

# ABC Call Volume Trend Analysis

## Final Project-4

Excel Workbook Link:

[Call Volume Trend Analysis](#)

## Project Description:

In this project, we dive into the world of Customer Experience (CX) analytics, specifically focusing on the inbound calling team of a company. A dataset that spans 23 days and includes various details such as the agent's name and ID, the queue time (how long a customer had to wait before connecting with an agent), the time of the call, the duration of the call, and the call status (whether it was abandoned, answered, or transferred) has been provided.

A Customer Experience (CX) team plays a crucial role in a company. They analyze customer feedback and data, derive insights from it, and share these insights with the rest of the organization. This team is responsible for a wide range of tasks, including managing customer experience programs, handling internal communications, mapping customer journeys, and managing customer data, among others.

In the current era, several AI-powered tools are being used to enhance customer experience. These include Interactive Voice Response (IVR), Robotic Process Automation (RPA), Predictive Analytics, and Intelligent Routing.

One of the key roles in a CX team is that of the customer service representative, also known as a call center agent. These agents handle various types of support, including email, inbound, outbound, and social media support.

Inbound customer support, which is the focus of this project, involves handling incoming calls from existing or prospective customers. The goal is to attract, engage, and delight customers, turning them into loyal advocates for the business.

## Approach:

There are a total of five sheets where one is a data table and four are the tasks that are performed.

We have mainly made use of pivot tables and charts.

We have also used mathematical functions in excel.

# Tech-Stack Used:

## Softwares Used:

WPS Office  
Sheets  
Microsoft Edge  
OBS Studio  
Google Drive  
Google Docs

## Hardware Used:

HP Pavilion  
i5 Processor

## Insights:

Usually we start by cleaning data, but the given dataset is mostly clean and the minimal missing values are not causing any issues so we have skipped it here as it won't make much difference.

After checking the data we insert a table.

