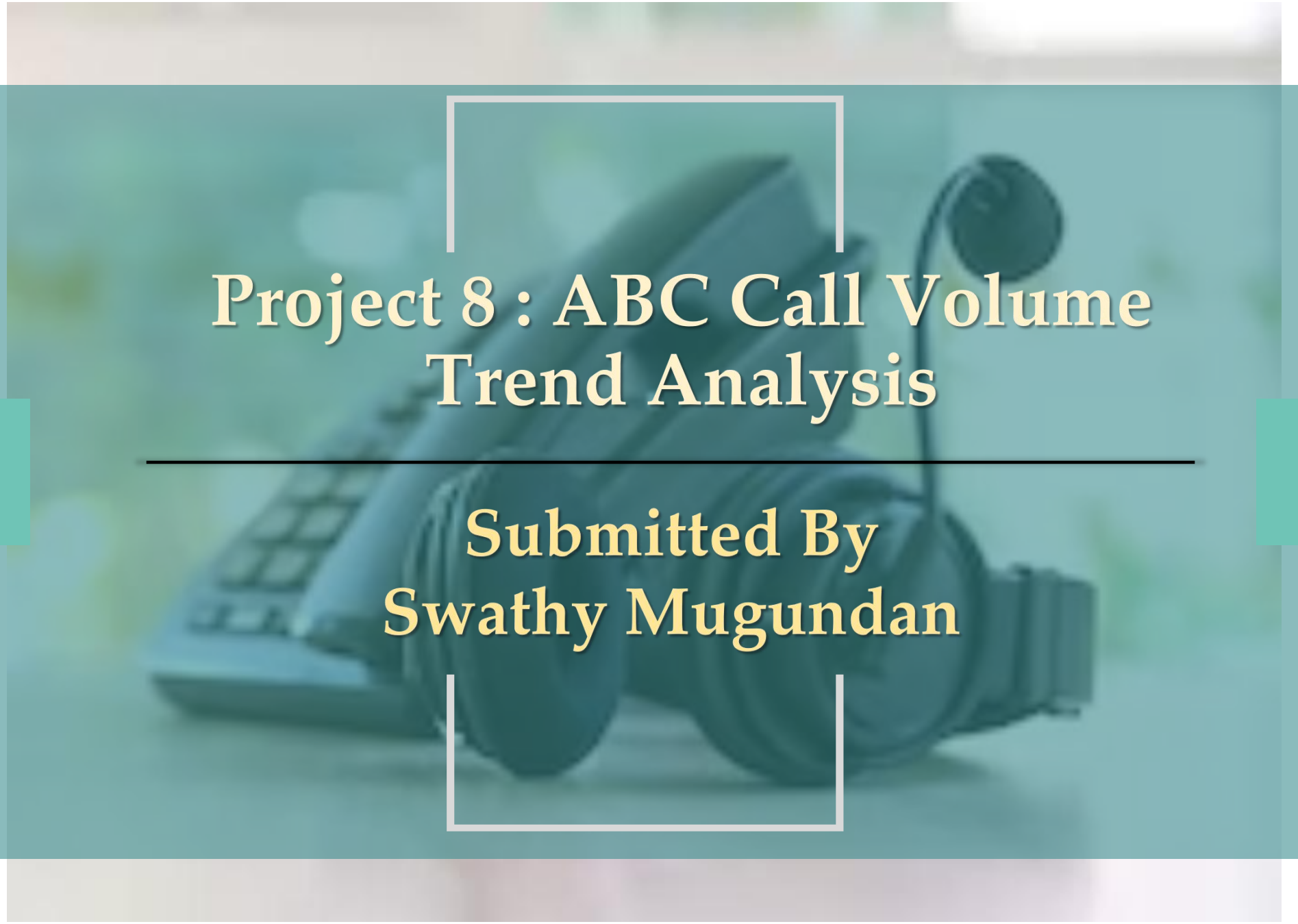


Project 8 : ABC Call Volume Trend Analysis

Submitted By
Swathy Mugundan

Problem Statement

- In this project, you'll be diving into the world of Customer Experience (CX) analytics, specifically focusing on the inbound calling team of a company. A Customer Experience (CX) team plays a crucial role in a company.
- This team analyze customer feedback and data, derive insights from it, and share these insights with the rest of the organization. It 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.
- In the current era, several AI-powered tools are being used to enhance customer experience which include Interactive Voice Response (IVR), Robotic Process Automation (RPA), Predictive Analytics, and Intelligent Routing.
- One of the key roles in a CX team is that of the customer service representative, also known as a call center agent who handle various types of support, including email, inbound, outbound, and social media support.
- Inbound customer support, which is the focus of this project, involves handling incoming calls from existing or prospective customers.
- The goal is to attract, engage, and delight customers, turning them into loyal advocates for the business.

Business Understanding

- Advertising is a crucial aspect of any business. It helps increase sales and makes the audience aware of the company's products or services. The first impressions of a business are often formed through its advertising efforts.
- The target audience for businesses can be local, regional, national, or international. Various types of advertising are used to reach these audiences, including online directories, trade and technical press, radio, cinema, outdoor advertising, and national papers, magazines, and TV.
- The advertising business is highly competitive, with many players bidding large amounts of money to target the same audience segment. This is where the company's analytical skills come into play. The goal is to identify those media platforms that can convert audiences into customers at a low cost.

Customer Experience Analytics (CX)

- 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.
- This data-driven approach helps businesses improve their customer service, enhance their product offerings, and make informed business decisions.

Importance of CX Analytics

Empowers With Customer Insights

Encourages Customer-Centricity

Discover Improvement Opportunities

- **Understanding Customer Behavior:** CX analytics provides insights into how customers interact with a business. This includes their browsing patterns, purchase history, product usage, and feedback. Understanding these behaviors helps businesses tailor their offerings to meet customer needs.
- **Personalization :** With CX analytics, businesses can create personalized experiences for their customers. This can lead to increased customer satisfaction and loyalty.
- **Predictive Analytics:** CX analytics can also be used to predict future customer behavior. This can help businesses anticipate customer needs and take proactive measures to meet them.
- **Improving Customer Service:** By analyzing customer feedback and interactions, businesses can identify areas of improvement in their customer service. This can lead to improved customer satisfaction and retention.
- **Driving Business Decisions:** The insights gained from CX analytics can inform business decisions. This can lead to improved product development, marketing strategies, and overall business performance.

