# ABC Call Volume Trend Analysis

Project Description:

In this project, we have studied and analyzed the call volume data and drawn some meaningful insights from it as a Customer Experience (CX) team member. 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.
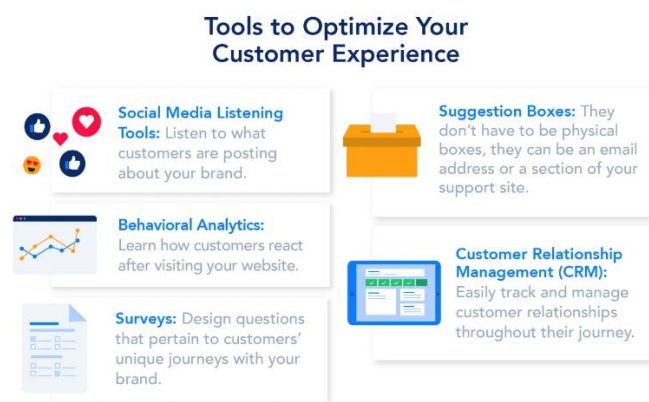
Inbound customer support is defined as the call centre responsible for handling customers' inbound calls. Inbound calls are the incoming voice calls of the existing customers or prospective customers for your business which are attended by customer care representatives.

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.

Here we have studied how to provide customer support by managing the manpower according to customer calls over the days.

Approach:

Initially understanding the columns containing different data is the most important step before analyzing the data. Whereas the dataset is of a Customer Experience (CX) Inbound calling team for 23 days. Data includes **Agent_Name**, **Agent_ID**, **Queue_Time** [duration for which customers have to wait before they get connected to an agent], **Time** [time at which a call was made by a 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).

Case Study Objectives:

Attached is the dataset of Inbound calls of a ABC company from the insurance category. Use this data to answer the following:

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

Average of Call_Seconds (s)
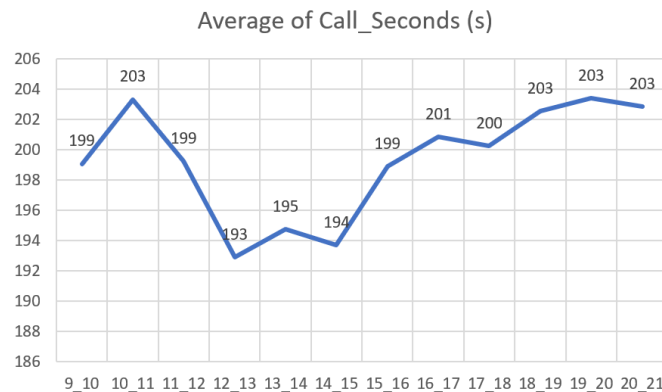
- The average call time duration for all incoming calls received by agents according to the time bucket i.e., from 9 am to 9 pm is shown in the above graph.
- The highest average time of answering a call is **203 seconds.**
- Between 12 am to 1 pm, the least average time of answering a call is noticed (**193 seconds**).
- Whereas the average time of answering a call per day is **199 seconds.**

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, …..)**

Count of Calls
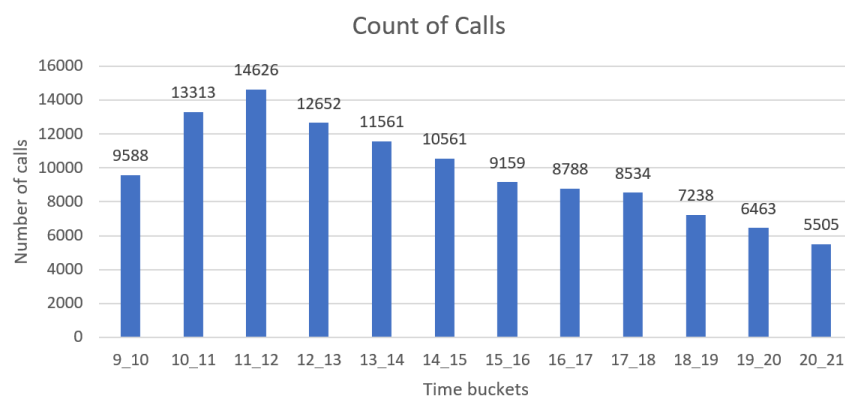
- Hence we can see most of the calls were done at the mid-day between 10 am to 1 pm by the customers/users.
- At the end of the working hours the numbers seem to be decreasing like 14.6k calls in the morning (11 am to 12 pm) and 5.5k calls at the end of the working day.

