

## **ABC Call Volume Trend Analysis**

### **Final Project-4**

#### **EXCEL SHEET:**

[https://docs.google.com/spreadsheets/d/1RWaNFENyVexAkZHHpBoumIF\\_numpuzyX/edit?usp=sharing&ouid=116979978035038082971&rtpof=true&sd=true](https://docs.google.com/spreadsheets/d/1RWaNFENyVexAkZHHpBoumIF_numpuzyX/edit?usp=sharing&ouid=116979978035038082971&rtpof=true&sd=true)

#### **Video Presentation :**

[https://drive.google.com/file/d/1wTxr9L\\_Bnkq4Z4CZPxze2Ra\\_O7RuLrWW/view?usp=sharing](https://drive.google.com/file/d/1wTxr9L_Bnkq4Z4CZPxze2Ra_O7RuLrWW/view?usp=sharing)

#### **Description:**

In this project, you'll be diving into the world of Customer Experience (CX) analytics, specifically focusing on the inbound calling team of a company. You'll be provided with 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).

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.

#### **Business Understanding:**

Advertising is a crucial aspect of any business. It helps increase sales and makes the audience aware of the company's products or services. The first impressions of a business are often formed through its advertising efforts.

The target audience for businesses can be local, regional, national, or international. Various types of advertising are used to reach these audiences,

including online directories, trade and technical press, radio, cinema, outdoor advertising, and national papers, magazines, and TV.

The advertising business is highly competitive, with many players bidding large amounts of money to target the same audience segment. This is where the company's analytical skills come into play. The goal is to identify those media platforms that can convert audiences into customers at a low cost.

In this project, you'll be using your analytical skills to understand the trends in the call volume of the CX team and derive valuable insights from it.

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### Data Analytics Tasks:

You have been provided with a dataset that contains information about the inbound calls received by a company named ABC, which operates in the insurance sector. Your task is to use this data to answer the following questions:

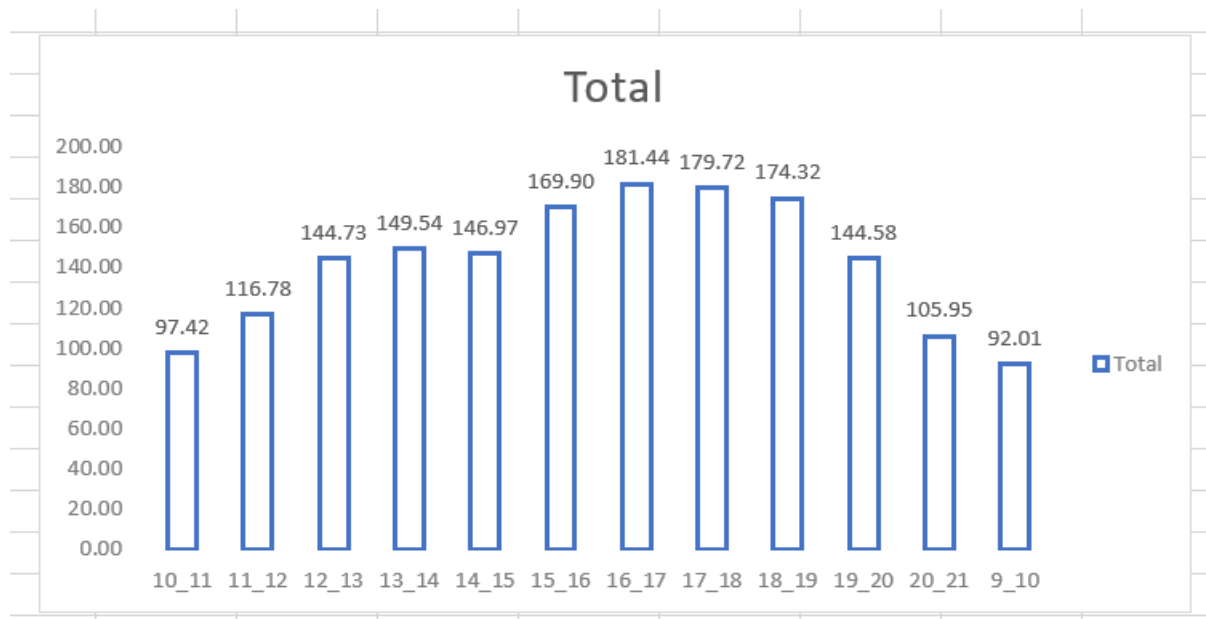
- 1. Average Call Duration: Determine the average duration of all incoming calls received by agents. This should be calculated for each time bucket.**

**Your Task: What is the average duration of calls for each time bucket?**

**In the Main step we have to clean the given dataset.**

**In the next step we have to create a pivot table. Time bucket , Avg of call seconds**

Row Labels	Average of Call_Seconds (s)
10_11	97.42
11_12	116.78
12_13	144.73
13_14	149.54
14_15	146.97
15_16	169.90
16_17	181.44
17_18	179.72
18_19	174.32
19_20	144.58
20_21	105.95
9_10	92.01
<b>Grand Total</b>	<b>139.53</b>



With the help of pivot table, we created bar graph.

