PROJECT 8
ABC CAR VOLUME TREND ANALYSIS

WHAT IS CALL VOLUME TREND?

- Call volume trend refers to the patterns and fluctuations in the number of incoming calls received by a business or organization over a specific period of time. Analyzing call volume trends is crucial for understanding the demand for customer service or support at different times. By tracking these trends, businesses can make informed decisions about resource allocation, staffing levels, and operational efficiency.

IMPORTANCE

❖ **Crucial for Resource Allocation:**

- Understanding the ebb and flow of call volumes helps us allocate resources efficiently, ensuring optimal staffing levels during peak periods.

❖ **Enhancing Customer Service Efficiency:**

- Enables us to streamline operations, reducing wait times and improving the overall customer experience.

❖ **Better Workforce Management:**

- Provides insights for strategic planning, helping us manage our workforce effectively to meet customer demands.

PROJECT DESCRIPTION

- This project focuses on analyzing the call volume trends within ABC Company. Understanding the patterns in call volume is essential for optimizing operations and enhancing customer satisfaction.

- In this presentation , we will analyze call volume patterns over a specific timeframe and make strategic approach for the betterment of the calls being answered/transferred/abandoned.

APPROACH

- **Data Collection**

- The approach involves gathering call volume data from multiple sources, including call center software, to ensure comprehensive analysis.

- **Data Analysis Techniques**

- Utilizing advanced statistical and machine learning techniques to extract meaningful patterns from call volume data.

- **Key Findings**

- Presenting the key findings derived from the call volume analysis, including peak hours, customer satisfaction trends, and more

TECH STACK USED
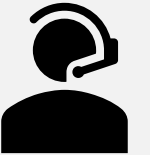
- **MICROSOFT EXCEL:**
  - Versatile tool for collecting and organizing data.
  - Used for data analysis including sorting, filtering and statistical calculations.
  - Used for creating visualizations (charts, graphs etc)

- **MICROSOFT POWERPOINT:**
 - Finalized report is visualized in the form of presentation.

- EXCEL LINK - https://drive.google.com/drive/folders/1062z8AuIxs778up6oS6PBWGeTvUqx0CK

A. 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?

- Creating a pivot table using the columns time_bucket and call_seconds
- Visualizing the pivot table via bar chart

