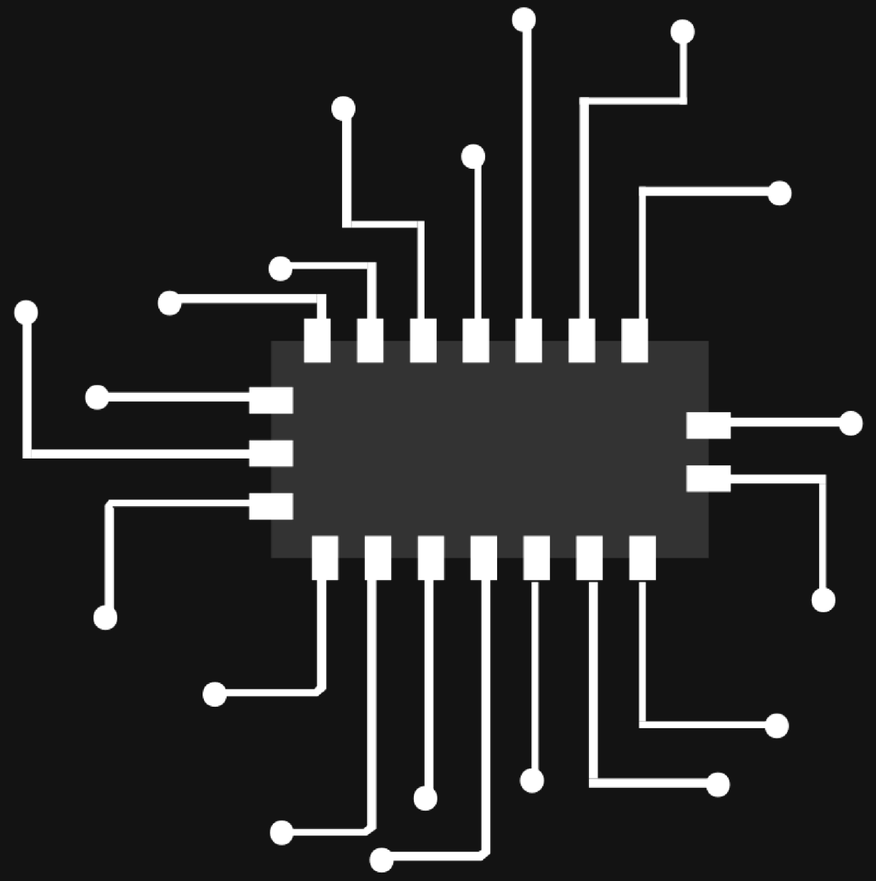
Internet of Things Project

SMART DUSTBIN

FOR ECONOMIC GROWTH AND SUSTAINABILITY



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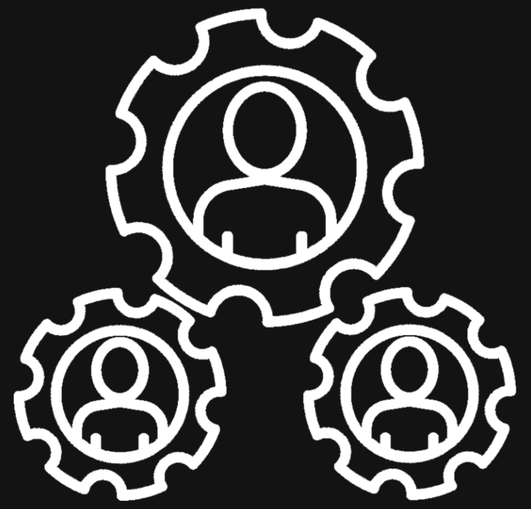
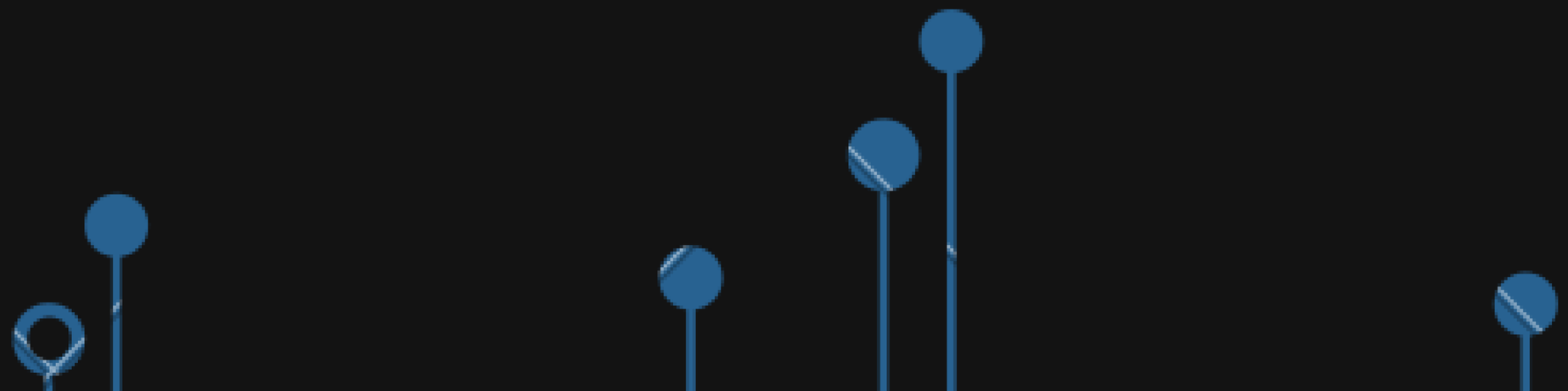


