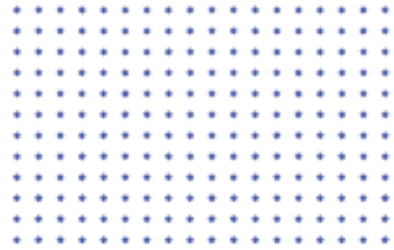


ABC CALL VOLUME TREND ANALYSIS

FINAL PROJECT - 4



DETAILS



PROJECT DESCRIPTION

This project is about analyzing and processing the data related to ABC insurance company's call records. A Customer Experience (CX) team is formed to carry out these operations in an organization. Basically what this CX team does is enhances the relationship of customers with the company by becoming the voice of customer, providing customer support and carry out several programs to elevate user experience.

I am supposed to analyze the dataset provided by the team and perform actions accordingly to get the desired outputs.

APPROACH

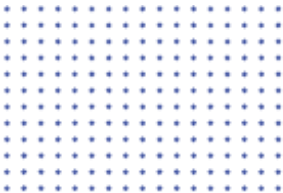
My approach here is to first look at the whole dataset, try to understand it properly because if I don't understand the dataset I won't be able to get the results which the query demands. So, understanding the dataset is the very first step, then moving onto the questions and taking appropriate actions.

TECH-STACK USED

Tech stack I have used here is MS Excel 2016 because of its ability to analyze the data, impute the data, and visualize the data quickly. I have also cleaned the data which is there in excel provided at the end.

