

Final Report



Gramma-Link

Gramma Niladhari Services Management System

Group - CS 13
28/04/2025

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Contents

1	Introduction	4
1.1	Domain Description	4
1.2	Current System and Limitations	4
1.3	Goals and Objectives	5
1.4	Process Re-engineered	5
1.5	Assumptions	6
2	Feasibility Study	7
2.1	Technical Feasibility	7
2.2	Operational Feasibility	7
2.3	Economic Feasibility	8
2.4	Legal and Ethical Feasibility	8
2.5	Schedule Feasibility	8
2.6	Social Feasibility	9
3	Requirements	14
3.1	Stakeholders / Actors	14
3.2	Functional Requirements	14
3.2.1	For Citizens	14
3.2.2	For Grama Niladhari (GN)	15
3.2.3	For Administrative Grama Niladhari (AGN)	15
3.3	Non-Functional Requirements	16
3.4	In-Scope and Out-of-Scope	16
3.4.1	In-Scope	16
3.4.2	Out-of-Scope	17
3.5	Constraints and Limitations	17
4	Proposed System's Architecture	19
4.1	Components and Their Functionalities	19
4.1.1	Model Layer	19
4.1.2	View Layer	19
4.1.3	Controller Layer	20
4.2	Component Interactions	20
4.3	Advantages of Using MVC Architecture	20
5	System Design Diagrams	22
5.1	Use case diagrams	22
5.2	Class diagrams	26
5.3	ER Diagram	27

5.4	Activity diagrams	28
6	Completeness of the Project	35
6.1	Functionalities completed	35
6.2	Functionalities Yet to Complete	35
6.3	Individual contribution of the team members	36
6.3.1	P.M.A.T. Srikantha (29%)	36
6.3.2	D.N. Kodithuwakklu (29%)	39
6.3.3	J.M.C.K. Jayathilake (21%)	42
6.3.4	L.H.L.S. Darshana (21%)	44
6.4	Group Members	50

Chapter 1

Introduction

1.1 Domain Description

The Grama Niladhari (GN) administrative system plays a crucial role in delivering government services at the grassroots level in Sri Lanka. It serves as a bridge between citizens and the government by managing a wide range of activities, including citizen applications for certificates, handling complaints, conducting field visits, maintaining address records, and escalating matters to Administrative Grama Niladharis (AGNs).

Despite its significance, the current GN system is predominantly manual, relying on paper-based processes and in-person interactions. These outdated methods result in inefficiencies, delays, and a lack of transparency for citizens. Problems such as missing records, miscommunication, and the inability to track request statuses hinder the effectiveness of the system.

To address these challenges, we propose **Gramma-Link**: a web-based platform designed to digitize and centralize the GN administrative framework. Gramma-Link aims to streamline operations, automate workflows, and enhance citizen interaction with government services, ultimately creating a transparent, efficient, and user-friendly administrative system.

1.2 Current System and Limitations

Current System: The existing GN system is entirely manual, involving paper-based record-keeping, face-to-face communication, and fragmented processes. Key administrative tasks, such as tracking citizen applications, managing field visits, and resolving complaints, are labor-intensive and prone to errors. There is limited use of technology, leading to inefficiencies in service delivery and delays in critical operations.

Limitations:

- **Lack of Centralization:** The absence of a centralized database results in redundancy and missing records.
- **Manual Workload:** Manual data handling is time-consuming, increases the chances of human errors, and results in delays.
- **Poor Communication:** Citizens and government officials lack a streamlined communication channel, leading to mismanagement and frustration.

- **Limited Tracking:** Citizens cannot track the status of their requests, causing dissatisfaction and reduced trust.
- **Resource Mismanagement:** Inaccurate record-keeping hampers resource allocation and decision-making.

1.3 Goals and Objectives

Goal: To develop **Gramma-Link**, an online administrative system that enhances efficiency, transparency, and accessibility in managing GN services. The platform will streamline operations for GNs, AGNs, and citizens while improving communication and accountability.

Objectives:

- **Automate Administrative Tasks:** Simplify field visit scheduling, application handling, and complaint resolution.
- **Enable Citizen Engagement:** Provide an easy-to-use platform for citizens to submit, track, and manage requests.
- **Enhance Communication:** Facilitate real-time notifications and interactions between GNs, AGNs, and citizens.
- **Improve Resource Management:** Centralize data storage and streamline resource allocation and decision-making.
- **Ensure Secure Data Management:** Implement robust data security protocols to protect sensitive information.
- **Provide Reporting and Analytics:** Offer tools for analyzing complaints, applications, and performance metrics to support informed decision-making.
- **Increase Transparency and Trust:** Build trust by allowing citizens to track the progress of their requests and access guidelines.

1.4 Process Re-engineered

- **Certificate Applications:** Manual to online form submissions.
- **Complaint Handling:** Manual registers to digital complaint management.
- **Field Visits:** Manual scheduling to auto-generated routes.
- **Citizen Communication:** From paper notices to real-time notifications.
- **Record Keeping:** Paper archives to centralized digital databases.

1.5 Assumptions

- All users, including citizens, GNs, and AGNs, have access to the internet.
- The system integrates with existing government databases to verify and manage citizen data.
- GNs and AGNs have basic computer literacy to operate the system.
- Citizens can access the platform via web and mobile applications.
- All necessary legal and administrative approvals are in place to implement the system.

Chapter 2

Feasibility Study

2.1 Technical Feasibility

The development of Grama-Link leverages modern, widely-used, and reliable technologies to ensure scalability, maintainability, and ease of use. Below is a breakdown of the technologies and tools utilized:

Category	Technologies/Tools
Front-end technologies	HTML, CSS, JavaScript
Back-end technologies	PHP, MySQL
Development tools	Visual Studio Code, XAMPP
Collaboration/version control	GitHub, Git
Designing/Visualization	Figma, Canva, Draw.io
Documentation tools	Google Docs, Google Drive
Communication tools	Zoom, Microsoft Teams, WhatsApp

Table 2.1: Technologies and Tools for Grama-Link Development

Grama-Link is feasible technically because it uses open-source and widely accessible tools, ensuring a cost-effective development process. Additionally, the project timeline allows ample time for learning and implementing these technologies effectively.

