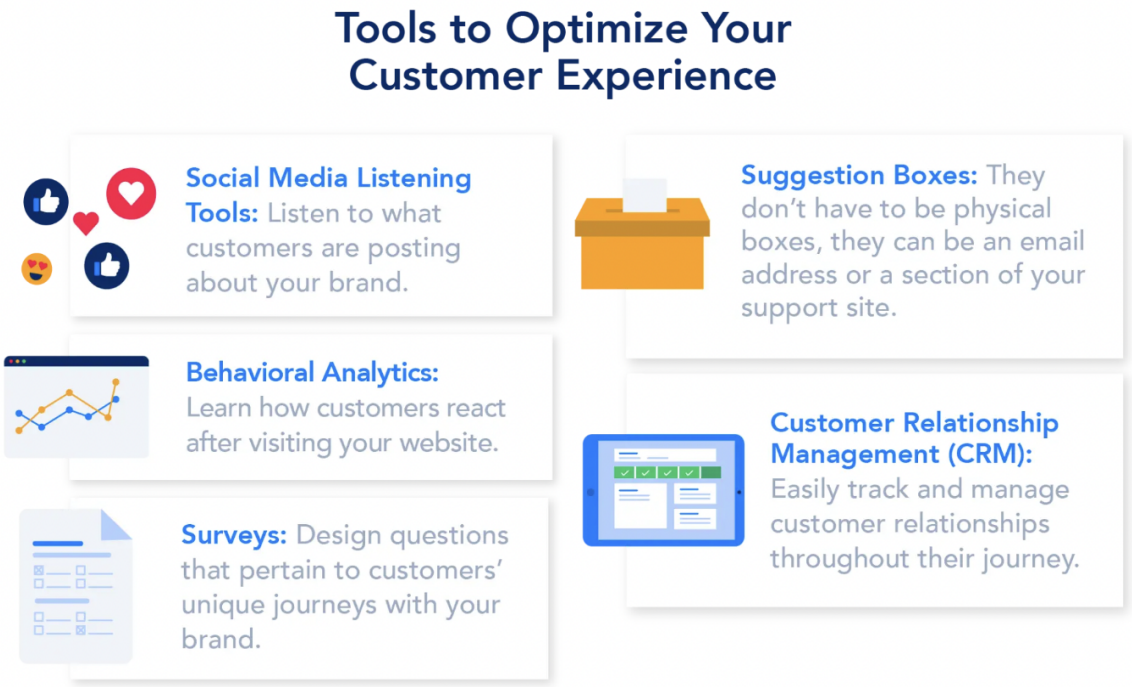
ABC Call Volume Trend Analysis



By Aayushi Singh

Project Description

A customer experience (CX) team consists of professionals who analyze 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.

Advertising is a way of marketing your business in order to increase sales or make your audience aware of your products or services. Until a customer deals with you directly and actually buys your products or services, your advertising may help to form their first impressions of your business. Target audience for businesses could be local, regional, national or international or a mixture. So they use different ways for advertisement. Some of the types of advertisement are: Internet/online directories, Trade and technical press, Radio, Cinema, Outdoor advertising, National papers, magazines and TV. Advertising business is very competitive as a lot of players bid a lot of money in a single segment of business to target the same audience. Here comes the analytical skills of the company to target those audiences from those types of media platforms where they convert them to their customers at a low cost.

Approach

Understanding the Columns of the dataset, Its functions and its descriptions. Our dataset consists of

- Agent Name: Name Of the Agent as stored in Database
- Agent ID: ID of the agent
- Customer Phone No : Phone Numbers of the customers
- Queue Time: duration for which customer have to wait before they get connected to an agent
- Date & Time: date at which the call was placed
- Time: time at which call was made by customer in a day
- Time_Bucket :for easiness we have used the time bucket Duration [duration for which a customer and executives are on call]
- Duration: Total conversion time between agent and customer
- Call_Seconds for simplicity we have converted duration time into seconds,
- call status: (Abandon, answered, transferred).
- Wrapped By:How did the call ended, either by the agent or Autowrapped
- Ringing: Did the call was received on our end, confeimed by ringing
- IVR duration:Interactive Voice Response (IVR) Duration

Total rows : 117988
Total columns :13

Raw Dataset:
https://docs.google.com/spreadsheets/d/1aE90aHBpkW0oO1qE-wqKVfa2pDGWovWq/edit#gid=1468500971

Analysed Dataset:
https://docs.google.com/spreadsheets/d/1eYmMcsAzmxaIbz5W45yIRtE7EI_R_LUB/edit?usp=drive_link&ouid=112832523234981292185&rtpof=true&sd=true

Through the data understanding various trends and call volume distribution, based on observation and analysis providing various options to increase it efficiency

