

# MINI PROJECT – IS2106

## GN Management System Group 21

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# **1 Introduction**

## **1.1 Purpose**

The GramaNiladhari Connect Android app is designed to empower Grama Niladhari officers with a comprehensive and user-friendly digital tool for efficient management and organization of resident, household, and local event data within their jurisdiction. The app aims to streamline data entry, editing, and deletion processes, while also offering advanced search and filtering options for quick access to relevant information. By automating manual tasks and reducing administrative burden, the app enhances officer productivity and facilitates timely scheduling and management of local events, promoting community engagement. With offline access capabilities, officers can work efficiently in areas with limited internet connectivity, and robust security features ensure data privacy and confidentiality. Additionally, the app facilitates data analysis and reporting with comprehensive reports on demographics and statistics, empowering informed decision-making. By fostering collaboration among officers and promoting effective communication with residents, the GramaNiladhari Connect app aims to transform traditional data management practices, delivering more efficient and effective services to the community.

## **1.2 Document Conventions**

The document was created in Microsoft Word 2019 with the font 'Times New Roman'. The headings are with the font size 16pts, sub-headings 14pts, and the content was typed using a fixed font size of 12pt with 1.15 line spacing. It has set the document's heads using the bold attribute. Except for the cover page, all pages are numbered; the numbers appear in the page's bottom right-hand corner. Each image and data table are numbered.

## **1.3 Scope**

The Grama Niladhari manages all the data, such as personal details, allowances , land-related details, government services manually for the people living in the village. This will be very difficult and trying task for the village officials. This is not efficient and correct data is not entered into the system. Many data entry errors occur. In our GN management system can solve above several issues and The Village officer can handle the system easier and more efficiently.

In this system allows to Grama Niladhari's to manage essential data related to individuals, households. There are more functionalities include adding new individuals, updating information and maintaining accurate records.

Grama Niladhari can use system to handle public services requests submitted by people within their division. And people can submit their requests for public services such as obtaining official documents , reporting incidents and seeking assistance.

The system facilitated the management of land ownership records such as land ownership, transfers and disputes

In above project scope in detail, stakeholders can have a clear understand about the objectives , functionalities and deliverable of this GN Management system.

## 1.4 Objectives

The objectives of the Grama Niladhari Connect Android app project aim to enhance data management efficiency, user experience, and security for Grama Niladhari officers. The app will enable officers to efficiently capture, edit, and manage resident, household, and event data, with an intuitive user interface tailored for Android devices. This app contains Robust security measures, including secure login will safeguard sensitive information. Additionally, the app will feature comprehensive reporting capabilities, real-time notifications and alerts, and promote collaboration among officers for improved teamwork and coordination. Training, support, and a scalable architecture for future integrations and advanced features are also key objectives to ensure the app meets the evolving needs of the officers and enhances community engagement.

## 2 Stakeholders

### 2.1 Primary Stakeholders

- Grama Niladharis      They are the primary users of the system and they are responsible for managing administrative tasks within their respective Grama Niladhari divisions.
- Government officials      Officials at various levels responsible for overseeing the project allocating resources.
- Residents      They are the individuals living in the village who interact with the system to request public services and provide information

### 2.2 Secondary Stakeholders

- System Administrators      IT professionals responsible for server maintenance , database management and user support.
- Development Team      Development team include developers , designers , testers and other technical staff. They are responsible for development and implementation of the GN Management System.

## 3 Functional Requirements

### 3.1 User Authentication:

- **Secure Login:** Implement a secure login system for Grama Niladhari officers using username and password authentication.
- **Role-Based Access:** Assign different access levels or roles such as admin, officer, or viewer with specific permissions to ensure role-based access control and data security.

### 3.2 Data Entry Form

- **Resident Details Form:** Provide a structured form to capture resident information including name, address, contact details, family members, and occupation.

- **Household Information Form:** Design a form to collect household details such as structure type, Income, Assets and property, subsidies, Medical conditions, amenities, ownership status, and occupancy details.
- **Local Event and Community Activity Form:** Create a form to record local events, community activities, or meetings with details like event name, date, time, location, and attendees.

### 3.3 Search and Retrieval:

- **Search Functionality:** Implement a robust search functionality allowing officers to search for resident, household, or event data based on various criteria such as name, address, event date, etc.
- **Data Retrieval:** Enable officers to retrieve and view detailed information of residents, households, or events from the database quickly and efficiently.

