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IOT Based Waste Monitoring For Smart City

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***Abstract*— The IOT is a new trend technology which includes different wireless connectivity like wi-fi, GSM, zigbee, Bluetooth .IOT that is internet of things which basically defines connecting things over wireless connectivity things are any physical quantity in day to day life which will need to be monitor. These quantity may be temperature, level, weight, pressure which impact on human activity these things are monitor control over wireless media. While using such system major focus on capability and system should make user friendly. Conventional wireless media is zigbee to get more capability and physical quantity which monitor is level. To enhance the smart city environment of such IOT based system it is essential to provide smart solution to become smarter. This paper is giving possible solution to make a city clean, hygiene, healthy in smart way.[1][2][6].**

***Index Terms*— IOT, IR sensor Zigbee, visual Basic,8052**

I. INTRODUCTION

Internet and its application are increased in this digital generation. Everyone need less time fast work complabily.people start to way of work in smart way using mobile laptop pc's or many OS software or apps.comunication between human are going beyond to communication between devices. This will give the birth of to IOT that make device communicate interact, sharing over wireless media. This concept connects the physical life to the devices like interaction of visual to unvisual things. This paper finds a smart way with IOT to give healthy and hygiene smart city.

Due to high population density in metro city, increasing growth of population improper collection of garbage and method of transportation government of India facing a problem of managing a garbage or to enhance the way of collection of garbage in over country including small city to metro city. As report of many worldwide organization in India waste produce 1.3 to 1.5 pounds a person and this rate is increased per year. It is become more difficult to municipal cooperation to keep city clean and hygiene. The process of monitoring garbage includes assorting, transportation, process, reuse, elimination, recycle.one other thing is also include in managing garbage is awareness in people about garbage. With issue of population & improper way of working there are spot of overflowing garbage bin in city. This will increase diseases due to organism in such city also it impact on city environment.[2]

This paper gives the solution on above all problem. by using smart way this will find solution of overflowing dustbin on the basic of IOT.as above mention today's lifestyle of human depend upon internet or everyone want go everything on fingtips.so going to become smart with internet and its application. Things(physical quantity) that are connected to Internet or any wireless media and these things are monitor on the internet from the controller(89c52)this is Internet of Things.In our paper the garbage bins are connected to the zigbee to get the real time information or physical quantity of the garbage bins. These garbage bins are interfaced with micro controller based system with IR Sensors and RF modules. Where the IR sensor detects the level of the garbage bin The IR sensors will show us the various levels of garbage in the dustbins and also the weight sensor gets activated to send its output ahead when its threshold level i.e.100% full and sends the signals to microcontroller the same signal are encoded and send to zigbee transmitter which will send to the USB receiver of the zigbee. Zigbee transmitter module has range from 50meters to USB receiver of zigbee. At the receiver section a zigbee USB connected to the laptop or pc's that all information is display and also record on laptop pc by visual basic programming.[2][3].

II. USE OF ZIGBEE INSTEADED OF GSM

As many of researches it is finding that GSM is more applicable than zigbee then commonly asked question is why we use zigbee? And answer is:

- GSM need SIM card so it will become more complicated to use no. of SIM card and keep record of each SIM number.
- Another problem is network problem for SIM card there is so many traffic of network in metro as well as small cities over these recent year so there is possibility of delay to getting status of dustbin.
- Another issue with GSM is topology to connect more nodes (garbage bin) is connected over city it must be star topology or mesh topology and is possible by zigbee than GSM.
- To make easy, cheap and user friendly system compatible media is zigbee than GSM.
- As one advantages of zigbee that is sleep mode it is battery saving device.it work for long time upto batteries are replaced[5]

III. use of VB programming

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Visual Basic has evolved from the simplest programming language for Microsoft Windows complex development environment, capable of delivering virtually anything from tiny utilities to huge client/server applications.

Visual Basics provide IDE (Integrated Development Environment) the IDE gives everything you need to create great applications, to write code for them, to test and fine-tune them, and, finally, to produce executable files. These files are independent of the environment and therefore can be delivered to Customers for execution on their machines, even if they haven't installed Visual Basic. Even for editing IDE give advantage of we can edit program form any editor including aged notepad.

As our system is working for municipal co operation keeping that in mind the access of program should be as easy as possible to everyone, including higher authority to small worker. That all need is get form VB programming.[7]

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IV. METHODOLOGY

A. Component of proposed system.

1.IR sensor:

IR sensor emits the light, which is invisible to naked Eye but the electronic components can detect it. It consists of IR transmitter and IR receiver. Both analog and digital output is produced by IR sensor. This sensor produces the output a logic „1" at the digital output when it senses the object and a logic "0" when it doesn't senses any object. Depending on the distance between the object and sensor, sensor produces the analog output voltage between 0 and 5V. An LED is present on the IR sensor board. It is used to indicate the presence or absence of an object. IR sensors are highly sensitive to surrounding lights. Hence, these sensors are covered properly in order to reduce the light effect on the sensor.

