



A Review on Smart Garbage Monitoring System Using Internet of Things (IOTs)

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ABSTRACT

Garbage Monitoring System helps to eradicate or minimize the garbage disposal problem also helps to manage unwanted material left over from City, College, home, Society, colonies, Public area etc. This paper provides survey on various smart garbage monitoring existing ideas in the recent years, using IoT (Internet of Things). IoT is developing day by day effective methods, that transparently and seamlessly a large number of different and heterogeneous end systems.

Keywords: IoT, Garbage Monitoring System, heterogeneous.

I. INTRODUCTION

Narendra Modi's ambitious project to make INDIA a clean country is nothing but Swachh Bharat Abhiyan. With increase in population wastage or garbage is also increased. It is necessary that monitoring and regulation of garbage collection, because it causes various diseases as large number of insects and mosquitoes breed on it. Smart garbage collection system contains collection, transport, treatment and disposal of waste together. Hence it is a big challenge for the cities to keep city clean[1].

Internet of Things (IoT) means, embedded devices are not only connected to Internet but also controlled from the internet. Smart Garbage monitoring system implemented by using smart dustbins to check the fill level of smart dustbins whether the dustbin is full or not. In these types of systems, the information of all smart dustbins can be accessed from anywhere and anytime by the concern person by using the internet [2]. In this paper we are presenting the different types of Smart Garbage monitoring System and introduction section provides the importance of Smart Garbage monitoring System where as the section two i.e. literature survey provides an overview on Smart Garbage monitoring systems developed in the recent year, section three provides the different advantages Existing system and finally proposed system is given.

II. LITERATURE SURVEY

Prof. Dr. Sandeep M. Chaware et al. [3] presents Garbage Monitoring system, which monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. Fig. 1 shows the System Architecture, in which system uses ultrasonic sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth. The proposed system uses Arduino family microcontroller (The LPC2131/32/34/38 microcontrollers are based on a 16/32-bit ARM7TDMI-S CPU with real-time emulation), LCD screen, Wi-Fi modem(The ESP8266 supports APSD for VoIP applications and Bluetooth co-existence interface) for sending data and a buzzer, GSM (used to send message to the garbage depot if the Garbage Can

exceeds the set threshold level) Ultrasonic Sensor (Sensor sends out a high-frequency sound pulse and then times how long it takes for the echo of the sound to reflect back).

