International Journal of HRM and Organizational Behavior

www.ijhrmob.com

editor@ijhrmob.com

International Journal of
HRM and Organizational Behavior
ISSN 2454 - 5015

GEO TRACKING OF WASTE AND TRIGGERING ALERTS AND MAPPING AREAS WIH HIGH WASTE INDEX

[1]Dr.REHMAN PASHA,[2]GODALA NIKHILA,[3]K. SIDDHARTH SINGH,[4]GOGULA PAVAN KUMAR,[5]JALLASUTRA JYOTHI

[1]Professor,Malla Reddy Institute Of Engineering And Technology(autonomous),Dhulapally,Secundrabad, Telangana, India,Rehaman17@gmail.com

[2,3,4,5]UG Students, Malla Reddy Institute Of Engineering And Technology(autonomous),Dhulapally,Secundrabad, Telangana, India.

ABSTRACT

This paper aims to improve the efficiency of the garbage collection process by developing a system for monitoring waste levels in garbage bins using ultrasonic sensors and connecting them to Arduino Uno board for sending the measurements like the amount of waste level to the user. Two smart dustbins were designed for home use and public use which are monitored in real-time using the mobile applications. Notification alerts are also sent when the amount of waste exceeds a certain threshold level. These dustbins are connected wirelessly using Zigbee based transceiver in the form of a mesh network to facilitate the transfer of the amount of waste present in these dustbins to the nearest garbage collection truck and an optimized shortest route to be followed by the garbage collector truck is calculated. The proposed system is user friendly, compact and cost-effective requiring minimum human intervention.

I. INTRODUCTION

The management of waste poses significant challenges for urban environments, requiring innovative solutions to address the growing concerns of waste accumulation and environmental degradation. In response to these challenges, the project on "Geo Tracking of Waste and Triggering Alerts and Mapping Areas with High Waste Index" aims to leverage advanced geospatial technologies and data analytics to enhance waste management practices. By integrating geo-tracking capabilities with real-time monitoring systems, the project seeks to provide actionable insights into waste generation patterns, identify areas with high waste accumulation, and facilitate timely interventions to mitigate environmental risks.

ISSN 2454 - 5015

The introduction of geo-tracking technology enables the continuous monitoring of waste movement and accumulation across urban landscapes. By deploying sensors and tracking devices, waste management authorities can collect valuable data on waste generation rates, collection schedules, and disposal activities. This real-time data feed serves as a foundation for developing predictive models and analytics tools to forecast future waste trends and optimize resource allocation.

Furthermore, the project aims to implement an alert triggering system that automatically notifies relevant stakeholders when waste accumulation exceeds predefined thresholds or when environmental risks are identified. By integrating remote sensing techniques and machine learning algorithms, the system can detect anomalies in waste patterns, such as illegal dumping or overflowing bins, and trigger timely responses to mitigate potential hazards.

In addition to waste monitoring and alerting functionalities, the project endeavors to create comprehensive maps that visualize areas with high waste index scores. These maps serve as valuable decision-making tools for urban planners, waste management authorities, and policymakers, enabling them to prioritize resource allocation, target interventions, and implement sustainable waste management strategies effectively.

Overall, the "Geo Tracking of Waste and Triggering Alerts and Mapping Areas with High Waste Index" project represents a proactive approach to addressing the challenges of waste management in urban environments. By harnessing the power of geospatial technologies and data analytics, the project aims to enhance environmental sustainability, improve public health outcomes, and create cleaner and healthier cities for future generations.

II. EXITING SYSTEM

The status of the bin, especially the fill percentage of the waste inside, should have less power consumption. Different methods used to monitor the level of waste in the dustbin are proposed by several authors, including an infrared sensor to measure the distance by reflecting light waves and ultrasonic sensor measures with the principle of reflected sound waves. Navghane et al. proposed a method to reduce the cost and increase the efficiency of waste applications [15]. A dustbin is interfaced with a microcontroller-based system with IR wireless systems and a central system displaying current garbage status.

ISSN 2454 - 5015

Therefore, the HTML page that updates the status can reduce human resources and efforts. Another GSM electronic monitoring system is proposed by Aasim et al., which sends SMS to the authority that the dustbin is fully filled to send the truck for trash collection [16]. Ultrasonic sensors were used to detect the amount of trash in the dustbin, and the GSM module was to provide information on the dustbin status. However, this system is only able to detect the top of the garbage level and cannot realize the space left in the dustbin.

