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IMPLEMENTATION OF SMART WASTE DISPOSAL MANAGEMENT SYSTEM USING ZIGBEE

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ABSTRACT

A major concern in the urban communities is that of waste administration as there is fast development in rate of urbanization. With the development of urban communities, the waste created also increases likewise. A considerable lot of the world's developing urban areas are still lagging in the region of waste administration, specifically, the gathering of waste inside the urban communities. Along these lines, trash tends to heap up in specific zones. This framework will enable the city specialists to better deal with their assets in the accumulation of trash and give a stage that will consider a productive waste gathering framework.

Keywords: *Atmega 328 micro controller, Arduino uno, GSM SIM800 module, UDM sensor, Zigbee.*

I. INTRODUCTION

As the total population develops at a fast rhythm, progressively more waste is created each day and waste administration turns into a more noteworthy matter of significance. Of interesting importance is gathering of waste from city. Research has demonstrated that solid waste accumulation and transport gave by a town to its occupants takes up more than 70% of the city garbage control spending plan in developing worldwide areas, and up to 60% in cutting edge countries. This now not just exhausts the gathering of its value go in a solitary locale, however also lessens the sources that can be spent in different segments of waste administration, for example, reusing vegetation and so on. According to the sources utilized, it has moreover been demonstrated that deficient or wasteful gathering approaches likewise result in unwanted and in a couple of examples unsanitary circumstances that represent a hazard to the people living nearby. Such dangers are provided inside the type of overloaded junk pressing holders and foul smells. It ended up distinguished that the monstrous number of assets utilized is generally because of the deficiency of making arrangements, data on the accumulation, and repulsive foundation.

This paper gives an outline of waste administration methodologies and making life simple for regular folks.Next section deals with Problem statement. Implementation results are given in section IV. Result and discussion is shown in section V. Conclusion & future work is depicted in section VI.

II. RELATED WORK

The proposed framework is one that gives numerous valuable capacities to any city that needs to streamline its trash gathering way notwithstanding diminish the general charge of running the accumulation. This not just basically offers the city's municipal corporation the capacity to manage their waste better, yet in addition, also offers them the capacity to anticipate and design better their benefits and assets.

This section discusses about the existing approaches in the field of smart waste management.

Insung Hong et.Al [1] has recommended that replacing SGS(Smart Garbage Sensor) as opposed to RFID garbage collection system helps to improve their energy efficiency as much as 16% and can lessen the food waste reduction. Inside the SGS they have mounted SGBs(Smart Garbage Bins) to manipulate the energy efficiency of the system.

Dario Bonino et.al [2] has recommended that it gives end-to-end security and protection that is based upon dynamic organization smart city platform. Its advantages is that it has great steadfastness and has flexibility on disappointment of a framework over a specific month. It centers around the accumulation of wastages and achievement of ontology technique.

Alvaro Lozano Murciegoet.al [3] has recommended that to gather the dustbins that are been filled utilizing a truck. The principle advantage is that it diminishes the fuel cost of the trucks instead of traveling a long distance it makes the way more straightforward and simpler to reach the dustbin utilizing route optimization.

TheodorosAnagnostopoulos et.al [4] has proposed that it first begins with a presumption that the brilliant city must incorporate the IoT base. It utilizes dynamic booking. It depends on the way that the waste will be gathered just when it is completely filled or the most extreme limits of the dustbins are filled.

Ala Al-Fuqaha et.al [5] has suggested that portray of the IoT with a weight on innovation, application and convention concern. It clarifies about the contrasts amongst IoT and creating innovations like distributed computing and data analytics.

Jose M. Gutierrez et.al [6] has suggested the useful smart city and the utilization of a keen waste administration .It utilizes IoT for detecting the wastage level in the dustbins, forms the information and sends it to the server for putting away and process the information. The procedure is done by the Geographical Information framework.

III. BACKGROUND

The revealed generation of Municipal garbage in the State of Himachal Pradesh was assessed to be 304.3 TPD in 2011 (CPCB, 2012). The per capita garbage generation rate in Himachal Pradesh is around 0.413 kg/day. It is in like manner surveyed that 60% of the garbage ends up in landfills. Disposing of waste in an informal way influences hazardous condition at the transfer to site which prompts the unrestrained release of toxic gases which are ozone hurting substances like methane. The total GHG radiations from squander area in Himachal

Pradesh is assessed at 6.129 tons of equivalent CO2 (Department of Science and Technology, GoHP, 2012). The sewage treatment confine in Class I urban communities of Himachal Pradesh is 35.63 MLD and the authentic

sewage generation rate is of 28.94 MLD (CPCB, 2009). The state makes 42147 MTA of hazardous waste out of which 84.27% is landfillable , 5.33% is burnable and 10.39% is reusable (CPCB, 2009). This paper, be that as it may, significantly centers around the issues identified with the metropolitan waste administration.

The number of inhabitants in Himachal Pradesh is required to climb in the years to come as is the generation of garbage. The urban masses in 2011 and the garbage generation rate in were used to infer the per capita garbage generation in H.P. Total of garbage collected is presented in Table 1 beneath.

