Wi-Fi DustBin System

Prof.Mrs. N.P.Dhole, TejaswiniGawande, RutujaRaut, AkshayDhood, Abhishek Kularkar, DhananjayGharad

Prof. Ram Meghe Institute of Technology and Research, Badnera, Amaravati.
Corresponding Author: Prof. Mrs. N.P.Dhole

Abstract: *In our country, Garbage is a very big issue. It creates some unhygienic problems and problems related to the society health issue, it creates multiple type of diseases. Careless trashing of garbage on the roads is a common scenario to be found in our country. And also now a days internet is a very important part in our life for digitization. Thus for this kind of issues, a Wi-Fi Dustbin can be use, it is a system that whenever someone throws the garbage or waste into a dustbin then it automatically detects the garbage and gives a temporary access code to the user, to use the Wi-Fi available.*
Keywords: *IR Sensors, Micro-controllers, Wi-Fi Routers, Software Development Kit(SDK).*

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 2014Indian 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.

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. Literature Survey

This is not an original idea, for the implementation of Wi-Fi trash bin; the idea has existed for few years, After the Internet of Things (IoT) field finding its grip in our lives.

M. Prasanth , Pragnya Srinivasan et.al proposes system where the sensors in the bin check if the bin is filled up to the brim or not. If it is filled it sends an automated message to the server end of the system, through the Ardiuno SIM module, which is made use of by the application of the Ardiuno board. Once the server receives the message it forwards the message to the worker in charge, with respect to the Worker ID that is stored it the worker database. If the worker is available, he will notify of his/her presence by accepting the work and will reach the required destination. If the worker is not available, the work will be transferred to another worker.

P. Suresh, Vijay et.al gave the idea of IoT subject and addition details about IoT. The proper smart environment and various applications. This paper aims in structuring a state of the art review on IoT. The technology, history and applications have been discussed briefly along with various statistics.

SaurabhDugdhe, Pooja Shelaret.al proposes Waste Collection System architecture using Internet of Things has been proposed. The architecture consists of embedded device with sensors and microcontroller for sensing information of Bins and sending to workstation, which is situated at municipal office for finding shortest path. This technique of waste removal will keep the city clean. The proposed system is an attempt to improve current waste collection system in India for the "Clean India Mission". The system will also generate reports about waste gathering and fuel consumption.

Parkash and Prabhu V have implemented real time waste management system by using smart dustbins to check the fill level of smart dustbins whether the dustbin are full or not. In this system the information of all

smart dustbins can be accessed from anywhere and anytime by the concern person and he/she can take a decision accordingly. By implementing this proposed system the cost reduction, resource optimization, effective usage of smart dustbins can be done. This system indirectly reducing traffic in the city. In major cities the garbage collection vehicle visit the area's everyday twice or thrice depends on the population of the particular area and sometimes these dustbins may not be full. Our System will inform the status of each and every dust bin in real time so that the concerned authority can send the garbage collection vehicle only when the dustbin is full.

Meghana K C & Dr. K R Natraj includes implementation of managing the garbage using sensor, LabVIEW and GSM is shown in this paper. Bin management is one of the major applications of IOT. Here sensors are connected to the all the bins at different areas. It senses the level of garbage in bin. When it reaches threshold a message is sent via GSM to the concerned person to clean it as soon as possible. The completed task is done in LabVIEW environment.

S.S.Navghane1, M.S.Killedaret.al proposes smart garbage management system using IR sensor, microcontroller and Wi-Fi module. This system assures the cleaning of dustbins soon when the garbage level reaches its maximum. If the dustbin is not cleaned in specific time, then the record is sent to the higher authority who can take appropriate action against the concerned contractor.

This system also helps to monitor the fake reports and hence can reduce the corruption in the overall management system.

