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IOT ENABLED SMART CITY

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I. Abstract:

A system is introduced to manage waste in big cities effectively without having to monitor the parts 24×7 manually. Here the problem of unorganized and non- systematic waste collection is solved by designing an embedded IOT system which will monitor each dumpster individually for the amount of waste deposited. Here an automated system is provided for segregating wet and dry waste. A mechanical setup can be used for separating wet and dry waste into separate containers using sensors. For detecting the dry waste we use IR sensor and for detecting wet waste we use water level sensor . The ultrasonic sensor is used for measuring distance and calculates the weight of bin. This makes it possible to measure the amount of waste in the containers if one of the containers is full ,then alert message will be sent to the corresponding person, and the person who is in charge can go and collect the particular waste.collection is being done could be monitored and followed up by the municipality authority with the aid of this system. In addition to this the necessary remedial / alternate measures could be adapted. An Web based application is developed and linked to a web server to intimate the alerts from the micro controller to the urban office and to perform the remote monitoring of the cleaning process, done by the workers, thereby reducing the manual process of monitoring and verification. The notifications are sent to the Web based application using Wi-Fi module.

Keywords: Arduino uno, Ultrasonic Sensor, WIFI Module.

II.INTRODUCTION:

The generation and disposal of waste in large quantities has created a greater concern over time for the world which is adversely affecting the human lives and environmental conditions. Wastes are the one which the growth of the country. Segregation of waste is important for proper disposal of vast amount of garbage in modern society. By this way we can monitor environment changes remotely from any part of the world via internet.

This systems architecture would be based on context of operations and Processes in real-time scenarios. Smart collection bin works in the similar manner with sensor namely ultrasonic sensor that indicates its different levels. The ultrasonic sensors will show us the various levels of garbage in the dustbins and also to find the distance .These details are further given of the Arduino UNO controller. At the receiver section the garbage bin details are displayed in the TELNET Application in mobile.

III.   LITERATURE REVIEW

In the existing system we are using IR sensor, micro controller and Wi-Fi module. This system assured the cleaning of dustbins soon when the garbage level reached its maximum. If the dustbin was not cleaned in specific time, then the records were sent to the

higher authority who took appropriate action against the concerned contractor. This system also helped to monitor the fake reports and hence helped to reduce the Dustbin a Infrared Sensor.

The smart dustbin elevated using a micro controller based platform Arduino UNO board interfaced with sensor and Wi-Fi module.it consists of 2 main modules the mechanical designed components and the electric components. The mechanical components consist of the level sensing plate and motor.while the electric components consist of various components like Arduino,LCD Display screen, IR Sensor,water level sensor and ultrasonic sensor,

Three different dustbins are used in this proposed system they are

1.   Water waste

2.   Dry waste

3.   Electronic waste

Problem Statement & Relevant Theory Instead of using plenty of bins in an unordered fashion around the city, we can have minimal no. of smart bins that can be placed that are feasible and affordable. As we have seen all around

us, the dustbins are getting over flown and concerned municipal authorities usually don't get information within the stimulated time. While considering the need of technology and innovation, this is not an original idea. The idea has been proposed. But however, we need an original plan for designing a Smart Bins with ultrasonic sensors Already existing system involves complex circuitry and high costs and features are also limited. In India, if we have a costly garbage bin that will not be a priority experiment for people. Thus here we are deploying such kind of system that is not only cheaper but with extended features that has never been implemented. For detection of trash in the bin, many sensors can be used like weight sensors, IR sensors, etc. But here we are using ultrasonic sensors which gives us directly information about percentage of trash in the dustbins. It is advantageous over weight sensors because weight sensors only tells us about the weight of the garbage, but this does not let us know the level of garbage in the bins,low cost, fuel use, clean environment.

Objective of this method:

The proposed system would be able to automate the solid waste monitoring process and management of the overall collection process using IOT (Internet Of Things). In the proposed system,

whenever the waste bin gets filled this is acknowledged by using ultrasonic sensor connected through the waste bin, which transmits it to the receiver at the desired place in the area or spot.4. In the proposed system, the received signal indicates the waste bin status at the monitoring and control system.

IV. DESIGN REQUIREMENTS

This contains LCD Display screen, IR Sensor, ultrasonic sensor,water level sensor,Wi- Fi ,motor.

When the user dumps the trash into the dustbin the trash is collected from the bins once the bins are filled the information is sent the corresponding and the worker who is available can take a charge.
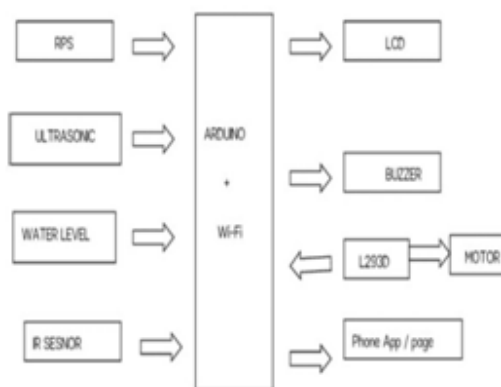

Fig 1 : block diagram of proposed method

1. Power supply :

The Power supply will provide electrical power for the micro controller, the shredder, and the router which are the most important part of the system.
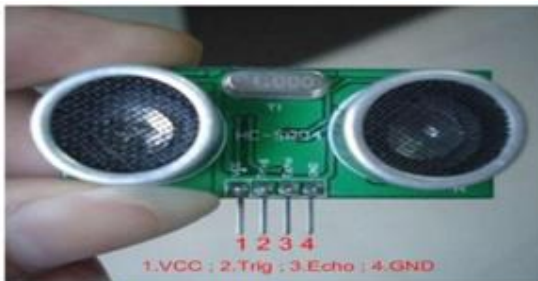
2.   Ultrasonic sensor:

Fig 2: ultrasonic sensor

1: VCC ; 2: trig (T); 3: echo (R); 4: GND

Supply module with 5 V, the output will be 5 V while obstacle in range, or OV if not.The out pin of this module is used as a switching output when anti- theft module, and without the feet when ranging modules.

