City of Carrollton: Customer Service Data Analysis Report (FY22-FY24)

Introduction

This report analyzes the City of Carrollton's Customer Service call center data for fiscal years 2022 to 2024. The analysis is aimed at gaining insights into trends in call volume, response rates, and out-call activity. Based on these insights, recommendations are provided to improve call center efficiency and customer satisfaction.

1. Data Cleaning and Preparation: Link to Dataset

The dataset provided for the analysis contained several missing values and inconsistencies. Missing values in the columns ***Average Abandoned Time*** and ***Average Queue Time*** were addressed using the median, as it minimizes the effect of outliers. For ***Out Calls***, the formula Calls Answered + Out Calls = Total Calls Handled was used to fill in missing values. Additionally, time-related columns were converted to seconds to simplify the calculation of averages and sums during data visualization. The ***Service Level*** metric was derived using a linear regression model based on past data, which considered the percentage of calls answered, the average speed to respond, and the call abandonment rate.
The formula used was:

Service Level = 0.42 * (% Answered) - 0.0002 * (Average Speed to Answer) - 0.111 * (Call Abandon Rate) + 0.1115

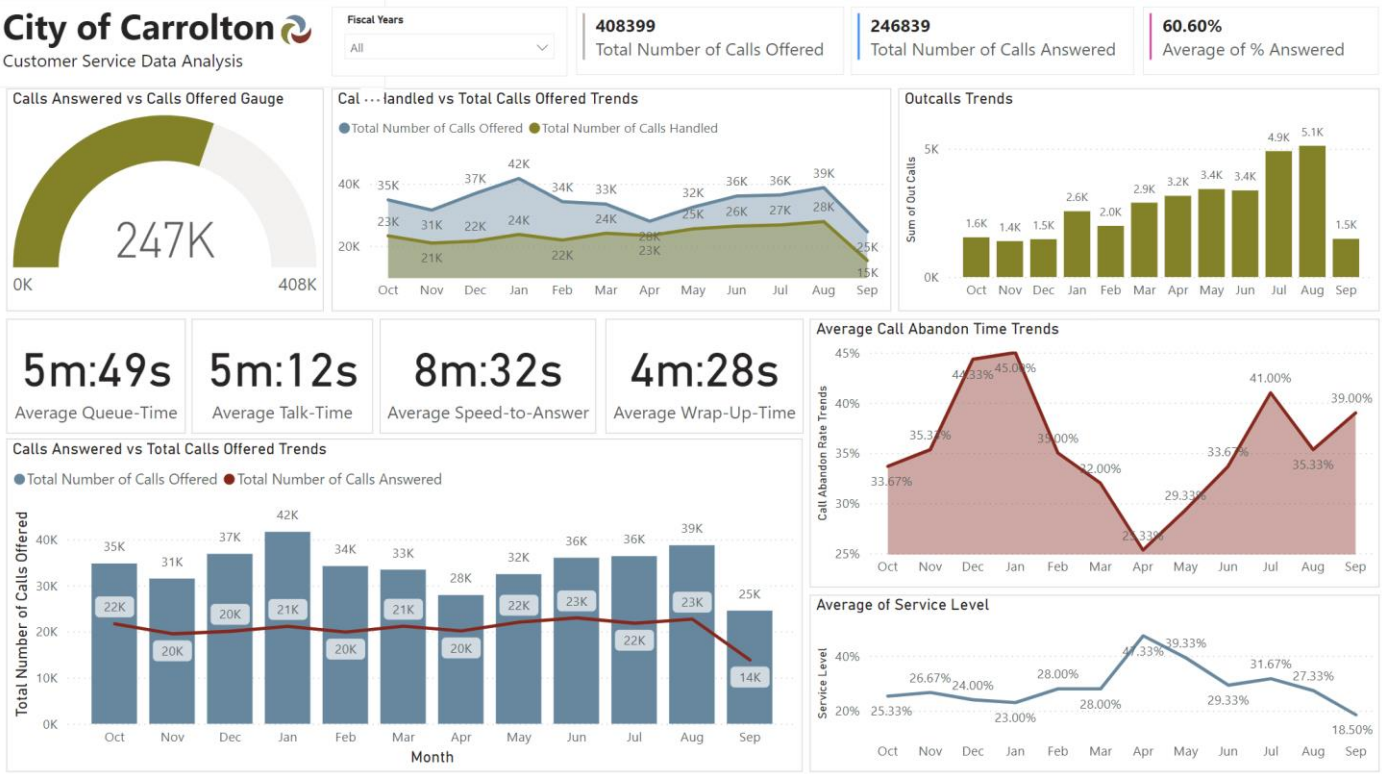
Month	Month Sort	FY	Calls Offered	% Answered	Calls Answered	Out Calls	Total Calls Handled	Call Abandon Rate	Average Abandoned Time	Average Queue Time	Average Speed to Answer	Average Talk Time	Average Wrap Up time	Average Handle Time	Service Leve
Oct	1	FY 22	9410	0.79	7666	0	7666	0.21	890	898	158	307	277	544	0.39
Nov	2	FY 22	9184	0.76	6864	0	6864	0.23	136	153	205	298	273	531	0.36
Dec	3	FY 22	10120	0.53	6570	0	6570	0.47	205	254	376	300	270	569	0.21
Jan	4	FY 22	10841	0.68	7342	0	7342	0.32	158	215	340	294	233	527	0.29
Feb	5	FY 22	9066	0.79	7120	0	7120	0.25	174	141	138	247	220	467	0.39
Mar	6	FY 22	10669	0.69	8253	0	8253	0.30	128	142	158	251	256	507	0.25
Apr	7	FY 22	11227	0.71	7980	3	7983	0.29	205	234	220	257	294	551	0.35
