

## LITERATURE SURVEY

TECHNOLOGY : INTERNET OF THINGS (IOT)

PROJECT TITLE : SMART WASTE MANAGEMENT  
SYSTEM FOR METROPOLITAN CITIES.

TEAM ID : PNT2022TMID26599

## CONTENTS:

1.Introduction

2.Reference articles

3.Article says

4.Technical paper(references)

5.Research publication(references)

6.Innovation we make

7.Conclution

## ABSTRACT:

Indiscriminate disposal of solid waste is a major issue in urban centres of most developing countries and it poses a serious threat to healthy living of the citizens. Access to reliable data on the state of solid waste at different locations within the city will help both the local authorities and the citizens to effectively manage the menace. In this paper, an intelligent solid waste monitoring system is developed using Internet of Things (IoT) and cloud computing technologies. The fill level of solid waste in each of the containers, which are

strategically situated across the communities, is detected using ultrasonic sensors. A Wireless Fidelity (Wi-Fi) communication link is used to transmit the sensor data to an IoT cloud platform known as Thing Speak. Depending on the fill level, the system sends appropriate notification message (in form of tweet) to alert relevant authorities and concerned citizen(s) for necessary action. Also, the fill level is monitored on Thing Speak in real-time. The system performance shows that the proposed solution may be found useful for efficient waste management in smart and connected communities. Here in this let us have a comparison between past and present technologies which makes this system more smart and helpful for the society.

#### **INTRODUCTION:**

This project completely depends upon “Smart waste management for metropolitan cities”. In this furious world and developing technology, we have no time to dispose waste of our own more often. As I have told about technology, we could find some genuine solution for this problem and maintain a proper waste management system using IOT platform. As it takes a long way in describing and designing the outline of this project, our team has been decided to take a literature survey more over which is based on past solutions.

#### **REFERENCE ARTICLE:**

Smart City Waste Management System using Internet of Things and Cloud Computing Aderemi A. Atayero<sup>1</sup>, Segun I. Popoola<sup>1</sup>, Rotimi Williams<sup>1</sup>, Joke A. Badejo<sup>1</sup>, and Sanjay Misra<sup>1</sup>  
<sup>1</sup> Department of Electrical and Information Engineering, Covenant University, P.M.B 1023, Ota, Nigeria. {atayero, joke.badejo,

**sanjay.misra}@covenantuniversity.edu.ng;**

**rotimi.williams@stu.cu.edu.ng; segun.popoola@stu.cu.edu.ng**

**ARTICLE SAYS: The waste management system in was developed using RFID, GIS and GPS interfaced with a low-cost camera for monitoring of solid waste. The main goal of the system was to monitor the waste content of the bin using an RFID tag attached to each bin. The purpose of the tag was to monitor and track the bin while collecting the waste. The camera was attached to the truck to collect images of the bin whenever it enters the bin's area in order to take images before and after collecting the waste. The proposed system in utilized sensors and a radio frequency transmitter to embody a smart trash system. Two sensors were employed for the monitoring. The two sensors which were used are an IR proximity sensor which detects the level of the waste in the smart bin and a load sensor which senses and measures the load of the waste in the bin. When the bin is filled up to a specific load and level, it generates a signal that is sent by the RF transmitter. The local base station receives then receives the transmitted signal and so on. In the proposed system, an integrated system of RFID, GPRS and geographic information system will resolve the issue of solid waste. The waste bins located are different points in the public area would provide inputs to the sensor module.**

#### **REFERENCES:**

- 1. Municipal Solid Waste Collection Problems: A Literature Review, Jeroen Beliën, Liesje De Boeck, Jonas Van Ackere 2. Nuortio, T., Kytojoki, J., Niska, H., Braysy, O.: Improved route planning and scheduling of waste collection and transport. Journal of Expert Systems with Applications 30(2), 223– 232 (2006) CrossRef TECHNICAL PAPERS (REFERENCES): 1. Glossary of Environment Statistics : Series F, No. 67 / Department for Economic and Social Information and Policy Analysis, United Nations. New York: UN, 1997. 2. United**