Percentage of number of calls
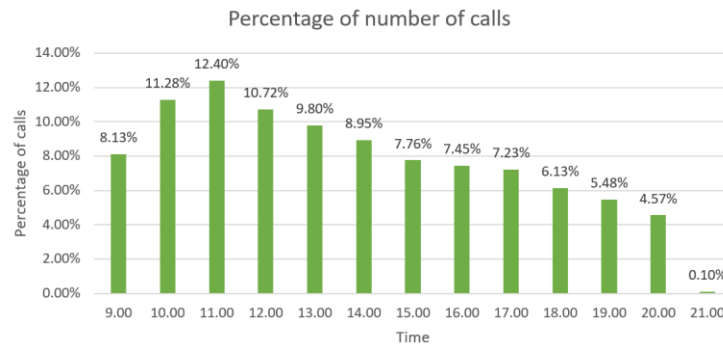
- The above graph is just similar to the previous graph but the number of calls is shown in terms of percentage here.

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

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.

An agent total working hrs in a day	**9 hrs**
An agent total working hrs in a day	**7.5 hrs (after snacks & lunch)**
An agent work in a week	**6 days**
Total unplanned leaves in a month	**4 days**
An agent work in a week	**5 days (after leaves)**
total days an agent works in a month	**20**
working hrs on calls in %	**60%**
working hrs on calls with customers	**4.5**

- An agent works 20 days a month (6 days a week and 4 days are considered as unplanned leaves in a month) and 7.5 hrs per day whereas only 60% of working hours are given on calls by an agent therefore **(7.5*0.6) = 4.5** hours an agent gives to customer calls.

	Abandon	Answered	Transfer	Total
Total calls	34403	82452	1133	**117988**
Daily Avg calls	1496	3585	49	**5130**
Total percentage of calls	29%	70%	1%	**100%**

Answer :	
Average time required to answer a call	199 seconds (from question 1)
Average hrs required to answer 90% of calls	255
Total person required to answer calls per day	57

- The above image states that on a daily average about **5130 calls** were done by the customers.

- From which **70% of calls** were answered and the remaining calls were abandoned (29%) and transferred (1%).
- Average time required to answer a call is **199 seconds** (derived in question 1).
- Average hours required to answer 90% of calls is calculated by –

  5130*199*0.9/3600 = 255 hours (divided by 3600 to convert seconds into hours)

- Lastly, the persons required for answering 90% of calls are discovered by dividing the **average hours required to answer 90% of calls** by **4.5** (actually time spent on calls by an agent),

  255/4.5 = 57 persons

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%.

As given, about 30% of calls were made by customers in the night between 9 pm to 9 am		
Calculation for Call volume between 9pm to 9am		
Total calls in night (9 pm to 9 am)	1539	(30 % of 5130)
Average hrs required to answer 90% of calls in night	77	
Total additional person required to answer calls in night	17	

Calculation for manpower for each time bucket between 9 pm to 9am				
Time Buckets	**Calls**	**% of time requi**	**Time required**	**man requires**
9pm-10pm	3	10%	8	2
10pm-11pm	3	10%	8	2
11pm-12am	2	7%	5	1
12am-1am	2	7%	5	1
1am-2am	1	3%	3	1
2am-3am	1	3%	3	1
3am-4am	1	3%	3	1
4am-5am	1	3%	3	1
5am-6am	3	10%	8	2
6am-7am	4	13%	10	2
7am-8am	4	13%	10	2
8am-9am	5	17%	13	3
Total	**30**	**100%**	**77**	**17**

The calculation for Call volume between 9 pm to 9 am -

- Here to plan manpower for the night after working hours from 9 pm to 9 am by taking the abandon rate as 10%, initially we have taken 30% percent of the total average calls per day (5130), 5130*0.3 = 1539

- Calculated the hours required to answer 1539 calls by the same method, C10*199*0.9/3600 = 77 hours
- Next the additional employees required for answering 1539 calls, 77/4.5 = 17 people, as each agent spent 4.5 hours on calls.