2.2 Operational Feasibility

Grama-Link's operational feasibility is assured by the clear requirements gathered from stakeholders, including citizens, Grama Niladharis (GNs), and Administrative Grama Niladharis (AGNs). The following factors support its viability:

- **Intuitive Design:** User-friendly interfaces with responsive designs for accessibility on both desktop and mobile devices.
- **Streamlined Processes:** Automation of manual tasks, such as complaint handling, application approvals, and scheduling, ensures efficiency.
- **Effective Communication:** Real-time notifications for request status updates and other alerts improve communication among all stakeholders.

- **User Training and Manuals:** Detailed user manuals and FAQs ensure smooth onboarding for all users.

By addressing the current system's inefficiencies, Grama-Link ensures a seamless operational process, making it both viable and user-friendly.

2.3 Economic Feasibility

Gramma-Link is designed to be a financially sustainable project with minimal development costs. Below are the cost considerations:

1. **Development Cost:** The project is built by university students, with no external charges for development.
2. **Hosting Cost:** A free hosting service is used to minimize operational expenses.
3. **Software/Hardware Costs:** Free and open-source tools (e.g., PHP, MySQL, Visual Studio Code) are utilized. Development is done on personal devices, eliminating hardware expenses.

Given its reliance on open-source technologies and minimal operational expenses, Gramma-Link is an economically feasible system.

2.4 Legal and Ethical Feasibility

To ensure compliance with legal and ethical guidelines, Gramma-Link incorporates the following measures:

- **Data Security:** Sensitive citizen data is encrypted during storage and transfer.
- **Privacy Protection:** Access to user data is restricted to authorized personnel only.
- **Regulatory Compliance:** The system aligns with Sri Lankan regulations regarding data protection and citizen records.
- **Transparency:** User interactions and request statuses are logged for accountability.

By prioritizing privacy, security, and compliance, Gramma-Link adheres to legal and ethical standards.

2.5 Schedule Feasibility

The project commenced in mid-2024 and follows a detailed timeline with an anticipated completion by mid-2025. Key points regarding the timeline include:

- **Development Hours:** Each team member dedicates five hours daily, totaling approximately 1,760 man-hours across the team.

- **Development Model:** An iterative waterfall model ensures consistent progress and adaptability during development.
- **Stability of Requirements:** Requirements have been finalized, minimizing risks of major changes during the development process.

The detailed timeline and clear milestones demonstrate the schedule feasibility of the Grama-Link project.

2.6 Social Feasibility

Gramा-Link addresses social feasibility by considering citizen needs, GN workflows, and AGN oversight. Stakeholder feedback indicates strong support for the system due to the following reasons:

- **Streamlined Services:** Citizens find it convenient to submit applications, track complaints, and receive real-time updates.
- **Enhanced Efficiency:** GNs and AGNs appreciate the reduction in manual tasks, allowing them to focus on core responsibilities.
- **Collaboration Opportunities:** The system promotes coordination among government officers, improving decision-making and communication.
- **Survey Insights:** Informal surveys highlight significant interest among users, with most respondents supporting a digital platform for government services.

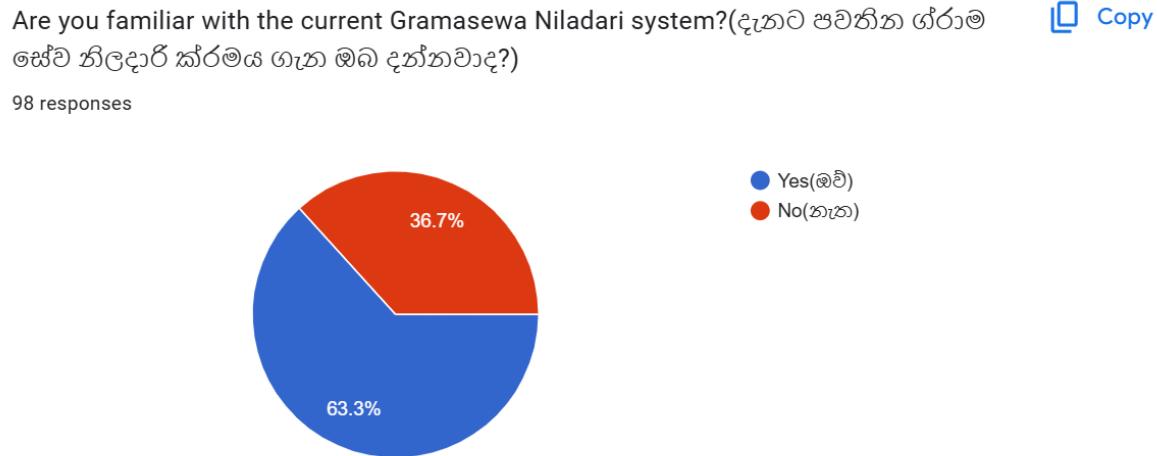


Figure 2.1: Social Feasibility Study Results - Survey Responses

If yes, how often do you interact with the Gramasewa Niladari system? (இலி நமி, அராமசேவை நிலைார் கீர்மய சுமங் ஒல கொபுமனை காட்டினு கர்நவாடு?)

