ABC Call Volume Trend Analysis

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Project Description

► We have dataset that contains information about the inbound calls received by a company named ABC 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 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, various types of support, including email, inbound, outbound, and social media support, among others.

► Interactive Voice Response (IVR), Robotic Process Automation (RPA), Predictive Analytics, and Intelligent Routing are one of the most impactful AI-powered customer experience tools.

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

► I will use my analytical skills to understand the trends in the call volume of the CX team and derive valuable insights from it.

Project Description

Analysis is done on following points:-

1. Average Call Duration

2. Call Volume Analysis

3. Manpower Planning

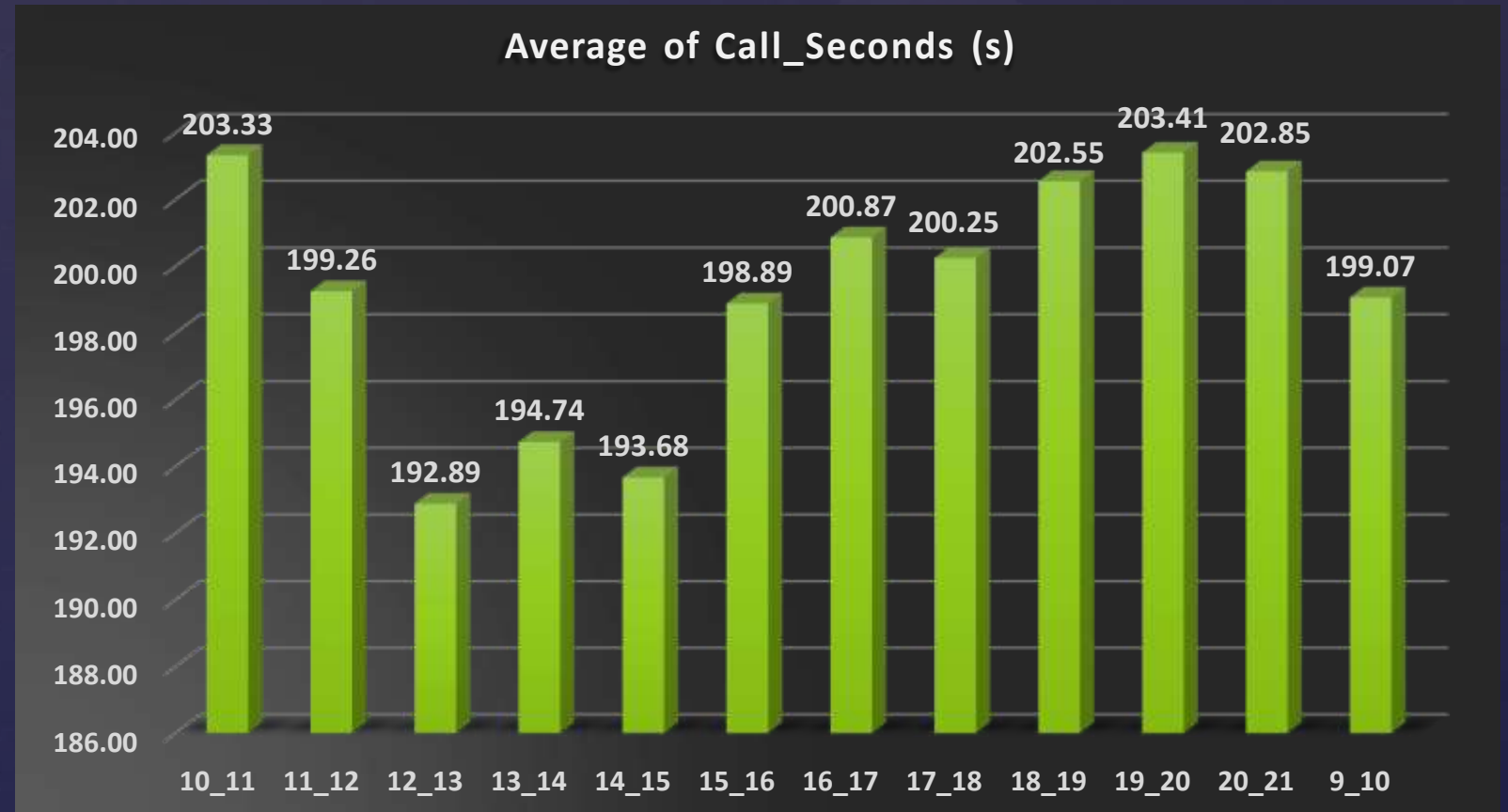4. Night Shift Manpower Planning

Tech Stack used:

► Microsoft Excel 2307

Average Call Duration

Task1: What is the average duration of calls for each time bucket?

| Row Labels	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**

Average Call Duration

Insights:-

► In the given Analysis scenario Time_Bucket measured in Rows section, Average of Call_Seconds (s) measured in Values section, Call_Status measured in Filters section and filtered the Call_Status as answered.