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**
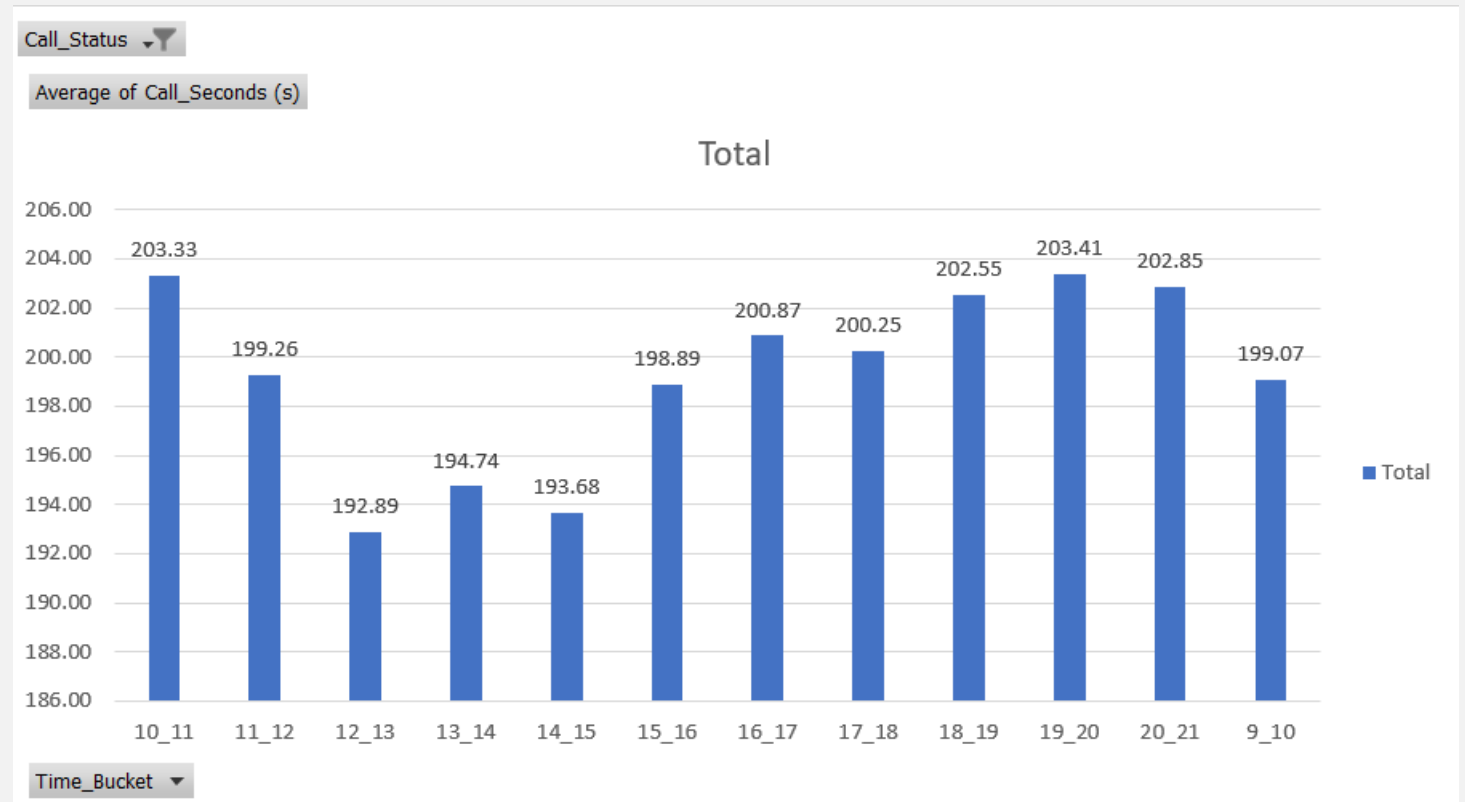
B. Call Volume Analysis: Visualize the total number of calls received. This should be represented as a graph or chart showing the number of calls against time. Time should be represented in buckets (e.g., 1-2, 2-3, etc.).
Your Task: Can you create a chart or graph that shows the number of calls received in each time bucket

- Creating a pivot table using the columns customer phone number, time_bucket, call_seconds
- Creating a bar chart using the pivot table

