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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 dont get an answer because there are no agents available. this creates a poor customer experience. Assumethat 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 maximun 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 hour 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 customer of days in monthis 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/1IIV2RpotYTDQZ8C1NH14jS7FvpLWJ08m/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 shood 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 stasus 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 stasus.
- 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

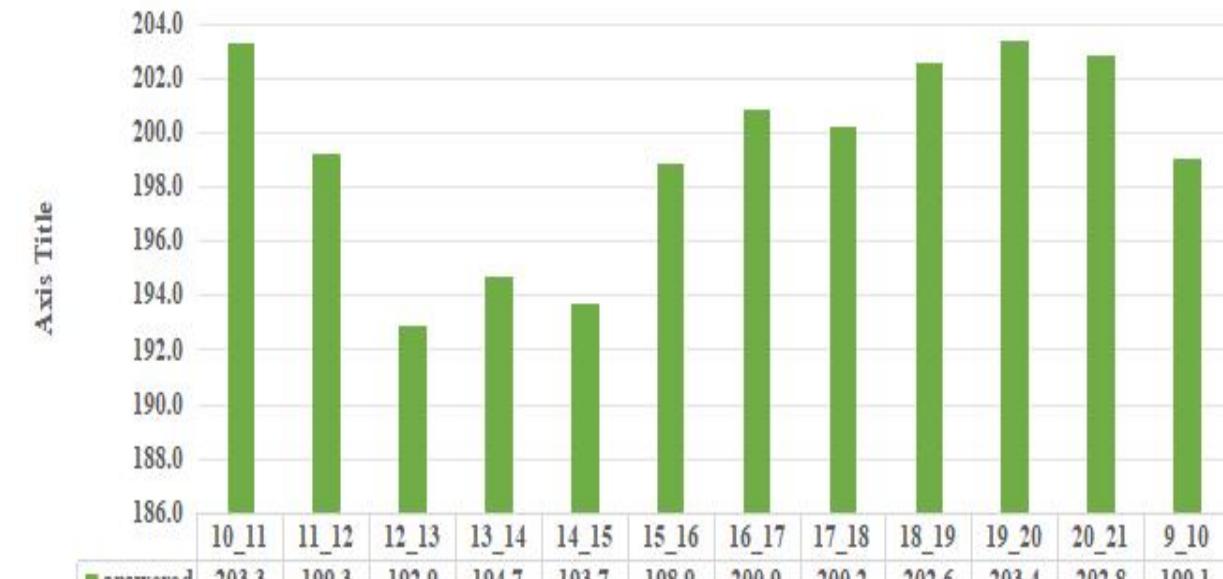
abandon

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:-**

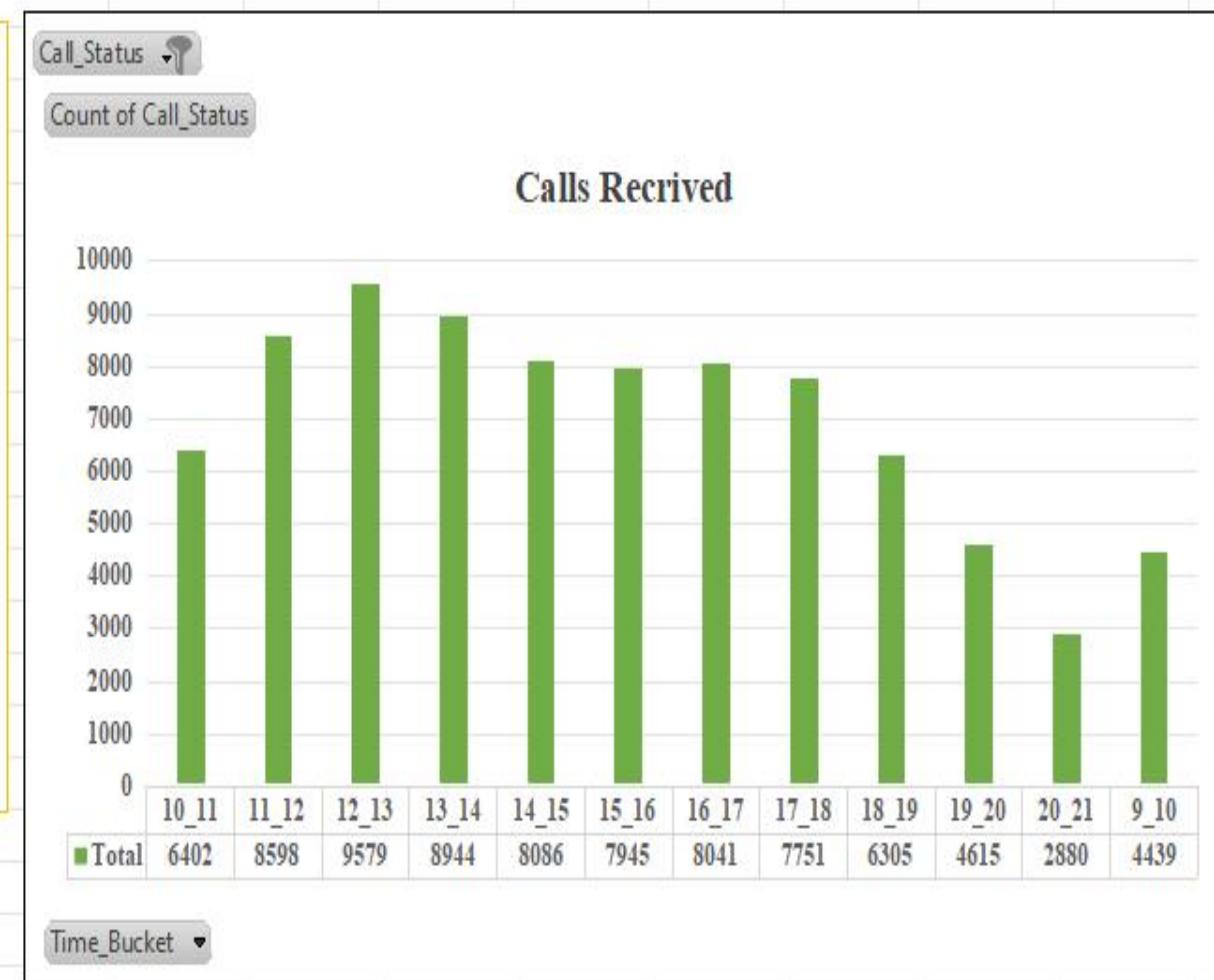
- First we use the Pivot table for this task placing the time bucket in rows, Call status in filter and Call sec. in values
- We use Count for call sec. from the value field setting.
- After that, we use the slicer of Call status. we only select the answered and transfer from call status to get the total 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 this we can say that, In time bucket 12-13 i.e. 12pm-1pm the highest count of calls received.(9579)

Call_Status		(Multiple Items)
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



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 Occupancy 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 Handeling 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:-	$\frac{(\text{working time of agent in seconds})(\text{occupancy})}{(\text{Average Call Handling Time}))}$
Call handling Capacity =	$\frac{\text{Total Incoming Calls}}{\text{Call Handling Capacity}}$
Minimum Agents Required=	$\frac{\text{Minimum Agents Required}}{1 - \text{Shrinkage Percentage}}$
Head Count Required=	

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 months is 30.

❖ **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.

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 Handeling 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 Handeling 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	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

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

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&ouid=103974361659264463652&rtpof=true&sd=true

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