► Based on the analysis Total average call duration answered by agents is 198.62 seconds.

► Further analysis reveals that maximum average duration of calls for incoming calls is at 10_11 AM and 7_8 PM .

► Based on analysis minimum average call duration for incoming calls received by agents is at 12_1 PM.

► These insights explains about the distribution of call durations, helping to identify peak and off-peak periods in terms of call handling.

Call Volume Analysis

Task2: Can you create a chart or graph that shows the number of calls received in each time bucket?
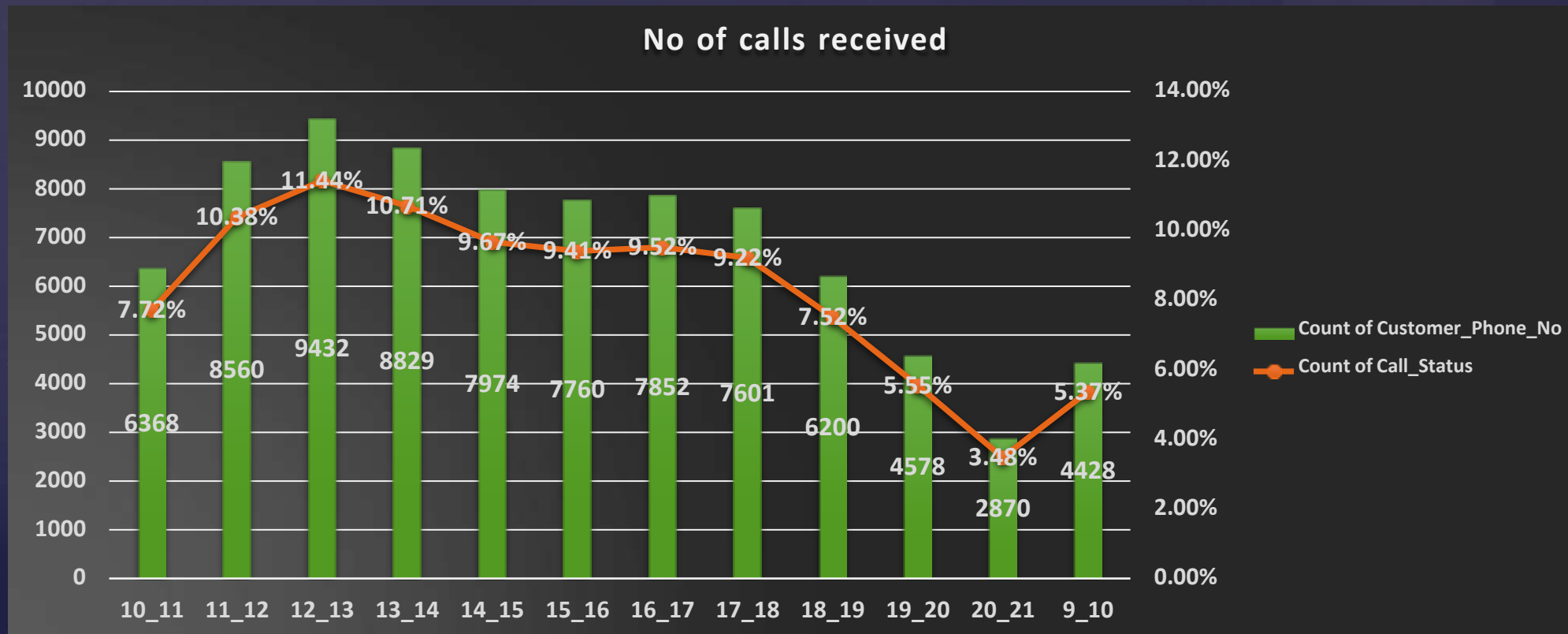
Call Volume Analysis

Insights:-

► In the given Analysis scenario Time_Bucket measured in Rows section, Count of Customer_Phone_No and Count of Call_Status measured in Values section, Call_Status measured in Filters section.

► Then filtered the Call_Status as answered and expressed Count of Call_Status as Percentage of the column total.

► Based on analysis highest number of calls received is between 12 PM and 1 PM.

