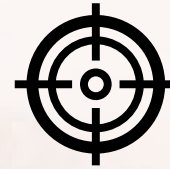




ABC Call Volume Trend Analysis

Project Description:

- In this project, I'll be diving into the world of Customer Experience (CX) analytics, specifically focusing on the inbound calling team of an insurance company named ABC.
- The dataset includes information that spans 23 days and includes various details such as the agent's name and ID, the queue time (how long a customer had to wait before connecting with an agent), the time of the call, the duration of the call, and the call status (whether it was abandoned, answered, or transferred).
- Customer Experience (CX) Analytics is a process that allows businesses to understand their customers interactions and experiences with their products or services.
- It involves the collection, analysis, and interpretation of customer data to gain insights into customer behavior, preferences, and expectations and share these insights with the rest of the organization.
- This team is responsible for a wide range of tasks, including managing customer experience programs, handling internal communications, mapping customer journeys, and managing customer data, among others.
- One of the key roles in a CX team is that of the customer service representative, also known as a call center agent. These agents handle various types of support, including email, inbound, outbound, and social media support.
- The focus of this project is in inbound customer support, involves handling incoming calls from existing customers. The goal is to attract, engage, and delight customers, turning them into loyal and recurring advocates for the business.



Approach:

- Firstly, I Filtered the dataset as per the client's convenience.
- In Time_Bucket column, I replaced the underscore{ _ } characters with hyphen{ - } character using Excel Power Query Editor.
- Further I performed Data Analysis Tasks by summarizing the Filtered dataset using Pivot Tables.
- By using Pivot Tables, I created Pivot Charts to understand the trends in the call volume of the Customer Experience team and derive valuable insights from it.

Tech-Stack used:



○ MS EXCEL 2019

- ✓ Used MS Excel in this project for data cleaning, data analysis and visualizations.



○ MS PowerPoint 2019

- ✓ Used MS PowerPoint to prepare the project report and presentation.



