Navigating Call Volume Trends: Uncovering Patterns & Progression

Project Description:

The provided dataset contains information about the inbound calls received by a company named ABC, which operates in the insurance sector. The aim of this report is to simply use perform Customer Experience (CX) analytics, specifically focusing on the inbound calling team of a company analyse patterns in the data and attract, engage, and delight customers, turning them into loyal advocates for the business.

The impact of this analysis are significant for Call Centres/Contact Centres, Consumer helpline or BPOs who want to understand the trend volume of the calls thereby mitigating it with the amount of resources required (The data is from ABC company and the analysis will vary for different clients). Utilizing a dataset that includes records of previous calls, Queue time etc. this project will aim to address specific questions designed to improve the decision making and effectiveness of the ABC call volumes and its trends. The ultimate goal is to provide data-driven recommendations that contribute to better outcomes for the ABC Company and its customers to avail smooth experience and to eventually generate maximum revenue for the Brand/Company.

MAIN_ExcelSheet Link Here: **Click_Here!**

OR use the below mentioned link:

https://docs.google.com/spreadsheets/d/1fQobbbflWS5wz2hUm6Eq8w5uhdGjvpG8/edit?usp=sharing&ouid=109807839321036950449&rtpof=true&sd=true

Objectives:

A. **Average Call Duration:** Determining the average duration of all incoming calls received by agents for each time bucket.
B. **Call Volume Analysis:** Total number of calls received for each time bucket/each hour.
C. Manpower Planning: Propose a plan for manpower allocation during each time bucket (from 9 am to 9 pm) to reduce the abandon rate to 10%.
D. **Night Shift Manpower Planning:** Assuming 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. Propose a manpower plan for each time bucket throughout the Night, keeping the maximum abandon rate at 10%.

Tech-Stack Used:

Microsoft Excel 2010.

Microsoft Excel 2010 is a powerful spreadsheet application that serves a wide range of purposes, from data organization and analysis to financial modelling and reporting. It offers a user-friendly interface with features such as advanced formulas, pivot tables, and charting tools that enable users to manipulate and visualize data effectively.

Excel 2010 is widely used in various fields, including business, finance, education, and research, allowing users to perform calculations, create budgets, track expenses, and analyse trends. Its ability to handle large datasets and automate repetitive tasks through macros makes it an invaluable tool for professionals seeking to enhance productivity and decision-making based on data insights.

Approach:

1. **Understanding the data and planning accordingly.**
2. **Data cleaning/wrangling: Cleaning and preparing the data.**
3. **Insights: Analysing the data to extract meaningful insights.**
4. **Visualization: Visualizing key factors for clear and concise communication.**
5. **Conclusion: Drawing conclusions with key highlights of data patterns and trends.**

Understanding and Cleaning the data for Analysis:

>> No of rows: **1,17,988**

>> No of Columns: **13**

>> Cells containing **N/A = 34,198 in Agent_name; N/A= 34,198 in Agent_id**

>> No of blank Cells: wrapped_by columns = **47,877.**

34198 rows in Agent_Name, Agent_id Column along with Wrapped_by column having blanks were replaced by "Abondaned_Call" tag (As the Call_Status Column indicated.

Remaining 13679 cells in wrapped by column were replaced by Statistical Descriptive Values (Mode)

Insights & Results of Analysis:

#Gather the required data by downloading the datasheet. Open the same using MS Excel(Currerntly using MS Excel 2010)

A. Average Call Duration:

Determining the average duration of all incoming calls received by agents for each time bucket.

