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Smart Dustbin

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Abstract: Solid waste generation has been increased in recent times. The concept of sustainable development is really important for co-existence of biosphere and human civilization. Solid waste management is a major issue toward global sustainability crises. An effective mechanism is needed to tackle this problem and to bring a change to the society. Way to sustainability is an efficient use of technology to bring a change to global environmental issues.
Keywords: Automatic segregation, Solid waste management, Dry & Wet waste segregation.

I. INTRODUCTION

The simple and basic concept of smart dustbin is to bring a change in society by keeping our surrounding neat and tidy. Hygiene is a very major problem now-a-days. When garbage starts to overflow from a dustbin various insects and mosquitoes starts to roam over there. This may cause serious health related problems. Smart dustbin is an efficient and effective tool to overcome this problem. To evade an unhygienic situation caused because of inferior garbage collection methods we propose to develop a proper mechanism for waste management. In this proposed system as soon as the level of garbage reaches to a threshold a message gets sent to the mobile phone of person responsible for the disposal of the waste via GSM. At the same time segregation is also a critical issue people finds it quite hectic to firstly identify the type of waste they have and then dispose it into the suitable bin i.e. either into dry waste collector or into wet waste collector. To overcome this challenge we are using moisture sensor in the dustbin. To detect the presence of any kind of substance which is burning over there on the dry side of bin a smoke detector is attached. This smoke detector will get triggered as soon as the smoke gets detected Also magnets are getting used to keep stray animals safe from kind of metallic object which might get stuck into their throat.

II. LITERATURE REVIEW

In this, we discussed about the various publications that we draw inspiration from. Tremendous research has been done on waste management throughout the world. Initially a dustbin got developed which opens the lid of the bin as soon as the presence of anyone approaching towards the dustbin gets detected and it also checks for the depth of the garbage in the bin [1].
Moving further a dustbin got developed which has the same function but in this as soon as the level of garbage reaches a threshold a text message gets sent to the user via WiFi who is responsible for the disposal of garbage [2].This is quite helpful as the time to time disposal of waste gets done which can ultimately prevents one from various diseases.
Segregation is a really major issue of the society. So to segregate the dry waste from the wet waste a conveyor belt got used [3]. This conveyor belt helps in segregating various kind of solid waste from wet waste. But using a conveyor belt in all the dustbin is not quite possible to attain. So the concept of automatic segregation comes into play.
Automatic segregation provides an alternate solution to the massive problem of segregation. For automatic segregation a moisture sensor gets used [4]. This moisture sensor will detect the type of waste which is getting disposed into the bin. If the moisture level of the object will be high then it will dispose the waste to the wet side collector and if the level of moisture is low then it will dispose the waste to the dry side of the dustbin.
This automatic segregation is quite effective and efficient and it can even get installed into all kind of bins and that too at a low cost and hence solid waste management becomes quite simple.
This system will eliminate the need to use two separate bins for the type of waste. Automatic segregation will also simplify process for pedestrians to identify the type of bins they need to throw garbage in.

A. Proposed Technique

In this proposed technique we are opting a technique which is different from traditional method of segregation. The smart bin will sense data through sensors and if the level of moisture in waste is high then it will get disposed to the wet side of the collector and if the level of moisture is low then it will get disposed to dry side of the collector.