ABSTRACT

In the recent decades, Urbanization has increased tremendously. At the same phase there is an increase in waste production. Waste management has been a crucial issue to be considered., smart bin is built on a microcontroller based platform Arduino Uno board which is interfaced with GSM modem and Ultrasonic sensor.
Arduino will be programmed in such a way that when the dustbin is being filled, the remaining height from the threshold height will be displayed.Once the garbage reaches the threshold level ltrasonic sensor will trigger the GSM modem which will continuously alert the required authority until the garbage in the dustbin is squashed.

OBJECTIVE

To implement a smart bin built on a microcontroller based platform Arduino Uno board which interfaced with GSM modem and ultrasonic sensor which can gives the status of the waste present in the dustbin to the municipal authority.



INTRODUCTION

This project work is the implementation of Automatic Garbage Fill Alerting system using Ultrasonic sensor, Arduino Uno, Buzzer and Wi-Fi module. This system assures the cleaning of dustbins soon when the garbage level reaches its maximum. It will take power supply with the help of Piezoelectric Device .If the dustbin is not cleaned in specific time, 37 then the record is sent to the Sweeper or higher authority who can take appropriate action against the concerned contractor. This system also helps to monitor the fake reports and hence can reduce the corruption in the overall management system. This reduces the total number of trips of garbage collection vehicle and hence reduces the overall expenditure associated with the garbage collection. It ultimately helps to keep cleanliness in the society. Therefore, the Automatic Garbage Fill Alerting system makes the garbage collection more efficient.

MOTIVATION

1) To replace traditional dustbins and implement efficient Smart dustbins.
2) To manage waste efficiently as it avoids unnecessary lumping of waste on roadside
3)To eradicate foul smell from wastes that remain untreated for a long time due to negligence of authorities and carelessness of public which may lead to long term problems.
4) Promoting clean environment by decreasing the rate of breeding of insects and mosquitoes which create nuisance.
5) To get rid of dreadful diseases by implementing better way of waste management through Smart Dustbin.

COMPONENTS

1) Arduino Uno Rev3 Board
2)GSM 900 modem
3) PIR Sensor
4) Ultrasonic sensor
5) Serve motor
6) Breadboard
7) Moisture Sensor
8) Wi-Fi Module
9)Connecting wires

DESCRIPTION OF COMPONENTS

ARDUINO

Smart bin is built on Arduino board platform.

If dustbin reach in 75% then arduino send message through GSM module.

GSM

In this project GSM 900 modem is used to send the messages

GSM acts as an medium between Microcontoller and control room

PIR SENSOR

The PIR sensor will observe a person nearby dustbin. If motion is detected the lid of dustbin is opened, the servo motor activates and as GSM connected it will send an alert message to user if dustbin is filled.

