

Optimised Resume:

Summary - The exponential increase in waste production due to rapid urbanization has led to considerable challenges in environmental and economic challenges. Traditional waste treatment practices separate recycling of often effective and recycled waste. The study includes Smart Bin, an automated IoT-enabled waste regulation system, waste in the wet and dry categories using Arduino UNO, soil moisture sensors and OLED displays. The system further improves waste management by combining industry with people who provide real-time recycling instructions and acquire waste through dedicated online platforms. The platform promotes entrepreneurship and allows individuals in slums and urban areas to earn income and recycled income. The project responds to the Swachh Bharat Abhiyan initiative and promotes sustainability, economic strengthening and the urban environment. The Smart Bin system achieved 90% accuracy in waste classification and demonstrated its effectiveness in real-world applications. First and foremost, we sincerely thank our mentors and faculty for their invaluable guidance, continued support and insightful feedback that helped shape the direction of this research. In particular, we are Dr. Mrinalini Srivastava, who is their unwavering mentor, and we are grateful for their expertise and encouragement throughout the research process. Your instructions were critical in improving our approach to IoT-based waste management and overcoming a variety of challenges along the way.

In addition, we are aware of the support of our family and friends. That encouragement and patience have motivated us to be patient through research and development challenges. Your contributions have played an important role in making this project come to fruition. Inefficient disposal of waste contributes to environmental pollution, resource reduction and increased greenhouse gas emissions. The growing global population, urbanization and rapid industrialization have strengthened the problem of waste accumulation, representing serious environmental and health risks. Unexpected waste leads to flooded landfills, leading to ocean pollution and pollution that puts both human and wild populations at risk. Technical interventions are needed to automate waste classification and facilitate efficient recycling. SmartBin is an IoT-based system that has encountered these challenges by using sen

sors to distinguish between wet and dry waste, distinguish feedback for real-time classification, and promote responsible disposal practices.

SmartBin's integration into the online platform further improves the benefits by allowing individuals to monetize waste through direct contracts with recycling companies. The system simplifies waste regulations and maximizes revenue while simultaneously contributing to a cleaner environment. By reducing the need for manual sorting, SmartBin minimizes exposure to hazardous waste and improves public health outcomes.

This project is responsible for the Swach Bharat Habiyan initiative of the Government of India, cleanliness, waste reduction and sustainable urban development. By integrating IoT technology, SmartBin not only improves waste management efficiency, but also promotes economic opportunities for waste collectors. The 90% accuracy of the system's waste classification indicates the widespread adoption and effectiveness potential in both urban and rural environments. Traditional methods for waste separation require manual sorting, which is inefficient, labor-intensive and often leads to inappropriate disposal. Research on IoT-based waste development systems shows that automation significantly improves the efficiency and accuracy of waste regulations. Machine learning approaches have been proposed for more effective classification of waste, but their implementation is limited due to the high cost of sophisticated sensors. Existing solutions for managing smart waste management also lack an integrated approach that directly links waste collectors with the recycling industry. Ultrasonic sensors such as sensors used in SmartBin have proven reliable as they promote object distance and automatic sorting. Floor moisture sensors play an important role in distinguishing between wet and dry waste, reducing human error in separation. Research suggests that integration of IoT platforms with real-time data tracking can improve waste efficiency and recycling effectiveness. However, many of these studies do not consider direct economic models that promote user participation in waste management.

The table below compares previous projects based on its accuracy, motion technology, and related state guidelines. This comparison shows progress in waste development systems and shows Smart Bin's position as a more efficient and scalable solution.

Table: Comparison of automated waste regulation systems

The Smartbin project is based on existing research by not only automating waste regulation, but also introducing model-based models of waste. The integration of online platforms will allow waste collectors and recyclers to seamlessly connect and promote a circular economy. Additionally, focusing on real-time feedback in the system improves user integration via OLED displays, making waste management more interactive and efficient.

[Optimised for JD keywords]

ATS Explanation:

Good keyword match, but improve measurable achievements.