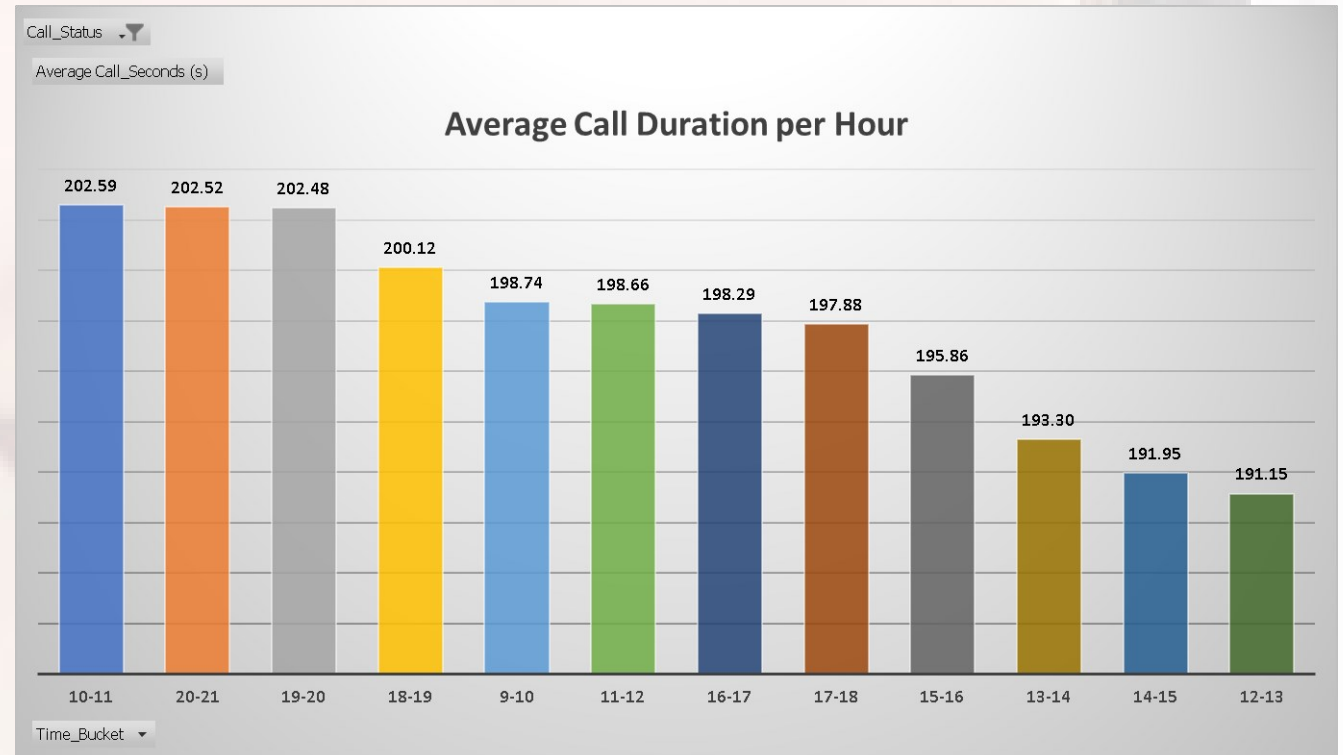
Insights



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

Call_Status (Multiple Items)

| Time Bucket | Average Call_Seconds (s) |
|-------------|--------------------------|
| 10-11 | 202.5938769 |
| 20-21 | 202.5173611 |
| 19-20 | 202.4782232 |
| 18-19 | 200.1208565 |
| 9-10 | 198.7373282 |
| 11-12 | 198.6600372 |
| 16-17 | 198.2948638 |
| 17-18 | 197.8801445 |
| 15-16 | 195.8571429 |
