

ABC CALL VOLUME TREND ANALYSIS

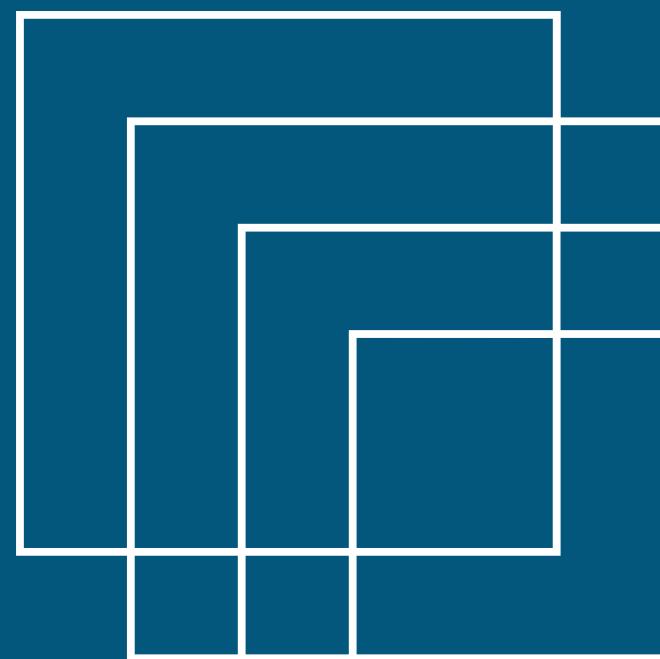
TRAINITY PROJECT 8

DONE BY ASHWIN K



CONTENT

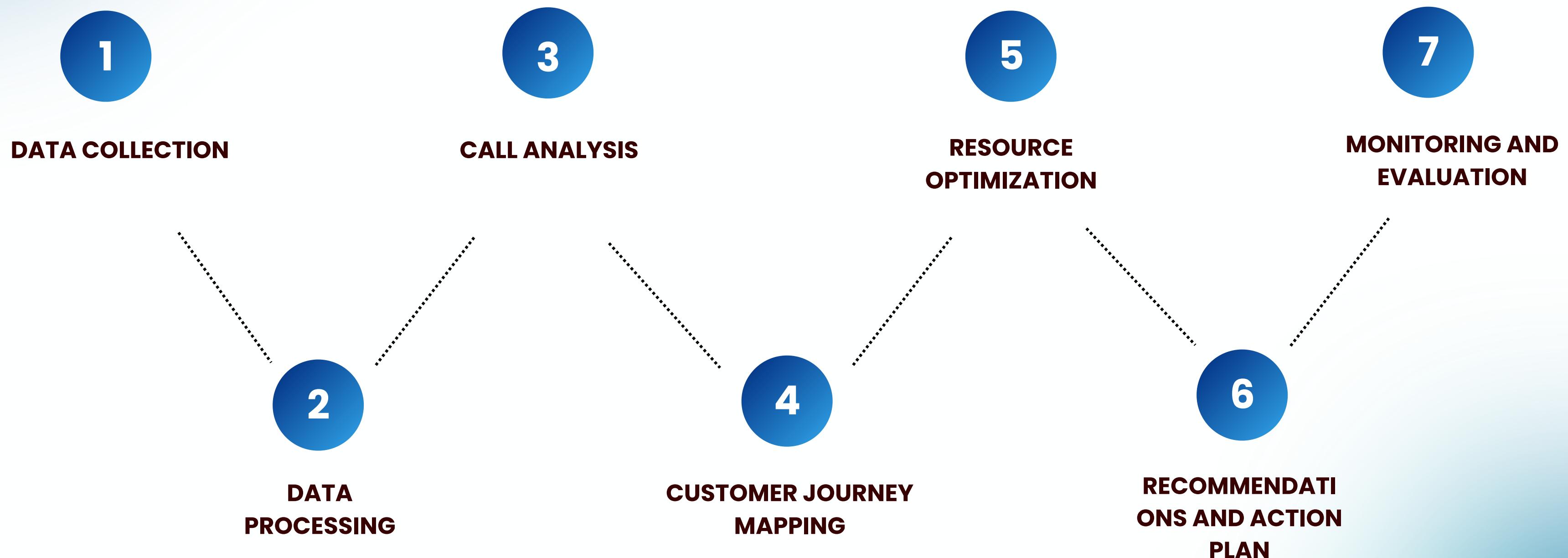
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PROJECT DESCRIPTION