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III. OBJECTIVE

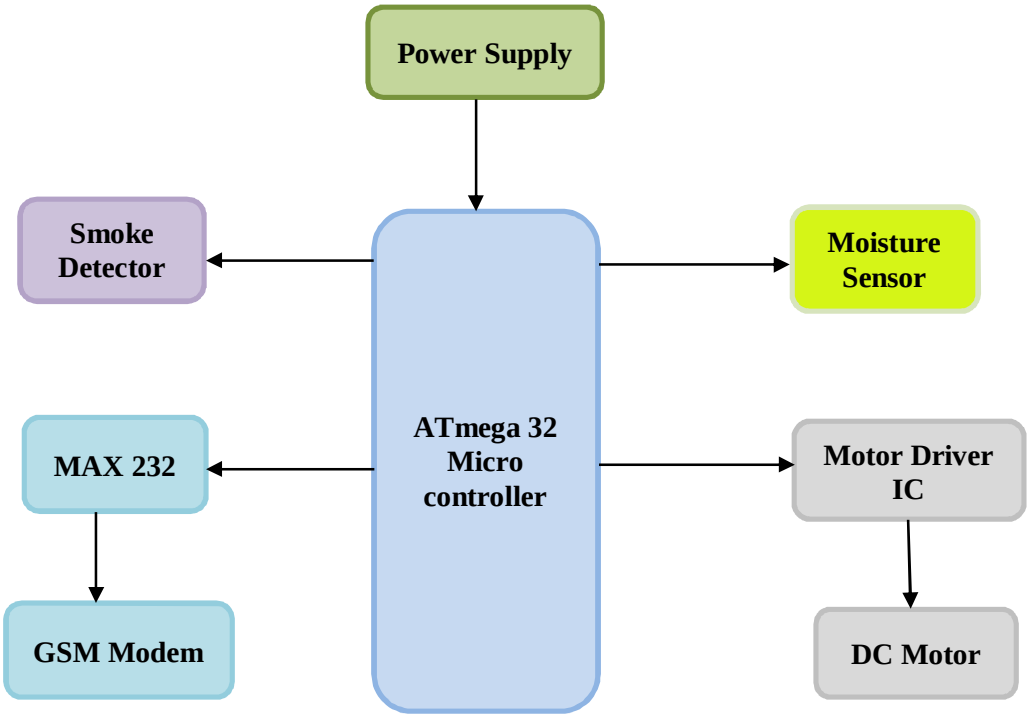
The given module main aspect is to develop a smart bin which can be really useful towards keeping our surrounding neat and tidy. The use of two different kind of bins for disposal of dry and wet waste is getting eliminated as the moisture sensor can segregate them by detecting the amount of moisture present into it.

IV. METHODOLOGY

We have developed a Waste Management system for smart cities in which garbage bin will have an ultrasonic sensor to sense the level of garbage in the bin. A moisture sensor is also used which will detect the amount of moisture present into the waste which is getting disposed. If the moisture level of the waste is high then the circuit of copper plate will get completed and the waste will get disposed to the wet side of the collector and if the moisture level of the waste is low then it will get disposed to the dry side of the bin. As soon as the level of trash into the bin reaches to a threshold a text message will get sent to the user via GSM so that garbage can get disposed when needed. A LCD screen is also installed at top which will regularly display the depth of waste into the bin. A smoke detector is installed on dry side of the collector so that if there is any waste which is burning into the bin can get detected and the smoke alarm will get triggered.

V. BLOCK DIAGRAM

In this ,we provide a power supply of 5V - 7V . AVR AT mega 32 MICRO CONTROLLER is used because of its high performance and low power. It operates on voltage ranging between 4.5V – 5.5V. A GSM Modem is used for sending text alert to the user. A DC motor of 4-12V supply is used. The motor has 30 RPM at 12V. A moisture sensor is used which will help in automatic segregation of the waste. As soon as the moisture level of the waste will get detected the waste will get disposed into the respective side of the collector.



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VI. WORKING

Firstly a power supply of 5V – 7V is required. As soon as the power supply gets provided the smart bin will begin its functioning. Whenever a waste comes for disposal the moisture sensor will detect the amount of moisture present into it. If the moisture level of the waste is high then the circuit of copper plate will get completed and the waste will get disposed to the wet side of the collector and if the moisture content of the waste is low then the circuit of copper plate will remain incomplete and it will get disposed to the dry side of the collector. An ultrasonic sensor is installed into the bin which will continuously check the depth of waste in the bin. An LCD is used at the top of the bin which will display the depth of waste in the bin. As soon as the level of waste reaches to a peak a text alert will get sent to the user for disposal of waste. This happens by the use of GSM Module. A smoke detector is used on dry side of the bin so that it can detect for any kind of waste which is burning over there in the bin and alarm will get triggered.

VII. RESULTS AND DISCUSSIONS

Solid waste generation in recent times has reached to a peak. So here we are proposing a more efficient measure for solid waste management. The segregation of dry and wet waste has been a major challenge. Traditional method used conveyor belt for this purpose. The use of conveyor belt was quite typical and complicated for the use in localities. So keeping this in mind we have used a moisture sensor for automatic segregation. The disposal of waste on proper time interval is also a challenge. So the use of GSM Module can send a text alert to the user so that proper disposal of waste can happen on time.