The calculation for manpower for each time bucket between 9 pm to 9 am –

- For each time bucket (from 9 pm to 9 am at night), we have discovered most of the calls were associated before 12 am and the early morning i.e., before 9 am.
- The time required to answer calls in each time bucket is calculated by –
  Number of calls*100/total calls in the night (30)
- According to the percentage of a time requirement, hours for calls in each time bucket are calculated by –
  Number of calls*Additional hours for night calls/total calls in the night
  Ex- For 9 pm to 10 pm for 3 calls,
  Time required to answer 3 calls, 3*77/30 = 8 hours
- Manpower required to answer calls is discovered by,
  Time required to answer calls/total working hours of an agent on calls
  Ex- For 9 pm to 10 pm for 3 calls,
  Manpower (headcounts) required to answer 3 calls, 8/4.5 = 2 headcounts

Note: The above analysis work is done using pivot tables, the PIVOT table technique is used to summarize large amounts of data in a more effective way.

Tech-Stack Used:

- **Microsoft Excel:** MS Excel is a good tool for data analysis when the dataset is small

and provides a better way of aggregating the summary of the data and presenting

them using different graphs and charts.

- **Microsoft Word:** It is used for making the report.

Insights:

1. The lowest average call answering time is recorded between 12 pm and 1 pm at midday i.e., **193** seconds.
2. Whereas **199** seconds is the average time required to answer a call per day.
3. About 30% of the calls got abandoned daily means those calls are not answered due to the high number of calls and a smaller number of headcounts to answer those calls.
4. The abandoned rate in the early morning between 9 am to 11 am is comparatively larger than the remaining hours approx. 52%.
5. It is identified that the greatest number of calls are made at 11 pm and the least number of calls at 8 pm.
6. On a daily average about **5130 calls** were done by the customers, out of which 3585 calls are **answered** daily, and the remaining them were **abandoned** (1496) and **transferred** (49) daily.

7. At the abandon rate of 10%, the average time required to answer 90% of daily average calls is 255 hours.
8. As an agent spent only 4.5 hours on calls, then to work 255 hours i.e., to answer 90% of daily average calls, about 57 headcounts should be required.
9. In order to reduce the abandon rate from 30% to 10%, about 57 headcounts need to manage or answer 90% of daily average calls.
10. For the night calls management, it is discovered that additionally, 17 headcounts seem to be required.
11. Especially between 9 pm to 12 am and 5 am to 9 am more concentration on incoming calls should be needed.
12. Considering the company has two shifts of working if some employees work in the early morning and if some work till late at night, then the 30% of calls coming at night daily can be managed easily.
13. In the case of the abandoned rate, about 20% (highest abandoned rate of calls as compared to other working hours) of calls were abandoned between 10 am to 11 am.
14. In terms of answering calls, most of the calls were answered between 12 pm and 1 pm.
15. The highest number of calls were transferred between 3 pm to 5 pm, transferred calls are those calls that are made for another purpose.

Result:

From this project, we get to know the business understanding and business points management. Got much familiar with MS Excel and the ways of displaying insights in a graphical manner. Understood how to draw additional insights out of raw data and also the best way to use a pivot table. Able to solve problems from the business point of view.

Excel File Link:

https://docs.google.com/spreadsheets/d/18Sf8V4FXvqzXELNlS6kbd9NU9ZX9IacJ/edit?usp=share_link&ouid=102746205635544467842&rtpof=true&sd=true

Please open in Microsoft Excel