- The main objective of this project is to analyze the inbound calls made by customers and identify the issues they face during their interactions with the Customer Experience (CX) Inbound calling team. By examining the provided dataset, we aim to uncover the specific challenges and pain points experienced by customers, such as long queue times, call transfers, or abandoned calls.
- This analysis will provide valuable insights into the areas where improvements are needed to enhance the overall user experience.
- Additionally, this project will focus on determining the optimal number of employees required to minimize the call abandon rate in the call center. By studying the call volume, queue times, and customer demand patterns, we can accurately estimate the workforce needed to effectively handle incoming calls and reduce customer wait times.
- This information will enable the organization to make informed decisions regarding staffing levels, scheduling, and resource allocation, ensuring that the call center operates efficiently and provides prompt and satisfactory customer service.

APPROACH



TECH STACK USED



MICROSOFT EXCEL

INSIGHTS

- **Identification of Customer Pain Points:** Identify specific challenges customers face, such as long queue times, call transfers, or abandoned calls.
- **Peak Call Hours:** Determine the busiest hours when the call center receives the highest call volume.
- **Call Status Distribution:** Analyze the distribution of call statuses (abandon, answered, transferred) to assess call handling effectiveness.
- **Agent Performance Evaluation:** Evaluate individual agent performance based on call duration, resolution, and customer satisfaction.
- **Average Call Duration:** Calculate the average length of customer-agent interactions to identify excessively long or short calls.
- **Queue Time Analysis:** Analyze average queue times to identify peak periods and improve wait times.
- **Staffing Optimization:** Estimate optimal staffing levels based on call volume and demand patterns to minimize call abandonment.
- **Recommendations for Improvement:** Provide actionable suggestions to enhance customer experience, such as optimizing queue management or implementing AI tools.

