



# **ABC CALL VOLUME TREND ANALYSIS**

**A PROJECT BY DEBARATI CHATTERJEE**

# PROJECT DESCRIPTION

- A customer experience (CX) team consists of professionals who analyse customer feedback and data, and share insights with the rest of the organization. Typically, these teams fulfil various roles and responsibilities such as: Customer experience programs (CX programs), Digital customer experience, Design and processes, Internal communications, Voice of the customer (VoC), User experiences, Customer experience management, Journey mapping, Nurturing customer interactions, Customer success, Customer support, Handling customer data, Learning about the customer journey.
- In a Customer Experience team there is a huge employment opportunities for Customer service representatives A.k.a. call centre agents, customer service agents. Some of the roles for them include: Email support, Inbound support, Outbound support, social media support.
- Inbound customer support is defined as the call centre which is responsible for handling inbound calls of customers. Inbound calls are the incoming voice calls of the existing customers or prospective customers for business which are attended by customer care representatives. Inbound customer service is the methodology of attracting, engaging, and delighting customers to turn them into my business' loyal advocates. By solving customers' problems and helping them achieve success using company's product or service, company can delight their customers and turn them into a growth engine for business.

# APPROACH

- ☐ I spent some time familiarizing myself with the data before commencing the analysis. Examine the data structure to obtain a feel of the overall content. This allows me to identify any potential concerns or obstacles that I may encounter while I do my analysis.
- ☐ I check for any null values or missing data in the dataset, and examine if removing blank cell would effect data analysis.
- ☐ When I finish my data analysis, I present my insights to the audience in a clear and concise manner. I use advance excel concept such as pivoting, conditional formatting and utilize visuals like charts and graphs to help me express my findings.
- ☐ I used Mathematical formula to find out solution for given problems.
- ☐ Link of Excel Work Book File :

<https://docs.google.com/spreadsheets/d/1-gOO6gozu1YG8mlzHH-Q5qigYeDCOH6u/edit?usp=sharing&oid=110345419604987102522&rtpof=true&sd=true>



# TECH-STACKED USED

## Microsoft Excel

To analysis and summarise given dataset, visualize with appropriate graphs and find valuable insights



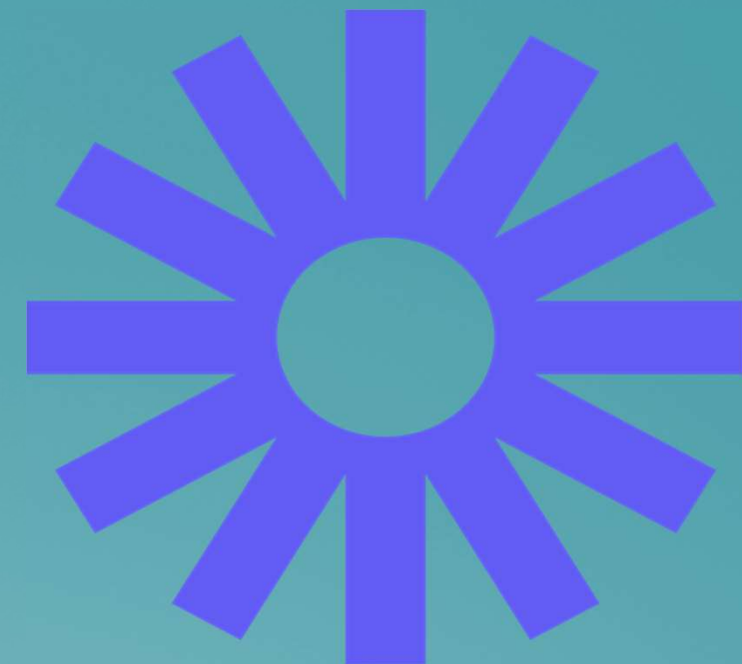
## Microsoft PowerPoint

To present the report in structured manner.



