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Garbage Complaint System Using Android Application

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Abstract – Issues must be addressed quickly and effectively to maintain a sanitary and safe workplace. This study investigates the creation of an Android-based garbage complaint system for improved identification and management of waste-related issues. The objective is to quantify the contribution of mobile technology integration to the complaint management process. The research investigates the topic using quantitative (statistical analysis) and qualitative (interviews and surveys) approaches. The findings imply that the Android application increases participation because it simplifies reporting problems with garbage pickup. Users were generally satisfied since it was easier to file complaints and monitor the status of requests. Due to the system's capability to monitor and alert customer complaints in real time, issues were resolved rapidly. The study's results shed light on the benefits and potential drawbacks of using an Android application to improve waste management by centralizing the complaint management process and increasing overall efficiency.

Keywords – *Mobile application, garbage complaint, complaint management, android application.*

I. INTRODUCTION

Maintaining the ecological and aesthetic integrity of urban environments requires prompt and effective responses to complaints about garbage. Inefficiency, delays, and a lack of transparency afflict the current system for reporting waste problems. However, mobile technology developments, specifically Android applications, have created new opportunities for more efficient waste complaint management. An Android application has been added to the waste complaint system to improve customer service and expedite the resolution of complaints. Using the rising prevalence of devices, these applications enable individuals to promptly disclose issues with garbage collection. This real-time data enables faster responses and more effective use of resources to address client concerns.

Several studies have examined the use of Android applications in waste management systems, focusing on user satisfaction, route optimization, and data analytics, among other factors. Regarding refuse complaint systems, Johnson et al. [1] highlighted the potential of mobile applications to enhance user interaction and the significance of consumer contentment. Li and Smith [2] surveyed the potential of Android applications in waste management and discovered that users prefer complaint reporting and monitoring.

A connected Android app to the refuse complaint system may improve communication between customers, government waste management organizations, and collection personnel. Providing tools such as real-time monitoring and alerts to users ensures transparency and accountability throughout the resolution process [3]. Android applications can also be used to capture data that can be utilized to analyze and improve waste management. By analyzing complaint data, authorities can more effectively allocate resources and take targeted measures to address recurring problems [4]. This data-driven strategy may result in enhanced waste management and faster resolution of consumer concerns.

II. Related Work

Discuss the advantages, disadvantages, and overall findings of the research on garbage complaint management using Android applications.

Garbage collection systems have a tremendous opportunity to profit from the development of mobile technology, mainly through Android applications. [5]. Android applications for trash collection offer several advantages over conventional methods. It is now possible for waste management authorities and end users to have more accessible communication channels, track vehicles in real time, and plan more efficient routes [6]. Android applications can improve the efficacy of waste management processes, which positively affect the natural world [7].

The user-friendly interface of Android applications for refuse collection systems engages individuals. Garbage collection can be quickly scheduled, collection schedules can be examined, and users can provide feedback [8]. It promotes both responsible waste management and a sense of community when consumers are given this much control over their garbage [9]. Several recent studies have examined the use of Android applications in waste collection. Among the topics covered in this literature are [10] user satisfaction, route optimization algorithms, refuse segregation techniques, and data analytics for improved decision-making. These studies demonstrate the utility of integrating Android applications into current waste management procedures.

The optimization of waste collection routes can reduce travel time and increase output. Wang et al. [11] conducted a case study on optimizing garbage collection times using Android applications. They discovered that the application's utilization of route optimization algorithms enhanced route effectiveness and resource allocation. Garbage complaint systems based on Android apps can increase community engagement and empowerment. Rahman et al. [12] investigated how individuals may become more involved in waste management using mobile applications. Using these applications increased citizen participation in the grievance procedure, resulting in a more resilient and livable community.

A digital divide hinders the widespread implementation of an Android app-based complaint system. Yang et al. [13] observe that resolving the digital divide is an urgent matter that must be addressed if the complaint system is to be accessible to all. They suggested alternative communication methods like brief message service (SMS) and phone calls. For the complaint system to function, users, waste management agencies, and local government entities must be able to communicate effectively. Jones et al. [14] studied garbage collection route optimization models and techniques. They emphasized the importance of cooperation among all parties for a successful launch.

Complaint management systems built on top of Android applications place a premium on protecting the privacy and security of their customers' information. Chen et al. [15] researched privacy and security in mobile applications. To safeguard the privacy and trust of consumers, they emphasized the significance of stringent data protection protocols. Boakye et al. [16] provide an Android-based garbage collection system that utilizes global positioning system monitoring to determine the most efficient route for garbage vehicles. The study’s findings suggest that the proposed method could enhance waste collection times and reduce administrative expenses. Citizen participation in garbage collection can be increased by mobile applications [17]. The study suggests developing a mobile application through which residents can report issues, view collection schedules, and monitor service delivery in real time.