SOLUTIONS

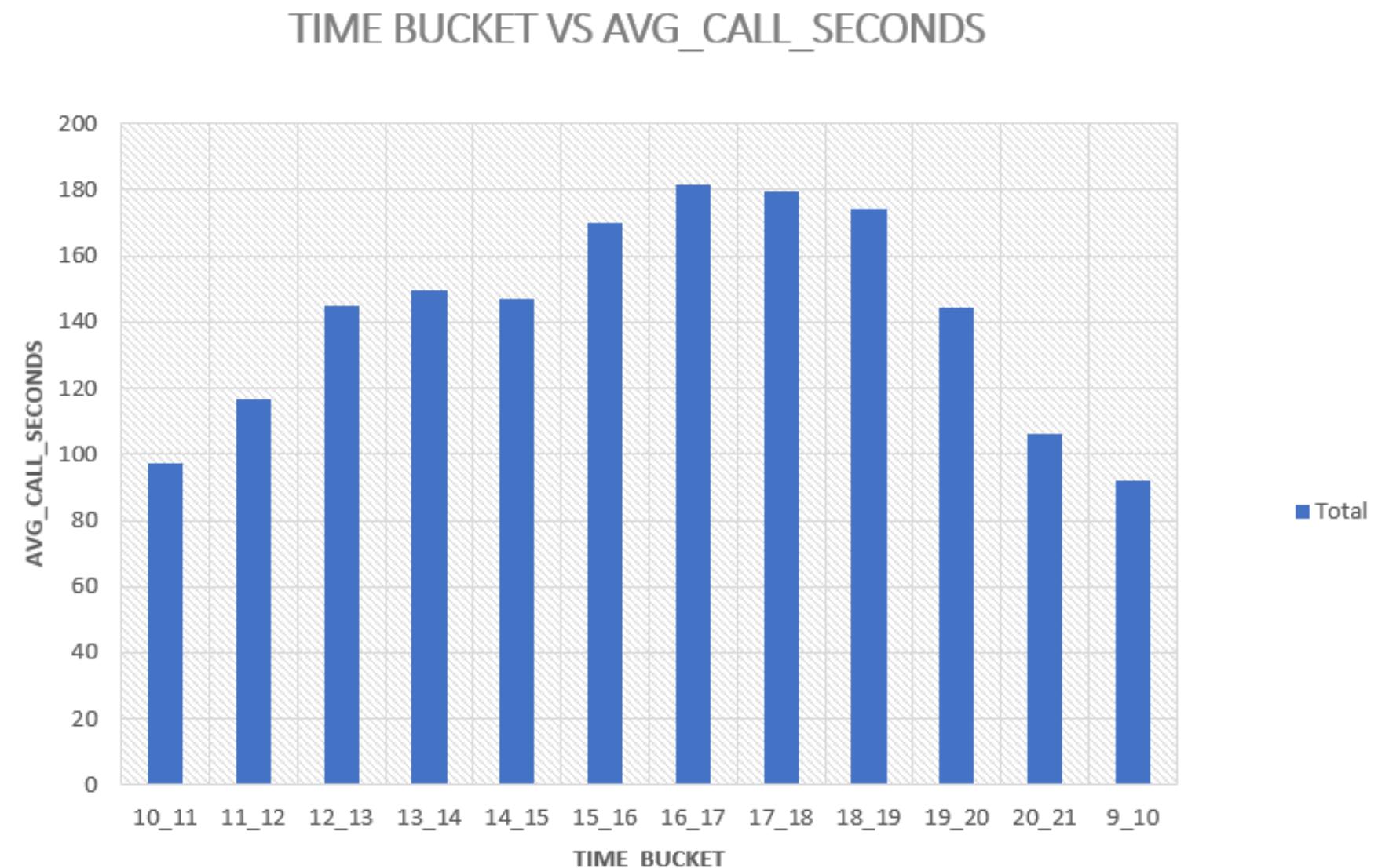
TASK A

Calculate the average call time duration for all incoming calls received by agents (in each Time_Bucket).

PIVOT TABLE

Time Buckets	AVG_CALL_SECONDS
10_11	97.42402163
11_12	116.7837413
12_13	144.7250237
13_14	149.5409567
14_15	146.9693211
15_16	169.8968228
16_17	181.4393491
17_18	179.7245137
18_19	174.3246753
19_20	144.5825468
20_21	105.9491371
9_10	92.01032541
Grand Total	139.5321473

COLUMN CHART



INFERENCE

- Call durations generally increase from the morning hours to the early afternoon, peaking between 3 PM and 4 PM at an average of 169.9 seconds.
- Between 4 PM and 5 PM, the agents experience the highest average call duration of 181.4 seconds.
- As the evening progresses beyond 5 PM, the average call duration gradually decreases, and the lowest average call duration is observed between 9 AM and 10 AM, at 92.0 seconds.
- Across all time periods, the overall average call duration is 139.5 seconds.

