SMART DUSTBIN FOR VISUALLY IMPAIRED

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SMART DUSTBIN FOR VISUALLY IMPAIRED

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ABSTRACT- The main concept of this project is to make our environment clean and eco-friendly by making the smart dustbin. This is made specially for the visually impaired people where it can notify itself once the dustbin is filled with the wastes. It will automatically produce a peep sound which alerts the people. This idea is inspired by Clean India Mission by our government. India is a country where there are many developing industries are growing. So, a country like India which has a growing nature with its increasing economic rate, it is much difficult to manage the waste disposal. Nowadays, people throw the trashes wherever they wish and that places becomes a thrash area causing diseases to the people living in that locality. Because of the immature nature of man-kind it has caused a great threat and reached its peak which leads to the origination of the bacteria, virus and some kind of germs. Thus, by considering this situation, with the help of technology and also to make our area clean we are designing the smart dustbin with the help of IoT devices like Arduino UNO. This is called as Smart because it acknowledges itself when someone is throwing the thrash into it through the ultra-sonic sensor. This can also be used by the visually impaired people as it as fixed with the automatic notification of producing a peep sound when the dustbin is filled. Now, it is made by both hardware and software devices and this is connected with the help of jumper wires, battery, servo motor, sound making sensor, ultra-sonic sensor along with Arduino UNO. After connecting it properly, the lid of the dustbin opens automatically and the thrash is throwed into it gets closed. When the dustbin is full it makes a peep sound and alerts that the dustbin is fill. This can be used in homes, offices and even in public places. So that it may make our area tide and clean.

KEYWORDS: IoT, Arduino UNO, Ultra Sonic Sensor

I. INTRODUCTION

For the recent years in our country, the population growth is increasing rapidly which leads in the increasing of every sector works. Increase in the food production, agricultural fields, and so on. This all results in the waste management which is not maintained properly. As the people throw the wastes according to their wishes without thinking of its effects has led to the pollution and it causes soil erosion, air pollution, etc., Thus, ecological factors that has more influence in this may be global warming, health issues, and the ozone depletion. This can be solved by making the smart city i.e., trying to maintain the better and clean environment which can reduce the air pollution and makes us to breathe the pure air. Dustbin is a box like vessel that collects the garbage or store things that are recyclable, non-recyclable, decomposable and non-decomposable. Air pollution due to dustbin may lead to the origin of bacterial, viral disease which may cause serious health issues to humans. Hence, the dustbin should be maintained properly and so every time we cannot watch it so Smart Dustbin takes a play here. In our paper, we are using IoT devices for implementing the concept of Smart Dustbin. When someone comes to throw the thrash into the dustbin the lid of the dustbin opens by itself with the help of ultra-sonic sensor and then it closes once the thrash is throwed into it. After sometime when the dustbin is filled with the garbage, it produces the sound notifying that the dustbin is full. This is a concept of making the living place clean. This is mainly used for our future generations as they make the places mess. And also adding that Smart Dustbin can also be played by the children by making fun at the same time it also makes the place clean. This is made for collecting all the type of wastes. Thus, the use of smart dustbin can make the drastic change in the environment. We can make this world full of technologies by saying,

"Smart Home with Smart Technologies!!!"

II. RELATED WORKS

Hassan S, Jameel N, Şekeroğlu B are the authors discussed about the solid waste monitoring and collection of the wastes by using the technical devices. Through this we have got the idea of making the smart dustbin with the key points mentioned in the above given paper which made us to make our initiative towards smart work in the field of IoT. Moreover, this paper made us also to think about the automatic collection of wastes when the scum is identified naturally. This paper has more explanation about the waste management system and it prime factors of cause and the drawbacks that are not properly maintained [2]. Rafeeq M, Alam S. are the authors discussed about the collection of plastic, iron, glass and metal wastes that are automatically identified in the scrap industry and then segregated separately using the Arduino UNO board. This made us to realize think about the separation of biodegradable and non-biodegradable wastes and its effects. If biodegradable means it can be sent to the gardens for the purpose of using as a manure. In case of, non-biodegradable it is sent to recycle centre or scrap industry. Moreover, from this paper we have got the point of making the iron metals collection way [9].

Anushri G, Manikandan A, Vignesh K are the authors discussed about the monitoring of the garbage system which makes the environment clean and blissful. This paper gave us the topic of proper maintenance of the dustbin and specially when it is filled up the peep sound is produced and alerts about it. This idea is emerged as a result of reading and referring this paper. According to this, the monitoring system is properly checked [7]. Mamta P, Anamika G are the authors gave us the clean and clear representation of the features of using the smart dustbin and its involvement in the society for the purpose of cleaning and also encourages the youngsters as well as children in the cleaning activity. This paper made the best approach of smart dustbin without the implementation which helped us to implemented it with the sound alarm and made our project unique [10].