Nations Environmental Programme (2013). "Guidelines for National Waste Management Strategies Moving from Challenges to Opportunities. 3. "Arduino - Introduction". arduino.cc. 4. "Programming Arduino Getting Started with Sketches". McGraw-Hill. Nov 8, 2011. Retrieved 2013-03-28. 5. Anton A. Huurdeman, The Worldwide History of Telecommunications, John Wiley & Sons, 31 juli 2003, page 529 6. "GSM Global system for Mobile Communications". 4G Americas. Retrieved 2014-03- 22. 7. The national environment policy, 2006 available at <http://www.tnpcb.gov.in/pdf/nep2006e.pdf> 8. Florence Nightingale, Selected Writings of Florence Nightingale, ed. Lucy Ridgely Seymer (New York: The Macmillan Co., 1954), pp. 38287

**RESEARCH PUBLICATIONS (REFERENCES):** [1] Hitesh Poddar, Rituraj Paul, Sourangsu Mukherjee & Budhaditya Bhattacharyya. (2017). Design of smart bin for smarter cities. In. IEEE Proceedings of Innovations in Power and Advanced Computing Technologies (iPACT), Vellore.1-6. [2] Rajkumar Joshi & Sirajuddin Ahmed. (2016). Status and challenges of municipal solid waste management in India: A review. Cogent Environmental Science, 2: 1139434, 1-18. [3] Eunice Likotiko, Dmitry Petrov, Joseph Mwangoka & Ulrich Hilleringmann. (2018). Real time solid waste monitoring using cloud and sensors technologies. The Online Journal of Science and Technology, 8(1), 106-116. [4] Sreejith S, Ramya R, Roja R. & Sanjay Kumar A. (2019). Smart Bin for Waste Management System. In. Poceedings of the IEEE 5 th International Conference on Advanced Computing & Communication Systems, Coimbatore, India, 1079- 1082. [5] Hassan, S. A., Jameel, N.G.M. & Boran. S. (2016). Smart Solid Waste Monitoring and Collection System. International Journal of Advanced Research in Smart Solid Waste Monitoring and Collection System, 6(10), 7–12. **INNOVATION WE MAKE: On**

having a glance over the article and previous references, we could develop a system with separation of degradable and non-degradable waste with the same monitoring system with GPS, cloud, RFID. And we are going to create a monitoring system throughout the city and managing all those data. In case of any fault, it will intimate what is the error by itself which could be more useful for overcoming issue.

**CONCLUTION:** Solid waste management is faced with a number of issues which include lack of throughput, inadequate solid waste data, efficiency problem, delays in collection and resistance to new technologies. Presently, waste management is a major problem for authorities who are responsible for such task because it's a costly service and it hugely impacts the environment as a whole. This study introduced a smart waste monitoring system that uses several sensors and communication technologies to achieve the set task. The proposed system was achieved through the development of theoretical models, layout and decisionmaking algorithms in the course of the project. There is an enormous amount of room for the development of this project in order for it to meet commercial standards. One of my many recommendations would be that of the addition of other sensors e.g. accelerometer. The accelerometer will make the system save more energy by turning on the system to measure the bin level only when the lid is opened to dispose waste. The system would then update its current state on Thing Speak and turn off, preventing unnecessary measurement when the bin's level has not been altered due to dormancy. Another recommendation is the use of solar panel for power generation making it.

## **ACKNOWLEDGMENT:**

**The authors wish to appreciate the Center for Research, Innovation, and Discovery (CU-CRID) of Covenant University, Ota, Nigeria, for partly funding of this research. REFERENCES: 1.**

**Municipal Solid Waste Collection Problems: A Literature Review, Jeroen Beliën, Liesje De Boeck, Jonas Van Ackere 2. Nuortio, T., Kytojoki, J., Niska, H., Braysy, O.: Improved route planning and scheduling of waste collection and transport. Journal of Expert Systems with Applications 30(2), 223– 232 (2006) CrossRef**