ABC Call Volume Trend Analysis

Project Description:

The given dataset consists information of 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 [for easiness we have also provided you with the time bucket], Duration [duration for which a customer and executives are on call, Call_Seconds [for simplicity we have also converted those time into seconds], call status (Abandon, answered, transferred).

A customer experience (CX) team consists of professionals who analyze customer feedback and data, and share insights with the rest of the organization. Typically, these teams fulfil various roles and responsibilities such as: Customer experience programs (CX programs), Digital customer experience, Design and processes, Internal communications, Voice of the customer (VoC), User experiences, Customer experience management, Journey mapping, Nurturing customer interactions, Customer success, Customer support, Handling customer data, Learning about the customer journey.

Interactive Voice Response (IVR), Robotic Process Automation (RPA), Predictive Analytics, Intelligent Routing

In a Customer Experience team there is a huge employment opportunities for Customer service representatives A.k.a. call centre agents, customer service agents. Some of the roles for them include: Email support, Inbound support, Outbound support, social media support.

Inbound customer support is defined as the call centre which is responsible for handling inbound calls of customers. Inbound calls are the incoming voice calls of the existing customers or prospective customers for your business which are attended by customer care representatives. Inbound customer service is the methodology of attracting, engaging, and delighting your customers to turn them into your business' loyal advocates. By solving your customers' problems and helping them achieve success using your product or service, you can delight your customers and turn them into a growth engine for your business.

Tech-Stack Used:

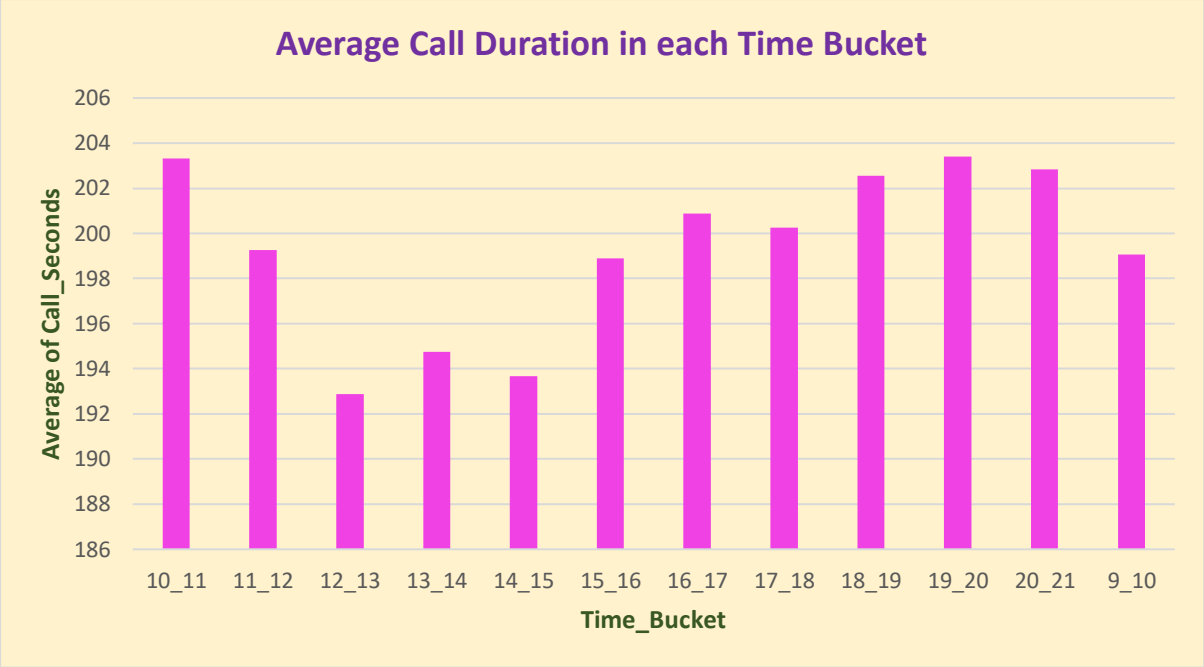
MS Excel for analysis of data and visual representation of dataset.

