DIGITAL TAP

Karan Rathore, Aalekh Sajonia, Aditya Malik

Email ID: - karanrathore7777@gmail.com
aalekhbh@gmail.com
malik.aditya1905@gmail.com

ABSTRACT

As people are getting smarter so are the things used in regular life. While the thought comes up for the Smart cities there is a requirement for Smart waste management. The idea of Smart Dustbin is for the buildings like Colleges, Hospitals. Bus stands and Airport. The Smart Dustbin thus thought is an improvement over the conventional dustbin by elevating it to be smart using sensors and logic [1]. Smart dustbins is a new idea of implementation which makes a normal dustbin smart using ultrasonic sensors for garbage level detection and sending notifications to the authorised user updating the status of the bin using an android application. Based on the received information user can take actions accordingly.

KEYWORDS

Dustbin, Smart Dustbin, Sensor based waste collection bins, waste collection bins, garbage collection, IR sensor.

INTRODUCTION

Sensor Based Waste Collection Bins or Smart Dustbins are used to identify status of waste bins if it is empty or filled so as to customize the waste collection schedule accordingly and also save the cost and manpower. Real time waste management system by using smart dustbins to check the fill level of dustbins whether the dustbins are full or not and through this we can figure out which dustbins are used often and hence can improve the collection route, through this system the information of all smart dustbins can be accessed from anywhere and anytime by the authorized person. It will inform the status of each and every dustbin in real time so that concerned authority can send the garbage collection vehicle only when the dustbin is nearly full. By implementing this system resource optimization, cost reduction, effective usage of smart dustbins can be done

RELATED WORK

An inevitable consequence of development and industrial progress of a country is generation of waste. Therefore, efficient waste management is a matter of international concern and countries have setup robust regulatory waste management regimes for balancing the objectives of development and environment sustainability [2]. In India, the national environment policy, 2016

rapid urbanization and uncontrolled growth rate of population are main reasons for Municipal Solid Waste (MSW) to become an acute problem. According to population size per capita waste generation rate and its growth during a decade .It is anticipated that population of India would be about 1,823 million by 2051 and about 300 million tons per annum of MSW will be generated however, these projections are on conservative side, keeping 1.33% annual growth in per capita generation of MS [3].

Currently there is very little to no integration of technology with the waste disposal system through which we can save the unnecessary trips of the garbage truck which results in wastage of money and time of personnel's.

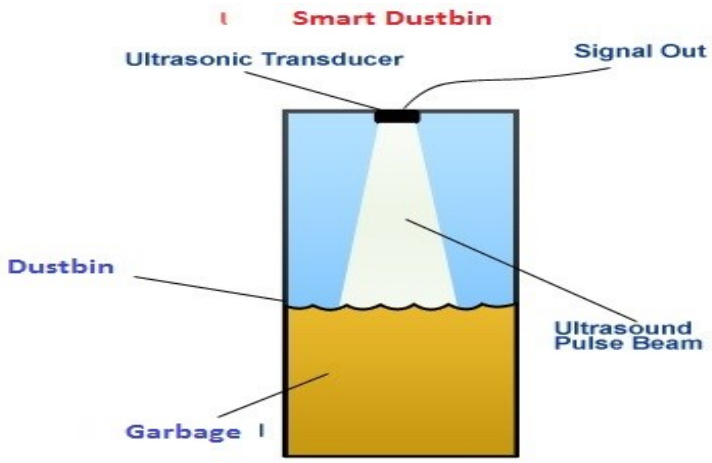
PROPOSED METHODOLOGY

ALGORTHM:

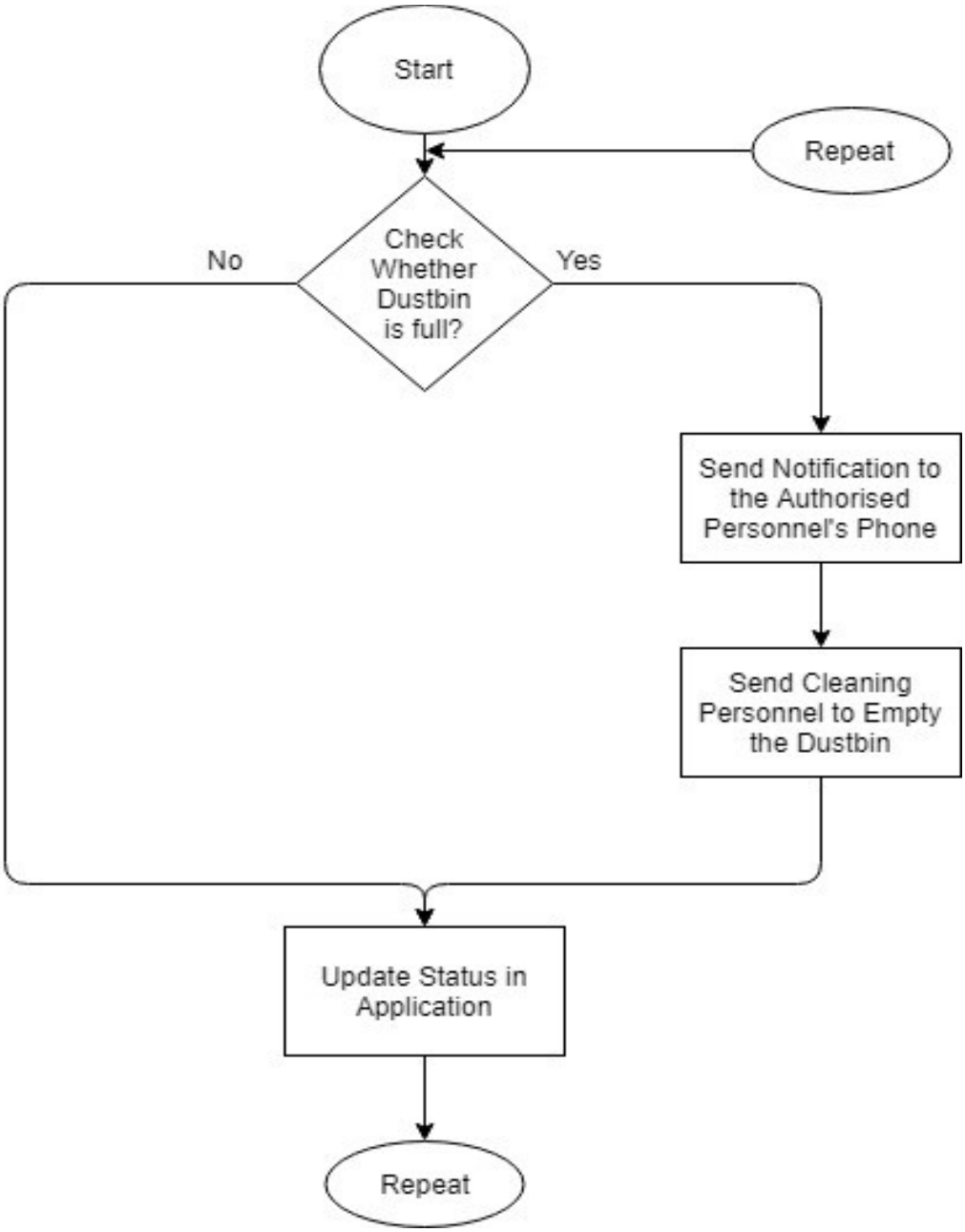
The algorithm that calculates the level of garbage in dustbin :-

```
int calculateDistance() // returns the level of garbage in dustbin
{
 delayMicroseconds(2);
 digitalWrite(trig,HIGH); //trigger the sound waves to be emitted from sensor
 delayMicroseconds(10); //triggering of waves continues for 10 microseconds
 digitalWrite(trig,LOW); //triggering stops
 duration=pulseIn(echo,HIGH); // sensor will start receiving reflected sound waves
 distance=(int)duration*0.034/2; // converts the pulse signal into length in cm
 return distance;
}
```

DESIGN:

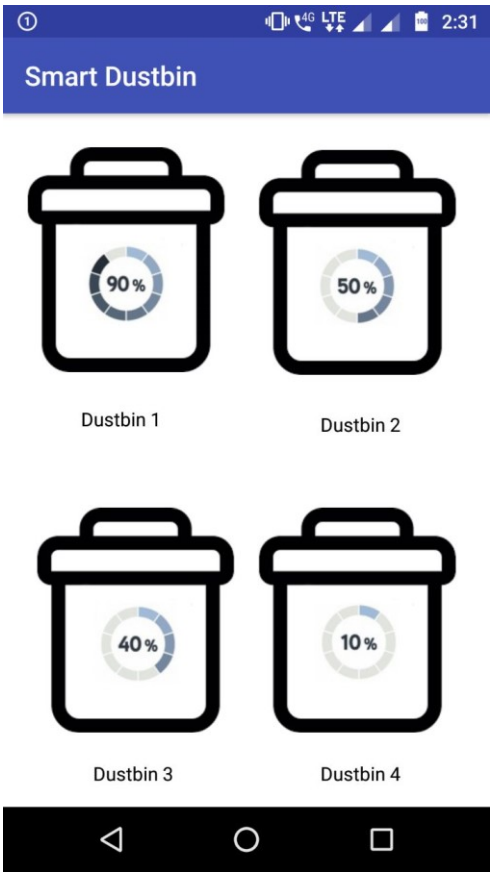


FLOW CHART:

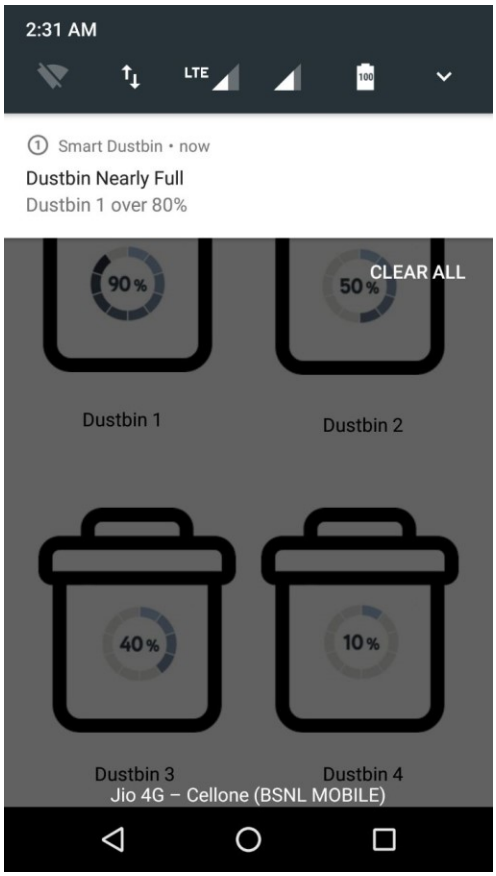


PROJECT DEVELOPMENT TECHNOLOGY

The working of dustbin totally depends on the ultrasonic sensor. The ultrasonic sensor will sense the garbage in the dustbin using sound waves. After sensing the garbage the ultrasonic sensor sends the data to the microcontroller (ESP8266-01 which is a wifi module along with a integrated processor) in the form of pulse waves. The microcontroller coverts the pulse wave signal into distance in centimetre and sends the data to real time database (Firebase) . From database the Smart Dustbin app fetches the data and coverts the data into percentage and displays it on UI.



Status of all Dustbins



Notification on over 80% full

CONCLUSION

Smart dustbins are the needs of Smart buildings. Smart waste monitoring and management is the keen idea of smart city planners [1]. Smart dustbins is a new idea of implementation which makes a normal dustbin smart using sensors for garbage level detection and sending notification and updating the status of the dustbin in real time. As soon as the dustbin is full there is a notification to concerned personnel.

FUTURE SCOPE: There is a great scope for the modifications of the Smart Dustbin in future. The system can be improved by adding new functionalities. Dumping of the waste was manual in Smart dustbin this can be automated by using robotics. The path tracking can be GPS enabled and the route can be optimised for the trash truck.

REFERENCES

[1] National Conference on Product Design (NCPD 2016), July 2016
[2] https://www.bioenabletech.com/smart-bins-for-smart-city.html
[3] Status and challenges of municipal solid waste management in India: A review,2016