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SMART BIN MONITORING SYSTEM USING ZIGBEE TECHNOLOY

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Abstract: The heart of a city depends on its purification of air, cleanliness of the road and highways an overall it's surrounding environment. In our daily life, we see the pictures of garbage bins being overfull and all the garbage spills out resulting in pollution. Now a days there are a number of techniques build up for well management of garbage. HC-12(zigbee) module is the latest trends. Hence we use HC-12(zigbee) module. To give a brief description of the project, the ultrasonic sensors are placed at the garbage at thetop. When the garbage reaches the level of the sensor, then the controller will give indication to the house keeping as to which garbage bin is completely filled and needs urgent attention. Atmel328 will give indication by sending information using HC-12 module (zigbee) technology.

Keywords: **Zigbee, Atmel1328, HC-12module, ultrasonic sensor.**

I. INTRODUCTION

As the population increases the cleanliness also decreases. In the metropolitan city, more diseases have spread the problem of garbage waste. The development of smart cities needs a smart garbage monitoring system. So the garbage waste management system plays a major problem in the global world. The garbage monitoring system is succeeding with smart bins. We develop the smart bins and it is connected to the dashboard and it can be accessed anywhere. Our smart bins are implemented using HC-12 module (zigbee) technology.

•A big challenge in the urban cities is soil waste management.

•In our daily life, we see the picture of garbage bin being overfull and all the garbage spills out resulting in pollution.

•The project gives us on the most efficient ways to keep our environment clean and green

II. RELATED WORK

Prof. R.M.Sahu, AkshayGodase, PramodShinde, ReshmaShinde, "Garbage and Street Light Monitoring System".

In solid waste bin monitoring system garbage bin set the public place then Camera set for garbage bin location. The camera captured image for garbage bin. Radio Frequency Identification (RFID), GPS and GIS send image for work station. The RFID reader and camera are mounted in the truck, when truck comes closer to the bin RFID reader communicated RFID tag. & send all information. The System is use controlling Hut. This Controlling Hut is SMS Technology. The GPS and GPRS mapping server to analyzing data of various location. The control station compiled all the information and stored in the system database. The bin status and waste truck was monitored.

Kanchan Mahajan, Prof.J.S.Chitode, "Waste Bin Monitoring System Using Integrated Technologies".
In waste bin monitoring system using zig bee and Global mobile communication system (GSM).The sensors are place in the common garbage bins placed at the public place when the garbage reaches the level of the sensors. Then that indicated will give in indication to the driver by ARM7 they sending SMS using GSM technology. The technology use by Zig bee, Global mobile system (GSM), ARM 7 Controller. The range of communication of the zig bee is almost 50 meter. They use for range GSM Module, analyzing the image we get an idea about level of garbage. The zig bee and GSM system wold be able to monitor the solid waste collection process. This technique overcomes some disadvantages which are use of minimum route, low cost, fuel use, clean environment.

III. METHODOLOGY

The process is to sense the dumped waste. For sensing the waste ultrasonic sensor is used. The dumped garbage is sensed and instructed to the controller room. After the indication, particular number to clear the bin. the power supply is given to 7805 regulator. The ultrasonic sensor is used to sense the level of garbage. The sensor is connected to the microcontroller. HC-12 module(ZigBee) transmitter is used. The microcontroller display the level of bin to LCD display.

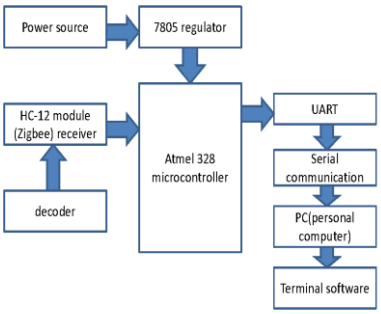

Fig 3.1: receiver block diagram

The 5v power supply is connected to 7805 regulator. HC-12 module (ZigBee) receiver is connected to microcontroller. UART is used to data transmission. Serial communication is sending the data to computer to clear the bin.

IV. PROPOSED SYSTEM

•"Smart Bin" which makes the municipality work easier in cleaning process by using the ultrasonic sensors and HC-12 (zigbee) module.

•It monitors the level of garbage in the bin and indicates the level of bin to the municipal staff. The level of the bin information can be transmitted using HC-12 (zigbee) module.
•The transmitted information can be viewed in PC with the help of terminal software.
•This system can be placed in office, college, school, etc…
The pros we have in our project :

1. Avoid manual collection.
2. Less time consuming.
3. It is user-friendly and pollution controlled

V. EXPERIMENTAL RESULTS

Crystal display is a flat panel display, electronic visual display or video display that uses the light modulating properties of liquid crystal. The LCD screen is more energy efficient and can be disposed of more safely than a CRT. It's low electrical power consumption enables it to be used in battery powered electronic equipment as shown in the below figure 5.1.

Fig 5.1: Bin level monitor

The transmitted information is received by the ZigBee receiver module. From receiver module the RS232 is communicated via HL-340 serial port to the computer by indicating the bin is full as shown in the below figure 4.

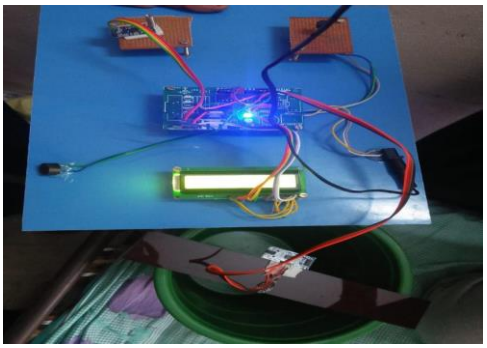

Fig 5.2: Receiver circuit

The level of bin is full the indicator will indicate the information through ultrasonic sensor. It display the the level in LCD(crystal display) display. It is send to the particular person to indicate the level of bin is full as shown in the below figure 5.2.
It is to display the level of garbage continuously. Ultrasonic sensor and microcontroller is used to indicate the notification to computer to clear the bin as shown in the below figure 5.3.

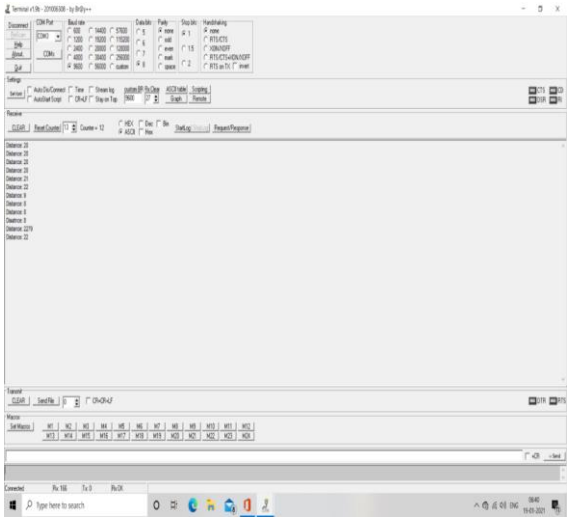

Fig 5.3: Bin alert indication

VI. CONCLUSION

In this project, an integrated system of HC-12 (zigbee) module, Ultrasonic Sensor is introduced for efficient and economic garbage collection. The developed system provides improved database for garbage collection time and waste amount at each location. By implementing this project we will avoid over flowing of garbage from the container in residential area which is previously either loaded manually or with the help of loaders in traditional trucks. It can automatically monitor the garbage level & send the information to collection truck. The technologies which are used in the proposed system are good enough to ensure the practical and perfect for solid garbage collection process monitoring and management for green environment.

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