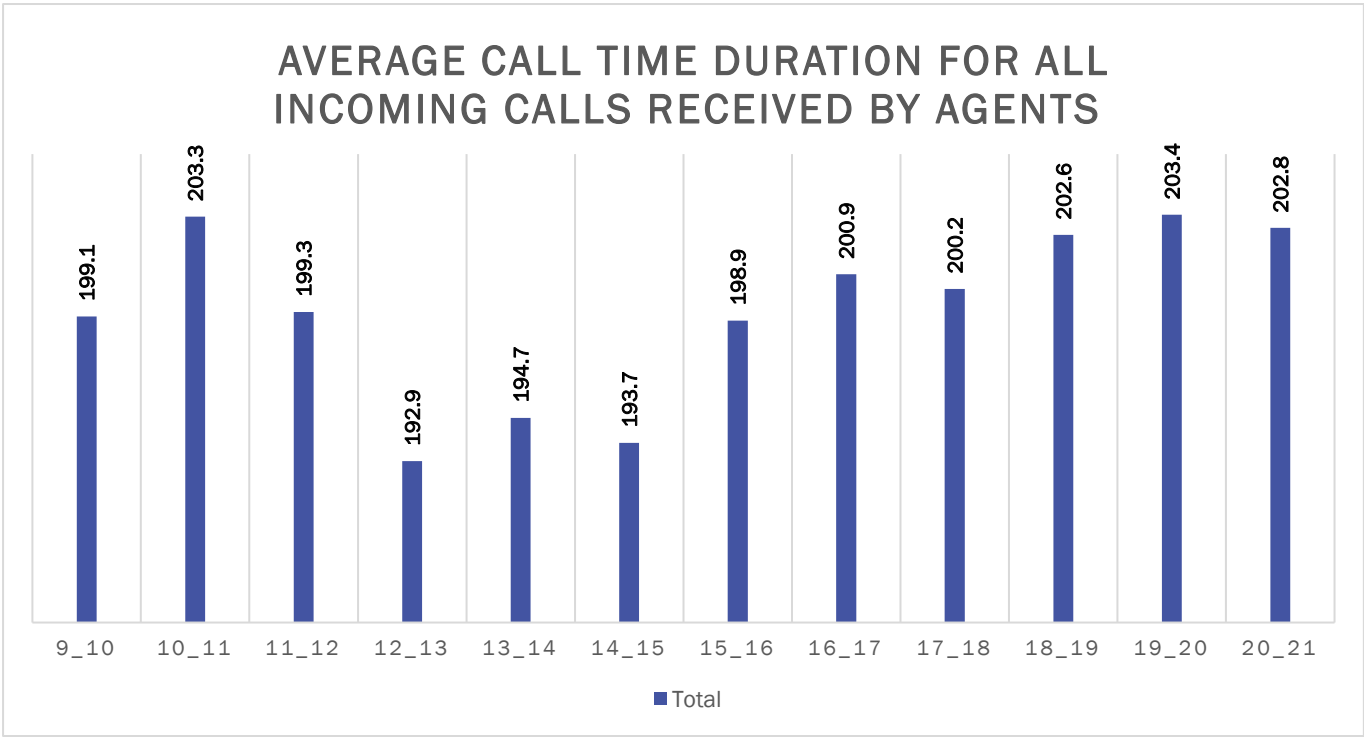


RESULTS



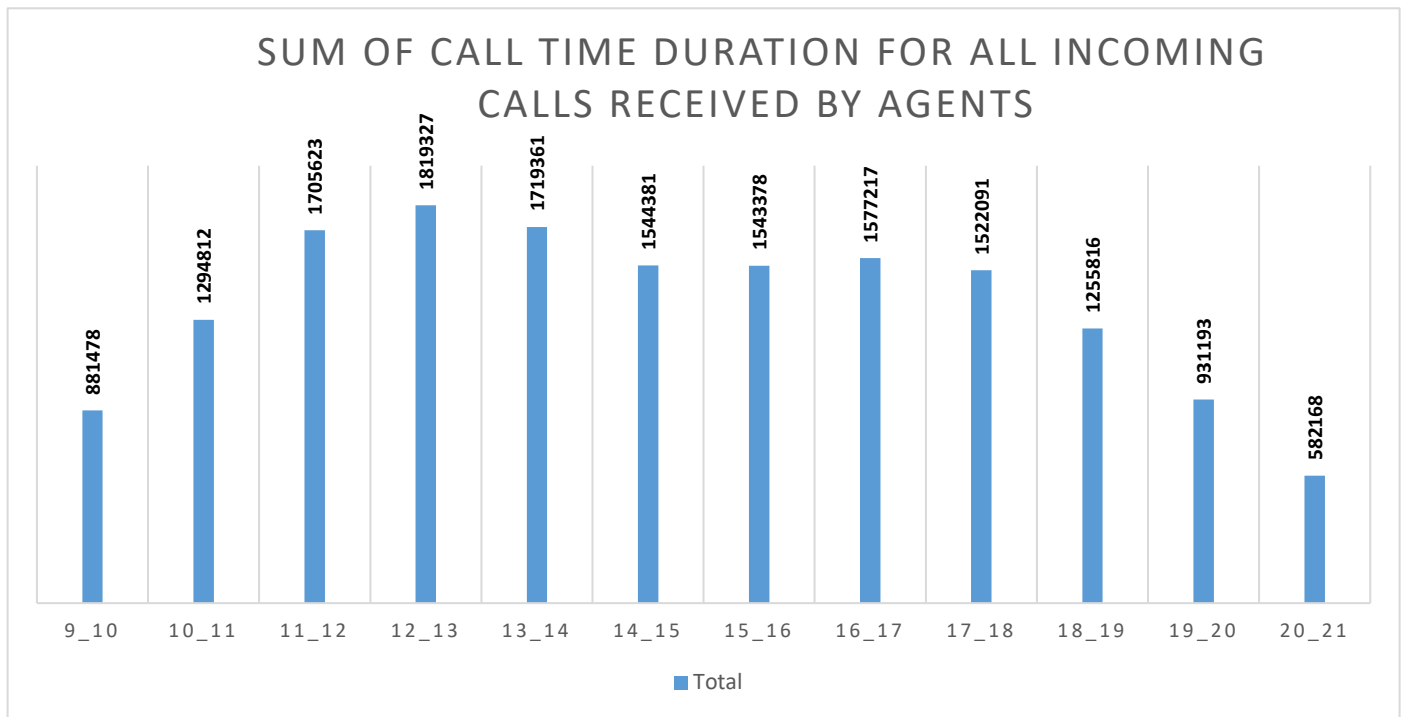
- 1. Average call time duration for all incoming calls received by agents in each time bucket.

Call_Status	answered	
Row Labels	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	



