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Smart Wi-Fi Dustbin

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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.NarendraModi 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. PROBLEM DEFINITION AND OBJECTIVE

Nowadays, due to increasing population the waste management is also becoming challengeable. Government also tries their best for handling the garbage but some extinct garbage collection is not properly done, which impact the health

and environment of our society. The detection, monitoring and management of wastes is one of the primary problems of the present era.

Smart waste management is an idea where we can control lots of problems which disturbs the society in pollution and diseases. The waste management has to be done instantly else it leads to irregular management which will have adverse effect on nature. The Smart waste management is compatible mainly with concept of smart cities.

II. RELATED WORK

1. AN IOT BASED WASTE MANAGEMENT SYSTEM

Green IoT focuses on energy efficiency from all perspectives of iot development. There are some research works related to Smart waste management that are utilizing IoT technologies. This paper uses the smart bin development using Arduinouno R3, the web application of waste management system is used via smartphone application. Hardware implementation is a critical challenge for proposed system. The main issue is the scarcity of diffey components.

2. SMART WASTE COLLECTION MONITORING AND ALERT SYSTEM VIA IOT

Using an ultrasonic sensor connected to Arduino UNO as to keep checking waste bin garbage level. Waste bin depth level will be sent via Ubidots IOT cloud but it won't update immediately. It won't detect the gas and public won't know the status of Garbage level.

3. IOT BASED SMART WASTE BIN MANAGEMENT SYSTEM WITH AN OPTIMISED ROUTE

A method that uses many solutions to show the issues of spillages and unfit collection scheme is presented. They have used smart waste bins to detect and report the level of waste through SMS notification for further actions. The data collection is done through sensors then the data is analysed using KNN classifier. It uses too many algorithms and has calculations for surveys so it is a very complex process for solid waste management.

4. CITY GARBAGE COLLECTION INDICATOR USING RF(ZIGBEE) AND GSM TECHNOLOGY.

This paper gave the details for the module required for the transmission of the data to the receiver side and also the main channel follow of the project. Initially we used GSM technology for our project but later on decided to us Wi-Fi module for the ease of data transmission.

III. PROPOSED METHODOLOGY

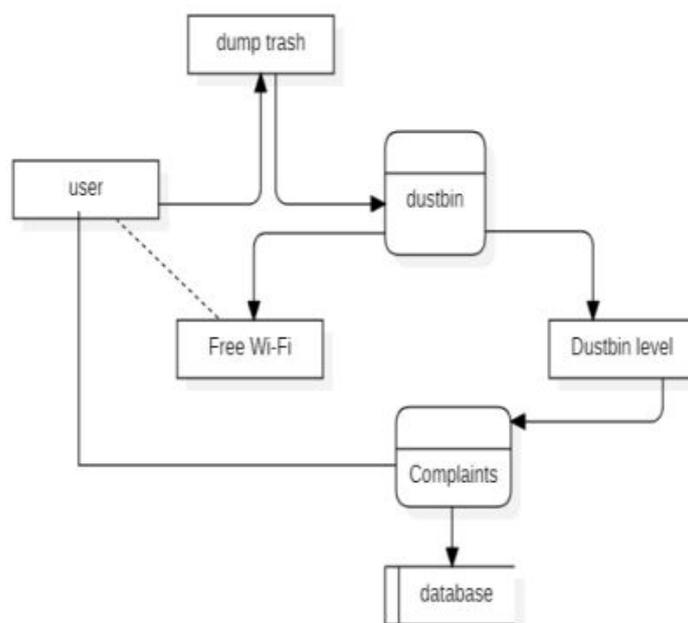


Fig 1. Proposed System Architecture

In this system we have proposed a smart Wi-Fi dustbin. When somebody dumps trash into a dustbin the bin ashes a Wi-Fi 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. Also when dustbin full it alert to corporation person about the bin overflow. The system divided in two techniques as Embedded and Android application. In embedded system it include Arduino UNO, IR, Ultrasonic, Wi-Fi router, relay module, and Bluetooth or wireless module. Android application have two to three module as Users, Corporation people, and admin. Where user can complaints against corporation person if they not done there work properly. For monitoring them admin module is there.

IV. WORKING MODULE

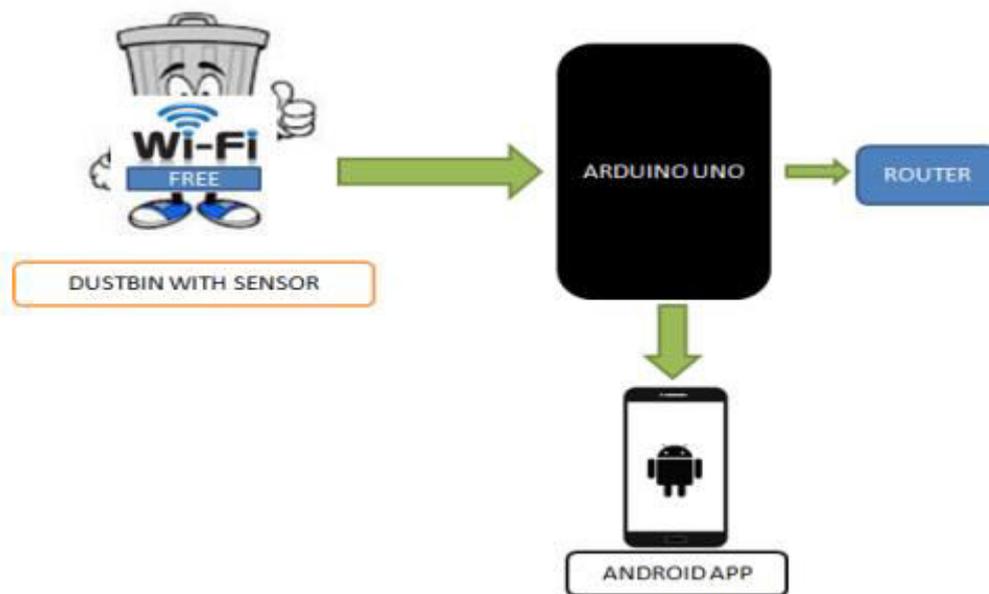


Fig 2. System Module

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.

In Smart Wi-Fi dustbin system design two main modules:

1. Hardware Module
2. Android Application.

Hardware Module In our system the hardware part is design by the using of the IR sensor, Microprocessor as Arduino UNO, LCD, Ultrasonic, Router, Adapter are completely integrated for complete setup we use Embedded C language.

Android Application. In this system for developing the android application for submit the any complaints. After downloading file from system data user will decrypt file by performing encryption technique.

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. CONCLUSION

As the population increases the production of waste also increases, so proper waste management is essential. By implementing this smart garbage system, the environment remains clean and hygiene. It helps in proper collection of garbage which helps the authorities to monitor and manage garbage disposal to avoid overflowing of garbage around the surroundings. To provide ease of transportation, the wastes are compressed to increase the available space. The development of smart systems, especially in the development of smart dustbins tends to increase, this is due to the trend of the existence of intelligent technology. The test results state that overall the mini and super-smart dustbins system works and functions properly. The results of the evaluation of the application for smart dustbins with an average value of 87.80% of the 50 respondents involved stated that the presence of smart dustbins spread 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 all the academic community which is a shared responsibility.

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