ABC CALL VOLUME TREND ANALYSIS

Project Description:

we are providing you with 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 [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).

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.

Let's look at some of the most impactful AI-empowered customer experience tools you can use today:
Interactive Voice Response (IVR), Robotic Process Automation (RPA), Predictive Analytics, Intelligent Routing

ROLE: To Analyze customer feedback and data, and share insights with the rest of the organization.

Business Understanding:

Advertising is a way of marketing your business in order to increase sales or make your audience aware of your products or services. Until a customer deals with you directly and actually buys your products or services, your advertising may help to form their first impressions of your business. Target audience for businesses could be local, regional, national or international or a mixture. So they use different ways for advertisement. Some of the types of advertisement are: Internet/online directories, Trade and technical press, Radio, Cinema, Outdoor advertising, National papers, magazines and TV.

Approach:

Problem Statement:

Advertising business is very competitive as a lot of players bid a lot of money in a single segment of business to target the same audience. Here comes the analytical skills of the company to target those audiences from those types of media platforms where they convert them to their customers at a low cost.

Analysis Approach:

- Downloading the dataset of a Customer Experience (CX) Inbound calling team for 23 days.
- Identifying the missing values and dealing with it.
- Removing the duplicates if present in the dataset.
- Analyzing the Dataset and getting insights.

Tech Stack Used:

I used

- **Microsoft® Excel® 2019 MSO (Version 2304 Build 16.0.16327.20200) 64-bit** which enables us to Clean, Format, Organize and Calculate the data in a spreadsheet.
- **Ms Word 2019** for the preparation of the document to be presented.

Insights:

Based on the achieved results I can conclude the following things:

- The company should hire 17 new agents for the night shift.
- Least number of calls are made in the evening by customers.
- Company can shift the timings of some employees as per requirement.
- Some of the day working agents can be shifted to nights.

Results: The detailed answers to the questions are below:

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.

Agents Total working hours	9	hrs
Agents on field Working hours	7.5	hrs
Working Days per week	6	days
Agent works out of 30 days	24	days
unplanned leave days	4	days
Working Days per month	20	days
No. of days agent work in a week	5	days
Actual working hours	60%	
Total time spent on call	4.5	hrs

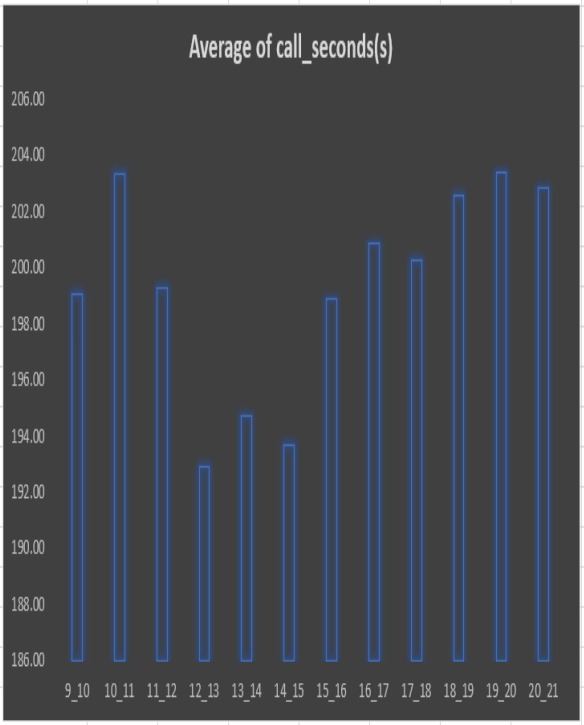
a. Calculate the average call time duration for all incoming calls received by agents (in each Time_Bucket).

Created a pivot table with Time bucket into rows section and Call_Seconds into values section (value field settings as average to calculate the average of call_seconds), Call_Status into filters section with answered as filter. Then, Copied and pasted values and inserted a column chart which shows the average of call_seconds per time bucket.

Call_Status	answered

Row Labels	Average of Call_Second
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**

Timebucket	Average of call_seconds(s)
9_10	199.07
10_11	203.33
11_12	199.26
12_13	192.89
13_14	194.74
14_15	193.68
15_16	198.89
16_17	200.87
17_18	200.25
18_19	202.55
19_20	203.41
20_21	202.85
Grand Total	**198.62**



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, …..)

Created a pivot table with time bucket into rows section, customer phone no. into values section(with value field settings as count to calculate the Count of customer_phone_no) and Count of Time into values section (with value field settings as % of Column Total). Then, copied,pasted all the values and inserted a combo chart with two data series (count of customer phone no. and count of Time).

Row Labels	Count of Customer_Phone_No	Count of Time
10_11	13313	11.28%
11_12	14626	12.40%
12_13	12652	10.72%
13_14	11561	9.80%
14_15	10561	8.95%
15_16	9159	7.76%
16_17	8788	7.45%
17_18	8534	7.23%
18_19	7238	6.13%
19_20	6463	5.48%
20_21	5505	4.67%
9_10	9588	8.13%
Grand Total	**117988**	**100.00%**

