

# E-GRAM SAMASYA NIVARAN APPLICATION

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## ABSTRACT :

The rapid growth of digital technologies has transformed governance systems and public service management across urban areas. However, many rural and semi-urban regions still rely on traditional manual methods for registering and resolving public grievances. These methods are often time-consuming, inefficient, and lack transparency. The proposed “E-Gram Samasya Nivaran Application” is an Android-based grievance redressal system developed to bridge the communication gap between citizens and local governing authorities. The system enables villagers and citizens to register complaints digitally using smartphones by uploading complaint details along with multimedia evidence such as images, videos, and GPS location. The application is developed using Android Studio and Java, while Firebase services are used for authentication, database management, cloud storage, and real-time notifications. The system provides a secure admin panel where government authorities can review complaints, verify uploaded data, update complaint status, and provide remarks regarding issue resolution. Real-time synchronization and cloud-based data management improve transparency, accountability, and communication between citizens and authorities. The proposed system supports Digital India and Smart Village initiatives by promoting e-governance, reducing paperwork, improving response time, and enabling efficient grievance handling in rural and semi-urban areas. The application can be further enhanced with AI-based complaint classification, multilingual support, and integration with government grievance portals.

**Keywords :** Android Application, Grievance Redressal System, Firebase, Digital Governance, Smart Village, Complaint Management, E-Governance.

## 1. INTRODUCTION

In today’s digital era, mobile applications have become an important part of daily life by providing convenient and efficient solutions for real-world problems. Despite technological advancement, many rural and semi-urban areas still face difficulties in communicating civic issues to local authorities. Citizens are often required to physically visit Gram Panchayat or municipal offices to report problems such as road damage, drainage blockage, garbage accumulation, water supply issues, sanitation problems, and electricity failures. Traditional complaint management systems are manual, paper-based, and time-consuming. Due to lack of transparency and poor communication, complaints may be delayed, misplaced, or unresolved. This creates dissatisfaction among citizens and reduces trust in governance systems. To overcome these limitations, the “E-Gram Samasya Nivaran Application” is proposed as a smart Android-based digital grievance reporting platform. The application allows citizens to submit complaints directly from their smartphones by entering complaint details and uploading multimedia evidence such as images and videos. The system also integrates Google Maps API for location-based complaint tracking. The admin panel enables government authorities to monitor complaints, verify uploaded evidence, update complaint status, and maintain transparency throughout the complaint management process. Firebase services provide secure cloud storage, authentication, and real-time database synchronization. The project supports Smart Village and Digital India initiatives by encouraging digital governance and improving public service management in rural areas.

### 1.1 Objectives of the System

The major objectives of the E-Gram Samasya Nivaran Application are:

1. To develop a user-friendly Android application for digital complaint submission.
2. To provide real-time communication between citizens and local authorities.
3. To reduce paperwork and manual complaint handling processes.
4. To improve transparency and accountability in grievance management.
5. To provide secure complaint storage using cloud-based Firebase services.

## 2. LITERATURE SURVEY

Digital grievance redressal systems have become an important part of e-governance and smart city applications. Many researchers have developed Android and web-based complaint management systems to improve communication between citizens and government authorities. These systems mainly focus on reducing paperwork, increasing transparency, and improving complaint resolution efficiency. P. Sharma and A. Kumar proposed a Smart Grievance Redressal System using an Android application for digital complaint registration and tracking. S. Patel, R. Desai, and K. Bhatt developed an E-Governance application integrated with GPS and multimedia features to improve complaint verification and issue identification. R. Gupta and S. Singh introduced a cloud-based Digital Complaint Management System for smart cities that improved real-time synchronization and complaint monitoring. Similarly, N. Sharma and P. Nair proposed a mobile-based E-Gram application for smart village governance and citizen participation. Several studies also focused on GPS-based complaint systems. T. Mehta and H. Patel developed a location-aware complaint handling system to improve response time, while R. Iyer and M. Thomas integrated Google Maps and multimedia technologies for efficient civic issue tracking. Although existing systems provide features like cloud storage, complaint tracking, and GPS integration, most applications are mainly designed for urban governance and lack a simple platform specifically for rural areas. The proposed “E-Gram Samasya Nivaran” system overcomes these limitations by integrating Android technology, Firebase cloud services, multimedia uploads, GPS tracking, and real-time notifications into a single platform designed for rural governance and smart village initiatives.

