

Waste Management System for Smart City

Sumit Anna Harne¹ Paresh Ravindra Patil² Piyush Hemant Patil³ Sagar Jaykisan Kumavat⁴
 Ms. Akshata Kirtiwar⁵

^{1,2,3,4}BE Student ⁵Assistant Professor

^{1,2,3,4,5}Department of Electrical Engineering

^{1,2,3,4,5}G.H.R.I.E.M., Jalgaon, M.S. India

Abstract— As there is rapid increase in the population there, is rapid increase in the waste also. Due to that dust bins which are placed near to the public places in cities/villages are get filled in quick manner, so due to this garbage management is becoming a global problem. Due to the lack of care & the attention by the authorities the dust bins are mostly seem to be overflowing. It has to be taken to overcome this. This huge unmanaged accumulation of garbage is polluting the environment, spoiling the beauty of the area & also leading the health hazards. To overcome this situation we have developed “SMART DUSTBIN”. The aim is to accumulate more & get the dustbins cleaned timely using alert services. Due to development of this smart dustbin the land pollution, Spread of diseases & unhygienic conditions can be avoided & also it ensures the clean & healthy atmosphere around. This is the kind of survey paper which involves the various ideas to solve these problems which involves the use of “Smart Dustbin”.

Keywords: IoT Module, Microcontroller (ARDUINO Based), Multiple Sensors, Servomotor

I. INTRODUCTION

Now-a-days sensible cities represents hot topic in terms of up living conditions. Jointly of the applying of sensible town. Sensible trash bin is associate system which may solve all issues associated with waste. Betting on the physical state of the waste they're categorized as solid & wet waste, our work focuses on the municipal waste assortment procedure & this paper deals therewith [1].

Because of less time and inefficient efforts we are able to clearly see misdirection within the kitchen appliance system. The dustbins are noticed to be overflowing at several places. This overflow can about to cause a unclean setting, to avoid this we tend towards developing a wise trash bin that is intended & factory-made & programmed such once the waste/garbage within the trash bin reaches concerning eightieth to ninetieth of full level of trash bin then through GSM the message are going to be send to the govt. or municipal corporation/respective authority, to gather the waste for the waste for the disposal from trash bin instantly. The targeted waste assortment saves time, cash & fuel & additionally reduces the exhaust gas emissions from waste. The classification of Solid waste is done into 3 main varieties by creating relevance the sources of waste. These 3 varieties of solid waste are municipal solid waste, overall construction waste and special waste. The careful description of some ordinarily used terms is represented below. Municipal solid waste includes domestic waste, business waste and industrial waste.

During this project, a model has been projected during which the gathering of garbage is formed real time. A network is established victimization wireless sensing element nodes with every trash bin hooked up to a sensing element

electronic equipment, sensing element incorporates unbearable sensing element are going to be placed on the rubbish bin or trash bin. Once the burden reaches to the brink worth i.e. up to unbearable vary, a sms are going to be sent to the individual Municipal / Government authority person. Then that person will send the gathering vehicle to gather the complete garbage bins or dustbins. If garbage doesn't collect among the 2 hours nevertheless message to be send to the municipal/government authority. Gas sensing element is additionally accustomed sense the gas and once more send sms to the municipal authority. E.g. suppose folks through lead acid battery within the trash bin and if battery can destroy then some gas are going to be leak. Therefore gas sensing element can sense these gases and send sms to the municipal authority. Hearth sensing element also will use during this system. If hearth within the garbage, then hearth can sense by the hearth sensing element, and once more message can send to municipal.

II. LITERATURE SURVEY

R. Narayanmoorthi, Shubham Thakkar: System that offers previous info of the filling of the bin that alerts the municipality & propose a “SMART GARBAGE BIN”, which is able to alarm & inform the licensed person once the rubbish bin is near to fill [1].

Insung Hong: Has recommended that exchange the SGS (Smart Garbage Sector) rather than Reid garbage assembling system helps to enhance their energy potency up to Sixteen Personality Factor Questionnaire & will reduced the garbage reduction [2].

Rachae E. Marshal: Declared that the sensible Waste Management system within the salaried countries & developing countries [3].

