International Journal of Applied and Advanced Scientific Research (IJAASR)
Impact Factor: 5.655, ISSN (Online): 2456 - 3080
(www.dvpublication.com) Volume 8, Issue 1, 2023

SMART BIN FOR WASTE MANAGEMENT SYSTEM

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Cite This Article: G. Kiran Kumar, K. Pavani, P. Venkata Sai Karthik, P. Charan & K. Sarath, "Smart Bin for Waste Management System", International Journal of Applied and Advanced Scientific Research, Volume 8, Issue 1, Page Number 36-38, 2023.

Abstract:

This paper, titled "Smart Bin for Waste Management System," is crucial. A strong domain must be in good health and upbeat atmosphere. Environments that are clean and sanitary are essential for human habitation. The goal of Smart Bin is to create a profitable and flexible trash management system. In public areas, trash cans are being inundated as the garbage flows out, contaminating the area. As a large number of bugs breed on it, this also increases the frequency of diseases. In order to track garbage production, construct an automated waste disposal system, and detect rain, a smart bin was created. The results showed that the detection system is clever and practical, and can be used to automate any solid waste.

Key Words: Wi-Fi, DC, IR, Waste Bins

Introduction:

Trash management is an activity that takes place in a remarkable variety of locations. A moderate percentage of waste may be found in every environment that is under human influence. Waste management is a crucial requirement for naturally sustainable progress in many countries. The use of garbage containers for waste build up is a common approach for strong waste transmission. Without being aware of the receptacle status, the waste administration team must identify themselves in person at each trash collection location. There are two possible outcomes in this situation: either there is no tragedy for the social occasion or the container has over flew.

Related Work:

The use of smart rubbish bins is an eccentric concept. Using IR sensors, US sensors, motors, and GSM for real-time data sharing, we are able to develop smart garbage cans. We read and looked through a number of publications that discuss the idea of smart bins. At the beginning, they gave us a briefing on the many approaches that had been suggested for scraping and managing garbage in various research articles. Publication [1] provided information on the various approaches. In this study, a different method was provided and actualized for the Smart City's ideal outstanding waste management achieved using IoT [3], The Top-k question and the dynamic planning concept needed for occasional dustbin cleaning led us to need-based cleaning of bins. Using GSM technology, the City Waste Collection Indicator [4]. Using US Sensors and GSM, it can identify dustbin fills and alert the professionals. As it sends all of the alarms to the same person, there is no efficient ready structure accessible.

Design:

This study suggests a prototype system that would enable waste monitoring staff to prompt waste collection by alerting them when the fill level or acceptable gas emission standards are exceeded. By ensuring that collections take place only when necessary, overfilling is minimised, and collection expenses are decreased, the suggested method can assist in increasing productivity. Moreover, it contains a gas sensor to identify dangerous gases and warn adjacent persons through a buzzer. The bin automatically closes when an IR sensor detects person even the bin was filled. The Arduino microcontroller is employed in this system.. Moreover, By using the gsm 800I module it can send messages such as bin was filled and the location of the bin and at the same, time GPS module was used to provide the precise location of the bin.

Figure 1: Prototype

As is frequently seen, trash cans are overflew, concerned parties are not promptly informed, and a foul odour results from the garbage that has been dispersed around the area. Certain damaging illnesses may spread successfully in a specific area as a result of the unhygienic conditions. The current system monitors compartment dimensions and sends an SMS to the appropriate expert for trash cleaning. It isn't engaging and has several obstacles, making it less effective and tiresome as it progresses. Very expensive; unclean environment; infection causing odour from rubbish; increased traffic and clatter around the vehicle used to clean the container.

Figure 2

Implementation:

Urbanization has dramatically risen in the modern world. There is an increase in garbage output at the same time. Waste management has been an important topic to think about. This study offers an alternative strategy for advancing the cause. In this study, a smart bin is constructed using an Arduino - Uno board, a microcontroller-based platform, and an ultrasonic sensor. As smart Dustbins are maintained in real time, it will stop dustbins along roadsides and in neighborhoods from overflowing. The garbage can be swiftly controlled to its efficient level once these smart bins are introduced on a big scale by replacing the regular dumpsters since it prevents the wasteful lumping of wastes on the roadside.

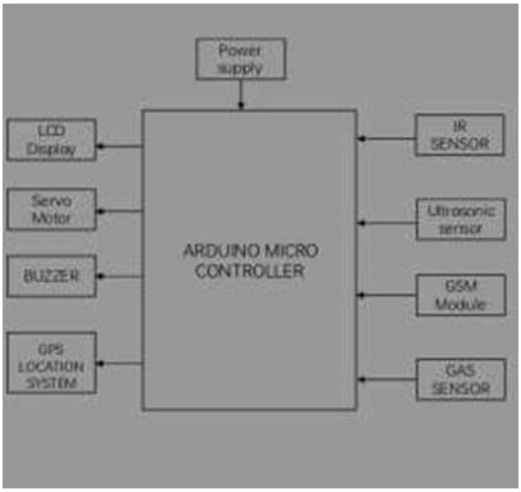

Figure 3: Visualization

These decaying wastes' foul odor, which has persisted for the system's fundamental functionality. By measuring the distance between the bin's lid and the garbage using a sensor, the fullness condition of the bin is ascertained. The bin dimensions will be used to determine a distance threshold. A microcontroller board will direct a GSM module to send an SMS alert with the bin ID and the alert message to a predetermined phone number when the distance measuring sensor shows that the trash can is full. A sanitation worker has

predetermined the position of the bin, and will locate the filled bin using its ID as obtained from the SMS alert. When the sanitary worker empties the bin, the system will resume its default state.

Result and Discussion:

When it detects motion, the dustbin may use a servo motor to open the lid. The dustbin's ultrasonic sensor is providing information about the rubbish that is there. Every time the garbage exceeds the threshold value, the status is passed to the local authorities. The intended application benefits include establishing a clean, green atmosphere free of the foul stench of wastes, which creates a healthy environment and maintains cities' attractiveness. The real-time monitoring of the dustbin status to prevent insect infestation and the spread of diseases brought on by the decomposition of the accumulation of waste, the reduction of the need for human labor to handle the garbage by limiting the frequency of garbage collection to only when the dustbins are full, which will save time and money, the improvement of resource management to advance the development of the smart city, and the reduction in traffic flow as a result of less waste collection. The application's prediction component increases the effectiveness of the waste management system, which can give useful information based on sensor data, such as an estimation of the fullness of the trash can. If the prediction algorithm in this application is enhanced and utilized with different types of actual data, such as population growth, it will be possible to forecast urban development.

Conclusion:

The "Smart Event Management Waste Bin" was created to help the event management crew, which is mostly made up of students and cleaners, boost the effectiveness of clearing our already-filled trash cans. In addition, it is primarily intended to avoid overfilling of trash cans, which has frequently happened at several events. The prototype was able to perform as expected thanks to the results of the user acceptability testing, with an overall success rate of 80% among the users. Finally, the majority of users who provided input agreed that the "Smart Event Management Waste Bin" prototype can prevent trash bins from being overfilled and can keep an eye on them while an event is going on an occasion. As a result, all of the goals outlined in this report have been accomplished.

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