**Table 1: Comparative Analysis of Existing E-Gram Complaint Management System**

| Reference               | Method                  | Key Contribution                                    | Limitation                            |
|-------------------------|-------------------------|---|---------------------------------------|
| P. Sharma et al. (2023) | Android App             | Digital complaint registration and tracking system  | No GPS integration                    |
| S. Patel et al. (2023)  | GPS & Multimedia App    | Better issue verification using images and location | Mainly focused on urban areas         |
| R. Gupta et al. (2022)  | Cloud-Based System      | Real-time complaint monitoring and management       | Requires stable internet connection   |
| N. Sharma et al. (2022) | Mobile E-Gram System    | Supports digital rural governance                   | Limited notification features         |
| T. Mehta et al. (2023)  | GPS Complaint System    | Faster identification of complaint locations        | No multimedia support                 |
| R. Iyer et al. (2023)   | Google Maps Integration | Efficient civic issue tracking through maps         | Limited implementation in rural areas |

## 3. PROBLEM STATEMENT

In many rural and semi-urban areas, public grievance reporting systems still rely on manual processes where citizens must visit Gram Panchayat or municipal offices to submit complaints regarding roads, sanitation, water supply, drainage, electricity, and other civic issues. These traditional systems are time-consuming, lack transparency, and often result in delayed complaint resolution, poor communication, and inefficient record management. Citizens are also unable to track the status of their complaints effectively. To address these challenges, there is a need for a digital grievance redressal system that enables citizens to register complaints easily through a mobile application with multimedia evidence and GPS-based location tracking. The system should provide secure complaint management, real-time status updates, and efficient communication between citizens and local authorities to improve transparency, accountability, and public service delivery in rural governance.

## 4. PROPOSED SYSTEM

The proposed “E-Gram Samasya Nivaran” system is an Android-based grievance redressal application for rural governance. The system allows citizens to register complaints related to roads, sanitation, water supply, drainage, and electricity through their smartphones. Users can upload images, videos, and GPS location details for accurate issue reporting. The application uses Android Studio, Java, Firebase services, and Google Maps API for secure complaint management and real-time notifications. The admin panel helps authorities monitor complaints, update status, and manage issue resolution efficiently. The system improves transparency, reduces paperwork, and supports smart village governance.

