ABC Call Volume Trend Analysis

Report By

Aditya Shekhar

Contents:-

1. Project Description

This a data set 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).

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.

2. Tech-Used

MS-Excel

Microsoft Excel is a spreadsheet developed by Microsoft for Windows, macOS, Android and iOS. It features calculation or computation capabilities, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications. Excel forms part of the Microsoft Office suite of software.

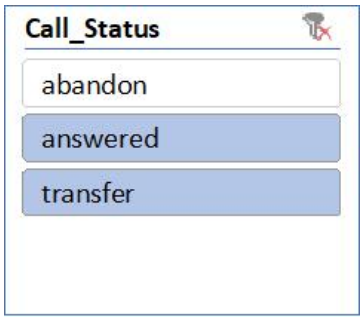
- These sheets are used for cleaning and manipulating the data.
- In this sheets we can perform different types of analysis
- We can apply different formulas and functions.
- In order to move further in the process , we use Excel or Google sheets to answer the questions.
- We can use Pivot Tables and can also insert Charts for Visualizations.
- We can also use Statistical formulas and charts in the analysis.

3. Insights

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

Average Call time duration is calculated by dividing the total duration of all calls attended by agents by the number of calls received by the agent.

Here I am using pivot table to show the average call time duration for all incoming calls received by agents (in each Time_Bucket). I have taken call seconds, Ivr duration and queue time of answered and transferred calls.



Time_Bucket	Sum of Call_Seconds (s)	Average of Call_Seconds (s)	Sum of Queue_Time(Secs)	Average of Queue_Time(Secs)	Total received calls
10_11	1297006	202.5938769	453450	70.8294283	6402
11_12	1708079	198.6600372	499733	58.12200512	8598
12_13	1831061	191.1536695	242535	25.31944879	9579
13_14	1728843	193.2963998	240420	26.88059034	8944
14_15	1552143	191.9543656	236349	29.22940885	8086
15_16	1556085	195.8571429	169162	21.29162996	7945
16_17	1594489	198.2948638	154791	19.25021763	8041
17_18	1533769	197.8801445	141554	18.26267578	7751
18_19	1261762	200.1208565	175270	27.79857256	6305
19_20	934437	202.4782232	217726	47.17789816	4615
20_21	583250	202.5173611	170162	59.08402778	2880
9_10	882195	198.7373282	286489	64.53908538	4439

Sum of IVR _Duration	Average of IVR _Duration
1.652488426	0.000258121
2.254849537	0.000262253
2.522731481	0.000263361
2.395405093	0.000267823
2.121423611	0.000262358
2.087280093	0.000262716
2.093194444	0.000260315

2.024953704	0.000261251
1.66087963	0.000263423
1.195104167	0.000258961
0.726851852	0.000252379
1.161516204	0.000261662