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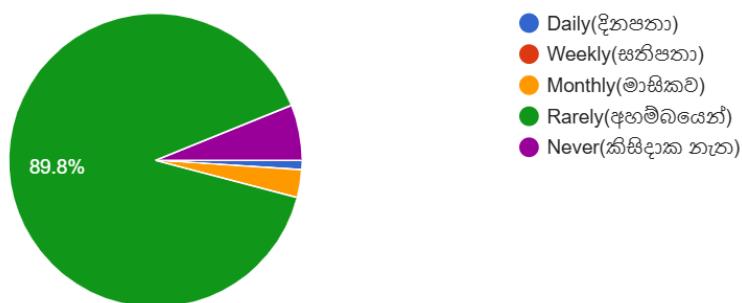


Figure 2.2: Social Feasibility Study Results - User Feedback

What services do you usually seek from the Gramasewa Niladari? (Select all that apply) (இலி சாமாநீர்யையென் அராமசேவை நிலைார்களென் லொகந்நா சேவையின் மோனவாடு? (அடால வன சியல்லே நேர்ந்ந))

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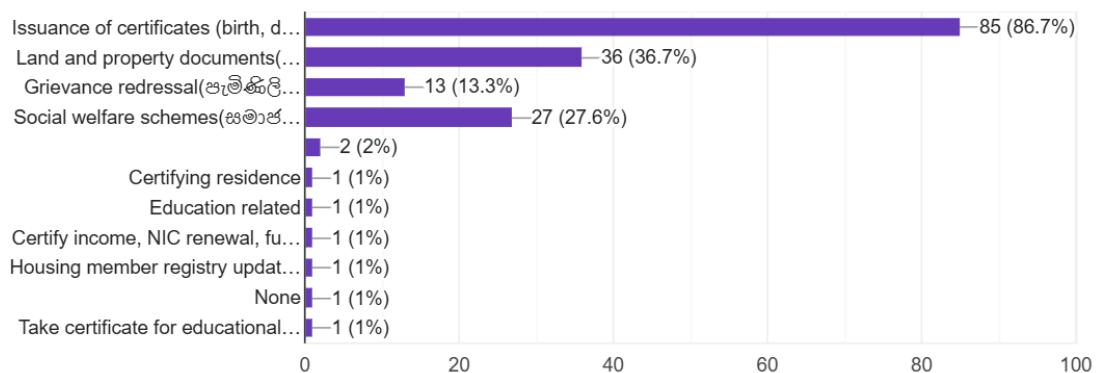


Figure 2.3: Social Feasibility Study Results - User Feedback

What challenges do you face with the current Gramasewa Niladari system? (Select all that apply)(වත්මන් ග්‍රාමසේව නිලදාරී ක්රමය සමග ඔබ මූහුණ දෙන අභියෝග මොනවාද? (අදාළ වන සියල්ල තෝරන්න))

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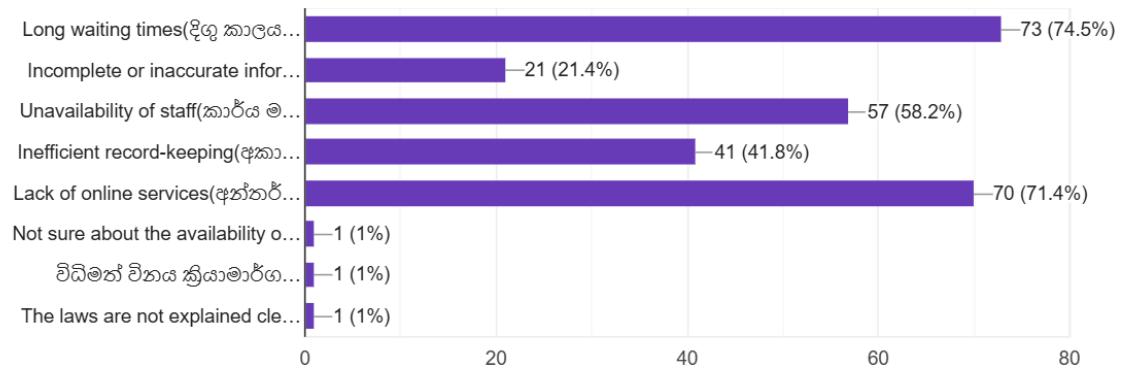


Figure 2.4: Social Feasibility Study Results - User Feedback

What features would you like to see in a new Gramasewa Niladari system? (Select all that apply)(නව ග්‍රාමසේව නිලදාරී ක්රමය තුළ ඔබ දැකින්න කැමති විශේෂාංග මොනවාද? (අදාළ වන සියල්ල තෝරන්න))

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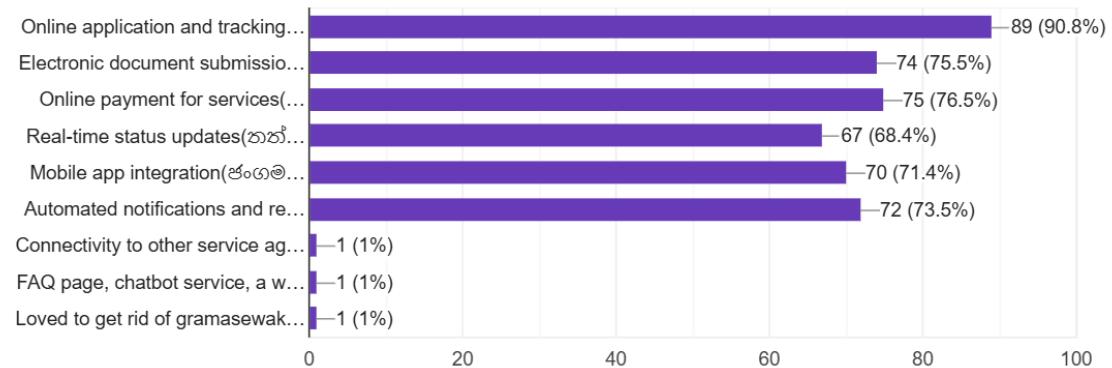


Figure 2.5: Social Feasibility Study Results - User Feedback

How important are the following features to you? (Rate from 1 to 5, with 1 being not important and 5 being very important)(පහත දක්වෙන විශේෂාංග ඔබට කොනරම් වැදගත්ද? (අනුපාතය 1 සිට 5 දක්වා, 1 වැදගත් නොවන අතර 5 ඉනා වැදගත් වේ))

