IOT BASED SMART GARBAGE MONITIORING SYSTEM USING ESP8266 WITH GPS LINK

MAHESH S.SHINDE

Department Of MCA SEM VI, YMT College of Management, Institutional Area, Sector-4, Kharghar, Navi Mumbai

---***---

Abstract:- Waste management is now one of the main issues facing the world regardless of advanced or developing countries. The main problem in waste management is that the waste bin in government locations is overflowed well in advance before the next cleaning method starts. An ultrasonic sensor is used to detect whether or not the waste can be filled with waste. Here Ultrasonic Sensor is mounted at the top of Trash Can and can be used to measure the garbage distance from the top of Trash and we can set a limit value depending on the size of the trash. If the distance is less than this threshold value, means that the trash can be filled with garbage and that we can print the Basket message is Full on the webpage and if the distance is greater than this threshold value, then we will print the Basket message EmptyHere we have set the 5 cm border within the program code. We will use the ESP8266 Wi-Fi module to connect the Arduino to the web server. This in turn leads to multiple risks, such as poor odor and ugliness, which may be the basis for the unfolding of multiple illnesses. This work is installed on a wise garbage scheme to prevent all such hazardous situations and to preserve public cleanliness and safety. Web server for immediate mud bin cleaning with right verification endorsed trash filling level. This technique is motor-assisted by a supersonic device interfaced with Arduino UNO to visualize the quantity of trash stuffed inside the mud bin and to send the alert to the municipal net server once the trash is filled.

Key Words: IOT, Cloud, GPS, ID, IR sensor, ESP8266, Raspberry-Pi, GSM, etc...

Introduction:

The key to Smart City & quot; is the ultimate development country need. This could include dangerous pollution, impacts on human health, alarming global warming, and depletion of the ozone layer, etc. To effectively and efficiently overcome the created environment, proper maintenance becomes mandatory. This project proposes an e-monitoring scheme that produces an embedded system and web-based software that is assimilated with IOT technology. The ultrasonic sensor could sens / monitor the filling level of the waste bin in the powder bin and its initial level height. Arduino UNO programming is carried out in such a manner that, once a certain amount of filling is identified, data is sent asking for cleaning and updating of bin status.

Existing system

Fig.1 old garbage collection system

On the planned routine basis, i.e. weekly or 2-3 times in the months, municipal servants collect the trash in the current scheme. As we see many times, as the waste rises every day, garbage bins are being positioned in the city's government places overflowing. As a result, the garbage shrinks and produces the bad odor that tends to cause air pollution and spread disease. That can be harmful to human health. So the big issue is cleaning. Finding the route of the garbage bin is also one of the duties especially for fresh drivers. Therefore we have developed an enhanced system to prevent these circumstances.

Proposed System

In our suggested scheme, which is the IOT-based intelligent trash surveillance system together with the GPS link, there is real-time surveillance with warning facility. Earlier constructed devices were not cost-effective, they are also voluminous in size as they used Raspberry-Pi module, GSM module, some using GPS antenna, and so on. We have removed all the hardware part here in our purpose system to reduce the size of the circuitry, Which also reduces the price of the scheme. We also use the Solar Panel here for cloudy situations battery backup.

Literature review:

Set the government location t hen Camera set for trash bin location in strong waste bin surveillance system trash bin. The camera captured the garbage bin picture. Identification of Radio Frequency (RFID), GPS and GIS send picture to the workstation. The RFID reader and camera will be installed in the truck as the truck approaches the RFID tag transmitted to the bin RFID reader. & send all the details. The Hut control system is used. This SMS technology is the Controlling Hut. The mapping server for GPS and GPRS to analyze information from different locations. All data was collected by the control station and stored in the database of the scheme. The status of the bin and the waste truck have been tracked.

They went to a point It is essential to know the societal concerns about the enhanced level of resource consumption and waste manufacturing and thus the policymakers urged recycling and reuse approaches to reduce the demand for raw materials and decrease the amount of waste going to landfill. 3] This article proposes the implementation of an embedded scheme coupled with an embedded radio frequency identification scheme, a global positioning system, a general packet radio service, a geographic information system and a web camera to fix the solid waste issue. They also evaluated the system's real output. In[4] outlined that solid waste management is a significant challenge in metropolitan regions around the globe. In that scheme, Radio Frequency Identification (RFID), Global Position System (GPS), General Packet Radio Services (GPRS), Geographic Information System (GIS) and Web camera were implemented into an embedded system. Built in truck, the RFID reader would automatically collect all manner of client and bin data from the RFID tag installed in each bin. GPS is used to provide truck location data. All center server data would be updated. The data will be updated via GPRS communication system. GIS map server is used for truck monitoring. In this System bin as well as database has developed in the way that information of not only bin but also truck ID, data and time of waste collection, bin and truck GPS coordinates information. Bin status and amount of waste are compiled in data packet. The system is showed that real-time image processing and other bin information have been displayed in the GUI.n [5] described system used two technologies. Zigbee and Global System for Mobile Communication (GSM) are the latest trends. This combination is one of the best combinations which is used in that system. There are a number of methods that are being used and developed to manage trash well.

The sensors are put in popular garbage bins to describe the scheme, which are positioned in government locations. When the trash reaches the sensor level, the indication will be provided to the microcontroller in that ARM7 controller. This ARM7 controller will provide the garbage collection truck driver with data about which garbage bin is fully filled. Using GSM technology, ARM7 will provide hint by sending SMS. In the mentioned text, a scheme is created to focus on eradicating not only ugliness but also disorder. Two sensors, IR and gas sensor, are used by the intelligent garbage. The IR sensor is used to detect the garbage amount inside the bin and the toxic gas detector will be sensed. Once the trash is filled, the RFID inside the trash will provide the corporation office with data about overflowing trash. The current garbage surveillance scheme is fully manual across the nation. The method of collecting is a sort of attempt and mistake.