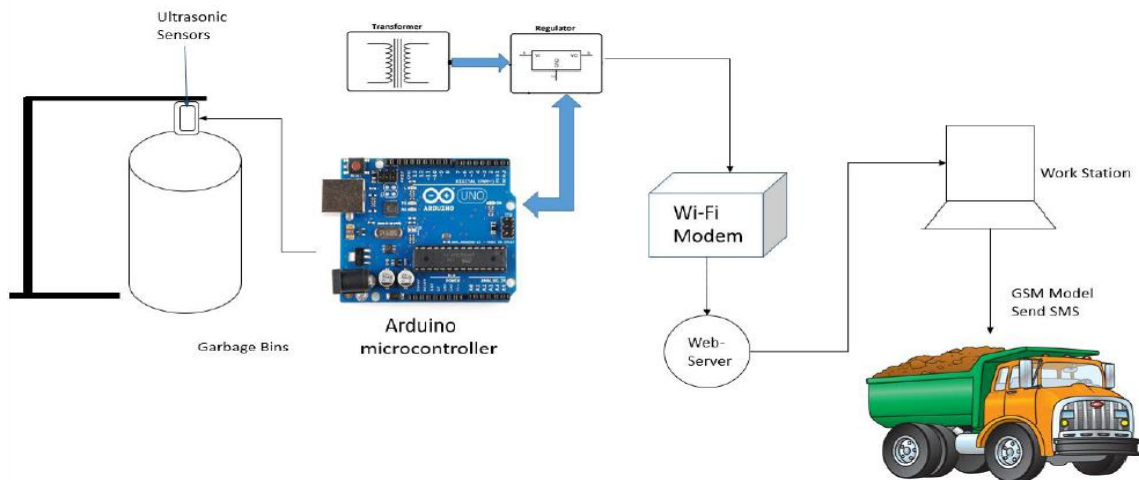


Fig. 1 System Architecture

P.R. Naregalkar et al. [4] developed IoT Based Smart Garbage Monitoring System, in which dustbins are interfaced with microcontroller based system having Ultra sonic sensors with wireless systems. These wireless systems central system showing current status of garbage, on mobile web application with connected via Wi-Fi, as shown in fig. 2. This proposed system implemented using ultrasonic sensor (also known as transceivers when they both send and receive, also work on a principle similar to radar or sonar, which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively), microcontroller (AT89S52 was used and designed with static logic for operation down to zero frequency and supports two software selectable power saving modes) and Wi-Fi module (Espressif Systems' Smart Connectivity Platform is used, which provides a set of high performance, high integration wireless SOCs, designed for space and power constrained mobile platform designers).

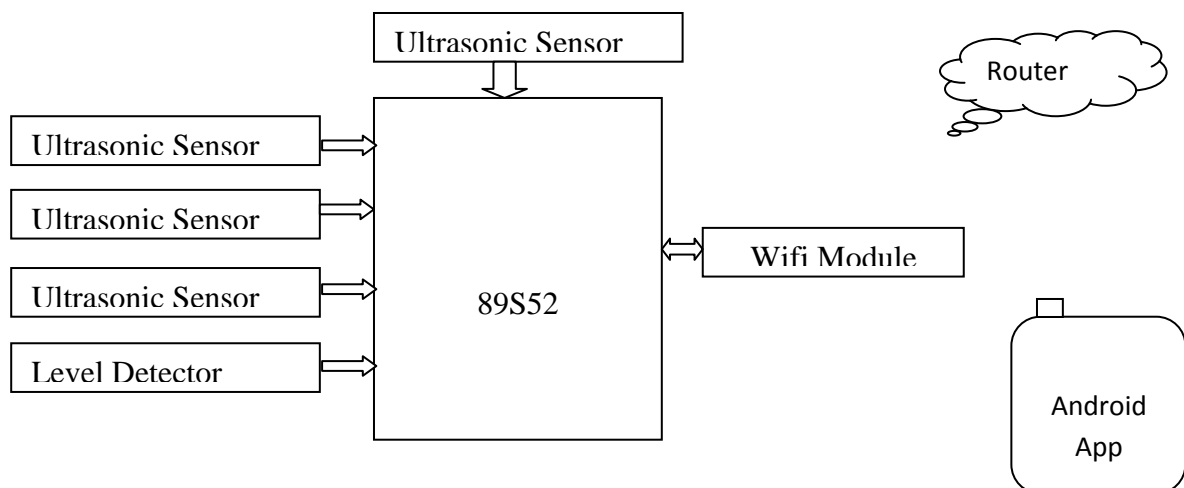


Fig. 2.System Architecture [2]

Lilyan Anthony et al. [5] proposed a model in which the collection of garbage is made real time. A network is established using wireless sensors, which are placed in the garbage bin, set at a particular level. Sensors will send a signal to the nearest vehicle driver if the level of garbage is crossed to set level. Fig. 3 shows the Architectural Diagram, which consists major three modules; Sensor Module, in which sensors are used to sense the garbage levels once and connected to the Arduino board, Communication Module, in which Bluetooth is used for communication between the sensors and Arduino Uno board, and last module is Analysis and Monitoring Module, in which collected is sent to the admin for analysis.