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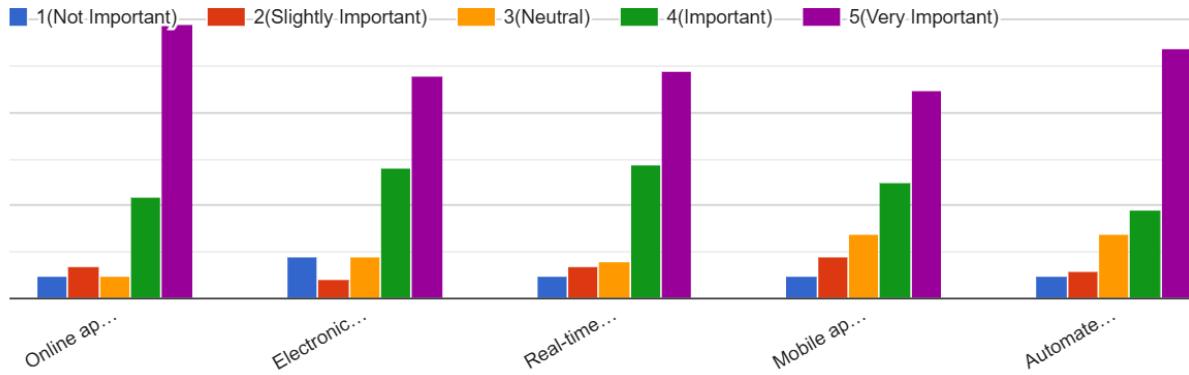


Figure 2.6: Social Feasibility Study Results - User Feedback

What devices do you use to access the internet? (Select all that apply)(අන්තර්ජාලයට ප්‍රවීණව ඔබ භාවිත කරන උපාංග මොනවාද? (අදාළ වන සියලුළු තෝරන්න))

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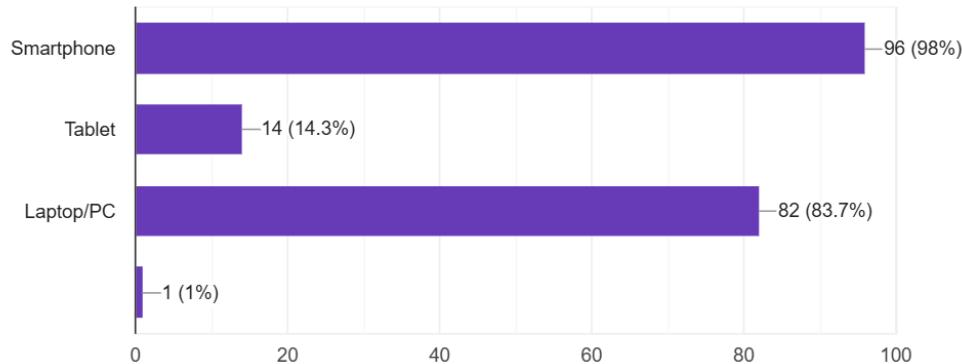


Figure 2.7: Social Feasibility Study Results - User Feedback

How comfortable are you with using online services? (අන්තර්ජාල සේවාවන් භාවිත කිරීම ගැන ඔබ කොතරම් සුව්පහසුදා?)

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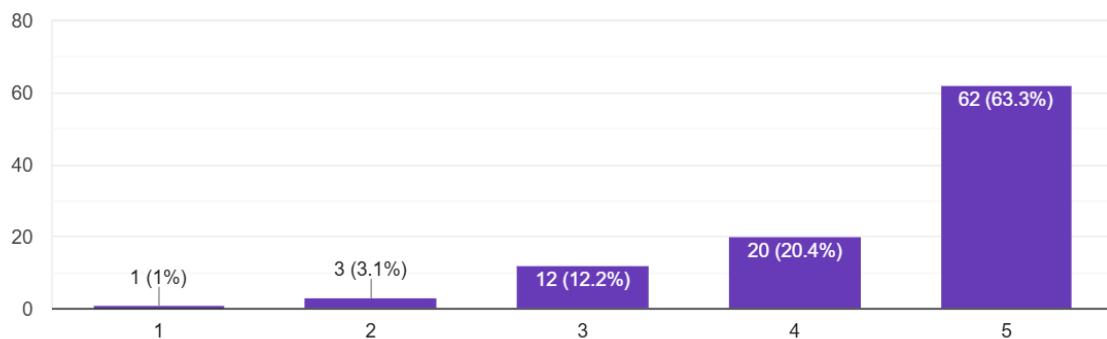


Figure 2.8: Social Feasibility Study Results - User Feedback

By addressing both operational needs and social acceptance, Grama-Link ensures high adoption rates and effectiveness in transforming administrative processes.

Chapter 3

Requirements

3.1 Stakeholders / Actors

The stakeholders of the Grama-Link system include the following:

- **Citizens:** Citizens interact with the system to submit applications, file complaints, provide feedback, schedule appointments, and respond to field visit requests. They can also view notifications about their submissions and track the progress of their requests.
- **Grama Niladhari (GN):** GNs use the system to manage citizen applications and complaints, schedule field visits, and generate daily schedules. They can submit citizen requests for approval by Administrative Grama Niladharis (AGNs) and maintain detailed citizen profiles. GNs also receive notifications about complaints, field visits, and performance metrics.
- **Administrative Grama Niladhari (AGN):** AGNs oversee the operations of GNs, manage reports, handle escalated requests, and monitor compliance. They provide approvals, update citizen and GN records, and ensure that all operations align with policy standards.

3.2 Functional Requirements

The following functional requirements are essential to the Grama-Link system:

3.2.1 For Citizens

- Log in and log out of the system.
- Submit, and track status of applications(for certificates and permits) and complaints.
- Schedule appointments with GN.
- Respond to field visit requests.
- Request to register as a voter.

- View next election and polling center details.
- View profile details and request for changes.
- Receive notifications.
- Change password.
- Recover forgotten password.
- View announcements, rules and community information.

3.2.2 For Grama Niladhari (GN)

- Log in and log out of the system.
- View and manage citizen applications(for certificates and permits), complaints, and field visit schedules.
- Approve, reject, or forward applications to AGNs.
- Create and update daily schedules and field visit routes.
- View and add new citizen, edit citizen details, respond to detail edit requests by citizen.
- Manage next election, polling centers details and voter registration requests.
- Manage announcement, rules and community information notices.
- Request for profile and contact details changes.
- View and download copy of daily activity report.
- Change password
- View notifications
- Instant message with AGN

3.2.3 For Administrative Grama Niladhari (AGN)

- Login and logout of the system.
- View, edit, delete(make inactive) and add new GN.
- View and respond to GN details edit requests.
- View and Review forwarded certificate and permit applications.
- View and download GN daily activity reports.
- Add new, edit, view and delete announcement, rules and community information notices.

