ABC CALL VOLUME TREND ANALYSIS

Final Project4

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PROJECT 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).

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

In this abc call volume trend analysis, I have used Microsoft excel for performing the various tasks which they have asked. With that, I have downloaded the dataset which is given for whole project analysis and performed little data cleaning strategy on it.

So after that , I have been analyzed the raw dataset with the help of microsoft excel , analyzed each column with a table and its attribute and also that checked a connection with another columns.

Then I checked for null values and duplicate values. Pivot table helps a lot for doing this project. It helps to connect different columns and helps to perform the task.

TECH-STACK USED

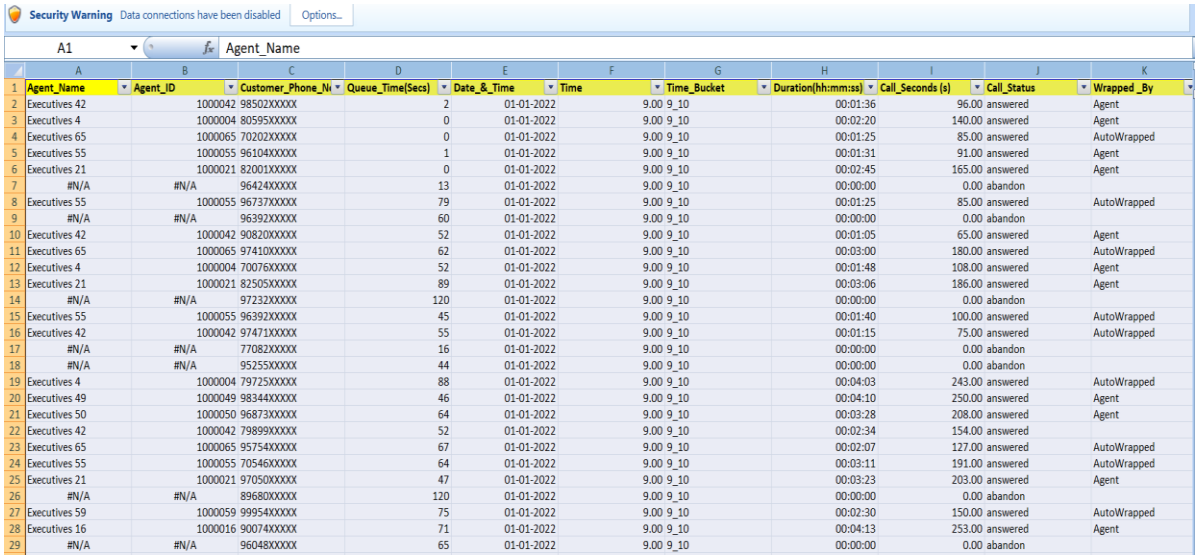
In this project , I have been used Microsoft excel version 2007 for finding and analyzing the whole tasks, and it is worked really well for simple calculations and good for making pivot tables helps us to track almost the kind of information.

INSIGHTS

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?

For this tasks , I have first collected the data which have been provided then that dataset called call_data is been used for every other tasks.



Security Warning Data connections have been disabled Options...

