

## Survey of Wi-Fi Trash Bin

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**Abstract:** This paper uses the concept of Automation used in the domain of Public Cleanliness and Hygiene. Careless trashing of garbage onto the roads is a common scenario to be found in all developing countries. A Wi-Fi Trash Bin is a concept of an attached Wi-Fi router along with a dustbin. Whenever anyone puts the trash in the dustbin, it automatically detects that trash and generates a temporary Wi-Fi code for the user to connect to free Wi-Fi for a limited period of time. Once the time limit is over it automatically disconnects the user. A single user can use the Wi-Fi twice a day. A Wi-Fi Trash Bin uses multiple technologies. The first is Wi-Fi technology which we have to optimize to make sure that all the generated codes work properly. The second technology used for motion sensing and figuring out how the trash comes in and its movement. The third is entire bridge between the motion sensor and the Wi-Fi network to ensure that they connect at the right time. So it is a mix of hardware and software technologies. Wi-Fi dustbin is a new concept where users get awarded (free Wi-Fi connectivity) for keeping their surroundings clean. We got inspired from "Swachh Bharat Abhiyan" which is a national campaign by the Government of India, to clean the streets, roads and infrastructure of the country. Citizens are now becoming active participants in cleanliness activities across the nation; the dream of a Clean India once seen by Mahatma Gandhi has begun to get a shape.

**Keywords:** waste management, public cleanliness, hygiene, careless trashing, assiduous ask, recycling, decomposing, unhygienic conditions, trash-populated areas, trash bin, sensors, Self-Awareness.

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### I. Introduction

Garbage accumulation is so high that it becomes a crisis if left uncollected. If the garbage collector does not turn up, a household would probably direct their maidservant to pick the bags of trash, as it would be too much for the bags to be kept inside the home. The servant would probably dump the trash at the end of the lane. Having seen that, others would follow suit. The place would gradually turn into a garbage dump yard, which would turn into a haven for health diseases. Inefficient waste collection systems lead to environmental pollution, which in turn results in breeding of insects, animal scavengers and rodents, and giving rise to range of diseases. The traditional method includes burning of the waste if not collected in time. Burning of waste causes air pollution to great extent. Uncontrolled release of methane by an aerobic decomposition of waste also adds in social health issues.

Waste is an important issue, which needs to be tackled smartly. Wisely, we segregate the waste at our homes for ease at processing and recycling. We observed trash vans/trucks come irregular to homes creating a havoc of households. Due to this many civilians empty their overloaded dustbins in open spaces. This in turn increases environmental pollution. We got inspired from "Swachh Bharat Abhiyan" which is a national campaign by the Government of India, to clean the streets, roads and infrastructure of the country. The citizens want to have better service, lower cost and having easy accessible reports on what has been done and how much it cost.

Prime Minister Narendra Modi may want a "Swachh Bharat" (clean India) by 2019, but sweeping the streets does not address the enormity of India's real garbage challenge. As prosperity grows, 62 million tonnes of garbage is generated everyday by the 377 million people living in urban India, now the world's third-largest garbage generator. However, it's not the amount of waste generated that's as much of an issue as the fact that more than 45 million tons, or 3 million trucks worth, of garbage is untreated and disposed of by municipal authorities everyday in an unhygienic manner leading to health issues and environmental degradation. These 3 million trucks, if laid end to end, would cover half the distance between the earth and the moon. Or to put it another way, that's the distance you would cover if you made 15 trips between Mumbai and Los Angeles. With rapid urbanization, industrialization and an explosion in population in India, solid waste management will be a key challenge for state governments and local municipal bodies in the 21st century. The "Swachh Bharat Abhiyan" (Clean India Mission) was created to tackle these very issues related to waste management, cleanliness and sanitation on a national level. The campaign was launched on 2nd October 2014, on the occasion of Mahatma Gandhi's birth anniversary and is expected to be completed by 2019, on Gandhiji's 150th birth anniversary.

Without Internet you cannot move ahead in today's world. So people are attracted towards free Wi-Fi connectivity anywhere. When somebody dumps trash into a dustbin the bin flashes a unique code, which can be used to gain access to free Wi-Fi. Mumbai-based Agarwal and his partner Raj Desai, a self-taught programmer, travelled extensively to countries like Denmark, Finland, Singapore etc. and realized that keeping surroundings clean needed apart from a difference in structure, a change in the attitude of people[7]. We see it on the roads where no one is driving in their lane. We see it in the way people disrespect public spaces by throwing garbage anywhere that they want to." So Desai and cofounder Pratik Agarwal had an idea: Reward people for throwing things away[8].

## **II. Literature Survey And Existing System**

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. In paper[1] authors 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.

Authors[2] 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.

Authors in paper[3] 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.

In Paper[4] authors 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.

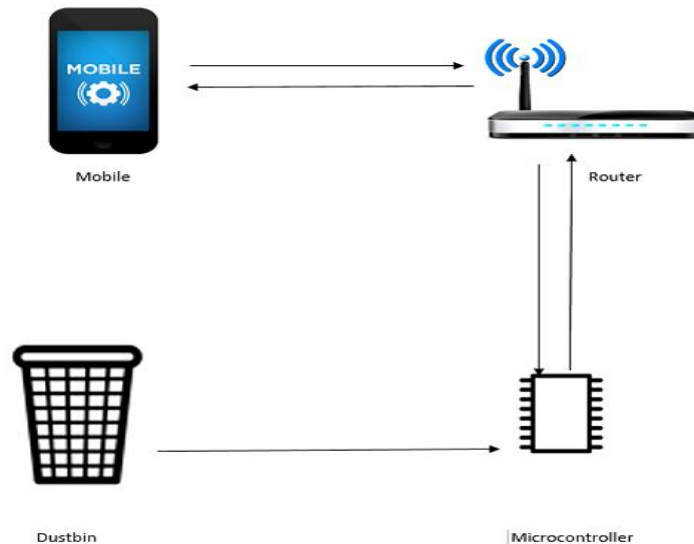
Paper[5] includes implementation of managing the garbage using sensor, LabVIEW and GSM is shown in this paper. Bin management is one of the major applications of IOT. Here sensors are connected to the all the bins at different areas. It senses the level of garbage in bin. When it reaches threshold a message is sent via GSM to the concerned person to clean it as soon as possible. The completed task is done in LabVIEW environment.

In Paper[6] 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. This reduces the total number of trips of garbage collection vehicle and hence reduces the overall expenditure associated with the garbage collection. It ultimately helps to keep cleanliness in the society.

## **III. Proposed System**

The Wi-Fi Dustbin is just a normal dustbin box but it has Wi-Fi Router attached with it. The Dustbin will have an Passive Infrared Sensor. The Wi-Fi router will be programmed to display the temporary connecting code. When the user throws trash in the dustbin, the PIR sensor detects the trash and sends signal to the microcontroller. The microcontroller detects the signals and forwards it to the router device. The router verifies the signals and generates random codes and then forwards it again to the microcontroller. The microcontroller scans the signals and forwards it to the LCD Display. The LCD Display displays it. The user enters the random code generated by the router on the PHP interface which is hosted on the server. The server then responds to the request and displays the Master Wi-Fi password to the user. The user then uses the Master Wi-Fi password to connect to the internet. The user gets the internet access for 10 minutes and automatically gets disconnected

after 10 minutes. Here we are using automatic on-off Technology where router will automatically turn off after fixed period and will turn on when someone will throw trash in dustbin. The figure is a basic layout/Architecture of Wi-Fi Dustbin.



**Fig1.**System Architecture

#### IV. Plan of 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.

#### V. 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.

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