III. MATERIALS AND METHODS

3.1 Methodology-

We have created a simplified and the better system for the disposal of wastes in the environment by using the IoT devices. This method will be more useful than the other concepts of smart dustbin. This method will be useful for all the people without any impact. The entire architecture of the system is given below in Figure.1,

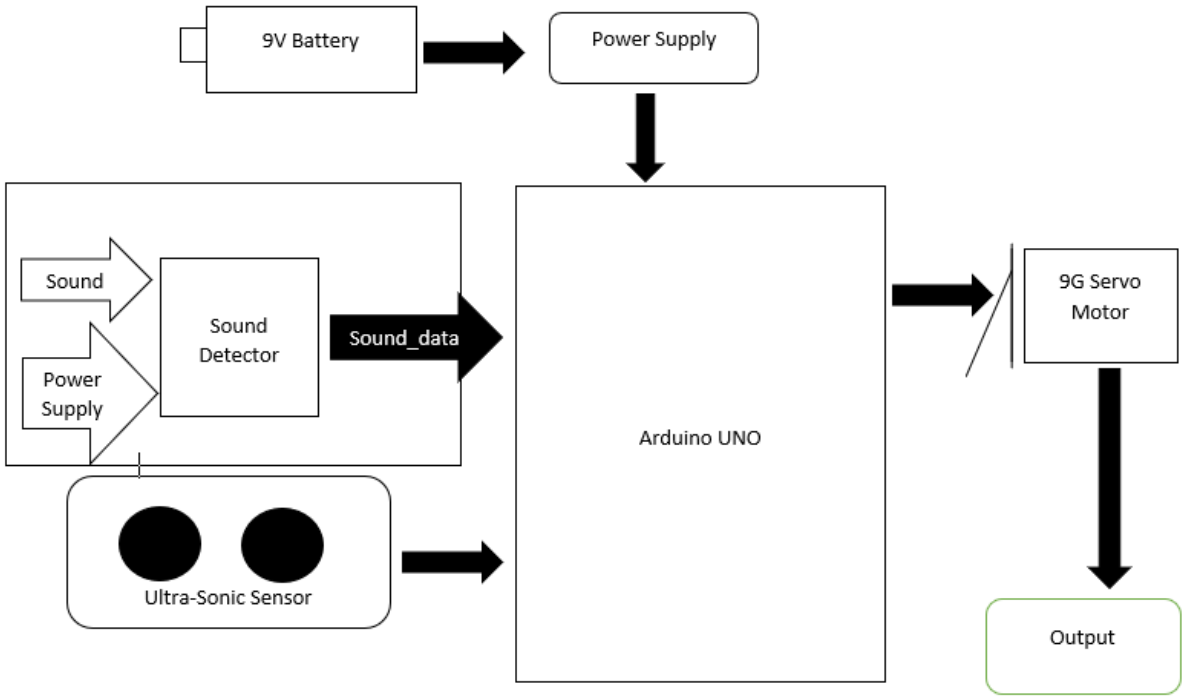

Figure.1 Architecture of this proposed system

In this Project we have used Arduino UNO for executing the code and ultra-sonic sensor for sensing and then servo motor is connected to the Arduino UNO which helps in opening and closing the lid of the dustbin. This will bring the serious changes in the field of cleanliness. Everything in the world is getting with the technology for the better improvement of man-kind. So, this helps in maintaining the environment clean. This project is a sensor based one which can be accessed by any age group of people as it displays the role of dustbin. Our aim in this is to make in less cost efficient so that it can be used by all kind of people.

3.2. Procedure –

3.2.1. Servo Motor Connection –

Here, we go to the actual setup and building the process of Smart dustbin using Arduino. We start with the first step of connecting the servo motor to the Arduino which helps in opening of the lid. In order to open the lid automatically, I have connected a plastic nut to the servo motor using double sided tape. This is connected for the purpose of opening of the lid so that it is attached to the other side of the lid. From this the actual setup of the dustbin is made by using Arduino.

3.2.2.Ultra-Sonic Sensor Connection-

After connecting the servo motor successfully, it's time for the ultra-sonic sensor set up. We have used ultra-sonic sensor (HC-SR04) and that is placed in the front of the dustbin by making holes with the help of the drilling machine. It does the sensing and makes the lid open. The pins in the sensor are connected to the Arduino UNO.

3.2.3. Wiring The Components-

The next step is to make the required connections as per the required circuit diagram and those are connected properly without hanging around. All the wires from the components, i.e., Ultra-sonic sensor and servo motor are connected to the respective pins of the Arduino board. This finishes the building process of the Smart Dustbin.

3.2.4.Arduino UNO Connection-

Now, it is the final process of the connection and it is done using the Arduino Board. The Arduino UNO is used for the execution of the coding. Arduino board is connected to the Laptop through the USB cable. Then, the code is uploaded successfully. Then with all the set-up completion, we will run our dustbin by connecting the Arduino board to the battery and check whether its working or not.

3.2.5.Sound Detector-

It helps in producing the peep sound after the dustbin is filled with thrashes.

IV. BLOCK DIAGRAM

Arduino UNO has ATmega328 P microcontroller, which is the important component of UNO board. The components of this model is ultra-sonic sensor, servo motor, power supply etc., The ultrasonic sensor, servo motor and battery are connected to the Arduino board with jumper wires with their respective pins. Hence, the present level of distance between dustbin and hand is fixed to 35 cm and the servo motor is used for the opening and closing of the lid. The block diagram of smart dustbin is given below in Fig.2.