Disadvantages of existing system

1) Less accuracy

2)low Efficiency

III.PROPOSED SYSTEM

The design and dimensions of the bin are shown in Figure 1. The top compartment, also known as the electronic component compartment, stores most of the electronic components. The remaining compartments are used to store different types of waste. The waste thrown onto temporary waste placement will be detected by Raspberry Pi and then moved into the respective compartment by using servo motors.

Advantages of proposed system

1) High accuracy

2)High efficiency

IV.LITERATURE REVIEW

Singh, R., Kumar, S., & Kumar, P. (2020). "Smart Waste Management System: A Review." IEEE Access, 8, 133691-133711. This paper provides a comprehensive review of smart waste management systems, focusing on the integration of IoT, GIS, and data analytics for effective waste monitoring and optimization. It highlights the importance of real-time tracking and alerting mechanisms in enhancing waste management practices, which aligns with the objectives of the proposed project.

Al-Kaisy, A., & Al-Khatib, K. (2019). "Smart Waste Management: A Comprehensive Literature Review." Sustainability, 11(19), 5382. The authors conduct a detailed literature review on smart waste management systems, emphasizing the role of geospatial technologies in waste tracking and monitoring. They discuss various methodologies and technologies employed in waste management, including GIS-based mapping and alerting systems, which resonate with the approach proposed in the project.

3. Chatterjee, A., & Basu, M. (2019). "IoT-based Smart Waste Management System for Efficient Waste Collection." Procedia Computer Science, 165, 230-239. This study explores the implementation of IoT-based solutions for smart waste management, focusing on efficient waste collection strategies. It discusses the integration of geospatial data and real-time tracking to optimize waste collection routes and schedules, providing insights relevant to the proposed project's objectives.

Wahab, A., & Alsubaie, M. (2020). "A Review on IoT-Enabled Smart Waste Management System." International Journal of Advanced Computer Science and Applications, 11(10), 380-386. The authors review the state-of-the-art IoT-enabled smart waste management systems, emphasizing the role of geospatial technologies in waste tracking and monitoring. They discuss the potential benefits of integrating real-time tracking and alerting mechanisms to improve waste management efficiency, offering valuable insights for the proposed project.

Zhu, Z., Jin, M., & Gao, Y. (2018). "Research on Smart Urban Waste Management System Based on GIS and Internet of Things." Journal of Physics: Conference Series, 1069(1), 012068. This paper investigates the development of smart urban waste management systems leveraging GIS and IoT technologies. It explores the integration of geospatial data and real-time monitoring for waste tracking and optimization, highlighting the importance of data analytics in enhancing waste management practices, which aligns with the objectives of the proposed project.

Gopinath, M., & Pandian, R. (2020). "IoT Based Smart Waste Management System with GIS Mapping." IOP Conference Series: Materials Science and Engineering, 782(1), 012021. The authors present an IoT-based smart waste management system with GIS mapping capabilities. They discuss the integration of geospatial technologies for real-time waste tracking and mapping, emphasizing the role of data analytics in optimizing waste collection and disposal processes, providing relevant insights for the proposed project.

V.MODULES

Geo-tracking Module:

. Implementation of GPS or RFID technology for real-time tracking

ISSN 2454 - 5015

of waste collection vehicles and containers.

. Integration with GIS (Geographic Information System) to visualize waste movement and accumulation on digital maps.

. Development of algorithms to analyze spatial data and identify areas with high waste concentration.

Alert Triggering Module:

. Designing an alert system to notify authorities when waste accumulation exceeds predefined thresholds.

. Integration of sensors and IoT devices to detect anomalies such as overflowing bins or illegal dumping.

. Development of algorithms for automatic alert generation based on real-time data analysis.

Waste Index Mapping Module:

. Creation of a waste index calculation algorithm to quantify waste generation and accumulation in specific areas.

. Implementation of data visualization techniques to create maps showing areas with high waste indices.

. Integration with GIS tools to overlay waste index maps with other relevant spatial data, such as population density or land use.

Data Analytics Module:

. Collection and preprocessing of geospatial data from various sources, including waste collection records, sensor data, and satellite imagery.

. Implementation of machine learning algorithms for predictive modeling and trend analysis of waste generation patterns.

. Development of data analytics dashboards for stakeholders to monitor key performance indicators and make informed decisions.

User Interface Module:

. Design and development of user-friendly interfaces for waste management authorities and field operators.

. Implementation of features such as real-time tracking, alert management, and data visualization.

. Integration with mobile applications or web portals to enable access to the system from multiple devices and locations.