ULTRASONIC SENSOR

Dustbin placed in public place, people throw garbage in dustbin, place the ultrasonic sensor in top of the garbage bin

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Serve motor

A Servo Motor is a small device that has an output shaft. This shaft can be positioned to specific angular positions by sending the servo a coded signal.

Bread board

A breadboard is a construction base for prototyping of electronics.

connecting wires

Used to connect components in transmitter and reception part seperately

Working Procedure

1)The PIR sensor will observe a person nearby dustbin. If motion is detected the lid of dustbin is opened, the servo motor activates and as GSM connected it will send an alert message to user if dustbin is filled.

2)Dustbin placed in public place, people throw garbage in dustbin, place the ultrasonic sensor in top of the garbage bin. If dustbin reach in 75% then arduino send message through GSM module. When dustbin level is reach threshold level buzzer will give alert sound for don’t again put waste in dustbin. This all process updated in IOT GECKO platform for monitoring garbage bin.

3) Level detector consists of IR sensors which is used to detect the level of the garbage in the dustbin. The output of level detector is given to microcontroller. Four IR sensors are used to indicate the different levels of the amount of the garbage collected in the dustbin which is placed in public area.)

4)When the dustbin is filled up to the highest level, the output of fourth IR receiver becomes active low. This output is given to microcontroller to send the message to the Control room via GSM

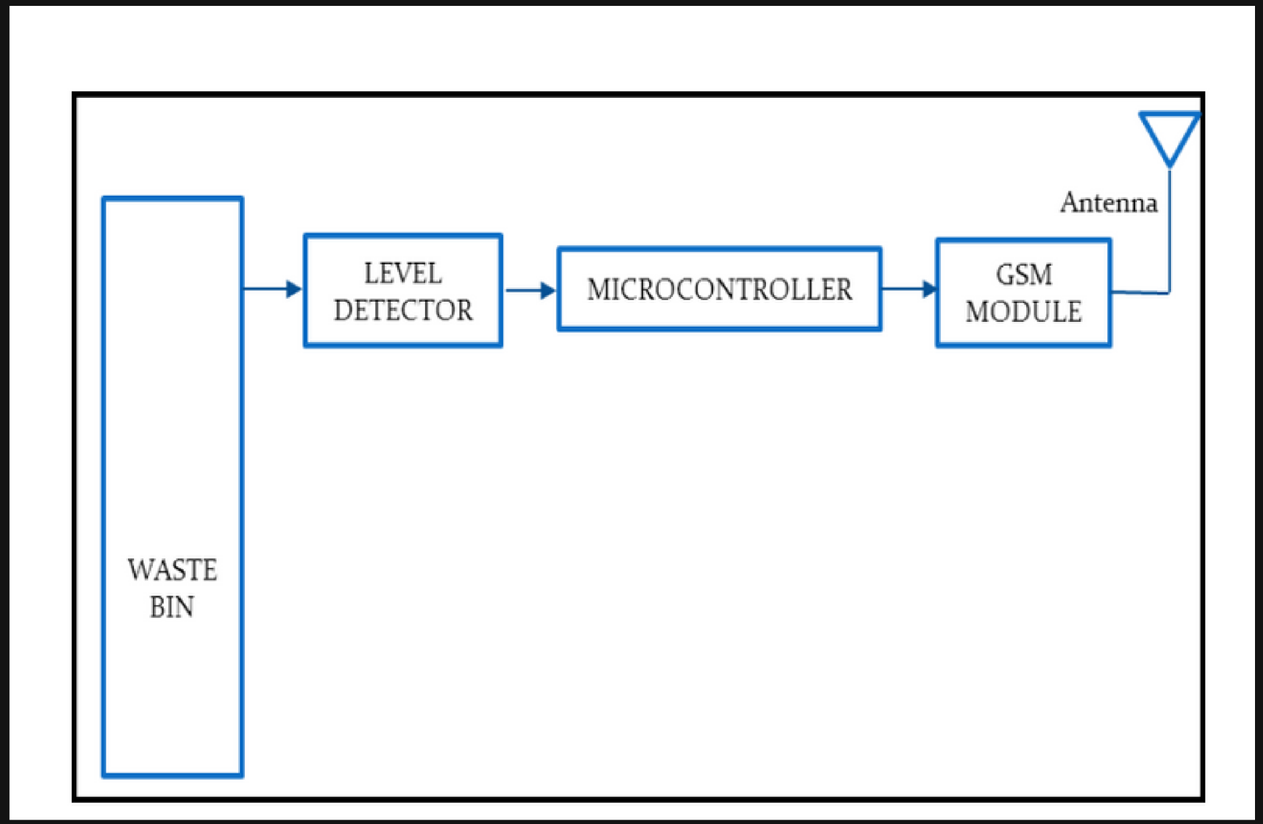
5) At receiver, control room is present where all the activities are managing. The number of the control room is depending on the dustbins present in the area. The person sitting in the control room monitors the entire system.

