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Data Analytics Trainee
Project-8. ABC Call Volume Trend Analysis.
Software Used:- Microsoft Excel.

❖ **Analysis done on following Points:-**

1) Average Call Analysis:- Determine the average duration of all incoming calls received by agents. this should be calculated for each Time bucket.


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

2) 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 bucket(e.g., 1-2,2-3..etc)

Task:- Can you create a chart or graph that shows the number of calls received in each time bucket?

3) Manpower Planning:- The current rate of abandoned calls is approximately 30%. Propose a plan for manpower allocation during each time bucket (from 9am to 9pm) to reduce the abandonrate to 10%. in otherwords, you need to calculate the minimum number of agents require in each time bucket to ensure that at least 90 out of 100 call are answered.

Task:- What is the minimum number of agents require in each time bucket to reduce the abandon rate to 10%?



4) 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 between 9am-9pm, the distribution of these 30 calls is as follows:

Task:- Propose a manpower plan for each time bucket throughout the day, keeping the maximum abandon rate at 10%.

Assumptions:- An agent works for 6 days a week; On average, each agent takes 4 unplanned leaves per month; 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 of days in month 30.

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

MICROSOFT EXCEL FILE:-

https://docs.google.com/spreadsheets/d/1lIV2RpotYTDQZ8C1NH14jS7FvpLWJ08m/edit?usp=drive_link&oid=103974361659264463652&rtpof=true&sd=true

VIDEO LINK:- <https://www.loom.com/share/792c1e6f88bf498787e8b15f3499eaae?sid=d3880972-6d14-4cbc-a57b-298c54aa8fd4>

1) Average Call Analysis:- Determine the average duration of all incoming calls received by agents. this should be calculated for each Time bucket.

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

❖ **Process:-**

- First we use the Pivot table for this task placing the time bucket in rows, Call status in columns and Call sec. in values
- We use Average for call sec. from the value field setting.
- After that, we use the slicer of Call status. we only select the answered from call status.
- Then we use the column chart for Time bucket and average call status.

❖ **Result:-**

- The Average duration of calls for each time bucket is 198.6 i.e. 199 sec.
- From chart we can say that, time bucket 19-20 i.e. 7pm-8pm had the highest average call answered in seconds.(203.4).

Average of Call_Seconds (s)	Call_Status	
Time_Bucket	answered	Grand Total
10_11	203.3	203.3
11_12	199.3	199.3
12_13	192.9	192.9
13_14	194.7	194.7
14_15	193.7	193.7
15_16	198.9	198.9
16_17	200.9	200.9
17_18	200.2	200.2
18_19	202.6	202.6
19_20	203.4	203.4
20_21	202.8	202.8
9_10	199.1	199.1
Grand Total	198.6	198.6

Call_Status

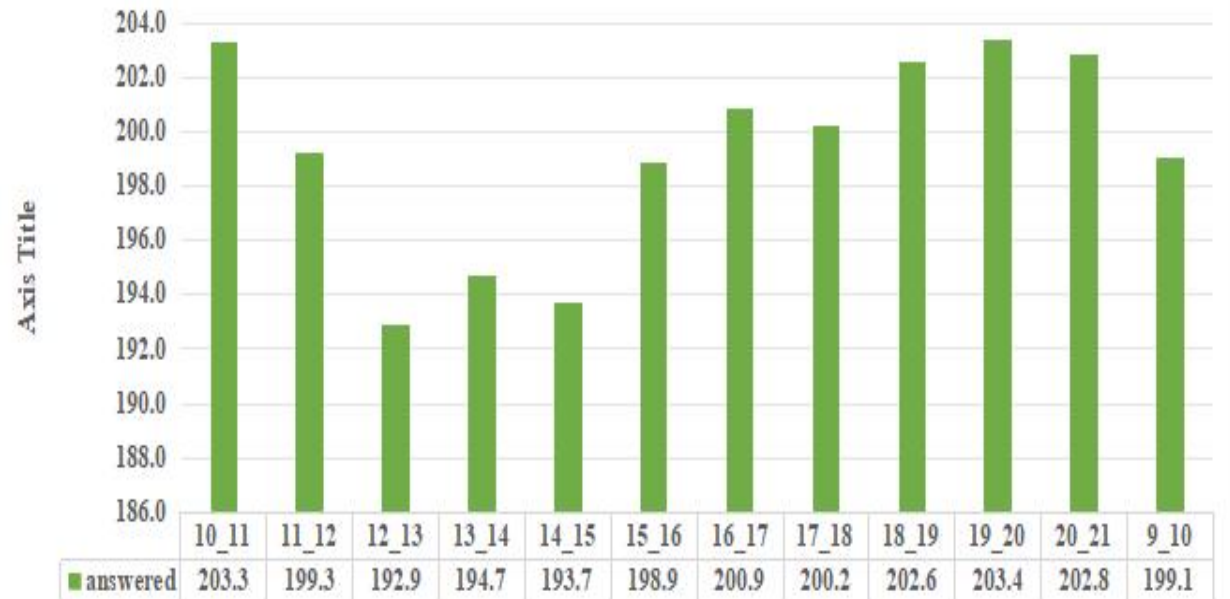
abandon

answered

transfer

Average of Call_Seconds (s)

Average Call Duration



Time_Bucket

Average Call Duration 198.6

2) 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 bucket(e.g., 1-2,2-3..etc)

Task:- Can you create a chart or graph that shows the number of calls received in each time bucket?

