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Automated Self Navigated Dustbin Dispensary System in Smart Cities

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Abstract: **Today main issue for pollution is Garbage Overflow. It creates unhygienic condition for the people and create bad smell in the surrounding's leading to spread of some deadly diseases and human illness. To avoid all such situation's we are going to implement a project called IoT Based waste management using smart dustbin. Implementation is done with the help of IoT concept. The Internet of Things (IoT) is a concept in which surrounding objects are connected through wired and wireless networks without user intervention. Objects communicate and exchange information. In this system multiple dustbins are located throughout the city or the Campus, these dustbins are provided with a sensor which helps in tracking the level and weight of the garbage bins and a unique ID will be provided for every dustbin in the city so that it is easy to identify which garbage bin is full. When the level and weight of the bin reaches the threshold limit, the device will transmit the reading along with the unique ID provided. After that the dustbin will move for dispatch the excess waste to the particular navigated place. In order to avoid the decaying smell around the bin harm-less chemical sprinkler is used which will sprinkle the chemical as soon as the smell sensors detect the decaying smell. Once the bins are full then user will not be able to access the bins. In such circumstances the bin displays the direction of the nearby bins on LCD display also generate the voice messages if the user place's the waste on the floor. The status of the bin is accessed by the concerned authorities from their place with the help of Internet and an immediate action will be taken to replace overflowing bins with the empty bins.**

Keywords: Smart Dustbins, L293D Drivers ,IR sensor, Toxic sensor,, Motor Driver, IOT Module Rain sensor, PIC Micro controller.

1.INTRODUCTION

Garbage has been a big problem in most of the cities, where very often one can see the pictures of garbage overflow. Amount of garbage waste is generally determined on the basis of two major factors, the population in a given area and also on consumption patterns. They are lakhs of bins at public places but still, there is waste overflow from these bins as they are not automated. The user of the bin throws the waste and do not care for the overflow. If waste overflow from dustbins is solved, it decreases foul smell in surroundings of bin and users will use the bin with comfort. Therefore, waste collection and management is becoming a huge challenge for Municipal Corporation of a city. In general, the garbage wastes are collected manually after visiting the entire area by the corporation vans, which is a tedious and sometimes faced huge challenge to manage the entire city. Moreover, in big cities, where extensive numbers of dustbins are deployed, physically hunting down and cleaning in routine basis is challenging. The garbage bins may get filled early or may get damaged, which requires immediate attention to resolve the problems or the bin will should itself has the smart facility to address the problems. Therefore, smart and efficient management of the waste is one of the focused areas in all the projects on the smart city, smart living. In literature, several research groups have attempted to mitigate this waste management issues, but a few works have been aimed to address both the bin monitoring and waste collection efficiently.

2.BLOCK DIAGRAM

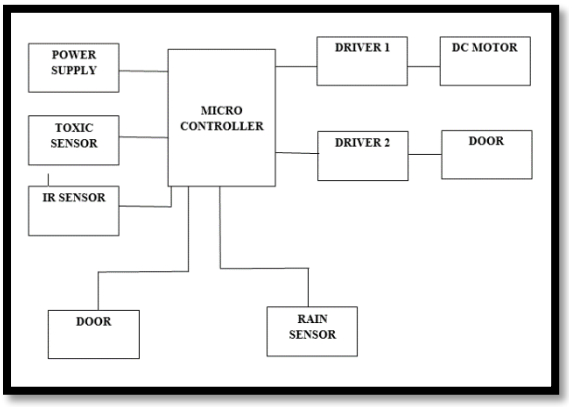

Fig 2.1: Block diagram of the Dustbin model

2.1 SOFTWARE USED

The project is monitor and maintain by an Android Application. The Smart Dustbin detects by the Pictorial Map Formation

2..2 IR OBSTACLE SENSOR

The IR sensor is used to detect the presence of an obstacle in front of the dustbin. It has an IR emitter and a receiver. Generally, this sensor has a high precision. The IR obstacle sensor has a potentiometer which can be used to adjust the range of measurement. The onboard LED indicator is used to check the presence of an obstacle.

2.3 RAIN SENSOR

A rain sensor or rain switch is a switching device

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activated by rainfall. It is made up of two parallel conducting material such as copper, aluminum.

2.4 GAS SENSOR

Gas sensor measure and indicate the concentration of certain gases in an air via different technologies. Typically employed to prevent toxic exposure and fire, gas detectors are often battery operated devices used for safety purposes.

2.5 DC MOTOR

Direct electric current motor works on the principle ,when a electric current carrying conductor is placed in a magnetic field, it experiences a torque and has a tendency to move. This is known as motoring action. If the direction of electric current in the wire is reversed, the direction of rotation also reverses. When magnetic field and electric field interact they produce a mechanical force, and based on that the working principle of dc motor established.

2.6 L293D MOTOR DRIVER

A motor driver is an integrated circuit chip which is usually used to control motors in autonomous robots. Motor driver act as an interface between Microcontroller and the motors. The most commonly used motor driver IC's are from the L293 series such as L293D, L293NE, etc. These ICs are designed to control 2 DC motors simultaneously. L293D consist of two H-bridge. H-bridge is the simplest circuit for controlling a low current rated motor. We will be referring the motor driver IC as L293D only. L293D has 16 pins.

3. FLOW DIAGRAM

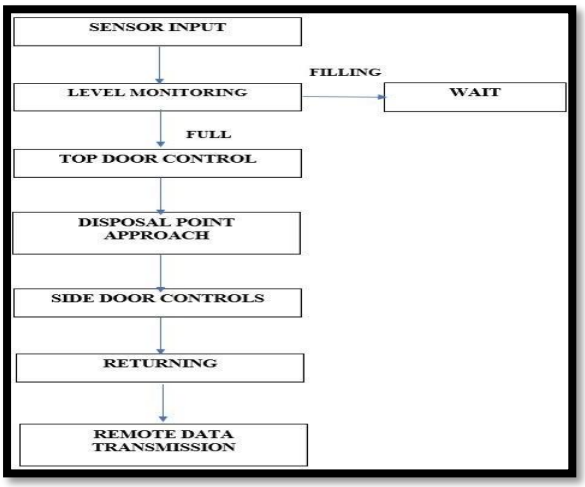

Fig 3.1 Flow Diagram

4. RESULTS AND DISCUSSION

All the hardware modules are implemented in real life dustbins as shown in Fig. 4.1. Demonstrates the working of IR sensors to detect the presence of a person, which gives the signal to the DC motor to open the lid of the dustbin. Therefore, the automatic closing and opening of lid help the person to throw the garbage inside the dustbin. This will help to reduce the spreading of diseases.

An Android Application monitor and maintain the Dustbin Output Data's. A normal pictorial Map are used detect the Dustbin

Fig 4.1: Motor drive and Sensors integrated in the dustbin

Fig 4.2: Interfacing sensors with Micro Controller

Fig 4.3: Android App

Fig 4.4: Login Page

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5. CONCLUSION AND FUTURE SCOPE

Waste management and disposal is one of the major challenges in all the cities. The present papers presents a self navigated dustbin dispensary system for automated operation of dustbins saving both time and money. The proposed waste management model is implemented in small scale using the IR, gas sensors , ultrasonic sensors and 12V battery supply. The authority must only monitor the common disposal point. This can contribute a lot towards the clean and hygienic environment in building a smart city. Further the present model will be made more user friendly and cost effective by connecting an Android Application to indicate the status of the bins and generating the required energy at the sensor node itself to make them self sustainable.

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