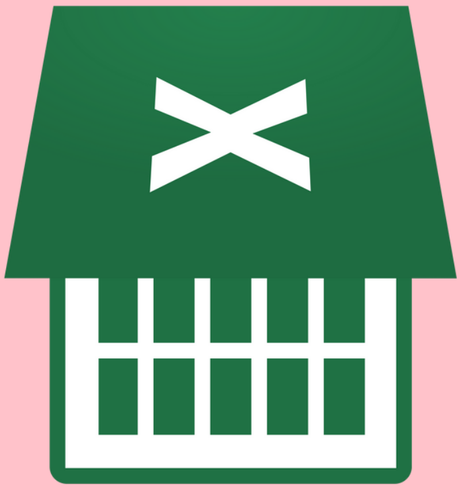
ABC Call Volume Trend Analysis

Problem statement

Objective is to analyze the calls data, and provide insights like number of customer calls are being answered at different time slots in a day, and providing solutions to increase this answering rate to customers by agents. Doing these improves the By solving your customers' problems and helping them achieve success using your product or service, you can delight your customers and turn them into a growth engine for your business. And this even helps to make aware of the product to the customer at low cost.

Tech stack used



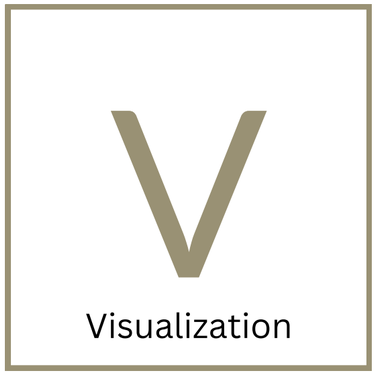
Approach

Business Understanding

Understanding the Business and gaining domain knowledge in order to solve the problem

Data Understanding

Inspecting the given data and understanding the data by understanding the columns



Visualization and operations

Visualizing the data to see the changes or gain some insights

Deriving Insights

Summarizing the insights

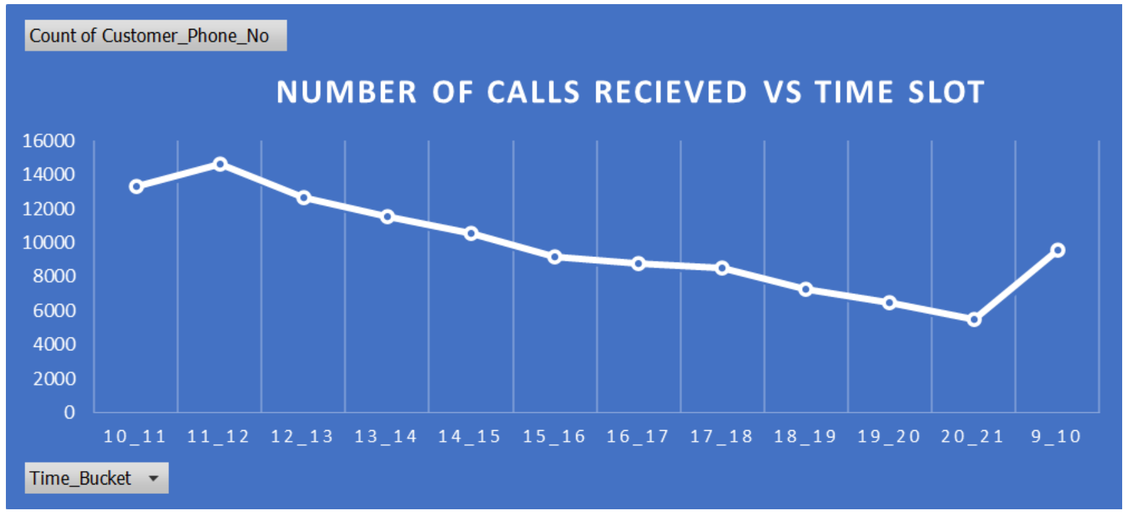
Q1) **Calculate the average call time duration for all incoming calls received by agents (in each Time_Bucket).**

We can calculate the average duration by taking the average of the call duration column for each time bucket (like b/w 9am to 10am, 10am to 11am..)
A new column named "Average call duration" has been created which holds the average call duration

