least in between 8 pm to 9 pm.

- **Assumption:** An agent work for 6 days a week; On an average total unplanned leaves per agent is 4 days a month; An agent total working hrs is 9 Hrs out of which 1.5 Hrs goes into lunch and snacks in the office. On average an agent occupied for 60% of his total actual working Hrs (i.e. 60% of 7.5 Hrs) on call with customers/ users. Total days in a month is 30 days.

  - ***Note**: For easy calculation, I assumed there are 28 days in a month.*

C.) As we 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%.



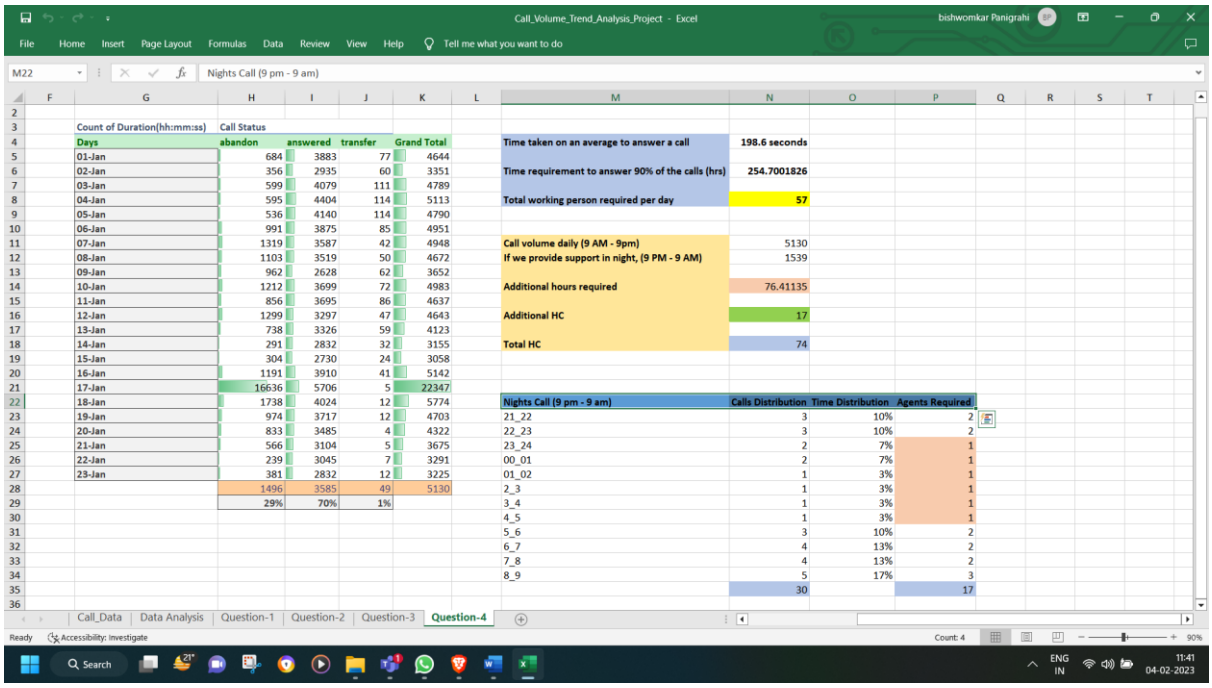
INSIGHT:-

1. First, we created pivot table. Date & Time is dragged down to Rows, Call Status to Columns, while taking count Call Duration in the Values section.
2. Then, we calculated the average of abandon, answered and transfer by using the average excel formula.
3. 29% of the calls are abandoned, 1% is transferred, while 70% of the calls are answered in the day time.
4. Total agents required to answer the 90% of the calls per day is 57.
5. The minimum number of agents required for each time bucket is calculated by 57 * count of time (calculated in the 2nd question).

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:**

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

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



Count of Duration(hh:mm:ss)	Call Status			
Days	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
	1496	3585	49	5130
	29%	70%	1%	

Time taken on an average to answer a call	198.6 seconds
Time requirement to answer 90% of the calls (hrs)	254.7001826
Total working person required per day	57
Call volume daily (9 AM - 9pm)	5130
If we provide support in night, (9 PM - 9 AM)	1539
Additional hours required	76.41135
Additional HC	17
Total HC	74

Nights Call (9 pm - 9 am)	Calls Distribution	Time Distribution	Agents Required
21_22	3	10%	2
22_23	3	10%	2
23_24	2	7%	1
00_01	2	7%	1
01_02	1	3%	1
2_3	1	3%	1
3_4	1	3%	1
4_5	1	3%	1
5_6	3	10%	2
6_7	4	13%	2
7_8	4	13%	2
8_9	5	17%	3
	30		17

INSIGHT:-

1. I We first calculated the Time Distribution by dividing each calls distribution by total calls i.e. 30.
2. The number of agents required for each time bucket is calculated by 17 * Time Distribution.

Note: 17 is calculated above by dividing the additional hours required to answer the night calls by 4.5 (actual working hours of agents).

DERIVATIVES:-

- The customers call the least in the evening. So, the company can reduce the number of agents at that time for answering the calls.
- The company can hire 17 customer support agents for the night shift work.
- The company can shift some of the day workers for the night shift.
- The employees who are working 9 am to 9 pm. The manager can change some of the workers shift from 5 am to 2 pm and some workers from 2 pm to 11 pm to get the most calls answered.
- The company can make the employers divide into 3 parts too, so that the agents are always available 24/7.
- We found there were few outliers in the data. And if we have removed that outliers, then the answers would have been different.

EXCEL SHEET LINK :-

https://1drv.ms/x/s!Arxa-xC1P_LYgQUVdmsfuxMVdYqN

Submitted by :- Bishwomkar Panigrahi