

CALL CENTER ANALYSIS

A POWER BI DASHBOARD &
(PYTHON) DATA VISUALIZATION

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OUTLINE

- Project Overview
- Process Map
- Power BI Dashboard (Demo)
- Insights & Recommendations
 - KPIs / Call Center Metrics
 - Hypothesis Testing
 - Data Visualization (Graphs)





OVERVIEW

OBJECTIVES

Analysis on call centre data.

- To extract insights on performance and highlight areas for improvement.
- To develop a report (Dashboard) in Power BI

DATA SOURCE

- Call center data (*from Kaggle*) combined with location data from SFO dataset.

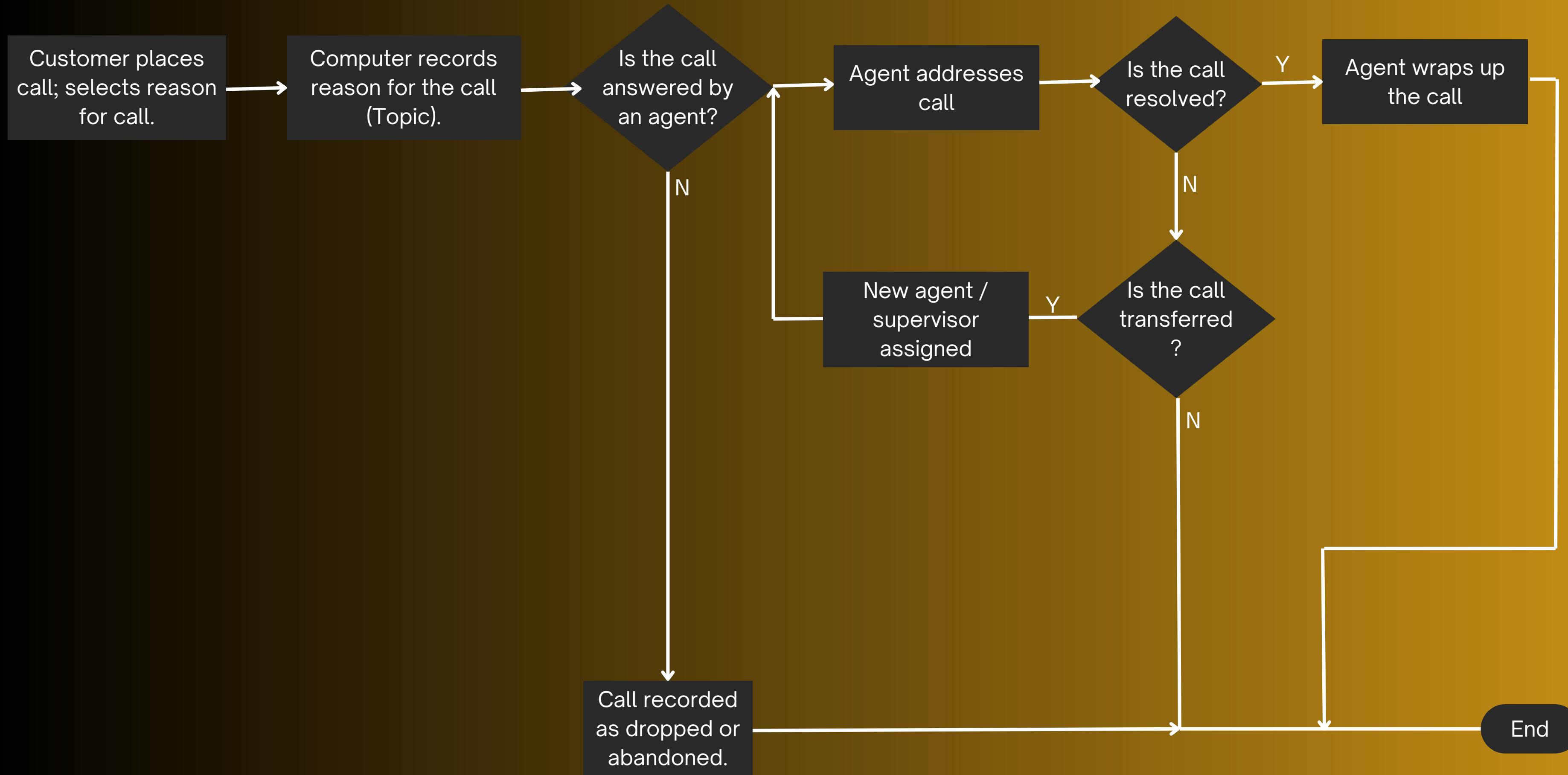
DATA PREPROCESSING & CALCULATIONS

- *Missing values*: imputation with 0 on ‘abandoned calls’.
- *Metrics*: KPIs calculated with Python & Pwer BI DAX

