

Data Analysis Report: Optimizing Call Center Performance

Introduction :-

In today's fast-paced world, exceptional customer service can be the key differentiator for businesses. Our call center serves as the frontline for customer interaction, making its performance crucial for customer satisfaction and retention. This report delves into a comprehensive analysis of our call center operations, identifying areas of strength and opportunities for improvement. By leveraging data analytics, we aim to optimize our call center performance and enhance the overall customer experience.

Objectives :-

- **Exploratory Data Analysis Goals:-**

1. Campaign Performance Report:
2. Lead Disposition Report.
3. Agent Performance Report:
4. Time Based Analysis.

- **Forecast Goals:-**

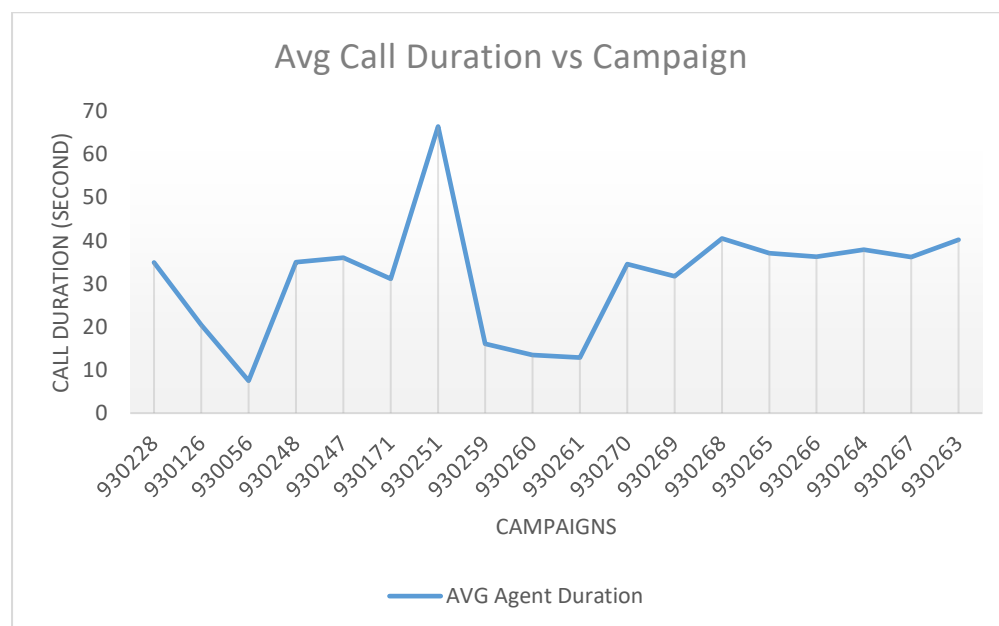
1. Call Volume Forecast.
 - Objective: Predict the total number of calls that will be made in the next 30 days based on historical data.
2. Lead Conversion Forecast:
 - Objective: Estimate the number of leads that will be converted into interested prospects over the next 30 days.
3. Agent Efficiency Forecast:
 - Objective: Predict agent performance metrics such as calls per hour, success rate, and average handling time.
4. Resource Allocation Forecast:
 - Objective: Forecast the number of agents required to handle the expected call volume and maintain desired performance levels.

Campaign Performance Report ([Link](#)):

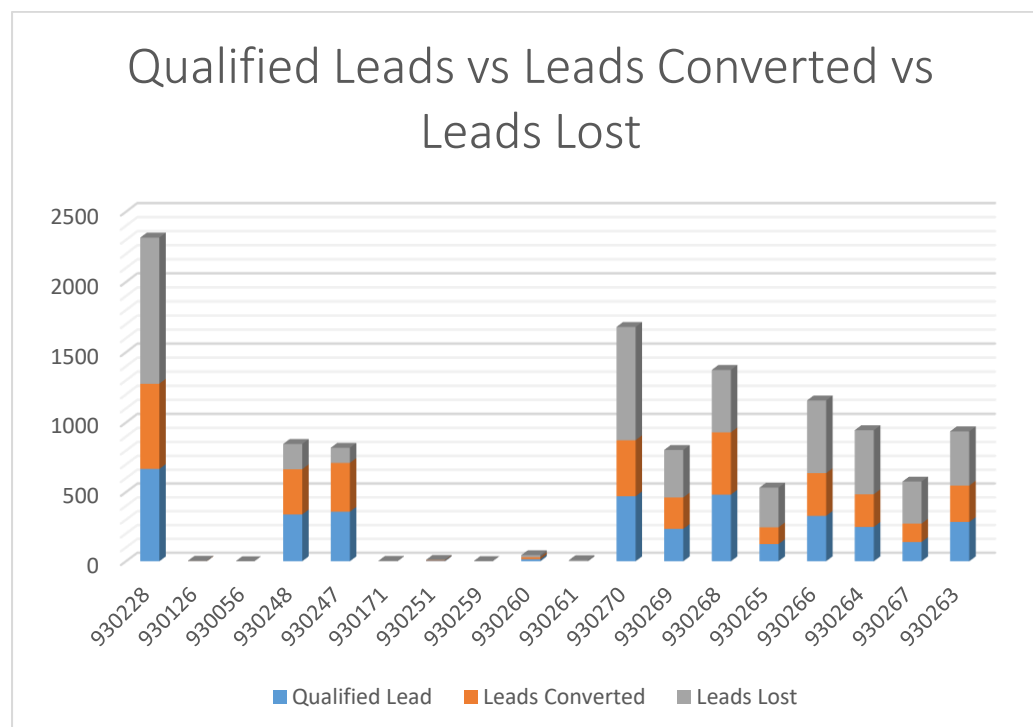
Purpose: To evaluate the performance of each campaign and agent.