6)GSM Module is connected to the computer of the control room through microcontroller. The entire system is monitor by the person sitting in the control room. The same GSM Module is used to send the message to the contractor for cleaning the dustbin.

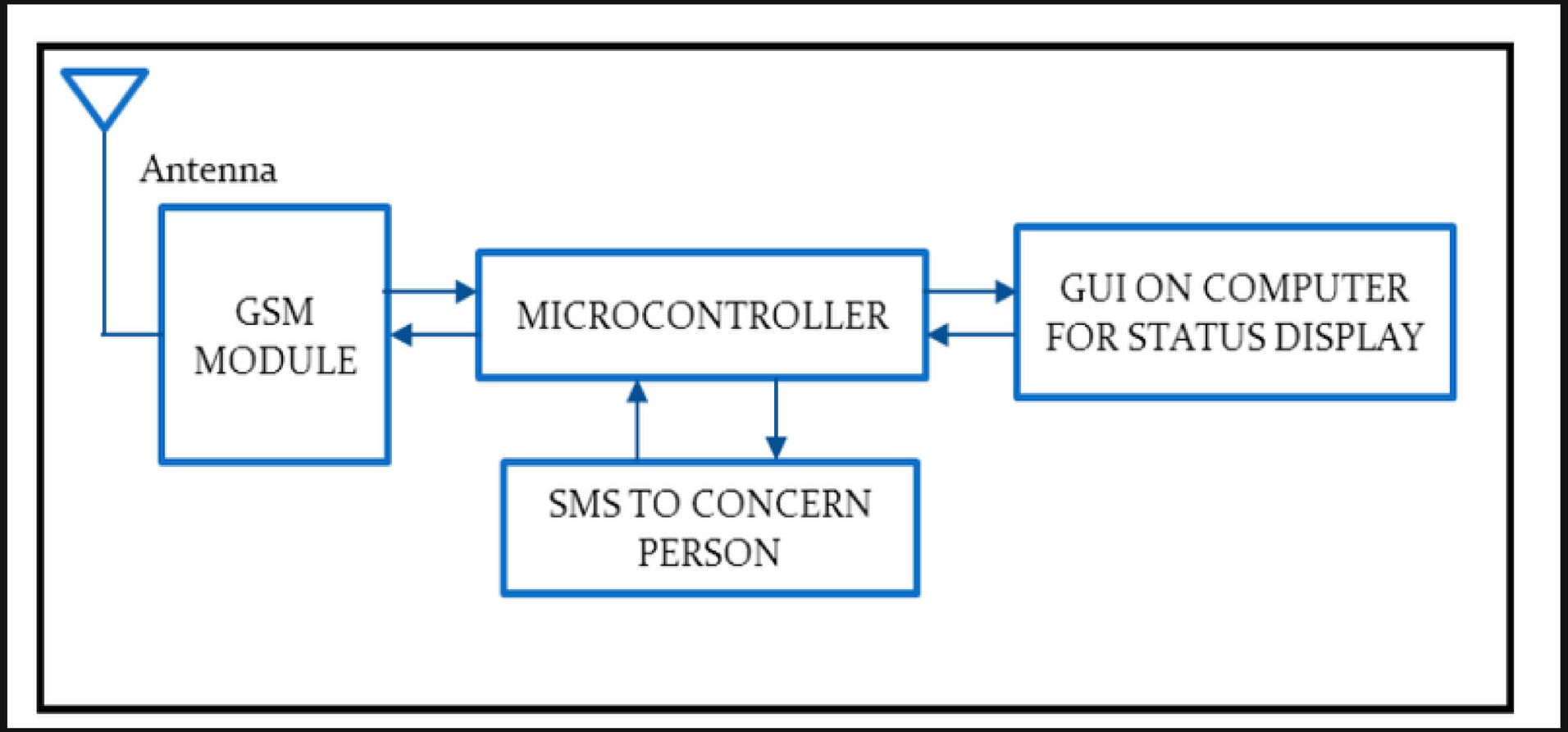
7)GUI is developed using MATLAB software. This GUI will be displayed on the computer screen in the control room to display the status of the garbage level in the dust bin

