

Smartbin Track

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Abstract

This project presents a sophisticated waste management system that combines IoT technology with an Android application to optimize garbage collection processes. The core infrastructure includes IoT-enabled smart trash cans equipped with sensors to detect fill levels autonomously. Complementing this hardware, the Android app serves as a comprehensive platform for managing various aspects of waste collection operations. Divided into modules for administration, employees, and truck drivers, the app offers functionalities such as real-time monitoring of trash levels, route optimization for collection trucks, and automated alerts for full bins. Through seamless integration of IoT capabilities and mobile technology, the system facilitates efficient and environmentally responsible waste management practices, contributing to a cleaner and more sustainable urban environment. Furthermore, the system enhances coordination and transparency within the municipal waste management framework. Municipal administrators gain valuable insights into waste collection efficiency through the app's dashboard. Employees can input data and perform tasks seamlessly, while truck drivers receive real-time updates on bin fill levels and optimized routes, improving overall operational efficiency. By harnessing IoT technology and mobile platforms, this innovative solution not only streamlines waste collection processes.

CHAPTER-1

INTRODUCTION

1.1 Aim

The primary objective of the project is to develop a smart dustbin system integrated with an Android application, aimed at promoting environmental cleanliness and eco-friendliness. Specifically designed for Municipal Corporation use, the system serves to efficiently manage and analyze the garbage transportation process. By leveraging IoT technology, the smart dustbins automatically notify when they reach full capacity, enabling Municipal Corporation authorities to promptly identify and address filled bins. This streamlined approach minimizes time-consuming manual inspections and facilitates the timely disposal of garbage, enhancing overall waste management efficiency.

1.2 About Project

The project aims to revolutionize waste management by introducing an IoT Garbage Monitoring with Sensing system, complemented by a user-friendly Android application. In the context of burgeoning "Smart City" initiatives, the need for efficient waste management solutions is paramount. Traditional methods of garbage collection, reliant on fixed schedules and manual inspections, often prove inadequate for dynamic urban environments. The proposed system addresses this challenge by leveraging IoT technology to monitor garbage bin fill levels in real-time.

The Android application, tailored for use by Municipal Corporation authorities, serves as a centralized platform for managing and analyzing garbage transportation activities. Through the app, administrators can track the movements of garbage collection trucks, ensuring optimal utilization of resources. The integration of IoT-enabled smart dustbins automates the process further by notifying truck drivers when bins reach capacity. Additionally, the app provides geolocation data for filled bins, facilitating efficient route planning for drivers.

Comprising three distinct modules—admin, employees, and lorry drivers—the app streamlines workflow processes. Administrators oversee database management and access comprehensive reports on garbage disposal activities. Employees input dustbin information, assign bins to drivers, and monitor their progress. Lorry drivers, equipped with real-time updates on filled bin locations, can report their work status directly through the app, eliminating the need for cumbersome paper logs.

By automating and optimizing waste collection processes, the system empowers Municipal Corporation to deliver a more responsive and environmentally responsible service to the public. The seamless coordination facilitated by the Android application ensures timely garbage disposal, contributing to a cleaner and healthier urban environment.

CHAPTER-2

LITERATURE SURVEY

2.1 Existing System

The existing waste management system relies primarily on manual processes and periodic garbage collection schedules. In this conventional setup, municipal authorities deploy dump trucks on fixed routes, typically operating on daily or weekly schedules. However, this approach often leads to inefficiencies and resource wastage due to its reliance on predetermined routines rather than real-time data.

Garbage collection personnel are tasked with manually inspecting bins to determine their fill levels and schedule pickups accordingly. This labor-intensive process is not only time-consuming but also prone to errors and inconsistencies, as the rate of garbage accumulation can vary significantly depending on factors such as location, population density, and seasonal trends.

Moreover, communication and coordination between different stakeholders, including municipal

administrators, garbage collection staff, and truck drivers, may be fragmented or inefficient, leading to delays, missed pickups, and suboptimal resource allocation.

Overall, the existing system lacks the agility and responsiveness needed to effectively manage waste in a dynamic urban environment. It is characterized by manual processes, limited visibility into real-time data, and a lack of coordination between key stakeholders. As a result, there is a pressing need for a more intelligent and automated solution to streamline waste management operations and enhance overall efficiency and effectiveness.

2.2 Proposed System

The proposed system revolutionizes waste management through the integration of IoT technology and a user-friendly Android application. At its core, the system incorporates IoT-enabled smart dustbins equipped with sensors for real-time monitoring of fill levels. These smart dustbins automatically detect when they reach capacity and transmit this information to a centralized database.

The Android application serves as the central hub for managing waste collection operations. It is divided into three modules: administration, employees, and lorry drivers. Administrators have access to advanced features such as comprehensive reporting and truck tracking, empowering them to oversee and analyze waste management activities effectively.

Employees utilize the application to input dustbin information, assign bins to drivers, and monitor collection progress, ensuring timely pickups and efficient operations on the ground. Lorry drivers receive real-time updates on filled bin locations, enabling them to plan optimized routes and report their work status directly through the app.

By seamlessly integrating IoT-enabled smart dustbins with the Android application, the system automates the process of garbage detection and collection, minimizing resource wastage and streamlining communication between stakeholders. This enhanced communication and coordination facilitate proactive decision-making, leading to improved service delivery and a cleaner urban environment.

CHAPTER-3 SYSTEM DESIGN

5.1 Modules

This project has following modules.

Admin:

Admin is the super-user of this application and can have the authority to add/edit and delete the lorry information that contain the drivers details and employees that are present in the application, username and password will be send via SMS for both lorry drivers and the employees. Admin has the ability to view the reports along with the date and time those of lorry drivers, when they update the status about their work.