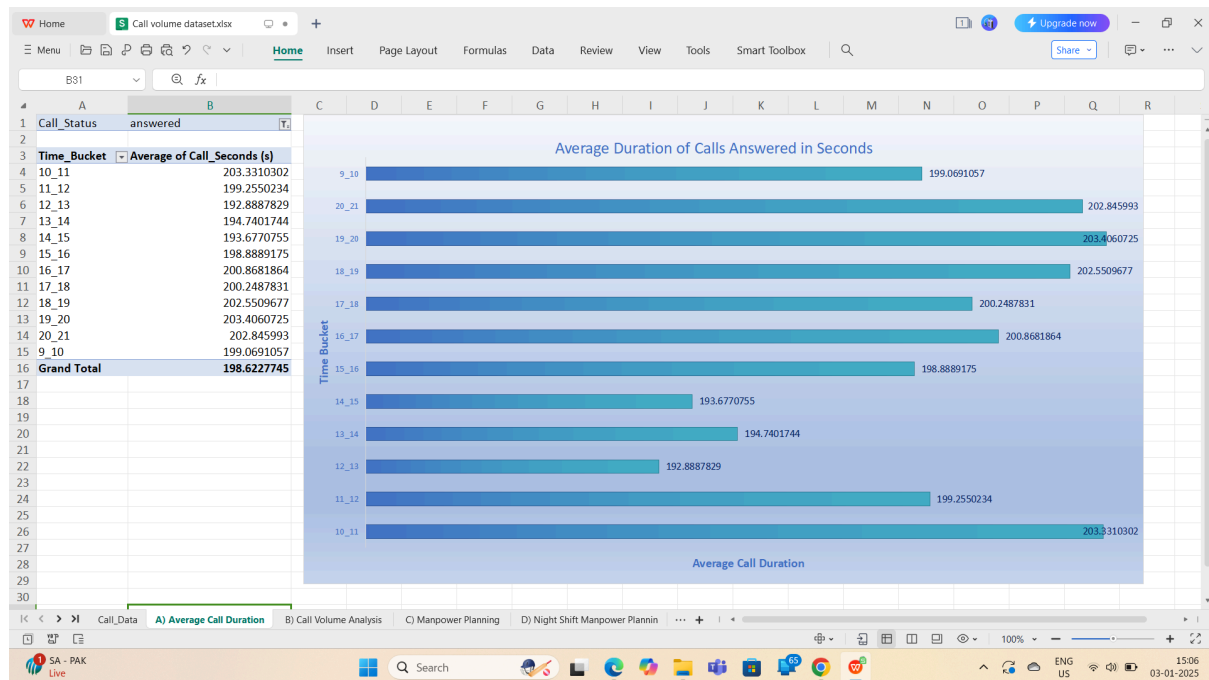
	A	B	C	D	E	F	G	H	I	J	K	L	M
	Agent_Name	Agent_ID	Customer_Phone_No	Queue_Time(Secs)	Date_&_Time	Time	Time_Bucket	Duration(hh:mm:ss)	Call_Seconds(s)	Call_Status	Wrapped_By	Ringing	IVR_Dura
2	Executives 42	1000042	98502XXXXX	2	01-01-2022	9:00	9_10	00:01:36	96.00	answered	Agent	YES	00
3	Executives 4	1000004	80595XXXXX	0	01-01-2022	9:00	9_10	00:02:20	140.00	answered	Agent	YES	00
4	Executives 65	1000065	70202XXXXX	0	01-01-2022	9:00	9_10	00:01:25	85.00	answered	AutoWrapped	YES	00
5	Executives 55	1000055	96104XXXXX	1	01-01-2022	9:00	9_10	00:01:31	91.00	answered	Agent	YES	00
6	Executives 21	1000021	82001XXXXX	0	01-01-2022	9:00	9_10	00:02:45	165.00	answered	Agent	YES	00
7	#N/A	#N/A	96424XXXXX	13	01-01-2022	9:00	9_10	00:00:00	0.00	abandon		YES	00
8	Executives 55	1000055	96737XXXXX	79	01-01-2022	9:00	9_10	00:01:25	85.00	answered	AutoWrapped	YES	00
9	#N/A	#N/A	96392XXXXX	60	01-01-2022	9:00	9_10	00:00:00	0.00	abandon		YES	00
10	Executives 42	1000042	90820XXXXX	52	01-01-2022	9:00	9_10	00:01:05	65.00	answered	Agent	YES	00
11	Executives 65	1000065	97410XXXXX	62	01-01-2022	9:00	9_10	00:03:00	180.00	answered	AutoWrapped	YES	00
12	Executives 4	1000004	70076XXXXX	52	01-01-2022	9:00	9_10	00:01:48	108.00	answered	Agent	YES	00
13	Executives 21	1000021	82505XXXXX	89	01-01-2022	9:00	9_10	00:03:06	186.00	answered	Agent	YES	00
14	#N/A	#N/A	97232XXXXX	120	01-01-2022	9:00	9_10	00:00:00	0.00	abandon		YES	00
15	Executives 55	1000055	96392XXXXX	45	01-01-2022	9:00	9_10	00:01:40	100.00	answered	AutoWrapped	YES	00
16	Executives 42	1000042	97471XXXXX	55	01-01-2022	9:00	9_10	00:01:15	75.00	answered	AutoWrapped	YES	00
17	#N/A	#N/A	77082XXXXX	16	01-01-2022	9:00	9_10	00:00:00	0.00	abandon		YES	00
18	#N/A	#N/A	95255XXXXX	44	01-01-2022	9:00	9_10	00:00:00	0.00	abandon		YES	00
19	Executives 4	1000004	79725XXXXX	88	01-01-2022	9:00	9_10	00:04:03	243.00	answered	AutoWrapped	YES	00
20	Executives 49	1000049	98344XXXXX	46	01-01-2022	9:00	9_10	00:04:10	250.00	answered	Agent	YES	00
21	Executives 50	1000050	96873XXXXX	64	01-01-2022	9:00	9_10	00:03:28	208.00	answered	Agent	YES	00
22	Executives 42	1000042	79899XXXXX	52	01-01-2022	9:00	9_10	00:02:34	154.00	answered	AutoWrapped	YES	00
23	Executives 65	1000065	95754XXXXX	67	01-01-2022	9:00	9_10	00:02:07	127.00	answered	AutoWrapped	YES	00
24	Executives 55	1000055	70546XXXXX	64	01-01-2022	9:00	9_10	00:03:11	191.00	answered	AutoWrapped	YES	00
25	Executives 21	1000021	97050XXXXX	47	01-01-2022	9:00	9_10	00:03:23	203.00	answered	Agent	YES	00
26	#N/A	#N/A	89680XXXXX	120	01-01-2022	9:00	9_10	00:00:00	0.00	abandon		YES	00
27	Executives 59	1000059	99954XXXXX	75	01-01-2022	9:00	9_10	00:02:30	150.00	answered	AutoWrapped	YES	00

## Tasks: Analysis

1. **Average Call Duration:** Determine the average duration of all incoming calls received by agents. This should be calculated for each time bucket.  
**Your Task:** What is the average duration of calls for 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 the Call\_Status column.

## Result:



The total average call duration for incoming calls received by the agent is 198.62 seconds.