| Campaign ID | Unique Lead | Calls | Calls_Connected | Unique Calls Connected | Qualified Leads | Leads converted | Leads Lost | Avg Agent Duration | Avg Customer Duration |
|-------------|-------------|-------|-----------------|------------------------|-----------------|-----------------|------------|--------------------|-----------------------|
| 930228 | 2404 | 5693 | 2088 | 1487 | 667 | 609 | 1040 | 34.90023 | 12.65783 |
| 930126 | 44 | 45 | 11 | 11 | 1 | 1 | 2 | 20.46667 | 4.444444 |
| 930056 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 7.5 | 0 |
| 930248 | 340 | 1498 | 533 | 296 | 338 | 327 | 182 | 35.02003 | 12.79105 |
| 930247 | 255 | 1103 | 381 | 222 | 358 | 353 | 109 | 36.06709 | 14.19764 |
| 930171 | 10 | 32 | 5 | 4 | 0 | 0 | 3 | 31.15625 | 4.5 |
| 930251 | 9 | 20 | 7 | 6 | 4 | 4 | 2 | 66.45 | 43.65 |
| 930259 | 16 | 41 | 3 | 3 | 0 | 0 | 1 | 16.09756 | 4.365854 |
| 930260 | 10 | 55 | 9 | 8 | 15 | 15 | 14 | 13.47273 | 5.545455 |
| 930261 | 10 | 27 | 4 | 3 | 0 | 0 | 8 | 12.88889 | 4 |
| 930270 | 1441 | 4340 | 1450 | 1005 | 470 | 404 | 806 | 34.57028 | 10.98387 |
| 930269 | 458 | 1612 | 511 | 353 | 234 | 227 | 343 | 31.72767 | 10.78412 |
| 930268 | 647 | 1859 | 717 | 515 | 481 | 449 | 444 | 40.46853 | 17.64766 |
| 930265 | 249 | 949 | 304 | 191 | 124 | 121 | 287 | 37.05269 | 12.6765 |
| 930266 | 613 | 2104 | 696 | 473 | 328 | 309 | 520 | 36.25475 | 12.64068 |
| 930264 | 783 | 2134 | 682 | 516 | 248 | 236 | 461 | 37.85848 | 13.57591 |
| 930267 | 302 | 1155 | 376 | 230 | 139 | 133 | 304 | 36.16104 | 12.19048 |
| 930263 | 685 | 1954 | 677 | 490 | 284 | 263 | 390 | 40.20573 | 16.14227 |

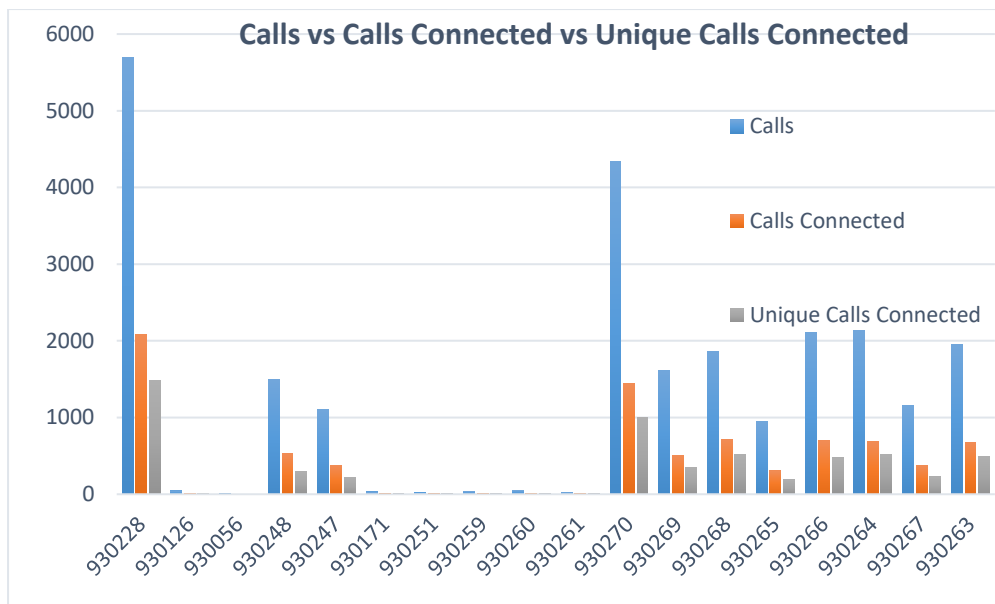
Insights :-



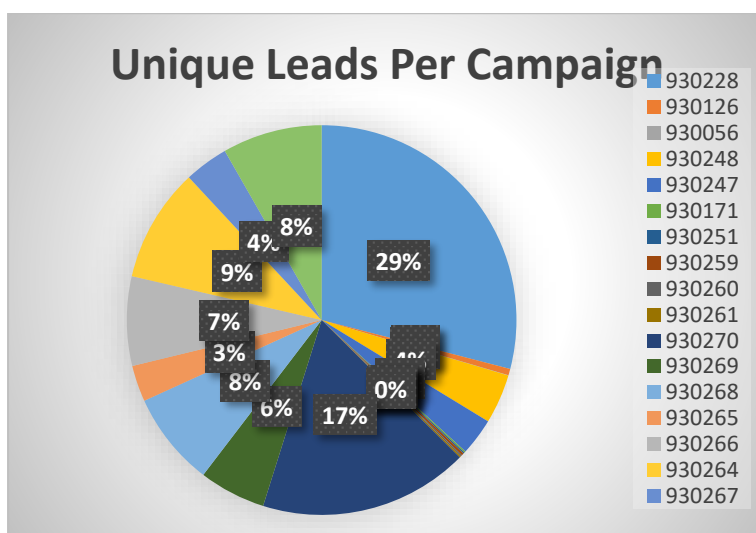
The graph "Avg Call Duration vs Campaign" shows that agent call durations generally range between 20-30 seconds, while customer call durations typically range between 10-20 seconds, indicating a stable pattern across most campaigns. A notable exception is campaign 930251, where both agent and customer call durations spike significantly, with agents averaging around 65 seconds and customers around 35 seconds. This suggests that campaign 930251 involved more complex interactions or specific issues requiring longer calls. Following this spike, call durations return to their usual levels, indicating the anomaly was isolated. The consistent difference in call durations between agents and customers is expected, given agents' additional responsibilities. Overall, shorter call durations across campaigns imply efficiency, while the spike in campaign 930251 highlights areas for potential process improvement or further training.