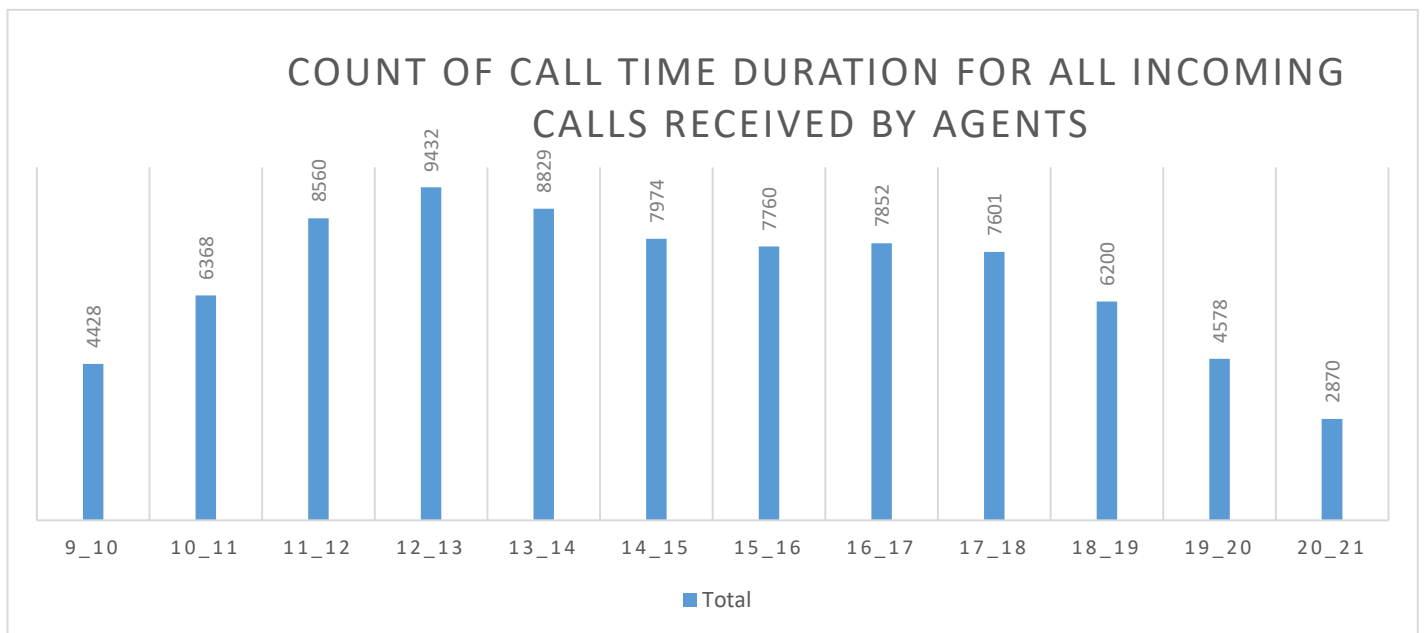
From the above chart we can see that the time bucket 19_20 which is 7pm to 8pm has the highest amount of average calls answered : 203.4

Call_Status	answered
Row Labels	Sum of Call_Seconds (s)
9_10	881478
10_11	1294812
11_12	1705623
12_13	1819327
13_14	1719361
14_15	1544381
15_16	1543378
16_17	1577217
17_18	1522091
18_19	1255816
19_20	931193
20_21	582168
Grand Total	16376845



From the above Bar plot we can infer that the time_bucket 12_13 i.e. during the time period 12PM to 1PM had the highest total number of calls answered i.e. 1819327