STATISTICAL ANALYSIS & HYPOTHESIS TESTS

- Summary statistics such as Mean etc applied.
- Correlation test with Spearman correlation
- Hypothesis testing

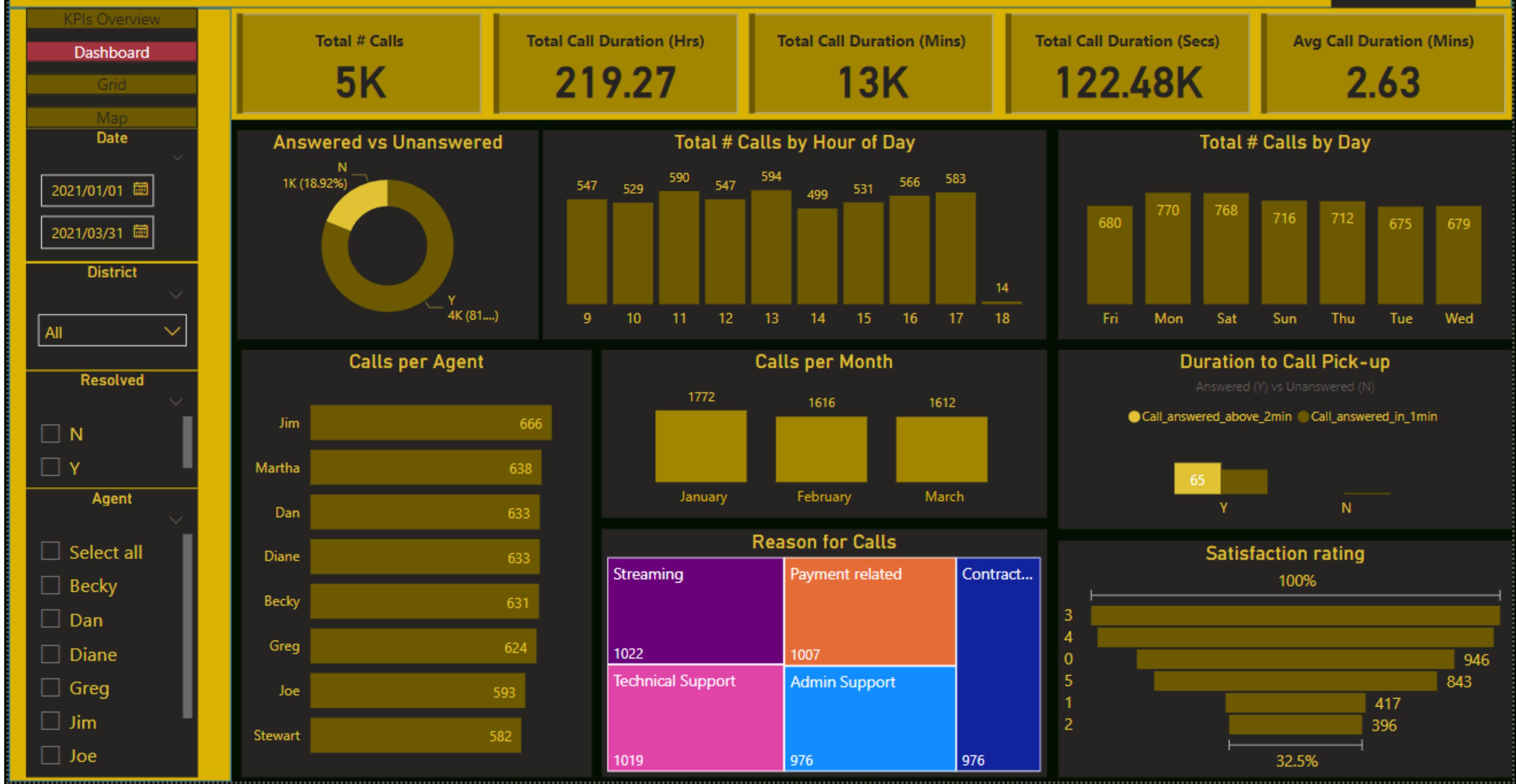
PROCESS MAP



POWER BI DASHBOARD

[YOUTUBE \(DEMO\) LINK](#)