A1 Agent_Name

	A	B	C	D	E	F	G	H	I	J	K
1	Agent_Name	Agent_ID	Customer_Phone_N	Queue_Time(Secs)	Date_&_Time	Time	Time_Bucket	Duration(hh:mm:ss)	Call_Seconds (s)	Call_Status	Wrapped_By
2	Executives 42	1000042	98502XXXXX	2	01-01-2022	9.00	9_10	00:01:36	96.00	answered	Agent
3	Executives 4	1000004	80595XXXXX	0	01-01-2022	9.00	9_10	00:02:20	140.00	answered	Agent
4	Executives 65	1000065	70202XXXXX	0	01-01-2022	9.00	9_10	00:01:25	85.00	answered	AutoWrapped
5	Executives 55	1000055	96104XXXXX	1	01-01-2022	9.00	9_10	00:01:31	91.00	answered	Agent
6	Executives 21	1000021	82001XXXXX	0	01-01-2022	9.00	9_10	00:02:45	165.00	answered	Agent
7	#N/A	#N/A	96424XXXXX	13	01-01-2022	9.00	9_10	00:00:00	0.00	abandon	
8	Executives 55	1000055	96737XXXXX	79	01-01-2022	9.00	9_10	00:01:25	85.00	answered	AutoWrapped
9	#N/A	#N/A	96392XXXXX	60	01-01-2022	9.00	9_10	00:00:00	0.00	abandon	
10	Executives 42	1000042	90820XXXXX	52	01-01-2022	9.00	9_10	00:01:05	65.00	answered	Agent
11	Executives 65	1000065	97410XXXXX	62	01-01-2022	9.00	9_10	00:03:00	180.00	answered	AutoWrapped
12	Executives 4	1000004	70076XXXXX	52	01-01-2022	9.00	9_10	00:01:48	108.00	answered	Agent
13	Executives 21	1000021	82505XXXXX	89	01-01-2022	9.00	9_10	00:03:06	186.00	answered	Agent
14	#N/A	#N/A	97232XXXXX	120	01-01-2022	9.00	9_10	00:00:00	0.00	abandon	
15	Executives 55	1000055	96392XXXXX	45	01-01-2022	9.00	9_10	00:01:40	100.00	answered	AutoWrapped
16	Executives 42	1000042	97471XXXXX	55	01-01-2022	9.00	9_10	00:01:15	75.00	answered	AutoWrapped
17	#N/A	#N/A	77082XXXXX	16	01-01-2022	9.00	9_10	00:00:00	0.00	abandon	
18	#N/A	#N/A	95255XXXXX	44	01-01-2022	9.00	9_10	00:00:00	0.00	abandon	
19	Executives 4	1000004	79725XXXXX	88	01-01-2022	9.00	9_10	00:04:03	243.00	answered	AutoWrapped
20	Executives 49	1000049	98344XXXXX	46	01-01-2022	9.00	9_10	00:04:10	250.00	answered	Agent
21	Executives 50	1000050	96873XXXXX	64	01-01-2022	9.00	9_10	00:03:28	208.00	answered	Agent
22	Executives 42	1000042	79899XXXXX	52	01-01-2022	9.00	9_10	00:02:34	154.00	answered	
23	Executives 65	1000065	95754XXXXX	67	01-01-2022	9.00	9_10	00:02:07	127.00	answered	AutoWrapped
24	Executives 55	1000055	70546XXXXX	64	01-01-2022	9.00	9_10	00:03:11	191.00	answered	AutoWrapped
25	Executives 21	1000021	97050XXXXX	47	01-01-2022	9.00	9_10	00:03:23	203.00	answered	Agent
26	#N/A	#N/A	89680XXXXX	120	01-01-2022	9.00	9_10	00:00:00	0.00	abandon	
27	Executives 59	1000059	99954XXXXX	75	01-01-2022	9.00	9_10	00:02:30	150.00	answered	AutoWrapped
28	Executives 16	1000016	90074XXXXX	71	01-01-2022	9.00	9_10	00:04:13	253.00	answered	Agent
29	#N/A	#N/A	96048XXXXX	65	01-01-2022	9.00	9_10	00:00:00	0.00	abandon	

From the above picture depicts that the cleaned the raw data of the call volume trend analysis project. The excel link is attached for the reference….