Approach and Insights:

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

- We can calculate the average call duration for incoming calls received for each time bucket by using pivot table, and by filtering only the answered calls from Call_Status column.
- The total average call duration for incoming calls received by the agent is 198.62 seconds.
- The average call duration for incoming calls received for each time bucket is given in the table below.

Time_Bucket	Average of Call_Seconds (s)
10_11	203.3310302
11_12	199.2550234
12_13	192.8887829
13_14	194.7401744
14_15	193.6770755
15_16	198.8889175
16_17	200.8681864
17_18	200.2487831
18_19	202.5509677
19_20	203.4060725
20_21	202.845993
9_10	199.0691057
Grand Total	**198.6227745**

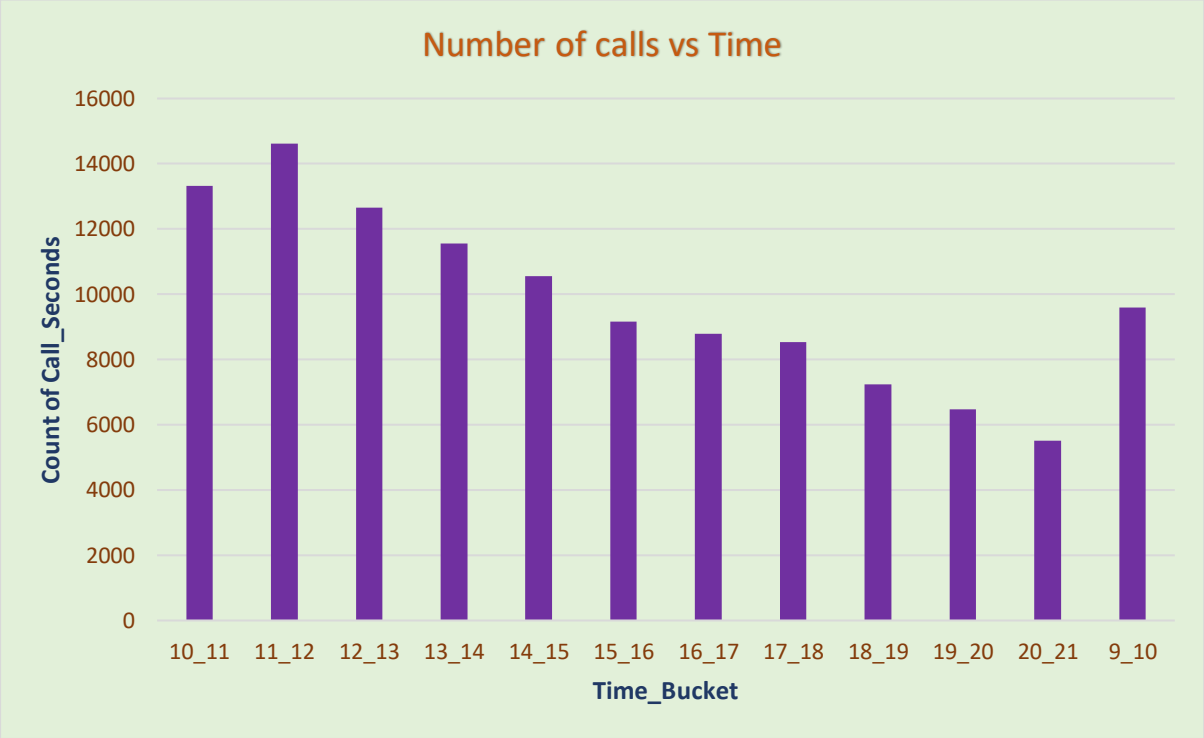


b. Show the total volume/ number of calls coming in via charts/ graphs [Number of calls v/s Time]. You can select time in a bucket form (i.e. 1-2, 2-3, …..)

We can calculate the number of calls coming in each time bucket by using pivot table by taking the Time_Bucket as rows and the count of Call_Seconds as values.