CONTACT CENTRE - CALLS ANALYSIS



CONTACT CENTRE - CALLS ANALYSIS



KPIs Overview
Dashboard
Grid
Map
Date
2021/01/01
2021/03/31
District
All
Resolved
<input type="checkbox"/> N
<input type="checkbox"/> Y
Agent
<input type="checkbox"/> Select all
<input type="checkbox"/> Becky
<input type="checkbox"/> Dan
<input type="checkbox"/> Diane
<input type="checkbox"/> Greg
<input type="checkbox"/> Jim
<input type="checkbox"/> Joe

Total # Calls	Total Call Duration (Hrs)	Total Call Duration (Mins)	Total Call Duration (Secs)	Avg Call Duration (Mins)
5K	219.27	13K	122.48K	2.63

Agent	Caller_District	Answered (Y/N)	Call_Answered_Duration	Resolved	Satisfaction rating	Topic	Count of AnsweredCalls	ID
Becky	BAYVIEW	N	Call_answered_in_1min	N	0	Admin Support	4	
Becky	BAYVIEW	Y	Call_answered_above_2min	N	3	Admin Support	1	
Becky	BAYVIEW	Y	Call_answered_above_2min	Y	2	Admin Support	2	
Becky	BAYVIEW	Y	Call_answered_above_2min	Y	3	Admin Support	1	
Becky	BAYVIEW	Y	Call_answered_in_1min	Y	2	Admin Support	1	
Becky	BAYVIEW	Y	Call_answered_in_1min	Y	3	Admin Support	1	
Becky	BAYVIEW	Y	Call_answered_in_1min	Y	4	Admin Support	1	
Becky	BAYVIEW	Y	Call_answered_in_1min	Y	5	Admin Support	1	
Becky	CENTRAL	N	Call_answered_in_1min	N	0	Admin Support	1	
Becky	CENTRAL	Y	Call_answered_above_2min	Y	3	Admin Support	1	
Becky	CENTRAL	Y	Call_answered_above_2min	Y	4	Admin Support	1	
Becky	CENTRAL	Y	Call_answered_in_1min	N	4	Admin Support	1	
Becky	CENTRAL	Y	Call_answered_in_1min	N	5	Admin Support	1	
Becky	CENTRAL	Y	Call_answered_in_1min	Y	1	Admin Support	1	
Becky	CENTRAL	Y	Call_answered_in_1min	Y	2	Admin Support	1	
Becky	CENTRAL	Y	Call_answered_in_1min	Y	3	Admin Support	4	
Becky	CENTRAL	Y	Call_answered_in_1min	Y	4	Admin Support	1	
Becky	CENTRAL	Y	Call_answered_in_1min	Y	5	Admin Support	2	
Becky	INGLESIDE	N	Call_answered_in_1min	N	0	Admin Support	1	
Becky	INGLESIDE	Y	Call_answered_above_2min	N	4	Admin Support	1	
Becky	INGLESIDE	Y	Call_answered_above_2min	Y	1	Admin Support	1	

CONTACT CENTRE - CALLS ANALYSIS

Dashboard

Grid

Map

Date

2021/01/01 

2021/03/31 

District

All

Resolved

N

Y

Agent

Select all

Becky

Dan

Diane

Greg

Jim

Joe

Total # Calls

5K

Total Call Duration (Hrs)

219.27

Total Call Duration (Mins)

13K

Total Call Duration (Secs)

122.48K

Avg Call Duration (Mins)