May	8	FY 22	10916	0.70	7892	122	8014	0.25	140	172	221	251	280	531	0.40
Jun	9	FY 22	12936	0.52	8047	718	8765	0.38	214	293	373	277	261	538	0.21
Jul	10	FY 22	12244	0.48	7224	634	7858	0.51	214	333	470	270	329	545	0.20
Aug	11	FY 22	14870	0.49	7690	1226	8916	0.43	235	410	671	271	348	612	0.11
Sep	12	FY 22	13566	0.46	6777	635	7412	0.45	244	444	752	261	348	619	0.10
Oct	1	FY 23	13053	0.60	7082	720	7802	0.34	158	242	576	288	864	1152	0.14
Nov	2	FY 23	10154	0.60	6372	698	7070	0.34	158	242	334	261	319	580	0.31
Dec	3	FY 23	8941	0.69	6344	621	6965	0.26	135	170	231	270	275	545	0.44
Jan	4	FY 23	10173	0.65	6633	1248	7881	0.46	206	278	299	272	241	514	0.31
Feb	5	FY 23	9943	0.66	6582	889	7471	0.45	195	260	298	277	238	515	0.35
Mar	6	FY 23	11418	0.58	6959	1204	8163	0.36	170	266	380	308	215	524	0.25
Apr	7	FY 23	9656	0.62	6012	937	6949	0.38	195	285	350	319	196	515	0.29
May	8	FY 23	11035	0.57	6566	1059	7625	0.42	209	334	419	329	185	515	0.21
Jun	9	FY 23	11209	0.61	7130	778	7908	0.39	190	281	326	329	192	521	0.27
Jul	10	FY 23	12856	0.51	6748	710	7458	0.49	235	411	574	311	191	502	0.14
Aug	11	FY 23	14332	0.54	7689	1204	8893	0.45	231	369	574	308	191	499	0.13
Sep	12	FY 23	10977	0.61	7042	856	7898	0.33	180	245	336	311	206	517	0.27
Oct	1	FY 24	12303	0.53	6927	831	7758	0.46	234	411	574	308	191	499	0.23
Nov	2	FY 24	12156	0.49	6277	704	6981	0.49	262	488	727	338	226	564	0.13
Dec	3	FY 24	17791	0.38	7141	856	7997	0.60	384	841	1626	366	227	593	0.07
Jan	4	FY 24	20620	0.35	7140	1320	8460	0.57	406	873	2336	412	300	712	0.09
Feb	5	FY 24	15198	0.41	6174	1109	7283	0.35	437	772	1724	420	238	634	0.10
Mar	6	FY 24	11341	0.52	5948	1699	7647	0.30	579	648	1114	394	227	621	0.34
Apr	7	FY 24	7036	0.87	6148	2230	8378	0.09	118	85	55	381	251	600	0.78
May	8	FY 24	10508	0.70	7573	2252	9825	0.21	231	223	215	322	215	536	0.57
Jun	9	FY 24	11866	0.67	7787	1885	9672	0.24	175	239	267	315	187	502	0.40
Jul	10	FY 24	11263	0.72	7826	3571	11397	0.23	114	141	109	322	216	538	0.61
Aug	11	FY 24	9521	0.73	7314	2692	10006	0.18	146	168	162	312	210	523	0.58

This screenshot shows the cleaned dataset, where the missing values have been handled, as indicated by the cells highlighted in yellow.

