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Smart Bin Using Android Application and Arduino

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ABSTRACT: Nowadays wastage pollution increases at an alarming rate all over the world. It is the major cause of air pollution. The heart of a city depends on its pure Air, clean roads and highways and overall it's surrounding environment. People living in the city suffer from various causes if the condition disrupted. Different kinds of Diseases spread out. It becomes tougher to lead a healthy life for people. But, people can fight with this problem by building up a healthy city. Hence new a system is integrating by citizen and authority in a common platform. They can work together to make the city healthier. The system is an android based application where the common man take part to clean the city, notify volunteer to take part or can inform City Corporation. The system involved application design and coding for android apps garbage collector, system design, data collections and database structure on firebase. Also when someone dumps trash into a dustbin the bin ashes a WiFi password, which can be used to gain access to free Wi-Fi". Sensor check garbage fills in dustbin or not and Router provides Wi-Fi to user. Major part of our project depends upon the working of the Wi-Fi module; essential for its implementation.

KEYWORDS: Smart Dustbin, QR code, Android Application, Wi-Fi, Arduino

I. INTRODUCTION

Many times, in our city we seen that trash was present in out of dustbin. It creates unhygienic conditions for people as well as ugliness to that place leaving bad smell and also Realizing the need of the Internet in everyday life, we decided to give free Wi-Fi to people in exchange of a cleaner surrounding with an unique initiative. Now days a very fast growth of urban population in recent time. Due to increasing population of cities or states the city or states can faces many problems like environmental problem in which increasing garbage waste, increasing various type of diseases and create health problem. In recent time Garbage waste collection and its management is very critical issue. For that In India 2 October 2014 Indian Prime Minister Mr. Narendra Modi announced Clean India Mission launched by Government of India. In this mission covering 4,041 cities and infrastructure of country.

The waste in the bins are collected everyday as a routine work. The wastes will be collected without considering whether bins are filled or not, which will obviously increase the time and fuel consumption. Additionally, improper disposal of waste cause many diseases through spreading of bacteria, insects and viruses which develops on the garbage and also affects the health and hygiene of the people who lives nearby areas and pollute the environment. The workers who are engaged in collecting the wastes may suffer from problems like skin irritations, blood infections, respiratory problems, growth problem. So as a responsible citizen, its our duty to keep the surroundings clean and neat. The tourists won't like to visit, if the city was poor in waste management. The main aim of this project is to benefit the society by maintaining purity of nature. Taking care of the environment is everyone's responsibility and it is necessary for the planet.

Furthermore, covid-19 pandemic has created a great impact on human health. In this situation it is necessary for everyone to be safe. For the public awareness and safety, smart garbage system plays an important role in people's health. It is on the safer side because it detects motion and without touching the lid of the dustbin wastes can be thrown. Safety is really important in this covid-19 situation. The safer side for the workers who can also be affected due to the covid19 crisis was also ensured through this project.

Inspiring by these mission we proposed the smart Wi-Fi dustbin system for smart garbage waste collection. The work proposed in this paper illustrates how the Smart bin solution empowers cleaning public area like Railway stations, Global store, Colleges, Hotels etc. to detect cleanliness issues in real time. Thus, the system is able to help in increasing overall productivity and cleanliness.

II. RELATED WORK

The implementation of a Wi-Fi trash can is not a novel concept; The concept has been around for a few years since the Internet of Things (IoT) field took hold of our lives.

M. Prasanth, Pragnya Srinivasan, and others suggest a system in which sensors in the bin check to see if it is full. Through the Arduino SIM module, which is utilized by the application of the Arduino board, it sends an automated message to the system's server end if it is filled.

P. Suresh, Vijay et.al gave the possibility of IoT subject and expansion insights concerning IoT. The legitimate savvy climate and different applications. This paper points in organizing a cutting edge survey on IoT. The innovation, history and applications have been talked about momentarily alongside different measurements.