Tech-Stack Used

MS Excel
Google Sheet
Google Docs

Insights and Results

Cleaning the data

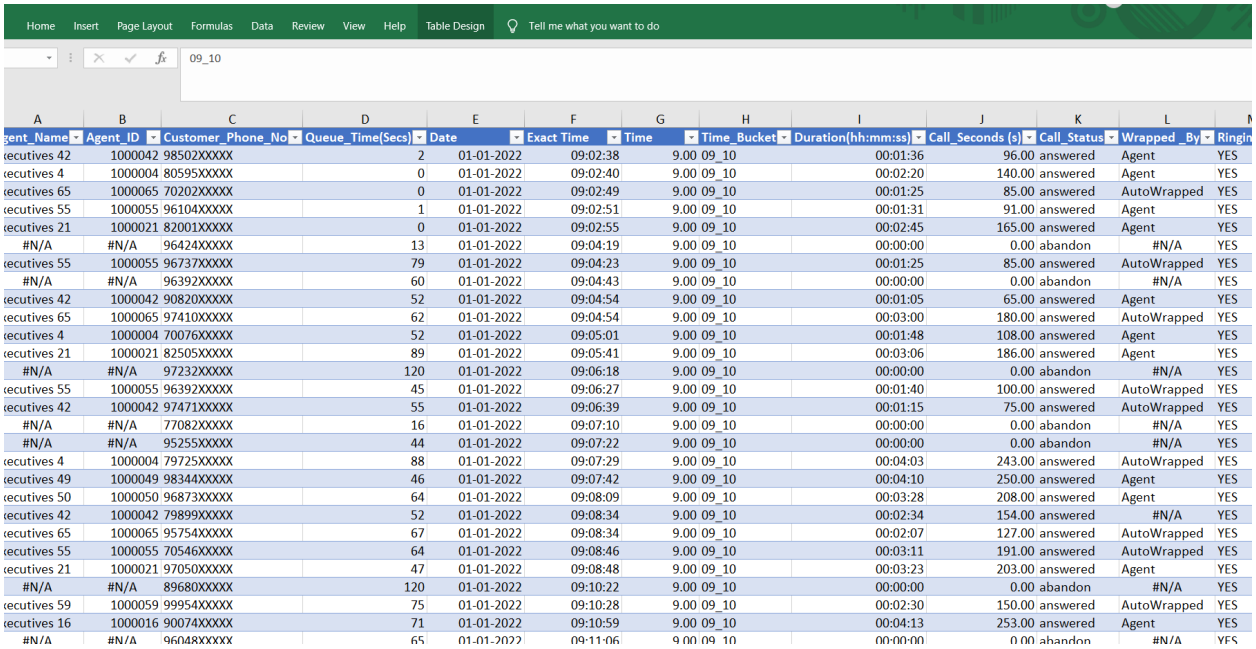
H3 | 09_10

	A	B	C	D	E	F	G	H	I	J
1	Agent_Name	Agent_ID	Customer_Phone_No	Queue_Time(Secs)	Date	Exact Time	Time	Time_Bucket	Duration(hh:mm:ss)	Call_Seconds (s)
2	Executives 42	1000042	98502XXXXX	2	01-01-2022	09:02:38	9.00	09_10	00:01:36	96.00
3	Executives 4	1000004	80595XXXXX	0	01-01-2022	09:02:40	9.00	09_10	00:02:20	140.00
4	Executives 65	1000065	70202XXXXX	0	01-01-2022	09:02:49	9.00	09_10	00:01:25	85.00
5	Executives 55	1000055	96104XXXXX	1	01-01-2022	09:02:51	9.00	09_10	00:01:31	91.00
6	Executives 21	1000021	82001XXXXX	0	01-01-2022	09:02:55	9.00	09_10	00:02:45	165.00
7	#N/A	#N/A	96424XXXXX	13	01-01-2022	09:04:19	9.00	09_10	00:00:00	0.00
8	Executives 55	1000055	96737XXXXX	79	01-01-2022	09:04:23	9.00	09_10	00:01:25	85.00
9	#N/A	#N/A	96392XXXXX	60	01-01-2022	09:04:43	9.00	09_10	00:00:00	0.00
10	Executives 42	1000042	90820XXXXX	52	01-01-2022	09:04:54	9.00	09_10	00:01:05	65.00
11	Executives 65	1000065	97410XXXXX	62	01-01-2022	09:04:54	9.00	09_10	00:03:00	180.00
12	Executives 4	1000004	70076XXXXX	52	01-01-2022	09:05:01	9.00	09_10	00:01:48	108.00
13	Executives 21	1000021	82505XXXXX	89	01-01-2022	09:05:41	9.00	09_10	00:03:06	186.00
14	#N/A	#N/A	97232XXXXX	120	01-01-2022	09:06:18	9.00	09_10	00:00:00	0.00
15	Executives 55	1000055	96392XXXXX	45	01-01-2022	09:06:27	9.00	09_10	00:01:40	100.00
16	Executives 42	1000042	97471XXXXX	55	01-01-2022	09:06:39	9.00	09_10	00:01:15	75.00
17	#N/A	#N/A	77082XXXXX	16	01-01-2022	09:07:10	9.00	09_10	00:00:00	0.00
18	#N/A	#N/A	95255XXXXX	44	01-01-2022	09:07:22	9.00	09_10	00:00:00	0.00
19	Executives 4	1000004	79725XXXXX	88	01-01-2022	09:07:29	9.00	09_10	00:04:03	243.00
20	Executives 49	1000049	98344XXXXX	46	01-01-2022	09:07:42	9.00	09_10	00:04:10	250.00
21	Executives 50	1000050	96873XXXXX	64	01-01-2022	09:08:09	9.00	09_10	00:03:28	208.00
22	Executives 42	1000042	79899XXXXX	52	01-01-2022	09:08:34	9.00	09_10	00:02:34	154.00
23	Executives 65	1000065	95754XXXXX	67	01-01-2022	09:08:34	9.00	09_10	00:02:07	127.00
24	Executives 55	1000055	70546XXXXX	64	01-01-2022	09:08:46	9.00	09_10	00:03:11	191.00
25	Executives 21	1000021	97050XXXXX	47	01-01-2022	09:08:48	9.00	09_10	00:03:23	203.00
26	#N/A	#N/A	89680XXXXX	120	01-01-2022	09:10:22	9.00	09_10	00:00:00	0.00
27	Executives 59	1000059	99954XXXXX	75	01-01-2022	09:10:28	9.00	09_10	00:02:30	150.00
28	Executives 16	1000016	90074XXXXX	71	01-01-2022	09:10:59	9.00	09_10	00:04:13	253.00
29	#N/A	#N/A	96048XXXXX	65	01-01-2022	09:11:06	9.00	09_10	00:00:00	0.00

Using Text to column to separate date and time in the same column and formatting the column to read MM-DD-YYYY instead of the system default date format DD-MM-YYY