- View complaints handled by GNs.
- View and edit profile and contact details.
- Change password.
- Receive notifications.
- Instant message with GNs.

3.3 Non-Functional Requirements

- **Usability:** The interface should be intuitive, mobile-responsive, and user-friendly for all stakeholders.
- **Performance:** The system should handle a high number of concurrent users with minimal response time.
- **Scalability:** The platform should be designed to accommodate a growing user base and increasing data.
- **Security:** User data must be encrypted, and all communications should use secure protocols.
- **Availability:** The system should be accessible 24/7 with minimal downtime.
- **Maintainability:** The system should follow modular design principles for easy updates and bug fixes.

3.4 In-Scope and Out-of-Scope

3.4.1 In-Scope

- **Authentication** Citizen signup/login, GN and AGN login, role-based dashboard access
- **Profile Management** — Citizens can update their profile info, GNs/AGNs manage assigned users
- **Appointments** — Citizens can book appointments; GNs can approve/reject/manage them; Citizens get confirmation via WhatsApp
- **Certificate Applications** — Citizens apply for certificates (e.g., Residence, Income, Character), dynamic fields based on certificate type
- **Complaint Management** — GNs review, make field visits and resolve issues. (Google Maps for finding best routes)
- **Document Uploading** — GNs upload verified soft copies after citizen visits; citizens can download approved documents

- **Appointment and Application Status Tracking** — Citizens track their appointments and application statuses
- **Announcements** — GNs and AGNs post notices for citizens or GNs respectively
- **Reports & Analytics (AGN)** — AGNs view summary reports (appointments, certificates issued, citizen registrations, GN performance)
- **Password Management** — Password change/reset for all roles
- **Security Measures** — Input validations, file upload restrictions, session management, SQL protection
- **Multi-language Support** — Basic multi-language front-end support (Sinhala, English) for citizen side
- **Mobile Responsiveness** — Frontend UI will be mobile-friendly (responsive design)
- **GN - AGN Messaging** — GN messages AGN, AGN messages GNs under their control

3.4.2 Out-of-Scope

- **Citizen Online Certificate Issuance (Fully Automatic)** — No automatic digital certificate issuance without manual GN verification
- **Real-time Video/Voice Chat** — No video conferencing/chat feature for appointments or meetings
- **Payment Gateway Integration** — No online payments or fees collection system
- **AI-based Document Verification** — No AI/machine-learning for verifying documents or forms
- **Mobile App Version** — No dedicated Android/iOS app (only mobile-friendly website)
- **National-Level System Integration** — No direct integration with external government systems (e.g., NIC database, Land Registry)
- **Complex Push Notifications** — No device push notifications (only simple in-system notification alerts)

3.5 Constraints and Limitations

- Each user is limited to one account per national identification number.
- Field visit schedules are restricted to pre-defined GN divisions.
- Applications and complaints require mandatory fields to be completed before submission.

- Notifications depend on users having reliable internet access.
- System functionality is limited to Sri Lankan government jurisdictions.

Chapter 4

Proposed System's Architecture

4.1 Components and Their Functionalities

The Grama-Link system is developed using the Model-View-Controller (MVC) architecture. This architecture separates the application's logic into three interconnected components, allowing for efficient development, scalability, and maintainability.

4.1.1 Model Layer

The **Model Layer** is responsible for handling all data-related logic. It interacts with the database, processes business rules, and provides data to the controller. Key functionalities include:

- Managing user data (citizens, GNs, AGNs) and their roles.
- Storing and retrieving applications, complaints, field visit schedules, and feedback.
- Maintaining records of notifications, appointments, and system logs.
- Managing reports and analytics for GNs and AGNs.

4.1.2 View Layer

The **View Layer** is responsible for presenting data to users through user interfaces (UIs). It handles the visual representation and user interactions. Key functionalities include:

- Displaying dashboards for citizens, GNs, and AGNs.
- Rendering forms for submitting applications, complaints, and feedback.
- Presenting calendars for scheduling field visits and appointments.
- Providing real-time notifications and status updates.
- Offering responsive and mobile-friendly designs for accessibility.

4.1.3 Controller Layer

The **Controller Layer** acts as an intermediary between the Model and View layers. It processes user inputs, updates the model, and determines which view to render. Key functionalities include:

- Handling requests from users and routing them to the appropriate modules.
- Validating user input and ensuring data integrity.
- Managing application logic, such as approving requests, scheduling tasks, and generating reports.
- Sending real-time notifications to users based on specific triggers.
- Coordinating interactions between different modules (e.g., citizen complaints and GN actions).

4.2 Component Interactions

The components in the MVC architecture interact seamlessly to ensure smooth system operation. Below is an outline of their interactions:

1. **User Interaction with Views:** Users (citizens, GNs, AGNs) interact with the system through forms, dashboards, and notifications in the View Layer. These inputs are passed to the Controller Layer for processing.
2. **Controller Processes User Requests:** The Controller receives user inputs, validates them, and performs the required business logic. It then updates the Model or retrieves data from the Model Layer.
3. **Model Handles Data Operations:** The Model interacts with the database to fetch or store data as requested by the Controller. It ensures that all data-related operations comply with business rules.
4. **Controller Updates the View:** Once the Model processes the data, the Controller updates the View Layer with the appropriate information or results (e.g., status of a request, notifications, or reports).
5. **Dynamic Updates:** The system ensures real-time updates through AJAX requests and event-based triggers, particularly for notifications, application statuses, and calendar updates.

4.3 Advantages of Using MVC Architecture

- **Separation of Concerns:** The clear separation between Model, View, and Controller enhances maintainability and scalability.
- **Reusability:** Models and Views can be reused for different components, reducing redundant code.

- **Scalability:** The modular nature of MVC allows for easier system expansion in the future.
- **Parallel Development:** Developers can work on different components (Model, View, Controller) simultaneously, speeding up development.
- **Testability:** Individual components can be tested independently, ensuring reliability.