## Loom

To record the video presentation



# DATASET DESCRIPTION

For your final project we are providing you with a dataset of a Customer Experience (CX) Inbound calling team for 23 days. Data includes

- Agent\_Name
- Agent\_ID
- Customer\_Phone\_No
- Queue\_Time [duration for which customer have to wait before they get connected to an agent]
- Date\_&\_Time
- Time [time at which call was made by customer in a day]
- Time\_Bucket [for easiness we have also provided you with the time bucket]
- Duration [duration for which a customer and executives are on call ]
- Call\_Seconds [for simplicity we have also converted those time into seconds]
- call status (Abandon, answered,transferred).

The table has **117988** entries of phone calls.

# PROBLEM STATEMENT

We propose few problem statement to find solution

1. Calculate the average call time duration for all incoming calls received by agents (in each Time\_Bucket).
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, .....)
3. 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.)
4. 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

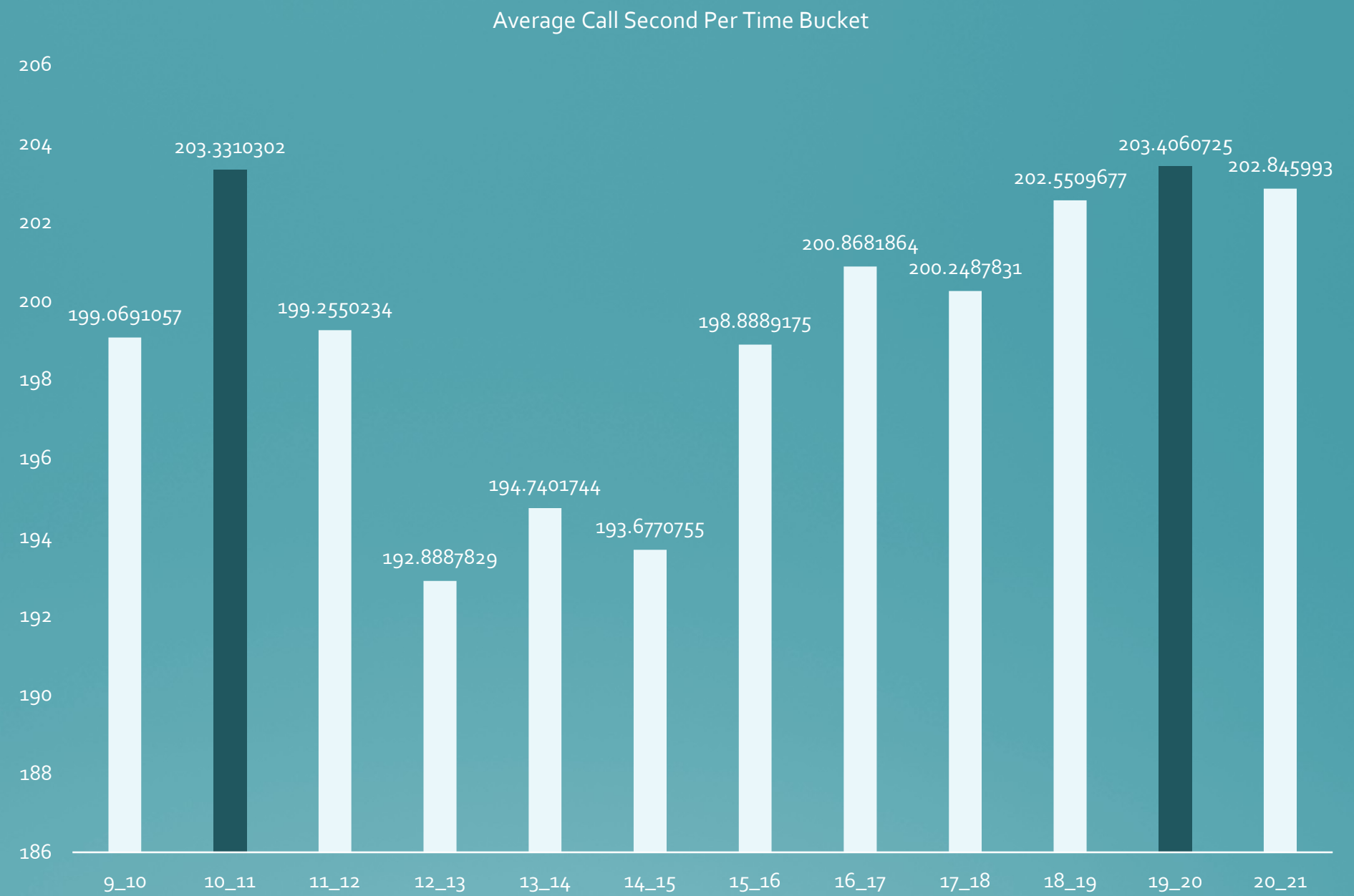
Now propose a manpower plan required during each time bucket in a day. Maximum Abandon rate assumption would be same 10%.