| Time_Bucket	Count of Customer_Phone_No	Count of Call_Seconds (s)
10_11	13313	11.28%
11_12	14626	12.40%
12_13	12652	10.72%
13_14	11561	9.80%
14_15	10561	8.95%
15_16	9159	7.76%
16_17	8788	7.45%
17_18	8534	7.23%
18_19	7238	6.13%
19_20	6463	5.48%
20_21	5505	4.67%
9_10	9588	8.13%
(blank)		0.00%
Grand Total	**117988**	**100.00%**
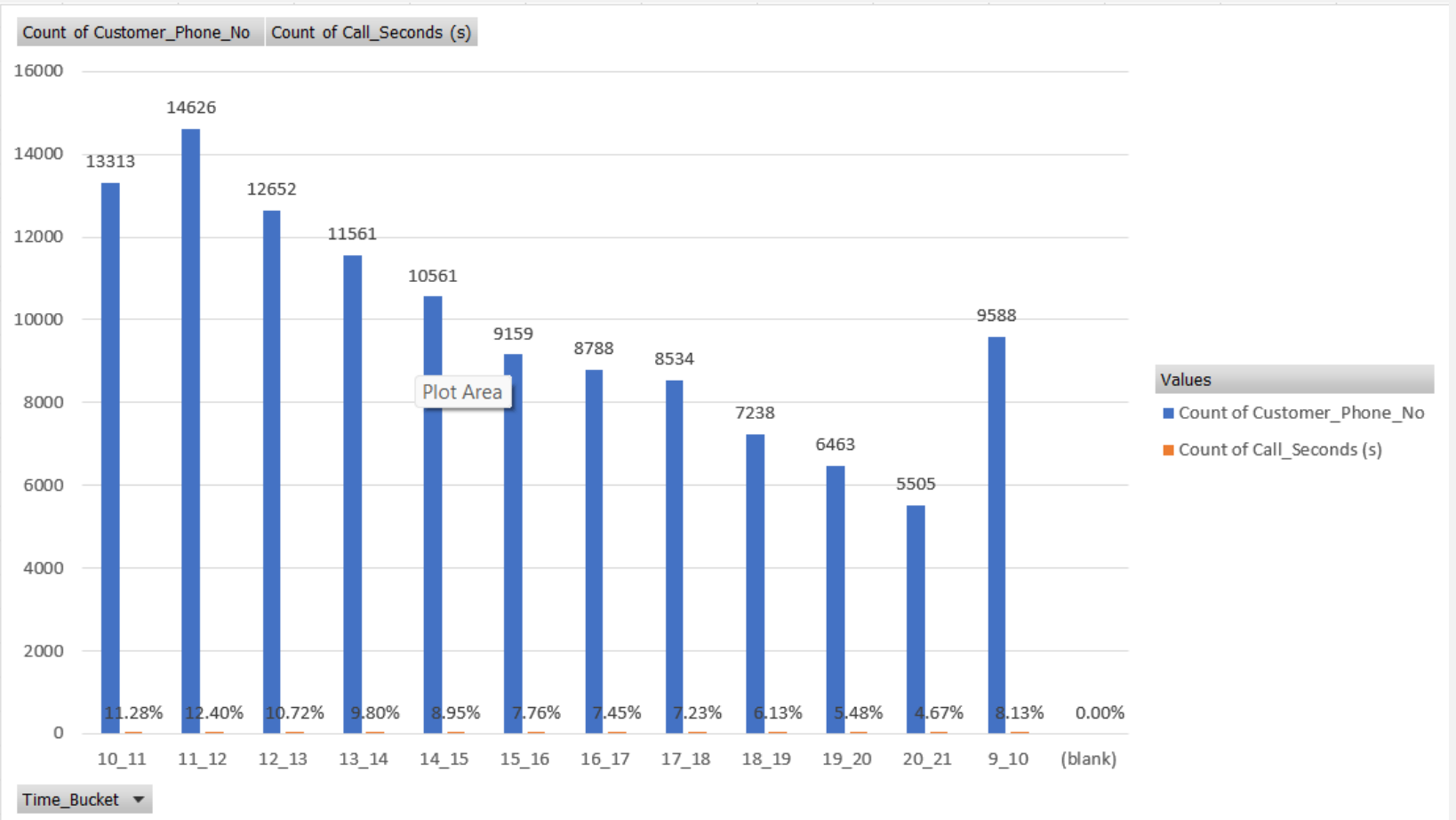
C. Manpower Planning: The current rate of abandoned calls is approximately 30%. Propose a plan for manpower allocation during each time bucket (from 9 am to 9 pm) to reduce the abandon rate to 10%. In other words, you need to calculate the minimum number of agents required in each time bucket to ensure 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%?

- Creating a pivot table using call_status, customer_phone_no
- Visualizing the call_status vs call_seconds and count of customer_phone_no using a bar chart

Call_status	Average of Call_Seconds (s)	Count of Customer_Phone_No	Percentage of Customer_Phone_No
abandon	0.00	34403	29.16%
answered	198.62	82452	69.88%
transfer	76.15	1133	0.96%
Grand Total	**139.5321473**	**117988**	**100.00%**