Solution: >> We simply created a Pivot table that shows the time bucket and Call_duration in Seconds (Average)

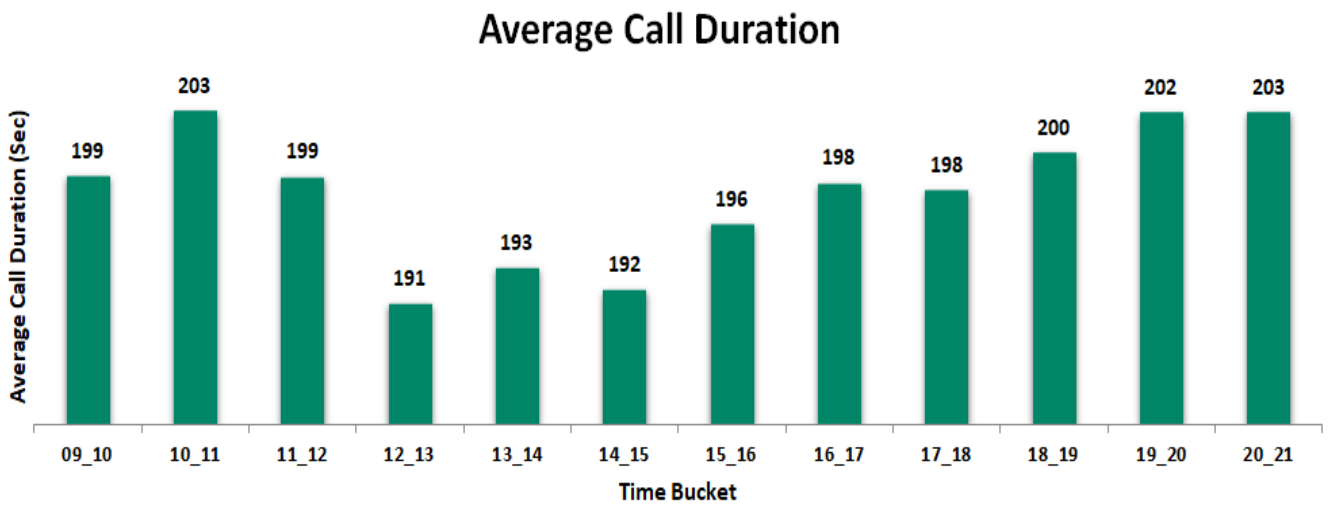
>> We even added a filter to the Pivot containing only Answered + Transferred Calls (Transferred calls are again Answered Calls before being transferred).

Call_Status	(Multiple Items)
Time_Bucket(hr)	Average of Call_Seconds (s)
09_10	199
10_11	203
11_12	199
12_13	191
13_14	193
14_15	192
15_16	196
16_17	198
17_18	198
18_19	200
19_20	202
20_21	203
Grand Total	197

>> The average call duration of a call is 197 seconds.

>> Moreover, most of the agents are consuming almost similar amount of time to cater the client; this shows consistency among the agents throughout the day.

>> For more info please refer the chart.



B. Car's Call Volume Analysis:

Total number of calls received for each time bucket/each hour.

Solution:

>> We simply plotted a pivot for this analysis where the 1st row contains time bucket and the second the ringing column count values.