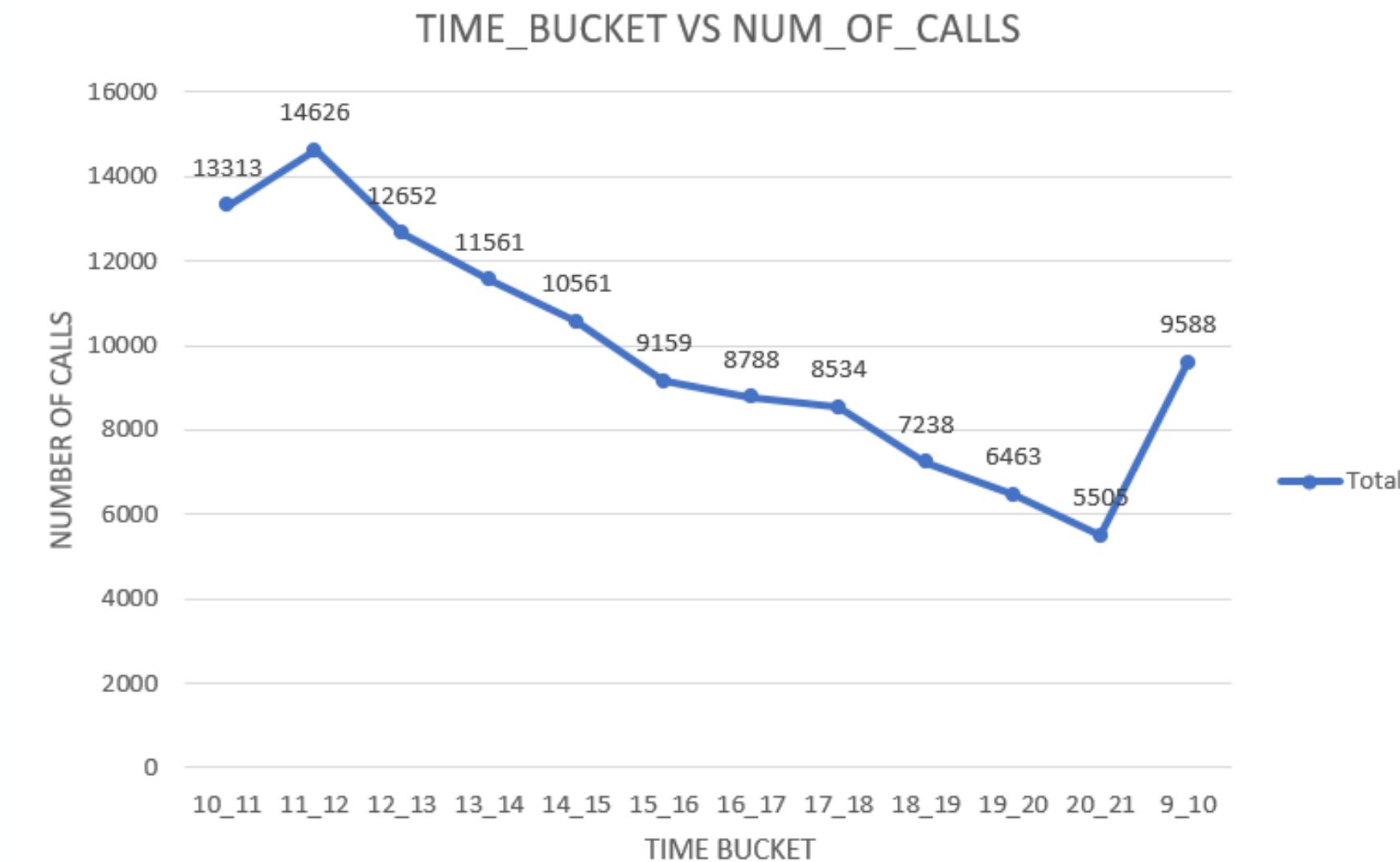
TASK B

Show the total volume/ number of calls coming in via charts/ graphs [Number of calls v/s Time]. You can select time in a bucket form (i.e. 1-2, 2-3,)

PIVOT TABLE

Call_Status	(All)
Time Bucket	Number of Calls
10_11	13313
11_12	14626
12_13	12652
13_14	11561
14_15	10561
15_16	9159
16_17	8788
17_18	8534
18_19	7238
19_20	6463
20_21	5505
9_10	9588
Grand Total	117988

LINE CHART



INFERENCE

1. Throughout the day, there is a gradual decline in the number of calls from the morning to the evening.
2. The highest call volume is observed between 11 AM and 12 PM, with a peak of 14,626 calls during this hour.
3. Conversely, the period from 8 PM to 9 PM experiences the lowest call volume, with only 5,505 calls.
4. Generally, the morning and midday hours exhibit higher call volumes compared to the evening hours.
5. In total, there were 108,361 calls received over the course of the day.

TASK C

As you can see current abandon rate is approximately 30%. Propose a manpower plan required during each time bucket [between 9am to 9pm] to reduce the abandon rate to 10%.