work days	6
unplanned leaves	4
work_days_in_a_month	20
duty hours	9
lunch break	1.5
actual working hrs	4.5
total days in a month	30
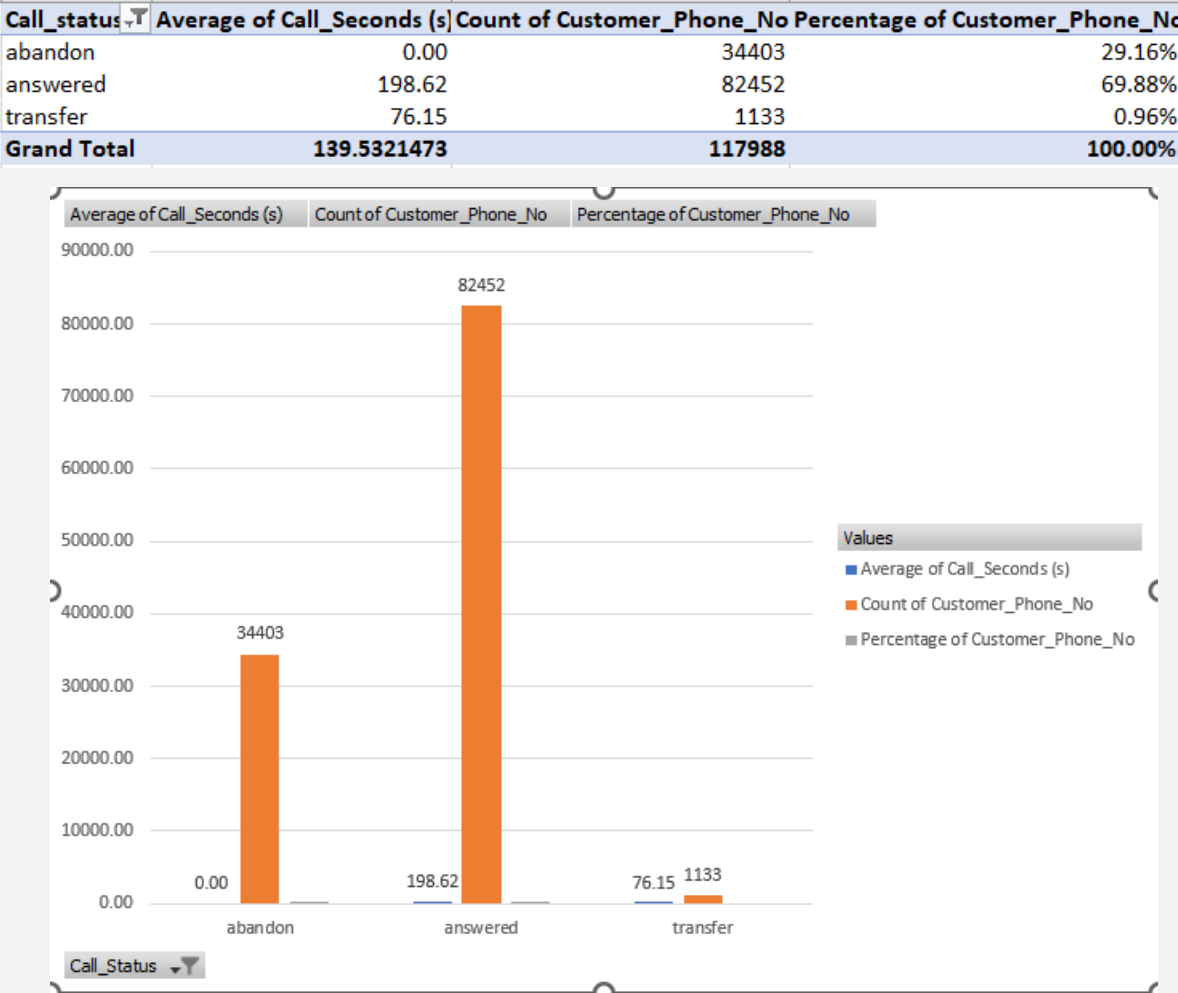
- Created a pivot table 1 to find out the total call_seconds on 1st January.
- Finding the sum of hour =i2/3600 where i2 is sum of call_seconds on 1st January
- Finding the agents working when 60% calls are answered using the formula =j2/5 where j2 = sum of hours
- Finding the agents required for 90% calls to be answered using the formula =(j3/60)*90 where j3 is agents working when 60% calls are answered
- Creating a pivot table with columns date, time_bucket , call_seconds as count (percentage as well as decimal)
- Multiplying the decimal (count of call_seconds) using the formula =ROUND(k12*J4$,0) WHERE K12 = decimal for count of call_seconds and j4 = agents required for 90% calls answered.
- Dragging the formula for all the time_buckets to get the agents required

