

# ABC Call Volume Trend Analysis

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# AGENDA

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- Data cleaning : [Jupyter notebook.ipynb](#)  
[Jupyter notebook.pdf](#)

- Data visualisation : [Tableau workbook](#)  
[Tableau workbook.pdf](#)

# Project Description

- Analyzing inbound calling team data of a company, to extract useful insights that can help in providing recommendations for manpower planning to reduce call abandonment rate and improve customer experience.
- We are given with 23 days call dataset which includes various details such as the agent's name and ID, the queue time, the time of the call, the duration of the call, and the call status (whether it was abandoned, answered, or transferred).
- The goal of the project is to attract, engage, and delight customers, turning them into loyal advocates for the business.



# Approach

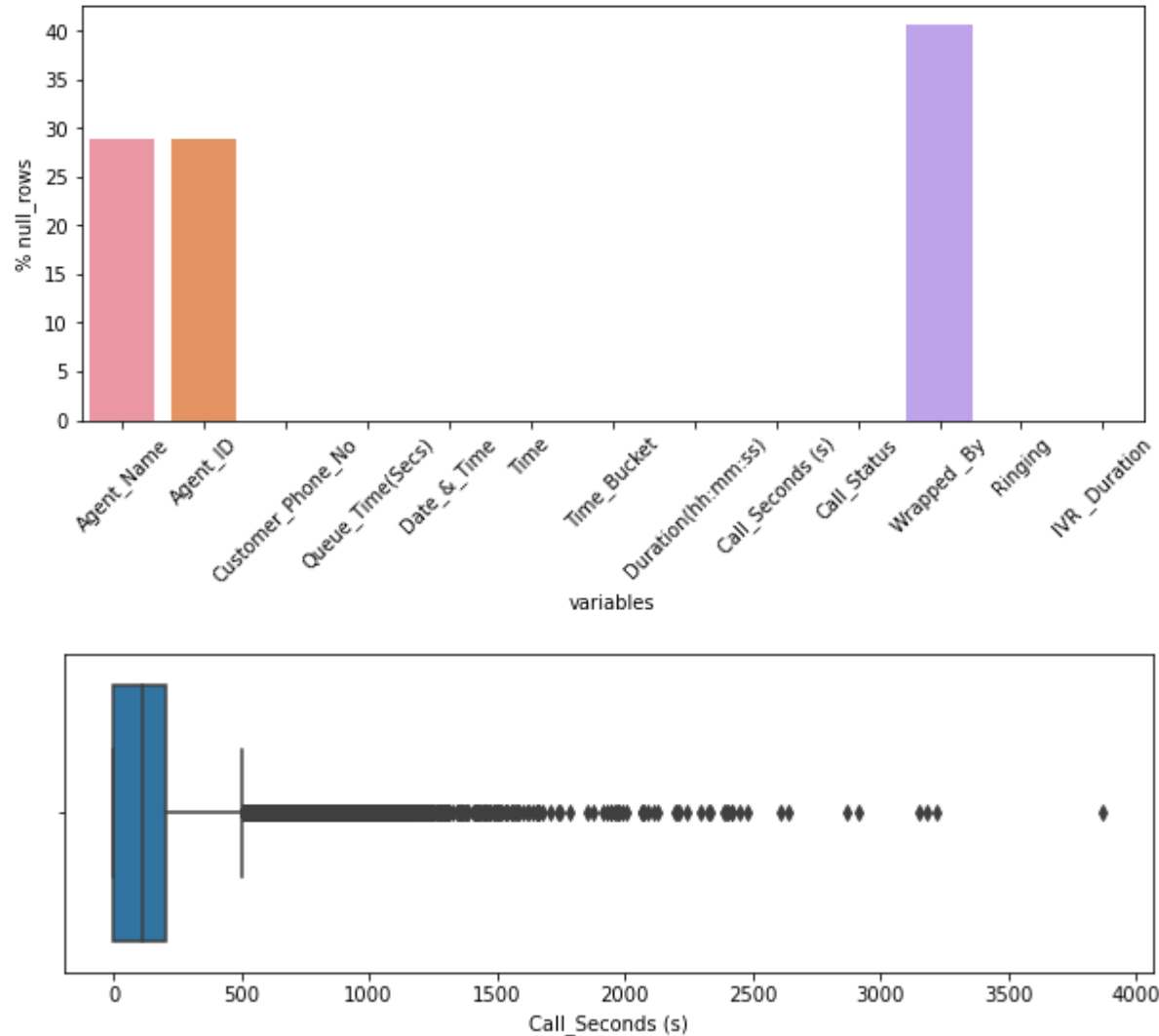
**Downloaded** and **imported** the dataset in Jupyter Notebook, performed **data cleaning** i.e. removing missing & invalid rows and handling outliers. Used **Tableau** a visualisation tool to draw **graphs** and **finding insights**. And finally drawn conclusions from insights and made recommendations