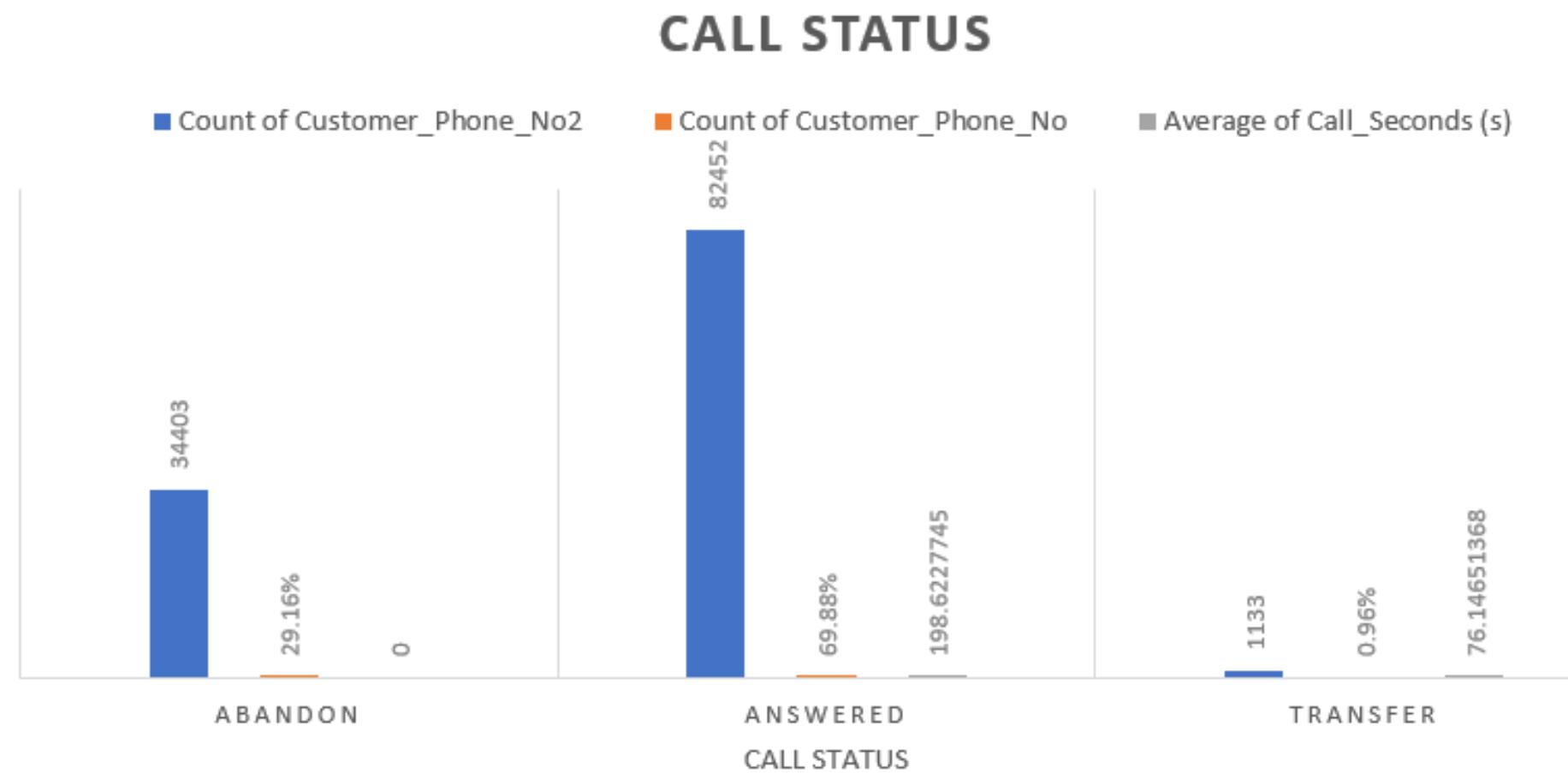
ASSUMPTIONS

NUMBER OF DAYS AGENT WORKS IN A WEEK	6 DAYS
UNPLANNED LEAVES PER AGENT	4 DAYS PER MONTH
AGENT TOTAL WORKING HOURS PER DAY	9 HOURS
BREAK AND LUNCH TIME	1.5 HOURS
ACTUAL WORKING HOURS ON CUSTOMER CALL	4.5 HOURS

PIVOT TABLE

CALL STATUS	Count of Customer_Phone_No2	Count of Customer_Phone_No	Average of Call_Seconds (s)
abandon	34403	29.16%	0
answered	82452	69.88%	198.6227745
transfer	1133	0.96%	76.14651368
Grand Total	117988	100.00%	139.5321473

COLUMN CHART



PIVOT TABLE CALCULATION

Date	SUM_CALL_SEC	HOURS
01-Jan	676664	187.9622
02-Jan	574003	159.4453
03-Jan	812863	225.7953
04-Jan	861946	239.4294
05-Jan	846798	235.2217
06-Jan	829040	230.2889
07-Jan	757019	210.2831
08-Jan	735444	204.29
09-Jan	541147	150.3186
10-Jan	778739	216.3164
11-Jan	785717	218.2547
12-Jan	709934	197.2039
13-Jan	691320	192.0333
14-Jan	564227	156.7297
15-Jan	556267	154.5186
16-Jan	674394	187.3317
17-Jan	945615	262.6708
18-Jan	796768	221.3244
19-Jan	750270	208.4083
20-Jan	759613	211.0036
21-Jan	639855	177.7375
22-Jan	621577	172.6603
23-Jan	553899	153.8608
Grand Total	16463119	198.8299