2.63

Total # Calls Resolved per Agent

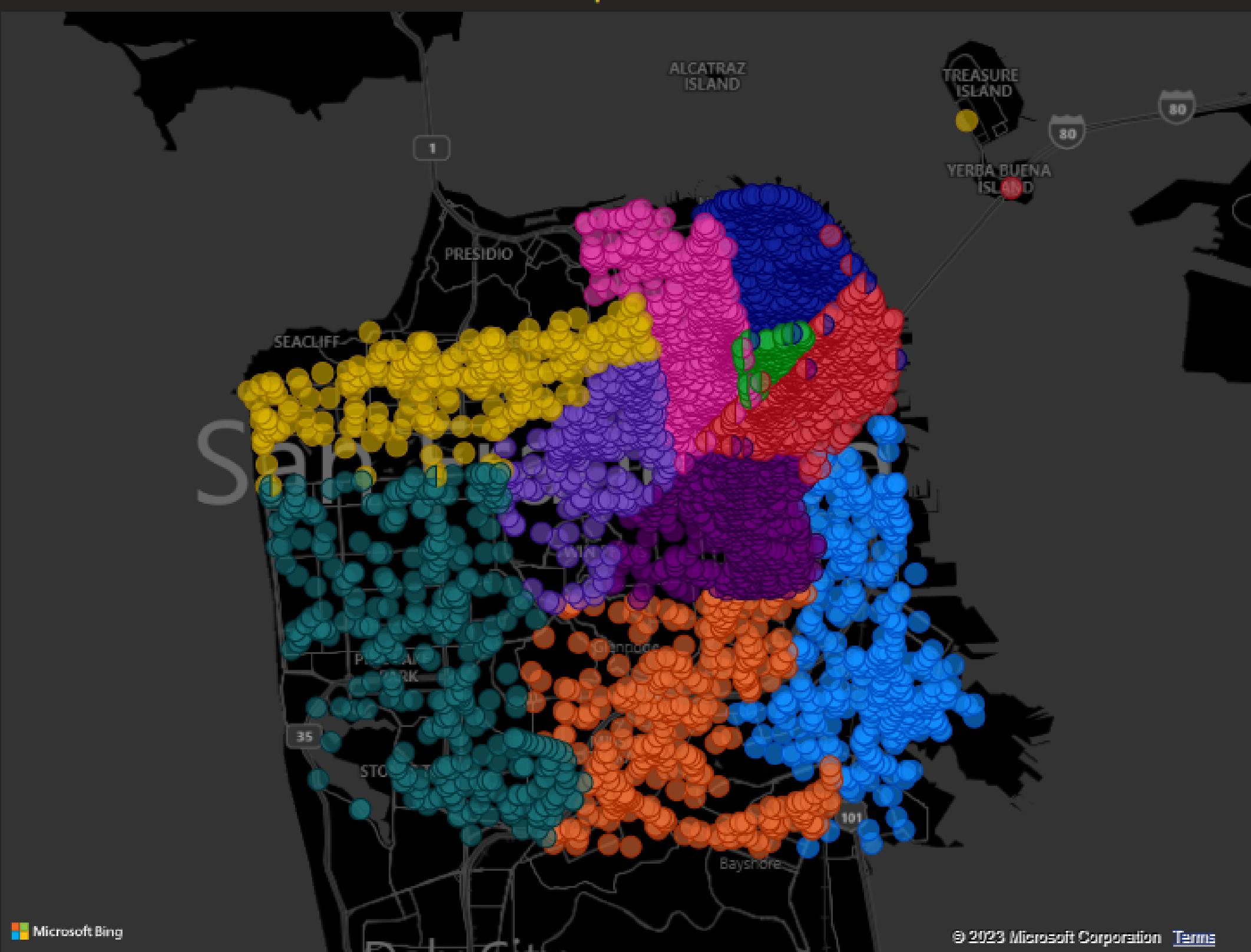


Total # Resolved Calls per District

Resolved ● N ● Y



Calls per District

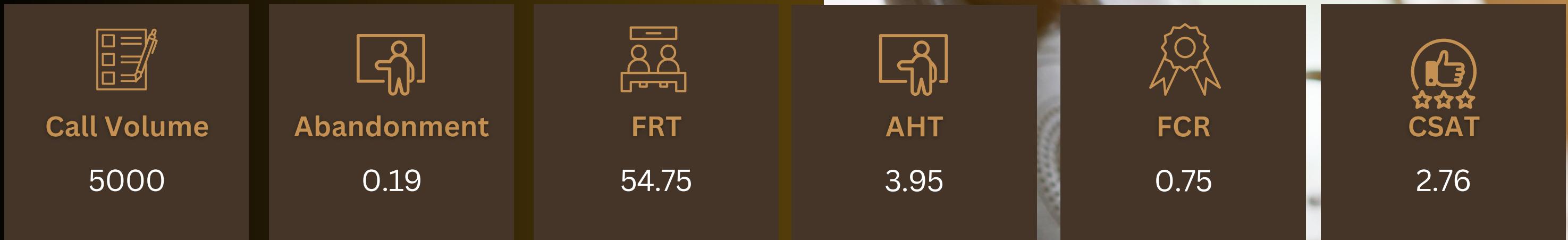


RECOMMENDATIONS & INSIGHTS

INSIGHTS & RECOMMENDATIONS

KEY PERFORMANCE INDICATORS

January - March 2021



Insights

- Only 0.01% of the calls fall within SLA.
- A significant drop in call volumes of 9.80% between January and February; an minimal increase of 0.24%
- All agents abandoned about a quarter of their calls. Majority of the topics , with the most abandoned call types being Technical Support and Payments.
- On average, it took about 3.95 minutes for a call to be addressed, with Streaming and Admin support having the longest duration.
- A quarter of the calls were resolved. Southern, Mission, and Central districts have the most unresolved calls.
- Customer satisfaction on resolved queries were lowest on Payment and Contract related calls, with an average of 3.38 and 3.37 respectively. It dropped significantly from an average of 2.84 in January to 2.71 in February. Minute increase from 2.71 to 2.72 in March.

Recommendations

- Call wrap up needs improvement.
- Re-training required for Technical Support and Payment related topics.
- An overall CSAT of 2.76 demands an improvement in service delivery .

STATISTICAL & HYPOTHESIS TESTS(INSIGHTS)

Topic	AvgTalkDurationSeconds	AvgRating
Admin Support	185.76	2.79
Contract related	184.33	2.73
Payment related	175.35	2.76
Streaming	188.74	2.82
Technical Support	177.80	2.70

#1 - Does the length of time a customer spends talking impact satisfaction rating?