| 13-14 | 193.2963998 |
| 14-15 | 191.9543656 |
| 12-13 | 191.1536695 |
| Grand Total | 196.9626009 |







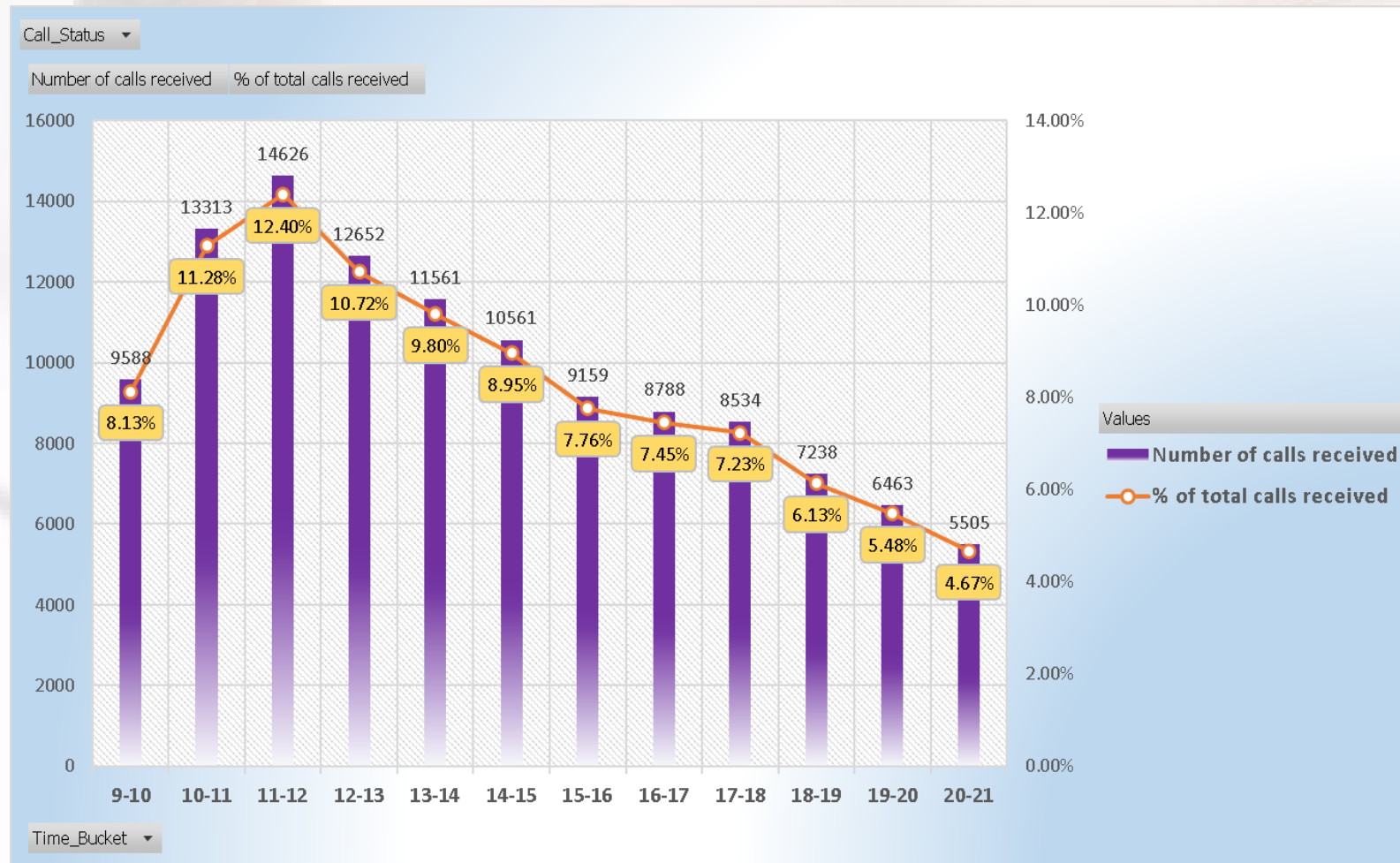
- * The average call duration of all incoming calls received by agents from 9 am – 9 pm is 196.96 seconds
- * The average call duration is highest between 10 am to 11 am and between 07 pm to 09 pm.
- * The average minimum call duration is between 12 pm to 13 pm.