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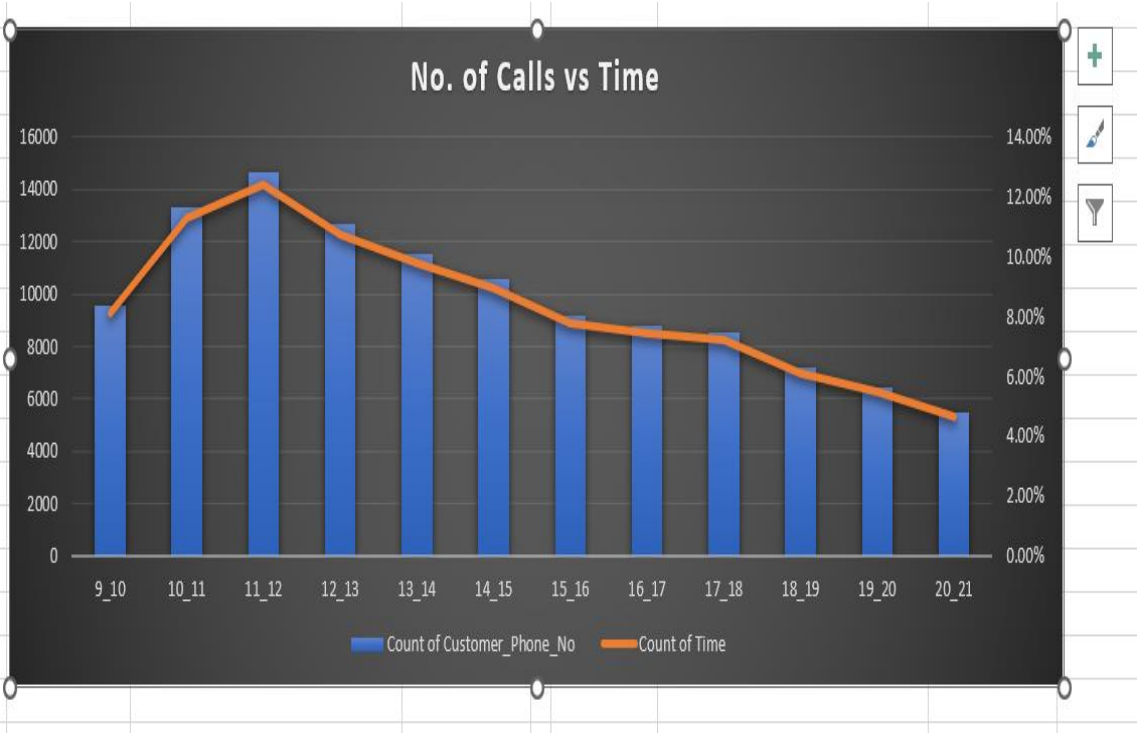

c. As you can see current abandon rate is approximately 30%. Propose a manpower plan required during each time bucket [between 9am to 9pm] to reduce the abandon rate to 10%. (i.e. You have to calculate minimum number of agents required in each time bucket so that at least 90 calls should be answered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

Created a Pivot table with Time into rows section, call_status into columns section and count of duration into values section.Then, Calculated the averages for abandon calls, answered calls, transfer calls and total calls.Then, Checked the % values of those 3 columns.

Calculated and Created a table with average time to answer a call, Time to answer 90% calls, Total Agents required per day and Average Call volume per day.

Created a Table with Time bucket, Count of customer phone no, % Count of time, no. of agents distributed across different time buckets with abandon rate reduced to 10%.

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

Average time taken to answer a call	198.6	seconds
Time required to answer 90% of the calls	255	hrs
Total agents required per day	57	agents
Average call volume (9am-9pm)	5130	seconds

Timebucket	Count of Customer_Phone_No	Count of Time	no. of agents
9_10	9588	8.1%	5
10_11	13313	11.3%	6
11_12	14626	12.4%	7
12_13	12652	10.7%	6
13_14	11561	9.8%	6
14_15	10561	9.0%	5
15_16	9159	7.8%	4
16_17	8788	7.4%	4
17_18	8534	7.2%	4
18_19	7238	6.1%	3
19_20	6463	5.5%	3
20_21	5505	4.7%	3
Grand Total		100%	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:

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%.

Created a Pivot table with Time into rows section, call_status into columns section and count of duration into values section.Then, Calculated the averages for abandon calls, answered calls, transfer calls and total calls.Then, Checked the % values of those 3 columns.

Calculated and Created a table with average time to answer a call, Time to answer 90% calls, Total Agents required per day and Average Call volume per day.

Calculated the night call volume, hours to work at night and Agents required at night.

From the information above, Created a Table with Night Time bucket, Calls, Time distribution, no. of agents distributed across different time buckets with abandon rate reduced to 10%.

Count of Duration(hh:mm:ss)	Column Labe			
Row Labels	abandon	answered	transfer	Grand Total
01-Jan	684	3883	77	4644
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Grand Total	34403	82452	1133	117988
Average	1496	3585	49	5130
%	29%	70%	1%	

Average time taken to answer a call	198.6	seconds
Time required to answer 90% of the calls	255	hours
N0. of agents required per day	57	agents
night call volume(9pm-9am)	1539	seconds
hours at night	76	hours
Agents required at night	17	agents
Total agents required	74	agents

Night time bucket(9pm-9am)	Calls	Time distribution	Agents
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
02_03	1	3%	1
03_04	1	3%	1
04_05	1	3%	1
05_06	3	10%	2
06_07	4	13%	2
07_08	4	13%	2
08_09	5	17%	3
Total	30		17

MY EXCEL FILE:

https://docs.google.com/spreadsheets/d/1cVK-xsnosQXSbZ-XBVmO1SgT3Xp3UwO3/edit?usp=share_link&ouid=104755012826368900391&rtpof=true&sd=true

Note: Download the file from the link and view it in Ms Excel , as Google sheets preview is not showing or responding to some options created in the excel