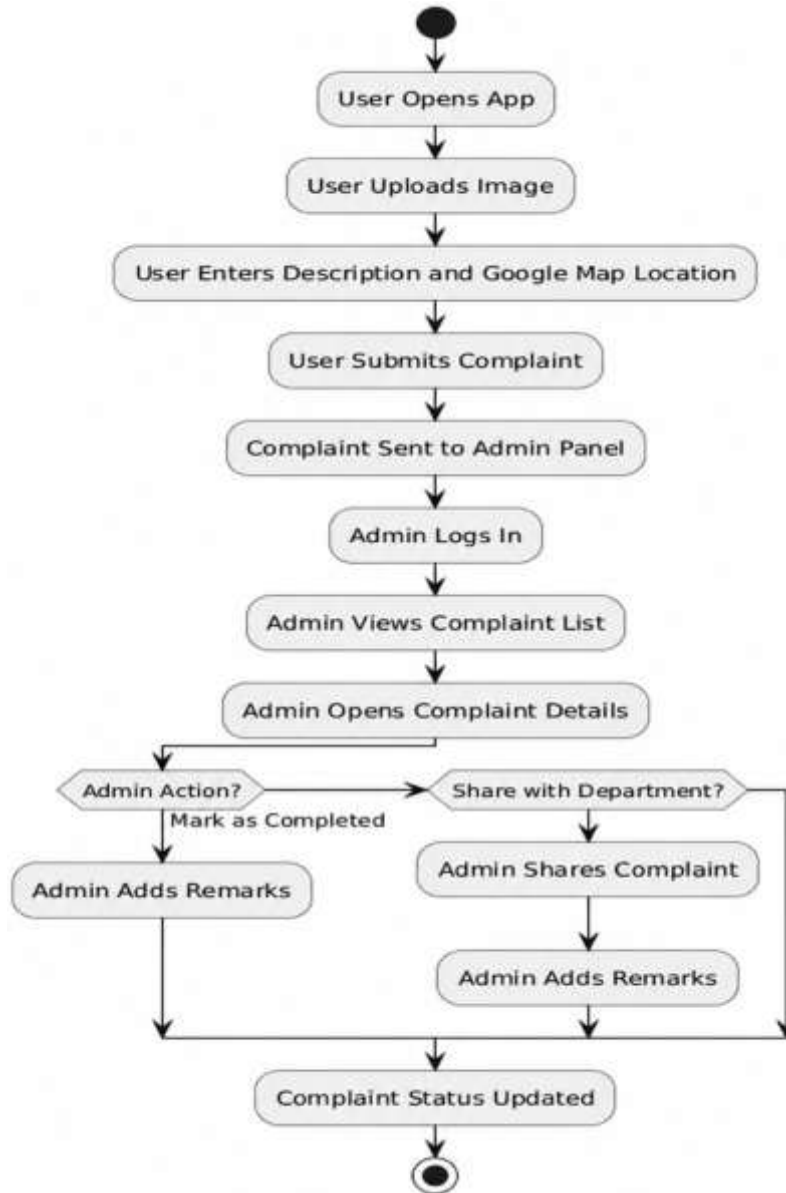
### 4.1 System Overview

The “E-Gram Samasya Nivaran” system is an Android-based grievance reporting platform developed to improve communication between citizens and local governing authorities. The application provides a digital environment where users can register complaints related to public issues such as road damage, water leakage, sanitation problems, drainage blockage, garbage accumulation, and electricity faults directly through their smartphones. The system aims to replace traditional manual complaint processes with a faster, transparent, and efficient digital solution. Citizens can submit complaints from any location and at any time without visiting Gram Panchayat or municipal offices physically. The application also supports multimedia uploads and GPS-based location tracking, which help authorities identify issues more accurately and take quicker action. The proposed system uses Android Studio and Java for application development, while Firebase services provide secure cloud-based backend support. Firebase Authentication ensures secure login and registration for users and administrators. Firebase Realtime Database and Firebase Storage are used for storing complaint records and multimedia evidence securely. Firebase Cloud Messaging (FCM) provides real-time notifications regarding

complaint registration, status updates, and resolution details. The admin panel enables authorities to manage complaints efficiently by viewing complaint details, verifying evidence, updating complaint status, assigning complaints to departments, and adding remarks related to issue resolution. The system improves transparency, accountability, and communication efficiency between citizens and local administration.

#### 4.2 System Architecture

The “E-Gram Samasya Nivaran” system consists of User, Admin, GPS, Multimedia, and Cloud Database modules. Users can register complaints with images, videos, and location details through the Android application. Firebase services are used for authentication, data storage, and real-time notifications, while Google Maps API provides GPS tracking. The Admin Panel helps authorities monitor complaints, update status, and manage issue resolution efficiently.



**Fig.1 Working flowchart of E-Gram Samsya Nivaran Application**

#### 1. User Module

The user module is designed for citizens who want to register complaints digitally. Users can create accounts using secure authentication methods and log into the application. After login, users can submit complaints by entering issue details and uploading supporting media files such as images, videos, and audio recordings. The module also allows users to track the status of submitted complaints in real time.

#### 2. Android Application Interface

The Android application provides a simple and user-friendly interface that enables citizens to interact with the system easily. The interface is developed using XML and Android Studio to ensure smooth navigation and accessibility for users from rural and semi-urban areas.