III. BLOCK DIAGRAM DESCRIPTION

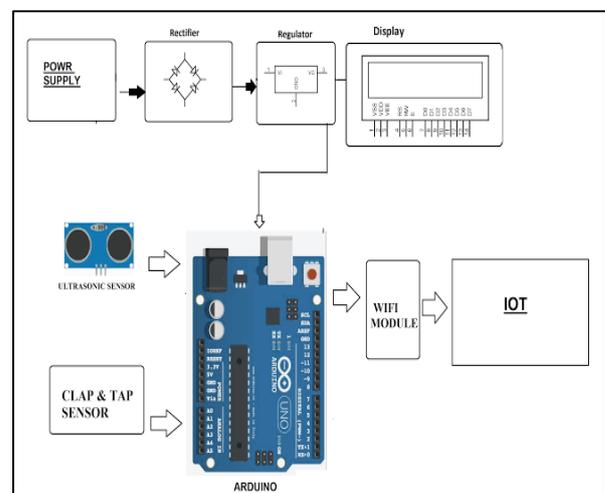


Fig. 1: Block diagram of smart dustbin

In this proposed system the power supply is developed for microcontroller is of +5V DC. The 230V supply AC is given to step down transformer the output of transformer is rectified by Bridge Rectifier.

The rectifier output is given to voltage regulator (7805). The output from regulator gives +5V supply to whole electronic component of system. Atmega 328/89S51 microcontroller is used.

The ultrasonic sensor is fixed in the garbage bin is also connected to microcontroller. This ultrasonic sensor is used for the sensing of level of dustbin whether full or empty. SIM 900 GSM module is used for module for mobile communication.

The various sensors are also connected to the controller like gas sensor this is used sense the gas in the system. Mostly (Carbon Monoxide) Gas is sensed by this sensor.

The fire sensor is used to detect whether there is fired in the dustbin or not. Sometimes the municipal people just fired the waste in the dustbins to save their money & time due to the use of this sensor this conditions can be avoided.

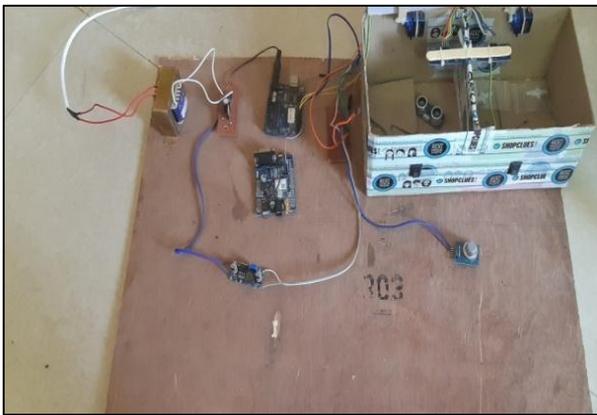


Fig. 2: Schematic view of project

IV. MAIN COMPONENTS DESCRIPTION

A. ATMEGA 328P Microcontroller

The ATMEGA328P is one of the most advanced microcontrollers from micro-chip. It is widely for experimental & modern applications due to low price, high quality.

B. IOT Module

The (IOT) Internet of Things is a system for the interrelated computing devices, communicated & digital machines that are provided with unique identifiers. Here we have a new idea of implementation which makes a normal dustbin smart using IOT module. The supply voltage is 3.4 to 5 V.

C. LCD Module

A 16x2 liquid crystal display which shows various characters. It is compact & light. It has low power consumption.

D. Different Sensors

The different sensors like gas sensor, Ultrasonic sensor, Fire sensors are been used. Fire sensors senses fire, Ultrasonic sensor senses the level of garbage in the bin & gas sensor is used to sense the carbon monoxide & other gases from bin.

V. RESULT

The garbage assortment is generally ready within the urban a part of Asian country. Quite sixty fifth waste is collected from urban cities. Again and again we have a tendency to see the rubbish bins are overflows, thanks to this insanitary condition are happens & causes deadly diseases. To avoid this we've enforced sensible garbage can exploitation GSM. The aim system exploitation automation technique reduces human efforts. It reduces transportation price & less time overwhelming system.

VI. CONCLUSION

This paper shows the innovative idea of Smart Dustbin using ultrasonic sensors, Microcontroller & GSM module. This system assure the cleaning of dustbins soon when garbage level reaches its maximum. If the dustbins is not cleaned in specific time, then the record is sent to the higher authority further they can take necessary action.

By using this method the collection of waste in city becomes easier. It helps in reducing Air pollution, Traffic flow, Manpower, Time & money with the help of proper technology (GPS Software Applications). We can guide the trucks in selecting the shortest path for garbage collection. This project can add an edge to the cities aiming to get smart & people friendly.

ACKNOWLEDGMENT

As our country has started a new project of smart city. We have taken the initiative to add some features and innovation into that up too knowledge and abilities. It provides digital, smart & smart way to reduce and control the waste & provide our contribution in smart cities development project.

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