H	I	J	K	L	M	N	O
me_Bucket	Duration(hh:mm:ss)	Call_Seconds (s)	Call_Status	Wrapped _By	Ringing	IVR _Duration	
_10	00:01:36	96.00	answered	Agent	YES	00:00:16	
_10	00:02:20	140.00	answered	Agent	YES	00:00:26	
_10	00:01:25	85.00	answered	AutoWrapped	YES	00:00:16	
_10	00:01:31	91.00	answered	Agent	YES	00:00:25	
_10	00:02:45	165.00	answered	Agent	YES	00:00:23	
_10	00:00:00	0.00	abandon	#N/A	YES	00:00:16	
_10	00:01:25	85.00	answered	AutoWrapped	YES	00:00:13	
_10	00:00:00	0.00	abandon	#N/A	YES	00:00:17	
_10	00:01:05	65.00	answered	Agent	YES	00:00:20	
_10	00:03:00	180.00	answered	AutoWrapped	YES	00:00:44	
_10	00:01:48	108.00	answered	Agent	YES	00:00:15	
_10	00:03:06	186.00	answered	Agent	YES	00:00:16	
_10	00:00:00	0.00	abandon	#N/A	YES	00:00:40	
_10	00:01:40	100.00	answered	AutoWrapped	YES	00:00:42	
_10	00:01:15	75.00	answered	AutoWrapped	YES	00:00:19	
_10	00:00:00	0.00	abandon	#N/A	YES	00:00:18	
_10	00:00:00	0.00	abandon	#N/A	YES	00:00:17	
_10	00:04:03	243.00	answered	AutoWrapped	YES	00:00:15	
_10	00:04:10	250.00	answered	Agent	YES	00:00:19	
_10	00:03:28	208.00	answered	Agent	YES	00:00:48	
_10	00:02:34	154.00	answered	#N/A	YES	00:00:26	
_10	00:02:07	127.00	answered	AutoWrapped	YES	00:00:45	
_10	00:03:11	191.00	answered	AutoWrapped	YES	00:00:40	
_10	00:03:23	203.00	answered	Agent	YES	00:00:25	
_10	00:00:00	0.00	abandon	#N/A	YES	00:00:25	
_10	00:02:30	150.00	answered	AutoWrapped	YES	00:00:21	
_10	00:04:13	253.00	answered	Agent	YES	00:00:20	
_10	00:00:00	0.00	abandon	#N/A	YES	00:00:17	

Filling the blanks of Wrapped by #N/A



Home Insert Page Layout Formulas Data Review View Help Table Design Tell me what you want to do