2. Data Analysis and Visualization: Link to Dashboard

This dashboard provides a comprehensive overview of the City of Carrollton's call center performance. Users can choose a certain year or even compare several years using the fiscal year filter to gain a better idea of how the call center operates.

- **Calls Handled vs. Total Calls Offered:** Highlights gaps between offered and handled calls, with gaps in December, January, and August.
- **Calls Answered vs. Total Calls Offered (Gauge):** Shows 60.6% of total calls were answered, and around 40% were missed.
- **Service Level:** Service level varies monthly, peaking at 47.33% in April and dropping to 18.5% in September.
- **Average Call Abandon Time:** Peaks in January at 45%, showing increased call abandonment during peak months.
- **Average Queue, Talk, and Speed-to-Answer Times:** Average queue time is 5m:49s, with calls taking 8m:32s on average to be answered.
- **Outcall Trends:** Outbound calls have steadily increased, reaching 5.1K in July, reflecting proactive outreach efforts.



Key Trends and Insights:

1. **High Call Volumes and Unanswered Calls in December and January:** During the holiday season, especially in December and January, the call center receives a lot of calls but struggles to answer a large portion of them. In January, over 65% of calls went unanswered.
2. **Better Call Handling in Spring and Summer:** The center performs much better in spring and summer months, like April and May when more calls are answered, and fewer are abandoned.
3. **Long Queue and Speed-to-Answer Times:** Customers wait almost **6 minutes** in queue and over **8 minutes** for their calls to be answered, contributing to the high call abandonment rates.
4. **Reasonable Talk and Wrap-Up Times:** Agents spend about **5 minutes** talking to customers and take around **4.5 minutes** for post-call wrap-up tasks, showing that while service quality may be good, efficiency in these areas can be improved.
5. **Service Level Below Expectations:** The service level is below 50% in some months, indicating the call center is not meeting response time expectations.

3. Actionable Recommendations for Call Center Improvement

Based on the analysis of the call center's performance data, here are three key recommendations to improve response rates, reduce missed calls, and enhance overall customer satisfaction:

1. **Increase Staffing During Peak Periods (December-January & August)**
    - **Observation:** The data shows a significant increase in call volumes during peak months like **January** (42K calls) and **August** (39K calls), yet a large gap remains between calls offered and answered. Only 60.6% of calls are being answered on average.
    - **Recommendation:** Increase staffing during these months to reduce the number of unanswered calls. Temporary hires, overtime shifts, or cross-training staff from other departments can help balance the workload.
    - **Supporting Data:** In January, the center offered 42K calls but answered only around 21K, leaving 50% unanswered. By adding more agents, the center can reduce the waiting time and improve the service level.
2. **Implement Call Overflow and Automation Solutions**
    - **Observation:** The **average queue time** is 5 minutes and 49 seconds, and the **average speed-to-answer** is 8 minutes and 32 seconds, both of which are long and likely contributing to customer dissatisfaction and call abandonment (especially with high abandon rates of 45% in December and 41% in July).

- **Recommendation:** Introduce a call overflow system that reroutes excess calls to other teams or implements automated systems (like interactive voice responses) to handle basic inquiries. This would help reduce wait times and call abandonments.
- **Supporting Data:** Reducing the queue time and speed-to-answer during peak months will directly reduce the high abandonment rate (as seen with 45% in December and 41% in July), leading to a higher percentage of calls being answered.

3. **Focus on Resource Planning for Consistent Service Levels**

- **Observation:** Service levels vary significantly throughout the year, ranging from 47.33% in April to a low of 18.50% in September. Inconsistent service leads to customer frustration during certain months when resources are low.
- **Recommendation:** Implement better workforce planning and predictive scheduling based on historical call volume data. This would ensure adequate resources are available during high-volume periods, improving service levels throughout the year.
- **Supporting Data:** The service level dipped to 18.50% in September indicates insufficient handling capacity during certain months. Better planning can stabilize performance and boost overall customer satisfaction.

4. Leadership and Decision Making:

The assignment was approached with a focus on independently analyzing the data to identify critical operational challenges, such as high call volumes and missed calls during peak months. A structured method was used to prioritize the most critical areas affecting customer satisfaction and operational efficiency, leading to targeted, data-driven recommendations.

The recommendations aim to enhance the department's ability to manage peak demand, reduce wait times, and improve service levels by focusing on increasing staffing, implementing overflow systems, and improving resource planning. These steps are expected to positively impact the department's operations by ensuring consistent performance and higher customer satisfaction.