Sensor Based Smart Dustbin for Waste Segregation and Status Alert

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Abstract – **Technology always help mankind in making life easier. Now presenting an innovative way which revolutionizes the trash management system through this we are taking a step towards clean India. Present scenario in the public places where proper disposal is not being done because of which we come across overflow dustbins. Even the private areas which are clean enough failed to utilize the resources efficiently. Using embedded technology to continue monitoring the dustbin in order to check whether dustbin is full or not. The sensors senses the amount of waste in the containers if it reached the maximum container capacity, sends instant messages to the trash management department which deploy them to collect the garbage in no time. The main objective is to separate the waste into different dust bins and send the information to respective office once the dust bin is filled with full of waste materials. By implementing this product at different location, instead of driving blindly in the static routes, we can optimize the collection schedule.**

Keywords- **Smart bin, Trash management, Embedded technology, Sensors, IOT.**

I. INTRODUCTION

In the recent decades, Urbanization has increased tremendously. At the same phase there is an increase in waste production. A harmonious and balanced relationship between human and nature on the earth is vital for the survival of life and sustainable growth. With advent of time, human directly or indirectly interfered with the natural environment for its comfort. One of the causes for pollution of air, water and soil is the way municipal solid waste is being managed. This solid waste problem cross is global and is a serious issue in developing countries such as India. The waste generation rates are increasing and the characteristics are changing with increase in population explosion, Industrial development, and living standards, particularly in growing cities. Due to financial constraints a proper municipal solid waste collection and disposal mechanism is not in place. For long, municipal solid waste management has not been recognized as a major attribute for the pollution of air, water and soil pollution. It is now abundantly clear that improper disposal of solid waste can affect all the spheres of the nature and can affect every form of life. For evolution of proper management of solid waste it is necessary to review the status of the current scenario of its collection and disposal methods.

Waste management has been a crucial issue to be considered. This project is a way to achieve this good cause. Though the world is in a stage of up gradation, there is yet another problem that has to be dealt with. Garbage! Pictures of garbage bins being overfull and the garbage being spilled out from the bins can be seen all around. This leads to various diseases as large number of insects and mosquitoes breed on it. The situation calls for an efficient system that can sort waste at the primary stage thus making waste management more efficacious and fruitful. We have thus come up with an Automatic waste segregator that categorizes the waste as wet, dry and metal.

II. EXISTING SYSTEM

In existing waste management, local governments manage food waste by deploying waste bins and employing multiple pickup businesses for waste collection. However, the existing waste management method is based on a flat rate, that is, a price structure that charges a single fixed fee, which causes environmental problems and increases waste discharge because there are no restrictions on heavy producers of waste and no incentives for lighter producers.
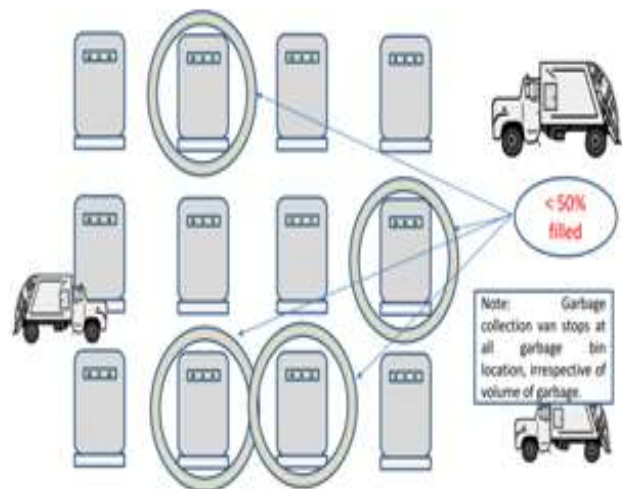

Fig.1 Conventional Method

III. PROPOSED SYSTEM

The proposed system, "Automatic Waste Segregator" sorts wastes into three different categories, namely metal, dry and the wet waste. Waste segregation means division of waste into dry waste and wet waste. Dry waste includes paper, cardboard, glass tin cans etc. Wet waste on the other hand, refers to organic waste such as vegetable peels, left-over food etc. Separating waste is essential as the amount of waste being generated today causes immense problem. Here, we have tested the household wastes which are generated in every home today and we have come up with the following result. Our project has been experimented with distinct categories of waste namely metal, dry and wet section. Each diverse category has been pigeonholed with the acceptance and the rejection rate with our system.

The waste segregator as the name suggests, segregates the waste into three major classes: dry, wet, metallic. The permanent magnets placed within the metallic bin further sorts ferrous and non ferrous metals.

Waste is pushed through a flap into the proposed system. The inlet section is provided with open and close mechanism to regulate the flow of waste on to the conveyor. Metal detecting sensor is used to detect the metallic waste. The signal from the sensor initiates the push mechanism to discard the metallic waste.
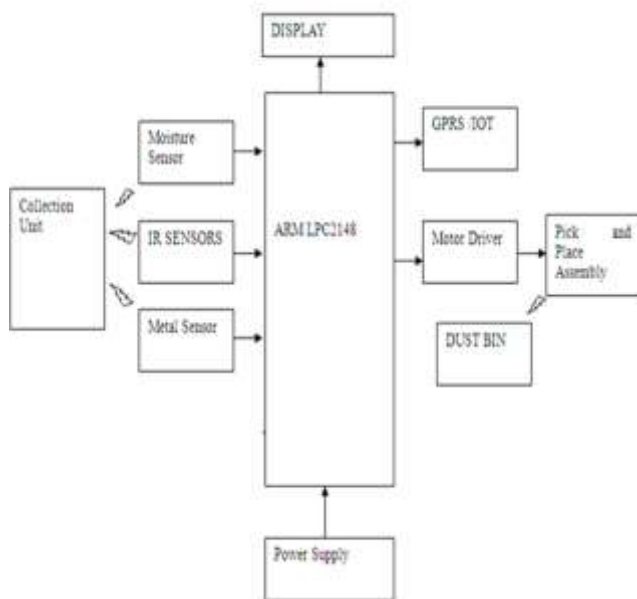

Fig.2 Block Diagram

Moisture and IR sensors distinguish between dry and wet waste. A blower mechanism is used to segregate dry and wet waste. Unnecessary operation of any particular section is thus avoided. IOT based intimation when garbage tank gets completely full. This will not only help in dealing with the

situation in a clever manner but will also improve the economy of our country.

Fig.3 Smart Reporting

3.1 Hardware Requirements

- ➢ ARM LPC2148
- ➢ LCD 16*2
- ➢ Moisture Sensor
- ➢ Metal detecting Sensor
- ➢ IR Sensors
- ➢ DC Motors
- ➢ Motor Drivers
- ➢ GSM Module

3.2 Software Requirements

- ➢ Embedded C
- ➢ Kiel M vision

IV. ADVANTAGES

1. Easy Collection of Waste and Automatic segregation of Waste as metal, dry and wet.
2. Minimal time
3. Optimizes Resources
4. Clean Environs

V. APPLICATIONS

This new technology for trash management is not only used for trash managing but also for management of the Waste oils, Textile products and Other recyclable materials. This product can also used in the places where human involvement in checking the levels of the fill up of containers is not possible E.g. Dams, Waste filled of tanks like UGD.

VI. CONCLUSIONS

The Trash management system is a step forward to make the manual collection and detection of wastes automated in

nature. It would pioneer work for solid waste collection, monitoring and management processes. This project for the management of wastes is efficient , automatic segregation and time saving process than the currently employing method in which concerned municipal employee has to look for the filled waste bins manually across different spots in an area/street for checking regularly whether the waste bin is filled or not.

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