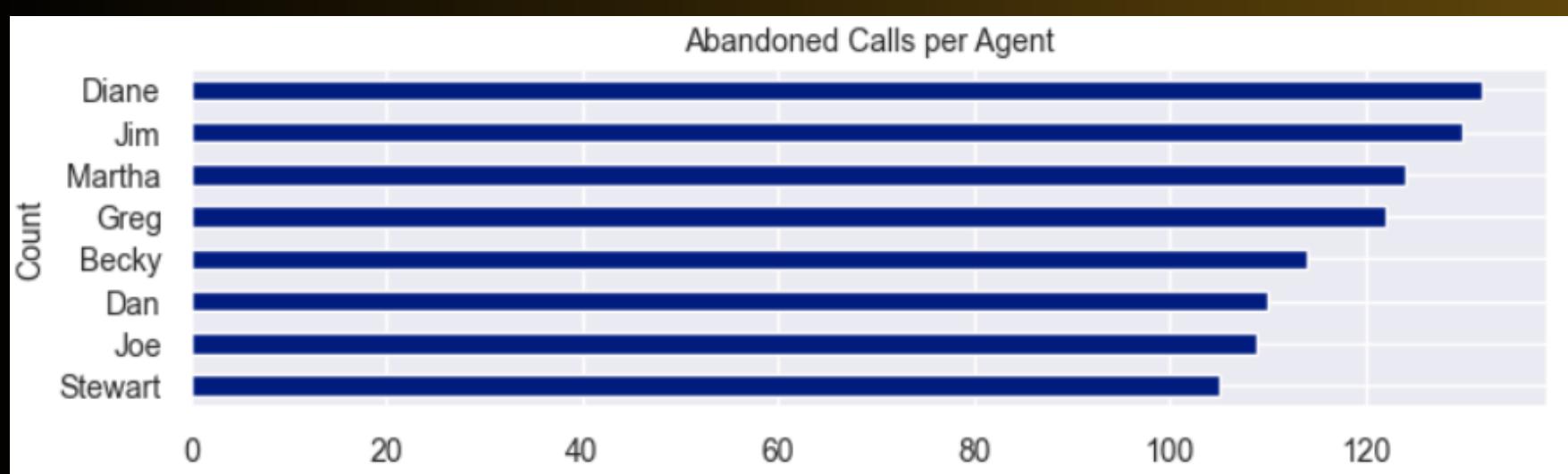
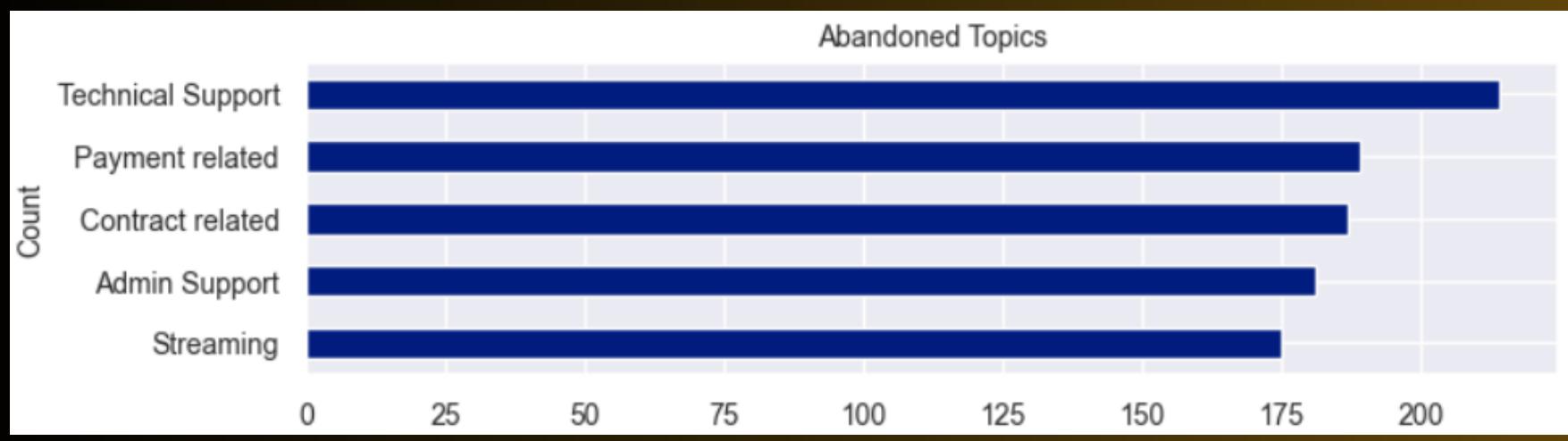
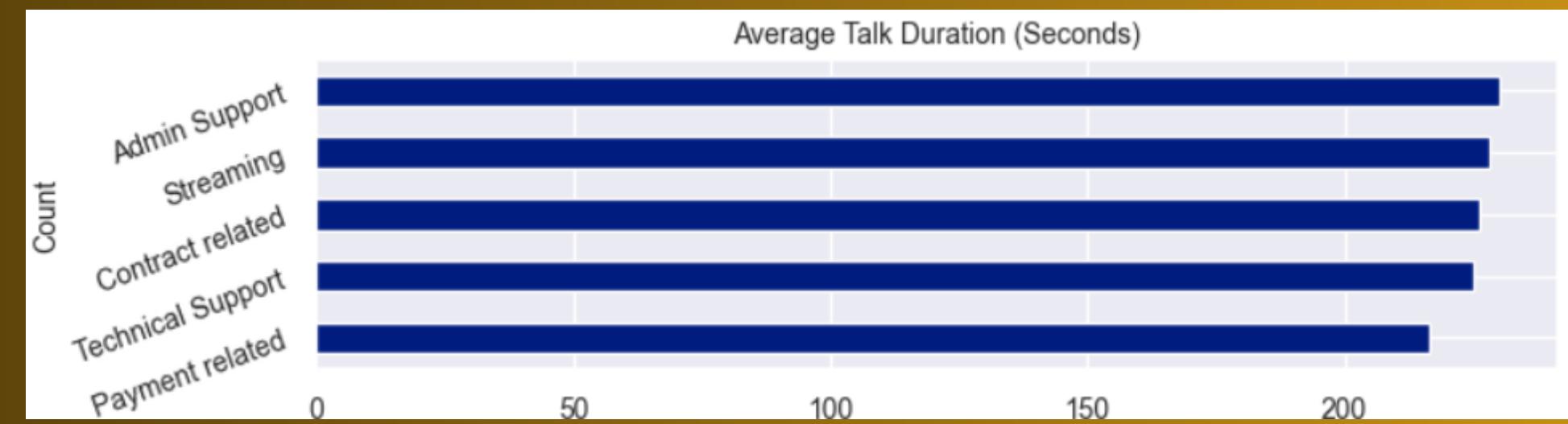
- **Correlation:** Spearman correlation (0.47) reveals a moderately weak and positive relationship between duration of talk and customer satisfaction.
- **Hypothesis:** No relationship between duration of talk and customer satisfaction (rating)
- **Conclusion:** Hypothesis rejected. There's a moderate chance that the longer a customer spends talking with the agent, there is likely higher rating. NB: This is a weak relationship.