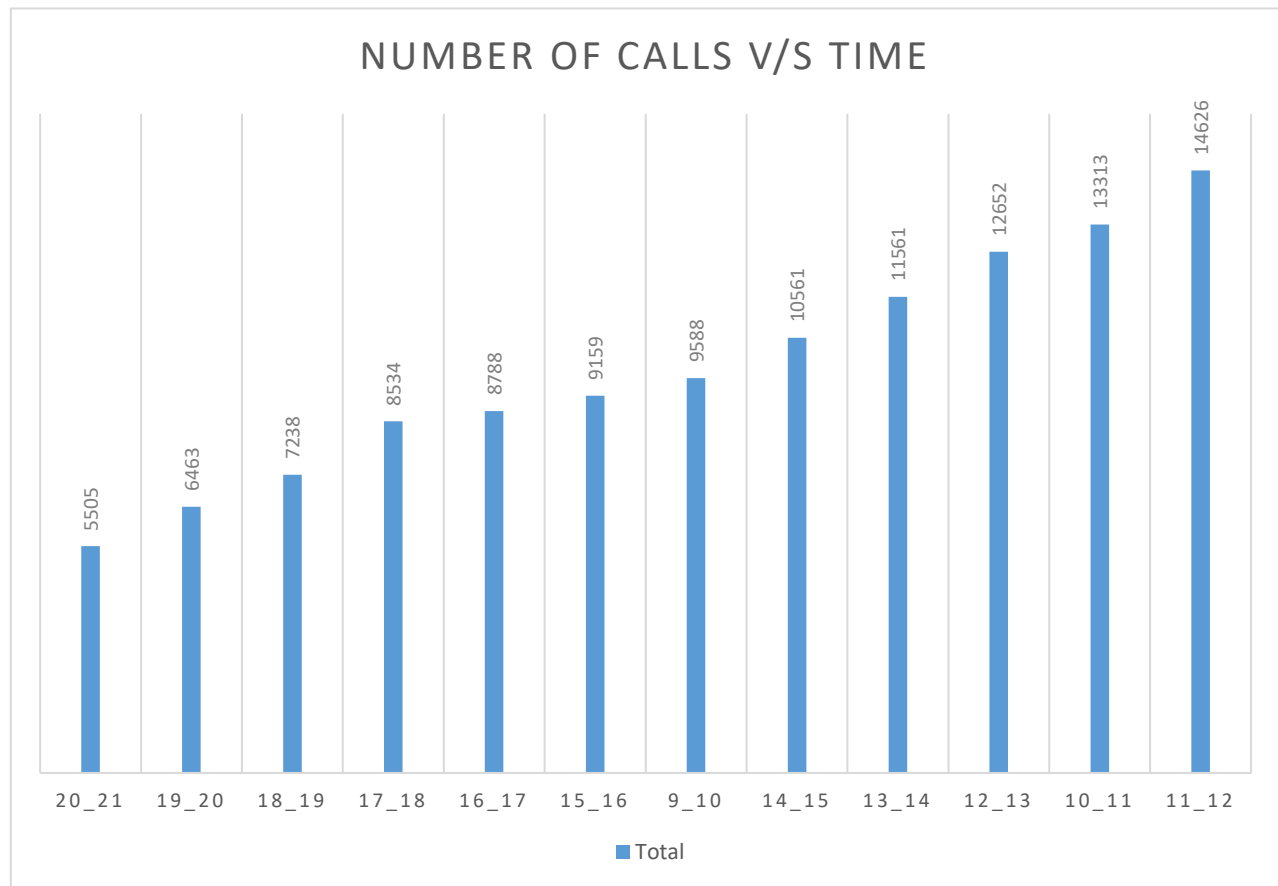
Call_Status	answered
Row Labels	Count of Call_Seconds (s)
9_10	4428
10_11	6368
11_12	8560
12_13	9432
13_14	8829
14_15	7974
15_16	7760
16_17	7852
17_18	7601
18_19	6200
19_20	4578
20_21	2870
Grand Total	82452



From the above bar plot we can infer that the time_bucket12-13 i.e.12PM to 1PM had the highest count of calls answered i.e.9432

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)

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



From the chart we can infer that the time bucket 11_12 that is 11am to 12pm has the highest count of incoming calls i.e. 14,626.

3. Manpower plan required during each time bucket from 9am to 9pm to reduce the abandon rate to 10%

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

From the above table we can infer that the current abandon rate is around 30%.

We need to propose a Manpower plan i.e. new total number of people working per day.

- From the Q1 analysis we can derive that Avg calls Answered per agent is 198.6 in each time bucket
- We need to reduce the abandon rate to 10% that is we need to add 20% of calls to answered column and reduce 20% from abandon column to match the total count of call records.
- To sum it up we need 90% of answered calls to reduce the abandon rate to 10%.
- To do this firstly what I did here is calculated the 10% and 20% of 5,130 which is average calls incoming per day and they are 513 and 1,026 respectively.
- Average calls answered per second is 198.6 and seconds per hour is 3,600.

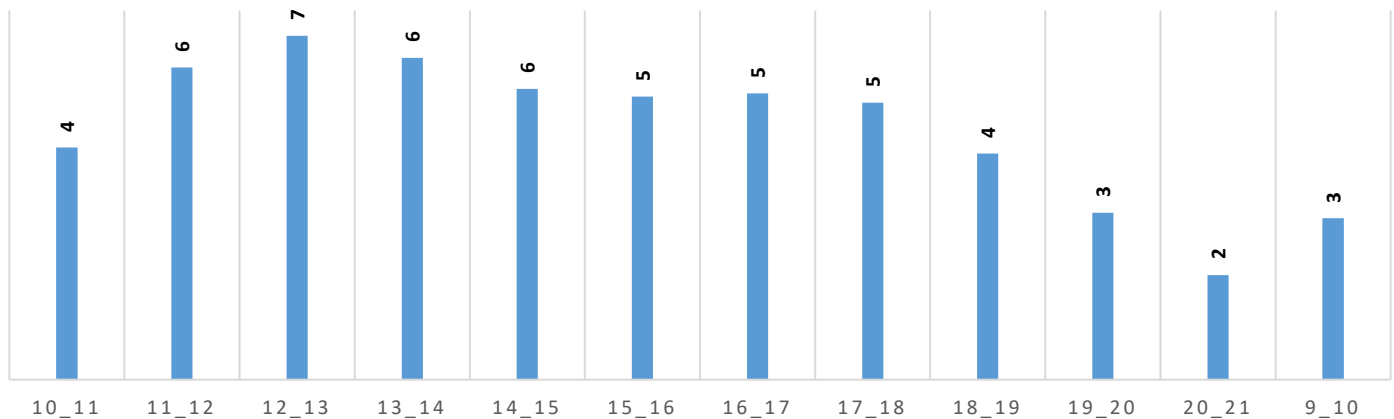
- Therefore time required to answer 90% of the incoming calls is