The graph illustrates the distribution of qualified leads, leads converted, and leads lost across various campaigns. Campaign 930228 stands out with the highest number of qualified leads, indicating a strong initial engagement. However, its conversion rate is moderate compared to the total qualified leads, suggesting room for improvement in closing deals. Campaigns 930248 and 930247 also show significant activity, with relatively higher conversion rates, indicating effective follow-up and closing strategies. In contrast, campaigns like 930126 and 930056 have minimal activity, reflecting either low engagement or inefficiency in converting and retaining leads. Overall, the data highlights the variability in campaign performance, emphasizing the need to analyze specific strategies used in successful campaigns to replicate and improve less successful ones.



The graph compares total calls, calls connected, and unique calls connected across various campaigns. Campaign 930228 shows a high call volume but low connectivity, suggesting issues with call effectiveness. Campaign 930270 also has a high call volume but with better connectivity, indicating more efficient dialing. Campaigns 930248 and 930247, despite lower call volumes, exhibit higher connection rates, indicating effective call management. Campaigns like 930056 and 930171 show minimal activity, suggesting either targeted efforts or operational issues. Overall, optimizing call strategies could enhance connectivity and campaign performance.



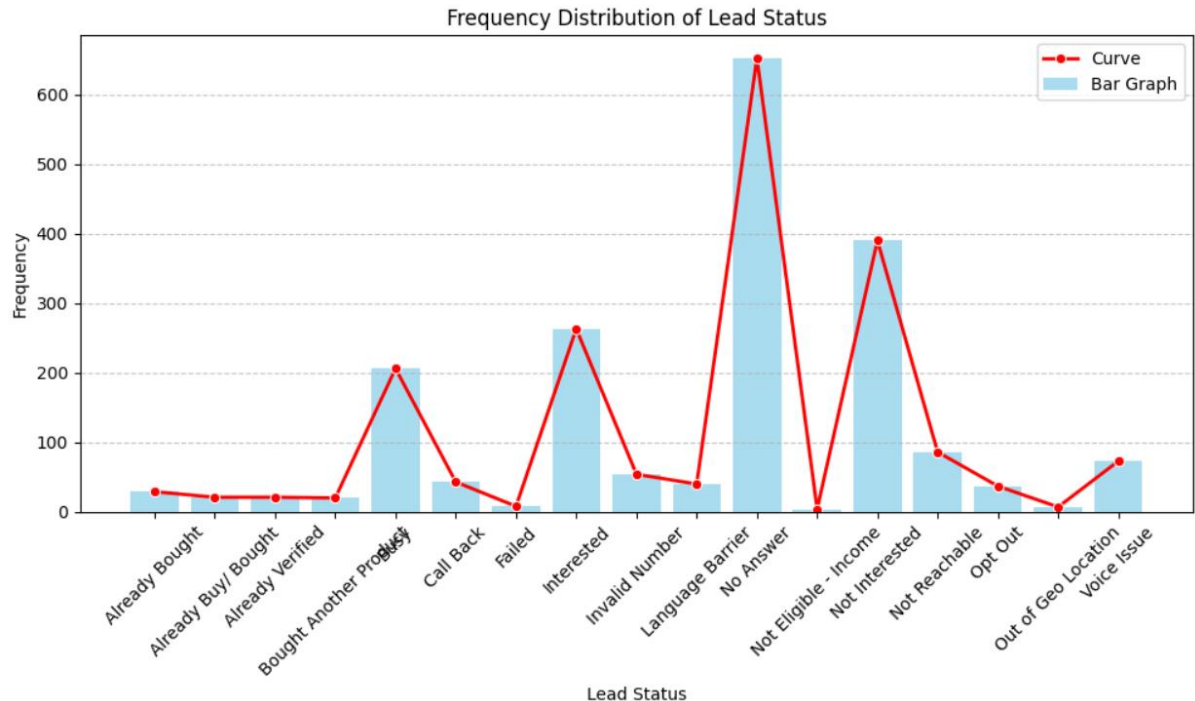
This graph shows that Unique Leads distribution Per each campaign.

Conclusion:-

While most campaigns maintain consistent call durations, campaign 930251 stands out with notably longer calls, indicating potential areas for process improvement or agent training. Variability in lead distribution underscores the need for tailored strategies, with campaigns like 930228 showing strong initial engagement but room for improvement in conversion rates. Moreover, differences in call connectivity highlight the effectiveness of call management strategies, emphasizing the importance of optimizing dialing approaches. Overall, these findings provide actionable insights for enhancing efficiency, refining engagement strategies, and maximizing campaign success.

Lead Disposition Report ([Link](#)):

Purpose: To analyze the outcomes of call attempts and improve call strategies



This Distribution graph provides a clear picture of the outcomes for your call attempts, categorized by lead statuses. Analyzing this data offers valuable insights for improving your call strategies and increasing lead conversion.

Key Observations: The graph reveals a distribution of lead statuses, indicating your sales team encounters various results during calls. We can see prominent spikes for statuses like "Not Reachable," "No Answer," and "Interested." **Challenges and Opportunities:** High "Not Reachable" and "No Answer": This suggests potential gaps in outreach strategy.