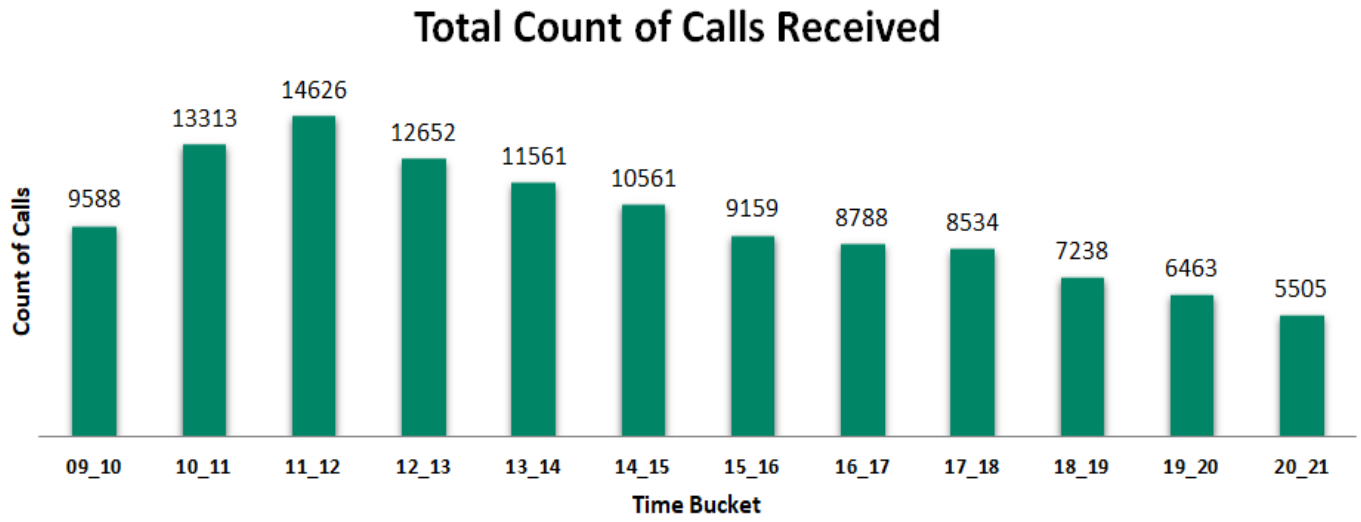
>> We noticed Majority of the call are received from 10am to 12pm

>> While 11-12pm is the busiest hour for the day.

>> A trend can be noticed in the call where initially the call volume is larger until 12pm and decreases gradually until 9pm

>> 8pm to 9pm is the hour where one can expect least amount of inbound calls

>> For more info please refer the chart.



C. Manpower Planning:

Propose a plan for manpower allocation during each time bucket (from 9 am to 9 pm) to reduce the abandon rate to 10%.

Solution:

>> Basically we had had two task here:

ASK:
1. Man power required 9am to 9pm
2. Reduce abandon call rate to 10%

>> Along with the dataset there is another data which was provided by the ABC Company which belongs to Agents, which is as follows:

DATA:	Details
Working days per week	6
No of unplanned leaves/month	4
Total working hour of agent per day(hour)	7.5
Avg on-call time spent in hours	4.5
Avg on-call time spent per day (Seconds)	16200
Avg call duration (Seconds)	197
No of calls per Agent per day(4.5 hr)	82
No of calls handled per Agent per hour	18
Total no days in a month	30
Data provided (days)	23

>> From the data we managed to calculate the Avg on-call time spent per day (Seconds): 16200 for each Agent.

>> From our previous Analysis we have the data for Avg call duration (Seconds): 197.

>> Lastly we calculated No. of calls per Agent per day(4.5 hr): 82 and
No. of calls handled per Agent per hour: 18.

>> We simply calculated Abondoned and Answered calls per time_bucket along with Grand total for 23 Days.

Calls for 23 days			
Row Labels	**abandon**	**answered**	**Grand Total**
09_10	5149	4439	9588
10_11	6911	6402	13313
11_12	6028	8598	14626
12_13	3073	9579	12652
13_14	2617	8944	11561
14_15	2475	8086	10561
15_16	1214	7945	9159
16_17	747	8041	8788
17_18	783	7751	8534
18_19	933	6305	7238
19_20	1848	4615	6463
20_21	2625	2867	5492
Grand Total	**34403**	**83572**	**117975**

>> From the above data we calculated data for calls per day.

Calls per day			
Total calls/day	% of Abondoned Calls/day	Calls Answered/day (90%)	Agents required (90% calls)
417	54%	375	21
579	52%	521	29
636	41%	572	32
550	24%	495	28
503	23%	452	25
459	23%	413	23
398	13%	358	20
382	9%	344	19
371	9%	334	19
315	13%	283	16
281	29%	253	14
239	48%	215	12
5129	---	4616	256