# AVERAGE CALL SECOND PER TIME BUCKET

Call_Status	answered
Time Bucket	Average of Call_Seconds (s)
9_10	199.0691057
10_11	203.3310302
11_12	199.2550234
12_13	192.8887829
13_14	194.7401744
14_15	193.6770755
15_16	198.8889175
16_17	200.8681864
17_18	200.2487831
18_19	202.5509677
19_20	203.4060725
20_21	202.845993
Total Average	198.6227745

**INSIGHT:**  
Average call seconds duration in incoming calls received by an Agent is 198.62 second, 19-20 time bucket has maximum average call duration

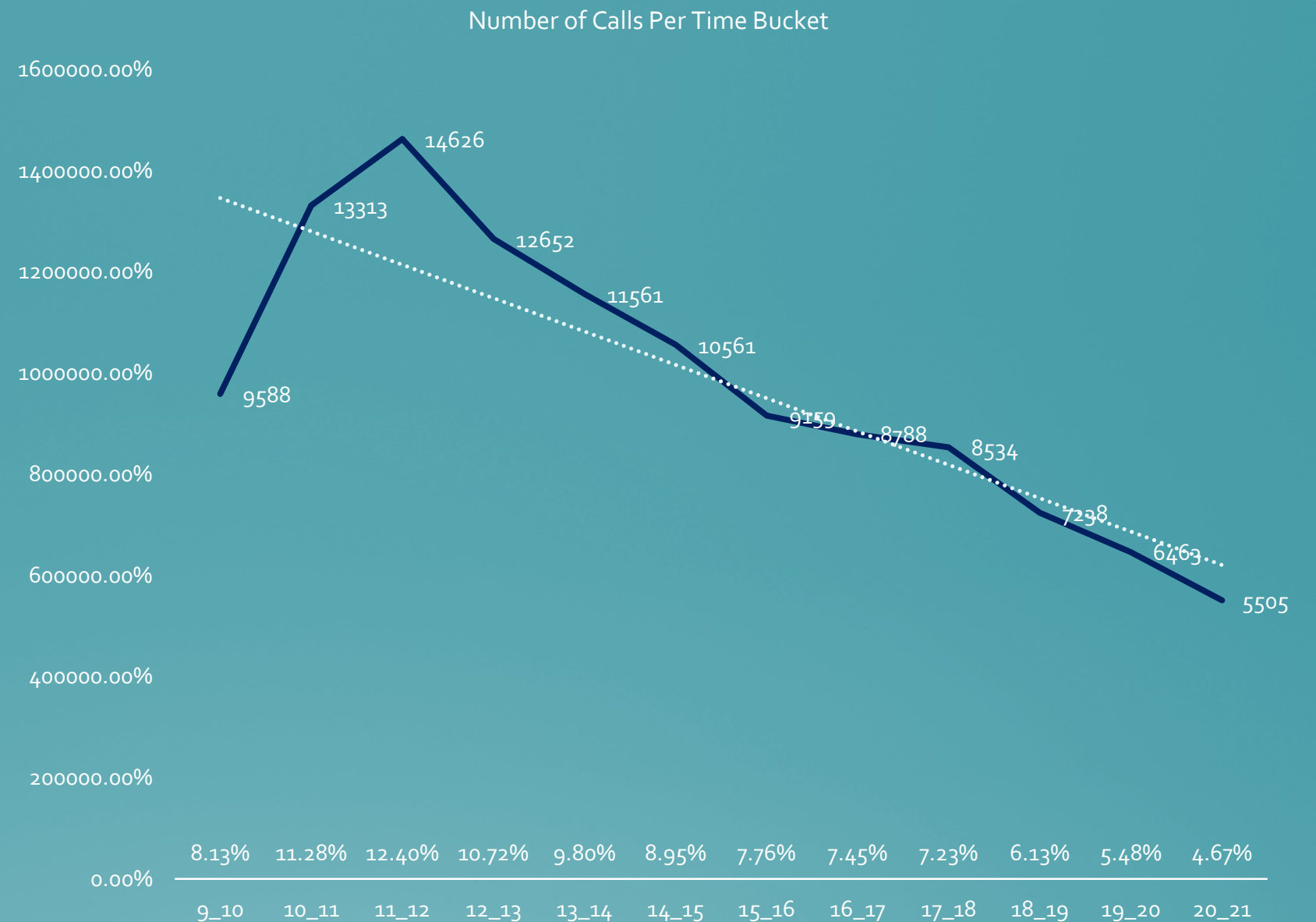


# CALL VOLUME TREND PER TIME BUCKET

TIME BUCKET	Volume/Number of Calls	Percentage of Calls
9_10	9588	8.13%
10_11	13313	11.28%
11_12	14626	12.40%
12_13	12652	10.72%
13_14	11561	9.80%
14_15	10561	8.95%
15_16	9159	7.76%
16_17	8788	7.45%
17_18	8534	7.23%
18_19	7238	6.13%
19_20	6463	5.48%
20_21	5505	4.67%
Total Calls	117988	100.00%

## INSIGHT:

Total 117988 calls came between 1 Jan 22 to 23 Jan 22, among all time bucket 11-12 had highest number of incoming calls which is 12.40% of total phone calls