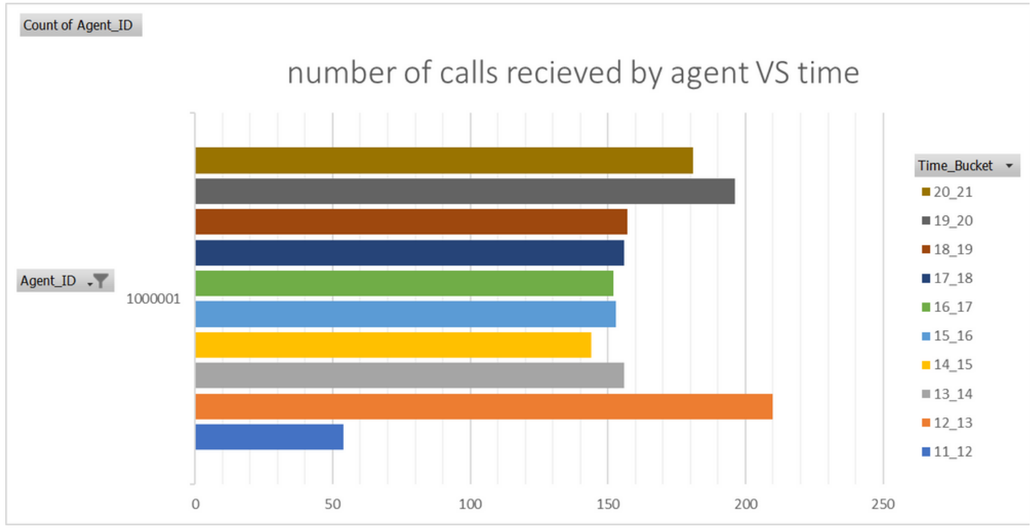
new column

Time_Bucket	Average time (in mins)	Average call time duration
9_10	1.305486024	92.01032541
10_11	1.388116878	97.42402163
11_12	1.662518802	116.7837413
12_13	2.045289282	144.7250237
13_14	2.115647435	149.5409567
14_15	2.079727299	146.9693211
15_16	2.410961895	169.8968228
16_17	2.58010924	181.4393491
17_18	2.550035154	179.7245137
18_19	2.479690522	174.3246753
19_20	2.062354944	144.5825468
20_21	1.516257947	105.9491371

2) 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, ...)



calls received over time



calls received agent wise

- we can see the calls received at day time are high comparing to the calls received at night times.

- The number of calls being received are decreasing over time when day makes a transition from day to night.

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%. (i.e. You have to calculate minimum number of agents required in each time bucket so that at least 90 calls should be answered out of 100.)

answering percentage	abandon percentage
69.88168288	30.11831712

As the current abandon rate is 30% and objective is to decrease it to 10%. By having the minimum number of agents in each time bucket we can make it possible.

As we have On average an agent occupied for 60% of his total actual working Hours i.e. for 6 hours out of actual working hours (9 hours)

- we can get the required number of agents for 90% answer rate if we can calculate the average calls received on a single day and total time spent.
- average calls on first day = (total number of agent on that day) * (total time spent)
- where total agents required = total number of agents on that day
- total agents required = average calls on first day / total time spent

First Day	Duration in hours
Jan-01	187.9622222

Assumption :

An agent work for 6 days a week; On an average total unplanned leaves per agent is 4 days a month; An agent total working hrs is 9 Hrs out of which 1.5 Hrs goes into lunch and snacks in the office. On average an agent occupied for 60% of his total actual working Hrs (i.e 60% of 7.5 Hrs) on call with customers/ users. Total days in a month is 30 days.

As per the assumption, the time spent by agent will be 60% of **7.5 hours, i.e. 5 hours**

For 60%, the agents number is 37 (approx)
How much it is gonna be for 90% for the same time spent?. Using this analogy we can get the minimum number of agents

For 60% occupancy agents required	37.59244444
For 90% occupancy agents required	?
	56.38866667

Hence the number of agents required are 56

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

By calculating the Average number of calls answered (per agent), we can get the additional agents required for the night time buckets i.e.

additional agents = percent of incoming calls/Average number of calls answered (per agent)

type of count	count
answered count	82452
count of abandoned	34403
transfer count	1133
total count	117988

Total agents	65
Average number of calls ans	1268.492308
	1268

Therefore, Agents required for 90% answering rate are

agents required = Incoming Calls/ Average number of calls answered (per agent)

Night shift Time buckets (PM	percent of incoming calls	Additional agents
9pm- 10 pm	3539.64	3
10pm- 11pm	3539.64	3
11pm- 12am	2359.76	2
12am- 1am	2359.76	2
1am- 2am	1179.88	1
2am- 3am	1179.88	1
3am- 4am	1179.88	1
4am- 5am	1179.88	1
5am- 6am	3539.64	3
6am- 7am	4719.52	4
7am- 8am	4719.52	4
8am- 9am	5899.4	5

Time Bucket	Incoming Calls	New Agents Required
9_10	9588	**8**
10_11	13313	**11**
11_12	14626	**12**
12_13	12652	**10**
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	**6**
20_21	5505	**5**

Thank You

by korada saikiran