09_10

A	B	C	D	E	F	G	H	I	J	K	L	M
gent_Name	Agent_ID	Customer_Phone_No	Queue_Time(Secs)	Date	Exact Time	Time	Time_Bucket	Duration(hh:mm:ss)	Call_Seconds (s)	Call_Status	Wrapped _By	Ringin
ecutives 42	1000042	98502XXXXX	2	01-01-2022	09:02:38	9.00	09_10	00:01:36	96.00	answered	Agent	YES
ecutives 4	1000004	80595XXXXX	0	01-01-2022	09:02:40	9.00	09_10	00:02:20	140.00	answered	Agent	YES
ecutives 65	1000065	70202XXXXX	0	01-01-2022	09:02:49	9.00	09_10	00:01:25	85.00	answered	AutoWrapped	YES
ecutives 55	1000055	96104XXXXX	1	01-01-2022	09:02:51	9.00	09_10	00:01:31	91.00	answered	Agent	YES
ecutives 21	1000021	82001XXXXX	0	01-01-2022	09:02:55	9.00	09_10	00:02:45	165.00	answered	Agent	YES
#N/A	#N/A	96424XXXXX	13	01-01-2022	09:04:19	9.00	09_10	00:00:00	0.00	abandon	#N/A	YES
ecutives 55	1000055	96737XXXXX	79	01-01-2022	09:04:23	9.00	09_10	00:01:25	85.00	answered	AutoWrapped	YES
#N/A	#N/A	96392XXXXX	60	01-01-2022	09:04:43	9.00	09_10	00:00:00	0.00	abandon	#N/A	YES
ecutives 42	1000042	90820XXXXX	52	01-01-2022	09:04:54	9.00	09_10	00:01:05	65.00	answered	Agent	YES
ecutives 65	1000065	97410XXXXX	62	01-01-2022	09:04:54	9.00	09_10	00:03:00	180.00	answered	AutoWrapped	YES
ecutives 4	1000004	70076XXXXX	52	01-01-2022	09:05:01	9.00	09_10	00:01:48	108.00	answered	Agent	YES
ecutives 21	1000021	82505XXXXX	89	01-01-2022	09:05:41	9.00	09_10	00:03:06	186.00	answered	Agent	YES
#N/A	#N/A	97232XXXXX	120	01-01-2022	09:06:18	9.00	09_10	00:00:00	0.00	abandon	#N/A	YES
ecutives 55	1000055	96392XXXXX	45	01-01-2022	09:06:27	9.00	09_10	00:01:40	100.00	answered	AutoWrapped	YES
ecutives 42	1000042	97471XXXXX	55	01-01-2022	09:06:39	9.00	09_10	00:01:15	75.00	answered	AutoWrapped	YES
#N/A	#N/A	77082XXXXX	16	01-01-2022	09:07:10	9.00	09_10	00:00:00	0.00	abandon	#N/A	YES
#N/A	#N/A	95255XXXXX	44	01-01-2022	09:07:22	9.00	09_10	00:00:00	0.00	abandon	#N/A	YES
ecutives 4	1000004	79725XXXXX	88	01-01-2022	09:07:29	9.00	09_10	00:04:03	243.00	answered	AutoWrapped	YES
ecutives 49	1000049	98344XXXXX	46	01-01-2022	09:07:42	9.00	09_10	00:04:10	250.00	answered	Agent	YES
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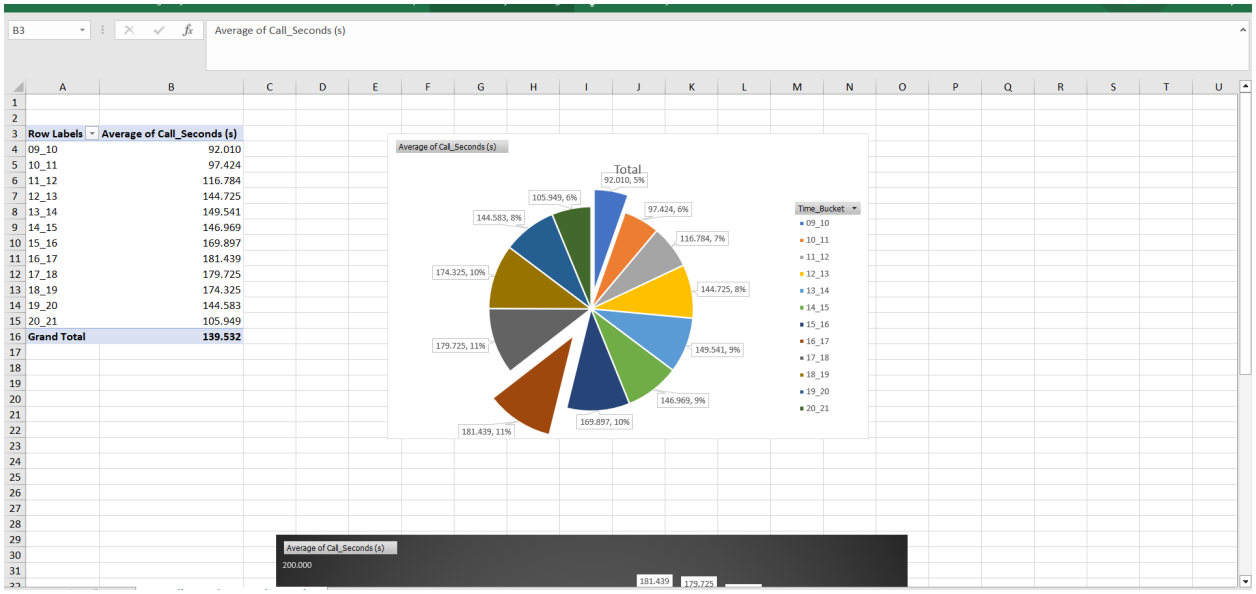
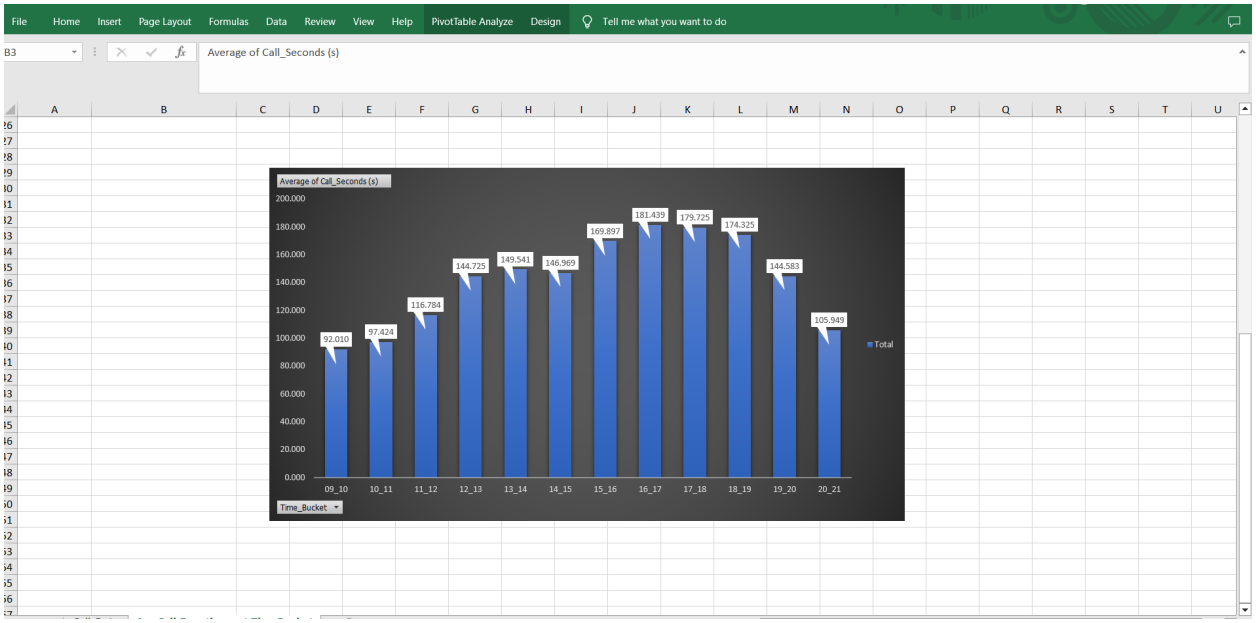
ecutives 42	1000042	79899XXXXX	52	01-01-2022	09:08:34	9.00	09_10	00:02:34	154.00	answered	#N/A	YES
ecutives 65	1000065	95754XXXXX	67	01-01-2022	09:08:34	9.00	09_10	00:02:07	127.00	answered	AutoWrapped	YES
ecutives 55	1000055	70546XXXXX	64	01-01-2022	09:08:46	9.00	09_10	00:03:11	191.00	answered	AutoWrapped	YES
ecutives 21	1000021	97050XXXXX	47	01-01-2022	09:08:48	9.00	09_10	00:03:23	203.00	answered	Agent	YES
#N/A	#N/A	89680XXXXX	120	01-01-2022	09:10:22	9.00	09_10	00:00:00	0.00	abandon	#N/A	YES
ecutives 59	1000059	99954XXXXX	75	01-01-2022	09:10:28	9.00	09_10	00:02:30	150.00	answered	AutoWrapped	YES
ecutives 16	1000016	90074XXXXX	71	01-01-2022	09:10:59	9.00	09_10	00:04:13	253.00	answered	Agent	YES
#N/A	#N/A	96048XXXXX	65	01-01-2022	09:11:06	9.00	09_10	00:00:00	0.00	abandon	#N/A	YES

