IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

# Smart Waste Management System for Hygiene Environment

**Chandru R[1], Dhayabaran B[2], Dinesh R[3], Gokul T[4], S. C. Prasanna[5]**
Students, Department of Electronics and Communication Engineering[1,2,3,4]
Assistant Professor, Department of Medical Electronics[5]
SRM Valliammai Engineering College, Chengalpattu, Tamil Nadu, India

**Abstract:** *Waste management is one of the serious challengesof the cities .The system now used in cities, continueto use an old and outmoded paradigm. Spilled waste containers giving off irritating smell causing serious health issues and atmosphere impairment. The Smart Waste Management System will simplify the existing serious scenarios. The Main objectiveof the project is to acquire user informationregarding garbage disposal. Here we introduced Loyalty card Tracking system which the process where the information of the Registered user canbe displayed through the php. Loyalty card is accessed by the RFID scanner .Through this process we can obtained details of registered user like Name, Mail id, Phone number, Gender. This willsurely fetch a solution for the persons who handle our living environment without public care. Sorting of waste properly will help us to reuse and produce sufficient profit for the society.*

**Keywords:** Waste Management.

## I. INTRODUCTION

Waste management is one of the serious challenges of the cities .The System now used in cities, continue to use an old and outmoded paradigm. Spilled waste containers giving off irritating smell causing serious health issues . And atmosphere impairment. The Smart Waste Management System will Simplify the existing serious scenarios. The Main objective of the project is to Acquire user information regarding garbage disposal. Here we introduced Loyalty card Tracking system which the process where the information of the Registered user can be displayed through the php . Loyalty card is accessed by the RFID scanner. Through this process we can obtained details of registered User like Name, Mail id, Phone number, Gender. This will surely fetch a solution For the persons who handle our living environment without public care. Sorting Of waste properly will help us to reuse and produce sufficient profit for the Society.

## II. LITERATURE REVIEW

[1] Sustainable Waste Management Model Rishabh Jain, Shreya Garg, Tarushi Agrawal, Saurabh Gangal, Indu Chawla, Shikha Jain. Waste Management; Clustering; Scrape Yard; Vehicle Routing; Budget Handling. The waste collection route is searched among all possible paths available in minimum amount of time.

[2] "Waste Management Improvement in Cities using IoT "Shivam Jagtap, Aditya Gandhi, Raviraj Bocha Re , Ashwinkumar Patil, Ajitkumar Shitole Feb 28-29, 2020. IoT, Segregation, Garbage Collection, Sensors, Waste Monitoring and Management. This system will save money and time compared to the already available process.

[3] "Garbage Management System"- Geethamani R, Rakshana P, Raveena P, Ragavi R June 30,2021. Administrator, Database, Waste Management, Garbage Collectors, Trash, webpage. It provides the best routes for garbage collectors, distributors, and stores the data in the database for future reference.

[4] "Smart Waste Management System using IOT"- Tejashree Kadus, Pawankumar Nirmal, Kartikee Kulkarn April-2020 Loadcell, IOT, load sensing plate, Arduino, Wi-Fi, Internet Assure clean environment ,good health,and pollution free society.

[5] "Smart Solid Waste Management" - Ravi Kishore Kodali and Venkata Sundeep Kumar Gorantla 2017.Smart Cities, Solid Waste Management, IoT Integration. Spread of civic sense, clear understanding and acknowledgment over the idea of waste segregation.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

[6] "Waste Management System Using IoT" Mohammed Adam, Omer Mohammed Tawfeeq, Bakri Nasreldeen, Mohammed Elnour Okasha, Mohammed Awad Margan September 02,2020.wireless sensor network, internet of things, waste management, smart bin. Determine the optimized distribution of the containers.
[7] "Eco-Friendly IOT Based Waste Segregation and Management" - Rohit K, Soundarya S Lokeshwari, Santhosh Kumar B R, Varalakshmi N, Manjunath 2017.Segregation,Recycling, Rapid industrialization, Different segments, Sensors, Unhealthy atmosphere, Sensors, Improper waste management. Waste collection and segregation at domestic level based on their nature of composition.