Employees:

Employees are the module used in this application and can contain the android app for their use. They can get the username and password from the application and login to the android app. He can have the option to add the dustbins along with the location of the dustbin where it is located; he can allot the dustbins to driver here and finally can have the option to update their profile.

Lorry drivers:

They can login to the app by using the user name password. Once they login they can view the location of the allotted filled dustbins. Once they can get the allotted status they can update their status regarding to

their work (once they empty the dustbins). They can have the option to view their profile here.

Smart Dustbins

The device monitors the status of the dust bins regularly. Filled dustbins information is send to lorry drivers via android app.

CHAPTER-4

Home page

SNAPSHOTS



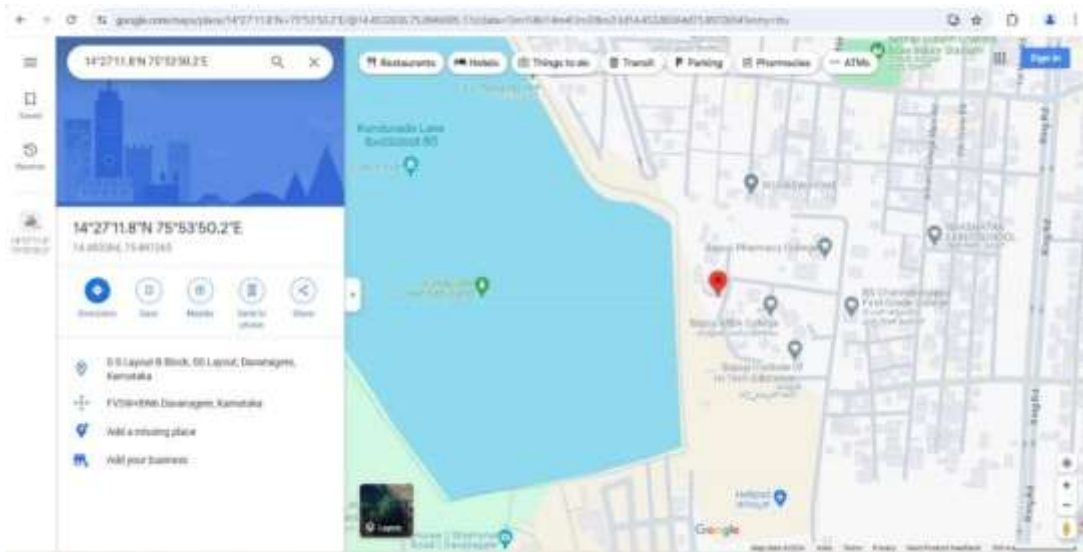
It is a landing page and it welcomes the user to use application.

Login page



It is a login page. And it is for the admin.

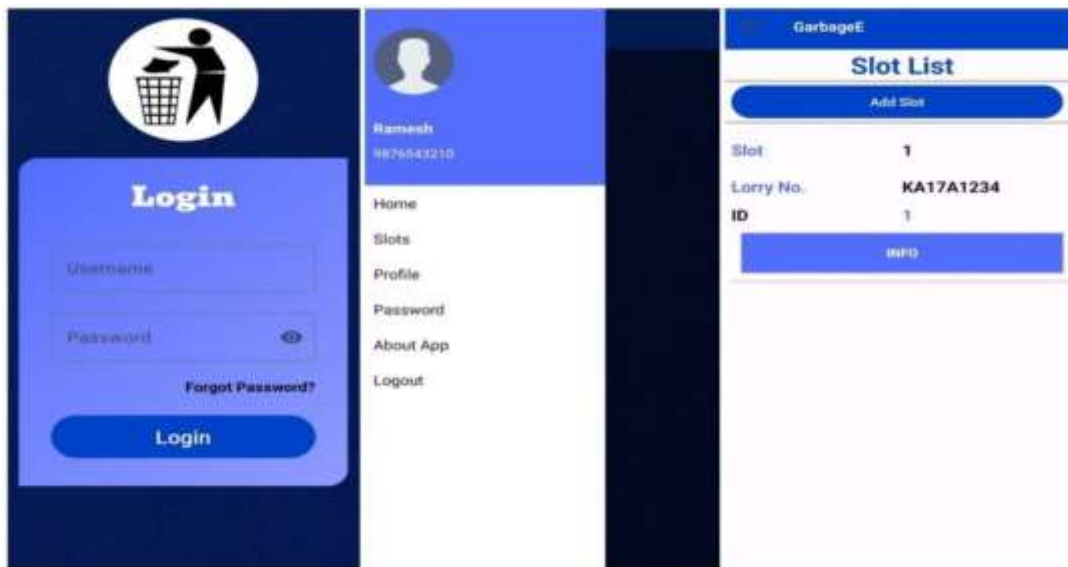
View Location Page



Here in this page we can view the location of the trashbin with the GPS.

Employee Login Page

Here this is the mobile app part. Here this is the employee login page with the proper



credentials and can view the profile, password, about app and slot list of the trashbin.

CONCLUSION

This project work is implementing a smart garbage management system using Sensor, Microcontroller, Wi-Fi and Android App. This system ensures dustbins will be cleaned soon when the level of garbage reaches its maximum. This program also helps track the false reports and therefore can eliminate corruption in the overall system of management. This reduces the total number of garbage collection vehicle trips and thus reduces the overall costs associated with the garbage collection. In the end, it helps to preserve cleanliness in society. The smart garbage management system therefore allows collection of the garbage more efficient.

This proposed system is developed in order to solve the problems faced by the people with respect to waste

management by taking it to the next level where it can be applied to the use in cities. By doing this, major problems faced by urban areas can be checked. Through this app employees of the municipal can allot the work to lorry drivers through the android app. Through this app admin can track the working of truck drivers. Finally, we hope that work done by us best.

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