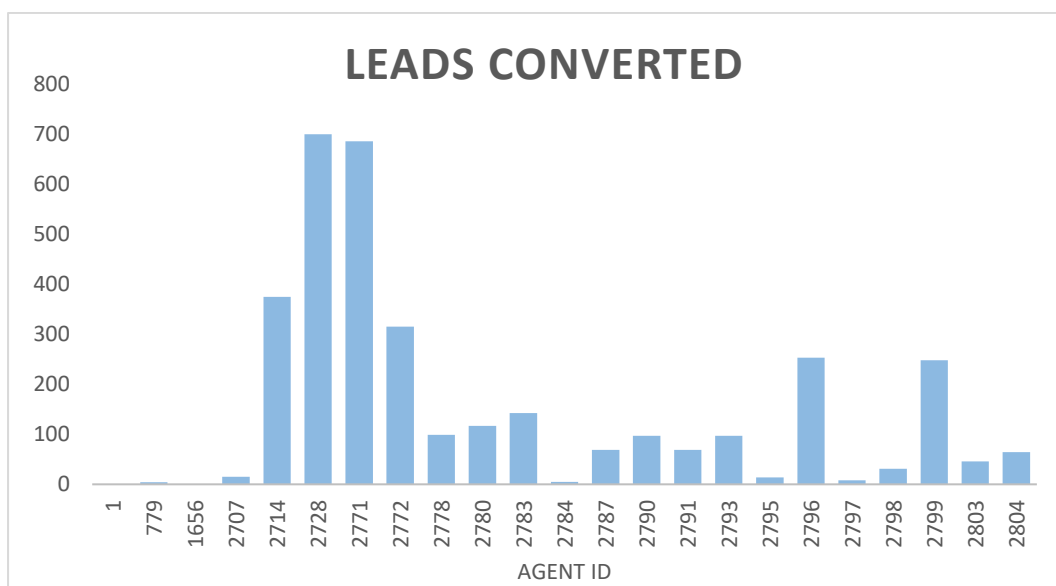
Conclusion:

Optimizing call timing: Analyze the data by time of day and adjust all schedules to target periods with higher reachability. **Exploring alternative contact methods:** Supplement phone calls with email, text messages, or social media outreach to increase engagement.

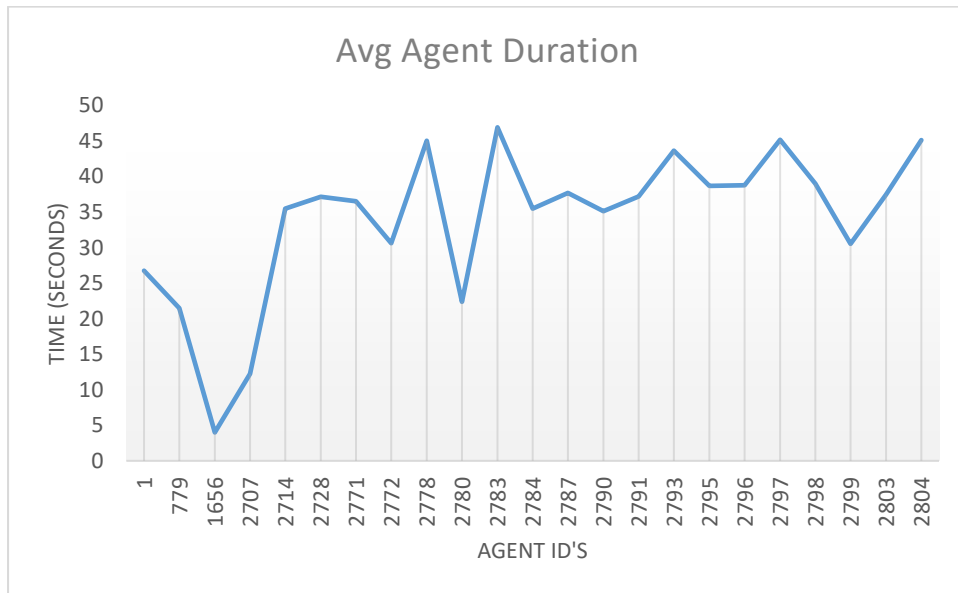
Agent Performance Report ([Link](#)):

Purpose: To assess the performance of each calling agent.

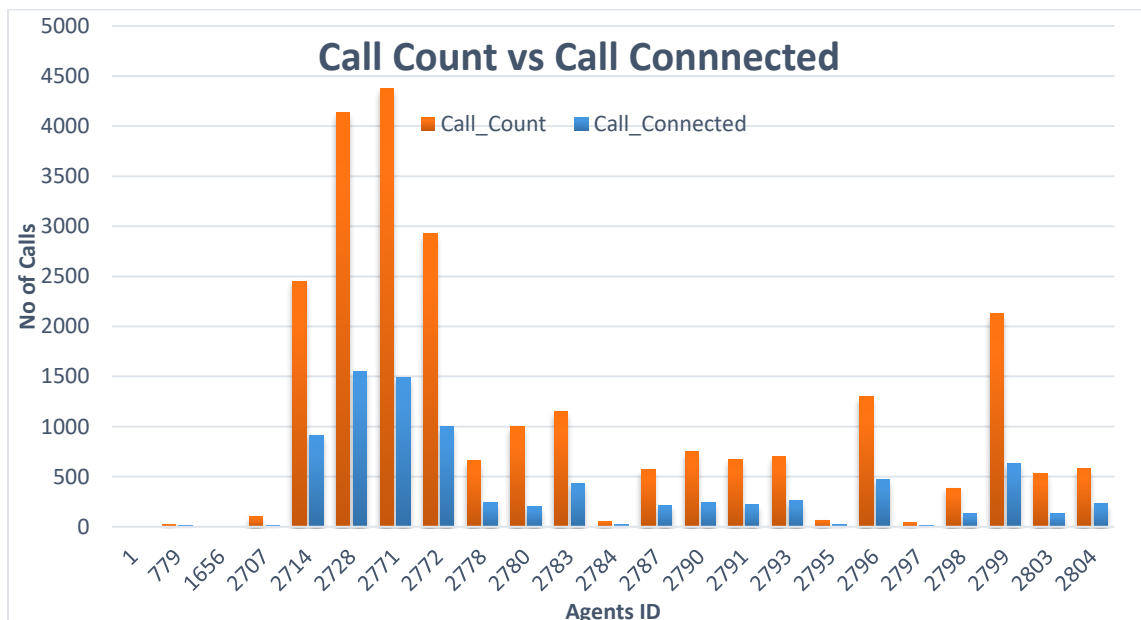
| Agent Id | Call_Count | Leads_Converted | Calls_Connected | Avg_Agent_Duration (Seconds) |
|----------|------------|-----------------|-----------------|------------------------------|
| 1 | 4 | 0 | 2 | 26.75 |
| 779 | 27 | 4 | 11 | 21.48148148 |
| 1656 | 1 | 0 | 0 | 4 |
| 2707 | 104 | 15 | 15 | 12.23076923 |
| 2714 | 2453 | 374 | 916 | 35.48512026 |
| 2728 | 4134 | 699 | 1553 | 37.16328012 |
| 2771 | 4372 | 685 | 1491 | 36.52973468 |
| 2772 | 2930 | 315 | 998 | 30.63720137 |
| 2778 | 659 | 99 | 238 | 45.04855842 |
| 2780 | 999 | 117 | 201 | 22.38038038 |
| 2783 | 1147 | 142 | 434 | 46.93199651 |
| 2784 | 57 | 5 | 20 | 35.50877193 |
| 2787 | 572 | 69 | 215 | 37.69405594 |
| 2790 | 750 | 97 | 247 | 35.13333333 |
| 2791 | 668 | 69 | 224 | 37.18862275 |
| 2793 | 704 | 97 | 259 | 43.64346591 |
| 2795 | 65 | 14 | 24 | 38.67692308 |
| 2796 | 1304 | 253 | 470 | 38.80138037 |
| 2797 | 44 | 8 | 13 | 45.18181818 |
| 2798 | 386 | 31 | 132 | 39.00777202 |
| 2799 | 2128 | 248 | 629 | 30.55545113 |
| 2803 | 533 | 46 | 130 | 37.46904315 |
| 2804 | 582 | 64 | 232 | 45.13573883 |