The Waste Collection System architecture based on the Internet of Things has been proposed by Saurabh Digdhe and

Pooja Shelaret. The architecture is made up of an embedded device with sensors and a microcontroller that sends information about bins to a workstation at the municipal office to find the shortest path. The city will remain clean with the help of this waste removal method. For the "Clean India Mission," the proposed system is an attempt to improve India's current waste collection system. Additionally, the system will produce reports on fuel consumption and waste collection.

Parkash and Prabhu V have implemented a real-time waste management system that makes use of smart dustbins to determine whether or not the smart dustbins are full. The concerned individual can access the information of all smart dustbins through this system at any time and from any location, allowing them to make an informed decision. By executing this proposed framework the expense decrease, asset enhancement, compelling utilization of savvy dustbins should be possible. The city's traffic is indirectly reduced by this system. Depending on the population of the area, the garbage collection vehicle makes twice or three trips to the area every day in major cities, and dustbins may not always be full. Each dust bin's status will be updated in real time by our system, allowing the appropriate authority to only send a garbage collection vehicle when the bin is full.

III. PROPOSED METHODOLOGY

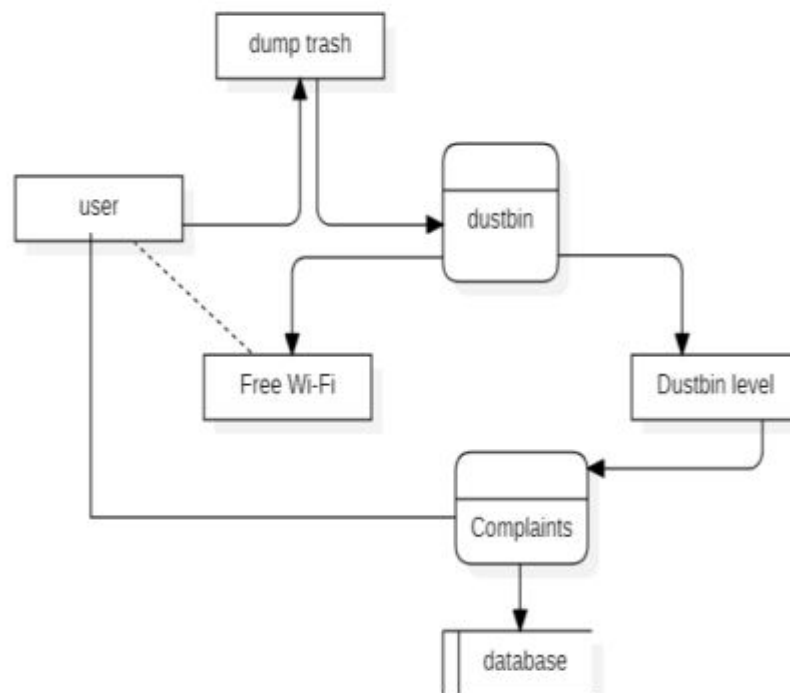


Fig 1. Proposed System Architecture

In this framework we have proposed a brilliant Wi-Fi dustbin. A Wi-Fi password that can be used to access free Wi-Fi is ignited when trash is thrown into a dustbin. Sensor check trash fills in dustbin or not and Switch gives Wi-Fi to client. Additionally, when the dustbin is full, it informs an employee of the overflow. The system is divided into embedded and Android application techniques. Arduino UNO, IR, ultrasonic, a Wi-Fi router, a relay module, and a Bluetooth or wireless module are all included in embedded systems. There are two to three modules in an Android application: users, corporate personnel, and administrators. Where customers can file grievances against employees of the corporation if they have performed their duties improperly. There is an admin module for monitoring them.

IV. WORKING MODULE

This architecture shows overall description of our system. The first part of our system the user simply put the some garbage in to the dustbin. The hardware which is the electronic device is already connected I to the dustbin, after user put the some garbage the sensor identify it and display the password for user. User use the same password of get free Wi-Fi. The second part of our system is the android application; user scan the QR code and submits the complaint if they have.