### 3. Google Maps Link Integration

The system allows users to attach a Google Maps location link while submitting complaints. This helps authorities identify the approximate location of the issue easily and improves complaint verification and response efficiency. Instead of using a dedicated GPS module, the project relies on Google Maps link sharing for location reference.

### 4. Camera and Multimedia Module

This module allows users to upload images, videos, and audio recordings related to complaints. Multimedia evidence improves the authenticity of complaints and helps administrators understand the seriousness of issues more effectively.

### 5. Cloud Server and Database

Firebase Realtime Database and Firebase Storage are used as cloud-based backend services. Complaint details, user information, and multimedia files are stored securely in the cloud, ensuring data accessibility, scalability, and real-time synchronization.

### 6. Admin Panel

The admin panel is designed for local governing authorities and administrators. Through this panel, authorities can view complaints, verify issue details, update complaint status, assign tasks to departments, and provide remarks regarding issue resolution. This module improves monitoring and accountability.

### 7. Notification System

Firebase Cloud Messaging (FCM) is used to send notifications regarding complaint registration, status updates, and issue resolution. Real-time notifications improve communication between users and administrators and keep citizens informed about complaint progress.

## 5. ALGORITHM

1. Start
2. The user opens the complaint management application.
3. The application interface is displayed, allowing the user to upload files and enter complaint details.
4. The user uploads an image, discription related to the complaint.
5. The system verifies the uploaded media file for correct format and size.
6. The user enters the description of the issue and adds the Google Map location for accurate tracking.
7. The system checks that all required fields are filled correctly.
8. The user submits the complaint.
9. The system validates the entered data and stores the complaint in the database.
10. The complaint is automatically sent to the admin panel for review.
11. The admin logs in to the admin dashboard using valid credentials.
12. The system verifies the login credentials and grants access to the admin.
13. The admin views the list of complaints received from users.
14. The admin selects a specific complaint from the list to open and view detailed information.
15. The admin reviews the complaint details including description, media, and location.
16. The system asks for the admin's action.
17. If the complaint is resolved or does not require further action, the admin marks it as completed and adds remarks.
18. If the complaint needs to be forwarded, the admin shares the complaint with the concerned department and adds remarks.
19. The system updates the complaint status in the database as "Completed," "Shared," or "In Progress."
20. The user receives a notification about the updated status of the complaint.