## Tech-Stack Used

- **Software:** Python 3.10.12, Tableau Desktop 2023.1.0
- **Version:** Jupyter Notebook 6.4.6
- **Purpose:** Data cleaning and visualization

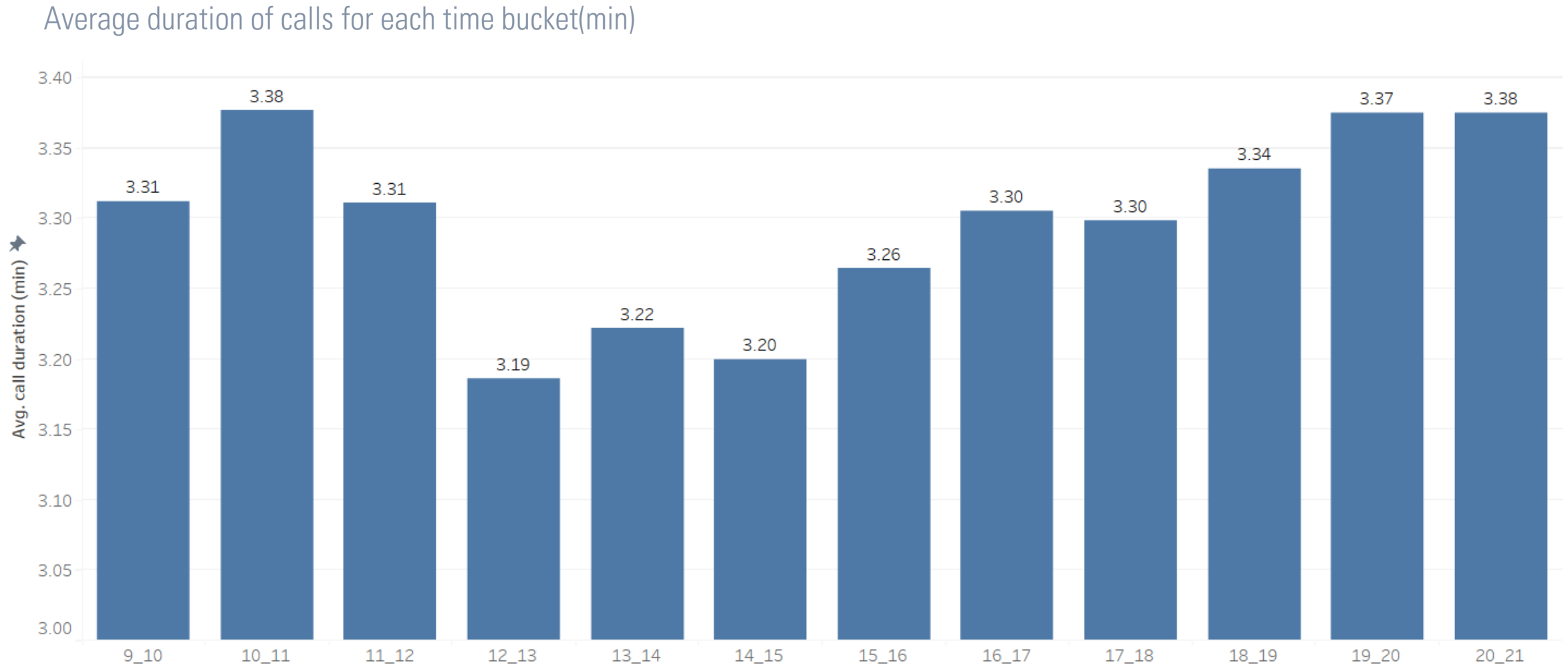
I used **Jupyter Notebook** and **Tableau** to clean and visualize data because these tools are **powerful** and **versatile**. Python is a general-purpose programming language that can be used for a variety of tasks, including data cleaning and visualization. Jupyter Notebook is an **interactive environment** that makes it easy to write and run Python code.

