



# CALL LOG ANALYSIS

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# PROBLEM STATEMENT



The city government of New York City is tasked with:

- Allocating finite resources towards a seemingly infinite set of problems.
- Overseeing many different tasks that touch every aspect of resident's lives

NYC 3-1-1 is a service channel that allows New Yorkers to access government services and to file complaints via multiple platforms:

- Phone calling
- Texting
- Other social media (About NYC311).

Each call creates a wealth of data but it is not readily usable in the raw format.

# PROPOSAL



## CLIENT:

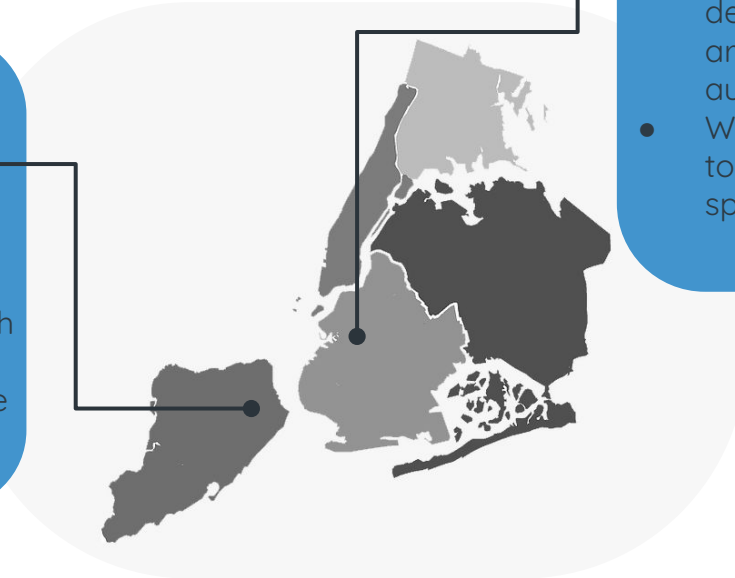
New York City Municipal  
Government

### Our team aims to help the NYC government to:

- relieve the stress of the call center
- allocate public resources efficiently
- maintain quality of service & reduce labor cost by incorporating tools such as call automation.
- Help managers, and executives make informed decisions

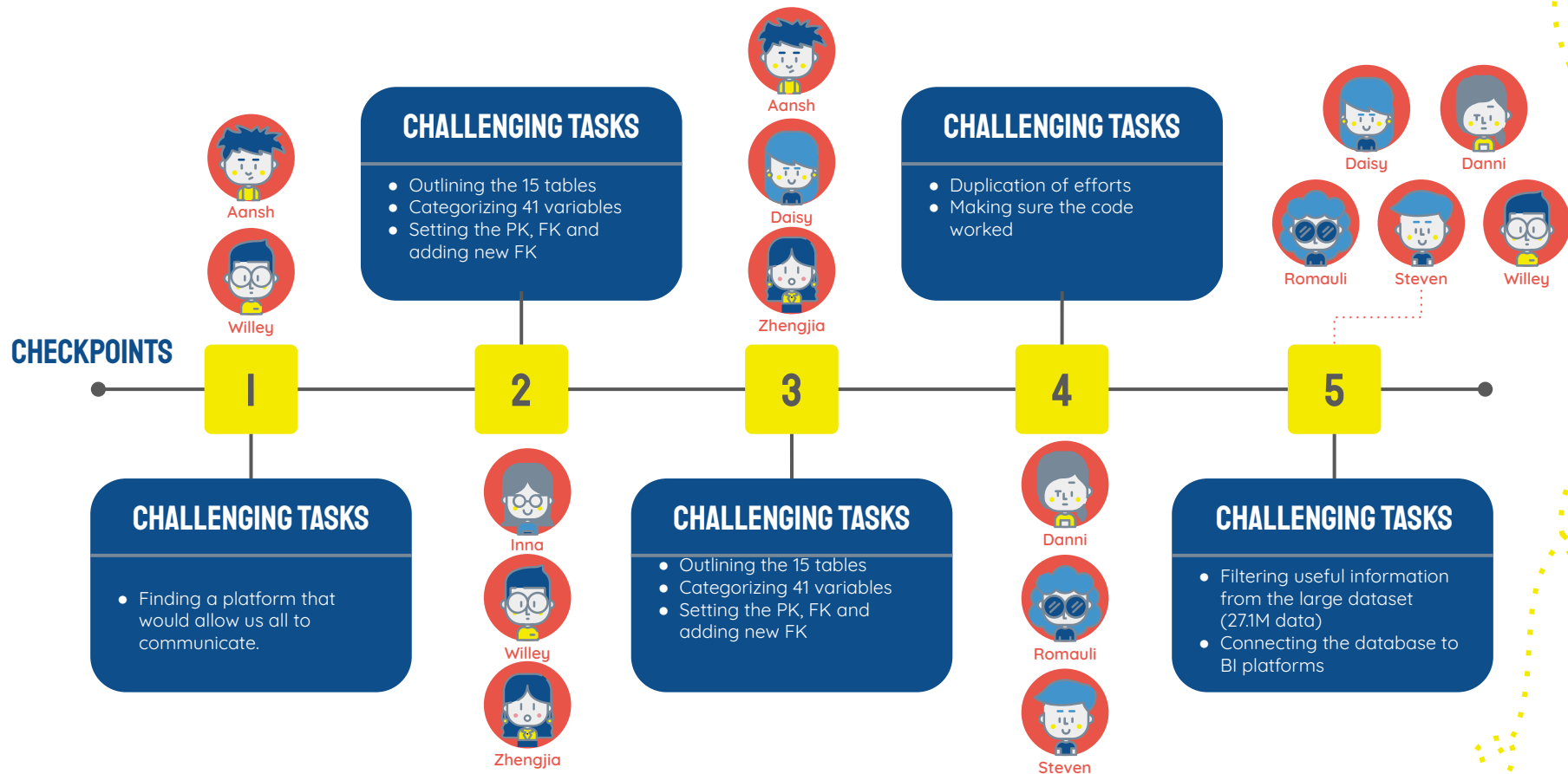
### Focus on three dimensions:

- Understand if there are specific service request categories that have a high rate of problem solving in a short duration.
- Using that information to decide on categories which are suitable to incorporate automation.
- Work with the departments to decide on budget and spends



# TEAM STRUCTURE AND TIMELINE

Each member took the lead on the checkpoint they volunteered for. Also, a timeline of activities highlighting the most challenging tasks.



Our original data consists of: 41 columns and 27.1M+ rows

## DATA SCHEMA



Unique Key	Created Date	Closed Date	Agency	Agency Name	Complaint Type	Descriptor	Location Type	Incident Zip	Incident Address	Street Name	Cross Street 1	Cross Street 2	Intersection Street 1	Intersection Street 2
52775285	12/12/2021 12:00:00 AM		DSNY	Department of Sanitation	Derelict Vehicles	Derelict Vehicles	Street	10035	100 EAST 118 STREET	EAST 118 STREET	FF WILLIAM E WOODL...		LEXINGTON AVENUE	
52774094	12/12/2021 08:06:17 AM		DOT	Department of Transportation	Street Condition	Pothole		10039	547 WEST 181 STR...	WEST 181 STREET	AUGUBON AVENUE		ST NICHOLAS AVENUE	
52770874	12/12/2021 01:00:24 AM		NYPD	New York City Police Department	Noise - Residential	Loud Music/Party	Residential Building/House	11349	43 NORTH 3 STREET	NORTH 3 STREET	KENT AVENUE		WYTHE AVENUE	KENT AVENUE
52768808	12/12/2021 01:00:20 AM		NYPD	New York City Police Department	Noise - Residential	Loud Music/Party	Residential Building/House	10016	350 EAST 30 STREET	EAST 30 STREET	2 AVENUE		1 AVENUE	2 AVENUE
52775230	12/12/2021 01:00:16 AM		NYPD	New York City Police Department	Noise - Residential	Loud Music/Party	Residential Building/House	11206	10 MONTIETH STR...	MONTIETH STREET	BUSHWICK AVENUE		STANWIX STREET	BUSHWICK AVENUE
52773511	12/12/2021 01:00:04 AM		NYPD	New York City Police Department	Noise - Residential	Loud Music/Party	Residential Building/House	11212	285 EAST 91 STREET	EAST 91 STREET	CLARKSON AVENUE		LENOX ROAD	CLARKSON AVENUE
52772363	12/12/2021 12:59:31 AM		NYPD	New York City Police Department	Noise - Residential	Loud Music/Party	Residential Building/House	11360	17 AVENUE	17 AVENUE	17 AVENUE		201 STREET	17 AVENUE
52772396	12/12/2021 12:59:29 AM		NYPD	New York City Police Department	Noise - Residential	Loud Music/Party	Residential Building/House	10011	250 WEST 14 STREET	WEST 14 STREET	7 AVENUE		8 AVENUE	7 AVENUE
52771873	12/12/2021 12:59:00 AM		DOT	Department of Transportation	Street Light Condition	Bracket Arm Loose		10001					EDDY STREET	VICTORY BOULEVARD