The graph you sent appears to be a bar chart showing the number of leads converted by a sales agent with the agent ID on the x-axis and the number of leads converted on the y-axis. The y-axis goes from 0 to 800 and the x-axis shows several agent IDs. It appears that Agent ID 2778 converted the most leads, at around 779. There is a large gap between the number of leads converted by Agent ID 2778 and the rest of the agents. Agent IDs 2793, 2707, and 2714 also converted a relatively high number of leads.



Overall, the graph suggests a high variability in average interaction duration between agents to understand why there is such a variation we will discuss Call Connected by Agents.



Graph shows the number of calls received by the call center and the number of calls that were successfully connected to an agent. The x-axis likely represents Agent ID. We can see

from this graph that the number of calls received is consistently higher than the number of calls connected. Explains why there is such huge variability within Agents Avg Call Duration.

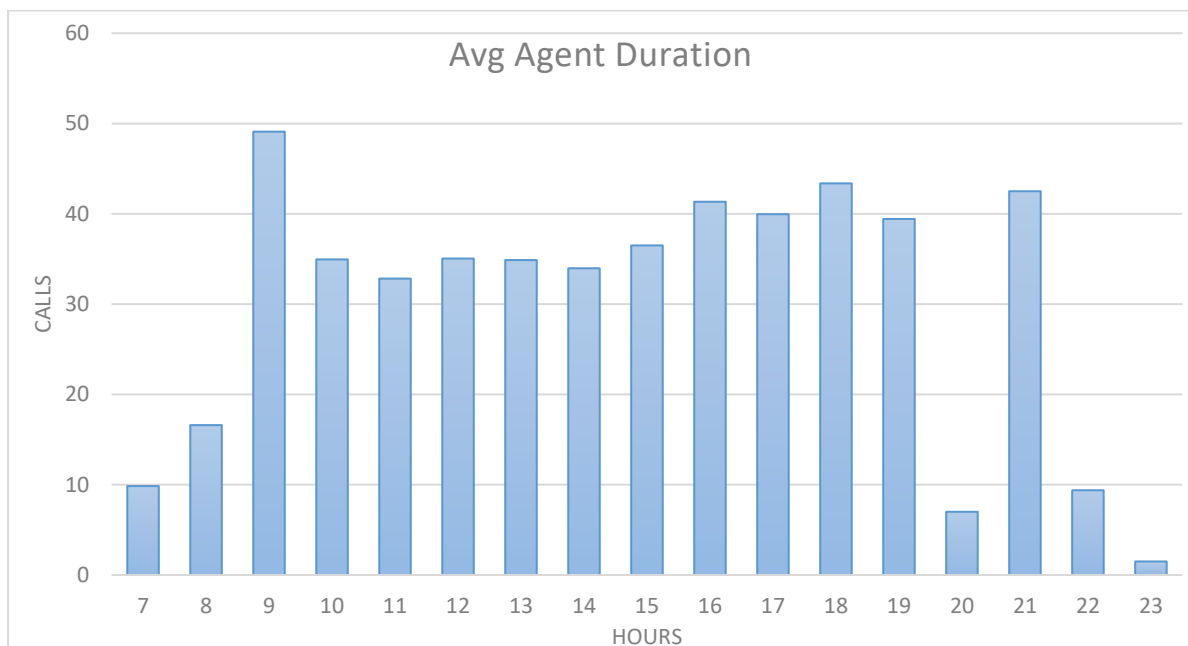
Conclusion:-

In conclusion, the call center appears to be facing challenges in managing call volume and efficiency. Distribution of Calls are not evenly distributed among agents. To improve the caller experience, the call center may want to consider optimizing agent performance through coaching or explore staffing adjustments to better match call volume.