Understanding Dataset and Preprocessing

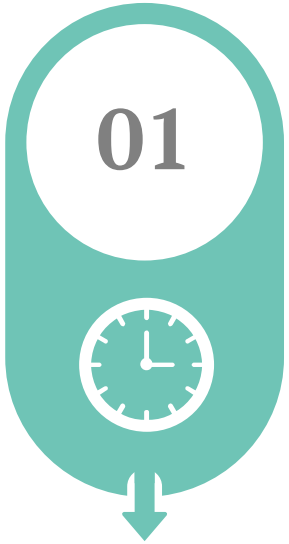
- For this project, provided with a dataset that spans 23 days and includes various details such as the agent's name and ID, the queue time (how long a customer had to wait before connecting with an agent), the time of the call, the duration of the call, and the call status (whether it was abandoned, answered, or transferred).
- **Data Preprocessing :** We can observe that, Agent_Name and Agent_ID has 28% null values, wrapped_by column has 40% null values.
    - All null rows with “Agent_ID” has the call duration as zero seconds.
    - All null rows with “Agent_Name” has the call status as “abandon”
    - Dropping the wrapped_by attribute will not have any impact in the analysis
- Hence, **no preprocessing** is required for the analysis.

Project Tech Stack Used

Tableau is a leading data visualization tool used for data analysis and business intelligence. Tableau supports powerful data discovery and exploration that enables users to answer important questions in seconds. No prior programming knowledge is needed. Tableau enables users to create reports by joining and blending different datasets. Tableau Server supports a centralized location to manage all published data sources within an organization

MS Excel is a spreadsheet program where one can record data in the form of tables. It is easy to analyse data in an Excel spreadsheet. A spreadsheet is in the form of a table comprising rows and columns. Easy to store and manage data, Application of Mathematical and Statistical formulas, More Secured, Clearer visibility of information and Data Processing Application

Data Analytics - Tasks



Average Call Duration

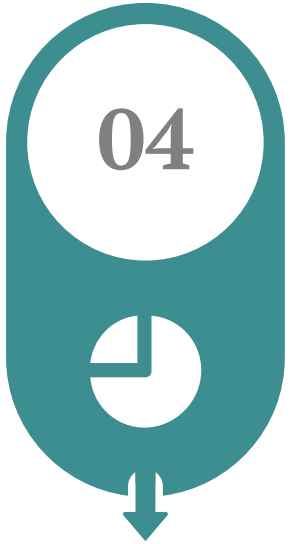
To determine the average duration of all incoming calls received by agents. This should be calculated for each time bucket.

Call Volume Analysis

To visualize the total number of calls received. This should be represented as a graph or chart showing the number of calls against time.

Manpower Planning

To propose a plan for manpower allocation during each time bucket (from 9 am to 9 pm) to reduce the abandon rate to 10%.



Night Shift Manpower Planning

To propose a plan for manpower allocation during night time, like they also make 30 calls at night between 9 pm and 9 am.

Average Call Duration

Objective : To observe the average call duration for each time bucket.

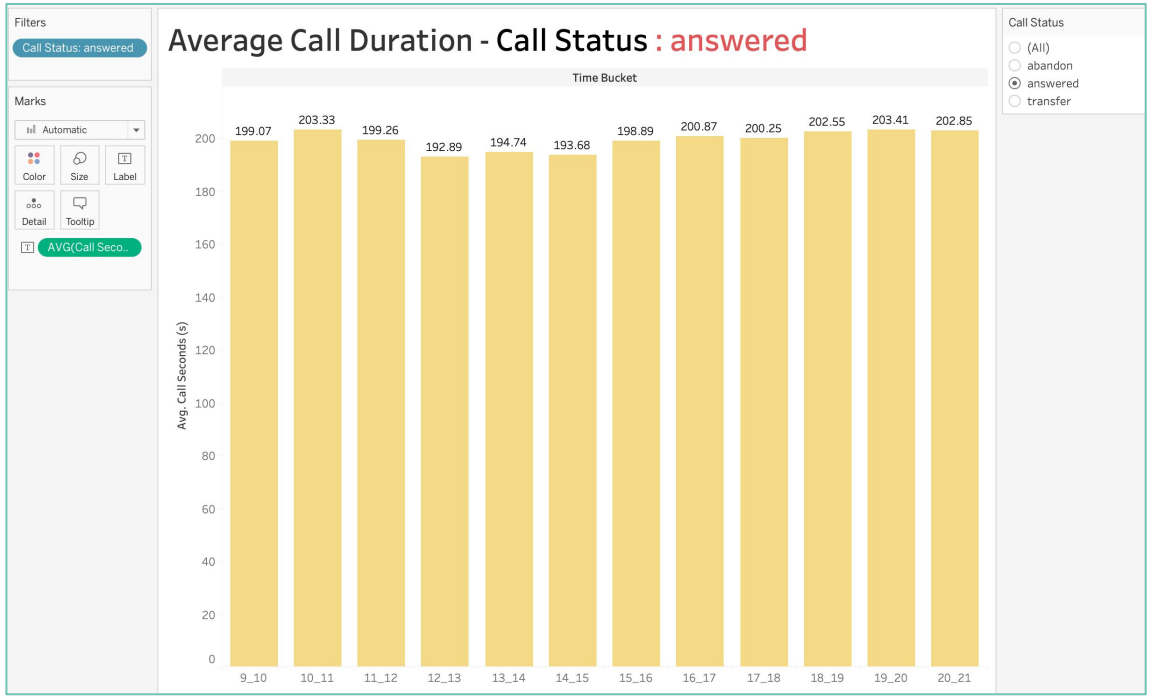
Approach : In tableau, the time bucket is taken as dimension and the call seconds is taken as measure. For the measure, the average value is calculated. Additionally, Call Status values are added as filters for more understanding.