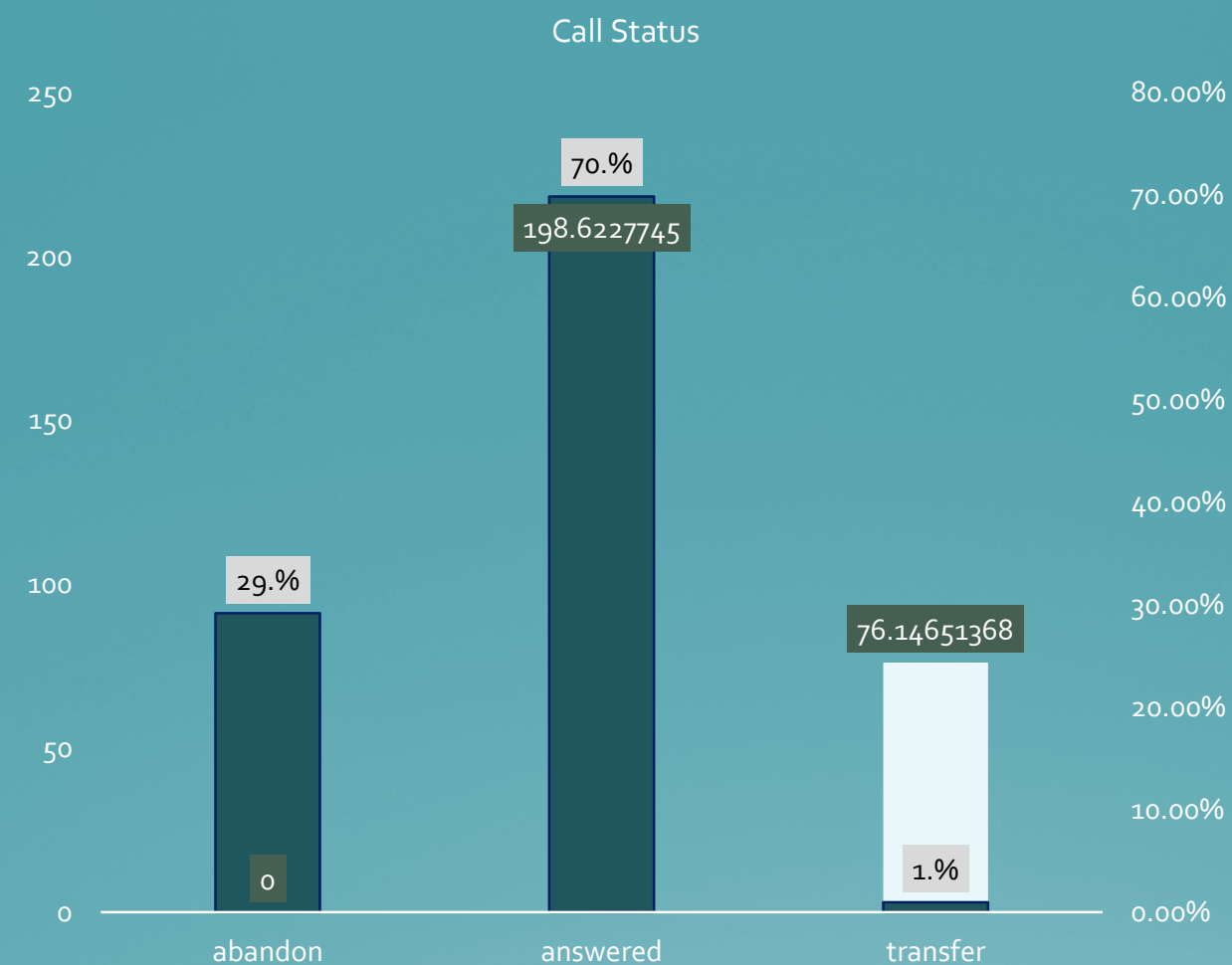




# CALL STATUS ANALYSIS

**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

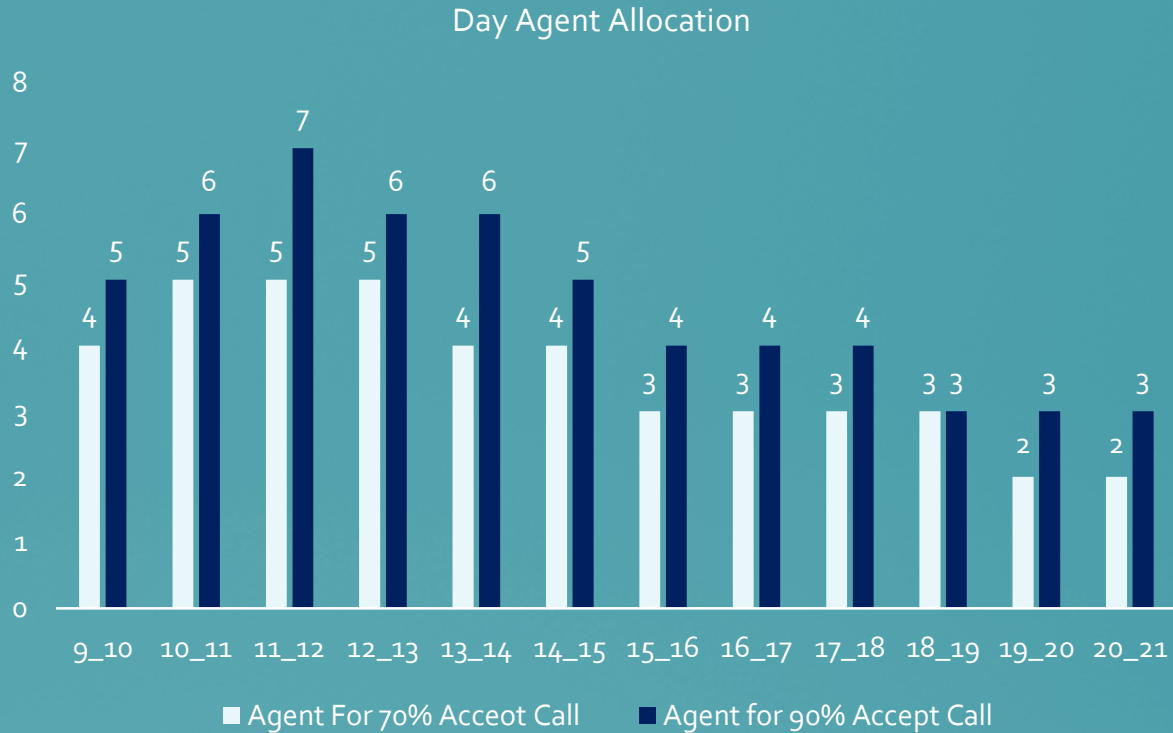
Date	Sum of Call_Seconds (s)
01-Jan	676664
02-Jan	574003
03-Jan	812863
04-Jan	861946
05-Jan	846798
06-Jan	829040
07-Jan	757019
08-Jan	735444
09-Jan	541147
10-Jan	778739
11-Jan	785717
12-Jan	709934
13-Jan	691320
14-Jan	564227
15-Jan	556267
16-Jan	674394
17-Jan	945615
18-Jan	796768
19-Jan	750270
20-Jan	759613
21-Jan	639855
22-Jan	621577
23-Jan	553899
Grand Total	16463119
Total Call second per Day On Avg	715787.7826