Replacing the 9_10 by 09_10 (for the reasons of analysis)

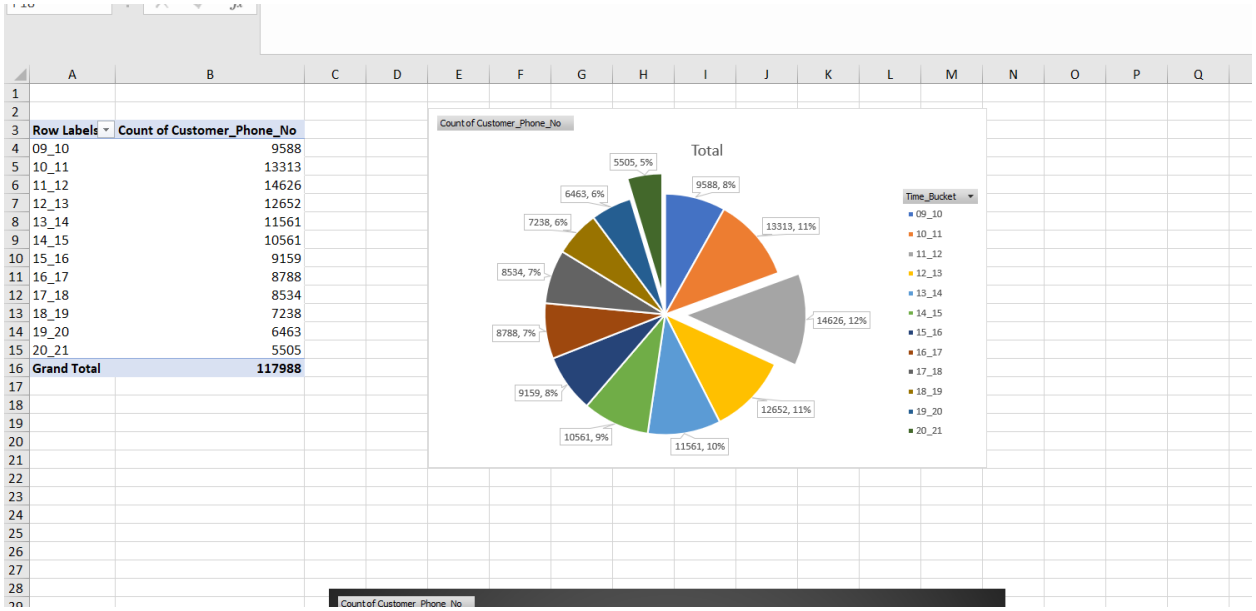
1. Calculate the average call time duration for all incoming calls received by agents (in each Time_Bucket).