2. Determine total number of calls received in each time bucket.

| Call_Status (All)  | | |
|---|--------------------------|---------------------------|
| Time Bucket  | Number of calls received | % of total calls received |
| 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% |
| Grand Total | 117988 | 100.00% |





* Based on the analysis, I found that the highest number of calls are made by customers between 11 am and 12 noon.

* Customers make the least calls between 8 pm and 9 pm.

* These insights give useful information regarding daily customer call trends, showing peak and low activity hours.

3. What is the minimum number of agents required in each time bucket to reduce the abandon rate to 10%?

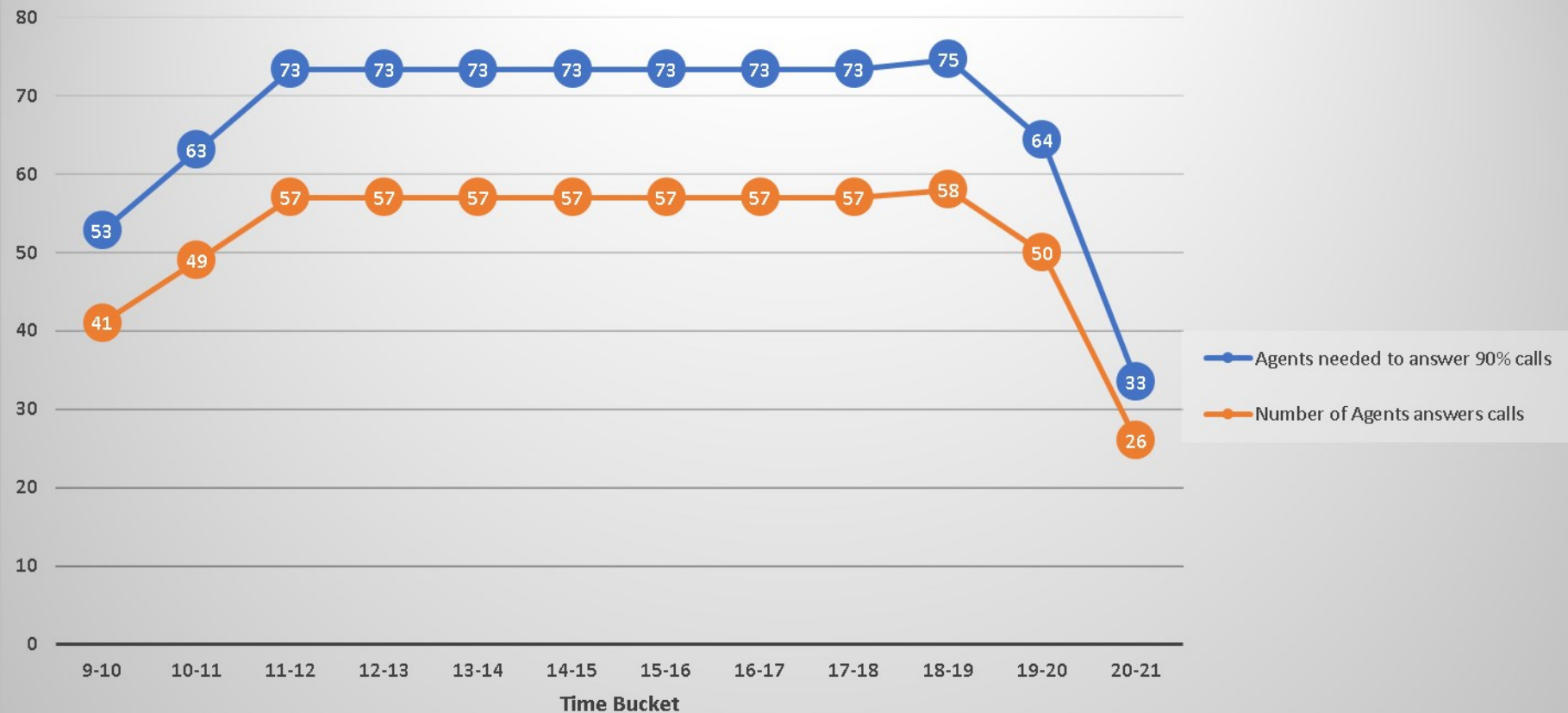
| Call_Status | Count of Call_Status | % of total | Average Call_Seconds (s) |
|-------------|----------------------|------------|--------------------------|
| abandon | 34403 | 29.16% | 0.00 |
| answered | 82452 | 69.88% | 198.62 |
| transfer | 1133 | 0.96% | 76.15 |
| Grand Total | 117988 | 100.00% | 139.53 |

Call_Status answered

| Time Bucket | total answered calls | % of total | Distinct Count of Agents | Number of Agents needed to answer 90% calls |
|-------------|----------------------|------------|--------------------------|---|
| 9-10 | 4428 | 5.37% | 41 | 53 |
| 10-11 | 6368 | 7.72% | 49 | 63 |
| 11-12 | 8560 | 10.38% | 57 | 73 |
| 12-13 | 9432 | 11.44% | 57 | 73 |
| 13-14 | 8829 | 10.71% | 57 | 73 |
| 14-15 | 7974 | 9.67% | 57 | 73 |
| 15-16 | 7760 | 9.41% | 57 | 73 |
| 16-17 | 7852 | 9.52% | 57 | 73 |
| 17-18 | 7601 | 9.22% | 57 | 73 |
| 18-19 | 6200 | 7.52% | 58 | 75 |
| 19-20 | 4578 | 5.55% | 50 | 64 |
| 20-21 | 2870 | 3.48% | 26 | 33 |
| Average | 6871 | 8.33% | 52 | 67 |

| Call_Status | Count of Call_Status | % of total | Distinct Count of Agents | 90% Agents : 69.88% Agents |
|-------------|----------------------|------------|--------------------------|----------------------------|
| abandon | 11798.8 | 10% | 0 | 0 |
| answered | 106189.2 | 90% | 67 | 1.29 |

Number of agents needed to reduce abandon call rate to 10%



| Time Bucket | minimum number of agents required |
|-------------|-----------------------------------|
| 9-10 | 12 |
| 10-11 | 14 |
| 11-12 | 16 |
| 12-13 | 16 |
| 13-14 | 16 |
| 14-15 | 16 |
| 15-16 | 16 |
| 16-17 | 16 |
| 17-18 | 16 |
| 18-19 | 17 |
| 19-20 | 14 |
| 20-21 | 7 |

- * Using Pivot Tables, I summarized the Call_Status column to find percentage of abandoned, answered calls and Transferred calls.
- * For each time bucket, I found number of distinct agents using Power-Pivot table for answered Call_Status.
- * To find number of distinct agents required to answer atleast 90% calls for each time bucket, I used 'ratio' method got from finding 'ratio' between average number of distinct agents currently answering the calls and average number of agents needed to answer 90% calls
- * The distinct number of agents for answering 90% calls in each time bucket is calculated using product of ratio number and distinct number of agents currently answering calls in each time bucket.
- * Minimum number of agents required is found by finding the difference between average number of agents needed to answer 90% calls and average number of agents currently answering the calls.