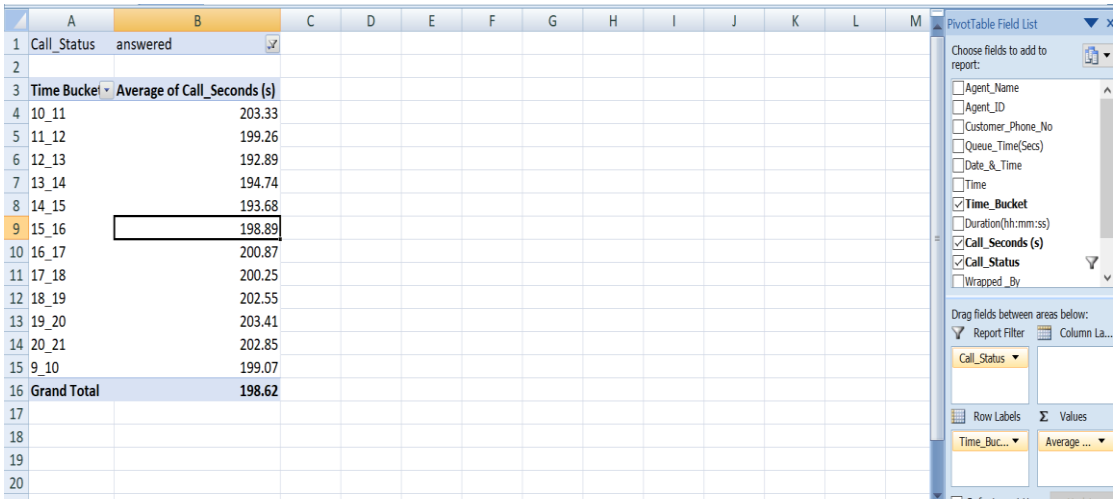
https://docs.google.com/spreadsheets/d/1apx4J2xkaqJqeBKSZxAxdUMuW-Kj9fzM/edit?usp=drive_link&ouid=103768596710140113695&rtpof=true&sd=true

For this tasks , that is, average duration of calls for each time bucket have found out to be average of call duration for each of the time bucket. So I have been analyzed in the cleaned data and created a pivot table based on the understanding of the question.

Call_Status	answered

Time Bucket	Average of Call_Seconds (s)
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
9_10	199.07
Grand Total	**198.62**



From the above excel picture represents that the pivot table calculation for finding the average of duration of calls with each of the time bucket and analyzed with pivot table calculation of finding the average of call duration.

So with that , the average of call duration for each time bucket is 198.62

The excel link is attached here….

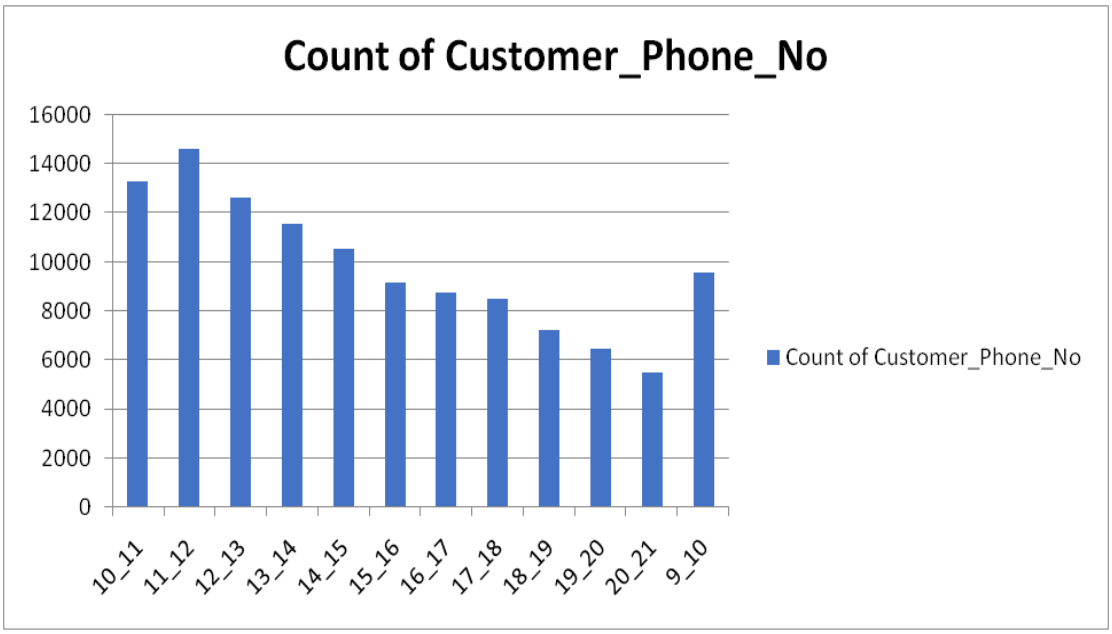
https://docs.google.com/spreadsheets/d/1qOfmyuiabfeXDgkC1ZWdSufCR1vz3k4o/edit?usp=drive_link&ouid=103768596710140113695&rtpof=true&sd=true

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?
For this tasks, I created the pivot table about the number of calls received with each of the time bucket, so taken with a time bucket, number of time and customer phone number.