► Further analysis also revealed that least number of calls answered is between 8 PM and 9 PM.

► These insights provide information about the number of calls received against time, helping to identify peak and off-peak periods.

Manpower Planning

Task3: 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%. What is the minimum number of agents required in each time bucket to reduce the abandon rate to 10%?
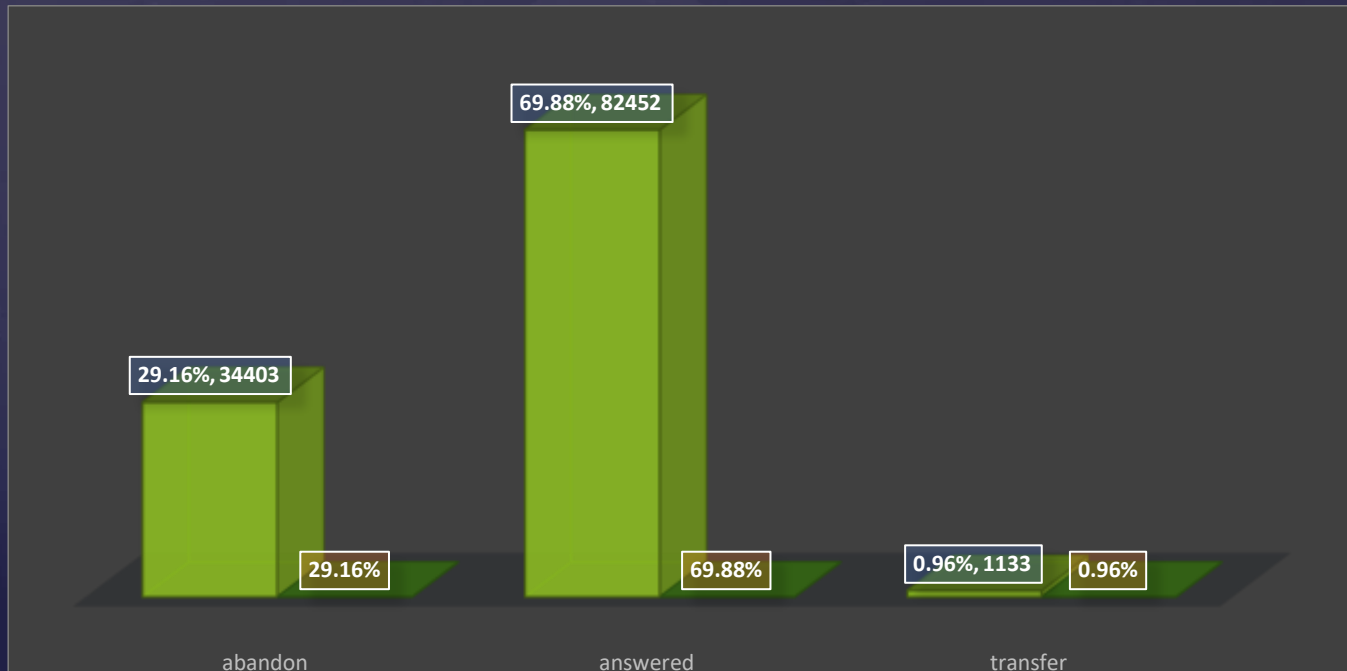
We can see in graph almost 30% calls are getting abandoned.

Manpower Planning

Assumption: 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.

Total Working hrs	9 hrs
Lunch & snacks	1.5 hrs
Total actual working hrs	7.5 hrs
Actual working hrs	4.5 hrs

Total Hours worked on 1st Jan

Row Labels	Sum of Call_Seconds (s)	Sum of Call_hours
1-Jan	676664	187.96

Total hrs worked	187.96	
Total no. of agents worked (as we know abandon rate is 30% we have to reduce it to 10 %)	42	
	Unitary Method	
42 agents are working for answered rate of 70%	42	70
	x	90
	x=	54

Manpower Planning

Row Labels	Count of Call_Seconds (s)	Percentage of Call_Seconds(s)	Time distribution	No of agents required for answered rate 90%
10_11	13313	11.28%	0.11	6
11_12	14626	12.40%	0.12	7
12_13	12652	10.72%	0.11	6
13_14	11561	9.80%	0.10	5
14_15	10561	8.95%	0.09	5
15_16	9159	7.76%	0.08	4
16_17	8788	7.45%	0.07	4
17_18	8534	7.23%	0.07	4
18_19	7238	6.13%	0.06	3
19_20	6463	5.48%	0.05	3
20_21	5505	4.67%	0.05	3
9_10	9588	8.13%	0.08	4
Grand Total	117988	100.00%	1.00	54

Manpower Planning

Insights:-

► First I converted Date_&_Time Column in integer and changed the format in MDY and put name of Column as Date_&_Time2.