Chapter 5

System Design Diagrams

5.1 Use case diagrams

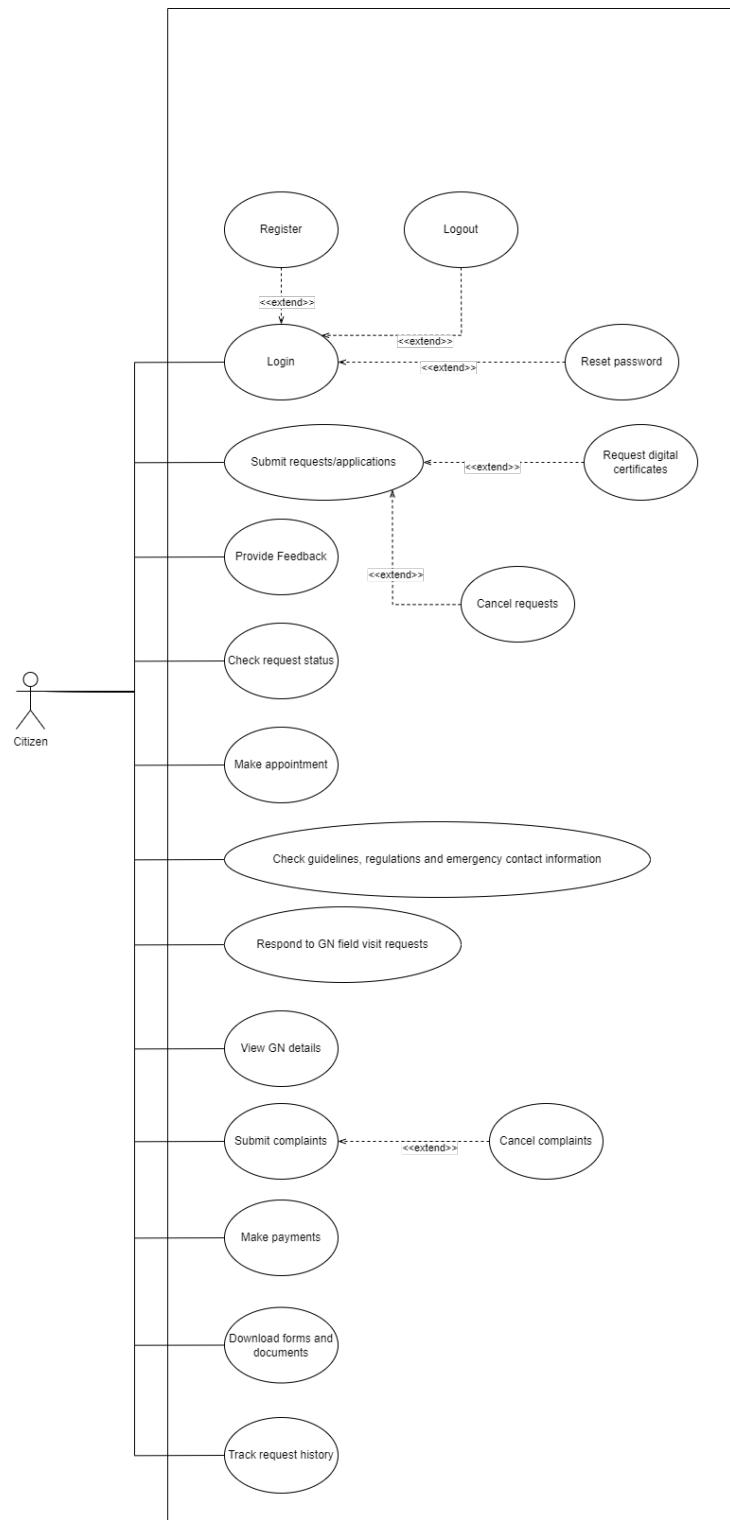


Figure 5.1: Use Case Diagram - Citizen

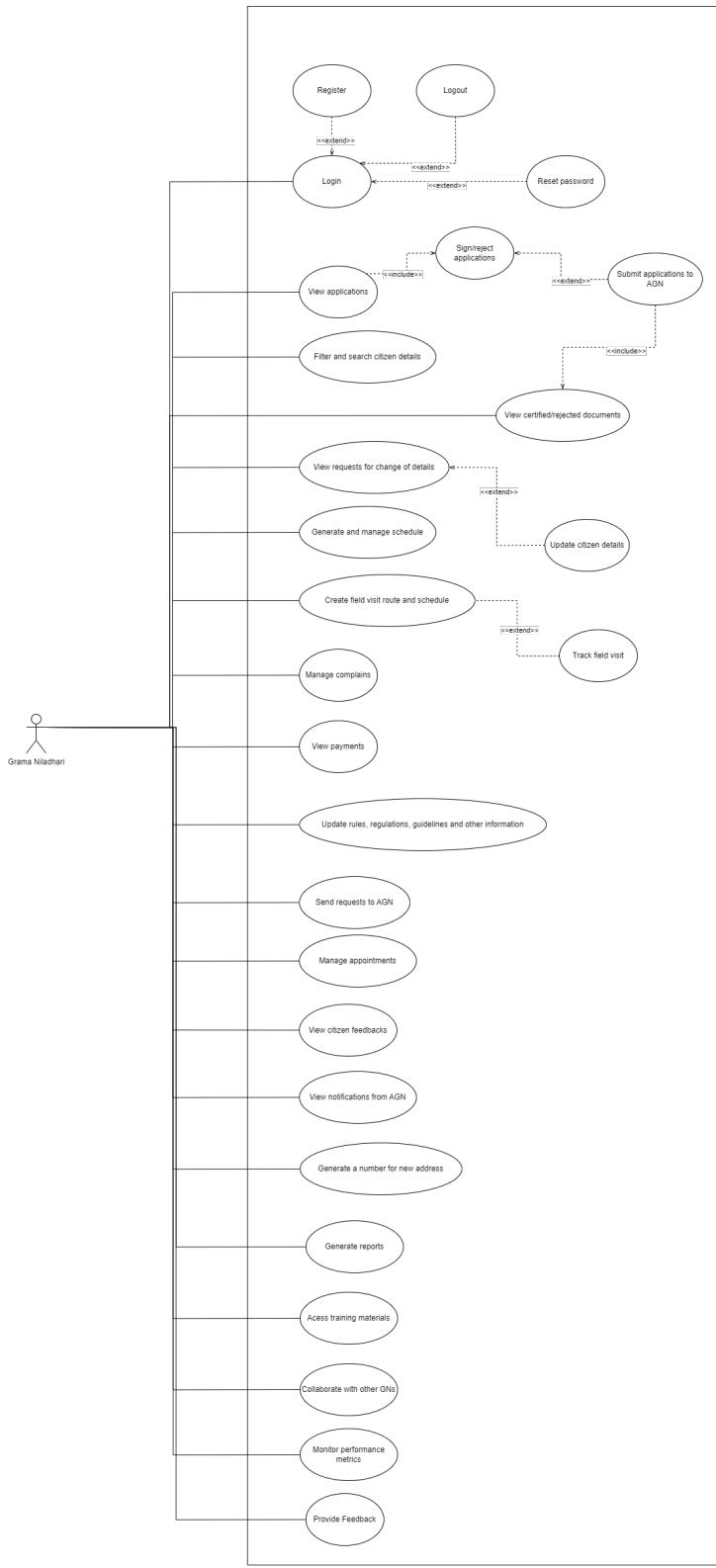