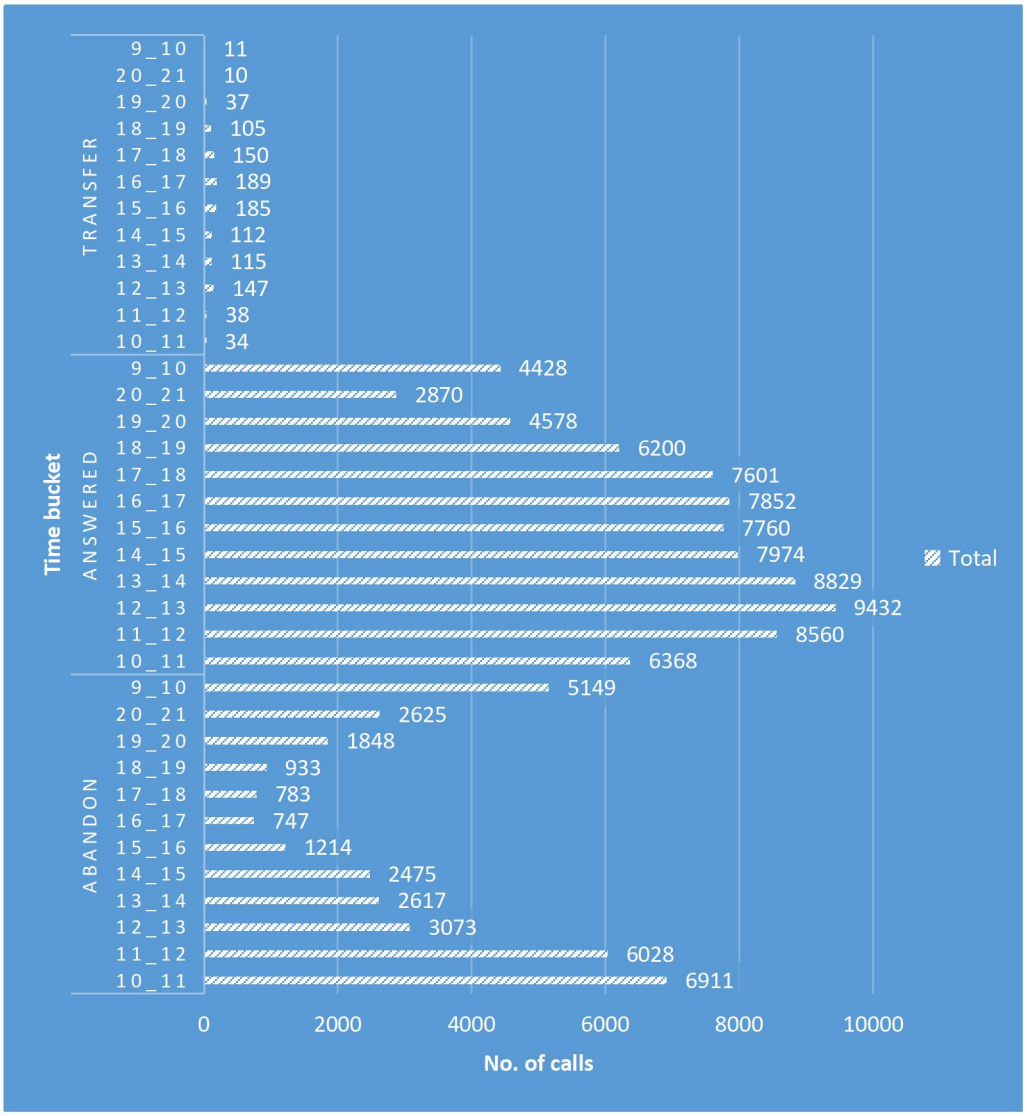
This is the average call time duration for all incoming calls received by agents.

10_11	273.42
11_12	256.78
12_13	216.47
13_14	220.18
14_15	221.18
15_16	217.15
16_17	217.55
17_18	216.14
18_19	227.92
19_20	249.66
20_21	261.60
9_10	263.28

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, …..)**

Call_Status	Time_Bucket	Count of Call_Status
abandon		**34403**
	10_11	6911
	11_12	6028
	12_13	3073
	13_14	2617
	14_15	2475
	15_16	1214
	16_17	747
	17_18	783
	18_19	933
	19_20	1848
	20_21	2625

	9_10	5149
answered		**82452**
	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
	9_10	4428
transfer		**1133**
	10_11	34
	11_12	38
	12_13	147
	13_14	115
	14_15	112
	15_16	185
	16_17	189
	17_18	150
	18_19	105
	19_20	37
	20_21	10
	9_10	11
Grand Total		**117988**


Time bucket
TRANSFER
9_10 11
20_21 10
19_20 37
18_19 105
17_18 150
16_17 189
15_16 185
14_15 112
13_14 115
12_13 147
11_12 38
10_11 34
ANSWERED
9_10 4428
20_21 2870
19_20 4578
18_19 6200
17_18 7601
16_17 7852
15_16 7760
14_15 7974
13_14 8829
12_13 9432
11_12 8560
10_11 6368
ABANDON
9_10 5149
20_21 2625
19_20 1848
18_19 933
17_18 783
16_17 747
15_16 1214
14_15 2475
13_14 2617
12_13 3073
11_12 6028
10_11 6911
Total
0
2000
4000
6000
8000
10000
No. of calls

3. **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.)**

To determine the number of agents required to manage calls between time bucket with a 90% service level and 10% abandon rate over a 23-day period, considering an agent's total working hours, unplanned leaves, lunch/snack break time, and occupancy rate, I can use the following formula:

Number of agents = (Total call volume x Average handle time) / (Effective work time available x (1 - shrinkage) x Service level x Occupancy rate)

Where:(For time-bucket= 10-11 and call volume 13313)

Total call volume = 13313 calls

Average handle time = the average time an agent spends on a call, including any after-call work. it is 0.051 hours for this time bucket.