Table1: Estimated waste generation in Himachal Pradesh

Year	Per capita waste generated(Kg/day)	Urban Population (x1000)	Waste generated (T/day)
2011	.413	735.3369	304.2
2021	.472	883.3212	416.6
2031	.538	1023.429	550.9
2041	.614	1155.249	709.6

The step by step garbage produced in the territory of Himachal Pradesh is depended upon to climb by pretty much 133% by 2041. Quantum of waste generated is recently foreseen that would assemble, which will expect a crisis for the urban close-by bodies in the State.

IV. EXPERIMENTAL SETUP

In this project we have two sides Transmitter side and Receiver side. In the transmitter side we have moving robot which represent the garbage truck. UDM sensor is placed in between area1 and area2. When robot moves from area1 to area2, UDM sensor senses and gives information to GSM and LCD display at receiver side. We used two zigbee to send the data in the form of radio waves. From UDM sensor the information will go to GSM module. We have used GSM SIM800 module. It will send the information as messages to mobile phones about the fill level of garbage truck. We used DC motors to run the robot. We used two Arduino Uno Boards to dump the program. One is at transmitter side and another is at receiver side. The two Arduino Boards is connected to PC(Laptops) through cables. The LCD display shows the information as same as messages from GSM.

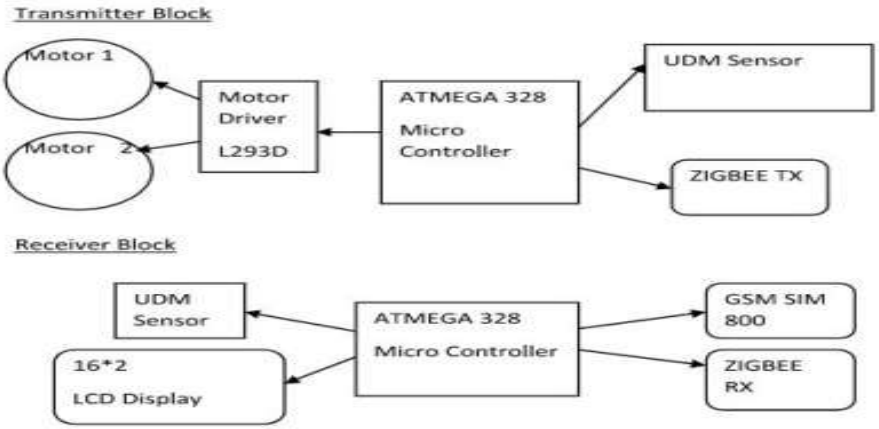

Fig1: Block Diagram

Fig2: Experimental setup

V. RESULTS & DISCUSSION

The snapshot shown below informs the location of garbage truck. It also gives data about the filled level of storage capacity in the garbage truck vehicle. The above information is sent to the service agency phone number with minimal delay in the SMS reception successively an action will be appropriated by the authority.

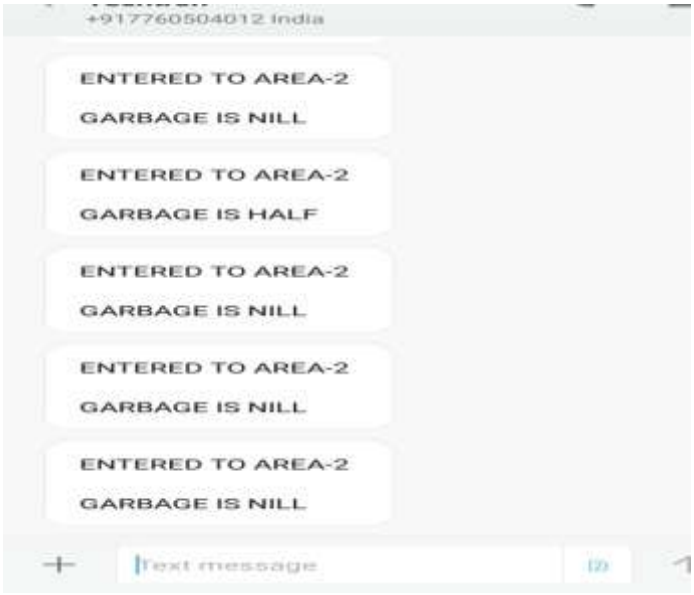

Fig3: Output of filled storage area and location

VI. CONCLUSION & FUTURE WORK

Hence, we tend to conclude that, by implementing this project we will give information regarding the location GCV(Garbage Collector Vehicle) and its filled level of storage to civilians. The civilians doesn't have to dump the waste in bins and take the odour for weeks before the authorities come to collect it. It does not produce any user inconvenience caused by advanced discharge method and odour nuisance. All that people have to do is dump the waste in garbage truck at a time by looking at the message where all information will be included about arrival and its filled area. In future we can implement the system using IOT technology. Civilians can get the information anywhere just by having internet connection and get the best experience.

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