## III. Proposed System

Today, waste management from its inception toits disposal is one of the important challenges for the municipal corporations in all over the world. Dust bins placed across cities set at open places are flooding because of increment in the waste each day and making unhygienic condition for the citizens, to maintain a strategic distance from such a circumstance a wireless garbage management system for Smart cities which allows municipal corporations to monitor status of dustbins remotely over wireless. Spilled waste containers giving off irritating smells causing serious health issues and atmospheric impairment. In our proposed system we have introduced Loyalty card Tracking System which will acquire the user information regarding the garbage disposal.

This will surely fetch a solution for the persons who handle our living environment without public care. Sorting of waste properly will help us to reuse and produce sufficient profit for the society.

Loyalty card is accessed by the RFID scanner .Through this process we can obtain the details of registered user like Name, Mail id, Phone number, Gender. This will surely fetch a solution for the persons who handle our living environment without public care. The whole proposed system works under two modules

- Data Acquisition
- Data Analysis

The Connections in the PCB board are split up into two Segment. They are ESP8266NodeMCU1 and ESP8266NodeMCU 2. The First Segment deals with level sensor, DHT 11 sensor ( Temperature and Humidity Sensor) and blynk webserver. The Second segment deals with MRF RC522 Scanner, MySQL, phpMyAdmin along with local server IP.

In First segment, the level sensor will recognise or identify the solid waste loaded in the bin and this covers a range from minimum 2cm to maximum 100m. The function of DHT - 11 sensor monitors the temperature and humidity of the bin and this prevents the fire accidents by providing messages. The output can displayed in the blynk application.

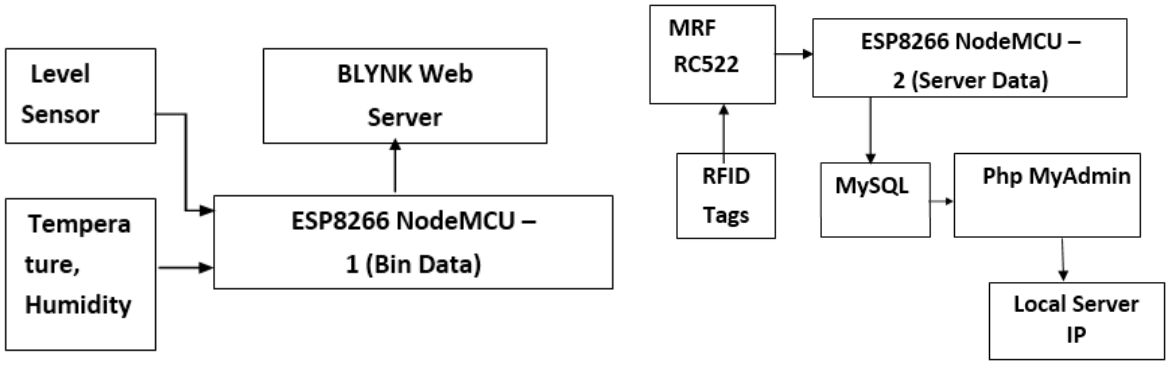


**Figure 1:** Block diagram of proposed system

In Second segment, all the registered user will be provided with a RFID tag. When the tag is brought in front of MRF RC522 scanner, the transmission between them is wireless. The process happens by the principle of Tesla. The Scanned data is sent to cloud server and the data is stored in SQL through phpMyAdmin by the local server. The database contains name, id, gender, email-id, mobile number.

## IV. Methodology

### 4.1 Data Acquisition Module

1. Data are collected from the garbage via the sensors and send to WEB Server through ESP8266 WI-Fi Module.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

2. The data collected are aggregate to the server point wirelessly.
3. A cloud is used to store the information of the users and it is made secure.