Iqbal et al. [18] present an Android-based waste management system that sorts refuse and provides immediate feedback to garbage collectors using image processing and machine learning techniques. According to the findings, the proposed method could increase the speed and precision of garbage sorting, thereby decreasing the amount of trash in landfills. Hasan et al. [19] assert that Android-based waste management systems may inform locals of nearby recycling facilities, thereby increasing recycling rates. The study proposes an Android-based waste management system that uses machine learning algorithms to separate recyclable garbage and financially recompense participants. Gouda and Subramanian [20] propose an Android-based system that utilizes a distributed blockchain-based ledger to provide transparency and accountability in refuse management. The results indicate that

the proposed strategy can increase public confidence in waste management agencies and promote sustainable disposal methods.

There is a place for creativity and initiative in developing waste management systems based on Android. Jain and Gupta [21] state that Android-based garbage collection systems have the potential to contribute to developing innovative refuse management approaches.

III. METHODOLOGY

This section describes the steps to create and evaluate the Android application that addresses waste concerns. System design, user testing, and data analysis comprise the three pillars of the methodology.

System Development

The first phase involved the creation of the Garbage Complaint System Android application. The system was designed and implemented using Android Studio, a well-known IDE for developing Android applications. We instituted agile practices from start to finish, including regular stakeholder feedback and iterative development [22, 23].

Experimental Use

Through user testing, the effectiveness and familiarity of the garbage complaint system were evaluated. The pilot program's assessment segment included residents and waste management organization representatives. Participants were provided with the Android app and instructed to use it to report waste issues. They were also requested to comment on the system's efficacy, usability, and overall appeal.

Data Analysis

Quantitative and qualitative approaches to data analysis were combined to determine the efficacy of the garbage complaint system.

Pseudocode

STEP 1: User Files the Complaint against Civic activities that are found in Society
STEP 2: The user can visualize the raised, pending, and solved problems in their dashboard
STEP 3: Admin can visualize the raised, pending, and solved problems in their dashboard
STEP 4: Admin Adds the Officer to solve the problem.
STEP 5:Officer can visualize the raised, pending, and solved problems in their dashboard
STEP 6: Once the Officer Solves the Problem and updates the status
STEP 7: Admin will approve updates to the completed status to User for the raised complaints
STEP 8: The user gets notified about the raised complaints and solved problems.

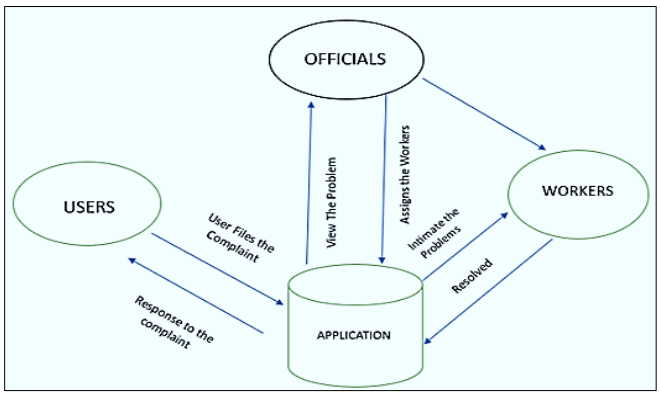


Fig. 1. Architecture Diagram for Garbage Complaint System

Figure 1 is the Architecture Diagram, the complete Working flow for the Garbage complaint system. The user files the complaint against the Improper civic activities found in the society by capturing the photo/video using GPS location.

- Once the complaint is registered successfully, Admin gets notified, Views the problem, and later assigns the workers to solve the issue in the particular area.
- The data gets stored in the database; it intimates the problem to works, and the workers will check the problem clearly and solve it.
- Once the problem is rectified, he updates the status of the complaint, whether it is completed successfully or in a pending state.

IV. IMPLEMENTATION

Client User Module

Fig. 2. Signup Page

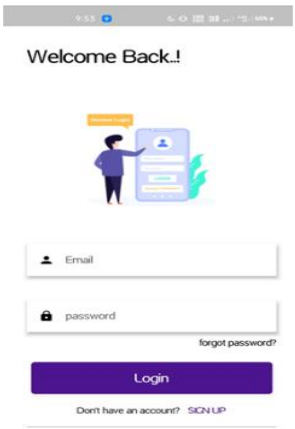


Fig. 3. Login Page

Fig 2 shows the signup page for the garbage complaint system. The user has to Sign up for the application and provide the necessary details to get signed up. Once registered, the user can log in with their registered credentials to access the application (Fig 3).