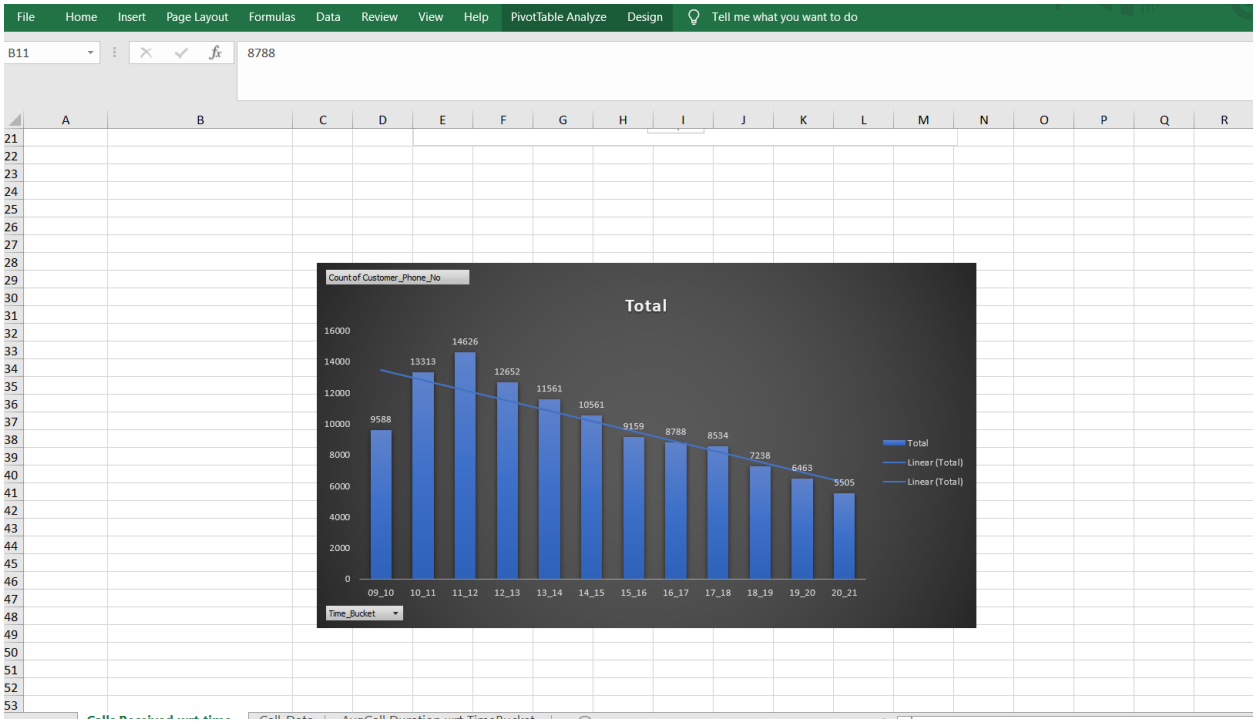


Using Pivot Table to Analyse the Relation between Call duration and Time

2. Show the total volume/ number of calls coming in via charts/ graphs [Number of calls v/s Time].



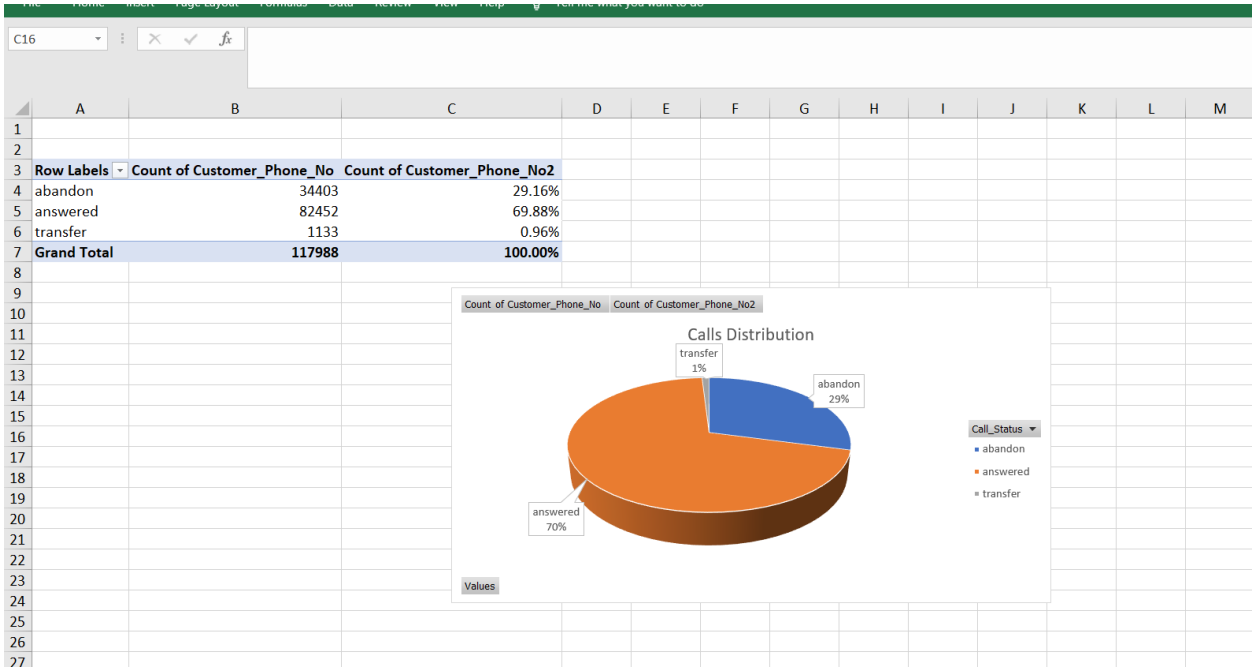
Row Labels	Count of Customer_Phone_No
09_10	9588
10_11	13313
11_12	14626
12_13	12652
13_14	11561
14_15	10561
15_16	9159
16_17	8788
17_18	8534
18_19	7238
19_20	6463
20_21	5505
Grand Total	117988



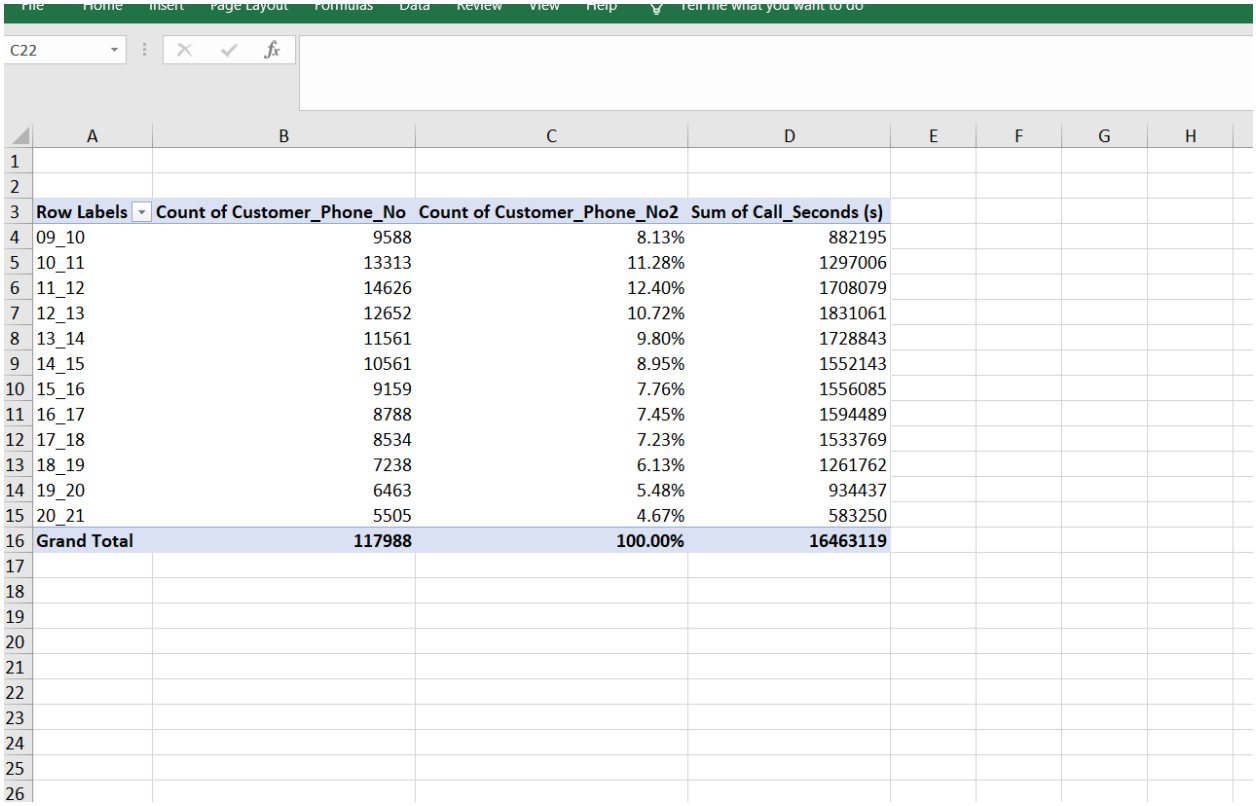
Using pivot table to understand the reaction between volume of call received in the morning Shift of the company, as can be observed by the trendline volume of calls

received decrease as the time increase with the highest call volume in the time bucket of 11_12 and lowest in 20_21

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.)