Figure 5.2: Use Case Diagram - GN

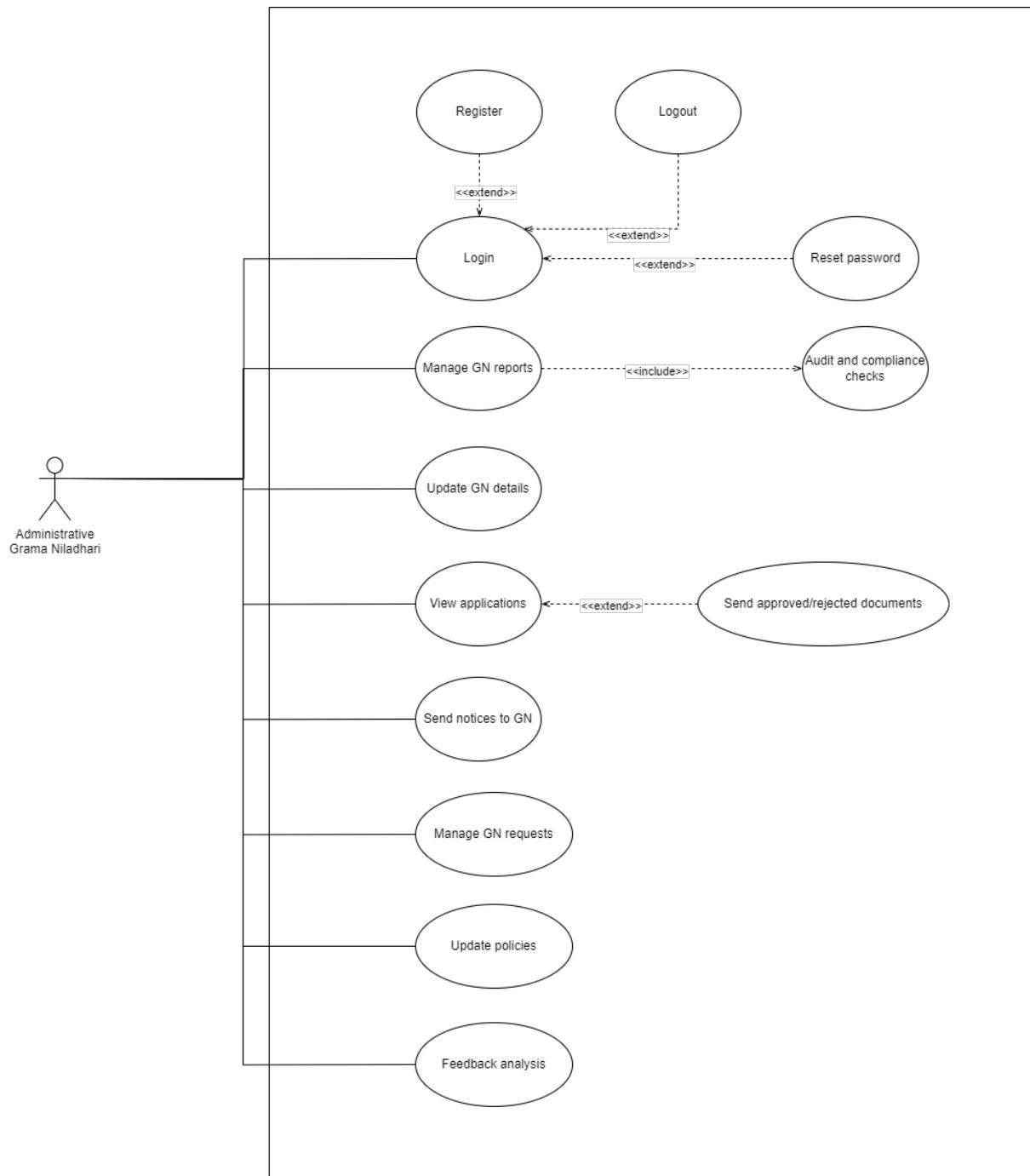


Figure 5.3: Use Case Diagram - AGN

5.2 Class diagrams

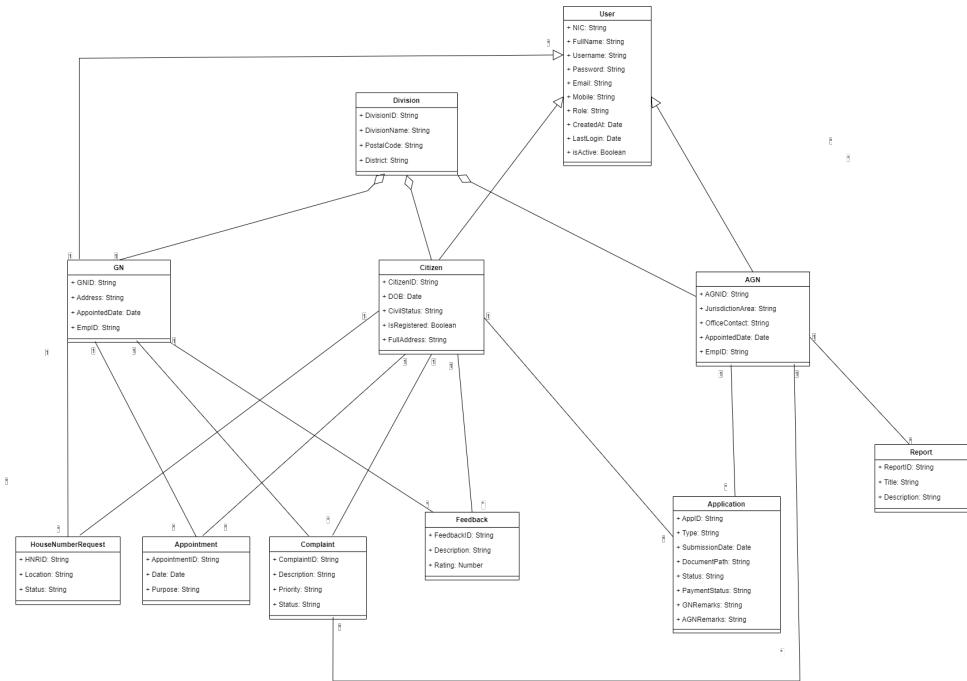


Figure 5.4: Class Diagram