### 4.2 Data Analysis Module

1. The results collected are processed and analyzed.
2. According to the usage and collection units if there is some anomalous changes or peek dump. The emergency state is declared and notified to the web applications.
3. Analysis of a different waste management options allows decision makers to use different instruments to consider more acceptable options and make decisions about the optimal option to satisfy their specific needs.
4. Large amount of container specific weighing data is utilized as the basis of the analytics.

### 4.3 Advantages

1. The proposed system offers remote monitoring of the real time bin status data from two sensing systems: waste filled level sensing, weights ensing.
2. Harmful disease is reduced.

## V. IMPLEMENTATION

In this paper, we use ESP8266 MCU unit to access the bins. It consists of two nodes. The ESP8266 NodeMCU1 and ESP8266 NodeMCU2. The NodeMCU1 consists of ultrasonic sensor, temperature and humidity sensor (DHT- 11). The NodeMCU2 consists of MRF RC522 Scanner. It is embedded with MySQL.

**Figure 2:** Bin with Level sensor


**Figure 3:** Blynk output of Level sensor

The ultrasonic sensor passes the infra-red lights and can measure the level of the bins. The temperature and humidity acts as a safety tool monitoring the fire actions. The output of this operation is displayed in the blynk webserver. The NodeMCU 2 that consists of MRF RC522 acts as scanner. The registered users are provided with RFID tags. When a registered user uses the bin with RFID tag the data of the user is obtained through MySQL and displayed in phpMyAdmin.

## VI. RESULTS AND DISCUSSION

### 6.1 Level Measurement

The amount of solid waste stored is found by the HC SR04 Ultrasonic sensor of the solid in a container or vessel using a level sensor. The DHT 11 sensor monitors temperature and humidity inside the bin and this prevents the fire accidents by alerting message .The output will be viewed in blynk application.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

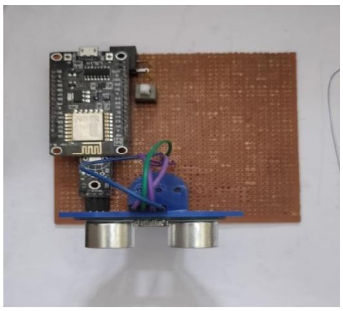

**Figure 4:** Level Measurement

### 6.2 Second Node MCU with RFID Scanner

In this second segment, the ESP8266 microcontroller is connected with RFID scanner.

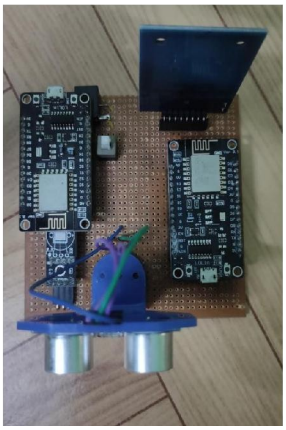

**Figure 5:** MCU with RFID scanner

- If a person want to use the bin, initially he/she has to display the Loyalty card infront of the RFID scanner.
- So it will grasp the information of the registered user in the municipal and that fledged database will be displayed in the system display through php.

### 6.3 Interfaces of Output in the Server

The fetched data is now displayed are interfaces of webpage which displayed on the system display.
Some of figures are shown below.
Figure 6 provides the information about the registration form where the user can register.
Figure 7 it gives details about user data who used the bin by Loyalty cards.
Figure 8 are the sample database of registered users.