Data Visualisation : Bar Graph is plotted for the above scenario to visualise the average call duration for each time bucket. Average Values are used as Labels.

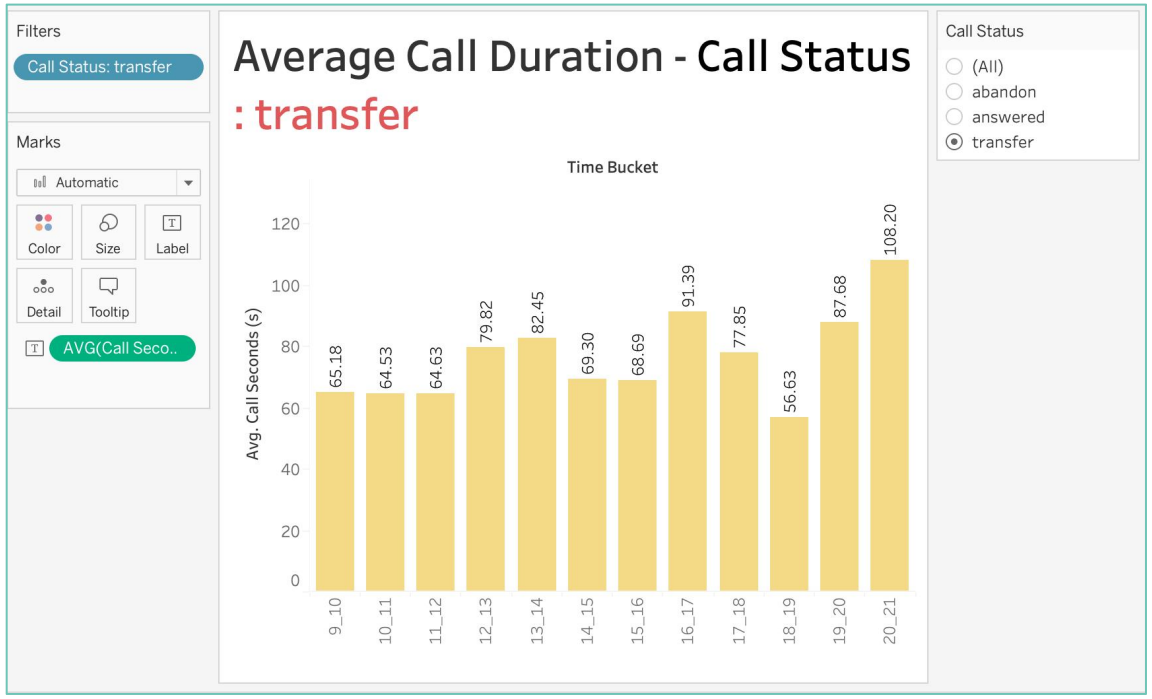
Tableau Sheet Name : Task 1

Task 1 : Average Call Duration

[Click Here for Tableau Link]



Bar Chart for Average Call Duration for the call status as “Answered” with each time_bucket



Bar Chart for Average Call Duration for the call status as “Transfer” with each time_bucket

Call Volume Analysis

Objective : To observe the total number of calls for each time bucket.

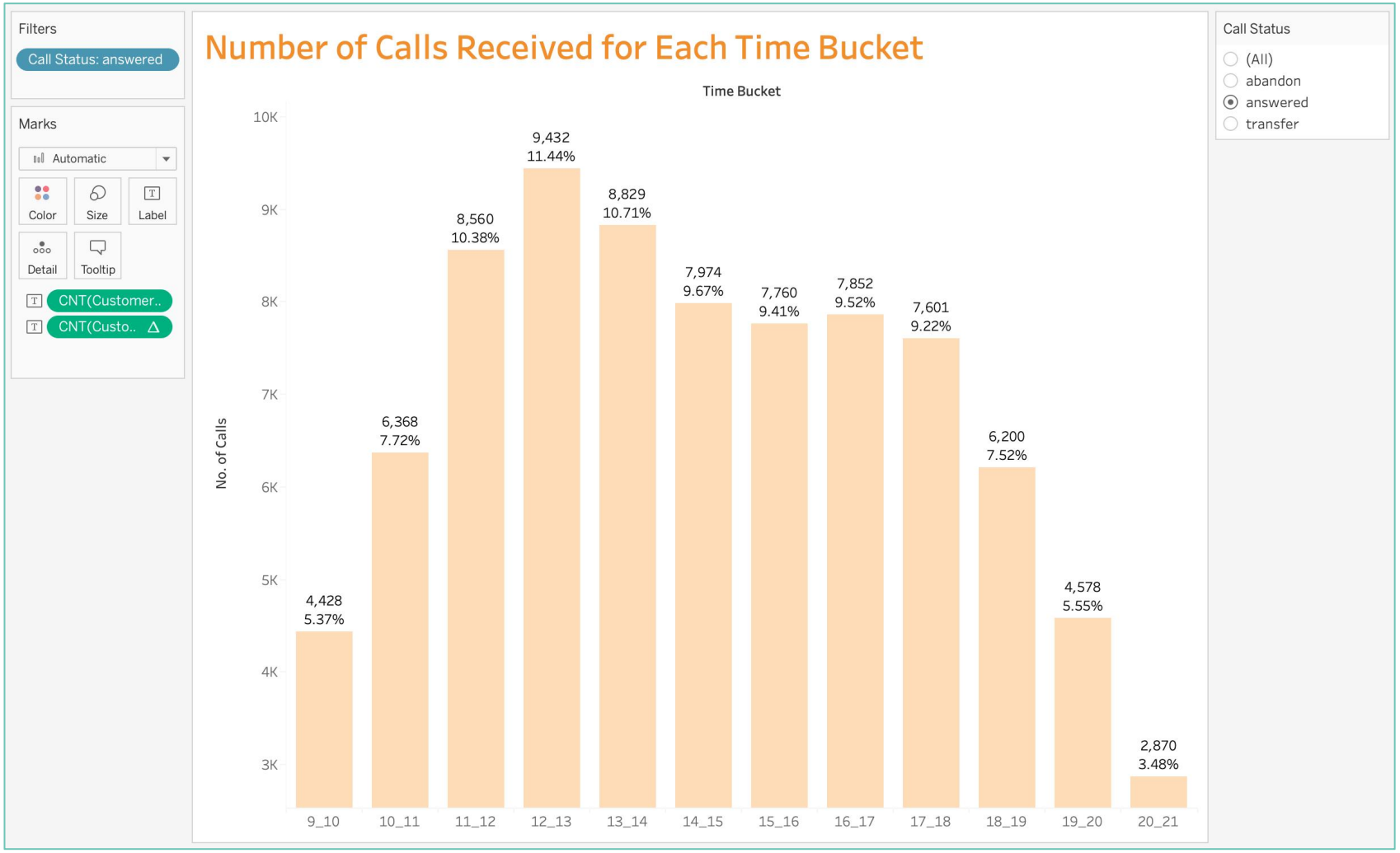
Approach : In tableau, the time bucket is taken as dimension and the count of customer phone number is taken as measure. For the measure, the percentage of proportion is calculated. Additionally, Call Status values are added as filters for more understanding.

