



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 10, Issue 2, February 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.542



9940 572 462



6381 907 438



ijircce@gmail.com



www.ijircce.com

Smart Waste Management System in Railway Coaches

Rutuja Kolhe¹, Divya Bhojar¹, Nainika Gangane¹, Vedika Punse¹, Prof.S.P.Bhonge²

UG Student, Dept. of EXTC, PRPCM, Sant Gadge Baba Amravati University, India¹

Assistant Professor, Dept. of EXTC, PRPCM, Sant Gadge Baba Amravati University, India²

ABSTRACT: The Indian Railway is the second largest railway network in Asia. One of the biggest worries is the amount of solid waste generated each day by train passengers across the country. The waste management is one of the serious challenges of the nation, the system now used in railways, we continue to use an old and outmoded paradigm that no longer serves the entail of railway, still find over spilled waste containers giving off irritating smells causing serious health issue for the passengers. As of now there is no comprehensive system to collect and manage this enormous amount of waste. The Smart Waste Management System in Railway Coaches manage the waste from the railway coaches. From the dust bin there is pipeline through the waste passes at the initial position there is air blower to pass the waste into the container. Whenever blockage is occur, it is detected by the air pressure sensor that sense the blower's air pressure and send the message of blockage. The whole system is control by NodeMCU32s. By using this system it is easier to the person and specially oldest person for disposal of waste, and in this way the train always clean.

KEYWORDS: Waste Management; solid waste in railway; NodeMCU32s; problem; scope.

I. INTRODUCTION

Developing countries like India are progressing in urbanization and economic profile but at the same time monitoring the public service systems manullay is getting more complicated. If we consider an example of Indian Railway, there is a large amount of waste generated in running trains as well as stations which include waste from passengers, visitors, suppliers and staff. The management of waste will be very crucial to maintain the hygiene in the train.

Generally all the solid waste collected in the dustbin, but the waste that is collected in the running trains need to be collected eventually without any delay. It is difficult to assign an individual to check the wastage level, based on the number of trains in the railway this leads to delay in disposal and if the waste start degrading it may cause the unhygienic environment in railway. To avoid this we can go for Smart Waste Management System which will collect all the waste from the coach in single container.

The main purpose of Smart Waste Management System is to manage the waste in railway to avoid the all problems.

II. LITERATURE SURVEY

Throughout the years, Indian Railways, which is being one of the largest railway systems in the world suffers with a very major problem. A problem, over which no one has looked since decades and the problem has achieved its height from the time-to-time when plastic, Bisleri bottles, and chip packet were introduced in Railway. It is a problem of waste generated inside the running train and around the railway track, and so Indian Railway itself becomes one of the biggest garbage centers. Just think a while, what we do with the plastic bottles, chip packet, and eatable thing that we purchased during the journey. What result come after all this? We are actually polluting our environment. The area around the track in India (Which is around 16000 km) has never been cleaned. So here is a technological system which can solve this problem, and even generate revenue from the same waste. A smart dustbin system being connected to each other is introduce in the compartments. Input waste is crushed at the inlet of dustbin by an automatic system and crushed and being collected in one place automatically. This will almost reduce such problem, and so, this is also considered as an effective Waste Management system as well as Fluent and Effortless Revenue system for Indian Railways.

Indian Railway is one of the largest network in the world. Millions of people and millions of goods are handled by this network on a daily basis. Through its 9116 trains and 1.6 crore passengers, it generates 300,000 liters of human waste from the "open discharge" toilets and 8960 tons of solid waste across its terminal building all over the nation. Surprisingly, although the Indian Railways could be termed as the highest generator of solid waste, it does not have any specialized solid waste team for effective handling and disposal of solid waste. Waste management or waste disposals

are the actions required to manage waste from its collection to its final disposal in raily to maintain the hygiene. This includes few steps like collecting, transporting, treating and disposing of waste together with monitoring and regulation on time-to-time basis.