- On average 70% incoming call answered
- Employee's working hour= 7.5 hours
- Employee's working hour on call = 60% of 7.5 hour = 4.5 hour
- Average no of incoming calls per day =  
Total calls /23 = 117988 / 23 = 5130

# AGENT DISTRIBUTION PER TIME BUCKET IN DAY

Time Bucket	Agent For 70% Acceot	Agent for 90% Ac
9_10	4	5
10_11	5	6
11_12	5	7
12_13	5	6
13_14	4	6
14_15	4	5
15_16	3	4
16_17	3	4
17_18	3	4
18_19	3	3
19_20	2	3
20_21	2	3



- On average total call seconds per day=715787.7826 s
- On average total call hours per day =  $715787.7826/3600=198.8299396$  hour
- Agent required for 70% accepted calls =  $198.8299396 \text{ hours} / 4.5 \text{ hours} = 44$  (approximately)
- Agent required for 90% accepted calls =  $44*9/7=57$  (approximately)

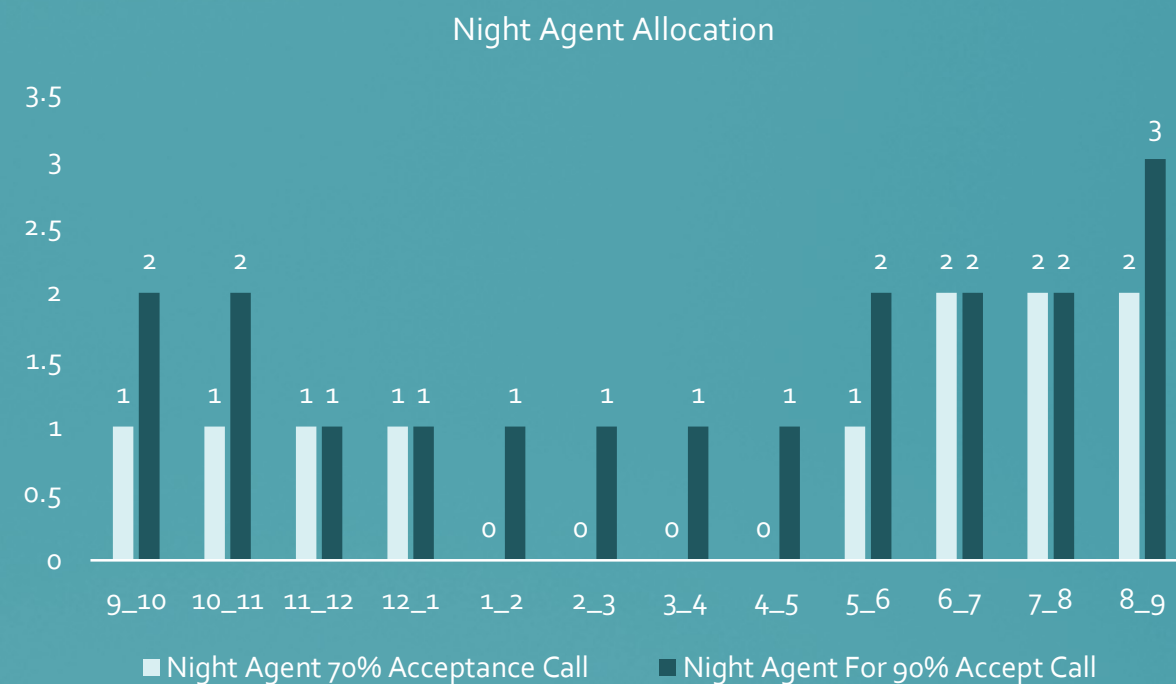
We can distribute 57 agents on different time bucket for requirement.