Data Visualisation : Bar Graph is plotted for the above scenario to visualise the average call duration for each time bucket. The count and percentage values are used as labels.

Tableau Sheet Name : Task 2

Task 2 : Call Volume Analysis

[Click Here for Tableau Link]



Manpower Planning

Objective : To propose a manpower allocation for the time bucket to reduce the abandon rate to 10%

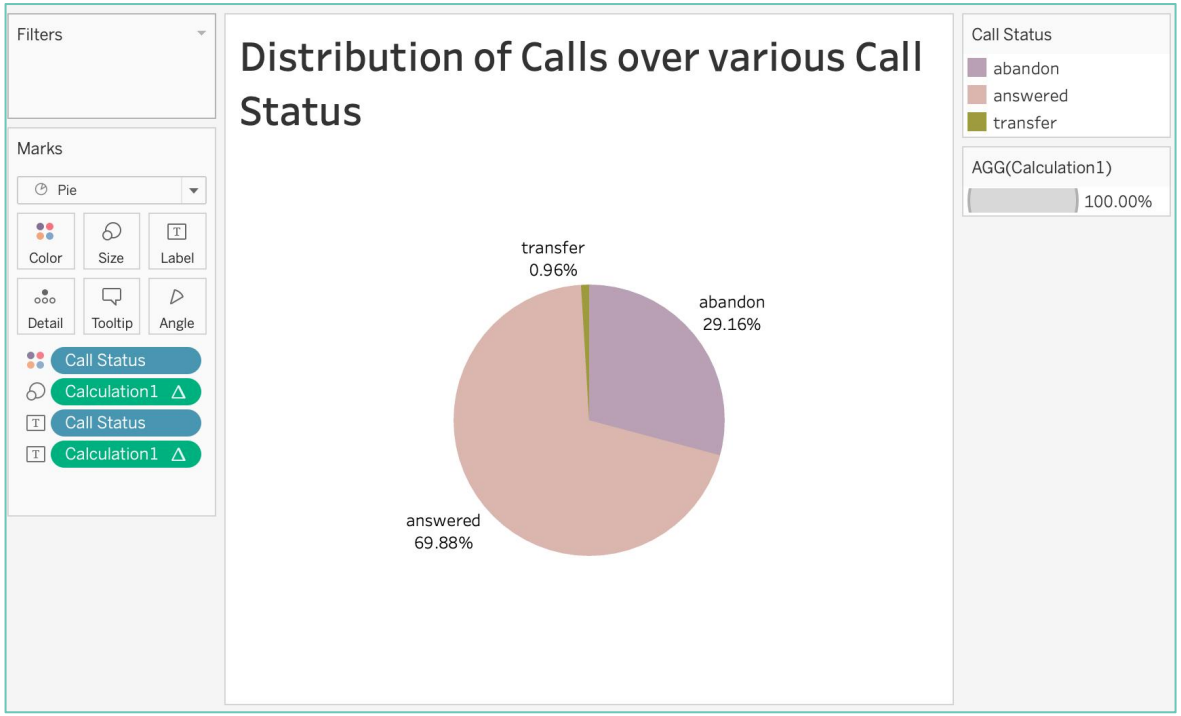
Approach : In tableau, the distribution of various call status are observed. Based on this, the number of agents required to answer 90 out of 100 calls are calculated to reduce the abandon rate.

Data Visualisation : Pie Chart, Bar Graph, Stacked Bar Chart are plotted for the above scenario to visualise the average call duration for each time bucket. The count and percentage values are used as labels.