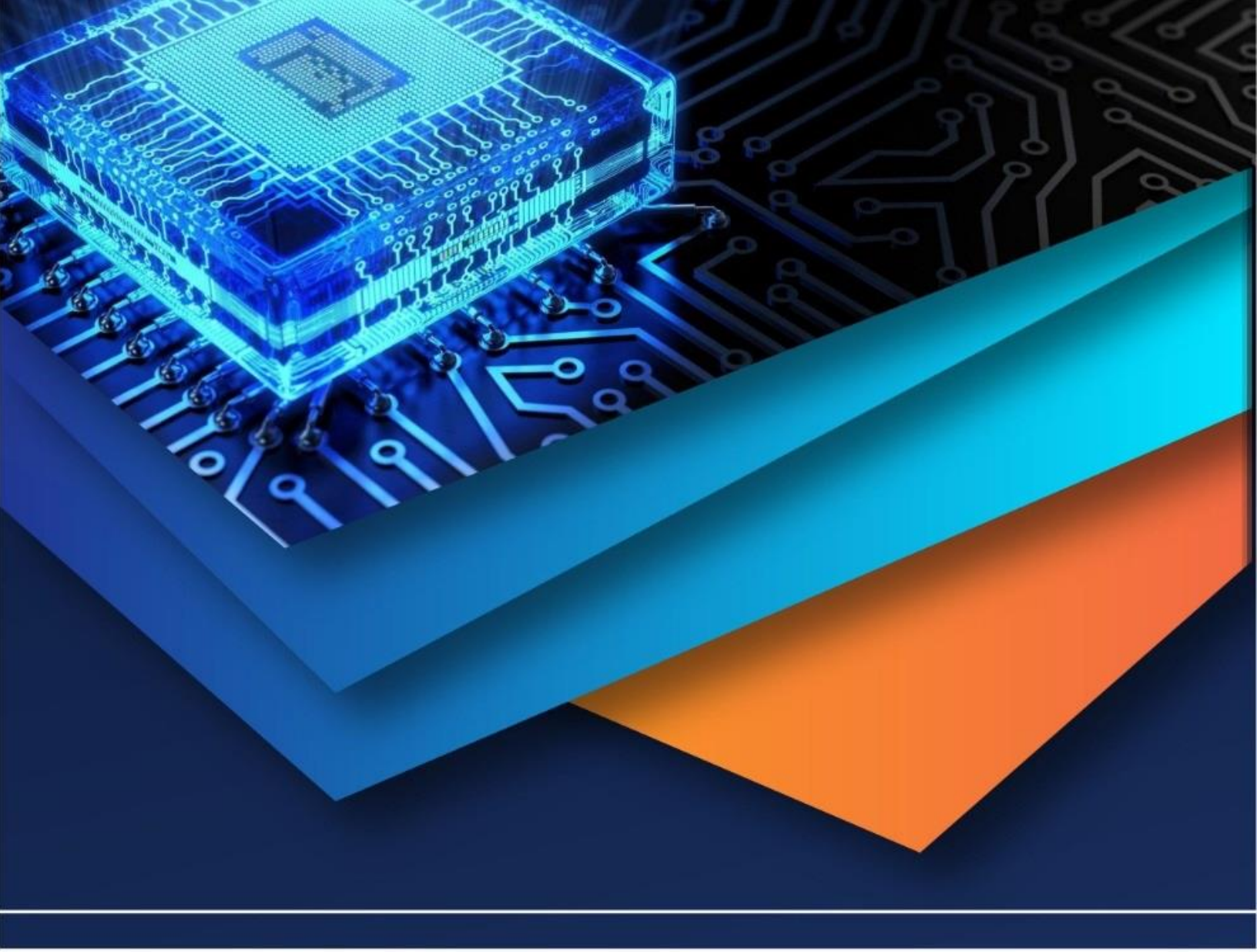
VIII. CONCLUSION

The automatic segregation of wet and dry waste proves useful to identify economic value of waste and also manage the waste effectively. Further the system can be made greener and cleaner by utilizing clean and renewable source of energy. Much more advancement can be done like detecting metallic waste and segregating it from dry and wet waste. Managing the waste effectively and efficiently will be a huge move toward greener and cleaner environment.

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