Time Based Analysis ([Link](#)):

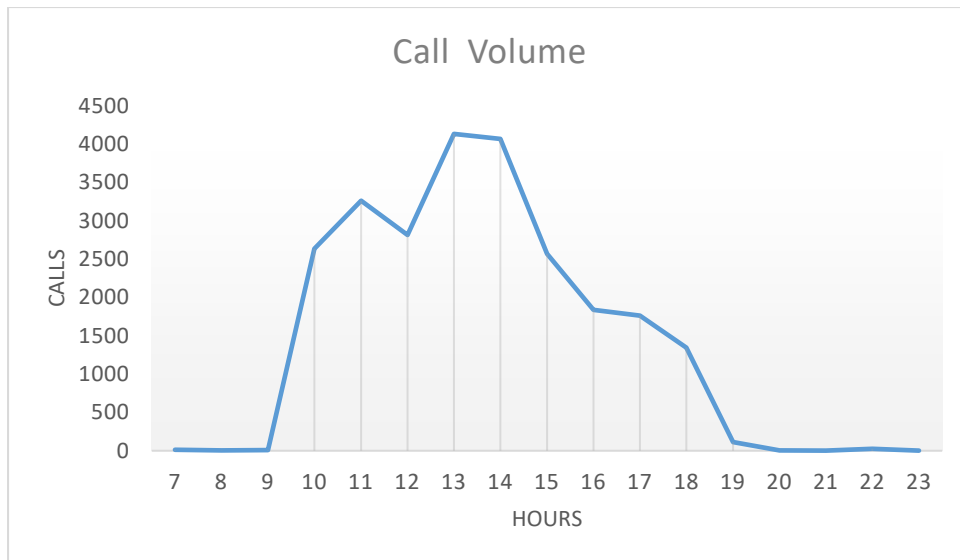
Purpose – To assess performance of call center in working hours.

| call_hour | Total Calls | Conversion Rate | Avg Agent Duration |
|-----------|-------------|-----------------|--------------------|
| 7 | 13 | 0.153846154 | 9.846153846 |
| 8 | 5 | 0 | 16.6 |
| 9 | 10 | 0.2 | 49.1 |
| 10 | 2638 | 0.124336619 | 34.94958302 |
| 11 | 3265 | 0.135987749 | 32.82542113 |
| 12 | 2819 | 0.160695282 | 35.04753459 |
| 13 | 4136 | 0.141682785 | 34.87935203 |
| 14 | 4069 | 0.123371836 | 33.96583927 |
| 15 | 2571 | 0.166861144 | 36.49902762 |
| 16 | 1840 | 0.160869565 | 41.33586957 |
| 17 | 1764 | 0.120181406 | 39.95578231 |
| 18 | 1347 | 0.135115071 | 43.3674833 |
| 19 | 112 | 0.089285714 | 39.42857143 |
| 20 | 4 | 0 | 7 |
| 21 | 2 | 0 | 42.5 |
| 22 | 26 | 0.192307692 | 9.384615385 |
| 23 | 2 | 0 | 1.5 |



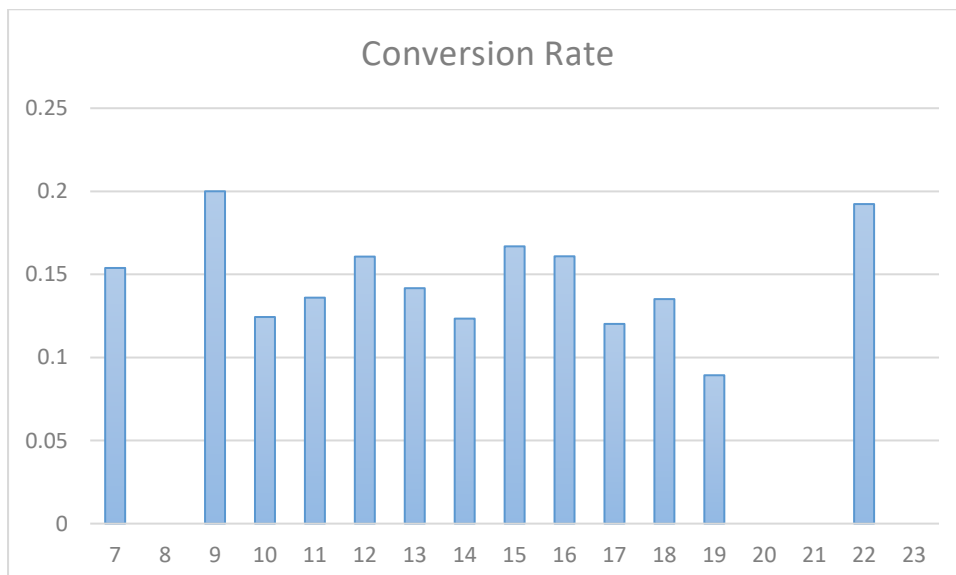
The x-axis is labeled "Hours" and goes from 7 to 23. The y-axis is labeled "Avg Agent Duration" and goes from 10 to 60.

The average call duration appears to be highest in the middle of the day, between 11 AM and 4 PM, and lowest at the beginning and end of the workday. This could be because agents are more likely to be dealing with complex inquiries during peak hours.



The x-axis is labeled "Hours" and goes from 7 to 23. The y-axis is labeled "No of Calls" and goes from 0 to 4500. The Call Volume starts to increase starting from 9 AM, reaches its peak in the afternoon.

The Call Volume appears to be highest in the middle of the day, between 11 AM and 4 PM, and lowest at the beginning and end of the workday.



As we can see in the graph at 7 AM and 10 PM there is significantly higher conversion rates, but we see in previous graphs call volume and avg agent call duration are comparatively low. We can label them as outliers in these graphs.

For the rest of Day Hours we Can see it is same as previous graphs 9 AM to 7 PM conversion rates remains constant with slight increase and decrease.

Conclusion:-

The analysis of average agent duration and call volume throughout the day reveals interesting patterns in agent activity and call behavior. Peak average call durations occur between 11 AM and 4 PM, suggesting that agents are likely handling more complex inquiries during these hours. This aligns with the trend of increasing call volume during the same period, indicating higher demand for agent assistance during midday hours.

Call Volume Forecast ([Link](#))

Forecast Summary:

This report summarizes the call volume forecast created in Excel for the period of May 16, 2024, to June 14, 2024.

- **Week of May 16th:** The average call volume is expected to be around 1229 calls per day.
- **Week of May 23rd:** The average call volume is expected to be around 1457 calls per day.
- **Week of May 30th:** The average call volume is expected to be around 1687 calls per day.
- **Week of June 6th:** The average call volume is expected to be around 2510 calls per day.
- **First Half of June 14th Week:** The call volume is expected to be around 2907 calls per day.

