



# Solar Powered Smart Garbage Can for Waste Segregation

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## Abstract:

In the present scenario the waste management is the main problem which is seemed in the urban and rural areas. The overflow of the dustbin will leads to the pollution and diseases in the society. The overflow of the dustbin will become dirtier to the environment. So the people have negative impression created on the environment. Shortage of manpower and equipment has resulted in the municipal corporation not being able to collect or transport waste generated by the city. So we are implementing a new system which having a high role in the environment cleaning. It is a time consuming process, so every person can be operate it easily. This process will take a vital role in all region and it is hygienic for the people who are applying this method. This system consists of two parts, automatic segregation of the waste and alerting the waste monitoring operator using GSM Module. The IR sensor for detecting the waste, ultrasonic sensor for how much of waste is filled in the dustbin, blowers for removal of plastic wastes, permanent magnet for segregating metals, siever and DC motor for running the conveyor. The entire system is controlled by the PIC Microcontroller. The main objective of this project is monitoring the waste management, providing a smart technology for waste system, avoiding human intervention, reducing human time and resulting in healthy and waste ridden environment.

**Index Terms:** DC-Direct Current, IR-Infrared sensor PIC – Programmable Interrupt Controller, LCD-Liquid Crystal Display, AC-Alternating Current.

## I. INTRODUCTION

The waste collection process is a critical aspect for the service providers. The traditional way of manually monitoring the wastes in waste bins is a complex, cumbersome process and utilizes more human effort, time and cost which is not compatible with the present technologies. Irregular management of waste typically domestic waste, industrial waste and environmental waste is a root cause for many of the human problems such as pollution, diseases and has adverse effects on the hygiene of living beings. The key issue of an inadequate waste management is that the garbage bin at public places gets overflowed well in advance before the commencement of the next cleaning process. Hence, we need such a system that can deracinate or at least minimize this problem to some extent. In order to overcome all these problems, we are proposing the idea of Solar Powered Garbage Can for Waste Segregation for the Waste Management System which helps in Auto-management of waste without human interaction in order to maintain a clean environment. This system is useful for monitoring and controlling the waste management and reducing the human intervention and it is a automatically operated without manual power and it is applicable for all rural and urban areas. By using this system the segregation process is easier. After the waste bin is filled, then it sends alert signal to the waste monitoring operator. The entire process works automatically as it is powered by solar energy.

## II. LITERATURE SURVEY

1) Solar power smart waste bin identifies the presence of human and it is automatically open the lid. The entire system is automatically powered by renewable energy.

2)The solar-powered compaction garbage bins are designed to reduce the need to empty waste receptacles in public areas.

3) Comparison of different collection systems for sorted household waste is separating the bio-degradable waste and non bio-degradable waste it needs an external supply for the segregation process.

## III. HARDWARE DESCRIPTION

**PIC MICROCONTROLLER** - In this PIC is used to control the entire process and it is programmed. The program starts when the object fall on the collector.

**MOTOR** - DC Motor is used to move the conveyor belt and to run the siever which is driven by the relay.

**Conveyor** - Conveyor is used to move the object from one one place to the another place. Here the DC Motor acts as a pulley to move the belt.

**PERMANENT MAGNET** - Here the permanent magnet collects the iron and magnetic material and it is isolated from the other material.

**SIEVER and BLOWER** – Siever is used to separate the organic waste and inorganic waste and blower is used to separate the plastic and recycling waste materials.

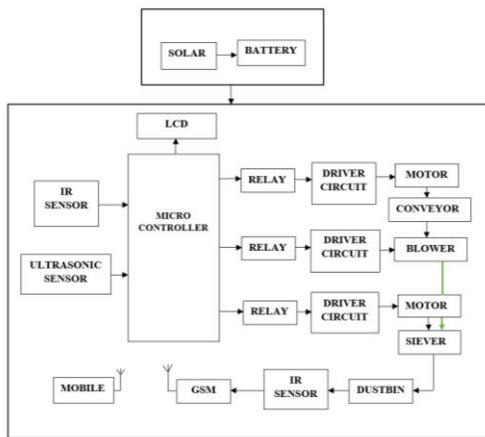
**ULTRASONIC SENSOR AND INFRARED SENSOR** –

Ultrasonic sensor detects the metal waste and presence of human and object nearer to that and the infrared sensor sense the object fall on the garbage can and it measures the amount of waste filled in the bin.

**RELAY and VOLTAGE REGULATOR** – relay is used for switching purpose and the voltage regulator is for regulating the voltage, when the voltage is higher than the predetermined value.

**GSM Module** – It send an alert to waste monitoring operator when the waste is filled in the dustbin and it is programmed by using the PIC Microcontroller.

## IV. BLOCK DIAGRAM



## V. METHODOLOGY

When the waste fall on the collector first detects the metal waste and the other materials detected in the infrared sensor. The microcontroller voltage is less so we are introduce the relay for obtaining the high voltage and it is regulated in the voltage regulator which is controlled by the microcontroller. Relay get the signal and drive the motor and it runs the conveyor belt. The motor starts rotating with the help of the microcontroller and the conveyor moves the object. Then it undergoes the segregation process first isolate the light weight materials through blower, iron materials are attracted by the permanent magnet and the siever is used to separate the organic waste. The entire process is powered by the renewable solar energy. The solar power is stored in the two 6v battery which is connected in series.

## VI. CONCLUSION

In this proposed system the segregation of waste is automatically controlled by PIC Microcontroller. This reduces the manual power and easily operated. This innovation has more desirable and economical. Automated Waste Segregator has been successfully implemented for the segregation of waste into metallic, dry and wet waste at a domestic level. **Automatic waste segregation machine** makes use of a variety of sorting means to separate organic matter, plastics, metal, bricks, stones and other substances out from garbage to the maximum, to improve the reusing and recycling of waste. At the same time, the separated waste materials can be further re-processed into useful resources. So, the main purpose of the automatic waste sorter is for reduce processing and turning waste into treasure. The system can segregate the waste at a time with an assigned priority for metal, plastic, wet and dry waste. Thus, improvements can be made to segregate mixed type of waste by the use of buffer spaces. This project **“SOLAR POWERED SMART GARBAGE CAN FOR WASTE SEGREGATION”** is designed with the hope that it is very much economical and help full to operate for cleaning the environment.

## VII. REFERENCES

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