8) Moisture Sensor : It is used to identify if the garbage is wet or dry. The content of moisture in the waste is tested and accordingly it is dropped in the appropriate dustbin.

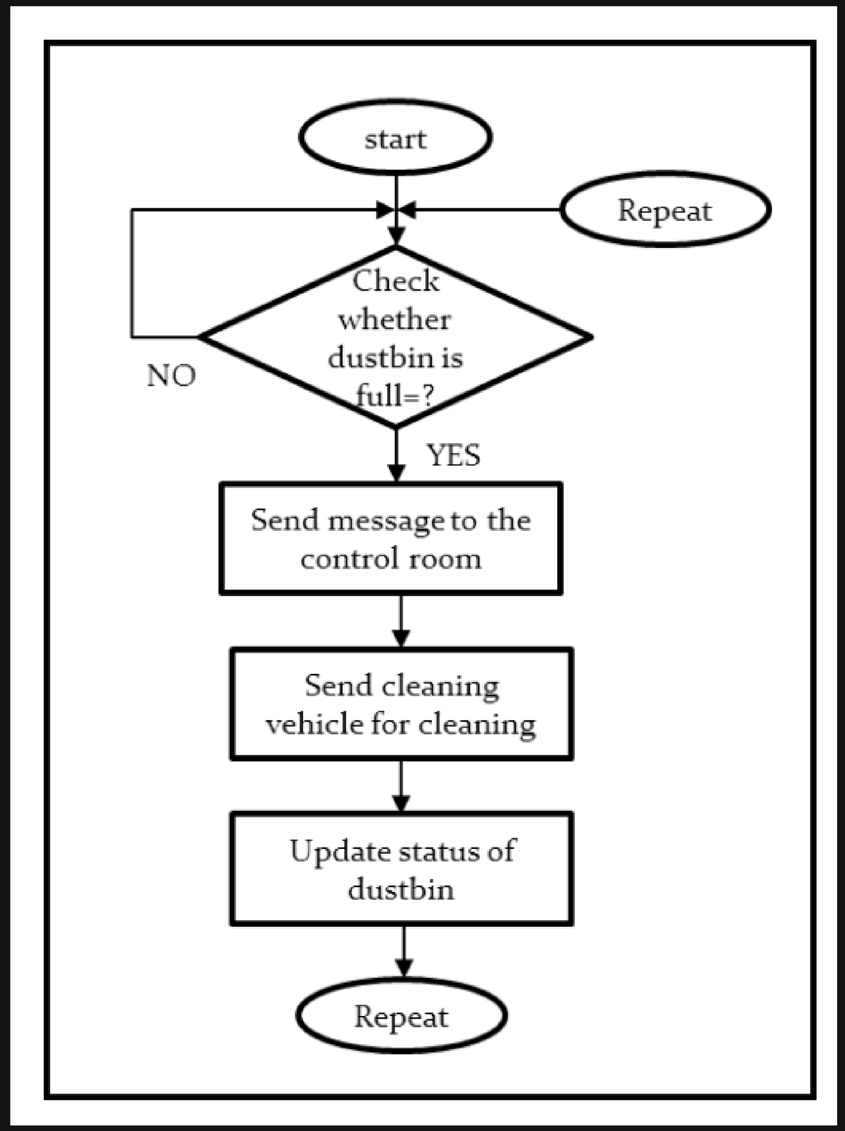
Transmitter Part from Dustbin



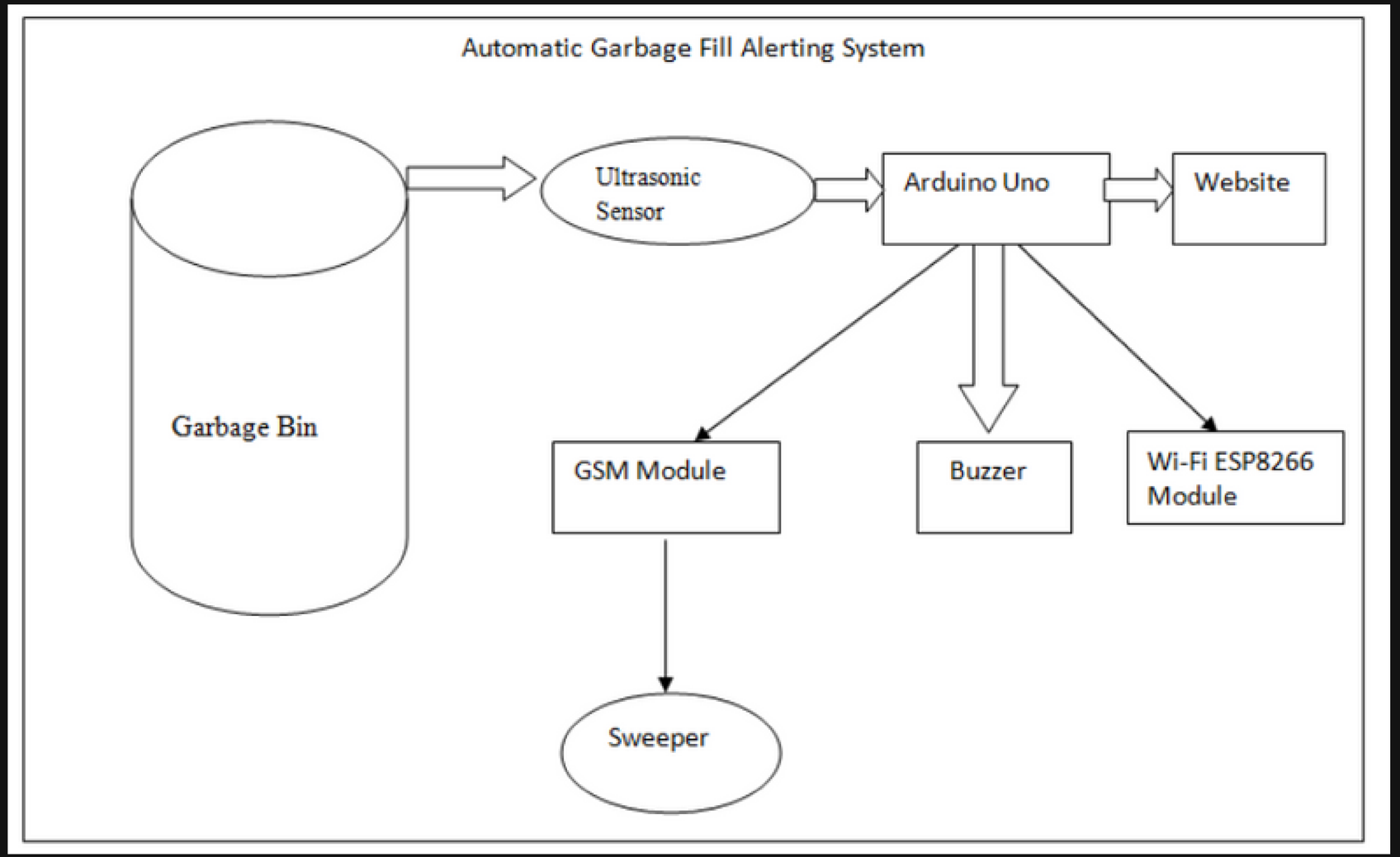
Reception part to dustbin



Flow chart of Working principle



ARCHITECTURE DIAGRAM



BUDGET

1) Arduino Uno Rev3 Board - 2049
2) GSM 900 Modem - 800
3) PIR Sensor -200
4) Ultrasonic sensor -150
5) Serve motor -250
6) Bread Board - 60
7) Moisture Sensor - 195
8) Connecting wires - 105
9) Wi-Fi Module - 745

TOTAL : 4,554 INR