

Garbage Monitoring System

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ABSTRACT

Internet of Things facilitates the realization of the sustainable growth of numerous smart systems and devices. Smart IoT based Garbage Monitoring System is an indispensable part in building clean college campuses. Garbage bins are kept at various places in the college campuses. Manual checking of each of these bins kept at various places inside the college campuses, might consume more time and energy sometimes leads to overflowing of garbage bins. Overflowing of garbage will cause air pollution which in turn will affect the historical college campus buildings. To overcome the drawbacks in the traditional way of garbage monitoring, SMARGAR -an IoT based SMART GARBAGE Monitoring System is proposed to monitor the garbage bins constantly and to inform sweepers about the level of garbage collected in the garbage bins at regular intervals via a mobile app.

Keywords : IoT, Smart Systems, Garbage Monitoring

I. INTRODUCTION

IoT based Garbage management is one of the most noteworthy concepts deployed for preserving the historical college campus buildings through intelligent monitoring. The effective remote monitoring of garbage levels anytime and anywhere is an important factor [1]. Excess garbage causes air pollution which in turn will affect the historical college campus buildings. The existing garbage collection and management system is not flawless. It depends on a vast amount of human resources and material resources. Poor monitoring and lack of efficient management policy lead to excessive piling up and even spillage. This phenomenon will not only cause air pollution, but also

will affect the historical college campus buildings. As a result, it is significant to deploy an IoT based Smart Garbage Monitoring System for preserving historic College Campuses. SMARGAR – an IoT based Smart Garbage Monitoring System proposed in this paper will save historical resources and time.

II. RELATED WORK

Some of the following garbage typePackaging waste, Agricultural waste, Inorganic waste, Liquid waste etc. 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 come closer to the bin RFID reader communicated RFID tag. & send all information. The System are use controlling Hut. This Controlling Hut are SMS Technology. The GPS and GPRS mapping server to analysing 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. [1] 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, analysing 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 overcome some disadvantages which are use of minimum route, low cost, fuel use, clean environment. [2]The waste management is built around several element. Waste item, domestic bin, trash bags, collective containers and collecting vehicles. The waste flow start from the waste item and the domestic bin to end in the collecting vehicles. Use the waste identification for sorting process. Base on RFID technology new trash bag is added in a collective container. The technology use Radio Frequency Identification (RFID), Smart vehicular and Trash Bag.They only identify RFID tags garbage bins, Low data speed, high cost.The zig bee and GSM system wold be able to monitor the solid waste collection process. This technique overcome some disadvantages which are use of minimum route, low cost, fuel use, clean environment. [3]A single directional cylinder is suspended next to the lid of dustbin. The piston is free to move up and down vertically inside the dustbin to a certain level. A plate is attached to the cylinder for compressing the garbage.

The shape of this plate depends upon the shape of the dustbin. The compressing plate consists of a side hole through which the leaf switch is suspended upside down. Technology use Piston, Switch, microcontroller, the single directional cylinder, smart dustbin.Only use for smart dustbins, they are not provide garbage collection.Smart Dustbins can prevent the accumulation of the garbage along the roadside to a great extent thereby controlling the widespread of many diseases. It can prevent pollution and also prevent the consumption of the spread out garbage by the street animals. [4]A laser diode is a p-n junction diode which produces a narrow beam of light that is intense, focused and coherent. In a LASER diode a mirrored resonant chamber is used to reinforce the light waves so that the light emitted by the device is at a single frequency and of the same phase. A photo detector is a device that converts light signals into electrical signals, which can be amplified and processed. Technology use Dustbins, LASER Diode, Photo Detector Diode, Road Side Units (RSU), and Garbage Collecting Vehicle (GCV).Only support for simulation of Transmission Control Protocol (TCP), routing and multicast protocols over wired.The dynamic routing of GCV compared with static solution is much more efficient and will be much effective when more than one dustbin fills up at the same time. The initial planned route is saved so that when real-time data is received only portion of the planned path may be changed. [5]For the garbage detection, weight sensor can be used. It gives the weight of the garbage in the dustbin. But it doesn't provide any information about the level of the garbage in the dustbin. Hence author used Infrared (IR) sensor for garbage detection. IR sensor radiates light which is invisible to the human eye because it is at infrared wavelengths, but it can be detected by electronic devices.IR transmitter consists of LED which send the IR beam. Technology use Infra-red sensor (IR), Microcontroller, Global System for Mobile (GSM), graphical user interface (GUI).Infrared sensor (IR), Global System for Mobile (GSM).They only use GSM network. Power and internet supply