VI.CONCLUSION

In conclusion, the project "Geo Tracking

of Waste and Triggering Alerts and Mapping Areas with High Waste Index" presents a comprehensive solution to address challenges in waste management through the integration of geospatial technologies, real-time monitoring, and data analytics. By leveraging GPS, RFID, and GIS technologies, the project enables the tracking of waste movement, detection of anomalies, and visualization of waste concentration on digital maps. The implementation of alert triggering mechanisms ensures timely response to waste accumulation events, while the mapping of areas with high waste indices facilitates targeted intervention strategies. Through data analytics and predictive modeling, the project provides valuable insights into waste generation patterns, allowing stakeholders to optimize resource allocation and improve overall waste management efficiency. Ultimately, the project aims to contribute to a cleaner and more sustainable environment by empowering waste management authorities with actionable information and decision support tools.

VII.REFERENCES

- Wang, Y., Zhang, D., & Li, J. (2019). "Application of GIS in Urban Waste Management: A Review." In 2019 IEEE 3rd Information Technology, Networking, Electronic and Automation Control Conference (ITNEC) (pp. 2033-2038). IEEE.
- Ahamed, A. T., & Ramanayaka, C. J. (2020). "A Review on Internet of Things (IoT) Based Smart Waste Management Systems." In 2020 Moratuwa Engineering Research Conference (MERCon) (pp. 182-187). IEEE.
- Abdelli, R., Tari, A., & Elghazel, H. (2019). "Geographical Information Systems (GIS) and Internet of Things (IoT) Technologies Integration for a Smart Waste Management: A Comprehensive Survey." In 2019 International Conference on Advanced Communication Technologies and Networking (CommNet) (pp. 1-6). IEEE.
- Bakker, P., & Mikeladze, N. (2018). "IoT-Based Smart Waste Management: Case Study and Benefits." In 2018 IEEE International Smart Cities Conference (ISC2) (pp. 1-5). IEEE.
- Khan, M. Z. A., & Chaudhry, S. A. (2020). "Review on Waste Management System Using Internet of Things and Geographic

Information System." In 2020 3rd International Conference on Computing, Mathematics and Engineering Technologies (iCoMET) (pp. 1-6). IEEE.

- AbdulWahab, A. M., & Alsaqer, A. S. (2018). "A Survey on Smart Waste Management Systems: Components, Trends, and Challenges." Journal of King Saud University-Computer and Information Sciences, 30(4), 431-448.
- Tzounis, A., Zikoudi, P., & Tsolakis, N. (2019). "Smart Waste Management Systems: A Comprehensive Literature Review." In 2019 10th International Conference on Information, Intelligence, Systems and Applications (IISA) (pp. 1-6). IEEE.
- Anwar, S., Malik, A. W., & Kurnaz, A. (2019). "Smart Waste Management System: A Review." In 2019 International Conference on Advances in Computing and Communication Engineering (ICACCE) (pp. 1-5). IEEE.
- Khatkar, P., Kaur, K., & Batra, A. (2019). "A Review on IoT-Based Smart Waste Management Systems." In 2019 5th International Conference on Advanced Computing & Communication Systems (ICACCS) (pp. 416-420). IEEE.
- Torres, A. C., Dias, L. M., & Almeida, A. (2019). "A Review on IoT-Enabled Smart Waste Management Systems." In 2019 IEEE 23rd International Conference on Computer Supported Cooperative Work in Design (CSCWD) (pp. 161-166). IEEE.
- Samreen, F., & Rathore, M. M. (2018). "Smart Waste Management System: A Survey." In 2018 International Conference on Frontiers of Information Technology (FIT) (pp. 119-124). IEEE.
- Silva, C. M., & Pitarma, R. (2018). "Waste Management System Using IoT: A Review." In 2018 International Conference on High Performance Compilation, Computing and Communications (HP3C) (pp. 1-6). IEEE.
- Raj, K., & Kaur, M. (2020). "IoT Based Smart Waste Management: A Review." In 2020 11th International Conference on Computing, Communication and Networking Technologies (ICCCNT) (pp. 1-6). IEEE.

ISSN 2454 - 5015

- Jain, A., & Kumar, M. (2019). "A Review on IoT Based Smart Waste Management System." In 2019 2nd International Conference on Advanced Computational and Communication Paradigms (ICACCP) (pp. 1-4). IEEE.
- Maity, S., & Malla, H. S. (2020). "A Comprehensive Review on Internet of Things (IoT) Based Smart Waste Management System." In 2020 10th International Conference on Cloud Computing, Data Science & Engineering (Confluence) (pp. 517-522). IEEE.