21. The system saves all admin actions and remarks for record-keeping.  
 The process ends.

### 6. IMPLEMENTATION / TECHNOLOGY STACK

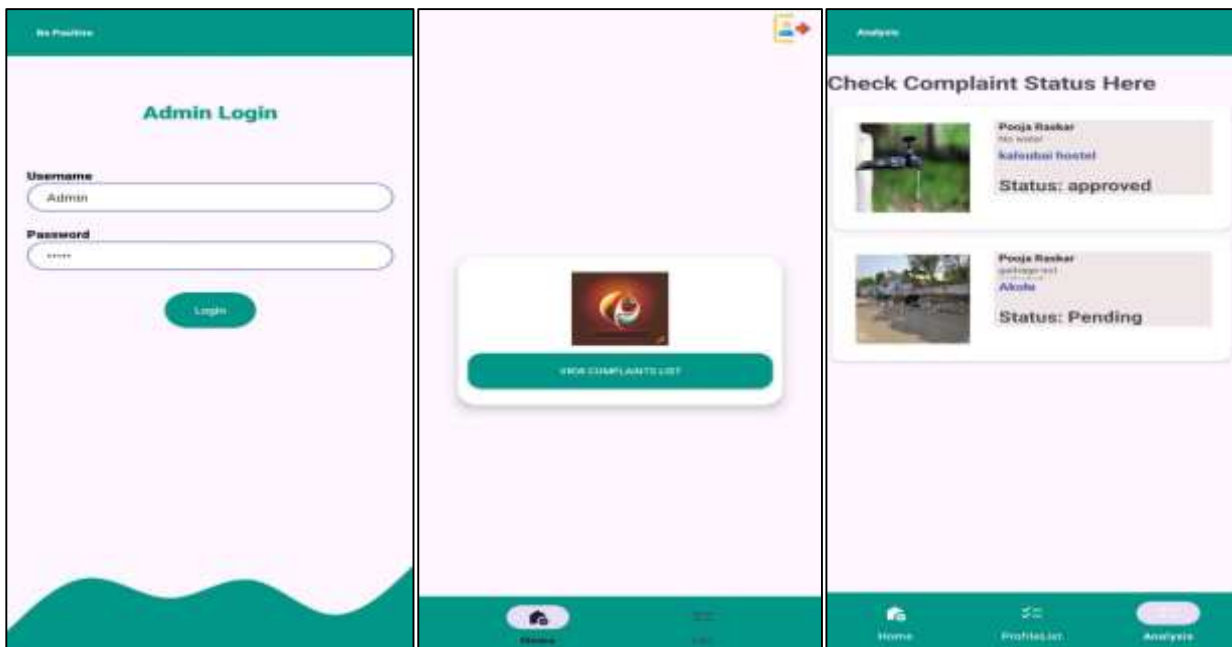
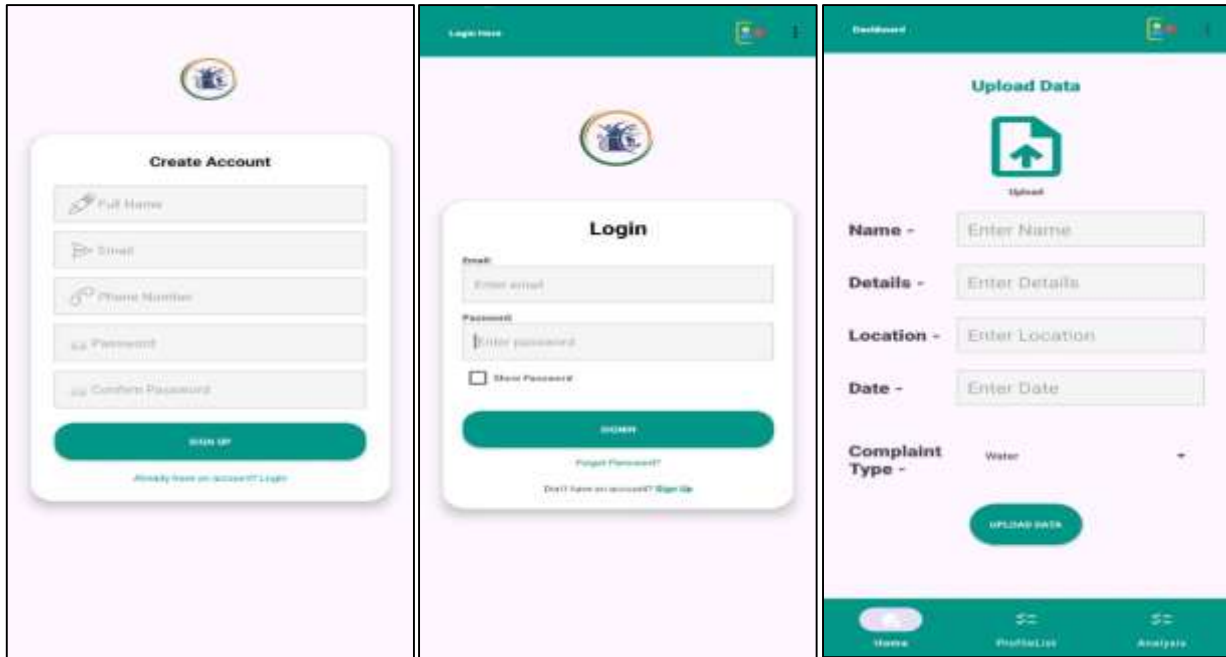
The E-Gram Samasya Nivaran Application is implemented as a cloud-based Android grievance management system that enables citizens to register and monitor public complaints digitally. The system architecture follows a client-server model in which the Android application acts as the client interface while Firebase cloud services function as the backend server for data storage, authentication, and synchronization. The frontend of the application is developed using Android Studio with XML for designing interactive and user-friendly interfaces. The backend functionality and application logic are implemented using the Java programming language because of its reliability, platform independence, and compatibility with Android development. The application uses Firebase Realtime Database to store complaint records, user details, complaint status, timestamps, and GPS coordinates. Firebase provides real-time synchronization, allowing instant updates between the user application and admin dashboard. This improves transparency and communication between citizens and authorities. For secure login and user management, the system integrates Firebase Authentication, which supports email-password authentication and secure session management. Complaint-related images and multimedia evidence are uploaded and stored using Firebase Storage, ensuring secure cloud-based file management. The application also integrates Google Maps API and GPS services to capture the exact geographical location of complaints. This helps authorities identify issue locations accurately and respond more effectively. To improve communication, Firebase Cloud Messaging (FCM) is used for sending real-time notifications related to complaint registration, complaint progress, and resolution updates. The complete technology stack provides scalability, security, reliability, and efficient digital governance support for rural and semi-urban grievance management systems..