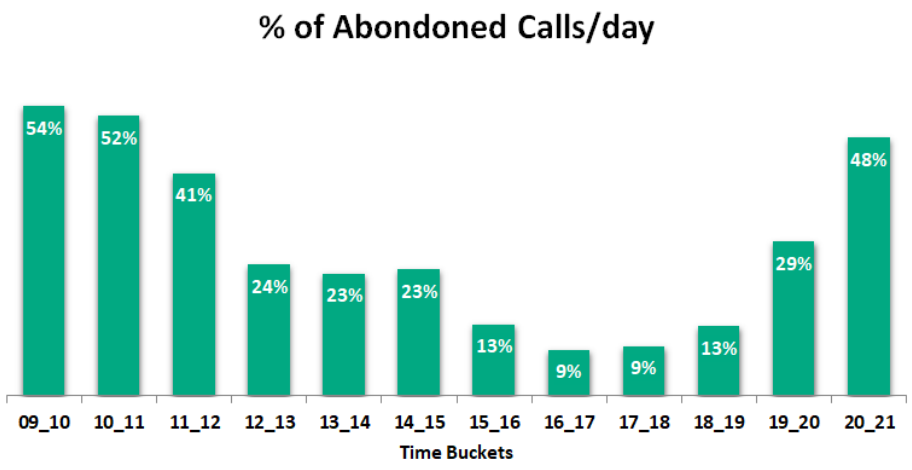
>> Total Calls/Day was calculated by dividing Grand_Total/23 days.

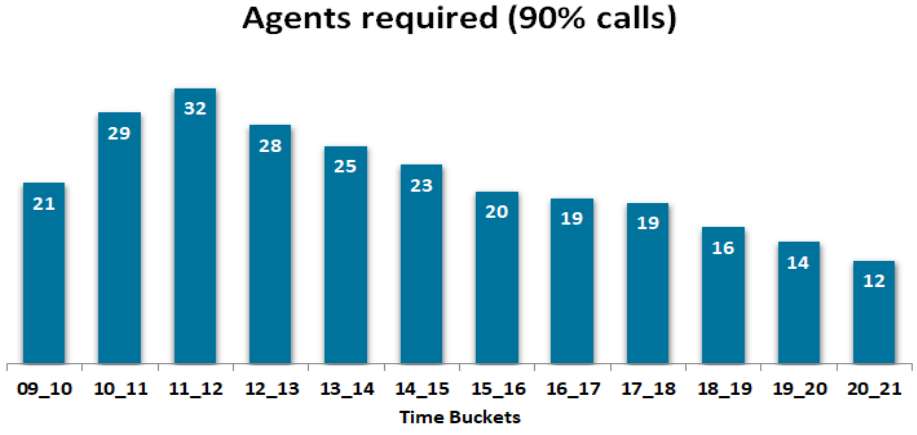
>> Calls Answered/Day that have 10% tolerance; was calculated by 0.9*Total_Calls/Day

>> Agents or Man power required per day were calculated by Calls_Answered/Day(90%) / 18. (As each agent can handle 18 calls per hour.

>> We then plotted a bar chart for our abandoned call rates and Man Power required for each time bucket.

>> The charts SS for the same has been pasted below for the reference:





>> Our analysis reveals that the percentage of abandoned calls is notably higher in the early morning and late evening, which could be attributed to various factors.

>> We observe that between 10 AM and 1 PM, a significant number of agents is required to handle client needs, as indicated by the previous graphs.

>> For more info kindly refer the excel sheet.

D. Night Shift Manpower Planning:

Assuming 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. Propose a manpower plan for each time bucket throughout the Night, keeping the maximum abandon rate at 10%.

Solution:

>> From the additional agent data provided by the ABC Company; they also provided the distribution of calls of each time bucket for the night shift.

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

>> Currently, we do not have any resource in the night shift. We are assuming the same data that was provided for the day shift agents will apply for the night shift. Given below:

DATA:	Details
Working Nights per week	6
No of unplanned leaves/month	4
Total working hour of agent per Night(hour)	7.5
Avg on-call time spent in hours	4.5
Avg on-call time spent per Night (Seconds)	16200
Avg call duration (Seconds)	197
No of calls per Agent per Night (4.5 hr)	82
No of calls handled per Agent per hour	18
Total no days in a month	30
Data provided (Night)	23

>> From our previous analysis we had data for 90% efficiency in calls being answered.