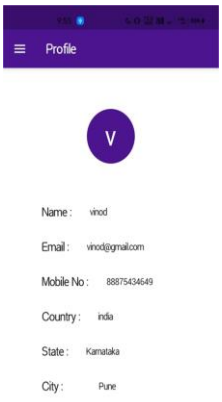


Fig.4. User Profile View

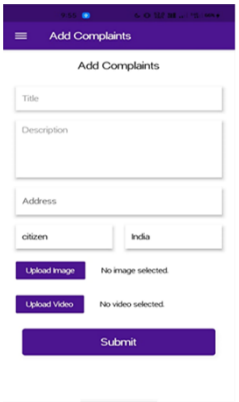


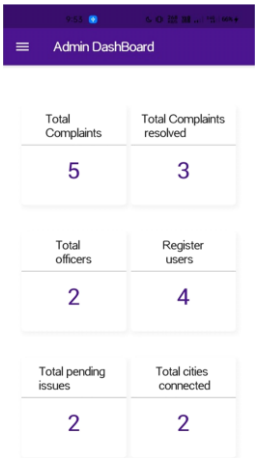
Fig.5. User Complaint Page

Fig.5. Dashboard

Admin Module

- Once the user gets registered successfully in the application, the User can view their profile page (Fig 4) as the User registered during the sign-up page.
- In (Fig 5) we can see the user complaint page, where the user can file the complaint so that the User can briefly describe the problem in his area. With the help of GPS, the camera captures the Photo and address of the area,
- Finally, the User submits the complaint to the admin.

Admin Module



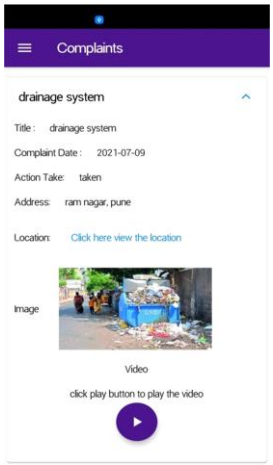
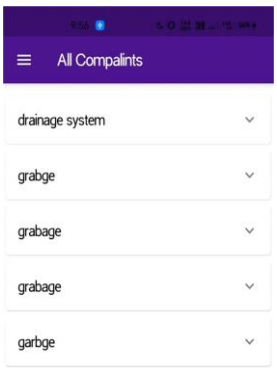


Fig. 5. Dashboard **Fig. 6. Admin views**

Complaint

- Figure 5 is the Admin Dashboard, where the admin monitors all activities to solve the issues as soon as possible. Admin receives the problem from the user.
- Admin will go through the problem and analyze the situation with the help of the provided media by the user. In Figure 5, the Admin will get the total count of Complaints, Resolved, pending issues, Registered users, and total cities connected in the admin dashboard (Fig 6)
- Admin opens the Complaint menu to check out what complaint has been filed by the user and tracks the location tagged by the user.



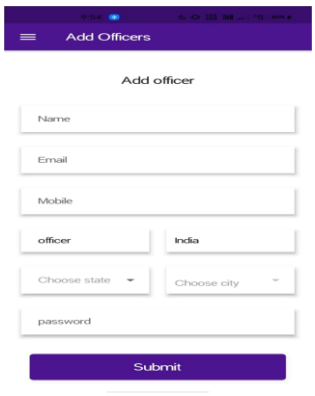


Fig. 7. Admin View **Fig .8. Admins adds officer all Complaints**

- In Figure 7, The Admin can view the list of user complaints. Admin will check the complaints to see whether they can be rectified. If the complaints still need to be solved, he can reject the complaint.
- If the complaint contains all details correctly filed by the user, The Admin appoints the Officer to a nearby location tagged by the user; the admin will fill in all the officer credentials and appoint the officer (Fig 8). Once the Admin Adds the Officer, the complaint data will be sent to the Officer to solve the issue.