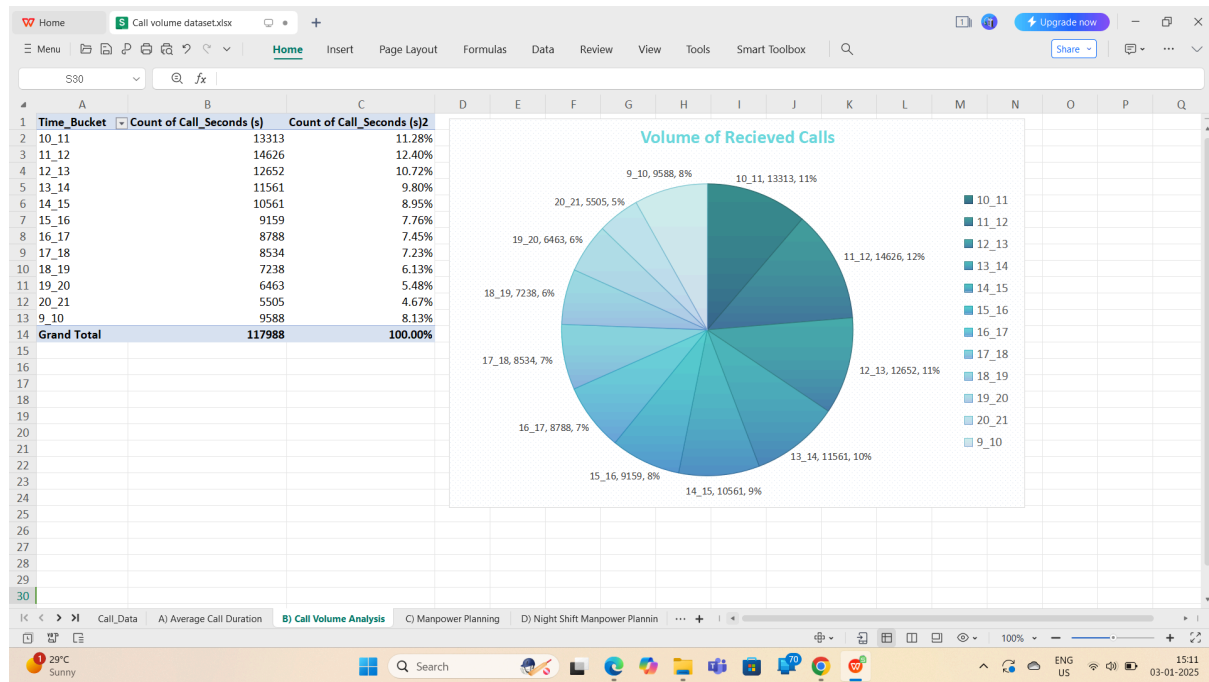
2. **Call Volume Analysis:** Visualize the total number of calls received. This should be represented as a graph or chart showing the number of calls against time. Time should be represented in buckets (e.g., 1-2, 2-3, etc.).

**Your Task:** Can you create a chart or graph that shows the number of calls received in each time bucket?

We can calculate the number of calls coming in each time bucket by using pivot tables by taking the Time\_Bucket as rows and the count of Call\_Seconds as values.

Then we use a pie chart to graphically show these values.

## Results:



Time Bucket 11\_12 has the highest call volume which is 12% of the total volume, while 20\_21 has the lowest.

3. **Manpower Planning:** The current rate of abandoned calls is approximately 30%. Propose a plan for manpower allocation during each time bucket (from 9 am to 9 pm) to reduce the abandon rate to 10%. In other words, you need to calculate the minimum number of agents required in each time bucket to ensure that at least 90 out of 100 calls are answered.

