Abstract

Objectives: This paper describes an intelligent garbage monitoring system. Garbage management is an essential and mandatory process due to increase in human population and the amount of waste being accumulated. Methods/Statistical Analysis: Garbage accumulation leads to unhealthy environment and enables spreading of infections and diseases. The present invention provides a monitoring system and further includes a system to control the littering of the garbage in the vicinity of the bin aiming for a healthy and safe environment. An intelligent garbage monitoring system will be installed in all the localities and allows the monitoring party, the municipal corporation to view and take action according to the status of the garbage bin in that locality. Findings: The intelligent garbage monitoring system further has a control feature that prevents the users from spreading the waste around the vicinity of the garbage bin. The system aims for a cleaner environment and promotes a healthy life, by reducing the number of diseases that spreads due to improper waste management. Application/Improvements: The smarter garbage monitoring system enables a cleaner, healthier safer and disease free environment.

Keywords: Database, Environment, Garbage Monitoring System, Internet of Things, Litter, Municipal Corporation, Safe and Healthy Penalise

1. Introduction

The present invention relates to the field of Internet Of Things (IOT) in Garbage Monitoring System.

Waste management is a mandatory process and is a challenge for most of the cities in India. Solid wastes in developing countries are difficult to monitor due to growing accumulation of garbage and improper attitude of people. This issue is a burden on the municipal corporation and also spreads disease.

Our research team has developed a solution for this problem. A smart garbage monitoring system is developed for an improved waste management and a healthy environment. The system monitors the garbage/garbage bins in all localities and clears it once the bin is filled and also prevents littering around the bin.

The invention discusses a system that monitors the garbage in every locality by Internet of Things (IOT) thereby providing an effective method of clearing the garbage at the right time and also taking necessary actions on individuals who litter around the bin. The invention has the following advantages:

1. A laser level indicator to measure the level of garbage in the bin
2. A display present in the municipal corporation to view the level of garbage in the bin indicated by different colours
3. A camera to prevent littering around the bin
4. A registration stage to capture the identity of the individuals and store the details on the server creating a database

2. Description

The paper describes an effective method for garbage management that provides a healthy and a disease free environment.
A smart garbage monitoring system allows the municipal corporation to observe the quantity of the garbage present inside the garbage bins thus taking immediate action, if required. These features along with the control features are illustrated in the present invention. The garbage bin is shown in Figure 1.

The control feature that directs the user to throw the garbage in the bin to reduce the breeding of mosquitoes with simultaneous reduction in the diseases being spread by refraining the users from spreading the waste around the vicinity of the bins will be described hereafter.

These garbage bins are positioned in all the localities; thus the users can dispose the waste in the bins located in their vicinity. The garbage bin 200 mentioned above has a laser level sensor 202 that works in a similar way as a SONAR functions, the difference lies in the usage of laser instead of sound.

As mentioned above, these garbage bins are present in all the localities thus they form a continuous chain of monitoring system with the main control provided to the municipal corporation. The municipal corporation sends and receives the status update of the garbage bins, thus an early action could be initiated, if required.

As mentioned the garbage bins are equipped with laser level sensors, these sensors measure the quantity of waste material present inside the garbage and sends the status to the municipal corporation. A GSM module (not shown in the figure) is connected with the level sensor that transmits the intended message to the corporation.

The status regarding the quantity of garbage present in the bin is indicated on the display screen 100 of the corporation as shown in Figure 2. In the figure only one bin 101 has been showed for illustrative purpose. The status 102 is displayed using four sets of colour, namely, green, yellow, red and violet. Green colour indicates that the garbage bin has quantity less than 30% inside, yellow colour indicate the presence of waste inside the bin from 30% to 70%. Red colour indicates the status of the bin upto 90%. Finally, when the user display indicates violet colour, it alarms the municipal corporation to empty the bin in that particular locality. In the user display, the garbage bin shown is highlighted by the respective colour in respective situations.

As the status displayed on the user display turns violet, the corporation people take immediate action to empty the bin turning the status to green. The information which is sent to the municipal corporation with the said GSM module, and the bin is identified using an identification number.

The present invention further provides a control method to prevent the spreading of waste materials around the vicinity. As mentioned above, due to the lack of proper waste management, there arises a chance for mosquito breeding leading to a number of infectious diseases.

In the present invention, the said municipal corporation registers all the individuals into their server creating a database with their personal details like name, address, and date of birth, identification number (PAN card) and the photo of the user. The garbage bin located in multiples places in a locality has a small camera that is connected with bin. If any person is found littering around the garbage bin is identified by using the camera 201.

The camera 201 is used to monitor the activities of the people in the vicinity of the garbage bin. The data generated during such continuous monitoring is stored in the servers of the municipal corporation. If any person is found littering around the vicinity, the person is penalised in subsequent stages.

As mentioned above, the camera system that is used to monitor the activities of individuals in the vicinity of the garbage, the camera is located at an elevated position...
to cover the area in the vicinity of the garbage bin. Inside the locality, if any individual is found littering around the garbage bin or throwing the garbage not inside the bin, such an activity is being monitored by the camera, the data of which is telecasted at the municipal corporation.

The individuals or people caught red handed are penalised for such indecency. As mentioned above, the details of the all the individuals living in a particular locality is maintained by the municipal corporation, this data is used to identify the details of the individual or the person who are found littering. Such people are penalised so that such instances are not repeated in the future. The penalty includes fine and if the action is repeated in the future, people may be charged with imprisonment. The details of all the deeds in regard to littering will the stored in the individual's database.

In case people do not adhere to the habit of stop littering around the bin, severe action in the subsequent leading to imprisonment can be implemented. This act allows the prevention of littering around the garbage thus reducing the risk of health hazards due to diseases spread by mosquito breeding. Such little action, if taken can have a huge impact on the health of humans and also render cleaner environment [2,3].

3. Implementation

The present invention and its advantages can be implemented as described below.

An intelligent garbage monitoring system which will be installed in all the localities allows the monitoring party, the municipal corporation to view and take action according to the status of the garbage bin in that locality.

Further, the garbage bin has level sensors that aid the corporation in identifying the quantity of waste present inside thus allowing them to act immediately. The intelligent garbage monitoring system further has a control feature that prevents the users from spreading the waste around the vicinity of the garbage bin.

The above mentioned implementation aims for a cleaner environment and promotes a healthy life, by reducing the number of diseases that spreads due to improper waste management. Thus, the present invention aims to provide the above mentioned features.

4. Conclusion

The present invention provides a smarter garbage monitoring system that enables a cleaner, healthier safer and disease free environment.

5. References

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