continue on. Smart garbage management system using IR sensor, microcontroller and GSM module. This system assures the cleaning of dustbins soon when the garbage level reaches its maximum. [6] Arduino is best described as a single-board computer that has deliberately been designed to be used by people who are not experts in electronics, engineering, or programming. It is inexpensive, cross-platform (the Arduino software runs on Windows, Mac OS X, and Linux), and easy to program. Both Arduino hardware and software are open source and extensible. Arduino is also powerful: despite its compact size, it has about as much computing muscle as one of the original navigation computers from the Apollo Programmers, designers, do-it yourself, and artists around the world take advantage of Arduino's power and simplicity to create all sorts of innovative devices, including interactive sensors, artwork, and toys. [7]

III. PROPOSED SYSTEM

The IOT Garbage Monitoring system is a very innovative system which will help to keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. For this the system uses ultrasonic sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth. The system makes use of Arduino family microcontroller, LCD screen, Wi-Fi modem for sending data and a buzzer. The system is powered by a 12V transformer. The LCD screen is used to display the status of the level of garbage collected in the bins. Whereas a web page is built to show the status to the user monitoring it. The web page gives a graphical view of the garbage bins and highlights the garbage collected in colour in order to show the level of garbage collected. The LCD screen shows the status of the garbage level. The system puts on the buzzer when the level of garbage collected crosses the set limit. Thus this system helps to keep the city clean by informing about the garbage levels of the bins by providing

graphical image of the bins via a web page. The ESP8266 Wi-Fi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes preprogrammed with an AT command set firmware. The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

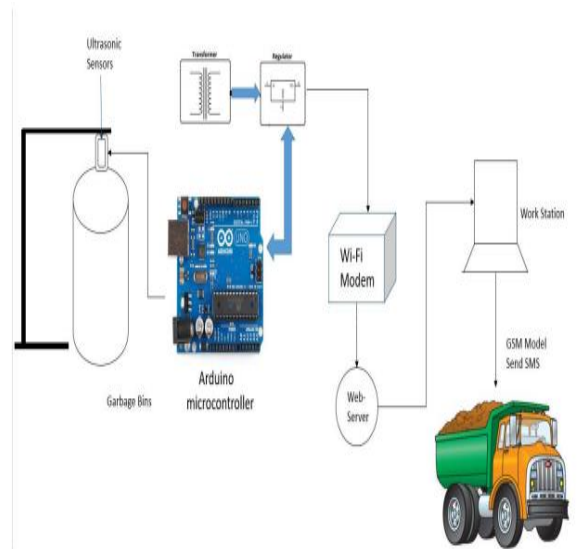


Figure 1: System Architecture Diagram

IV. RESULTS

Sr. No.	Parameters considered	Value
1	Time taken for segregation	10 seconds
2	Approximate Assembly Size	75cm x 25cm x 75cm
3	Power requirement	12V, 2A DC
4	Transportation efficiency	Garbage truck trips become demand based, Hence optimized.
5	Spill Over Probability	0.1
6	Reduction in mass of garbage.	Recyclable-10% Non-Recyclable-90%

Table 1 : system analysis

V. CONCLUSION AND FUTURE SCOPE

To conclude from the researches carried out on waste management worldwide, the garbage needs to be segregated and then disposed appropriately. This can help in reducing huge pyramids forming at the garbage dumping grounds. This model segregates the litter effectively from its source itself. This will help to cut down the tedious and monotonous process of the waste segregation. This system integrates for garbage monitoring and collection in a way which enables optimum use of resources. The system proposes a real time optimum solution for a tiresome problem of junk management. The system improves the garbage management by reducing the possibility of spill over of rubbish in cities. The system also provides a broader overview of scrap generation pattern of the city which further can be utilized for better planning of waste management by centrally providing the real time scenario of any locality where the system is employed.

In future, the data can be enhanced, that is stored on the server helps to compute the optimized collection

routes for the collector. The scope for future work is the implementation of same system with less complexity at affordable costs and more security to the sensors so its life is increased.

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