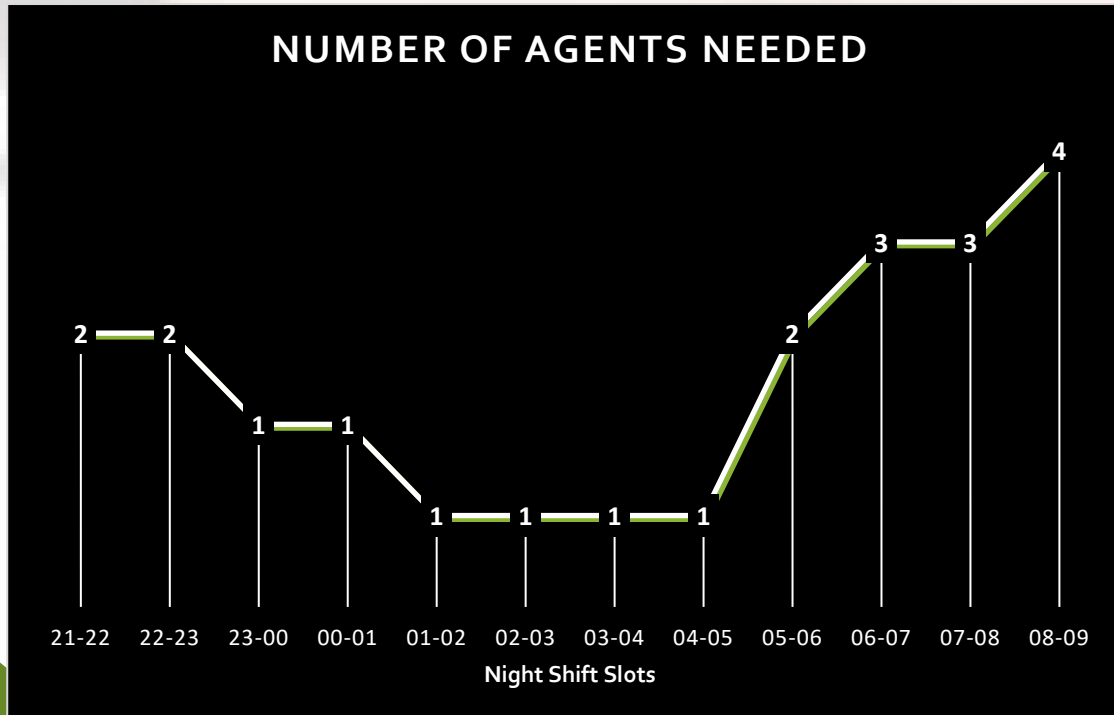
4. Propose a manpower plan for each time bucket throughout the night, keeping the maximum abandon rate at 10%.

| Count of Call_Status | Call_Status | | | |
|----------------------|-------------|----------|----------|-------------|
| Date | abandon | answered | transfer | Grand Total |
| 01-01-2022 | 684 | 3883 | 77 | 4644 |
| 02-01-2022 | 356 | 2935 | 60 | 3351 |
| 03-01-2022 | 599 | 4079 | 111 | 4789 |
| 04-01-2022 | 595 | 4404 | 114 | 5113 |
| 05-01-2022 | 536 | 4140 | 114 | 4790 |
| 06-01-2022 | 991 | 3875 | 85 | 4951 |
| 07-01-2022 | 1319 | 3587 | 42 | 4948 |
| 08-01-2022 | 1103 | 3519 | 50 | 4672 |
| 09-01-2022 | 962 | 2628 | 62 | 3652 |
| 10-01-2022 | 1212 | 3699 | 72 | 4983 |
| 11-01-2022 | 856 | 3695 | 86 | 4637 |
| 12-01-2022 | 1299 | 3297 | 47 | 4643 |
| 13-01-2022 | 738 | 3326 | 59 | 4123 |
| 14-01-2022 | 291 | 2832 | 32 | 3155 |
| 15-01-2022 | 304 | 2730 | 24 | 3058 |
| 16-01-2022 | 1191 | 3910 | 41 | 5142 |
| 17-01-2022 | 16636 | 5706 | 5 | 22347 |
| 18-01-2022 | 1738 | 4024 | 12 | 5774 |
| 19-01-2022 | 974 | 3717 | 12 | 4703 |
| 20-01-2022 | 833 | 3485 | 4 | 4322 |
| 21-01-2022 | 566 | 3104 | 5 | 3675 |
| 22-01-2022 | 239 | 3045 | 7 | 3291 |
| 23-01-2022 | 381 | 2832 | 12 | 3225 |
| Average | 1496 | 3585 | 49 | 5130 |