**Table 2: Software and Hardware Requirements**

| Component            | Technology used /Specification              |
|----------------------|---|
| Frontend Development | Android Studio, Xml                         |
| Backend Programming  | Java  |
| Database             | Firebase Realtime Database                  |
| Cloud Storage        | Firebase Storage                            |
| Device Required      | Android smartphone with internet connection |
| Notification system  | Firebase Cloud Messaging                    |

### 7. RESULT AND EVALUATION

The E-Gram Samasya Nivaran Application was successfully developed and implemented as an Android-based grievance management system for rural governance. The system effectively enables citizens to register complaints digitally using smartphones, reducing the need for manual paperwork and physical visits to government offices. The application successfully integrates complaint registration, image upload, GPS-based location tracking, cloud storage, and real-time notification services into a single platform. Firebase Realtime Database provided fast and reliable real-time synchronization between the user application and admin panel. Firebase Authentication ensured secure login access for both users and administrators. The admin module efficiently handled complaint monitoring, verification, and status updates. Users were able to track complaint progress and receive instant notifications regarding complaint registration and resolution. The integration of Google Maps API improved complaint accuracy by providing exact issue locations. The system evaluation showed improvements in transparency, communication, and efficiency in grievance handling. The proposed system reduced manual effort, improved response time, and increased accountability in local governance processes. Overall, the application proved to be a reliable, scalable, and user-friendly solution for digital complaint management in rural and semi-urban areas.



## 8. FUTURE SCOPE

1. Integration with official government grievance portals for faster complaint processing.
2. AI-based complaint classification and priority management.
3. Multi-language support for better accessibility in rural areas
4. Voice and chatbot-based complaint registration system.
5. SMS notification support for non-smartphone users.
6. Offline complaint submission with later synchronization.
7. GIS-based visualization for complaint location tracking.
8. Data analytics dashboard for higher authorities and decision-making.
9. Expansion of the system to city, district, and state-level governance platforms.

## 9. CONCLUSION

The E-Gram Samasya Nivaran Application successfully provides a digital platform for complaint registration and grievance management in rural and semi-urban areas. The system allows citizens to report public issues easily through an Android application using complaint details, images, and GPS-based location tracking. The integration of Firebase services ensures secure authentication, real-time database synchronization, cloud storage, and instant notifications. The admin panel improves transparency and accountability by enabling authorities to monitor, verify, and update complaints efficiently. The application also helps maintain proper digital records of complaints, reducing the chances of data loss and improving administrative workflow. The proposed system significantly reduces paperwork, saves time, and improves communication between citizens and authorities. Real-time complaint

tracking and notification services increase user satisfaction and encourage active citizen participation in governance activities. The use of cloud technology and mobile-based services makes the system reliable, scalable, and accessible from any location. Furthermore, the project supports Digital India and Smart Village initiatives by promoting e-governance and technology-driven public service management. Overall, the E-Gram Samasya Nivaran Application provides an efficient, secure, and user-friendly solution for modern digital grievance management and contributes toward building transparent and smart governance systems.

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