# Data Cleaning



- Agent\_Name (28%), Agent\_ID (28%), Wrapped\_By (40%) columns have null rows.
- all null rows of "Agent\_Name" have **null "Agent\_Id"** and **call duration is 0** which is as expected
- all rows with null Agent Name have **call\_status "abandon"**
- thus keeping all these values as it is, as it will not create any problem in our analysis.
- **dropping** "wrpped\_by" column **having 40% null** rows and it is also no use in our analysis
- **Outlier** values of **call\_durations** beyond **~2500(41min)** left as it is as they are valid values with **just very high** call duration and kept in mind while analysis.

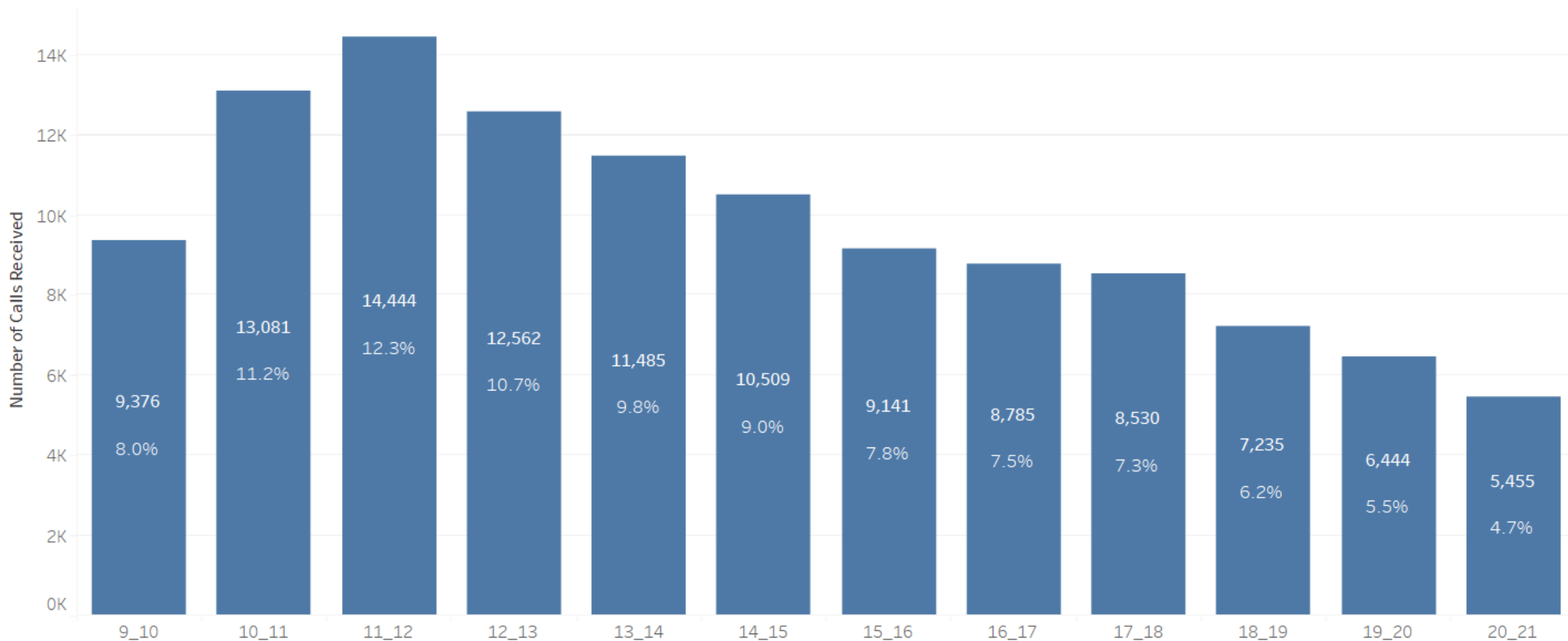
# Insights: There is not much variation in avg. call duration, approx. 3 min for each time bucket



