A Review on IOT Based Waste Carrier Management System

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***Abstract*- Waste management is one of the primary problem that the world faces irrespective of the case of developed or developing country. The key issue in the waste management is that the garbage bin at public places gets overflowed well in advance before the commencement of the next cleaning process. It in turn leads to various hazards such as bad odor & ugliness to that place which may be the root cause for spread of various diseases. To avoid all such hazardous scenario and maintain public cleanliness and health this work is mounted on a smart waste management system. This paper contains review of the research work done by different authors to develop a smart intelligent garbage alert system for a proper garbage management. This paper proposes a smart alert system for garbage clearance by giving an alert signal to the municipal web server for instant cleaning of dustbin with proper verification based on level of garbage filling.**

I. INTRODUCTION

As the population is increasing the solid waste is additionally increasing in urban and rural areas and waste management has become a worldwide concern. We need to require the right call so as to manage this overflowing garbage. Internet and its applications have become an integral part of today's human lifestyle. It has become an essential tool in every aspect. Due to the tremendous demand and necessity, researchers went beyond connecting just computers into the web. These researches led to the birth of a sensational gizmo, Internet of Things (IoT). Communication over the internet has grown from user - user interaction to device – device interactions these days. The IoT concepts were proposed years back but still it's in the initial stage of commercial deployment. Home automation industry and transportation industries are seeing rapid growth with IoT. This work aims in structuring a state of the art review on IoT. The technology, history and applications have been discussed briefly along with various statistics. Since most of the process is done through the internet we must have an active high speed internet connection. The technology can be simply explained as a connection between human computers-things. All the equipment's we use in our day to day life can be controlled and monitored using the IoT. A majority of process is done with the help of sensors in IoT. Sensors are deployed everywhere and these sensors convert raw physical data into digital signals and transmits them to its control center. By this way we can monitor environment changes remotely from any part of the world via internet. These systems architecture would be based on context of operations and processes in real-time scenarios.

Things(Embedded devices) that are connected to Internet and sometimes these devices can be controlled from the internet is commonly called as Internet of Things. In our system, the Smart dust bins are connected to the internet to get the real time information of the smart dustbins. In the recent years, there was a rapid growth in population which leads to more waste disposal. So a proper waste management system is necessary to avoid spreading some deadly diseases. Managing the smart bins by monitoring the status of it and accordingly taking the decision. There are multiple dustbins are located throughout the city or the Campus (Educational Institutions, Companies, Hospitals etc.). These dustbins are interfaced with micro controller based system with ultrasonic Sensor, fire sensor and wi-fi module. Where the ultrasonic sensor detects the level of the dust in dustbin and sends the signals to micro controller the same signal are encoded and send through Wi-Fi at the Central System and an Internet connection is enabled through a LAN cable from the modem. The data has been received, analyzed and processed in the cloud, which

displays the status of the Garbage in the dustbin on the GUI on the web browser.

II. LITERATURE SURVEY

Solid waste management is one amongst the major side that needs to be thought of in terms of constructing a geographical region atmosphere healthier. The common dustbins placed by the municipal corporation and leading no. of health, environmental and social issues. Various causes are there like improper trash can placement in town, the improper system of aggregation waste by town Corporation, and additional specifically folks don't seem to be aware enough to use dustbins in a proper way. These varied major causes are leading serious issues like Associate in Nursing unsanitary condition, pollution, and unhealthy atmosphere making health sickness. Up until currently, analysis has been applied by developing a software package Applications for indicating trash can standing, another by Shortest path technique for garbage aggregation vehicles by desegregation RFID, GSM, GIS system; however no any active efforts have been taken being attentive towards managing such waste in the atomized method. Considering of these major factors, a sensible solid waste management system is intended that may check to stand and provides an alert of trash can fullness and additional considerable system incorporates a feature to literate folks to use a trash can properly and to mechanically sense and clean garbage gift outside the trash can. Thus given resolution achieves sensible solid waste management satisfying goal of constructing Indian cities clean, healthy and hygienical.[1]

Waste assortment services, today, area unit exhausted and unable in touch the burden of rising cities. It is one of the biggest on-going challenges, being faced by developing economies, where a large variety of goods ranging from cars to metal and hardware end up in inadequately managed and uncontrolled dumpsites, spreading diseases and increasing pollution. However, most of these plans have been able to manage waste once it has already been created. We, therefore, propose a system through a mobile application associated with a Smart Trash Bin. The main aim of this application is to reduce human resources and efforts along with the enhancements of a smart city vision. At regular intervals, dustbin will be squashed. Once these smart bins are implemented on a large scale, by replacing our traditional bins present today, waste can be managed efficiently as it avoids unnecessary lumping of wastes on the roadside. Breeding of insects and mosquitoes will produce nuisance around promoting unclean setting. This may even cause dreadful diseases. [2]

