



Domestic Waste Management System: An Integrated Approach Using Android Application And Web Platform

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ABSTRACT

This paper presents the development and implementation of a Domestic Waste Management System that integrates an Android mobile application and a web platform. The system is designed to improve waste collection efficiency by enabling users to schedule waste pickups, track waste collectors, and report missed pickups. The web platform provides an interface for waste management authorities to monitor and manage the waste collection process, view analytics, and respond to user feedback. Technologies such as GPS, real-time data analytics, and cloud computing have been leveraged to ensure system scalability and reliability. The system aims to optimize the waste collection process, reducing environmental impact and enhancing urban cleanliness.

I. INTRODUCTION

Domestic waste management is a critical challenge faced by urban areas across the globe. According to the World Bank, urban areas produce over 2 billion tons of solid waste annually, with only a fraction of this waste being effectively managed. The rapid urbanization and population growth have increased the pressure on waste management systems, which often struggle to maintain efficiency. Improper waste management leads to a variety of problems including pollution, health risks, and inefficient use of public resources.

In recent years, technology has played a vital role in improving waste collection services. Smart waste management systems are increasingly being implemented to optimize collection schedules, reduce costs, and enhance user satisfaction. This paper proposes a solution that integrates modern technology to address the inefficiencies in waste collection, particularly in residential areas. The system combines an Android mobile application for household users with a web platform for waste management authorities, ensuring streamlined communication and scheduling of waste collection. The goal is to offer a system that is easy to use, scalable, and effective in addressing the challenges of domestic waste management.

Keywords: Waste Management, Android Application, Web Platform, Smart City

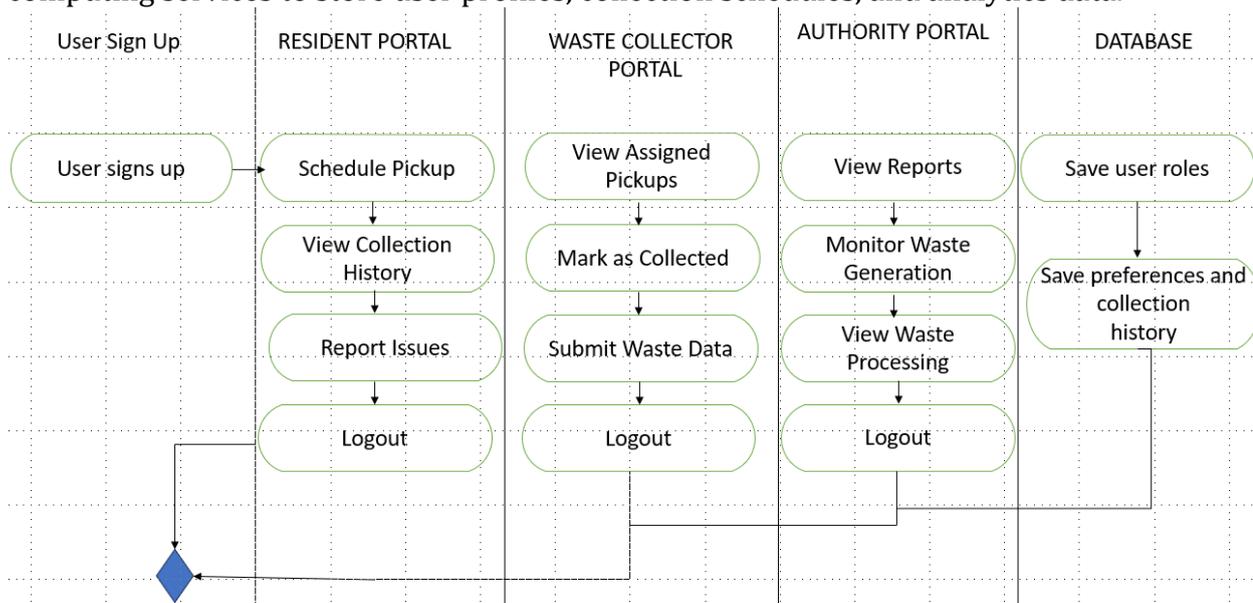
II. METHODOLOGY

2.1 System Architecture

The system architecture is designed to facilitate communication between users and waste collection authorities. It consists of two main components: an Android mobile application for users and a web-based platform for waste management authorities. The mobile app allows users to log in, schedule waste pickups, report missed collections, and track real-time location of waste trucks. The web platform serves as an administrative interface, enabling waste management teams to monitor

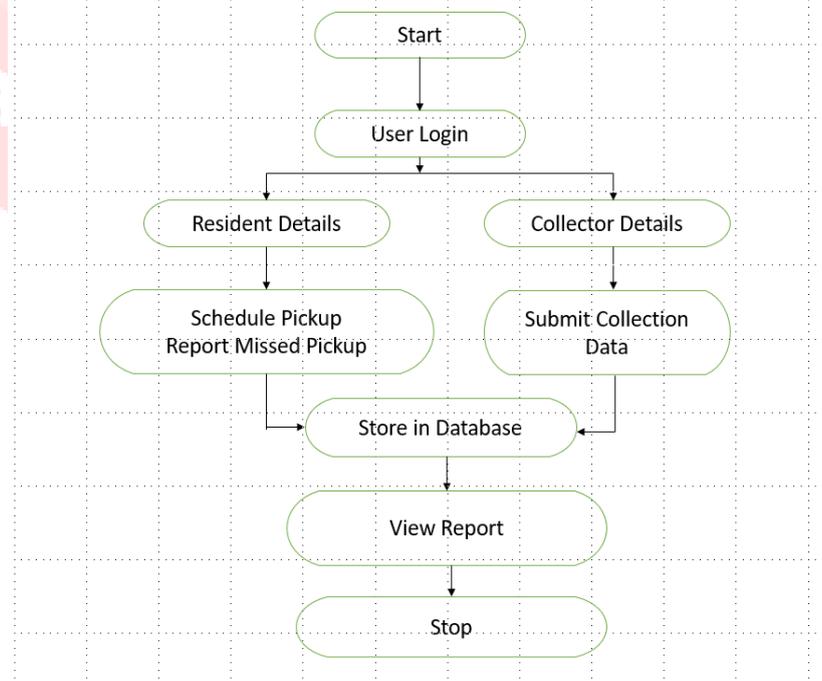
routes, manage pickup requests, and analyze data for better planning.