52769717	12/12/2021 12:58:08 AM		NYPD	New York City Police Department	Noise - Residential	Loud Music/Party	Residential Building/House	11238	961 FULTON STREET	FULTON STREET	WASHINGTON AVENUE		ST JAMES PLACE	WASHINGTON AVENUE
52773344	12/12/2021 12:58:08 AM		NYPD	New York City Police Department	Noise - Residential	Banging/Pounding	Residential Building/House	11372	94-06 34 AVENUE	34 AVENUE	94 STREET		JUNCTION BOULEVARD	94 STREET
52768256	12/12/2021 12:58:01 AM		NYPD	New York City Police Department	Illegal Parking	Blocked Hydrant	Streets/Sidewalk	10487	3447 OLIVILLE AV...	OLIVILLE AVENUE	WARRING AVENUE		MAICE AVENUE	WARRING AVENUE
52771899	12/12/2021 12:57:54 AM		NYPD	New York City Police Department	Blocked Driveway	No Access	Streets/Sidewalk	11208	2577 RYTHM AVENUE	RYTHM AVENUE	MILFORD STREET		LOGAN STREET	MILFORD STREET
52775153	12/12/2021 12:57:53 AM		NYPD	New York City Police Department	Noise - Commercial	Loud Music/Party	Store/Commercial	11385	60-03 70 AVENUE	70 AVENUE	60 STREET		80 AVENUE	60 STREET

1NF

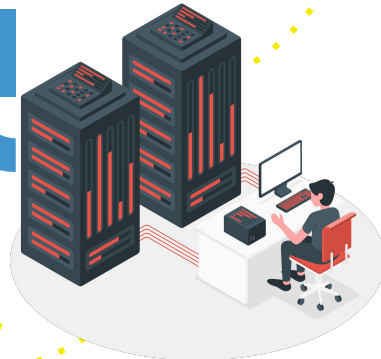
2NF

3NF

- 41 columns to start
- Separated into four big categories:
  - Service request
  - Responding agency
  - Complaint details
  - Location
- Separated categories into more tables specific to the four big categories
- Separated location fields down to 10 more tables

## ETL process

For the etl process, we decided to use python notebook as the insertion method. Some difficulties we encountered were getting the code to work.



# ETL PROCESS - PYTHON CODE

1

## Import Packages & Creating Connections

```
# Import necessary packages
import numpy as np
import pandas as pd
from sqlalchemy import create_engine, inspect

# Pass the connection string to a variable, conn_url
conn_url = 'postgresql://postgres:123@localhost/3_1_1'

# Create an engine that connects to PostgreSQL server
engine = create_engine(conn_url)

# Establish a connection
connection = engine.connect()
```

2

## Creating Table

```
# APAN 5310: SQL & RELATIONAL DATABASES SPRING 2020

# -- START PYTHON CODE --

# Pass the SQL statements that create all views
stmt = """

Create table Agency(
    Agency_id SERIAL,
    Agency_name char(50),
    Agency_type char(20),
    primary key(Agency_id)
);

Create table Complaint(
    Complaint_id SERIAL,
    Complaint_Type char(20),
    Descriptor char(50),
    Status char(20),
    primary key(Complaint_id)
);
```