The increase in population has a light-emitting diode to tremendous degradation within the state of affairs of hygiene with regard to waste management system. The spill over of waste in civic areas generates the polluted condition in the neighboring areas. It may worsen varied severe diseases for the near folks. This will injure the appraisal of the affected space. For eliminating or mitigating the garbage's and maintains the cleanness, it requires „smartness based waste management system. This paper is planned IOT based mostly good waste clean management system that checks the waste level over the dustbins by victimization detector systems. Once it detected like a shot this method altered to concern licensed through GSM/GPRS. For this method used Microcontroller as AN interface between the detector system and the GSM/GPRS system. To monitor and integrate a golem application is developed for the specified info that is expounded to the varied level of waste in several locations. This has ensured the green within the atmosphere and support for swachh Bharat for cleanness. [3]

Solid waste generated is an associate ever growing drawback at native regions or at international levels. There is proper disposal of solid wastes pollute all the components of the green environment (i.e., air, land, and water) at regional and global levels. Since there is a rapid increase in producing or consumptions, the quantity of wastes generated by urban society has increased. The problem is more faced in developing countries than in developed countries, as economic growth, as well as urbanization, is more rapid. The continuous flow of garbage in all places where public people move around creates unhygienic situations. It may invoke several injurious diseases among nearby people. To avoid such a state of affairs and to enhance the improvement, „smart waste management system‟ is projected. In the proposed system, the completeness of waste in the dustbins is checked with the help of Sensors used in the system, and the information is sent to the required control room

through GSM/GPRS system. The microcontroller is used to communicate the sensor system with the GSM system. An android application is been designed to monitor the information related to the waste for different selected locations. Through this, the collection of the garbage can be made efficiently.[4]

Ubiquitous objects have gotten "smarter" and additional "connected", every day. With this ever-growing web of Things, each object will currently be unambiguously known and created to speak with one another. This approach has been applied to dustbins too, to watch garbage pickup, throwing lightweight on various valuable insights. Our project too employs an identical approach, to not solely monitor garbage pickup however conjointly optimizes it, exploitation machine learning. The tactic of unsupervised learning we have a tendency to utilize is K means that cluster, widely employed in data processing and analytics. Our physical device uses associate degree supersonic sensing element to bear in mind of a dustbin's current content level. If the amount reaches or exceeds a threshold share of the entire capability of the bin, it informs our servers, via a web application programming interface (API) developed for this purpose. The API conjointly stores connected knowledge - fill time, cleanup time, and placement, to call some. This dynamic dataset generated is analyzed by our algorithmic program, to work out the days of the day, once a daily cleanup ought to be performed, specified the dustbins are clean, for the most potential portion of the day. The algorithmic program conjointly shows the locations, wherever another bin ought to be put in, for any optimization. This is often known by inspecting every cluster severally and scanning out - things that are the furthest removed from its highest centroid; and multiple things associated with an equivalent bin. In either case, a replacement bin installation is suggested at such locations.[5]

III. PROPOSED SYSTEM

The implemented design of the system is used to monitor garbage level of dustbins. The main aim of the project is to effectively perform the internet data acquisition process and using the Arduino Mega accurately. This system monitors the garbage bins to detect the garbage level and compare it with the garbage bins depth and informs the level of total garbage collected in the garbage bins to the monitoring person at the different place. The one of the main aim of this system is to stop overflow of garbage in dustbins which can be achieved by managing the time of garbage collection. For this the system uses ultrasonic sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth.

This project could be a lead taken towards clean environment. Arduino Mega microcontroller is used in this monitoring system. A 16*2 LCD is used at the dustbins to display the garbage levels. Ultrasonic sensors HC-SR04 are used to detect the garbage level of dustbins in different regions. Fire sensors are used in the system to detect the fire in dustbin if any. Also a temperature sensor and a gas sensor are also used to detect the smoke and to measure the temperature in the dustbin due to any reason. A power supply circuit is used for supplying power the circuit. Crystal oscillator is used for applying pulses to trigger the process of level detection in the system.

IV. CONCLUSION

In this paper, we survey the research work done by different authors to develop a smart intelligent garbage alert system for a proper garbage management. Our survey identifies issues occurred while implementation of various garbage management systems implemented in past. This paper proposes a smart alert system for garbage clearance by giving an alert signal to the municipal web server for instant cleaning of dustbin with proper verification based on level of garbage filling. Our proposed system tries to provide solutions to all these issues. Finally we plan to implement the proposed system for waste carrier management using smart dustbins.

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