\*Average of call duration (min) for each Time Bucket. The marks are labeled by average of call duration (min). The data is filtered on Call Status, which keeps answered and transfer.

14,000 calls received in 11\_12 time bucket within 23 days, 9am-12pm is the most busiest time slot

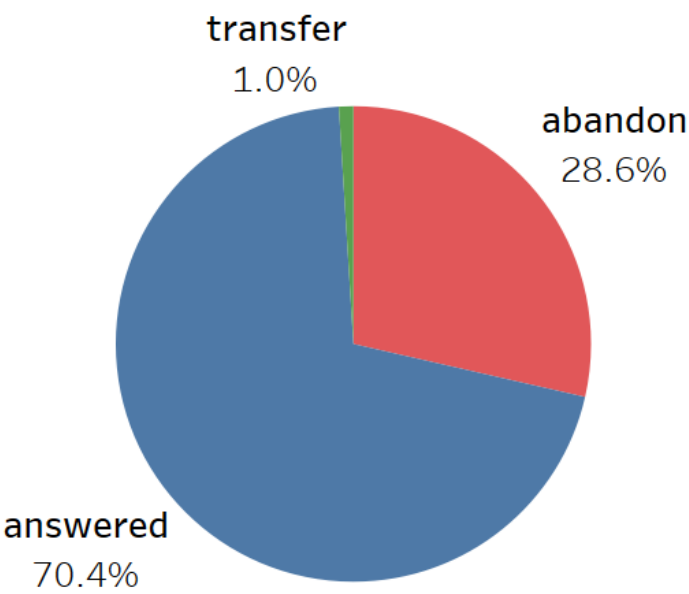
Number of calls received in each time bucket in 23 days