ACTUAL WORKING HOUR BY AN AGENT

4.5 HOURS

AVERAGE OF HOURS

198.82 hours

TOTAL AGENTS

44

NUMBER OF AGENTS NEEDED TO REDUCE THE ABANDON PERCENT BY 10%

57

INFERENCE

- The calculation reveals that there are a total of 44 agents working, based on an average of 198.82 call hours per day in the company and each agent working a 4.5-hour shift.
- To achieve a 10% abandon rate, the number of agents required can be calculated using the formula:

$$(44 \text{ agents} * 90) / 70 = 57 \text{ agents (rounded off)}.$$

AGENTS REQUIRED IN EACH TIME BUCKET

Row Labels	PERCENTAGE OF CALL SECONDS	REQ_AGENTS
10_11	11.28%	6
11_12	12.40%	7
12_13	10.72%	6
13_14	9.80%	6
14_15	8.95%	5
15_16	7.76%	4
16_17	7.45%	4
17_18	7.23%	4
18_19	6.13%	3
19_20	5.48%	3
20_21	4.67%	3
9_10	8.13%	5
Grand Total	100.00%	57

RESULTS OF TASK C

Based on the calculations, the following conclusions can be drawn to achieve a target abandon rate of 10% and ensure that at least 90 calls are answered out of 100 within each time bucket from 9 am to 9 pm:

- **Current Scenario:** With 44 agents working for 4.5 hours, the current abandon rate stands at 30%.
- **Number of Agents Required:** Applying the previously mentioned formula, it has been determined that approximately 57 agents are required to achieve the desired results.
- **Manpower Plan:** The 57 agents should be evenly distributed across each time bucket between 9 am to 9 pm, taking into consideration call volume patterns, customer demand, and peak times.
- **Enhanced Efficiency:** By implementing the manpower plan, it is possible to achieve the goal of reducing the abandon rate to 10%.

By adhering to the recommended manpower plan, the call center can enhance the utilization of its agent resources, enhance overall efficiency, and deliver improved customer service. This can be accomplished by decreasing the abandon rate and increasing the rate of answered calls within the designated time frame.

TASK D

Let's say customers also call this ABC insurance company in night but didn't get answer as there are no agents to answer, this creates a bad customer experience for this Insurance company.

Suppose every 100 calls that customer made during 9 Am to 9 Pm, customer also made 30 calls in night between interval [9 Pm to 9 Am] and distribution of those 30 calls are 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		

**Now propose a manpower plan required during each time bucket in a day.
Maximum Abandon rate assumption would be same 10%.**

AVVERAGE NUMBER OF CALLS

PIVOT TABLE

Date	ABANDON	ANSWERED	TRANSFERRED	TOTAL
01-Jan	684	3883	77	4644
02-Jan	356	2935	60	3351
03-Jan	599	4079	111	4789
04-Jan	595	4404	114	5113
05-Jan	536	4140	114	4790
06-Jan	991	3875	85	4951
07-Jan	1319	3587	42	4948
08-Jan	1103	3519	50	4672
09-Jan	962	2628	62	3652
10-Jan	1212	3699	72	4983
11-Jan	856	3695	86	4637
12-Jan	1299	3297	47	4643
13-Jan	738	3326	59	4123
14-Jan	291	2832	32	3155
15-Jan	304	2730	24	3058
16-Jan	1191	3910	41	5142
17-Jan	16636	5706	5	22347
18-Jan	1738	4024	12	5774
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
AVERAGE	1495.7826	3577.75	49.26086957	5130

CALCULATION

AVERAGE CALLS BETWEEN 9AM TO 9PM	5130
AT NIGHT	1539
ADDITIONAL HOURS REQUIRED	54
AGENTS REQUIRED	12

- Considering the calculation of an average of 5130 calls between 9 am to 9 pm and assuming that 30% of these calls occur at night, we can ascertain that there are approximately 1539 calls during nighttime:

$$\text{Number of calls at night} = 30 * 5130 / 100 = 1539 \text{ calls}$$

- To attain a 10% abandon rate, we can calculate the additional hours needed by considering the number of calls occurring at night:

$$\text{Additional hours required} = 1539 * (198.82 / 5130) * 0.9 = 54 \text{ hours (rounded off).}$$