11-12 time slot has high demand so we can allocate 7 agents while 18-21 time slot is low demand so we can allocate 3 agents per hour.

Formula used : Agent for 90% accept call = % of call per time bucket \* 57

# AGENT DISTRIBUTION PER TIME BUCKET IN NIGHT

Night Time Bucket	Night Agent 70% Acc	Night Agent For 90
9_10	1	2
10_11	1	2
11_12	1	1
12_1	1	1
1_2	0	1
2_3	0	1
3_4	0	1
4_5	0	1
5_6	1	2
6_7	2	2
7_8	2	2
8_9	2	3



- Average call at night = 30% of average call at day = 30% Of 5130 = 1539
- Average call seconds = 139.5321473
- Total call second at night = 139.5321473 \* 1539 = 214739.9747 s
- Total call hour at night = 214739.9747/3600 = 59.64999297 hr.
- Agent required for 70% call acceptance at night = 59.64999297/4.5 = 13
- Agent required for 90% call acceptance at night = 13\* 9/7 = 17

We can distribute 17 agents on different time bucket for requirement.

8-9 time slot has high demand so we can allocate 3 agents while 1-5 time slot is low demand so we can allocate 1 agents per hour.

Formula used : Agent for 90% accept call = % of call per time bucket \* 17



# MAN POWER MANAGEMENT

Time Bucket	Man Power For 70 % calls	Manpower for 90% Call
9_10	4	5
10_11	5	6
11_12	5	7
12_13	5	6
13_14	4	6
14_15	4	5
15_16	3	4
16_17	3	4
17_18	3	4
18_19	3	3
19_20	2	3
20_21	2	3
21_22	1	2
22_23	1	2
23_0	1	1
0_1	1	1
1_2	0	1
2_3	0	1
3_4	0	1
4_5	0	1
5_6	1	2
6_7	2	2
7_8	2	2
8_9	2	3
Total	57	74

Man Power Distribution



Total Agent requires for 10% abandon call rate throughout the day for each day = 57+17=74

Total Agent present at the call center = 65

Each agent work for 6 days in week with 4 unplanned leaves in month .

Total working day for each agent = 24 -4 = 20 day.

Total Man power needed in 30 days for 10% abandon call rate = 74\*30 = 2220

Total man power present = 65\* 20=1300

Man Power required = 2220-1300=920

Agent recruitment needed = 920/20 = 46

# INSIGHT

- Average call seconds duration in incoming calls received by an Agent is 198.62 second, 19-20 time bucket has maximum average call duration 203.4 s followed by 10-11 time bucket with 203.3s average call duration.
- Total 117988 calls came between 1 Jan 22 to 23 Jan 22, among all time bucket 11-12 had highest number of incoming calls which is 12.40% of total phone calls
- Average incoming call per day is 5130 and 70% call are answered on average.
- For 90% call acceptance rate 57 agents required per day on average and 17 agents requires per night on average.
- For 10 % abandon call rate each day throughout the month the company needs 46 more agents.

# CONCLUSION

- This project has helped gain experience on working with real life data set.
- I get the opportunity to explore Microsoft Excel in a larger level which helped me to level up my Excel skill.
- I learnt mathematical analysis to find deeper insight from any dataset.
- Further this project gives me an insight of call centre company and how incoming calls are handled. It also helped me to understand how we can manage man power in a company for best possible outcomes.



THANK YOU