3.   **Water level sensor:**

This is the most basic form of water level indicator used for measurement. If you need a fully automatic water level controller circuit then try this circuit Water level controller. The circuit is fully based primarily on transistors. The sensing section is somewhat similar to this circuit but there is additional circuitry for switching the pump ON when the water level falls below a set level and the pump will be switched OFF when the water is placed.

Fig 3: water level sensor

4.   **IR sensor:**

An infrared sensor is an electronic instrument that is used to sense certain characteristics of its surroundings. It does this by either emitting or detecting infrared radiation. Infrared sensors are also capable of measuring the heat being emitted by an object and detecting motion. Operating Voltage Range 3.6~5 VDC Average Current Consumption (mA) 0.06 Detection Angle 35 Â° Distance Measuring Range 2 ~ 30cm

Fig 4: IR sensor

5.   LCD DISPLAY:

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A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other.
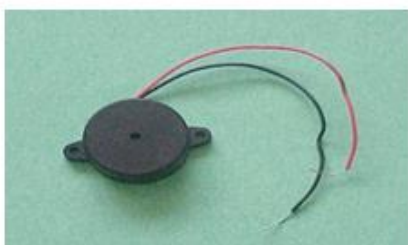

Fig 5: 2*16LCD display

6.Buzzer:

Fig 6: Buzzer

Buzzers can be both fun and useful in electric circuits.We'll use them a lot in projects, so let's take a look at what is going on inside a buzzer to produce sound.The buzzer consists of an outside case with two pins to attach it to power and ground.Inside is a piezo element, which consists of a central ceramic disc surrounded by a metal (often bronze)vibration disc.

When current is applied to the buzzer it causes the ceramic disk to contract or expand. Changing the This then causes the surrounding disc to vibrate. That's the sound that you hear. By changing the frequency of the buzzer, the speed of the vibrations changes, which changes the pitch of the resulting sound.

7.   MOTOR:

In Electric Motor is an electrical machine that converts electrical energy into mechanical energy. Most electric motors operate through the interaction between the motor's magnetic field and electric current in a wire winding to generate force in the form of rotation of a shaft. Electric motors can be powered by Direct Current (DC) sources, such as from Batteries, Motor vehicles or Rectifiers, or by Alternating Current (AC) sources, such as a Power Grid, Inverters or Electrical Generators.

8.   Wi-Fi module :

It consists of the router which will provide the internet facilities to the user for dumping the trash into the bin

9.   Micro controller:

Arduino will be the processing unit for the embedded system at the bins. This

will be used for controlling sensors and send information.
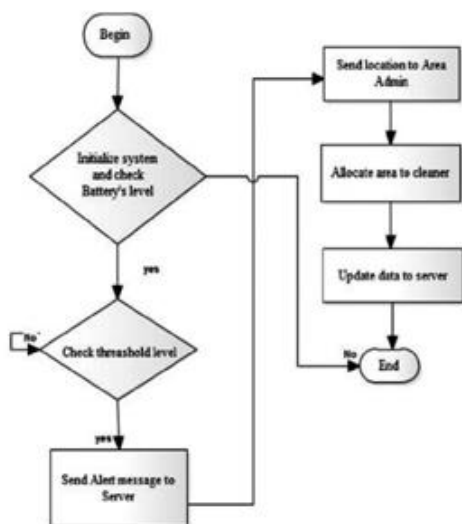

Fig 7: arduino uno

V. METHODOLOGY

Fig 8: flow chart

VI. ADVANTAGES

The proposed plan has many advantages, it is also cogent enough to be implemented in every street of a developing nation. the advantages lie in its easy and valuable functioning.

This will not only improve the streets we live in, but also provide a pavement for better working system.

• Efficient and effective Functioning.

• Cleaner Environs

• Better health issues.

• Pollution free and stinking free environment.

• Smart cities

• Technology development

VII. RESULT & ANALYSIS

Fig 9:display of dustbin is full

For this project we are using three dustbins whenever a single or double or triple bins are filled the corresponding alert is send to the TELNET application.To activate TELNET application we can connect this only by

"project 12" as wifi name \server name with the password "project 123456".

Fig 10: display of wet alert

When ever the wet bin is filled or waste waste is found in the garbage the corresponding alert is send to TELNET and we can see "WET ALERT " is shown on LCD and buzzer is ON.

Fig 11: display of person alert

once the bins are filled the corresponding person in municipality can collect the dust from bin this message is indicated from TELNET and Buzzer.

VIII. FUTURE WORKS

The moisture sensor can be implemented hand in hand with the other sensors and the compartments for segregating the dry and wet waste can be created which will solve the issues related to waste segregation.

VIII. CONCLUSION

Improper disposal and improper maintainance of domestic waste create issues in public health and environment pollution thus this paper attempts to provide practical solution towards managing the waste collaborating it with the use of IOT i.e. providing free internet facilities for a specific time once the trash is dumped into the bin. the proposed system will definitely help to overcome all the serious issues related to waste and keep the environment clean .

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