

# IoT Enabled Garbage Management System

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## Objective

The main objective of this project is to monitor, alert and process that data that we are collecting in the garbage bins. How we are going to do this we will be using a microcontroller and integrating this microcontroller with different sensors such as Ultrasonic Sensor, Temperature Humidity Sensor, Flame Sensor and a gas sensor. The purpose of using the ultrasonic sensor is to get the level of trash in the garbage bin. The temperature and humidity sensor is used to get that temperature and humidity measurements. If there is any significant alteration in the values we can take action. The flame sensor is used to alert if there is a fire in the garbage bin. The gaseous sensor detects the harmful gases and sends the data to the microcontroller.

## Introduction

This prototype facilitates the large scale implementation of garbage management which is not very common. We need this kind of project because the large-scale generation and recycling of waste has become a growing source of concern for the planet, negatively impacting human lives and environmental conditions. Waste is one of the things that grows in tandem with the country's growth. The proper handling of the massive amount of garbage generated by industrial civilization necessitates waste separation.

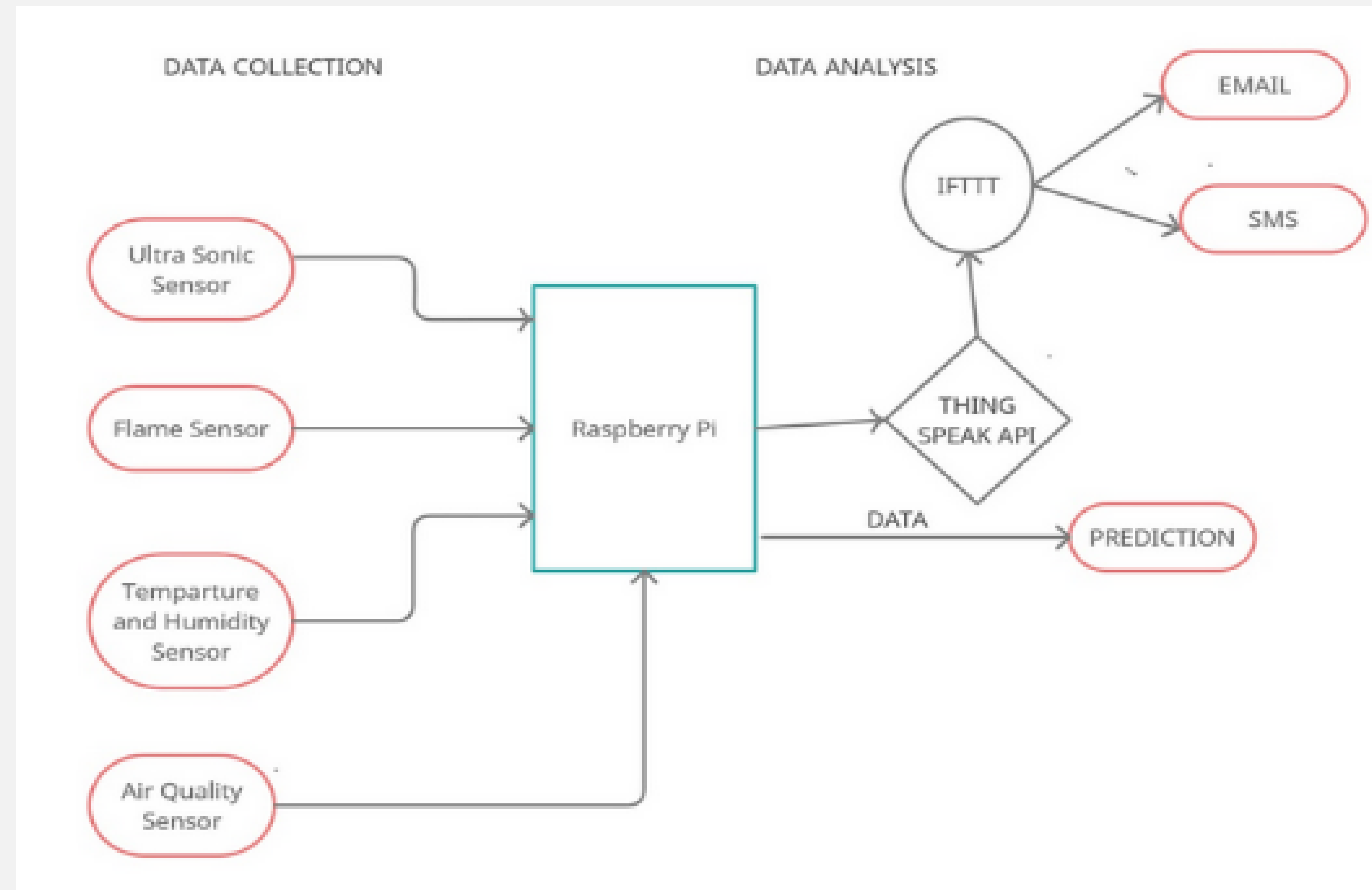


Figure: Block Diagram

## TASKS INVOLVED

- 1.Data Monitoring
- 2.Emergency Alerts
- 3.Prediction

## Tools Used

Raspberry Pi  
Ultrasonic Sensor - HC-SR04  
Temperature and Humidity Sensor - DHT11  
Flame Sensor - SEN16  
Air Quality Sensor - MQ-135  
ThingSpeak API  
IFTTT - If This Then That