Fig.IR sensor

2.Microcontroller:

The AT89C52 is a low-power, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash programmable and erasable read only memory (PEROM). The device is manufactured using Atmel's high density nonvolatile memory technology and is compatible with the industry standard 80C51 and 80C52 instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C52 is a powerful microcomputer which provides a highly flexible and cost effective solution to many embedded control applications.

3. Zigbee:

Zigbee is defined as set of communication over short range wireless networking. The maximum data rate is 250kbps.zigbee is targeted for battery power application where low data rate, low cost, long battery life are required this device work for battery saving application called as sleep mode. as a result zigbee being capable to operational for several year before battery replaced.

B .Proposed system design.

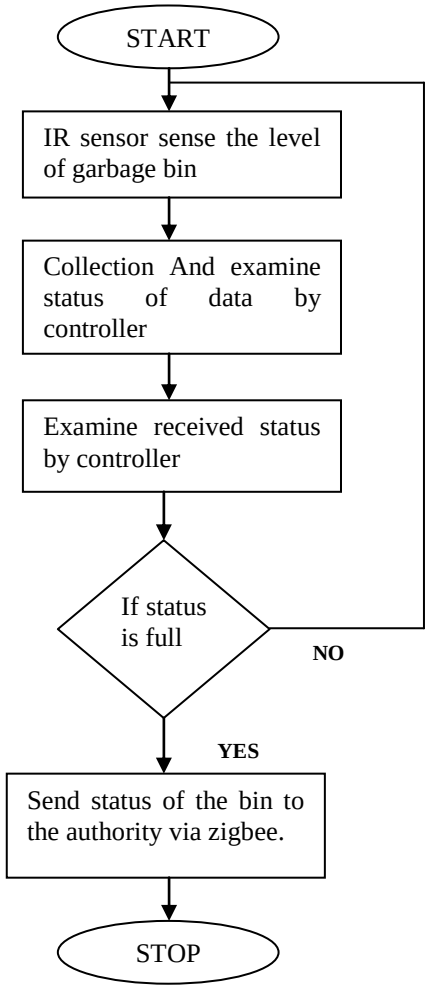

Fig: 2. Flowchart for proposed system

As system start, IR sensor set at threshold level i.e. garbage bin is full or 100% level. We can add many level of garbage bin like full, empty and overflowing. in proposed system one level is set.whenThe sensor senses the content of the garbage bin LED on IR glow transmission is start in IR sensor which is sends the signals or the data to the 8052 microcontroller, Power Supply +9V Battery power supply is given to the 8051 microcontroller to drive the system and for controller its +5v voltage regulator 7805are used to regulate output of for system and controller.8052 can collect read examine the received data and process the data it. All monitor and examine data that content status of garbage is send to zigbee transmitter which has range 50 meters so we use star topology over city to connect all garbage bins to one cooperation.

Zigbee is one of the most widely utilized Wireless Sensor Network standards with low power, low data rate, low cost and short time delay characteristics, simple to develop and deploy and provides robust security and high data reliability. Name of the Zigbee came from zigzagging patterns honey bees between flowers, represents the communication between nodes in a mesh network.

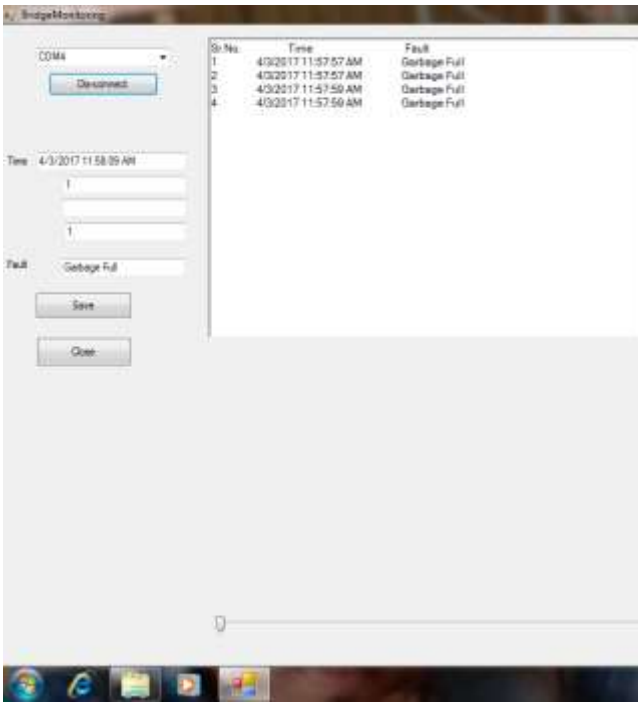

Fig:3. Status of garbage bin on VB platform.

V. CONCLUSION

This paper gives solution of how garbage management can be achieved. This method helps in keeping the waste bin clean when the bin is completely filled. The garbage managing system and the facility of collecting the garbage presently doesn't fit to the current requirement. Hence better facility of collecting garbage and thus, the garbage collection is made more efficient. If the dustbin is not cleaned in specific time, then the record is sent to the higher authority who can take appropriate action against the concerned contractor. This reduces the total number of trips of garbage collection vehicle and hence reduces the overall expenditure associated with the garbage collection. This system also helps to monitor the fake reports and hence can reduce the corruption in the overall Management system. This method finally helps in keeping the environment clean.

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