**Your Task:** What is the minimum number of agents required in each time bucket to reduce the abandon rate to 10%?

### Assumptions:

Agent working hours – 9 hrs

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 = 5 hrs

Total hours needed to attend the calls for a single day is 187.96 hours

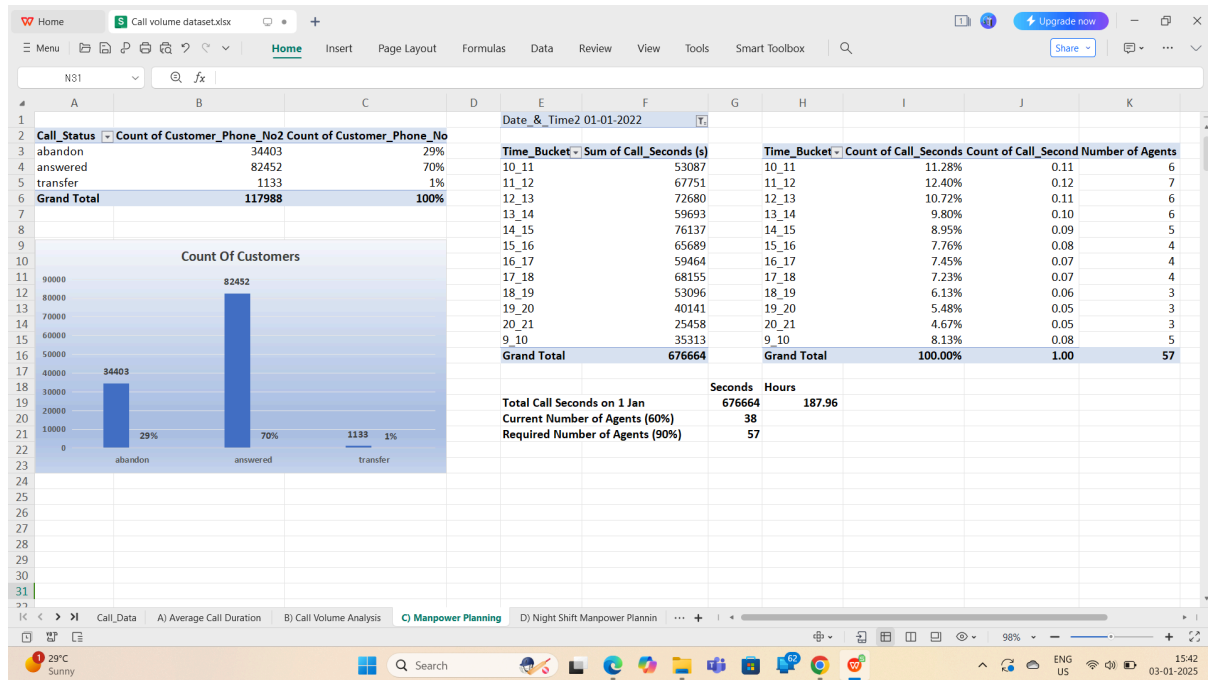
If one agent works 4.5hrs per day, then the total number of agents required to complete 187.96hrs (1 day) of work =  $187.96/5 = 38$

Total number of agents required to complete approximately 60% of work per day= 41.77

Total number of agents required to complete approximately 90% of work per day =  $90 \times 38/60$   
**=57 Agents**

To find number of agents required for each time bucket value of Count of Call Seconds in decimal\*57

## Result:



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

- Night Shift Manpower Planning:** Customers also call ABC Insurance Company at night but don't get an answer because there are no agents available. This creates a poor customer experience. Assume that for every 100 calls that customers make between 9 am and 9 pm, they also make 30 calls at night between 9 pm and 9 am. The distribution of these 30 calls is as follows:  
**Your Task:** Propose a manpower plan for each time bucket throughout the day, keeping the maximum abandon rate at 10%.

**Assumptions:** An agent works for 6 days a week; On average, each agent takes 4 unplanned leaves per month; An agent's total working hours are 9 hours, out of which 1.5 hours are spent on lunch and snacks in the office. On average, an agent spends 60% of their total actual working hours (i.e., 60% of 7.5 hours) on calls with customers/users. The total number of days in a month is 30.

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

We make use of a pivot table to find the count of calls according to their call status.

Average Daily Calls	Grand Total/Count(Date&Time) = 5130
Average Nightly Calls (30%)	5130*30/100 = 1539
Average night call seconds	1539*198.6*0.9/3600 = 76
Total agents required	76/5= 15

To find Time Distribution values for each time bucket 30/Call Distribution  
 To find number of agents required for each time bucket =15/Time Distribution

## Result:

Count of Call_Status																	
Date & Time	abandon	answered	transfer	Grand Total													
1-Jan	684	3883	77	4644	Average Daily Calls	5130	9-10	3	10	2							
2-Jan	356	2935	60	3351	Average Night Calls	1539	10-11	3	10	2							
3-Jan	599	4079	111	4789			11-12	2	15	1							
4-Jan	595	4404	114	5113	Average Night Call Second	76	12-1	2	15	1							
5-Jan	536	4140	114	4790	Required Agents	15	1-2	1	30	1							
7-Jan	1319	3587	42	4948			2-3	1	30	1							
8-Jan	1103	3519	50	4672			3-4	1	30	1							
9-Jan	962	2628	62	3652			4-5	1	30	1							
10-Jan	1212	3699	72	4983			5-6	3	10	2							
11-Jan	856	3695	86	4637			6-7	4	7.5	2							
12-Jan	1299	3297	47	4643			7-8	4	7.5	2							
13-Jan	738	3326	59	4123			8-9	5	6	3							
14-Jan	291	2832	32	3155			Total	30	1	15							
15-Jan	304	2730	24	3058													
16-Jan	1191	3910	41	5142													
17-Jan	16636	5706	5	22347													
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 analysis we find that the company needs to hire at least 15 more employees to work a night shift.

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