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SMART GARBAGE MONITORING SYSTEM USING IOT

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Abstract - *Waste management is one of the main problems that India is facing irrespective of the case of under development states or developed states. Urbanization and growth in population has increased tremendously. At the same phase there is an increase in waste generation also. Waste management is an important issue to be considered. Many of the cities are still lacking a proper waste management system particularly the waste collection within the cities.*

Time to time collection of waste from apartments and housing societies is an important factor in order to avoid pollution, piling of garbage in certain areas which may lead to an unhealthy environment and deadly diseases.

This project proposes smart garbage collection system using IOT in order to collect the garbage from the apartments and housing societies so as to avoid irresponsible dumping of garbage on the roadside or nearby areas. In the current scenario there is no proper schedule of garbage collection. The garbage collecting vehicle does not arrive or follow a specific schedule, because of which people dump garbage anywhere. In this project using GSM, GPS the concerned person (the waste analyzer) shall be informed through SMS that the garbage collecting vehicle will be arriving within sometime at their place, so to be prepared with the garbage that they want to dump. By this waste can be managed efficiently as it avoids unnecessary dumping of the waste on the roadside.

Key Words: Urbanization, Apartments, IOT, GSM, GPS.

1. INTRODUCTION

As the population is growing at a fast pace, waste is being produced at a higher rate and waste management becomes more crucial. Collection of waste from apartments, housing societies is of particular importance. If time to time collection of waste is not done, people tend to dump the garbage near the roadside or some isolated area in order to get rid of the garbage. As time lapses, pile of garbage is formed, polluting the nearby area. This piled up waste can cause air and land pollution, sometimes can cause water pollution also. Rotting garbage is also known to produce harmful gases that mix with the air and can cause foul smell and can lead to many air borne and water borne diseases.
Keeping all these factors in mind, proper waste collection system is implemented. In the proposed system, the residents or waste analyzer of a particular area will be informed before the arrival of garbage collecting vehicle. They can dump the garbage in that particular vehicle. They do not have to dump it anywhere on the roadside in order to get rid of it.
If proper collection is done, the segregation and handling of waste can be done more effectively. Garbage collection is important for protection of environment also. It helps in conserving the natural beauty and landscapes.

2. AIM & OBJECTIVE

Aim:

To design a proper waste management system which will be able to efficiently collect the waste.

Objective:

To protect the health, well-being of people and environment by providing a proper waste collection system. The system (garbage collecting vehicle) will send SMS using GSM module and GPS to the concerned person about its arrival. The system informs them before that the vehicle is going to arrive at their place in sometime so accumulate all the waste at one place which they want to dump.

3. LITERATURE SURVEY

Very less work is done in the field of garbage collection. In the current system, when the garbage collecting vehicle arrives to a particular area, it plays some specific music to inform the residents that the vehicle has arrived.
This system is not proper as the time when the residents collect all the waste from their house, pack it and comes to dump it in the vehicle, the vehicle would have left already. The vehicle waits for some specific time only.
The following research papers describe the earlier work done in the design and development of smart waste management system.

[1] Narayan Sharma, Nirman Singha, Tanmoy Dutta, "Smart Bin Implementation for Smart Cities".
The proposed smart bin will be sending data about the levels of the garbage bin. When the level reaches the threshold i.e. the bin gets full, SMS is sent to the authority about the status of the bin. Then the garbage collecting vehicle is sent to that location to collect the garbage & empty the bin.

[2] Namakambo Muyunda, Muhammad Ibrahim, "Arduino – based Smart Garbage Monitoring System".
The proposed system monitors the state i.e. level of the dustbin using various sensors and stores it in the central database. It alerts the authorities about the status of the bin in a given area. Then the system provides the route planning to collect all the filled bins.

4. BLOCK DIAGRAM

This section contains the design/ block diagram of the components used in the project.