3

## Creating Temporary Table for Raw Data (import csv file)

```
# CREATE TABLE TEMP
import pandas as pd
df = pd.read_csv('311_Service_Request_from_2015_to_Present.csv')
df.columns = [c.lower() for c in df.columns]

from sqlalchemy import create_engine
engine = create_engine('postgresql://postgres:123@localhost:5432/3_1_1')

df.to_sql("table_temp", engine)
```

4

## Data Cleaning & Data Type Modifying

```
# DATA CLEANING & DATA TYPE MODIFYING
stmt = """
ALTER TABLE public.table_temp
    RENAME "agency name" TO agency_name;

ALTER TABLE public.table_temp
    RENAME "complaint type" TO complaint_type;

ALTER TABLE public.table_temp
    RENAME "location type" TO location_type;
```

5

## Inserting Data

```
1 # Pass the SQL statements that insert data
2 stmtInsertAgency = """
3
4 INSERT INTO Agency (Agency_type,Agency_name)
5 SELECT DISTINCT
6     trim(Agency), trim(agency_name)
7 FROM table_temp
8
9
10 ""
11
12 # Execute the statement to create tables
13 connection.execute(stmtInsert)
```

<sqlalchemy.engine.cursor.LegacyCursorResult at 0x7fc07

Browser

FileObjectToolsHelp

DashboardPropertiesSQL StatisticsDependenciesDependents

public.table\_temp\_1\_3 PostgreSQL Docker Postgres

Foreign Data Wrappers

Languages

Schemas (1)

public

Collations

Domains

FTS Configurations

FTS Dictionaries

FTS Parameters

FTS Templates

Foreign Tables

Functions

Materialized Views

Procedures

Sequences

Tables (1)

agency

agency\_complaint

complaint\_address

incident\_info

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# CUSTOMER INTERACTION PLAN

## ANALYST

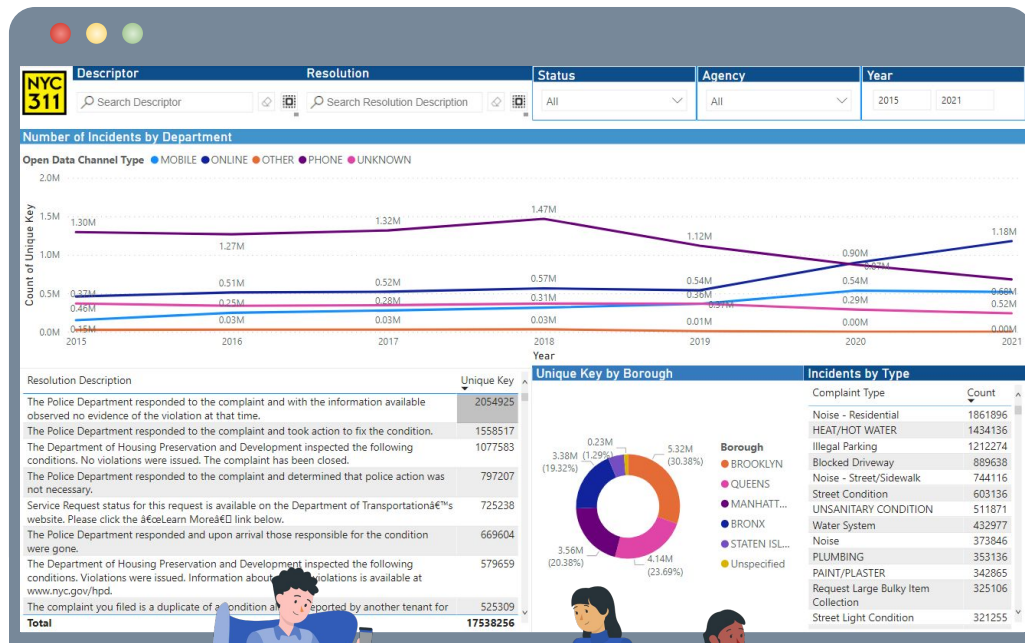
- Access to views/schemas
- Direct querying in database or PowerBI dashboard search.

## MANAGER

- Direct querying in database or PowerBI dashboard search
- Department based with internal information connected.
- Summarized data with ability to drill into more information

## EXECUTIVE

- Big picture /summary level reports
- Overview of department
- Future recommendations include adding financial data



# Q & A