❖ **Process:-**

- First we use the Pivot table for this task placing the time bucket in rows, Call status in filter and Call sec. in values
- We use Count for call sec. from the value field setting.
- After that, we use the slicer of Call status. we only select the answered and transfer from call status to get the total calls received.
- Then we use the column chart for Time bucket and Count of call status.

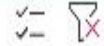
❖ **Result:-**

- The total count of calls received is 83585
- From the we can say that, In time bucket 12-13 i.e. 12pm-1pm the highest count of calls received.(9579)

Call_Status (Multiple Items) T:

Time_Bucket	Count of Call_Status
10_11	6402
11_12	8598
12_13	9579
13_14	8944
14_15	8086
15_16	7945
16_17	8041
17_18	7751
18_19	6305
19_20	4615
20_21	2880
9_10	4439
Grand Total	83585

Call_Status



abandon

answered

transfer

Call_Status

Count of Call_Status

Calls Received



Time_Bucket

3) Manpower Planning:- The current rate of abandoned calls is approximately 30%. Propose a plan for man power allocation during each time bucket (from 9am to 9pm) to reduce the abandonrate to 10%. in otherwords, you need to calculate the minimum number of agents require in each time bucket to ensure that at least 90 out of 100 call are answered.

Task:- What is the minimum number of agents require in each time bucket to reduce the abandon rate to 10%?

❖ **Process:-**

- First we use the Pivot chart placing call status in rows and count of customer phone number in values.
- Then we also calculate the percentage by dividing the value by total and then convert it into percentage.
- We get the total incoming calls and abandon calls by pivot table. then for no. of calls received we use sum function.
- Working hours, Average call handeling and Occuoancy on average is allready given.
- For calculating call handeling we use this formula

$$\frac{(\text{working time of agent in seconds})(\text{occupancy})}{(\text{Average Call Handling Time})}$$

- For minimun agents required we use

$$\frac{\text{Total Incoming Calls}}{\text{Call Handling Capacity}}$$

- For Head count required, $\frac{\text{Minimum Agents Required}}{1 - \text{Shrinkage Percentage}}$

- Lastly for calculating Man power in each time bucket we devide the heat count required by 12.

Call_Status ▾	Count of Customer_Phone_No	Percentage
abandon	34403	29.16%
answered	82452	69.88%
transfer	1133	0.96%
Grand Total	117988	100.00%

Total Call Incoming	117988
No. Of Call Received	83585
Abandon Call	34403
Working Hours	9
Average Call Handling Time	199
Occupancy on average	60%

Call Handling Capacity	97.7
Minimum Agents Required	1207.8
Head Count Required	1610.4
Man Power In Each Time Bucket	134.2


Formula:-	
Call handling Capacity =	$\frac{(\text{working time of agent in seconds})(\text{occupancy})}{(\text{Average Call Handling Time})}$
Minimum Agents Required=	$\frac{\text{Total Incoming Calls}}{\text{Call Handling Capacity}}$
Head Count Required=	$\frac{\text{Minimum Agents Required}}{1 - \text{Shrinkage Percentage}}$
Shrinkage Percentage on an average is 25% so 1-Shrinkage Percentage will be taken as 0.75	

4) 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 between 9am-9pm, the distribution of these 30 calls is as follows:

Task:- Propose a manpower plan for each time bucket throughout the day, keeping the maximum abandon rate at 10%.

Assumptions:- An agent works for 6 days a week; On average, each agent takes 4 unplanned leaves per month; 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 of days in this month.

❖ **Process:-**

- In this task use the same formulas in previous task.
 - First we calculate the no. of calls and then the no. of Agents required for this job.
 - Please refer the Excel sheet for detailed calculation.
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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

Total Call Incoming (9pm-9am)	30
Working Hour of Each Agent	9
Average Call Handling Time(s)	199
Occupancy on Average	60%

Call Handling Capacity	97.68844221
Minimum Agents Requested	0.307098765
Head Count Requested	0.409465021
Man Power In Each Time Bucket	0.034122085
Total Incoming Cal 9AM - 9PM	117988

Call Handling Capacity	97.68844221
Minimum Agents Requested	362.3396914
Head Count Requested	483.1195885
Man Power In Each Time Bucket	40.25996571
Total Incoming Cal 9AM - 9PM	35396.4

Time bucket	Average of Call_Seconds (s)
10_11	203
11_12	199
12_13	193
13_14	195
14_15	194
15_16	199
16_17	201
17_18	200
18_19	203
19_20	203
20_21	203
9_10	199
Grand Total	199

Assumptions	
Agents working hour	9
Lunch & Snacks time hours	1.5
Agents on-floor work hour	7.5
Working Days	6
Month days	30
Unplanned leave days	4
Work days per month	22
Actual working hours	60%
Total time spent on call	4.5
Total time spent on call(in Seconds)	16200
Dataset given having data of days	23

Time Bucket	No. Of Calls
9pm-10pm	3540
10pm-11pm	3540
11pm-12am	2360
12am-1am	2360
1am-2am	1180
2am-3am	1180
3am-4am	1180
4am-5am	1180
5am-6am	3540
6am-7am	4720
7am-8am	4720
8am-9am	5899

Average Time Taken On Call	199
Total working person required per day to achieve 90%	57
Call Volume Daily	5130
If we provide support in night, (9 PM - 9 AM), then call volume is 30% of day's call volume	1539
Additional Hours Request	77
Additional Head Count	17
Total Agents	74

MICROSOFT EXCEL FILE:-

https://docs.google.com/spreadsheets/d/1lIV2RpotYTDQZ8C1NH14jS7FvpLWJ08m/edit?usp=drive_link&oid=103974361659264463652&rtpof=true&sd=true

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END