- To calculate the required number of agents, we divide the additional hours needed by the hours worked per agent:

$$\text{Number of agents} = 54 / 4.5 = 12 \text{ agents}$$

AGENTS REQUIRED IN EACH TIME BUCKET

TIME_BUCKET (9PM-9AM)	CALL DISTRIBUTION	PERCENTAGE OF CALL DISTRIBUTION	AGENTS REQUIRED	FINAL AGENTS REQUIRED
9pm - 10pm	3	10	1	1
10pm - 11pm	3	10	1	1
11pm - 12pm	2	6.67	1	1
12am - 1am	2	6.67	1	1
1am - 2am	1	3.33	0.4	1
2am - 3am	1	3.33	0.4	1
3am - 4am	1	3.33	0.4	1
4am - 5am	1	3.33	0.4	1
5am - 6am	3	10	1	1
6am - 7am	4	13.33	2	2
7am - 8am	4	13.33	2	2
8am - 9am	5	16.67	2	2
GRAND TOTAL	30	100	12	15

Since the number of agents is a categorical variable, the decimal value (0.4) is rounded to the nearest whole number. Consequently, after rounding, it is determined that 15 agents are required to achieve the desired results.

RESULTS OF TASK D

- **Average Calls:** The calculation reveals that the average number of calls received between 9 am to 9 pm is 5130.
- **Calls at Night:** Taking into account that 30% of the calls happen during the night interval (9 pm to 9 am), it can be concluded that there are 1539 calls made during this period.
- **Additional Hours:** In order to achieve a 10% abandon rate, it is determined that an extra 54 hours of agent availability is needed, considering the number of calls received during the night period.
- **Number of Agents:** By dividing the additional hours required (54) by the hours worked by an agent (4.5), it can be estimated that approximately 12 agents are necessary.
- **Rounding Off:** Considering that the number of agents is a categorical variable, the decimal value of 0.4 is rounded to the nearest whole number. Consequently, after rounding, it is determined that 15 agents are required to fulfill the staffing needs.

In conclusion, a manpower plan is recommended to efficiently manage customer calls and minimize the abandon rate. The plan entails allocating approximately 15 agents for each time bucket throughout the day, taking into account call distribution patterns and customer demand. By implementing this manpower plan, the company can enhance the customer experience by reducing abandoned calls and achieving a higher rate of answered calls during both daytime and nighttime periods.

RESULTS

- Through the analysis of inbound customer calls and interactions with the CX Inbound calling team, valuable insights have been gained regarding challenges such as lengthy queue times, call transfers, and abandoned calls.
- The dataset examination allowed us to identify the peak call hours, enabling better staffing and resource allocation during periods of high demand.
- Agent performance evaluation based on call duration, resolution, and customer satisfaction revealed top-performing agents and areas for improvement.
- The analysis of queue times helped pinpoint peak periods and provided recommendations to minimize wait times and enhance customer satisfaction.
- By estimating the optimal staffing level using call volume and demand patterns, strategies were developed to reduce call abandon rates and ensure prompt customer service.
- In summary, these insights have resulted in an improved customer experience, reduced call abandon rates, and optimized staffing levels within the CX Inbound calling team.

EXCEL WORKBOOK LINK

*[https://docs.google.com/spreadsheets/d/1IOhsIAztphV2nLc1uFpdxcUhZ1dpdtm1/edit?
usp=sharing&ouid=111617584332759410517&rtpof=true&sd=true](https://docs.google.com/spreadsheets/d/1IOhsIAztphV2nLc1uFpdxcUhZ1dpdtm1/edit?usp=sharing&ouid=111617584332759410517&rtpof=true&sd=true)*

PRESENTATION LINK

*[https://drive.google.com/file/d/1S4pT0WBstB0PmOC7h8lylmLV9oDFe0Xr/view?
usp=sharing](https://drive.google.com/file/d/1S4pT0WBstB0PmOC7h8lylmLV9oDFe0Xr/view?usp=sharing)*



THANK YOU