Effective work time available = the total time agents are available to handle calls, after accounting for planned and unplanned absences and lunch/snack breaks.

Shrinkage = the amount of time agents are not available to handle calls, due to things like absenteeism, tardiness, and system downtime. Let's assume it is 30% or 0.7.

Service level = the percentage of calls answered within a certain time frame. It is 90%.

Occupancy rate = the percentage of time an agent is occupied with handling calls. It is 60%.

Now, calculate the effective work time available per day per agent:

Effective work time available per day per agent = Total working hours per day - Unplanned leaves per month / Total working days per month - Lunch/snack break time

Total working hours per day = 9 hours

Unplanned leaves per month = 4 days

Total working days per month = 6 days x 4 weeks = 24 days

Lunch/snack break time = 1.5 hours

Effective work time available per day per agent = (9 - 4/24 - 1.5) hours = 6.04 hours

Now, I can calculate the effective work time available over 23 days:

Effective work time available over 23 days = 23 days x 6.04 hours = 139.12 hours

Using these values, I can calculate the number of agents required:

Number of agents = (13313 x 0.051) / (139.12 x 0.7 x 0.9 x 0.6) = 13

I would need 13 agents to handle the call volume during the 10-11 time bucket over a 23-day period.

By following this manpower plan, I can help reduce the abandon rate from 30% to 10% by ensuring that at least 90 out of 100 calls are answered during each time bucket.

Sl No.	time bucket	call volume	required s. level	AHT(hrs)	Effective work time available per day per agent	Effective work time available over 23 days	Number of Agents
1	10_11	13313	90%	0.050	6.04	139.12	13
2	11_12	14626	90%	0.058	6.04	139.12	16
3	12_13	12652	90%	0.049	6.04	139.12	12
4	13_14	11561	90%	0.046	6.04	139.12	10
5	14_15	10561	90%	0.042	6.04	139.12	8
6	15_16	9159	90%	0.038	6.04	139.12	7
7	16_17	8788	90%	0.038	6.04	139.12	6
8	17_18	8534	90%	0.036	6.04	139.12	6
9	18_19	7238	90%	0.032	6.04	139.12	4
10	19_20	6463	90%	0.028	6.04	139.12	3
11	20_21	5505	90%	0.021	6.04	139.12	2
12	9_10	9588	90%	0.035	6.04	139.12	6

4. **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%.

Based on the given information, we know that the customer makes 130 calls in a 24-hour period, with 100 calls during 9 AM to 9 PM and 30 calls during 9 PM to 9 AM.

To determine the manpower required during each time bucket, we need to consider the following factors:

Average handling time (AHT) for each call, Service level (SL), Maximum abandon rate (MAR)

Assuming an average handling time of 5 minutes per call, we can calculate the number of agents required during each time bucket using the following formula:

Agents required = (Offered calls x AHT) / (60 x (1 - MAR)) x SL

Let's assume a service level of 80% for both time buckets and a maximum abandon rate of 10%.

During 9 AM to 9 PM:

Offered calls = 100

Agents required = (100 x 5) / (60 x 0.9) x 0.8 = 7.72 (rounded up to 8 agents)

During 9 PM to 9 AM:

Offered calls = 30

Agents required = (30 x 5) / (60 x 0.9) x 0.8 = 2.32 (rounded up to 3 agents)

Therefore, we would need 8 agents during 9 AM to 9 PM and 3 agents during 9 PM to 9 AM to maintain a service level goal of 80% and a maximum abandon rate of 10%.

Time Bucket	call distribution	Agent Required
10_11	3	3
11_12	2	2
12_13	2	2
13_14	1	1
14_15	1	1
15_16	1	1
16_17	1	1
17_18	3	3
18_19	4	3
19_20	4	3
20_21	5	3
9_10	3	3

4. Result

This project is tough. It has taken a lot of time to analyse the data. Unless you know how to analyse a call center data and extract different information for the project, it is mind killing. Question 3,Build a manpower plan, is very confusing.

I have learned a lot about call center. After this project it is all clear that how call centre works, how many hours agents work, what volume of calls they receive.This is a great project to understand the working of a call centre.

Thank You