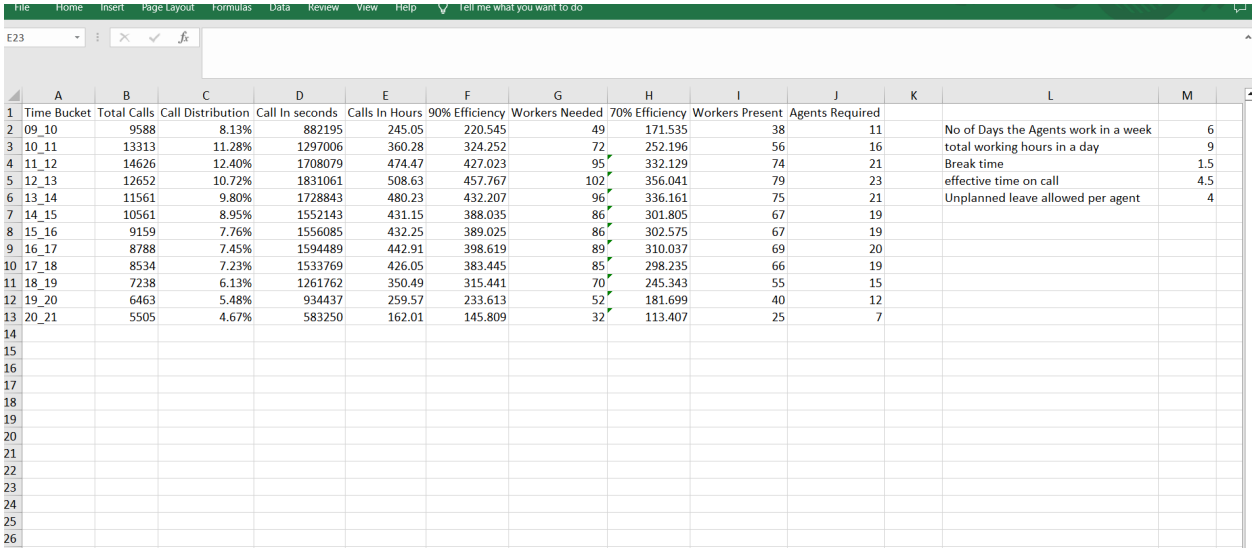


We can observe that the out of the total calls made almost 70% are answered, 29% were abandon and 1% transferred



Row Labels	Count of Customer_Phone_No	Count of Customer_Phone_No2	Sum of Call_Seconds (s)
09_10	9588	8.13%	882195
10_11	13313	11.28%	1297006
11_12	14626	12.40%	1708079
12_13	12652	10.72%	1831061
13_14	11561	9.80%	1728843
14_15	10561	8.95%	1552143
15_16	9159	7.76%	1556085
16_17	8788	7.45%	1594489
17_18	8534	7.23%	1533769
18_19	7238	6.13%	1261762
19_20	6463	5.48%	934437
20_21	5505	4.67%	583250
Grand Total	**117988**	**100.00%**	**16463119**

No of Days the Agents work in a week	6
total working hours in a day	9
Break time	1.5
effective time on call	4.5
Unplanned leave allowed per agent	4



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Time Bucket	Total Calls	Call Distribution	Call In seconds	Calls In Hours	90% Efficiency	Workers Needed	70% Efficiency	Workers Present	Agents Required			
2	09_10	9588	8.13%	882195	245.05	220.545	49	171.535	38	11		No of Days the Agents work in a week	6
3	10_11	13313	11.28%	1297006	360.28	324.252	72	252.196	56	16		total working hours in a day	9
4	11_12	14626	12.40%	1708079	474.47	427.023	95	332.129	74	21		Break time	1.5
5	12_13	12652	10.72%	1831061	508.63	457.767	102	356.041	79	23		effective time on call	4.5
6	13_14	11561	9.80%	1728843	480.23	432.207	96	336.161	75	21		Unplanned leave allowed per agent	4
7	14_15	10561	8.95%	1552143	431.15	388.035	86	301.805	67	19			
8	15_16	9159	7.76%	1556085	432.25	389.025	86	302.575	67	19			
9	16_17	8788	7.45%	1594489	442.91	398.619	89	310.037	69	20			
10	17_18	8534	7.23%	1533769	426.05	383.445	85	298.235	66	19			
11	18_19	7238	6.13%	1261762	350.49	315.441	70	245.343	55	15			
12	19_20	6463	5.48%	934437	259.57	233.613	52	181.699	40	12			
13	20_21	5505	4.67%	583250	162.01	145.809	32	113.407	25	7			
14													
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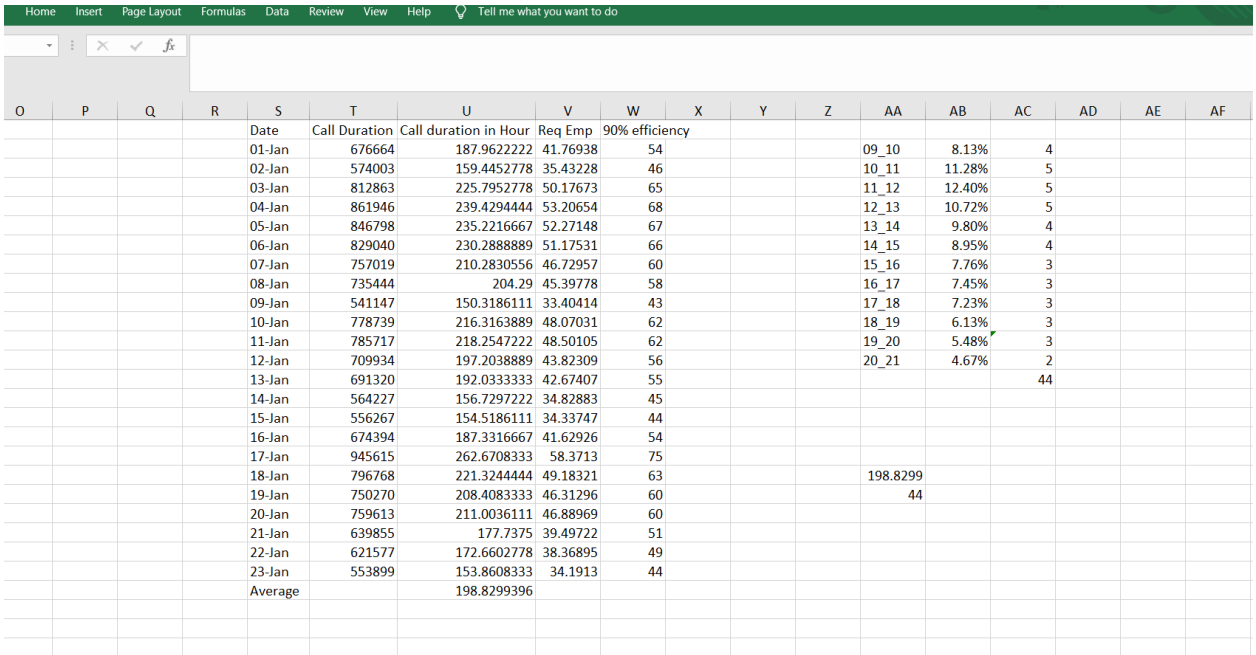