► In given Analysis scenario Date_&_Time2 measured in Rows section, Sum of Call_Seconds (s) measured in Values section

► Sum of Call_Seconds (s) on 1-Jan is 676664.

► Calculated Total hrs worked using this Formula:

Sum of Call_hours = (Sum of Call_Seconds (s) / 3600) = 187.96 hrs

► Based on assumption Actual working hrs per person is 4.5 hrs.

► Calculated Total no. of agents worked with answered rate of 70% using this Formula:

Total no. of agents worked (70%) = (Total hrs worked / Actual working hrs) = 42

Manpower Planning

Insights:-

► Total no. of agents worked with answered rate of 90% using unitary method:

Total no. of agents worked (90%) = (Total no. of agents worked (70%) / 70) * 90 = 54

► Total no. of agents required to reduce the abandon rate to 10% is 54.

► For Further Analysis,Time_Bucket measured in Rows section, Count of Call_Seconds (s) measured in Values section, expressed Count of Call_Status as Percentage of the column total and Time Distribution by dividing each number of calls distribution by total calls.

► To Calculate minimum number of agents required in each time bucket to reduce the abandon rate to 10% using this Formula:

number of agents required in each time bucket =   Time distribution * 54

► These insights provide information about the minimum number of agents required in each time bucket to reduce the abandon rate to 10%. It will help to optimize staffing resources to ensure efficient customer service and satisfaction.

Night Shift Manpower Planning

Task4: 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:

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

Average incoming calls	5130
Average incoming calls at night between 9 pm - 9 am (30% of 5130)	1539
Average seconds required to answer the calls (Avg incoming calls at night * Avg calls answered)	305680.4499
Average hours required to answer the calls	84.91123608
keeping the maximum abandon rate at 10%	
Actual average hours required to answer the calls	76.42011247
We know from the previous task that Actual working hrs is 4.5 hrs	
No. of agents required to answer the call	16.98224722

Total number of agents required is 17.

Night Shift Manpower Planning

Time_bucket	Call distribution	Time distribution	No. of agents required
9_10	3	0.10	2
10_11	3	0.10	2
11_12	2	0.07	1
12_1	2	0.07	1
1_2	1	0.03	1
2_3	1	0.03	1
3_4	1	0.03	1
4_5	1	0.03	1
5_6	3	0.10	2
6_7	4	0.13	2
7_8	4	0.13	2
8_9	5	0.17	3
Total	30	1.00	17

Night Shift Manpower Planning

Insights:-

► Total number of calls for 23 days is 117988.

   Average number of calls = (Total number of calls / 23) = 5130

► It means Customer make 5130 calls per day.

► 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. It means 30% of incoming calls are at night between 9 PM to 9 AM.

Formulas:

   Average incoming calls at night between 9 PM - 9 AM = (30% of 5130) = 1539

Average seconds required to answer the calls = (Avg incoming calls at night * Avg calls answered)

   = 1539 * 198.62 = 305680.4499

Average hours required to answer the calls = (Average seconds required to answer the calls / 3600)

   = 84.9

Night Shift Manpower Planning

Insights:-

► keeping the maximum abandon rate at 10%

   Actual average hours required to answer the calls = 0.9 * Average hours required to answer the calls

$$= 76.42011247$$

► We know from the previous task that Actual working hrs is 4.5 hrs.

No. of agents required to answer the call = (Actual average hours required to answer the calls /4.5) = 17

► Total number of agents required to answer the call at night 9 PM to 9 AM is 17.

► Calculated the Time Distribution by dividing each calls distribution by total calls i.e., 30.

► The number of agents required for each time bucket is calculated by 17 * Time Distribution.

Conclusions

► Company can divide workforce into three shifts to ensure 24/7 availability for addressing customer's queries and concerns.

► Based on analysis incoming calls in evening are less. So Company can optimize workforce by reducing the number of agents in evening for call handling.

► Company can hire 17 agents who will be available during night hours from 9 PM to 9 AM to handle the calls or shift some of the day workers to the night shift.

► During the analysis there were outliers in data but removing the outliers can lead to different outcomes.

► These insights provide the company with actionable strategies for optimizing workforce allocation, enhancing customer service efficiency, and ensuring continuous availability to address customer needs.

Conclusions

[google drive link excel sheet](#)

Please download google sheet in excel format