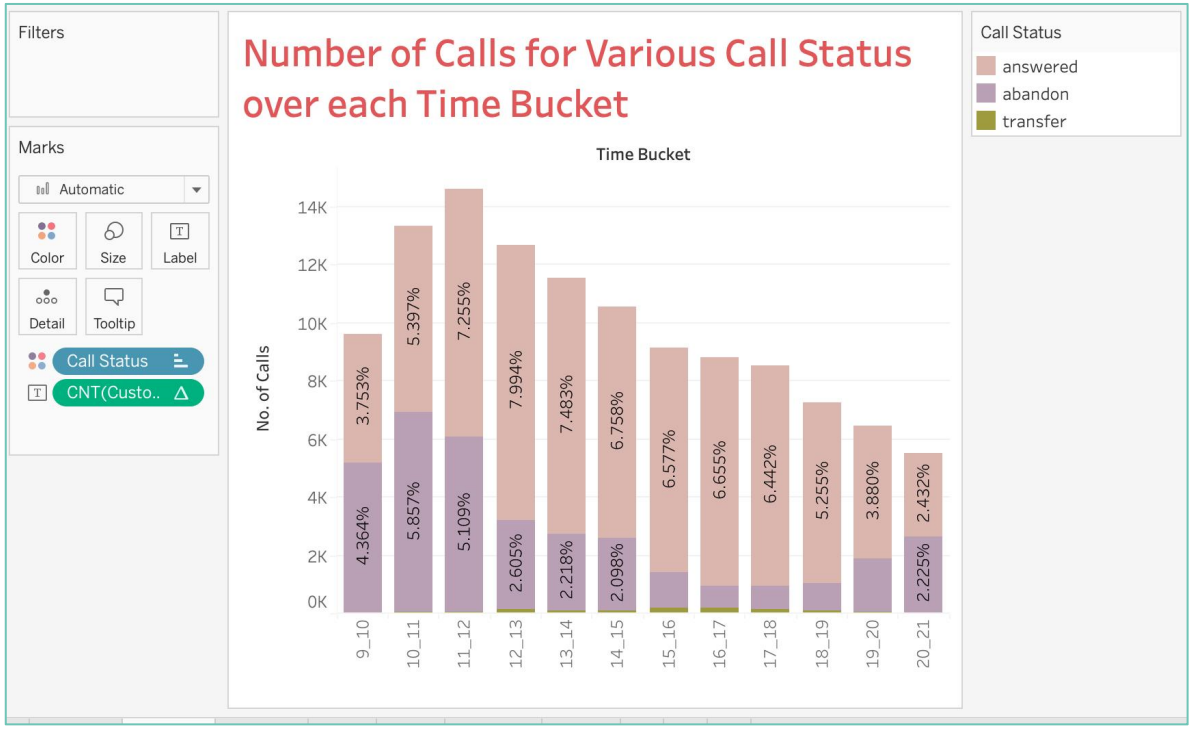
Tableau Sheet Name : Task 3(A), Task 3(B), Task 3(C), Task 3

Task 3 : Manpower Planning

[Click Here for Tableau Link]



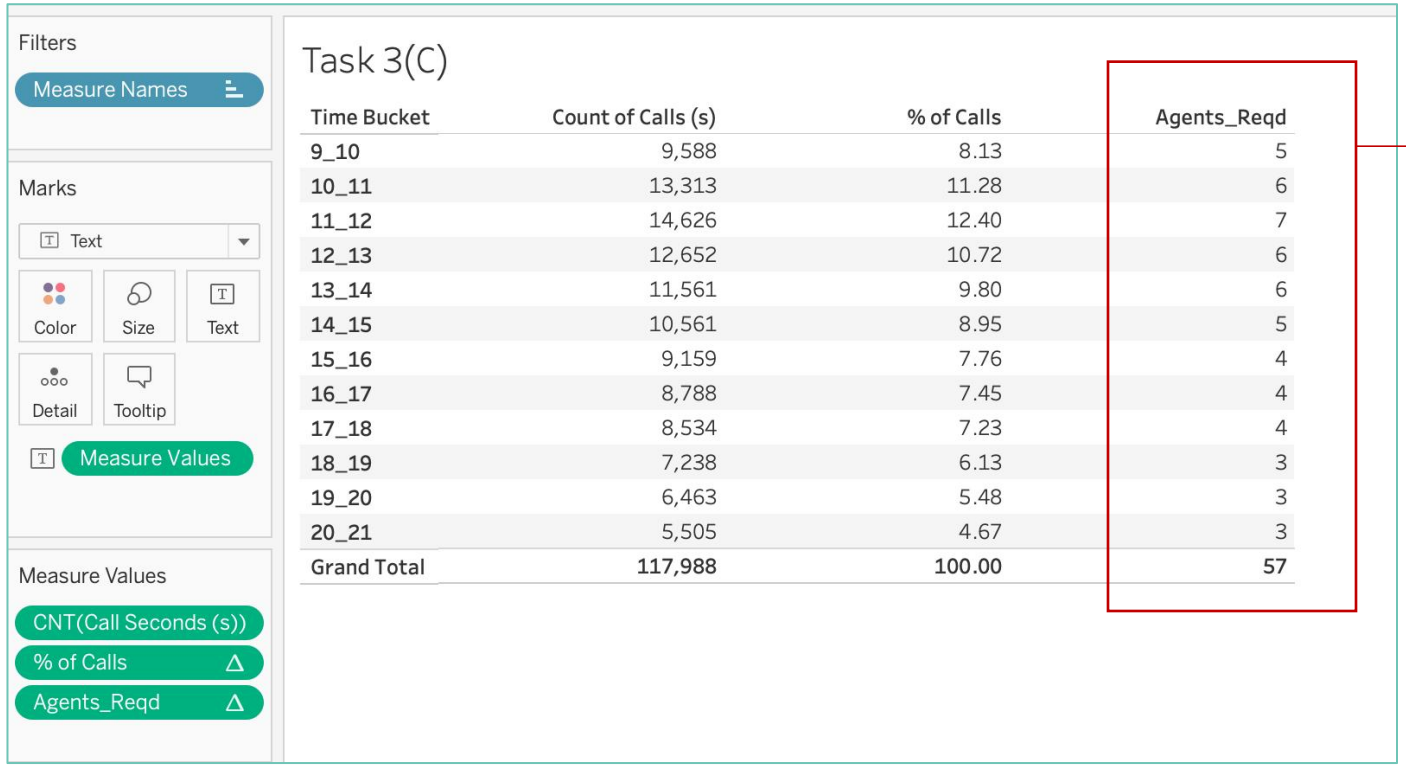
Pie Chart for the different call status is plotted along with the percentage of proportion



Stacked Bar Chart is plotted for observing the proportion of various call status over each time_bucket

Task 3 : Manpower Planning

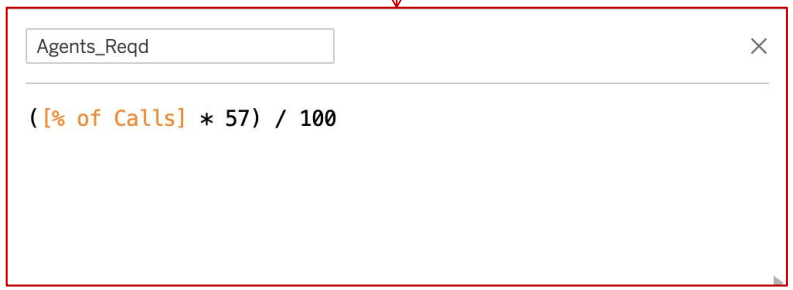
[Click Here for Tableau Link]