III. METHODOLOGY

A. Block Diagram :

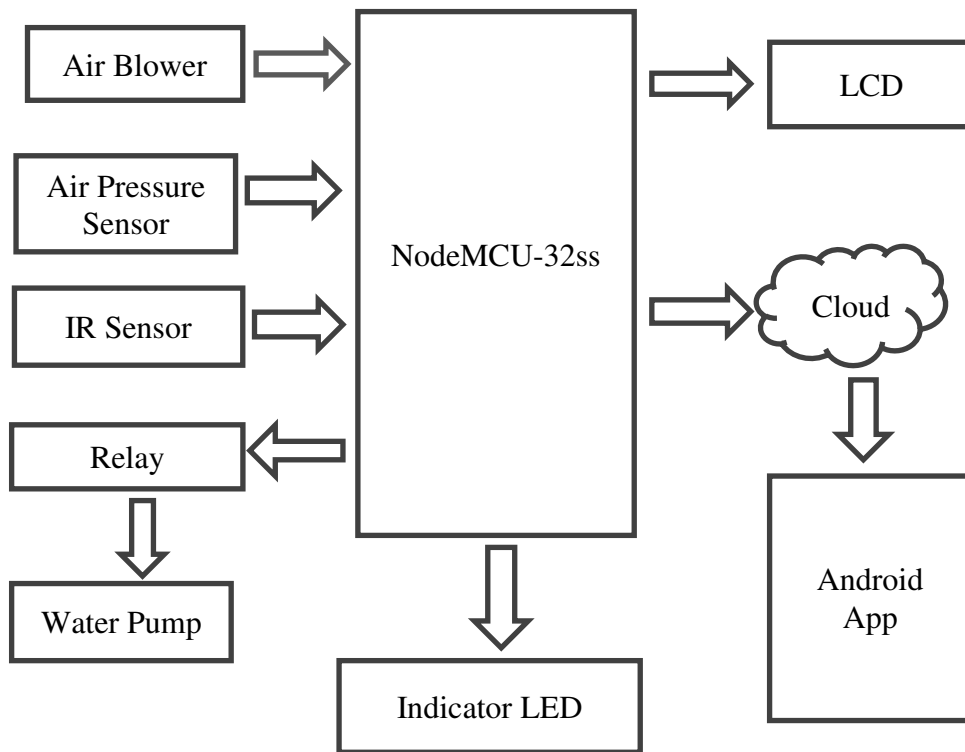


Fig.Block Diagram

B. System Architecture :

In this section, the architecture and frame work of the proposed system is discussed. We are using Node MCU32s it has inbuilt Wi-Fi module and number of pins are available on the controller board. It is used for controlling the waste management system with Wi-Fi connectivity. Air blower is used to pass the waste through the pipeline. It is the combination of fan and blower, it work to blow away the dust garbage from every nook and corner. The Air Pressure sensor is used for sensing the air pressure from the point of starting to the end of this pipeline. If we required any external supply then replay will provide an external supply and this relay drives through transistor BC548. The Transformer is used to step down the 230 AC voltage into 15V AC supply and this 15 Volt AC supply is rectified in DC supply through the diode. The Light Emitting Diode is use as a indicator. After that for measuring the level the IR sensor is used.

C.Working:

The system is proposed of IOT where different sensors are used with the microcontroller. As we are using pipeline for the waste. An air blower is connected to the start point pipeline which will continue flow the air which is used for passing the waste through the pipeline. Air pressure sensor which is connect to the two end of the pipeline which will measure the pressure of air from starting point to the end of the pipeline. If the received pressure get reduced the this sensor will tell us about the blockage to trmove this blockage we are connecting relay to the air blower which will trigger with the help of microcontroller that will increasing the seep of the air blower which helps to remove the blockage.