Admin Module

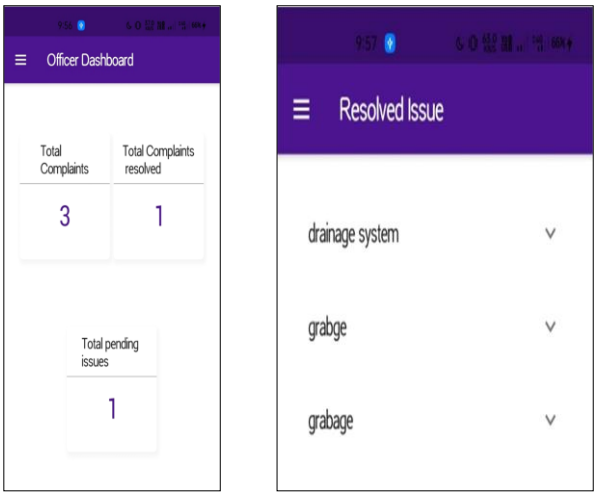


Fig. 9. Officer Profile Page **Fig.10. Resolved Issues**

The admin appoints the officer and sends all the complaint details to an Officer nearby. The Officer will get all login credentials from the admin. The Officer will log in to the application.

The officer can able to view his profile page, as we can see in Figure 9. The officer can view all the complaints filed by the user (Figure 10). The officer can select the complaint and look at it.

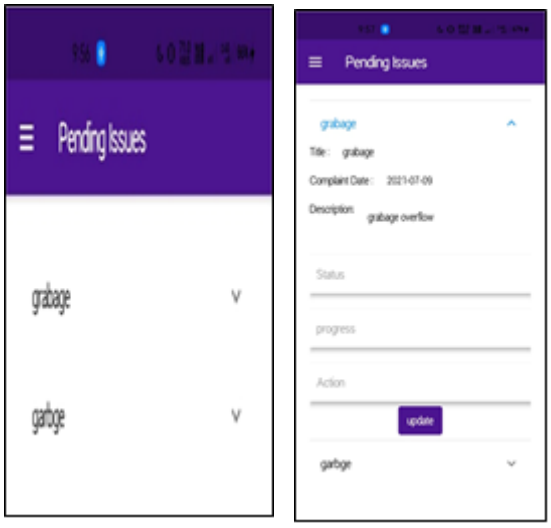
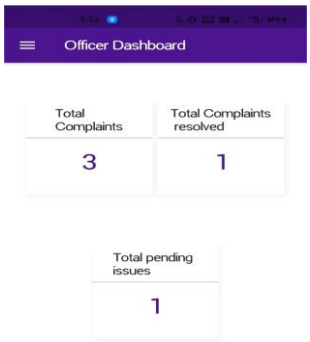


Fig.11. Pending Issues **Fig.12. Update Complaint Status**

- In Figure 11, the Officer will open the pending issue (Figure 11) menu to see all the pending complaints. Then, the officer will check the complaint and analyze the issue in the area. Then, the officer starts his work with his team.
- Once the Officer completes his work, the officer will open the pending issue menu to update the complaint status. If the Officer completed the assigned duty, he could update the complaint status (Fig 12) as completed. Else, he can update it as in a Pending state.



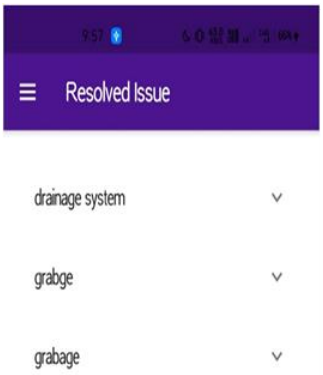


Fig. 13. Officer dashboards **Fig. 14. Resolved Issues.**

- Once the officer solves the issue in an area, He updates the complaint and checks the officer dashboard (Fig 13). In the dashboard, the officer can view total complaints, Resolved, and pending states.
- If the officer successfully solves the complaint and updates the status of the complaint, The solved Complaint will be updated in the Resolved issue (Fig 14). So, it will not be visible in the Pending issue.
- As soon as the complaint is solved, it will be sent to admin, confirming that the Issue has been solved successfully.
- Later, the admin will check whether the complaint status has solved the issue.

IV. CONCLUSION

The significant role of Android applications in improving the efficiency and effectiveness of garbage complaint systems. Integrating an Android application into the garbage complaint system holds great potential for enhancing user experience, improving response times, and optimizing waste management processes. This study further explores the benefits and challenges of implementing such a system while considering user satisfaction, stakeholder coordination, and data utilization for better decision-making. The findings from existing studies provide valuable insights for the successful implementation and operation of garbage complaint systems using Android applications. The agile development approach facilitated iterative improvements, while user testing and data analysis provided valuable insights into user satisfaction, system usability, and the system's impact on the complaint resolution process.

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