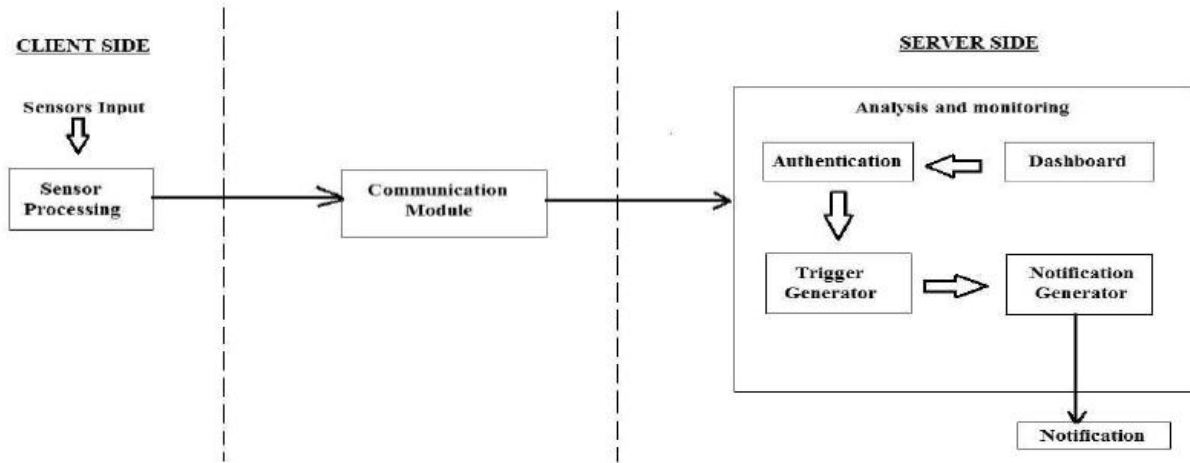


Fig. 3 Architectural Diagram [5]

KalyaniGhute et al. [6] presents IOT Based Smart Garbage Monitoring and Air Pollution Control System, in which system monitors the garbage bins and informs about the level of garbage via a web page. Fig. 4 shows the block diagram of proposed system. In this system two ultrasonic and two gas sensors are used for level of garbage and harmful gases in the air respectively. Sensors are connected to the AVR family microcontroller (ATmega328) which is interfaced with LCD display which shows the status of bins and Wi-Fi module (ESP8266) is used to transmit data for webpage applications, which is a self-contained SOC with integrated TCP/IP protocol stack.

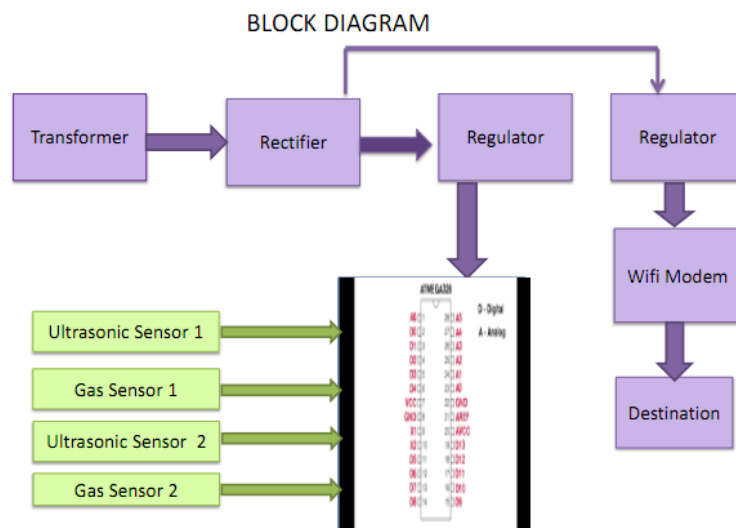


Fig. 4 Block Diagram [6]



III. ADVANTAGES

This type of system provides the different advantages to the society. Existing system provides the different advantages like Smartgarbage management system makes the garbage collection more efficient, It ultimately helps to keep cleanliness in the society, Monitors the garbage bins and informs about the level of garbage collected in the garbage bins, To keep our Environment clean & green, The cost & effort are less in this system and Automatic garbage level detection prevents overflow etc. [3,4,5,6].

IV. LIMITATIONS

Decomposition of Garbage in dustbin produces roughly 50 percent methane (the primary component of natural gas), 50 percent carbon dioxide (CO₂) and a small amount of non-methane organic compounds. If decomposition starts then it attracts flies and vermin, and has the potential to add biological oxygen demand (BOD) to the leachate. So we need to detect these gases.

V. PROPOSED SYSTEM

The proposed Smart Garbage monitoring system for Smart City is Energy efficient and based on the Internet of Things (IoT) & sensors. In the proposed system, at dust bin the NodeMcu development board with inbuilt Wi-Fi is used for accessing information about dust level and gases generated by IR sensor and gas sensor. At main system ESP8266 is used to continually access garbage bin data which is useful for machine learning and future prediction. If the level of garbage in bin goes above threshold value then main system alarm and send information to collection vehicle.

VI. CONCLUSION

This paper has been performed for collecting the details of smart garbage management methods using Internet of Things (IoT) in the recent years, which is helpful for hygiene environment in cities, College, home, Society, colonies, Public area etc. from the Literature Survey we can find out the effective methods which are useful for smart garbage management.

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