| | |
|---|------------------|
| Average Time taken in seconds to answer an call | 198.62 |
| Average Time needed in seconds to answer 90% calls | 255.81 |
| Average working agents to answer 90% calls (9 AM - 9 PM) | 67 |
| Total call volume during day (9 AM - 9 PM) | 5130 |
| For night, to answer 30% of overall day calls (9 PM - 9 AM) | 1539 |
| Additional hours required to answer 90% calls in night | 98.4214874037624 |
| Additional Agents needed to answer 90% night calls | 22 |
| Total Agents needed (Day + Night Shift) | 89 |

| Assumptions | |
|--|-----|
| Working Days/week | 6 |
| Agents total working hours | 9 |
| Agents actual working hours without breaks | 7.5 |
| Time spent on calls during day shift | 4.5 |
| No of days/month | 30 |
| Number of Unplanned leaves/month | 4 |

| Night Shift | Call Distribution | Time Distribution | Agents needed |
|--------------|-------------------|-------------------|---------------|
| 21-22 | 3 | 10.00% | 2 |
| 22-23 | 3 | 10.00% | 2 |
| 23-00 | 2 | 6.67% | 1 |
| 00-01 | 2 | 6.67% | 1 |
| 01-02 | 1 | 3.33% | 1 |
| 02-03 | 1 | 3.33% | 1 |
| 03-04 | 1 | 3.33% | 1 |
| 04-05 | 1 | 3.33% | 1 |
| 05-06 | 3 | 10.00% | 2 |
| 06-07 | 4 | 13.33% | 3 |
| 07-08 | 4 | 13.33% | 3 |
| 08-09 | 5 | 16.67% | 4 |
| Total | 30 | 100.00% | 22 |



- * Considering average total call volume of 5130 and if 30% of total call volume of day shift were to be answered then minimum calls to be answered in night shifts should be 1539.
- * Considering Time spent on calls during day shift as 4.5 hours and additional night hours needed to answer 90% calls, the minimum number of distinct agents needed to answer atleast 90% calls in night shifts is 22.
- * If there were 30 customers making calls during night out of 100 customers making calls during day at same time bucket, then the call distribution for each night shifts as shown in the table.
- * For each of these night slots, I have calculated the time distribution on dividing call distribution by total call distribution for each night shifts.
- * Using time distribution, I found out how these 22 additional agents can be distributed for each night shifts by finding product of (22 additional agents and time distribution) for each night shifts.

Results and Recommendations:

- * Maximum number of calls are made between 9 am to 12 pm. Hence, the company can assign more agents during these shifts to answer more calls from customers.
- * It is noticeable that there is declining trend of number of calls being made starting from 12 pm - 9 pm. The company can make a note of this in order to effectively manage the resources and manpower and can reduce the number of agents assigned in these time bucket as per number of calls being made in these time buckets and can some shift some of these agents to work during night shifts.
- * The company can also divide the total working agents into 3 parts or making them work in rotations by offering them perks like night shift allowance, free-dinner and snacks, so that the agents don't resign the company for better opportunities and can help the customers for maximum amount of time and thus reducing number of transferred calls for quick responses and better customer satisfaction.
- * Project link - [Call Volume Data](#)

(Recommended to open in MS Excel 2019 and above versions only).