Time_Bucket	Count of Call_Seconds (s)
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**



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.)**

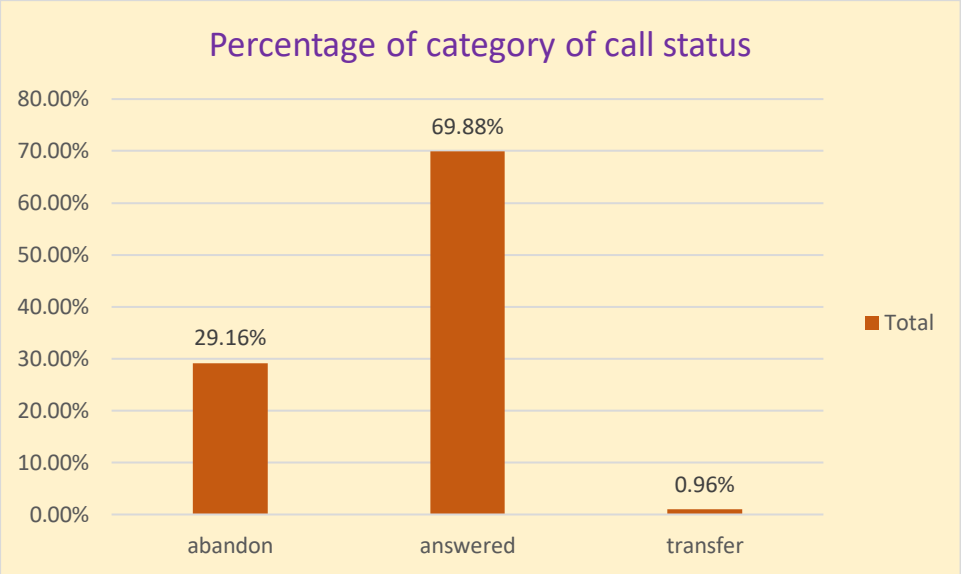
Assumptions:

- Agent working hours – 9hrs
- Time taken for lunch and snacks – 1.5hrs
- Agent actual working hours = 7.5hrs
- Duration for which agent is on call with customers = 60% of actual working hrs = 4.5hrs

Calculation of Percentage of Category of Call_Status:

From the below pivot table, we find that approximately 29% of calls are abandoned, 70% of calls are answered and 1% of calls are transferred.

Call_Status	Count of Customer_Phone_No
abandon	29.16%
answered	69.88%
transfer	0.96%
Grand Total	**100.00%**



- By analysing the data, we find that the sum of hours needed to attend the calls for a single day is 187.96 hours
- If one agent works 4.5hrs per day, then the total number of agents required to complete 187.96hrs (1 day) of work = 187.96/4.5 = 41.77
- Total number of agents required to complete approximately 70% of work per day= 41.77
- Total number of agents required to complete approximately 90% of work per day

=90*41.77/70

=53.7

~54 Agents

- Minimum number of agents required for each time bucket = 54* number of calls in each time bucket

Time Bucket	Count of Customer_Phone_No	Count of Customer_Phone_No	Agents Required
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	5
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	4
Grand Total	**100.00%**		54

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%.

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
Average	**1496**	**3585**	**49**	**5130**

- From the above table, we find that the daily average calls (9AM – 9PM) = 5130
- Since 30% of the calls are made at night, the calls at night = 5130*0.3 = 1539
- Additional hours required at night with 10% abandon rate = (1539*198.6*0.9)/3600 = 76.41 hours
- Additional agents required = 76.41/4.5 = 17

- Therefore, the minimum agents required in each time bucket at night between the interval 9PM to 9AM is given in table below

Time_Bucket	Call Distribution	Min Agents Req
9_10	3	2
10_11	3	2
11_12	2	1
12_1	2	1
1_2	1	1
2_3	1	1
3_4	1	1
4_5	1	1
5_6	3	2
6_7	4	2
7_8	4	2
8_9	5	3
Total	30	19

- From the analysis we can infer that the company needs to hire employees to work a night shift and it needs a minimum of 19 employees.
- If the employees find it difficult to constantly work in night shifts, then the employees can be scheduled a rotational shift.
- The managers must schedule the employees break time so that in each time bucket the minimum agents required are available to attend the call. In this way we would be able to reduce the abandon rate due to unavailability of staff.

Results:

By working on this project, I learnt how a staffing plan in a company might affect their productivity and customer satisfaction. As a data analyst this has helped to get some domain knowledge about customer service team and helped me in deriving useful insights from the analysis which is the main role of a data analyst.