III. Proposed System

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 unique id for user. User read the number then open the address of our web application in to the browser. The second part of our system is the web application, user put the unique id in to the textbox and submit. Then system checks the id and compare with database value, if it matches system give password of Wi-Fi network device to user or if it not matches it send failed message for user. After matches the password user can free to use internet facility.
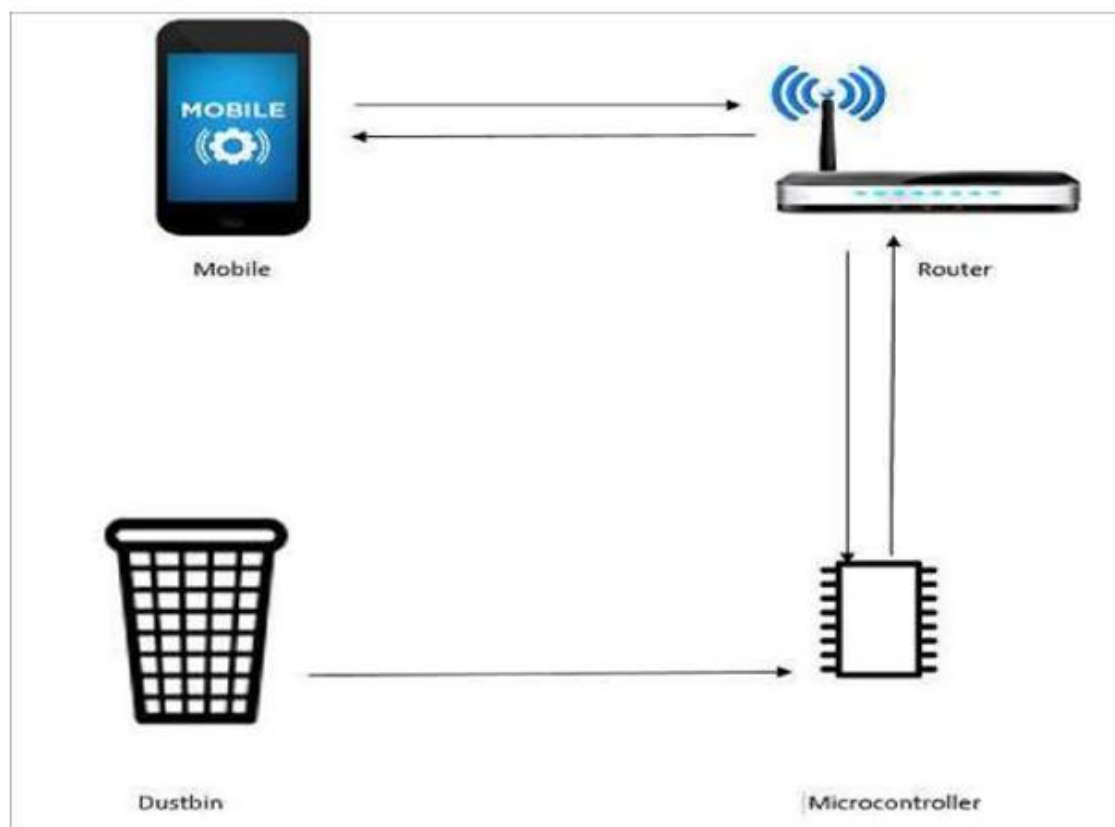

Fig. : Block Diagram

IV. Specification:

4.1: Mobile Phones

Mobiles:-

- Any Smartphones can we use in these system.
- Connectivity 2G/3G/4G for better experience use 4G Mobile.
- Hotspot & Wi-Fi should be available.

4.2: Router

Router Features:-

- Number of Connection **Ports** .
- Fast Forwarding.
- Fast Data Transfer Rate.
- Easy Setup
- Virtual Privet Network Capability.

4.3: Atmega328

Atmega328:-

- Atmega328 has 28 pins in total.

- It has 3 Ports in total which are named as Port B, Port C and Port D.

- So, in total ATmega328 has 14 digital pins.

- It needs a crystal oscillator for generating the frequency. You can use crystal oscillator ranging from 4MHz to 40 MHz.

4.4: Dustbin

Dustbin:-

- We can used any Dustbin According to our requirement.

V. Implementation

Based on studied literature we specify three modules of a system for implementation.

Module 1: In first module before starting actual implementation we will design the system prototype and also the GUI. Then we will select appropriate types of hardware and software components which will be needed for our project. By studying different type of microcontroller and IR sensors we will create overall basic structure of the program and how it would work.

Module 2: We will do coding part of the microcontroller which is Arduino, we are using Arduino IDE which is open source software and it makes easy to the code and uploads it to the board. We are also using NetBeans which is a software development platform written in java .The NetBeans platform allows applications to be developed from asset of modular software components called modules .in which we will code for password generation and changing. After the coding part in microcontroller we will go for circuit designing by using efficient components. Here we will also use embedded java programming for interface of the system.

Module 3: Wi-Fi router will be programmed to display the temporary connecting code. After implementing the entire interface we will check the working of the System and make the changes accordingly.

VI. Result

Fig.: Wi-Fi Dustbin System

VII. Application

- Domestic
- Hotels
- Home
- Gardens
- Mall
- Railway Station
- Bus Stop
- Colleges

VIII. Conclusion

Here we studied literature related to domestic waste collection and management. Using the advantages of IoT we proposed system which includes implementation of IR sensor, microcontroller and Wi-Fi module .This system assures that whenever anyone puts the trash in the dustbin, it automatically detects that trash and generates a temporary Wi-Fi code for the user and gives free Wi-Fi to that user as a reward. It ultimately helps to keep cleanliness in the society. It also helps us to reduce pollution.

IX. Future Scope

The main objective is to maintain clean environment in the city from an environment which is better for living.

The system can be used as benchmark by the people who are willing to take step for increasing the clean environment to clean their respected areas. Ultrasonic sensor is being used in this system to check the level of garbage in the dustbins but in future various other types of sensor can be used with the ultrasonic sensor to get more accurate output and to take this system to another level. Now this system can be in certain areas but a soon as it proves its popularity it can be used in all the big areas. As this system also reduces man work certain change can be don in the system to take it to another level and make it more useful for the employees and peoples who are using it. In Future, a team can be made which will be in charge for handling this system and also to care of its maintainance.

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