## Results

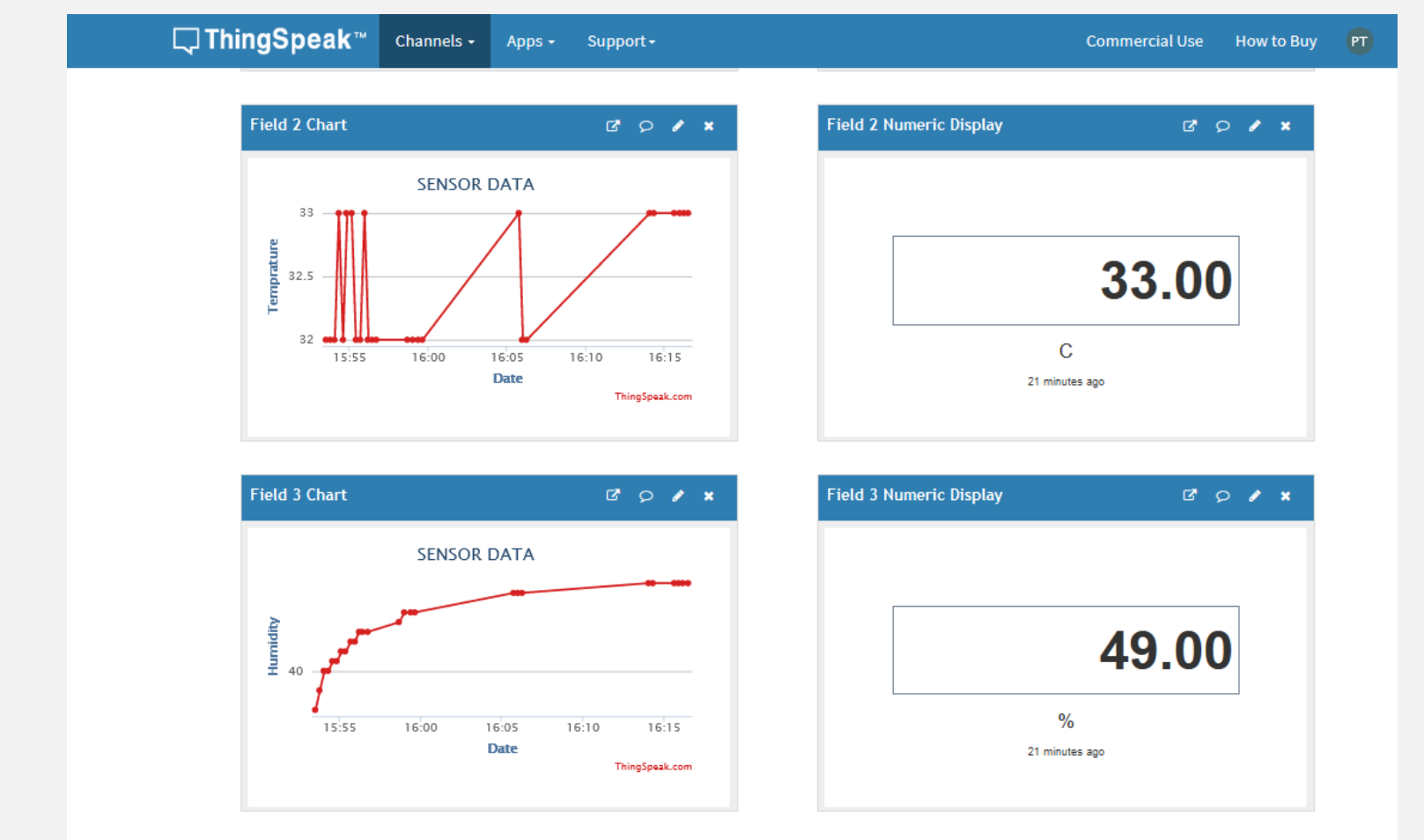


Figure: Temperature monitoring