Transmitter Side:

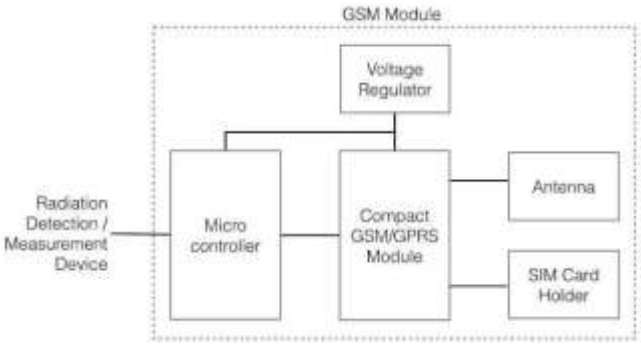

Figure 1: Block diagram of GSM Module

Receiver Side:

Figure 2: Receiver unit

4.1 Flow of Working Process

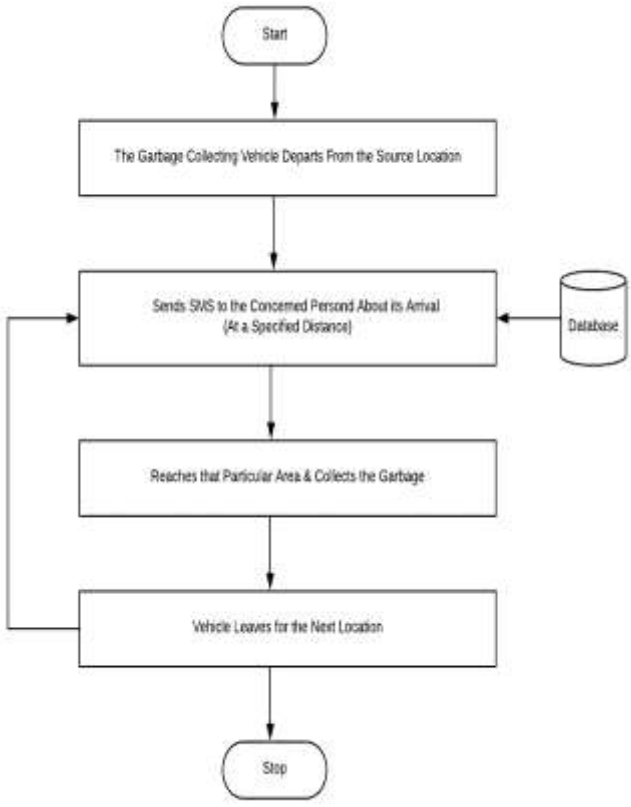

Figure 3: Working process

5. METHODOLOGY

The system comprises of micro-controller, GSM module and GPS. All these are connected and implemented using the concepts of IOT. GSM module is a circuit which is used to establish communication between a mobile device and a GSM system. It will be mounted on the garbage collecting vehicle. When the garbage collecting vehicle is about to reach (at a specified distance) a particular area, the GSM module will send SMS to the concerned people of that area. It will send SMS to them only, who have registered with the waste collection system. It sends the SMS saying the vehicle will arrive at their place in sometime. The vehicle reaches that area and garbage is collected from that area. At the same time, the apartments, housing societies which are located in next specified distance will be sent SMS that the garbage collecting vehicle will arrive soon. Within the time, the waste analyzers or the residents can accumulate all the waste at the gate so that when the vehicle arrives, the garbage collection task is completed easily and less time is consumed by the vehicle waiting for the waste analyzers to gather garbage at the gate.

6. CONCLUSION

The developed system provides useful features for any city which wants to optimize its waste collection process as well as prevent people from dumping garbage anywhere. This gives the city's waste management authorities the ability to handle the system properly and also ability to predict and plan their resources in a better way. In addition, the system will mitigate the risk of piling up of garbage and unsanitary conditions that are caused due to irresponsible dumping of garbage and irregular, improper collection process which is present currently.

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