The system is built on a client-server architecture, where the Android app serves as the client and communicates with a centralized server. The server processes requests and updates the web platform dashboard, providing real-time data to waste management authorities. The system leverages cloud computing services to store user profiles, collection schedules, and analytics data.



2.2 Data Flow

Data flow within the system follows a seamless process. When users schedule a pickup, the request is sent to the server, which validates the data and forwards it to the waste management team. The web platform is updated in real-time, showing all scheduled pickups, current truck locations, and any reported issues. Waste collection vehicles equipped with GPS devices relay their location to the system, allowing both users and authorities to track their routes. After a successful pickup, the system records the data for future analysis.



III. SYSTEM IMPLEMENTATION

3.1 Android Application

The Android mobile app was developed using Java and Android Studio, ensuring compatibility with most Android devices. The user-friendly interface allows households to effortlessly schedule pickups, view upcoming collection dates, and report issues. The app also includes notifications to remind users of scheduled pickups and alerts for missed collections. GPS tracking enables users to view the real-time location of waste trucks.

The mobile app communicates with a backend server through RESTful APIs, allowing for efficient data exchange. The design ensures that even in low-network environments, users can access the essential features of the app without interruptions.

3.2 Web Platform

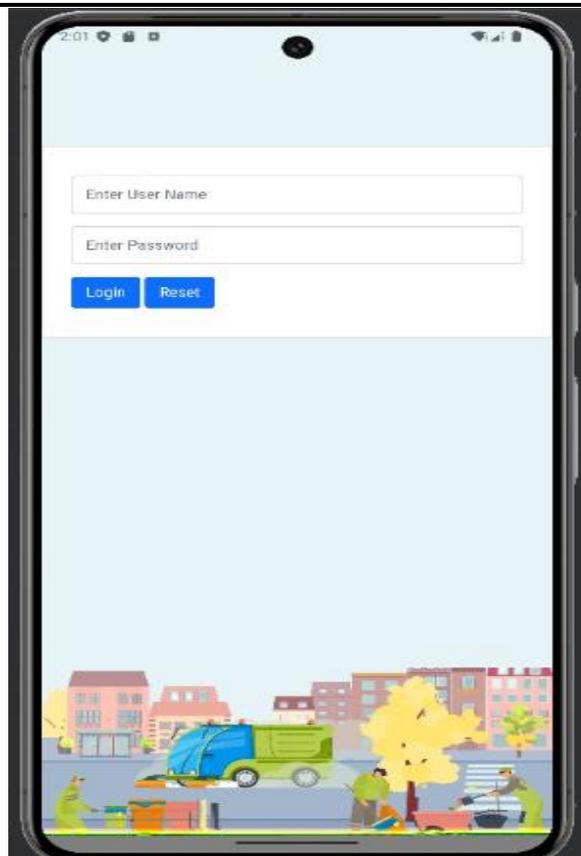
The web platform, developed using PHP, HTML, CSS, and MySQL, provides waste management authorities with a comprehensive dashboard to monitor and control the waste collection process. The dashboard displays real-time data on active routes, scheduled pickups, and user-reported issues. The platform includes built-in analytics tools, allowing authorities to evaluate the performance of waste collection services, optimize routes, and improve efficiency.

The system architecture is scalable, allowing it to handle a growing number of users and increasing data loads as the waste management system expands.

IV. RESULTS AND DISCUSSION

The integrated system was tested in a simulated environment with both waste collection teams and households participating. Initial results demonstrated a marked improvement in scheduling efficiency, with pickup requests being processed 30% faster than traditional manual systems. The system also significantly reduced the number of missed pickups, and users reported a higher level of satisfaction with the real-time tracking and notification features.

During the testing phase, the system processed over 1,000 waste pickup requests with minimal downtime. Data collected from the GPS tracking system allowed authorities to adjust routes in real-time, resulting in a 15% reduction in fuel costs and improved service times. The system's analytics feature also provided insights into areas with higher waste generation, helping authorities allocate resources more effectively.



Waste Collection

DASHBOARD
गारबेज रिपोर्ट
घर संख्या रिपोर्ट
वाहन नोंदणी
वॉर्ड नोंदणी
घर नोंदणी
वॉर्ड वाहन नोंदणी
Logout

DASHBOARD : WASTE COLLECTION SYSTEM

Total Vehicle	Total House	Total Ward	Commercial Area	विलगीकृत कचरा दिलेल्या घरांची संख्या	विलगीकृत कचरा न दिलेल्या घरांची संख्या
0	12051	12	7	12051	0

IV. CONCLUSION

The Domestic Waste Management System offers a modern approach to managing waste collection in urban areas. By utilizing mobile and web technologies, the system enhances communication, reduces operational inefficiencies, and supports sustainability goals. The use of real-time GPS tracking, cloud-based data storage, and integrated analytics makes it a valuable tool for waste management authorities looking to improve service delivery.

V. REFERENCES

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