### 3.4 Data Export:

- **Export Options:** Provide options to export data in CSV or PDF formats to facilitate data sharing, reporting, and printing.
- **Customizable Reports:** Allow officers to customize reports by selecting specific data fields, date ranges, or criteria before exporting to CSV or PDF formats.

## 4 Technology Stack

### 4.1 Frontend:

- **Flutter:** Utilize Flutter for cross-platform mobile app development. Flutter's rich widget library and reactive framework enable efficient and consistent UI development for the Android app, ensuring a smooth and responsive user experience.

### 4.2 Backend:

- **Node.js:** Implement the backend using Node.js, which offers scalability and asynchronous event-driven architecture, making it suitable for building fast and scalable server-side applications to support the Flutter-based Android app.

### 4.3 Database:

- **Firebase :** Firebase is a comprehensive platform offered by Google, designed to streamline the development of mobile and web applications. It provides a suite of tools and services that enable developers to build high-quality apps quickly and efficiently. One of the key components of Firebase is its real-time database, which allows for seamless data synchronization across multiple clients in real time

## 4.1 Backup and Restore:

- **Automatic Backup:** Implement automatic data backup functionalities to create regular backups of the database to prevent data loss.
- **Manual Restore:** Provide a manual restore option allowing officers to restore data from a backup in case of data corruption or accidental deletion, ensuring data integrity and availability.

## 5 Non-Functional Requirements

### 5.1 Performance:

- **Scalability:** The app should efficiently handle multiple concurrent users without any performance issues, ensuring a smooth and responsive user experience even during peak usage times.

### 5.2 Security:

- **Role-Based Access Control:** Implement role-based access control (RBAC) within the Android app to ensure that only authorized users can access specific functionalities and data, thereby preventing unauthorized access and maintaining data security.

### 5.3 Usability:

- **Intuitive Interface:** Design an intuitive and user-friendly interface tailored for Android devices with clear navigation and easy-to-understand layouts to facilitate easy data entry and navigation within the app.

### 5.4 Compatibility:

- **Mobile-Friendly Design:** Develop a responsive and mobile-friendly design that adapts to various Android screen sizes and resolutions, ensuring optimal user experience across different devices.

## 6 Data Requirements

### 6.1 Data Sources:

- **Manual Entry by GN Officers:** The primary source of data for the GramaNiladhari Connect Android app will be manual entry by Grama Niladhari officers. Officers will enter and update resident, household, and local event data directly into the app through data entry forms.

### 6.2 Data Storage:

- **Cloud-Based Storage Solution:** Utilize a secure and reliable cloud-based storage solution to store and manage the app's data. Cloud storage offers scalability, accessibility, and data redundancy, ensuring that officers can access and manage data anytime, anywhere.
- **Regular Backups:** Implement automatic data backup mechanisms to create regular backups of the cloud-based data storage. Regular backups will prevent data loss and ensure data availability in case of any unforeseen issues or disasters.

### 6.3 Data Security:

- **Regular Security Audits and Updates:** Conduct regular security audits and updates to identify and address any potential vulnerabilities or security threats. Keeping the app and its underlying infrastructure up-to-date with the latest security patches and updates will help in maintaining robust data security and protecting against evolving security threats.

## 7 Assumptions and Dependencies

### 7.1 Assumptions:

- **GN Officers' Smartphone/Tablet Proficiency:** It is assumed that Grama Niladhari (GN) officers have basic knowledge and proficiency in using smartphones or tablets. This assumption ensures that officers can effectively use the GramaNiladhari Connect Android app to manage resident, household, and local event data without requiring extensive training on using mobile devices.
- **Availability of Reliable Internet Connectivity:** It is assumed that reliable internet connectivity is available in most areas where GN officers operate. This assumption is crucial as the app relies on internet connectivity for data synchronization, cloud storage access, and real-time updates. Reliable internet connectivity ensures seamless data management and app functionality for officers in their day-to-day operations.

### 7.2 Dependencies:

- **Availability of Cloud Storage and Hosting Services:** The successful implementation and operation of the GN Management System Android app depend on the availability and reliability of cloud storage and hosting services. These services are essential for storing app data securely, ensuring data accessibility, and facilitating data backup and recovery functionalities.
- **Integration with Existing Systems or Databases:** If there are any existing systems, databases, or platforms used by GN officers or other stakeholders for managing resident, household, or event data, the integration with these systems will be a dependency on the GN Management System app. Seamless integration with existing systems ensures data consistency, reduces duplicate data entry, and enhances overall data management efficiency.