Forecast Data:

| Date | Forecast |
|------------|----------|
| 16-05-2024 | 1151.517 |
| 17-05-2024 | 1198.534 |
| 18-05-2024 | 1246.616 |
| 19-05-2024 | 1296.943 |
| 20-05-2024 | 1350.309 |
| 21-05-2024 | 1407.616 |
| 22-05-2024 | 1478.332 |
| 23-05-2024 | 1520.314 |
| 24-05-2024 | 1593.402 |
| 25-05-2024 | 1678.39 |
| 26-05-2024 | 1768.551 |
| 27-05-2024 | 1824.441 |
| 28-05-2024 | 1879.939 |
| 29-05-2024 | 1937.5 |
| 30-05-2024 | 1991.993 |
| 31-05-2024 | 2070.951 |
| 01-06-2024 | 2162.442 |
| 02-06-2024 | 2243.38 |
| 03-06-2024 | 2333.453 |
| 04-06-2024 | 2409.805 |
| 05-06-2024 | 2485.116 |
| 06-06-2024 | 2551.325 |
| 07-06-2024 | 2623.904 |
| 08-06-2024 | 2694.706 |
| 09-06-2024 | 2760.536 |
| 10-06-2024 | 2822.011 |
| 11-06-2024 | 2879.493 |
| 12-06-2024 | 2933.313 |
| 13-06-2024 | 2983.148 |

| | |
|------------|---------|
| 14-06-2024 | 3028.57 |
|------------|---------|

Limitaitons:

Accuracy of Historical Data: The forecast relies on the accuracy of past call volume data. If the data contains errors or inconsistencies, the forecast may not be entirely accurate.

Seasonal Trends: If there are seasonal variations in call volume, this model may not capture those trends unless historical data incorporates them.

Lead Conversion Forecast ([Link](#)):

Forecast Summary:-

This report summarizes the call volume forecast created in Excel for the period of May 16, 2024, to June 14, 2024.:

- **Week of May 16th:** The average Lead Conversion is expected to be around 153 per day
- **Week of May 23rd:** The average Lead Conversion is expected to be around 185 per day.
- **Week of May 30th:** The average Lead Conversion is expected to be around 213 per day.
- **Week of June 6th:** The average Lead Conversion is expected to be around 281 per day.
- **First Half of June 14th Week:** The Lead Conversion is expected to be around 320 per day.

Forecasted Data

| Date | Forecast |
|------------|----------|
| 16-05-2024 | 148.2798 |
| 17-05-2024 | 154.5633 |
| 18-05-2024 | 161.1832 |
| 19-05-2024 | 167.8181 |
| 20-05-2024 | 174.3332 |
| 21-05-2024 | 180.9077 |
| 22-05-2024 | 189.4616 |
| 23-05-2024 | 194.1387 |
| 24-05-2024 | 201.8858 |
| 25-05-2024 | 209.417 |
| 26-05-2024 | 216.5614 |
| 27-05-2024 | 221.7507 |
| 28-05-2024 | 226.7451 |
| 29-05-2024 | 231.5114 |
| 30-05-2024 | 236.0143 |
| 31-05-2024 | 241.0705 |
| 01-06-2024 | 258.2589 |
| 02-06-2024 | 270.6304 |
| 03-06-2024 | 284.414 |
| 04-06-2024 | 293.9482 |
| 05-06-2024 | 302.4741 |
| 06-06-2024 | 309.8953 |
| 07-06-2024 | 317.7779 |
| 08-06-2024 | 325.0462 |
| 09-06-2024 | 331.7845 |
| 10-06-2024 | 338.2409 |
| 11-06-2024 | 344.0435 |

| | |
|------------|----------|
| 12-06-2024 | 349.3369 |
| 13-06-2024 | 354.0583 |
| 14-06-2024 | 358.1408 |

Limitations:-

Accuracy of Historical Data: The forecast relies on the accuracy of past call volume data. Errors or inconsistencies in the data can lead to inaccurate forecasts.

Seasonal Trends: If there are seasonal variations in call volume, this model may not capture those trends unless historical data incorporates them.

Agent Efficiency Forecast ([Link](#))

This report summarizes the agent efficiency forecast data provided. We tried to predict efficiency score of agents based on data KPI we created for Agents like Call Count,Lead Converted, Avg Agent Duration etc.

Efficiency Score: A score that likely combines multiple factors like calls per hour and conversion rate.

| Agent Id | Call_Count | Leads_Converted | Calls_Connected | Avg_Agent_Duratio | Conversion Rate | Efficiency Score |
|----------|------------|-----------------|-----------------|-------------------|-----------------|------------------|
| 1 | 4 | 0 | 2 | 26.75 | 0 | 0 |
| 779 | 27 | 4 | 11 | 21.48148148 | 0.363636364 | 1.692789969 |
| 1656 | 1 | 0 | 0 | 4 | 0 | 0 |
| 2707 | 104 | 15 | 15 | 12.23076923 | 1 | 8.176100629 |
| 2714 | 2453 | 374 | 916 | 35.48512026 | 0.408296943 | 1.150614512 |
| 2728 | 4134 | 699 | 1553 | 37.16328012 | 0.450096587 | 1.211132564 |
| 2771 | 4372 | 685 | 1491 | 36.52973468 | 0.459423206 | 1.257669156 |
| 2772 | 2930 | 315 | 998 | 30.63720137 | 0.315631263 | 1.030222241 |
| 2778 | 659 | 99 | 238 | 45.04855842 | 0.415966387 | 0.923373358 |
| 2780 | 999 | 117 | 201 | 22.38038038 | 0.582089552 | 2.600892131 |
| 2783 | 1147 | 142 | 434 | 46.93199651 | 0.32718894 | 0.697155383 |
| 2784 | 57 | 5 | 20 | 35.50877193 | 0.25 | 0.704051383 |
| 2787 | 572 | 69 | 215 | 37.69405594 | 0.320930233 | 0.851408066 |
| 2790 | 750 | 97 | 247 | 35.13333333 | 0.392712551 | 1.117777658 |
| 2791 | 668 | 69 | 224 | 37.18862275 | 0.308035714 | 0.828306325 |
| 2793 | 704 | 97 | 259 | 43.64346591 | 0.374517375 | 0.858129314 |
| 2795 | 65 | 14 | 24 | 38.67692308 | 0.583333333 | 1.508220631 |
| 2796 | 1304 | 253 | 470 | 38.80138037 | 0.538297872 | 1.387316295 |
| 2797 | 44 | 8 | 13 | 45.18181818 | 0.615384615 | 1.362018263 |
| 2798 | 386 | 31 | 132 | 39.00777202 | 0.234848485 | 0.602055623 |
| 2799 | 2128 | 248 | 629 | 30.55545113 | 0.39427663 | 1.290364289 |
| 2803 | 533 | 46 | 130 | 37.46904315 | 0.353846154 | 0.944369336 |
| 2804 | 582 | 64 | 232 | 45.13573883 | 0.275862069 | 0.611183236 |