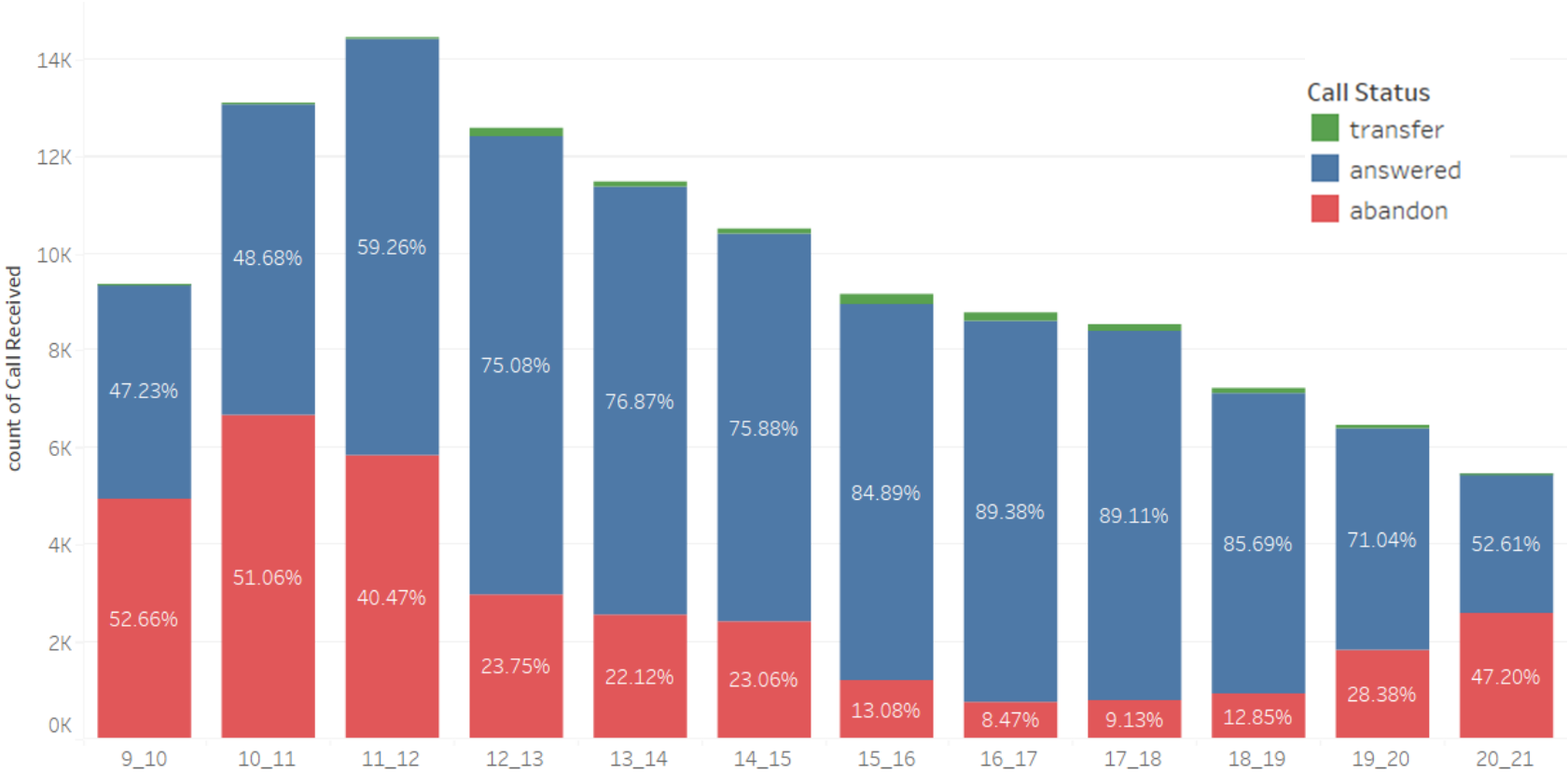
\*Count of Customer Phone No for each Time Bucket. The marks are labeled by count of Customer Phone No and percentage distribution.