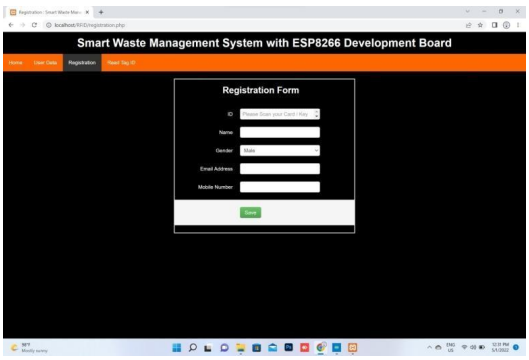


**Fig 6** Registration form

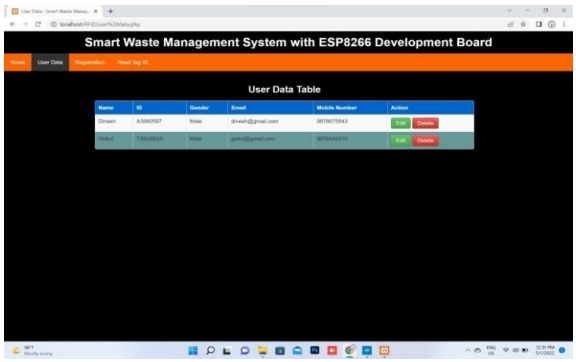


**Fig 7** User Data

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

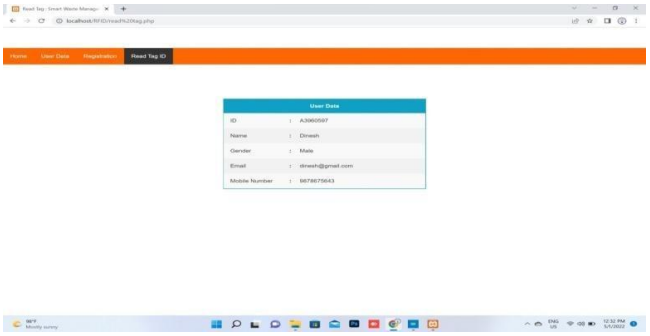

**Fig 8** Registered User

## VII. CONCLUSION

The smart waste management System has been done with the NodeMCU 8266 Micro controller and with the supported peripherals. The output has been demonstrated and displayed in the Display System of the Php interface.

## REFERENCES

**[1].** Sustainable Waste Management Model Rishabh Jain, Shreya Garg, Tarushi Agrawal, Saurabh Gangal, Indu Chawla, Shikha Jain. Waste Management; Clustering; Scrape Yard; Vehicle Routing; Budget Handling. The waste collection route is searched among all possible paths available in minimum amount of time.

**[2].** "Waste Management Improvement in Cities using IoT "Shivam Jagtap,Aditya Gandhi, Raviraj Bochare, Ashwinkumar Patil ,Ajitkumar Shitole Feb 28-29, 2020. IoT, Segregation, Garbage Collection, Sensors, Waste Monitoring and Management. This system will save money and time compared to the already available process.

**[3].** Garbage Management System" Geethamani R, Rakshana P,Raveena P, Ragavi R June30,2021. Administrator, Database, Waste Management, Garbage Collectors, Trash, webpage. Provides thebest routes distributors, and stores the data in the database for future reference.

**[4].** "Smart Waste Management System using IOT"- Tejashree Kadus, Pawankumar Nirmal, KartikeeKulkarn April-2020 Loadcell, IOT, load sensing plate, Arduino, Wi-Fi, Internet. assure clean environment, good health,and pollution free society.

**[5].** "Smart Solid Waste Management" - Ravi Kishore Kodali and Venkata Sundeep Kumar Gorantla 2017.Smart Cities, Solid Waste Management, IoT Integration. Spread of civic sense, clear understanding and acknowledgment over the idea of waste segregation.

**[6].** "Waste Management System Using IoT" - Mohammed Adam, Omer Mohammed Tawfeeq, Bakri Nasreldeen, Mohammed ElnourOkasha, Mohammed Awad Margan September 02,2020. wireless sensor network, internet of things, waste management, smart bin. Determine the optimized distribution of the containers.

**[7].** "Eco-Friendly IOT Based Waste Segregation and Management" - Rohit K, Soundarya S Lokeshwari, Santhosh Kumar B R, Varalakshmi N, Manjunath 2017. Segregation, Recycling, Rapid industrialization, Different segments, Sensors, Unhealthy atmosphere, Sensors, Improper waste management. Waste collection and segregation at domestic level based on their nature of composition.