For each time stamp

sum of calls_second on 1st jan	sum of hour
676664	187.96
60% answered ,agents =	38
90% answered ,agents =	56

Date_&_Time (Multiple Items)

Row Labels	Sum of Call_Seconds (s)
09	35313
10	53087
11	67751
12	72680
13	59693
14	76137
15	65689
16	59464
17	68155
18	53096
19	40141
20	25281
21	177
Grand Total	**676664**

date 01-01-2022

Row Labels	Count of Call_Seconds (s)	Count of Call_Seconds (s)2	Agents Required
10_11	11.89%	0.12	7
11_12	10.49%	0.10	6
12_13	10.10%	0.10	6
13_14	8.03%	0.08	4
14_15	9.32%	0.09	5
15_16	7.90%	0.08	4
16_17	7.13%	0.07	4
17_18	8.01%	0.08	4
18_19	7.26%	0.07	4
19_20	5.06%	0.05	3
20_21	7.08%	0.07	4
9_10	7.73%	0.08	5
Grand Total	**100.00%**	**1.00**	**56**

D. 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%

- Firstly, creating a pivot table using columns date, call_status as count of call_status

Count of Call_Status	Column Labels				
Row Labels	abandon	answered	transfer	(blank)	Grand Total
01-01-2022	684	3883	77		4644
02-01-2022	356	2935	60		3351
03-01-2022	599	4079	111		4789
04-01-2022	595	4404	114		5113
05-01-2022	536	4140	114		4790
06-01-2022	991	3875	85		4951
07-01-2022	1319	3587	42		4948
08-01-2022	1103	3519	50		4672
09-01-2022	962	2628	62		3652
10-01-2022	1212	3699	72		4983
11-01-2022	856	3695	86		4637
12-01-2022	1299	3297	47		4643
13-01-2022	738	3326	59		4123
14-01-2022	291	2832	32		3155
15-01-2022	304	2730	24		3058
16-01-2022	1191	3910	41		5142
17-01-2022	16636	5706	5		22347
18-01-2022	1738	4024	12		5774
19-01-2022	974	3717	12		4703
20-01-2022	833	3485	4		4322
21-01-2022	566	3104	5		3675
22-01-2022	239	3045	7		3291
23-01-2022	381	2832	12		3225
(blank)					
Grand Total	34403	82452	1133		117988

Given in the ques :

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

- Using the pivot table , finding the average calls in a day using formula =AVERAGE(J3:J25) where j3:j25 represents the calls in a day from 1st January to 23rd January.
- Now finding the calls in the night shift which is 30% of the calls placed in a day.
- To find the addition hours required , Used the formula =ROUND(I5*198.6*0.9/3600,0) where I5 = calls b/w 9m-9am and 198.6 = average call duration
- For agents required , used the formula =L8/5 where L8 = additional hours

average calls in a day		additional hrs required	
	5130		76

calls between9pm-9am		agents reuired	
	1539		15

- Now creating a table with time_bucket and call distribution given in the table provided in the question
- Finding the time distribution by using the formula =O14/02 where $0$14 = total calls and o2 = first call distribution (in the first time_bucket)
- Dragging the formula for all the time_buckets
- Creating a column "agents required"
- For finding the agents required for each time_bucket , Divided 15 i.e. total agents required by time distribution in each time_bucket

Time bucket	call distribution	time distribution	agents required
9_10	3	10.00	2
10_11	3	10.00	2
11_12	2	15.00	1
12_1	2	15.00	1
1_2	1	30.00	1
2_3	1	30.00	1
3_4	1	30.00	1
4_5	1	30.00	1
5_6	3	10.00	2
6_7	4	7.50	2
7_8	4	7.50	2
8_9	5	6.00	3
TOTAL	30	201.00	15

RESULT

- AVG call duration
- Calls abandoned
- Agents required to reduce calls abandonment
- Agents required for night shift
- No. of calls received
- Average calls in a day
- Exact working hours
- Unplanned leaves