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
					Date	Call Duration	Call duration in Hour	Req Emp	90% efficiency									
					01-Jan	676664	187.9622222	41.76938	54				09_10	8.13%	4			
					02-Jan	574003	159.4452778	35.43228	46				10_11	11.28%	5			
					03-Jan	812863	225.7952778	50.17673	65				11_12	12.40%	5			
					04-Jan	861946	239.4294444	53.20654	68				12_13	10.72%	5			
					05-Jan	846798	235.2216667	52.27148	67				13_14	9.80%	4			
					06-Jan	829040	230.2888889	51.17531	66				14_15	8.95%	4			
					07-Jan	757019	210.2830556	46.72957	60				15_16	7.76%	3			
					08-Jan	735444	204.29	45.39778	58				16_17	7.45%	3			
					09-Jan	541147	150.3186111	33.40414	43				17_18	7.23%	3			
					10-Jan	778739	216.3163889	48.07031	62				18_19	6.13%	3			
					11-Jan	785717	218.2547222	48.50105	62				19_20	5.48%	3			
					12-Jan	709934	197.2038889	43.82309	56				20_21	4.67%	2			
					13-Jan	691320	192.0333333	42.67407	55						44			
					14-Jan	564227	156.7297222	34.82883	45									
					15-Jan	556267	154.5186111	34.33747	44									
					16-Jan	674394	187.3316667	41.62926	54									
					17-Jan	945615	262.6708333	58.3713	75									
					18-Jan	796768	221.3244444	49.18321	63				198.8299					
					19-Jan	750270	208.4083333	46.31296	60				44					
					20-Jan	759613	211.0036111	46.88969	60									
					21-Jan	639855	177.7375	39.49722	51									
					22-Jan	621577	172.6602778	38.36895	49									
					23-Jan	553899	153.8608333	34.1913	44									
					Average		198.8299396											

4. 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%.

D2 =ROUNDDOWN((C2/100)*I9,0)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Time Bucket	Distr for every 30 callls	Perc Distr.	Add agents req							Date	Count of Calls	Call in Sec	Call in Hours		
2	9pm-10pm	3	10	1							01-Jan	4644	676664	187.9622222		
3	10pm-11pm	3	10	1				Total Calls At Daytime	5130		02-Jan	3351	574003	159.4452778		
4	11pm-12am	2	6.666666667	1				Night Calls(30%of Daytime)	1539		03-Jan	4789	812863	225.7952778		
5	12am-1am	2	6.666666667	1				Average Time	198.8299		04-Jan	5113	861946	239.4294444		
6	1am-2am	1	3.333333333	1							05-Jan	4790	846798	235.2216667		
7	2am-3am	1	3.333333333	1							06-Jan	4951	829040	230.2888889		
8	3am-4am	1	3.333333333	1				Additional Hours	76.49982		07-Jan	4948	757019	210.2830556		
9	4am-5am	1	3.333333333	1				Additional Agents	16		08-Jan	4672	735444	204.29		
10	5am-6am	3	10	1							09-Jan	3652	541147	150.3186111		
11	6am-7am	4	13.33333333	2							10-Jan	4983	778739	216.3163889		
12	7am-8am	4	13.33333333	2							11-Jan	4637	785717	218.2547222		
13	8am-9am	5	16.66666667	3							12-Jan	4643	709934	197.2038889		
14		30	100	16							13-Jan	4123	691320	192.0333333		
15											14-Jan	3155	564227	156.7297222		
16											15-Jan	3058	556267	154.5186111		
17											16-Jan	5142	674394	187.3316667		
18											17-Jan	22347	945615	262.6708333		
19											18-Jan	5774	796768	221.3244444		
20											19-Jan	4703	750270	208.4083333		
21											20-Jan	4322	759613	211.0036111		
22											21-Jan	3675	639855	177.7375		
23											22-Jan	3291	621577	172.6602778		
24											23-Jan	3225	553899	153.8608333		
25														198.8299396		
26											Averag	5129.913043				
27												5130				
28																
29																