$$= 5,130 * 198.6 * 0.9 / 3600 = \mathbf{254.7001826}$$
- So the new total number of agents working per day is 255 by the number of hours an agent actually works(on a consumer call) i.e. **4.5**

$$= 255/4.5 = 56.67 \sim \mathbf{57 \text{ Agents}}$$
 working per day.
- So to have abandon rate reduced to 10% we need 57 agents working per day.
- Distribution of manpower plan per time bucket to keep the abandon rate at 10% and answered rate at 90%.

Call_Status	answered	
Row Labels	Count of Customer	agents allotted
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

AGENTS ALLOTED PER TIME BUCKET TO KEEP ABANDON RATE AT 10%



4. Night calls management

Here the query is that if a customer calls 100 times a day and 30 of them are done at night between 9pm to 9am shift, but these 30 are unanswered as there are no agents available to pick these calls up. I have to propose a plan so that these calls can be answered in the day time with morning shift work as well by keeping the abandon rate @ 10%. There is some additional information given below:

- In a day, an agent works for 9 hours.
- Out of these 9 hours, 1.5 hours goes into lunch break and coffee/tea break; which equals to $9 - 1.5$ i.e. 7.5 hours.
- Out of these 7.5 hours per day an agent is occupied with consumer calls for only 60% of the time, therefore $0.6 * 7.5 = 4.5$.
- So an agent spends around 4.5 hours per day on consumer calls.
- Total working days for an agent is 6 days/week.
- In a month of 30 days, there are 4 weeks. So 7 days/week = 28 days month.
- Out of these 28 days 4 days are unplanned leave.
- So, total days left here are $28 - 4 = 24$ days out of 28 in a month.
- There is a Sunday per week which is holiday for everyone, if we consider it total number of Sundays are 4, therefore $24 - 4 = 20$ days.
- Therefore, an agent is available for 20 days in a month.

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

- For each 100 calls per day, 30 are at night.
- Therefore for 5,130 calls there will be $5,130 * 0.3 = 1539$ night calls.
- So the additional working hours keeping the answered rate @ 90% will be $1539 * 198.6 * 0.9/3600 = 76.41135$.
- Additional agents needed by the company to answer night calls will be $76.41135/4.5 = 16.98 \sim 17$.

- Therefore the total number of agents working per day by keeping the answered rate @ 90% will be $57 + 17 = 74$ agents.
- So 74 agents are required to reduce the abandon rate to 10% and increase the answered rate to 90%.

Night time slot	Calls per slot	Total Hours Needed	Agents needed	time distribution
21_22	3	7.641135	13	10%
22_23	3	7.641135	13	10%
23_24	2	5.09409	8	7%
00_01	2	5.09409	8	7%
01_02	1	2.547045	4	3%
02_03	1	2.547045	4	3%
03_04	1	2.547045	4	3%
04_05	1	2.547045	4	3%
05_06	3	7.641135	13	10%
06_07	4	10.18818	17	13%
07_08	4	10.18818	17	13%
08_09	5	12.735225	21	17%
Total	30	76.41135	126	100%

- Since the time distribution is not linear i.e. some time-buckets require more agents than others.
- Therefore it is not feasible for the company to hire new agents for this type of distribution, rather what they can do is ask agents working till 19_20 and 20_21 time buckets to extend their timing till 21_22 or 22_23 because the workload is higher here compared to midnight time buckets.
- Similarly, Agents working from 9_10 and 10_11 can be asked to start their working hours from 7_8 or 8_9 in the morning so that the morning workload will be distributed and calls won't remain unanswered.
- So in this way company will need to hire only few agents that will work from time bucket 1_2 till 6_7 in the morning.
- In this way the Answered rate can be kept at 90% and abandon rate at 10%.

GOOGLE DRIVE LINK FOR THE CLEANED AND ANALYZED EXCEL SHEET DATA:

ANSWER BOOK



THANK YOU