	Values	
Time Bucket	**Count of Customer_Phone_No**	**Count of Time**
10_11	13313	11%
11_12	14626	12%
12_13	12652	11%
13_14	11561	10%
14_15	10561	9%
15_16	9159	8%
16_17	8788	7%
17_18	8534	7%
18_19	7238	6%
19_20	6463	5%
20_21	5505	5%
9_10	9588	8%
Grand Total	**117988**	**100%**

From the above pivot table chart represents that count of time and with each of the customer phone number with the time bucket of 10_11 to 9_10.



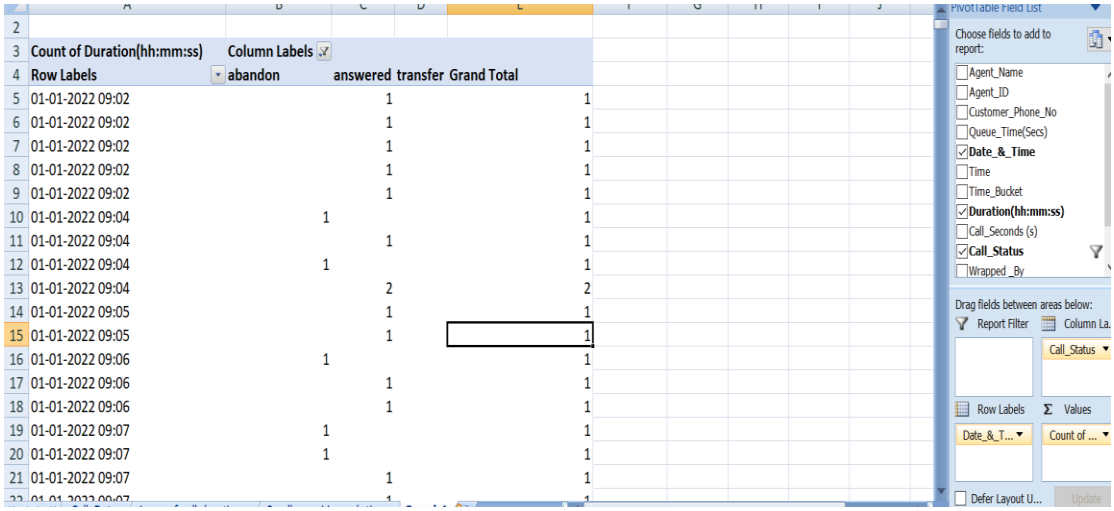
The above bar chart depicts that the time bucket with each of the customer phone number also that grand total of 117988 with count of time would be 100%.

The excel link is attached here….
https://docs.google.com/spreadsheets/d/1vSYPBXrp_nvrDnSK5YKGsxjgGebSBSr7/edit?usp=drive_link&ouid=103768596710140113695&rtpof=true&sd=true

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%?

In this tasks , first I have created the pivot table with the car data elements and also that analyzed through the call duration and call status with respect to it.



Count of Duration(hh:mm:ss)	Column Labels			
Row Labels	abandon	answered	transfer	Grand Total
01-01-2022 09:02		1		1
01-01-2022 09:02		1		1
01-01-2022 09:02		1		1
01-01-2022 09:02		1		1
01-01-2022 09:02		1		1
01-01-2022 09:04	1			1
01-01-2022 09:04		1		1
01-01-2022 09:04	1			1
01-01-2022 09:04		2		2
01-01-2022 09:05		1		1
01-01-2022 09:05		1		1
01-01-2022 09:06	1			1
01-01-2022 09:06		1		1
01-01-2022 09:06		1		1
01-01-2022 09:07	1			1
01-01-2022 09:07	1			1
01-01-2022 09:07		1		1

Then I have gone through the assumptions made in the previous part of the tasks with respect to the time bucket.