Task 3(C)

Time Bucket	Count of Calls (s)	% of Calls	Agents_Reqd
9_10	9,588	8.13	5
10_11	13,313	11.28	6
11_12	14,626	12.40	7
12_13	12,652	10.72	6
13_14	11,561	9.80	6
14_15	10,561	8.95	5
15_16	9,159	7.76	4
16_17	8,788	7.45	4
17_18	8,534	7.23	4
18_19	7,238	6.13	3
19_20	6,463	5.48	3
20_21	5,505	4.67	3
Grand Total	117,988	100.00	57

Calculated Field



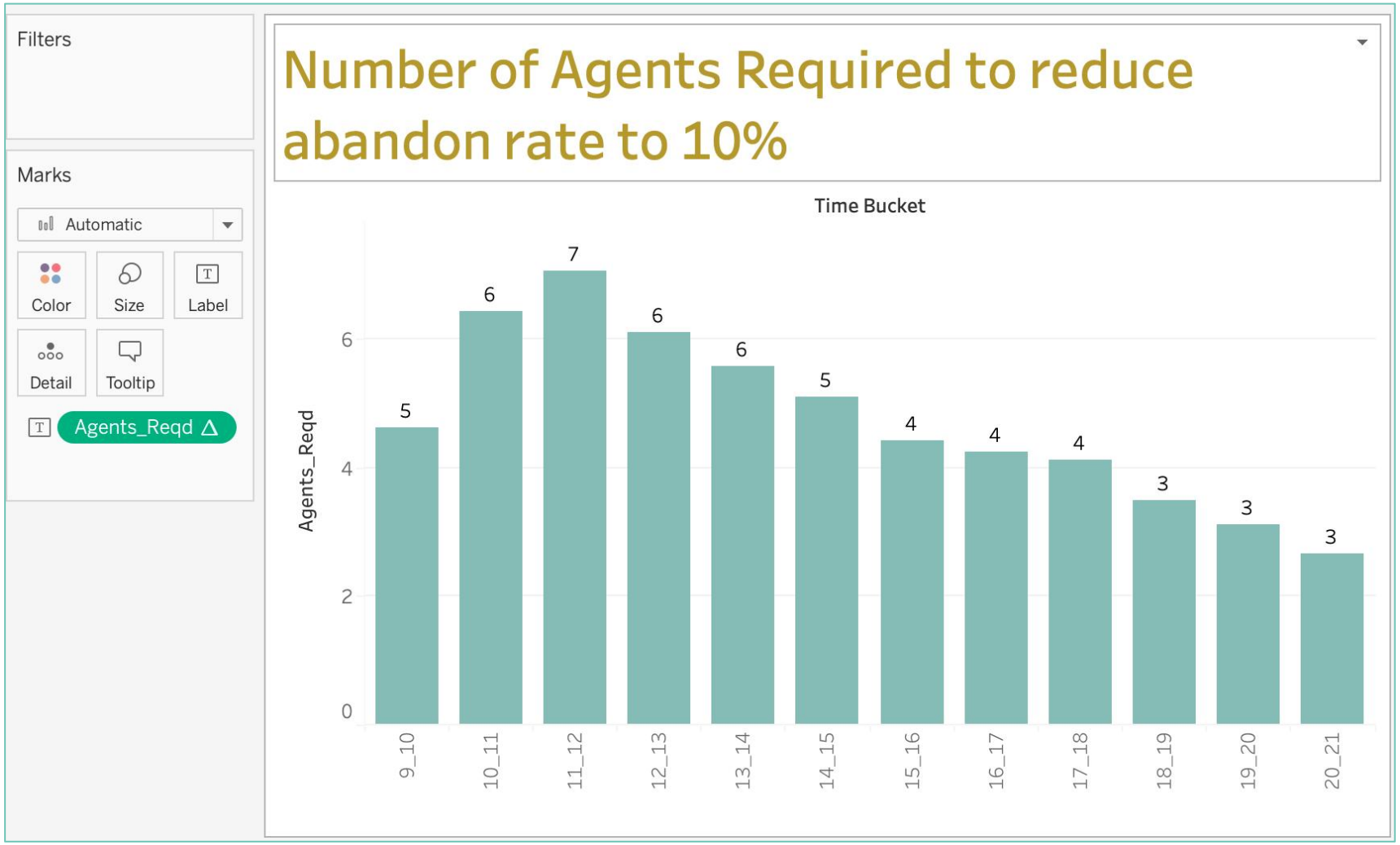
Text Table is constructed for visualising the count of calls, its respective percentage and the number of agents required to reduce abandon rate to 10% over time_bucket

Number of agents required to achieve 10% abandon rate is 57.

Using this value, the number of agents required for each time_bucket is calculated.

Task 3 : Manpower Planning

[Click Here for Tableau Link]



Night Shift : Manpower Planning

04

Objective : To propose a manpower allocation for the time bucket to reduce the abandon rate to 10% and manage the night calls.