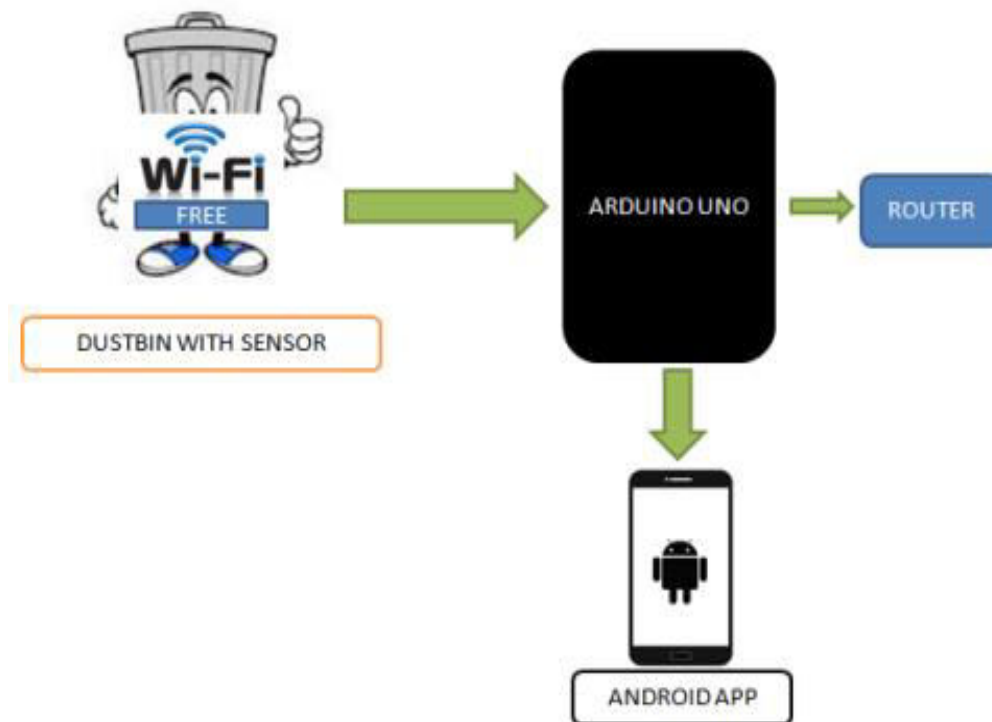


Fig 2. System Module

In our system we follow some steps as below:

- User should put or dump some trash in the dustbin.
- After that system shows password for free Wi-Fi for 10 min.
- For trip the network we use relay module
- If dustbin overflow system send the notification for higher authority to clean them
- User can send the complaints about dustbin overflow via using our application
- User need to scan the QR code present on dustbin
- System shows information about the dustbin. Then user select the option regards complaint.