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

From this assumptions, I have been analyzed through the simple mathematical operations in the microsoft excel, then delivered a distribution of time buckets of 30 calls coming in night for every 100 calls.

107018	23-01-2022 20:58		1		1			
107019	23-01-2022 20:58		1		1			
107020	23-01-2022 20:59		1		1			
107021	**Grand Total**	**34403**	**82452**	**1133**	**117988**			
107022		1496	3585	49	5130			
107023		29%	70%	1%	100%			
107024								
107025	Working Hrs / agent	4.5						
107026	Avg call duration	198.62						
107027								
107028								
107029	For 90% hrs needed	254.73015						
107030	No of agents need is	57						
107031					9am-9pm	57	90%	
107032					9pm-9am	17	90%	
107033	Avg no of calls in night is	1539			overall agents needed is	74		
107034	To increase call rate to 90% ni8 is	76						
107035	Num of agents needed in night	17						

So above picture is the calculation for finding the minimum number of agents required in each time bucket . Then I have calculated with the pivot table calculations and picked a

abandon (total value/no of values)

Answered(total value/no of values)

Transfer(total value/no of values)

With the count of duration(hh:mm:ss).

Working Hrs / agent	4.5
Avg call duration	198.62

This is calculated for finding the working hours per each of the agent is 4.5 and Average of call duration is 198.62(previous calculation). This is been calculated as …

Working hours per agent=(60/100)*7.5

=4.5

Average of call duration=198.62

Time Bucket	Average of Call_Seconds (s)
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
9_10	199.07
Grand Total	**198.62**

For 90% hrs needed	254.73015
No of agents need is	57

From this we can calculate the number of agents needed for 90Hrs is 57.This can be calculated as …..

For 90hrs needed =5130*198.62*0.9/3600

=254.73015

No of agents needed =254.73015/4.5

=57

The excel link is attached here….

https://docs.google.com/spreadsheets/d/1DdWOmCtrqXW-QVChyWgzf1x4KMiIybAI/edit?usp=drive_link&ouid=103768596710140113695&rtpof=true&sd=true

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%.

For this tasks , I have used previously calculated pivot table and used with respect to the analysis of tasks, 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. So I have done calculations based on the night shift between 9pm-9am.

Avg no of calls in night is	1539
To increase call rate to 90% ni8 is	76
Num of agents needed in night	17

In this excel sheet calculation, I have analyzed with a average number of calls in night is 1539 and to increase the call rate to 90% in night is 76 and number of agents have calculated for the night shift.

The calculations be….

Average number of calls in night =0.3*5130

=1539

To increase the call rate to 90% in night=198.62*1539*0.9/3600

=76

Number of agents needed in night=76/4.5

=17

9am-9pm	57	90%
9pm-9am	17	90%
overall agents needed is	74	

Then the overall agents is been listed above and the calculations would be….

9am-9pm = 57 (90%)

9pm-9am = 17 (90%)

And the overall agents needed = 57+17

=74

The excel link is attached here…..

https://docs.google.com/spreadsheets/d/1DdWOmCtrqXW-QVChyWgzf1x4KMiIybAI/edit?usp=drive_link&ouid=103768596710140113695&rtpof=true&sd=true

RESULT

In this project ABC Call Volume Trend Analysis we analysis customer experience. A customer experience team consists of professionals who analyse customer feedback and data, and share insights with the rest of the organization. Keep a good customer relationship that help business for future growth. The project done through using Microsoft excel. So it help me to increase my technical skills and knowledge in excel. In this analysis project I have analysis the customer relationship, to solve customer problem that keep good relationship between the business and customer. After doing this project this help me to improve my data analytical skills, visualization skills etc.

DRIVE LINK