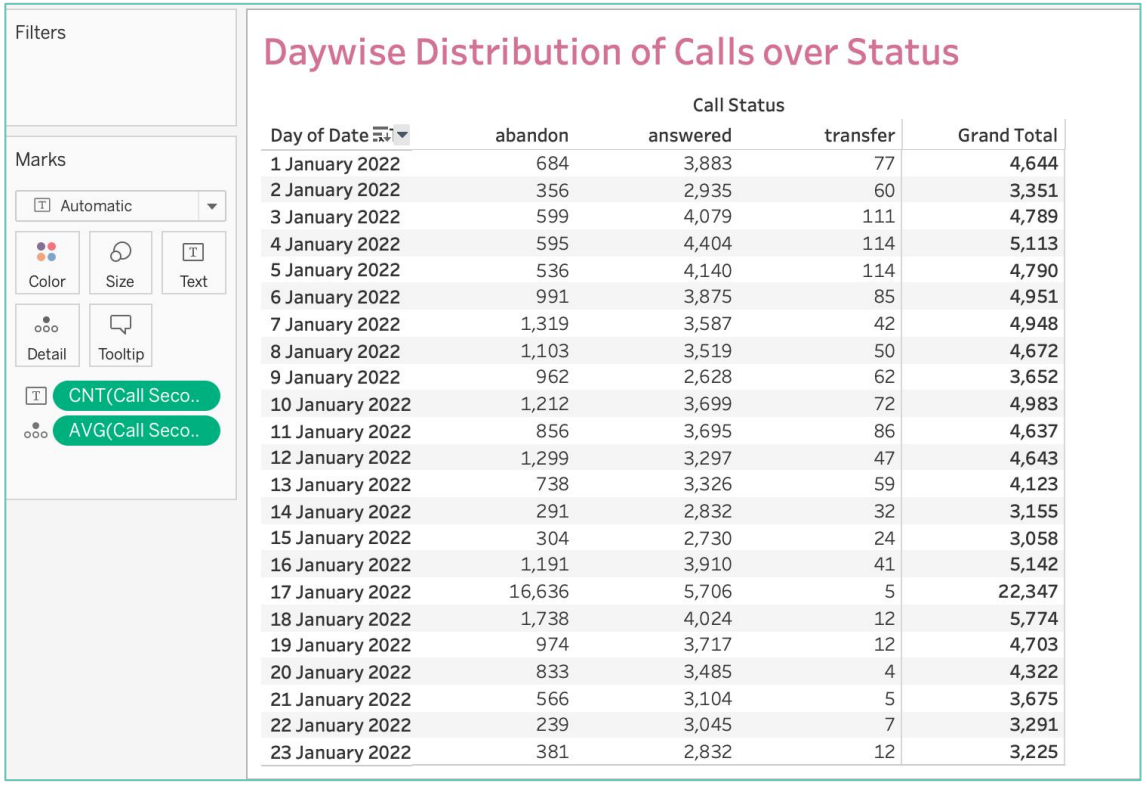
Approach : In tableau, the distribution of various call status are observed. Based on this, the number of agents required to night calls with 10% abandon rate is identified. Using Excel, the data is tabulated.

Data Visualisation : Using MS-Excel formulas, the time distribution is made and the agents are figured out. Bar chart is plotted for number of agents.

Tableau Sheet Name : Task 4, Excel Table

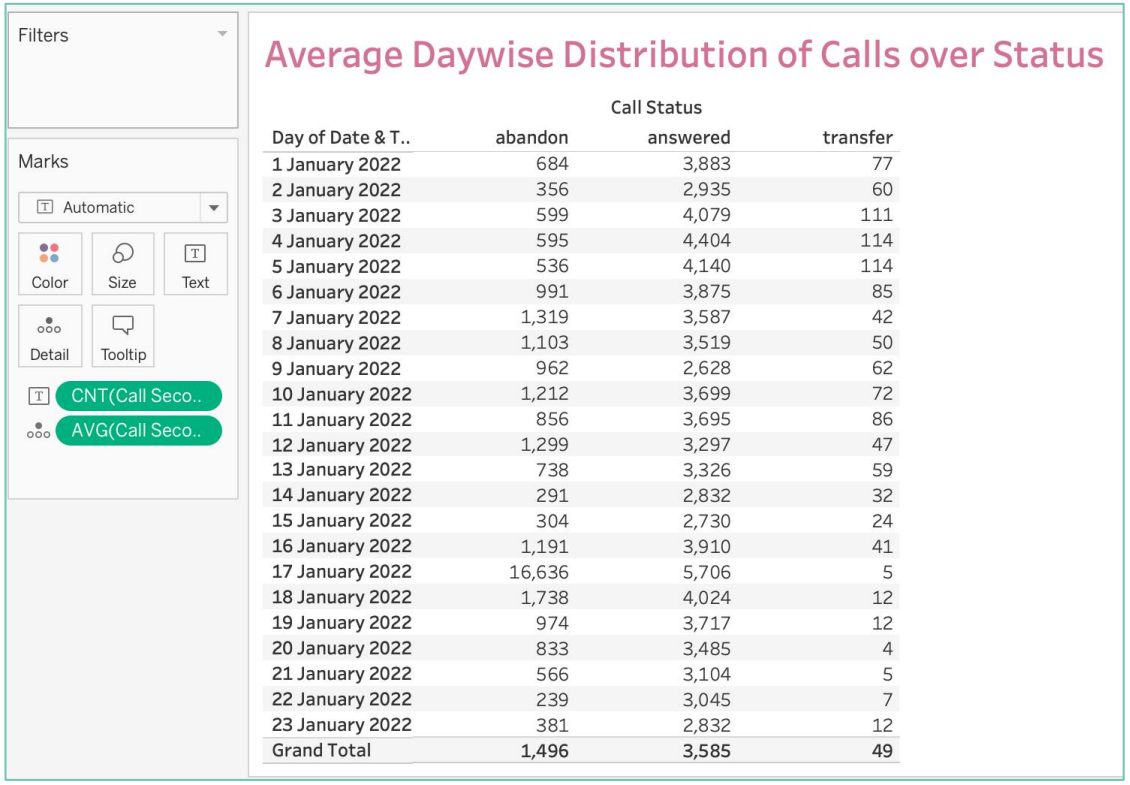
Task 4 : Night Shift : Manpower Planning

[Click Here for Tableau Link]