At set intervals, the garbage truck visits the garbage bins. This method has a lot of disadvantages because some garbage bins could get full before a week depending on the residence amount and their consumption, and others could get full in two weeks and so on.
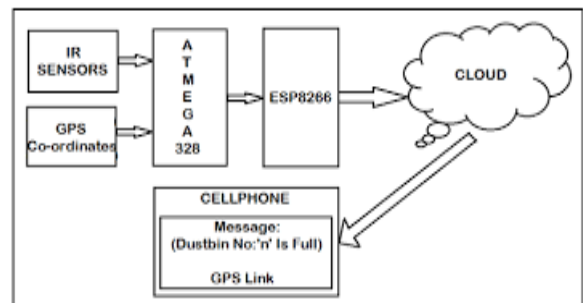
Working:

Fig.2 working garbage system

The intelligent IOT-based trash surveillance system using ESP8266 is very easy and in real time. Basically, the method begins with the garbage bin. Each garbage bin level is fitted with IR sensors. Here we take the 5 levels of the garbage bin to show our project. We provide the unique ID for each trash bin.

Fig.3 garbage collection

We also pick the amount of the limit for alert purposes. The trash amount is detected by the IR detectors. The message will be sent to the individual involved or to the municipal office once the trash in the garbage bin crosses the limit level. The GPS link to the garbage bin ID is included in this message. There are five primary components of the scheme as a whole. Power supply part, sensing portion, processing portion, uploading to server / cloud, and alert portion. IR sensors, senses the trash amount and thus sends the signal to the ATMEGA328microcontroller.ATMEGA328 processed the received signal and transmitted it to ESP8266. ESP8266 is a Wi-Fi module that also operates in our system as a transmitter.
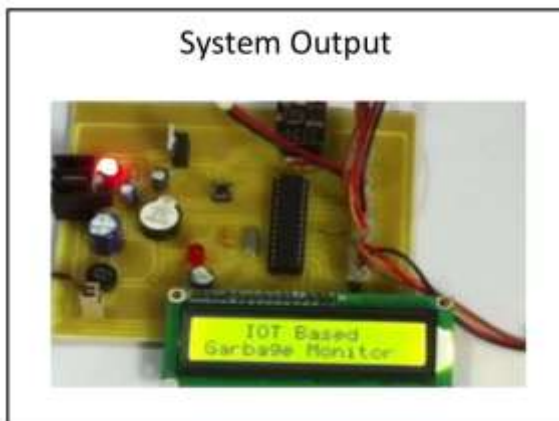

Fig.4 LCD Display

ESP8266 plays a major role in reducing the system It replaces the module of Raspberry-Pi. Since our system is based on IOT, the alert will be carried out with the help of IOT. Removed because of this GPS module. There is no need to use the GPS antenna to alert the message with the GPS link because we can feed the garbage bin coordinates in the programming part as the garbage bin position is fixed. Thus, when garbage crosses the threshold level, the alert message will be sent continuously until the person

concerned removes the garbage in the garbage bin. This will operate for our entire scheme. Together with the battery backup, we use the solar panel for the energy supply.

COMPONENTS IN OUR SYSTEM:

1. The amount of trash, in other words let's say you don't really need to empty it if your bin is half full. Our threshold, or the highest quantity we allow for garbage, is 75% of the bin. (You might change the threshold depending on your choice.)
2. If supposing a specific trashcan fills up 20 percent and does not alter for a week, our second criteria, time, will come into play. Even the small quantity of rotting will begin with moment leading to a smelly environment. To avoid our tolerance level being 2 days, it will also need to be emptied if a trashcan is less than 75% but it is two days old.

With these criterias in mind let's understand the technical part:

- There will be an ultrasonic sensor (a range device A.K.A) on the inside side of the box, the one facing the solid waste. The distance between the ultrasonic and the garbage reduces as the garbage rises. We will send this live information to our microcontroller.
- Then our micro-controller processes the information and sends it to an app using WiFi.
- What the app does, with a tiny animation, visually reflects the quantity of garbage in the bin.

APPLICATION:

1. Providing free Wi-Fi after dumping the garbage in the can for intelligent people.
2. Compressing in the bin the waste.
3. Providing ideal paths that assist to reduce collections of any location through ongoing monitoring based on real-time alternatives.
4. Smart solar-powered bins.
5. Providing free cash based on garbage / waste weight.
6. Crushing & Converting glass bottles into sand close to beaches to prevent beach erosions.
7. Efficient waste management for municipal welfare — Instant alerts and automatic information collection.

Software Description:

Arduino software (IDE) shows text output, including full error message and other data.

Conclusion:

Developing implementation for municipal administrations and municipal staff. IOT based mostly on trash observation scheme can be a horribly innovative system that can make it easier to keep towns clean.

Future Scope:

This project can also be used in the SMART CITY. It is also useful in SWACHH BHARAT ABHIYAN's public project

Reference

1] D.kornack and P.rakic, while not expanding in adult primate cerebral mantle, Cell Proliferation Science vol.294, December 2001, pp. 2127-2130, dol:10.1126. 1065467.

2] M.Young, Handbook of the Technical Writer. Mill Valley, CA: Science at the University, 1989.

3] R.Nicole, Paper title with capitalized phrase alone. J.Name Stand. Abbrev. in a press.

4] K. Elissa, Unpublished Title of document if know