

Arduino Based Smart Dustbin

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Abstract: *As people are getting smarter so are the things. While the thought comes up for Smart cities there is a requirement for Smart waste management. The idea of Smart Dustbin is for the Smart buildings, Colleges, Hospitals and Bus stands. The Smart Dustbin thus thought is an improvement of normal dustbin by elevating it to be smart using sensors and logics. Smart dustbins is a new idea of implementation which makes a normal dustbin smart using ultrasonic sensors for garbage level detection and sending message to the user updating the status of the bin using GSM module. As soon as the dustbin is full a Smart Solid Waste collecting system. It is a common sight to witness garbage spilled out in and around the dustbins. The area around an improperly maintained dust bins can house disease spreading insects like mosquitoes, flies, bees and driver ants. The environment around a dustbin is also conducive for increasing the pollution level in air. Air pollution due to a dustbin can produce bacteria and virus which can produce life threatening diseases in human beings.*

Keywords: Smart Dustbin

I. INTRODUCTION

The most important details in this text are the challenges of solid waste management in urban cities and the need for a system to eradicate this problem or reduce it to the minimum level. The smart city concept is still new in India, although it has received a lot of attention in recent years. The prime need of a smart lifestyle begins with cleanliness and cleanliness begins with dustbins. The main problem in the current waste management system in most of the Indian cities is the lack of proper dustbin placement and collection. To address this, a system has to be built which can eradicate this problem or reduce it to the minimum level. This paper aims to improve the health of dustbins in the urban waste management system.

II. LITERATURE SURVEY

The most important details in this text are the proposed Smart Dustbins, the proposed smart dustbin management system, and the proposed system based on Arduino Nano board and an ultrasonic sensor to monitor the fullness level of the container and give SMS alerts using a GSM module. Smart Dustbins can prevent the accumulation of garbage along the roadside and control the spread of diseases, pollution, and consumption of the spread out garbage by street animals. Swati Sharma and Sarabjit Singh proposed a smart dustbin management system using IoT as a hardware and ionic framework. Narayan Sharma, Nirman Singha, Tanmoy Dutta proposed a smart-bin designed to send data about the levels of garbage collected in different parts of the city/town. Fady E. F. Samann proposed a system based on Arduino Nano board and an ultrasonic sensor to monitor the fullness level of the container and give SMS alerts using a GSM module. The proposed system is powered by lithium battery power bank supported by solar cell panel and will store usage events, recorded by PIR sensor, and fullness level of the container.

This paper presents a smart bin built on a microcontroller based platform Arduino Uno board which is interfaced with GSM modem and Ultrasonic sensor. The sensor is placed at the top of the dustbin and measures the stature of the dustbin, with a threshold of 10cm. The system is implemented successfully with an acceptable overall cost for the intended application. The system performance was found satisfactory according to the obtained test results. Urbanization has increased tremendously and waste production has been a crucial issue to be considered. This paper is a way to achieve this good cause.

III. PROPOSED SYSTEM

The proposed system will help to avoid the overflow of dustbins, which are a major cause of diseases such as malaria, dengue, and chikungunya. It will provide real time information about the level of the dustbin and send a message when it is full. The cost of the system is minimal and the resources are easily available. The system improves environment quality by reducing the smell and making cities clean. It is open automatically without touch lid and is kept to provide a clean environment.

IV. METHODELOGY

4.1 Block Diagram

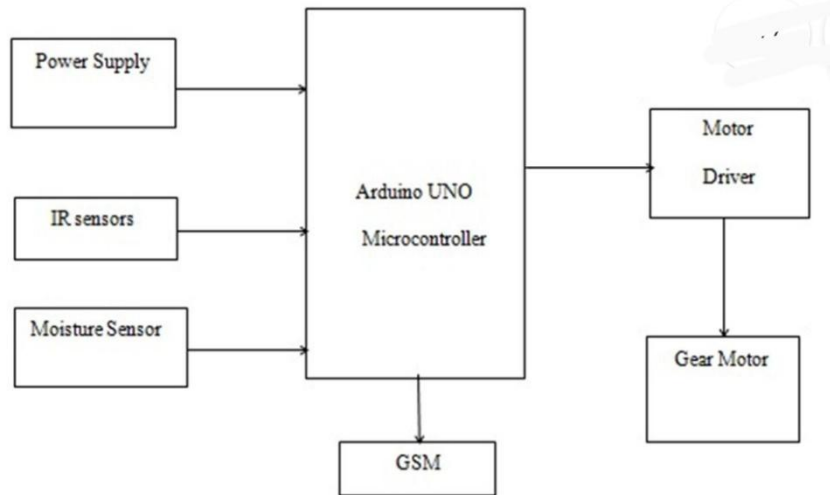


Figure 1. Block diagram of the setup

V. HARDWARE DISCRPTION

5.1 Ultrasonic Sensor

Ultrasonic sensors measure distance by emitting and receiving ultrasonic waves. An optical sensor has a transmitter and receiver, while an ultrasonic sensor uses a single ultrasonic element for both emission and reception. In a reflective model ultrasonic sensor, a single oscillator emits and receives ultrasonic waves alternately, enabling miniaturization of the sensor heath.

5.2 GSM 900

GSM is an open, digital cellular technology used for transmitting mobile voice and data services. It is a circuit-switched system that divides each 200kHz channel into eight 25kHz time-slots. It operates in the 900MHz and 1.8GHz bands in Europe and the 1.9GHz and 850MHz bands in the US. It supports data transfer speeds of up to 9.6 kbit/s.as SMS (Short Message Service). Another major benefit is its international roaming capability, allowing users to access the same services when travelling abroad as at home. This gives consumers seamless and same number connectivity in more than 210 countries.

3.3 ARDUINO UNO

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

Servo motors:

Servo motors are DC motors that allow for precise control of angular position. They have a revolution cutoff from 90° to 180° and a few have 360° or more. They do not rotate constantly, but their rotation is limited in between fixed

VI. SOFTWARE DISRIPTION

6.1 ARDUINO IDE

Arduino IDE is an open source software used to write and compile code into the Arduino Module, making it easy for anyone to use The Java Platform is a debugging, editing and compiling environment for C and C++ languages. It is available for MAC, Windows, Linux and runs on the Java Platform. It has inbuilt functions and commands for debugging, editing and compiling code.

VII. CONCLUSION

Smart dustbins are designed to address various features such as durability, affordability, prevention against damage and maintenance issues. They can contribute to a clean and hygienic environment in building a smart city, but proper awareness must be created among the public before it is implemented on a large scale. This could damage sensitive devices like sensors due to rough action of users.

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