Daywise Distribution of Calls over Status

	Call Status			
Day of Date	abandon	answered	transfer	Grand Total
1 January 2022	684	3,883	77	4,644
2 January 2022	356	2,935	60	3,351
3 January 2022	599	4,079	111	4,789
4 January 2022	595	4,404	114	5,113
5 January 2022	536	4,140	114	4,790
6 January 2022	991	3,875	85	4,951
7 January 2022	1,319	3,587	42	4,948
8 January 2022	1,103	3,519	50	4,672
9 January 2022	962	2,628	62	3,652
10 January 2022	1,212	3,699	72	4,983
11 January 2022	856	3,695	86	4,637
12 January 2022	1,299	3,297	47	4,643
13 January 2022	738	3,326	59	4,123
14 January 2022	291	2,832	32	3,155
15 January 2022	304	2,730	24	3,058
16 January 2022	1,191	3,910	41	5,142
17 January 2022	16,636	5,706	5	22,347
18 January 2022	1,738	4,024	12	5,774
19 January 2022	974	3,717	12	4,703
20 January 2022	833	3,485	4	4,322
21 January 2022	566	3,104	5	3,675
22 January 2022	239	3,045	7	3,291
23 January 2022	381	2,832	12	3,225



Average Daywise Distribution of Calls over Status

	Call Status		
Day of Date & T..	abandon	answered	transfer
1 January 2022	684	3,883	77
2 January 2022	356	2,935	60
3 January 2022	599	4,079	111
4 January 2022	595	4,404	114
5 January 2022	536	4,140	114
6 January 2022	991	3,875	85
7 January 2022	1,319	3,587	42
8 January 2022	1,103	3,519	50
9 January 2022	962	2,628	62
10 January 2022	1,212	3,699	72
11 January 2022	856	3,695	86
12 January 2022	1,299	3,297	47
13 January 2022	738	3,326	59
14 January 2022	291	2,832	32
15 January 2022	304	2,730	24
16 January 2022	1,191	3,910	41
17 January 2022	16,636	5,706	5
18 January 2022	1,738	4,024	12
19 January 2022	974	3,717	12
20 January 2022	833	3,485	4
21 January 2022	566	3,104	5
22 January 2022	239	3,045	7
23 January 2022	381	2,832	12
Grand Total	1,496	3,585	49

Text Table is constructed for visualising distribution of calls over each time_bucket.

The number of calls for each call status is observed.

Task 4 : Night Shift : Manpower Planning

[Click Here for Tableau Link]

Assumptions: An agent works for 6 days a week; On average, each agent takes 4 unplanned leaves per month; An agent's total working hours are 9 hours, out of which 1.5 hours are spent on lunch and snacks in the office. On average, an agent spends 60% of their total actual working hours (i.e., 60% of 7.5 hours) on calls with customers/users. The total number of days in a month is 30.

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

Total Average	5130	
Night Calls	1539	For every 100 calls, 30 calls are in night shift
Additional Hrs	76.41135	Average hours per day - 198.6
Agents Reqd	15.28227	

Based on the assumptions given in the problem, the average of night calls, the additional hours required by the agents and the number of agents for each time bucket are calculated respectively.

Task 4 : Night Shift : Manpower Planning

Click Here for Tableau Link

Time	Calls Distribution	Time Distribution	Agents Reqd	Approx
9pm - 10pm	3	0.10	1.53	2
10pm - 11pm	3	0.10	1.53	2
11pm - 12am	2	0.07	1.02	1
12am - 1am	2	0.07	1.02	1
1am - 2am	1	0.03	0.51	1
2am - 3am	1	0.03	0.51	1
3am - 4am	1	0.03	0.51	1
4am-5am	1	0.03	0.51	1
5am-6am	3	0.10	1.53	2
6am-7am	4	0.13	2.04	2
7am-8am	4	0.13	2.04	2
8am-9am	5	0.17	2.55	3
Total	30			15

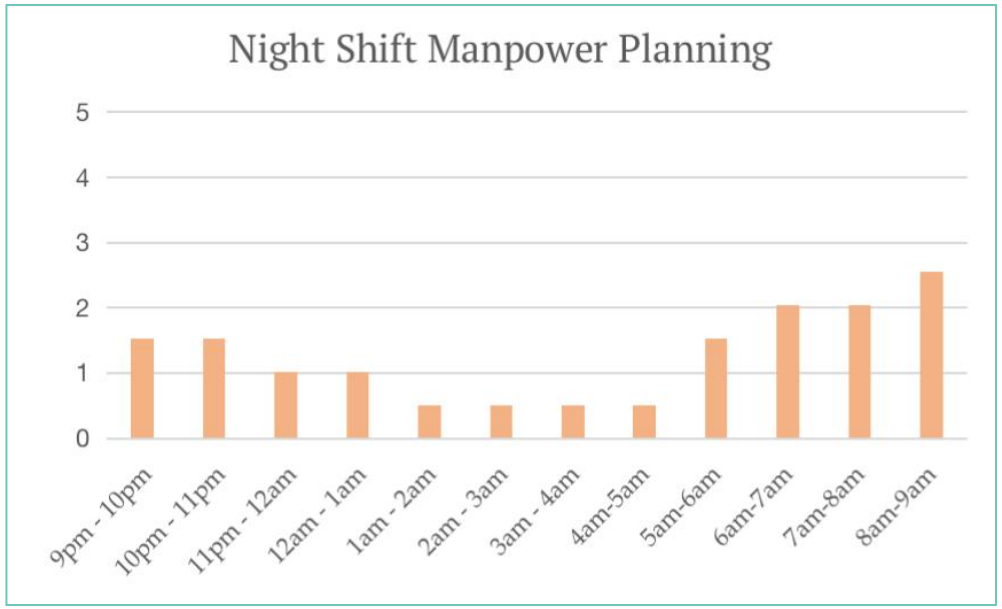


Table representing the time_bucket with additional agents required for night-shift planning to reduce the abandon rate to 10%

Bar Chart representing the night shift manpower planning with number of agents

Project Summary

- ✓ The dataset is observed completely before the analysis.
- ✓ Data Pre-processing is done for removal of irrelevant data.
- ✓ 9am - 12pm is the slot which receives the highest number of calls and also has a great impact in the company's abandon rate.
- ✓ Manpower planning will help to manage the agents efficiently.
- ✓ It will help to reduce the abandon rate and improve the customer experience.
- ✓ On a whole, this analysis would help the company to attract, engage and delight customers, turning them as loyal advocates for the busines.


Thank You