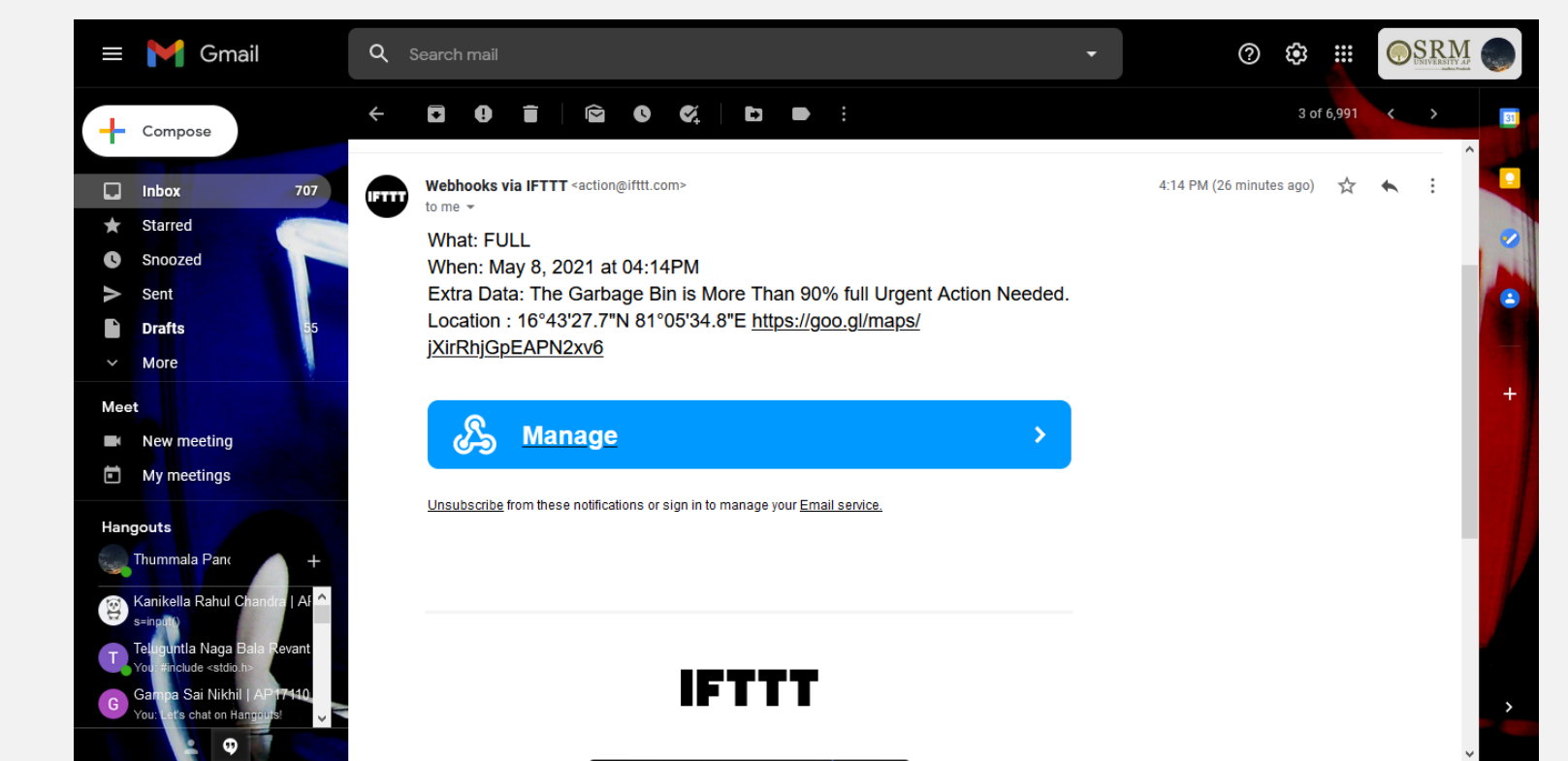


Figure: Garbage Level