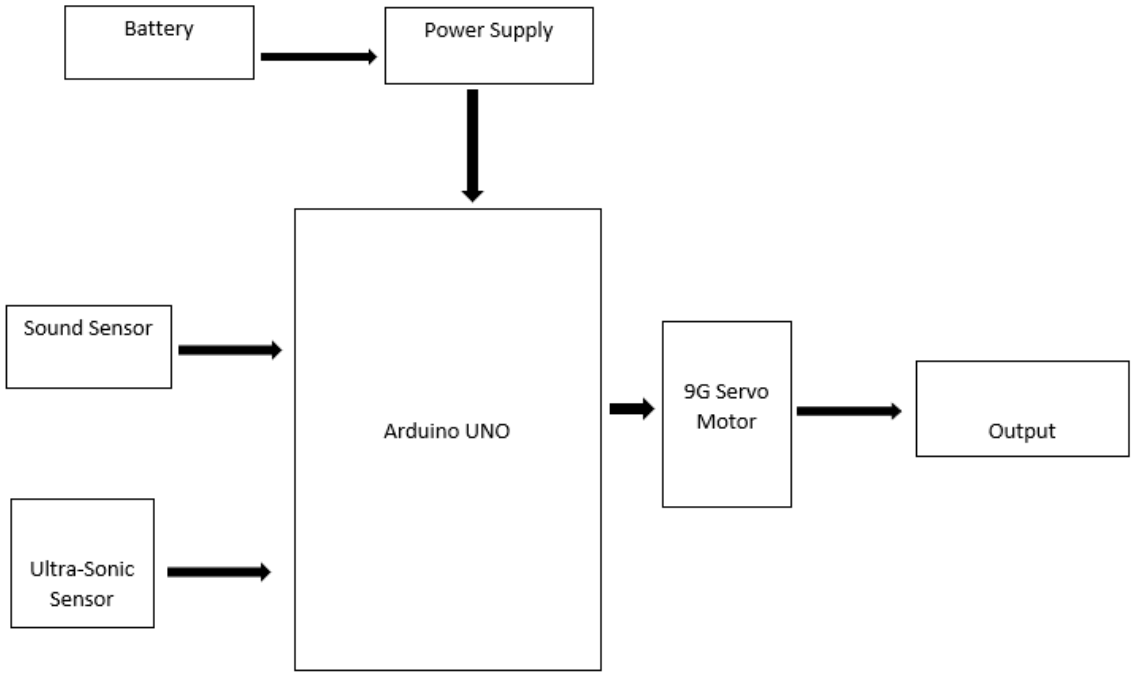

Figure.2 Block Diagram of the Smart Dustbin

Ultra-sonic sensor is used to locate the distance between the smart dustbin and object that comes near to it. The main principle behind finding the obstacle is sonar wave. The main reason of using Arduino UNO is because it is a software and it is clean, simple and easy to use.

V. WORKING

After the complete set up is done i.e., connecting the wires to the smart dustbin, now the important work is to check the connections whether all are connected properly or anything is missed. Next step to this is to upload the code in Arduino and connect it to the circuit. When system is booted Arduino monitors anything that comes near to the

sensor at the given short range. When Ultrasonic sensor detects object, Arduino calculates its distance and if it is less than a certain given value then the servo motor gets activated (Working) first and extend its arm which results in the opening of the lid. Lid will be open for small amount of time (20s) and then it automatically closes. This happens continuously and when the dustbin is full, the peep sound is produced with the help of the sound sensor and alerts the people.

VI. IMPLEMENTATION

Here, the implemented part of the dustbin is given below to show its function.

Figure.3 Implementation of Smart dustbin

Figure 3 represents the implemented part of the smart dustbin. The first diagram represents the image where there no signal detected nearby. The second image represents that the signal is detected using ultra-sonic sensor and the lid is opened by the servo motor and it is waited for some time and then it is closed. These things have done automatically without the effect of humans.

VII.CONCLUSION

This system gives us the greater environmental works as it has reduced 80% of the waste disposal which results in less man power, fuel emissions and so on. Here, we are going to make an evolution change towards smart dustbin and clean city. The combination of the waste detector and peep sound when the dustbin is full makes this paper unique. This peep sound is used for those who cannot see. Smart dustbins are better because in this dustbin not much man power is needed. It is equipped with smart devices like sensors, Arduino and battery. The bottom of the dustbin will automatically open when the objects come near to sensor and according to Arduino code it will close. This makes the best different in the smart world. Finally, this can be extended using the concept of making an automatic throwable and collectable thrash-cans that are separated as bio-degradable and non-bio-degradable. Bio-degradable are thrown near the roots of the trees and non-bio-degradable are sent to the recycling factory, some are destroyed through incineration, dumped under the soil and so on. This specified above methods will be helpful towards the health and cleanliness of the people as many as possible. This will bring the slow change in the society and will be notified by other people.

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