Topic	CustomerWaitingTimeMean	AvgRating
Streaming	55.44	2.82
Payment related	55.40	2.76
Admin Support	54.78	2.79
Contract related	54.29	2.73
Technical Support	53.81	2.70

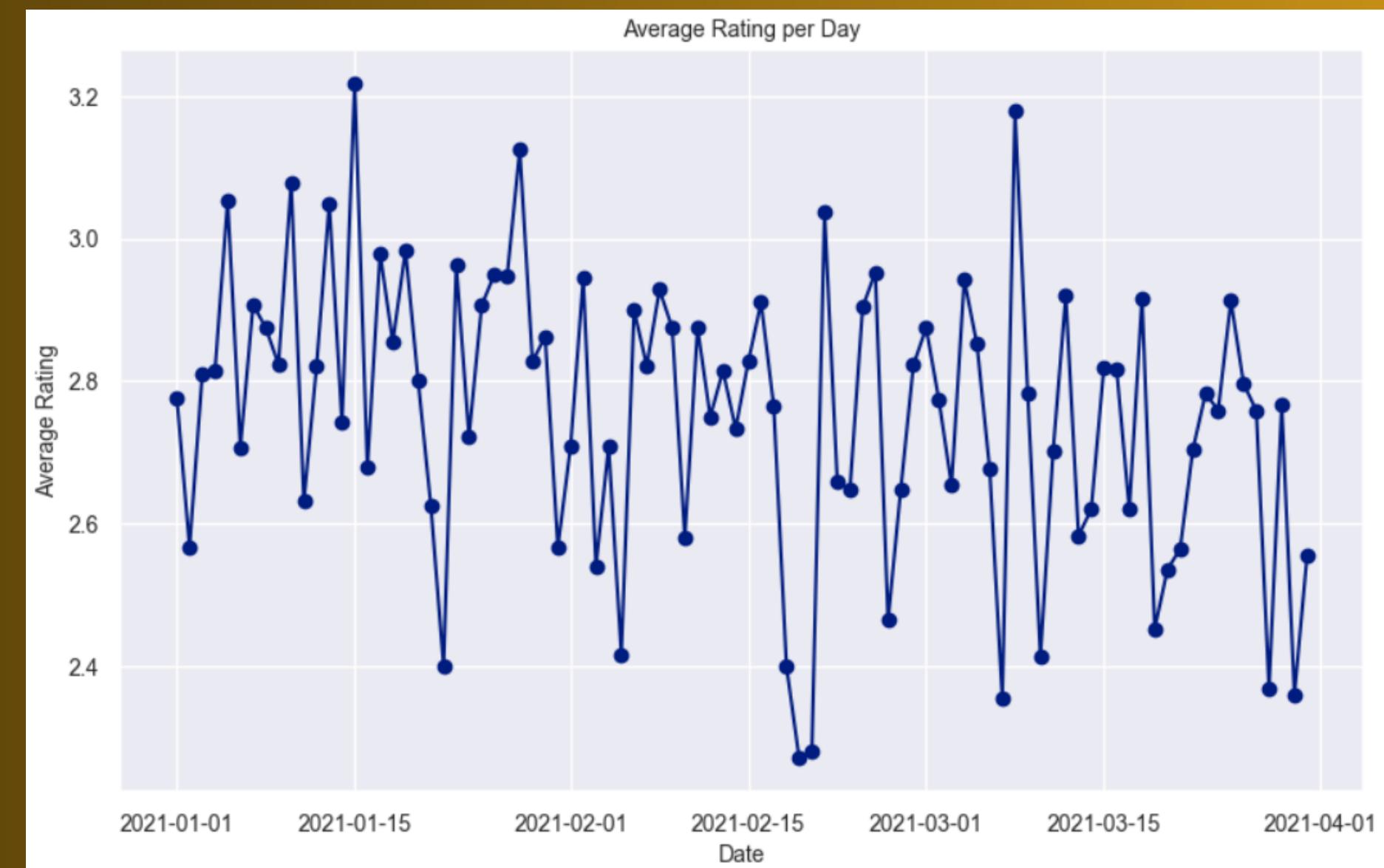
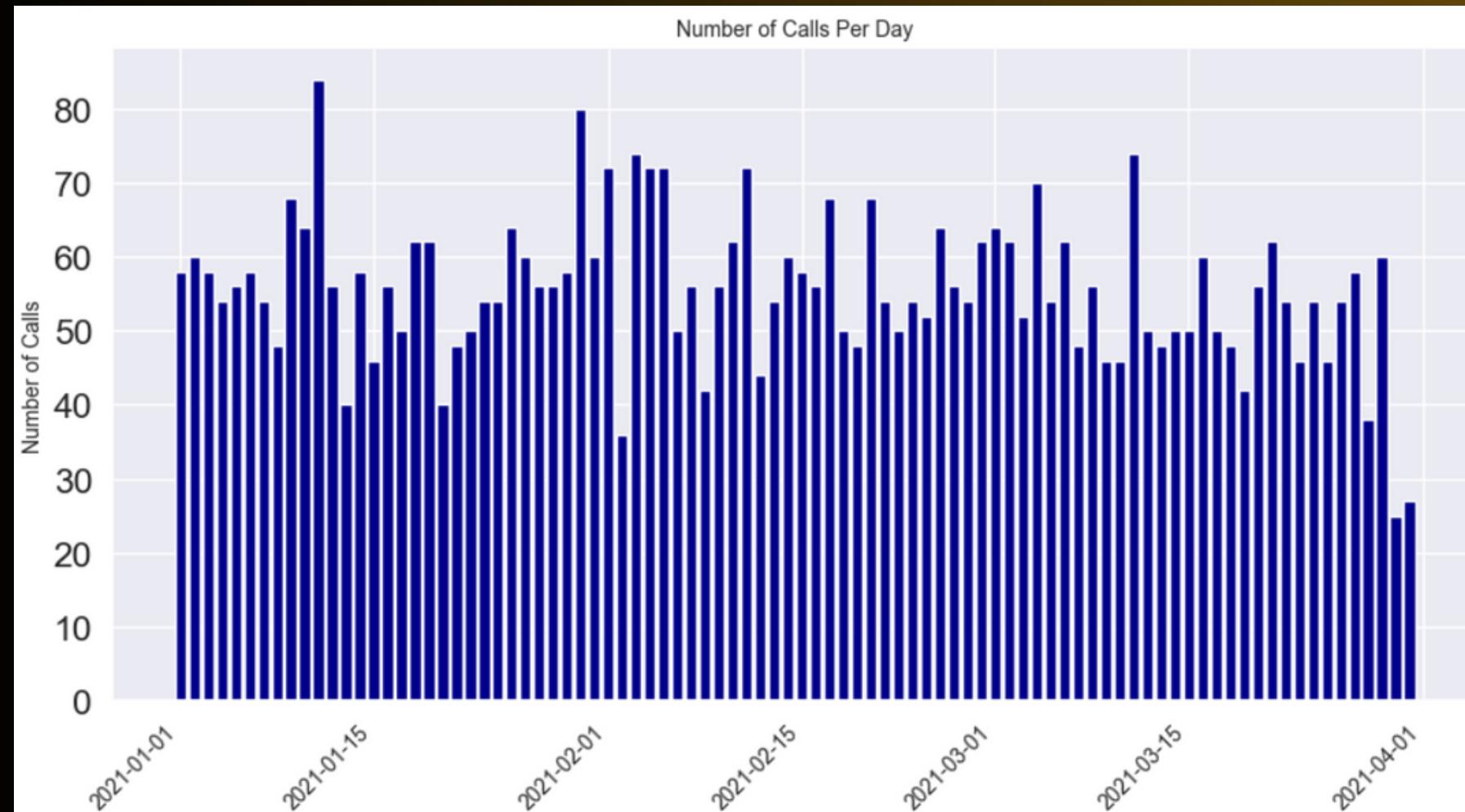
#2 - Does the length of time a customer spends waiting to have call answered impact rating?

- **Correlation:** Spearman correlation (0.47) reveals a moderately weak and positive relationship between duration of waiting and customer satisfaction.
- **Hypothesis:** No relationship between duration of waiting and customer satisfaction (rating)
- **Conclusion:** Hypothesis rejected. There is a moderate chance that the longer a customer spends waiting to have a call answered, there is likely a higher rating. NB: This is a weak relationship.

DATA VISUALIZATION (PYTHON)



DATA VISUALIZATION (PYTHON)



THANK YOU

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