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# Smart Bin

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**Abstract:** “Smart bin” is an IOT based Garbage monitoring and segregating system. This project “Smart bin” is a very innovative system which will help to keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. “Smart bin” is basically a metal box in which the garbage bins will be placed. One bin for one type of waste, “Smart bin” will comprise of following sensors. These “Smart bins” will contain a container at the top in which we need to put the waste. The sensors will sense the type of waste in the container and accordingly the container will be moved to the appropriate bin all empty the waste.

**Keywords:** Smart Bin, Sensors, Waste, Segregation, IOT (Internet of Things).

## I. INTRODUCTION

Due to rapid population growth, disorganization of city governments, a lack of public awareness and limited funding for programs, garbage management is becoming a global problem.

Now-a-days, we can also see garbage spilled out of the garbage bins in the locality and also it becomes extremely difficult for the local garbage authority to locate the garbage bins that are overflowing. Also there is a major concern regarding the segregation of different waste.

As we know there are different types of waste like dry waste, wet waste, non-biodegradable, etc and the process of segregating these waste into different dustbins is a tedious work.

Our project focuses on segregating different waste as well as monitoring of the dustbins. The hardware part of the project will comprise of separating different types of waste that are put into the Smart bin in different bins.

The software part of the project is based on IOT (Internet Of Things) where we will be monitoring the garbage based on the data we receive from the hardware part. Here in monitoring we will be continuously checking the level of garbage in the bins, getting the location of the garbage bin situated in the locality and also sending a text message to the local garbage stating the overflowing of the garbage bin along with its location.

## II. LITERATURE SURVEY

The garbage management in cities has to be effectively and efficiently implemented. The various proposals were put forward and some of them already implemented. But it cannot be considered as an effective one. So a survey was done among different proposals and this survey paper includes survey among different methods for smart garbage management in cities using IOT. The paper Smart Garbage Management in Smart Cities using IOT proposed a method as follows. The level of garbage in the dustbins is detected with the help of ultrasonic sensors system, and communicated to the authorized control room through GSM system. Raspberry PI microcontroller is used to interface the sensor system with GSM system. A GUI is also developed to monitor the desired information related to the garbage for different selected locations. This will help to manage the garbage collection efficiently. Level detector consists of IR sensors which is used to detect the level of the garbage in the dustbin. The output of level detector is given to microcontroller. Four IR sensors are used to indicate the different levels of the amount of the garbage collected in the dustbin which is placed in public area. When the dustbin is filled up to the highest level, the output of fourth IR receiver becomes active low. This output is given to microcontroller to send the message to the Control room via GSM module. At receiver, control room is present where all the activities are managing. At receiver, control room is present where all the activities are managing. 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 reduce the total number of trips of garbage collection vehicle and hence reduce the overall expenditure associated with the garbage collection. It ultimate helps to keep cleanness in the society. Therefore, the smart garbage management system makes the garbage collection more efficient.

Another method for garbage management is introduced as follows. A dustbin is interfaced with microcontroller based system having IR wireless systems along with central system showing current status of garbage, on mobile web browser with html page by Wi-Fi. Hence the status will be updated on to the html page. There by to reduce human resources and efforts along with the enhancement of a smart city vision. Considering the need of modern technology, the smart garbage bin can expensive but considering the amount of dustbin needed in India, there for they used based sensors to reduce its cost and also make it efficient in applications. And at the sender side they used only a Wi-Fi module to send and receive data. But because of the use of weight sensor for detection of amount of garbage in dustbin. It will only detect the weight of waste; not how much level it is of. The message can be sent directly to the cleaning vehicle instead of the contractor’s office. Thus garbage bins are managed.

### III. PROPOSED SYSTEM

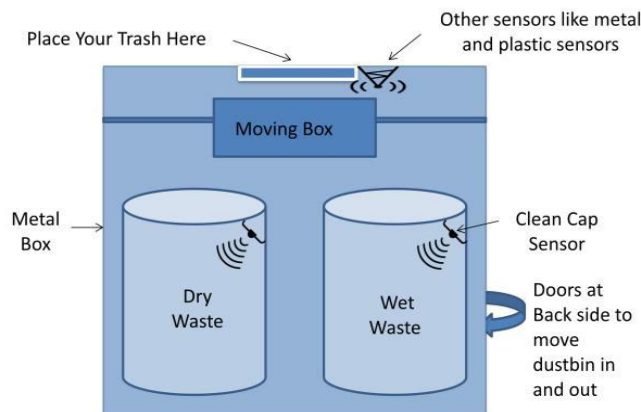
In our system we will be separating wet and dry waste. If the initial objectives are achieved we will try to separate metal and plastic. IOT gave us flexibility to monitor the garbage and the local areas using maps and notify the concerned authority about the status of the garbage bin and its location. People will not have to manually separate the waste as our system will be doing it by detecting the type of waste and putting it in concerned bins.

### IV. WORKPLAN

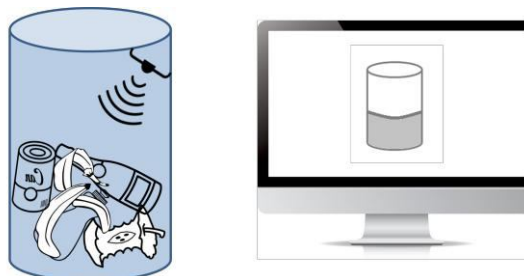
Using Raspberry Pi, the hardware part will be implemented. Using different sensors the types of waste will be detected and then segregated in to the garbage bins.

Besides this we will also monitoring the garbage bins to check whether they are overflowing. This IOT based application will also provide the location of the bin situated in the locality and will provide message to the local garbage authority.

### V. ARCHITECTURE



The trash will be place on the top of the Smart Bin which contains at the an opening on the top. Once the trash is placed the sensors will detect the type of waste and drop that waste into the moving box. The moving box is driven using stepper motors. The function of the moving box is to take command from the microcontroller and accordingly move to the intended bin and empty the trash.



The application used for monitoring the garbage bin is IOT based which will continuously notify the local garbage authority regarding the status of the garbage bin.



This application will also provide the location information of the garbage bin in the locality as it is about to overflow.

## VI. SOFTWARE REQUIREMENTS

- A. ZBLUE j for raspberry pi
- B. Android studio
- C. Visual studio

## VII. HARDWARE REQUIRMENTS

- A. Sensors
- B. Raspberry pi b model 3
- C. Stepper motors
- D. Two direction motors
- E. Gsm module

## VIII. CONCLUSION

Taking into account the waste management in this country there is a need for managing the waste properly as well as using the latest technology and reducing manpower. Smart bin can be a major revolutionary change in the study of waste management.

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