# Manpower Planning

Call abandon rate is around 30%



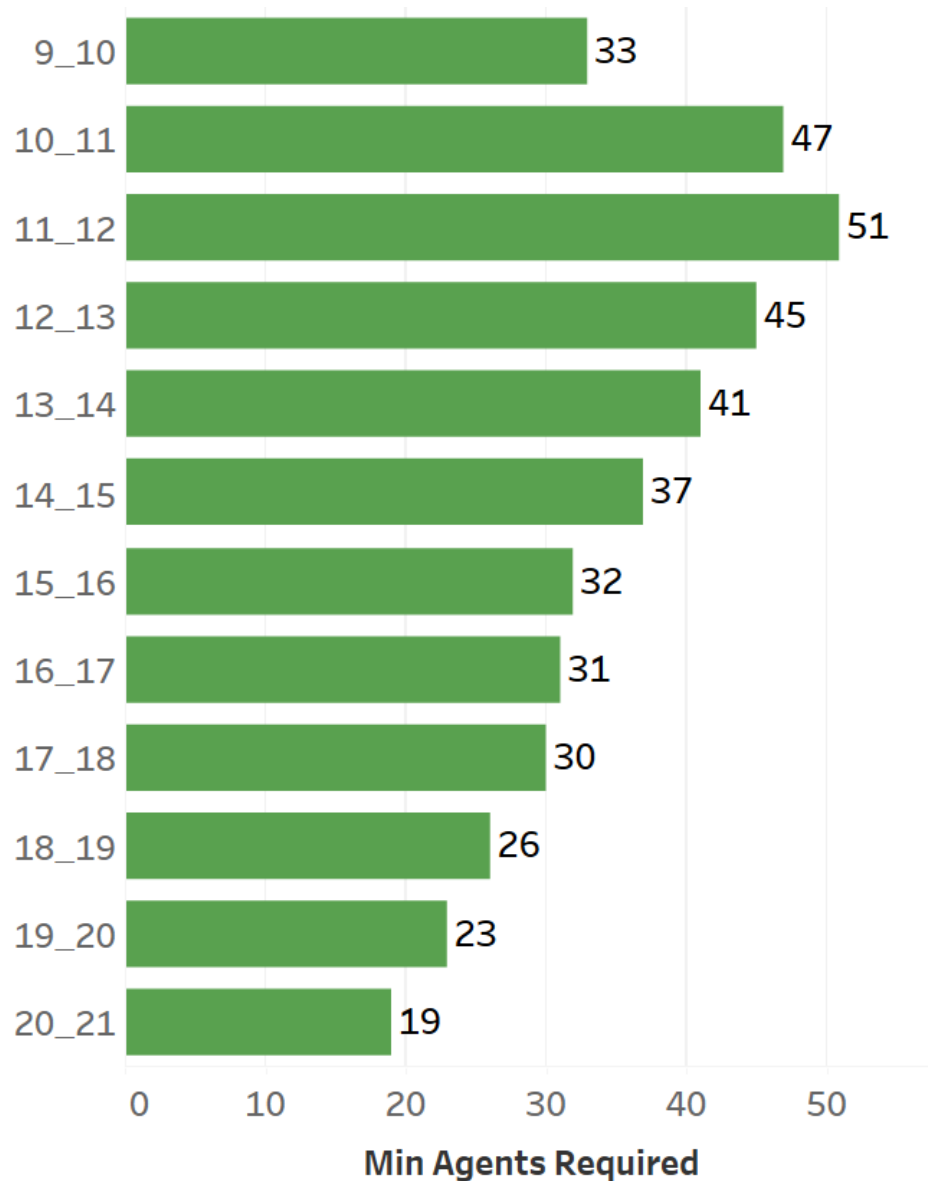
9 am to 12pm slots have high abandon rate, require max manpower