V. PROJECT OUTCOME

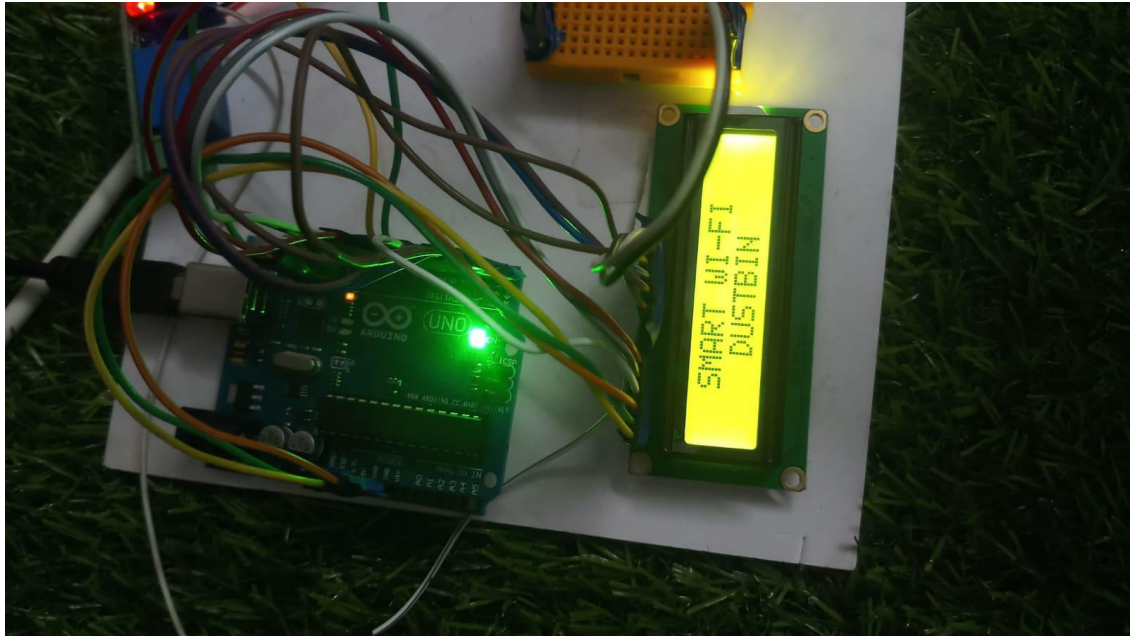


Fig. 3: Hardware Module

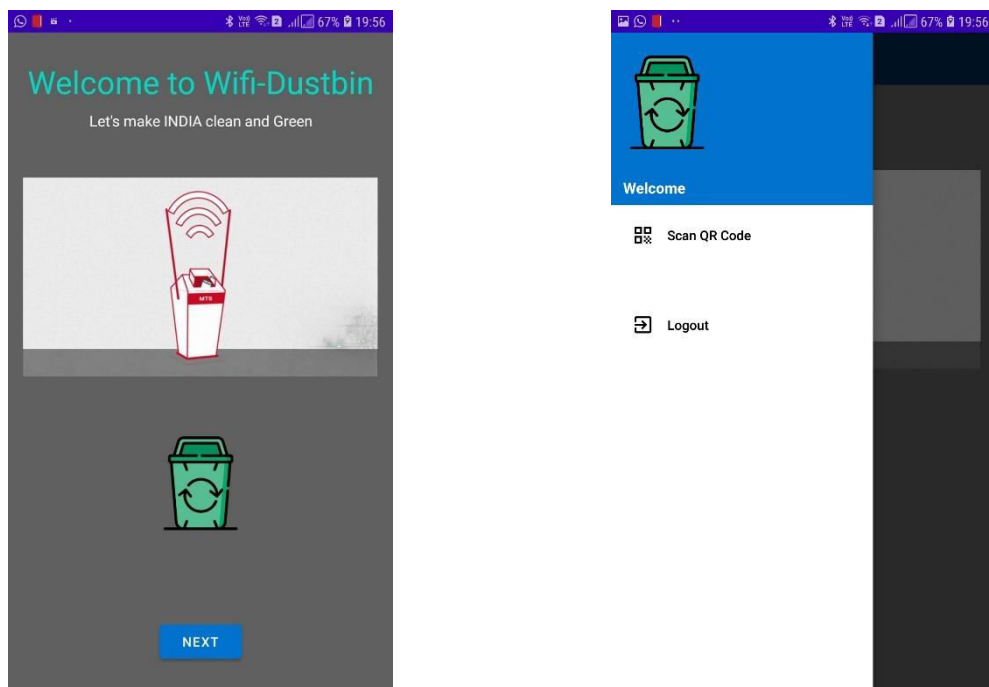


Fig. 4: Android App Module

VI. CONCLUSION

As the population grows, so does the amount of waste produced, making waste management essential. The environment is kept clean and hygienic by using this clever garbage system. It assists in the correct collection of garbage, which in turn assists the authorities in monitoring and managing garbage disposal to prevent garbage from filling up surrounding areas. The wastes are compressed to make more space available and make it easier to transport them. Due to the growing prevalence of intelligent technology, the development of smart systems, particularly smart trash cans, is on the rise. Overall, the mini and super-smart dustbins system appears to function as intended, according to the test results. The evaluation of the application for smart dustbins found that the presence of smart dustbins in the room strongly agreed to provide benefits and attracted very high interest in awareness of disposing of trash in the right place. However, it is necessary to improve the smart dustbin system to improve its performance as well as cooperation with the entire academic community, which is a shared responsibility. The average value of 87.80 percent of the 50 participants in the study stated that the presence of smart dustbins in the room strongly agreed to provide benefits.

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