Alert EMAIL

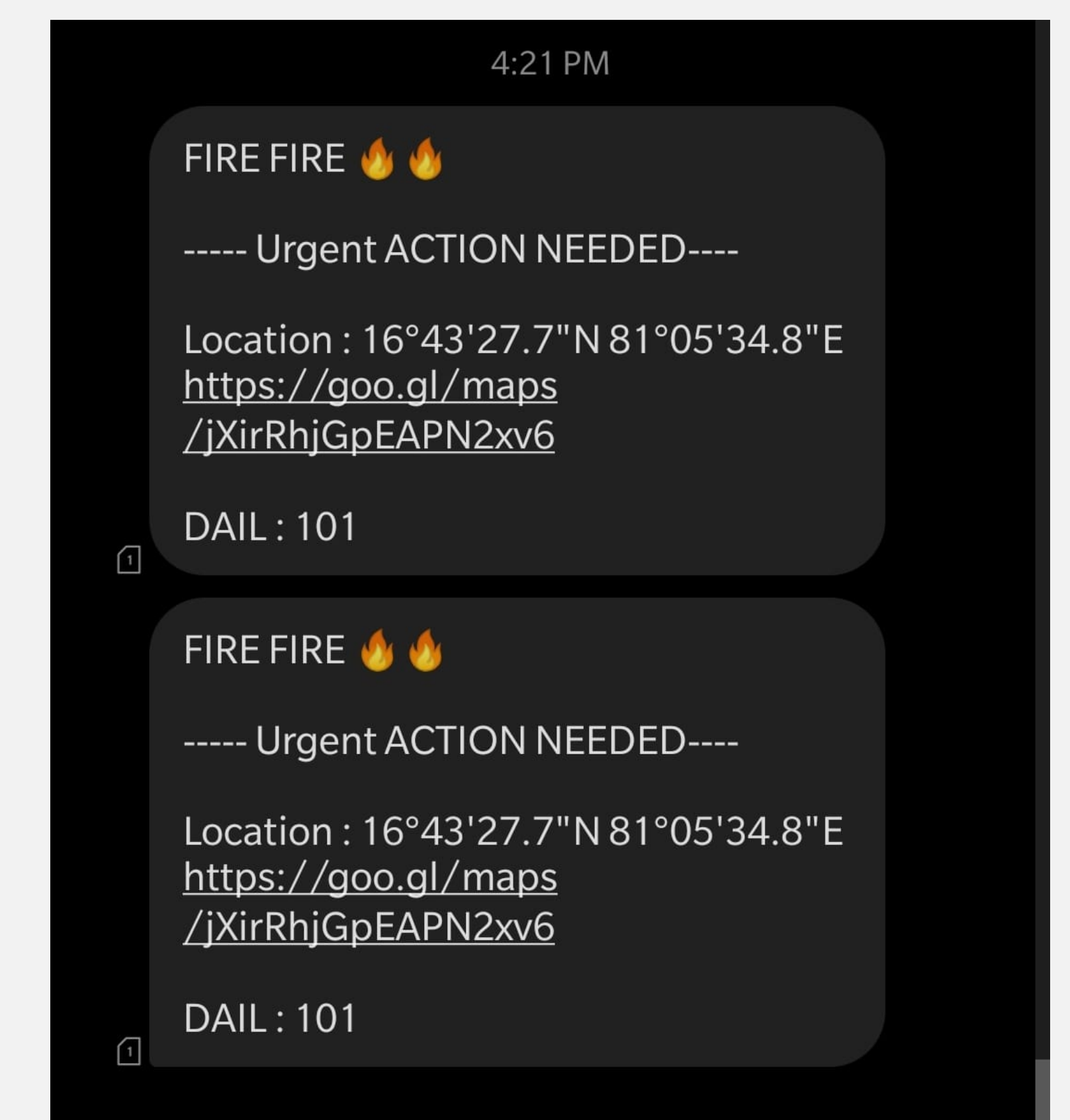


Figure: Fire Alert SMS