**Dynamic Solid Waste Collection and Management**

**Abstract**

Waste Management is the pervasive problem. Nowadays and rising continuously with rise in urbanization. Waste is always the mixture of different types of material. The main goal of this project is to design and develop a sorting system that is portable and also sorts the waste automatically. It’s an eco-friendly automatic system. With the Proliferation of Internet of Things (IOT) Devices as Such as Smart phones and Sensors, this Project describes the effective management of solid waste using embedded system. The solar panel and H-bridge are used by the motor to make the system portable. The moving system stops when a non-living obstacle arrives and takes a turn. Otherwise gets the inputs from the waste dumped by the person which is detected by the sensor. The sensor sends a signal to microcontroller where it decides the type of waste (degradable and non- degradable) and separates it automatically and moves forward. Here the IOT module is used to control and monitor the waste. The system consist of mobile app which receives a message when the dustbin is full (3kg) makes the system to alert and the information is sent to the authority who own this app(“Mr.Bin”). It even includes database of wastage collection on the particular day.

**Objectives**

The main aim includes efforts to maintain a clean and garbage free environment at historical monuments and pilgrimages across the country. The android application includes database of wastage collection and helps the government to take some measures for reducing the usage of non-biodegradable waste which supports the “Swatch Bharath Abhiyaan” initiated by Government of India.

**Technology:**

***Part of IOT in the project:***

The information or the database of the dustbin on a particular day is made enabled to people to look in into the android application called “Mr.Bin” and it also can be viewed by the Waste management organization. The IOT is also applicable to send signals(messages) through web-base software application when the dustbin is full.

***Innovation*** ***part of the project:***

Our project can be implemented for historical monuments and pilgrimages that may also includes tourist places such as parks ,gardens ,beaches etc .But specifically lets go with the monument places and pilgrimages .So ,the installation of process includes a tech bin , sensor(IR sensor, metal detector sensor, weight sensor, obstacle sensor), IOT module to instruct bin facility, a lid for management of waste segregation ,a motor and solar panel for the portability of the tech bin , GPS to keep the track of the bin. System is provided with the solar panels and H-Bridge which makes the system to be in motion, an IR sensor is interfaced in front of a bin which detects the obstacle arrived and this alerts the system to stop. The sorting part of the system starts if the waste material is placed on the lid, then the sensor transmits the signal and that signal is received by the microcontroller, depending on the signal received the lid of the system works. If the signal is transmitted by the metal detector then the lid tilts towards the bin that collect the non-biodegradable waste. If the signal is transmitted by the IR sensor then the lid tilt towards the biodegradable bin. In case no signal is transmitted by the either sensor the waste may be plastic bottle, glass bottle or polythene bag, then the lid tilt towards the bin which collects the non-biodegradable waste. Another IR sensor is interfaced in front the bin which detects the obstacle if it is a person who is arrived to throw the waste it takes input and moves forward in chance that the obstacle may be a non-living thing, in that case the system will automatically take a turn.

once the dustbin is filled 90% it sends the information (message) to a App called “Mr. Bin” and the person who owns this App can track the bin and make it empty and make it as reusable .The information or database of the dustbin on a particular day is also stored in android application and this monitored information can be also sent to a web-based software app which can also be viewed by municipal wastage community.

**Dustbin unit:**

Microcontroller

PIR sensor

GSM/GPRS

moisturesensor

GPS

Dc motor

IR sensors

Driver circuit

Dc motor

**Monitoring (PC) unit:**

GPRS

 PC

**COMPONENTS USED:**

**Hardware requirements:**

* Microcontroller
* PIR sensor
* Moisture sensor
* IR sensor
* GPS
* GSM modem
* Driver circuit
* DC motor
* PC

**Software requirements:**

* Embedded C
* Keil uVision 4
* Dotnet