Time-Bucket	Calls Answered/Night (90%)	Incoming Calls Distribution	% of Distribution	Total Calls Over Night	Resource required
21_22	375	3	10%	138	8
22_23	521	3	10%	138	8
23_00	572	2	7%	92	5
00_01	495	2	7%	92	5
01_02	452	1	3%	46	3
02_03	413	1	3%	46	3
03_04	358	1	3%	46	3
04_05	344	1	3%	46	3
05_06	334	3	10%	138	8
06_07	283	4	13%	185	10
07_08	253	4	13%	185	10
08_09	215	5	17%	231	13
Grand Total	**4616**	**30**	**100%**	**1385**	**77**
30 % of call volume received at Night	**1385**				

>> From the grand total of 4616 we calculated 30% calls, since this is the amount of calls are being expected.

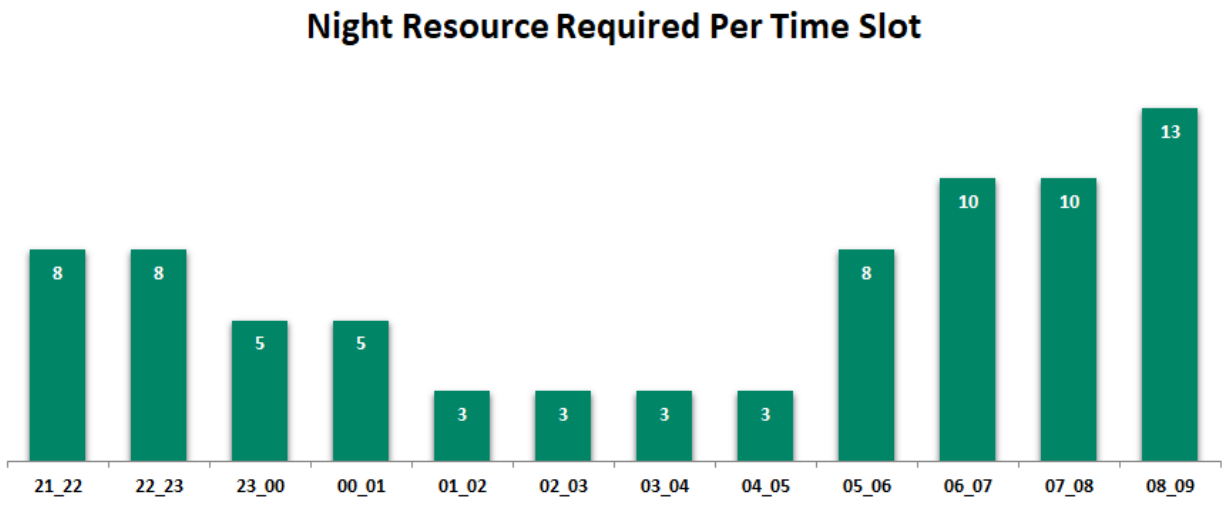
>> There 30% of Calls volume stands at 1385 calls.

>> We then calculated the % of distribution of calls as we already had data for distribution for each time bucket.

>> Multiplying the total 1385 calls with percentage distribution for each time bucket we got no. of calls over night for each time bucket.

>> This was later divided by 18 to fetch the resource required for each time bucket.

>> The SS of the chart has been pasted below for your reference.