## Minimum no. of agents required in each time bucket(from 9 am to 9 pm) to reduce the abandon rate to 10%

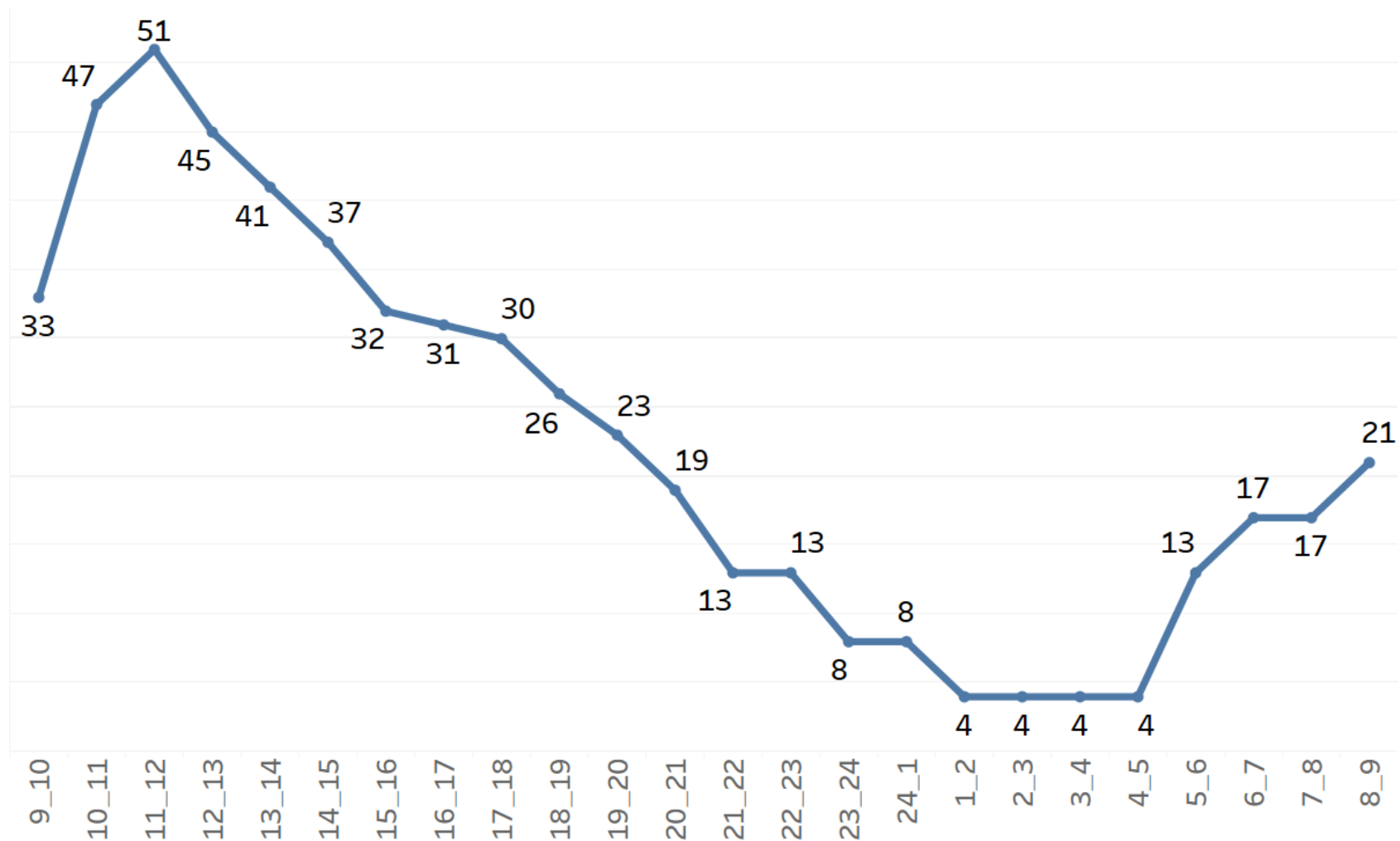
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- Actual working hour on calls with customers/users is **4.5hrs** (60% of 7.5 hours) per day
- avg. call duration = 198.6
- an agent **can answer** avg. calls per day =  $4.5 * 60 * 60 / 198.6s$   
= **81 calls/day**
- Average calls an agent can answer in **1hr time bucket** =  $81/7.5hr$   
= **11 calls/hr** approx.
- We calculated **minimum agents required** in each bucket to answer 90% call =  $"no\_calls\_recv" * 0.90 / 11$

# Manpower plan for each time bucket throughout the day, keeping the maximum abandon rate at 10%

Min agents required in each time bucket including night shift



## Night Shift Manpower Planning

- avg. calls/day in night shift  
= 30% of avg. calls/day 9am-9pm = 1527
- Cal count of calls received by distributing total calls at night to different time bucket using **prob. distribution**.
- We calculated **minimum agents required** in each bucket to answer 90% call = "no\_calls\_recv"\*0.90/11

# Results

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## ❑ Conclusions and recommendations :

- 9am-12pm slot received highest calls and also have the highest call abandoned rate company should use the man power planning in each time bucket and reduce it to 10%
- Man power planning will help to manage the agents and ultimately reduce call abandonment rate and improve customer experience.
- This will help to attract, engage, and delight customers, turning them into loyal advocates for the business.

Thank you