Limitations:

- This report only provides a snapshot of agent performance at a specific point in time.
- The accuracy of the forecast depends on the quality of the historical data used to train the model.
- External factors not considered in the model, like agent motivation or workload, could impact performance.

Resource Allocation Forecast ([Link](#)):

The resource allocation forecast created using a multiple linear regression model with an R-squared value of 0.75. This model predicts the number of agents required to handle the expected call volume while maintaining desired performance levels.

Mettric used for this Multiple Regression Model is Call Volumn, Efficiency Score, Day, Month and Year and predicting variable which is Number of Agents to Handle call volumn with desired efficiency score.

Overall Performance:

The R-squared value of 0.75 indicates a good fit for the linear regression model. This suggests the model can explain 75% of the variation in the number of agents needed based on call volume and efficiency score.

Mean Absolute Error : 2.3274704

Mean Squared Error : 11.740361

Root Mean Squared Error : 3.426421

which indicates better accuracy in estimating agent performance metrics, aiding in improving decision-making and resource allocation for effective agent management.

| Call Volume | Efficiency Score | Day | Month | Year | No of Agents |
|-------------|------------------|-----|-------|------|--------------|
| 406 | 1.180874 | 1 | 4 | 2024 | 2 |
| 388 | 1.180874 | 2 | 4 | 2024 | 2 |
| 397 | 0.787249 | 3 | 4 | 2024 | 3 |
| 421 | 1.351512 | 4 | 4 | 2024 | 3 |
| 460 | 1.040398 | 5 | 4 | 2024 | 4 |
| 692 | 1.16241 | 6 | 4 | 2024 | 4 |
| 0 | 0 | 7 | 4 | 2024 | 0 |
| 671 | 1.16241 | 8 | 4 | 2024 | 4 |
| 839 | 1.16241 | 9 | 4 | 2024 | 4 |
| 837 | 1.268486 | 10 | 4 | 2024 | 5 |
| 0 | 0 | 11 | 4 | 2024 | 0 |
| 0 | 0 | 12 | 4 | 2024 | 0 |
| 56 | 1.268486 | 13 | 4 | 2024 | 5 |
| 0 | 0 | 14 | 4 | 2024 | 0 |
| 537 | 1.026259 | 15 | 4 | 2024 | 5 |
| 746 | 1.16241 | 16 | 4 | 2024 | 4 |
| 437 | 1.16241 | 17 | 4 | 2024 | 4 |
| 588 | 1.16241 | 18 | 4 | 2024 | 4 |
| 236 | 1.16241 | 19 | 4 | 2024 | 4 |
| 205 | 1.166341 | 20 | 4 | 2024 | 3 |
| 13 | 8.176101 | 21 | 4 | 2024 | 1 |
| 181 | 1.234401 | 22 | 4 | 2024 | 2 |

| | | | | | |
|------|----------|----|---|------|----|
| 159 | 1.206472 | 23 | 4 | 2024 | 3 |
| 79 | 1.234401 | 24 | 4 | 2024 | 2 |
| 31 | 2.892017 | 25 | 4 | 2024 | 4 |
| 6 | 0.983486 | 26 | 4 | 2024 | 3 |
| 1 | 1.211133 | 27 | 4 | 2024 | 1 |
| 0 | 0 | 28 | 4 | 2024 | 0 |
| 1 | 1.211133 | 29 | 4 | 2024 | 1 |
| 2 | 1.257669 | 30 | 4 | 2024 | 1 |
| 3 | 1.69279 | 1 | 5 | 2024 | 1 |
| 21 | 8.176101 | 2 | 5 | 2024 | 1 |
| 32 | 1.150615 | 3 | 5 | 2024 | 1 |
| 25 | 8.176101 | 4 | 5 | 2024 | 1 |
| 3 | 8.176101 | 5 | 5 | 2024 | 1 |
| 150 | 2.565148 | 6 | 5 | 2024 | 5 |
| 603 | 1.268486 | 7 | 5 | 2024 | 5 |
| 1371 | 1.530934 | 8 | 5 | 2024 | 18 |
| 1727 | 1.173866 | 9 | 5 | 2024 | 17 |
| 2156 | 1.593171 | 10 | 5 | 2024 | 16 |
| 2135 | 1.167383 | 11 | 5 | 2024 | 15 |
| 70 | 0.923373 | 12 | 5 | 2024 | 1 |
| 2638 | 1.141758 | 13 | 5 | 2024 | 16 |
| 2795 | 1.512826 | 14 | 5 | 2024 | 18 |
| 2505 | 1.502239 | 15 | 5 | 2024 | 17 |

Limitations:

- The accuracy of the forecast depends on the accuracy of the historical data used to train the model.
- The model only considers call volume and efficiency score. Other factors, like call complexity or agent skillset, may also impact staffing needs.