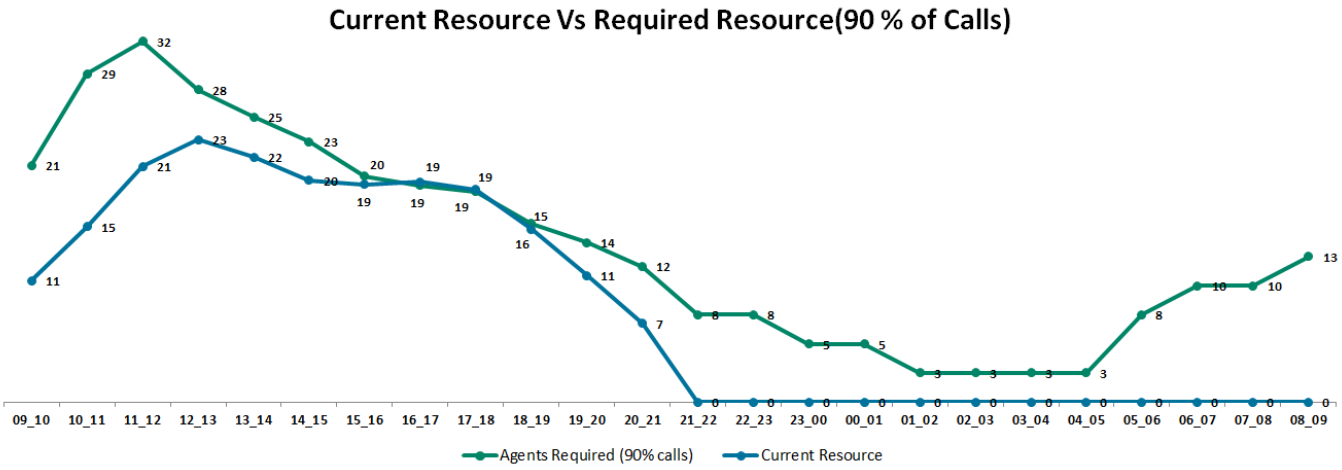


>> Our analysis shows higher agents are required for the 1st 2 hours. Later there is a decline in the requirement until 5am in the morning

>> For more info please refer the excel sheet attached.

Additional:

We have managed to plot data/graph for current resource and required resource to attain 90% of of Calls



>> We can simply observe from the graph that there exists a resource crunch at 9am to 4pm and 7pm till 9am in the morning.

>> The required man power/resource is also mentioned in the above graph to attend 90% inbound calls.

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Insights/Results:

This project has been an invaluable source of hands-on experience, greatly boosting my confidence in using MS Excel and its functions. I've come to realize that merely watching an instructor is not enough to truly master the tool—focusing solely on theory has its limitations. The real progress happens when you put the concepts into practice. This is the key to mastering any programming language; the practical application of knowledge gained throughout the process. Moreover, this project helped me understand how MS Excel can be used to manipulate data and how intricate the data can be to achieve the desired results by bringing subtle changes, a crucial skill in many industries. It also strengthened my understanding of statistics and its practical use in data analysis.

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All Objectives outlined in our project plan have been successfully accomplished. We have obtained the necessary answers from our analysis of the dataset and the results, along with the corresponding methodologies, have been published in detail.

- We noticed the average call duration of a call with a client is 197 seconds.
- Moreover most of the agents are consuming almost similar amount of time to cater the client; this shows consistency among the agents throughout the day.
- Majority of the call are received from 10am to 12pm, while 11-12pm is the busiest hour for the day.
- Based on the provided data, we can extract specific details for each agent, such as the number of calls made by each agent per day, which stands at 82. Therefore, no. of Calls handled per Hour by each Agent is 18.
- Our analysis reveals that the percentage of abandoned calls is notably higher in the early morning and late evening, which could be attributed to various factors.
- Our analysis for night shift shows higher agents are required for the 1st 2 hours. Later there is a decline in the requirement until 5am in the morning but after 5am there is a significant higher requirement of the agents.(for more info refer the excel sheet).

MAIN Excel sheet link:
https://docs.google.com/spreadsheets/d/1fQobbbflWS5wz2hUm6Eq8w5uhdGjvpG8/edit?usp=sharing&ouid=109807839321036950449&rtpof=true&sd=true