On the opening of the pipeline we are going to fixed the Bi-color led which will constantly ON with the green color but at the time of the blockageremoving it will turn to red color that means, that time noone is allow to throw the garbage in the pipeline. The IR sensor is used for measuring the level of the garbage container, it means that how much amount of waste is filled in the garbage container. The data obtained by the IR sensors in the running trains is sent to the cloud Wi-Fi module and also the message is send to the android application. When the message received to the android application which will monitor by the person which take care of the waste collection in the train then will arrange for the disposal based on the priority. The filled disposal binsa will be replaced with the empty bins and thus the effective disposal management will be done on the nearest station.

IV. RESULTS

The smart waste management system provid on-time garbage collection. The proposed work demonstrates that the waste management system in IOT empowers the cleaning operators to detect cleaning issues in real time. Therefore, this system helps in increasing overall to cleanness. With the help of sensors the blockage will also get removed which will help the system to work. In a smooth way. And with the IOT the LCD display will give us the message that the container is filed with garbage up to certain level so that the container will make empty on the next station. By this system the train will always clean that will help to reduce health related issue and the surrounding in the train will remain clean.

V. CONCLUSION AND FUTURE WORK

Here we studied all the component which is use smart waste management system for raily coaches. First of all we studies the how to design the hardware which components required for the project. Then studies their specification and which components like node MCU it is having wi-fi module which is the most important part required for our system to send and received the message. The various sensor like air pressure for measuring the pressure of the air and can be adjustable according to our requirements. Then the next is air blower and water pump for cleaning purpose. By sending the single through IR sensor it get received by the LCD which is used for receiving the message. In this way all the components we are selecting.

In future inside of air blower we can get air pressure from surrounding air which is generated by the speed of the train. And if the speed of the train will get slower then we will shift the air pressure to air blower by using this technology we can save the electricity and we also makes this system smart.

REFERENCES

1. Jadli and M.Hain, "Toward a Deep Smart Waste Management System Based on Pattern Recognition and Transfer learning ," 2020 3rd International conference on Advanced Communication and Networking (CommNet),2020,pp.1-5.
2. R.Elhassan, M.A.Ahmed and R. AbdAlhalem, "Smart Waste Management System for Crowed area: Makkah and Holy Sites as a model," 20194th MEC International Conference on Big Data and Smart city(ICBDSC), 2019,pp.1-5.
3. D. Ziouzos,N.Baras, M. Dasygenis and C.Tsanaktsidis, "Enhancing Technological Development Using Novel Internet Of Things Solutions: The Smart-Bin Project ," 2021 International Conference on Electrical,Communication, and Computer Engineering (ICECCE), 2021, pp. 1-5.
4. E. Y. Prisyach and O. A. Shvetsova, "Elements of Innovative Scenario's Development of Waste Management System in Russia," 2018 IEEE International Conference "Management of Municipal Waste as an Important Factor of Sustainable Urban Development" (WASTE), 2018, pp. 63-65.



5. M.Pamintuan, S. M. Mantiquilla, H. Reyes and M. J. Samonte, “i-BIN: An Intelligent Trash Bin for Automatic Waste Segregation and Monitoring System,” 2019 IEEE 11th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM), 2019, pp. 1-5.
6. K. L. Raju, M. A. Hussian, U. Chandra, V. N. Phanedhra and D. Narendra, “IOT Based Dust Bin Monitoring System Using NodeMCU,” 2019 Innovations in power and Advanced Computing Technologies (i-PACT), 2019, pp. 1-5.
7. N. V. Rummyantseva, A. S. Doronin and E. A. Primak, “Improvement of the System of Selective Collection of Household Waste in Latvia,” 2018 IEEE International Conference “Management of Municipal Waste as an Important Factor of Sustainable Urban Development” (Watse), 2018, pp. 14-16.



INNO  **SPACE**
SJIF Scientific Journal Impact Factor
Impact Factor: 7.542



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 **9940 572 462**  **6381 907 438**  **ijircce@gmail.com**



www.ijircce.com

Scan to save the contact details