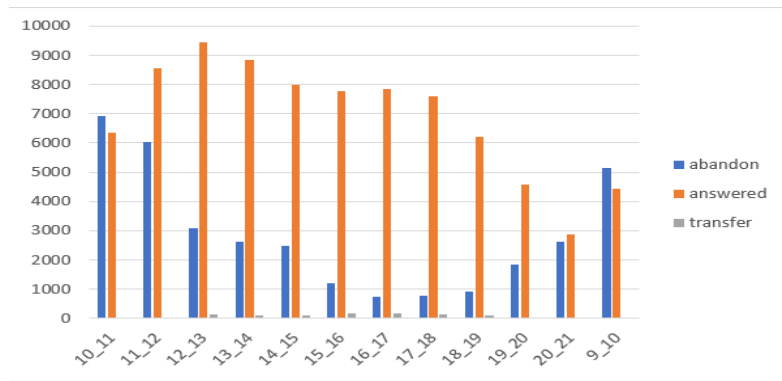
**2. Call Volume Analysis: Visualize the total number of calls received. This should be represented as a graph or chart showing the number of calls against time. Time should be represented in buckets (e.g., 1-2, 2-3, etc.).**

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

With the given data we will create a pivot table so, that we will get a clear insights of how time bucket with respective to the calls,

Count of Customer_Phone_No	Column Labels			
Row Labels	abandon	answered	transfer	Grand Total
10_11	6911	6368	34	13313
11_12	6028	8560	38	14626
12_13	3073	9432	147	12652
13_14	2617	8829	115	11561
14_15	2475	7974	112	10561
15_16	1214	7760	185	9159
16_17	747	7852	189	8788
17_18	783	7601	150	8534
18_19	933	6200	105	7238
19_20	1848	4578	37	6463
20_21	2625	2870	10	5505
9_10	5149	4428	11	9588
<b>Grand Total</b>	<b>34403</b>	<b>82452</b>	<b>1133</b>	<b>117988</b>

With the help of pivot table we created bar graph.



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%?

	A	B	C	D	E
1					
2					
3	Count of Call_Status	Column Labels			
4	Row Labels	abandon	answered	transfer	Grand Total
5	01-Jan	684	3883	77	4644
6	02-Jan	356	2935	60	3351
7	03-Jan	599	4079	111	4789
8	04-Jan	595	4404	114	5113
9	05-Jan	536	4140	114	4790
10	06-Jan	991	3875	85	4951
11	07-Jan	1319	3587	42	4948
12	08-Jan	1103	3519	50	4672
13	09-Jan	962	2628	62	3652
14	10-Jan	1212	3699	72	4983
15	11-Jan	856	3695	86	4637
16	12-Jan	1299	3297	47	4643
17	13-Jan	738	3326	59	4123
18	14-Jan	291	2832	32	3155
19	15-Jan	304	2730	24	3058
20	16-Jan	1191	3910	41	5142
21	17-Jan	16636	5706	5	22347
22	18-Jan	1738	4024	12	5774
23	19-Jan	974	3717	12	4703
24	20-Jan	833	3485	4	4322
25	21-Jan	566	3104	5	3675
26	22-Jan	239	3045	7	3291
27	23-Jan	381	2832	12	3225
28	Grand Total	34403	82452	1133	117988
29	Average of call status	1496	3585	49	5130
30	Call Status Percentage	29%	70%	1%	
31	Agents working hour	4.5			
32	Avg Of call duration in sec	139.53			
33	Hours needed for 90%	179			
34	Total No. Of agents Required	40			

In the task 3 we have first created a pivot table, and then we calculated average of call status, call status percentage, Agents working hours, Avg. of call duration in seconds.

Agent working hours:  $=(60/100)*7.5$

Hours need for 90% :  $=E29*B32*0.9/3600$

Total No. of agents Needed :  $=B33/B31$  (hours need for 90% / Agents Working Hour)

**4. 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

Total Call Incoming (9pm-9am)	30
Working Hour of Each Agent	9
Average Call Handling Time(s)	140
Occupancy on Average	60%

This is the given data from the dataset.

Time Bucket	Number of Calls
9_10	3540
10_11	3540
11_12	2360
12_1	2360
1_2	1180
2_3	1180
3_4	1180
4_5	1180
5_6	3540
6_7	4720
7_8	4720
8_9	5899
<b>Grand Total</b>	<b>35396</b>

Total Incoming Calls in 9am to 9pm	117988
Given that calls between 9pm to 9 am is 30% of calls between 9am to 9pm	
Total Incoming calls in 9pm to 9am	35396
Call Handling Capacity	139
minimum agents required	255
head count required	340
Man power in each time bucket	28

=0.3\*M9 for Total Incoming Calls in 9am to 9am.

=C10\*60\*60\*C12/C11 (for call Handling Capacity)

=M11/M13 (minimum Agents required)

=M14/0.75 (head count required)

=M15/12 (Man power in each time bucket)

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

For calculating time bucket number of calls we should do  $=3*\$M\$11/30$  according to this image