5.3 ER Diagram

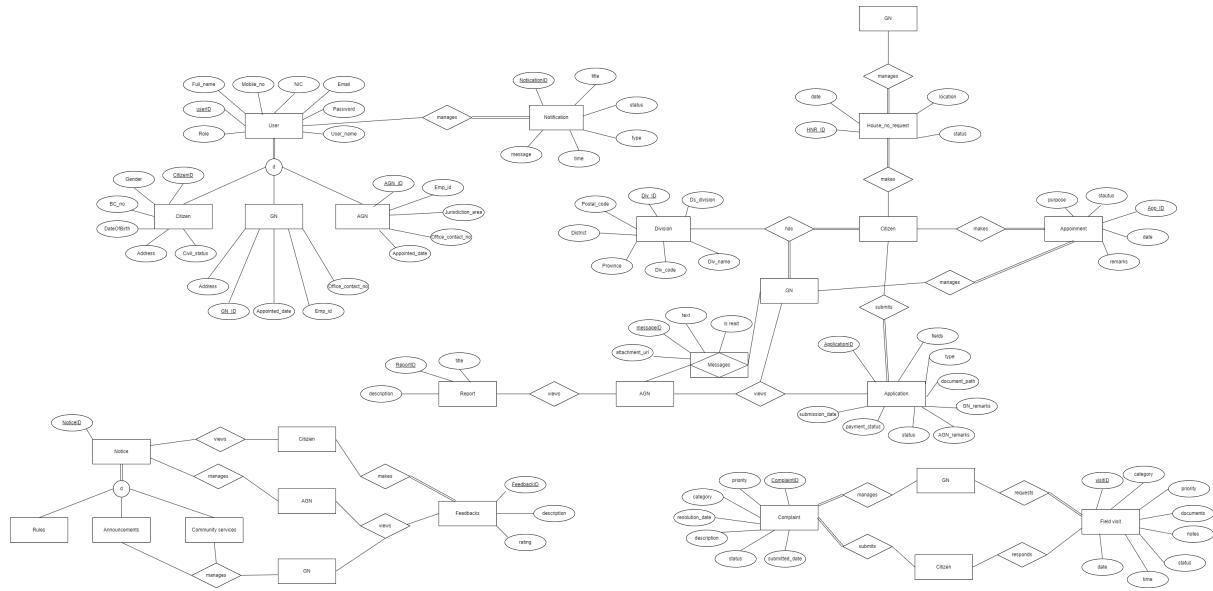


Figure 5.5: EER Diagram

5.4 Activity diagrams

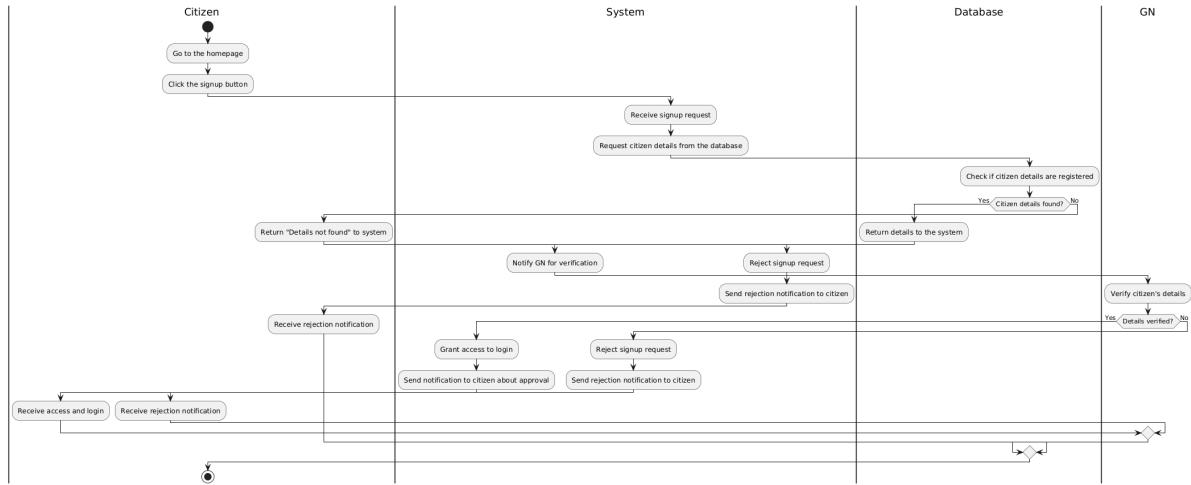


Figure 5.6: Activity Diagram - Signup

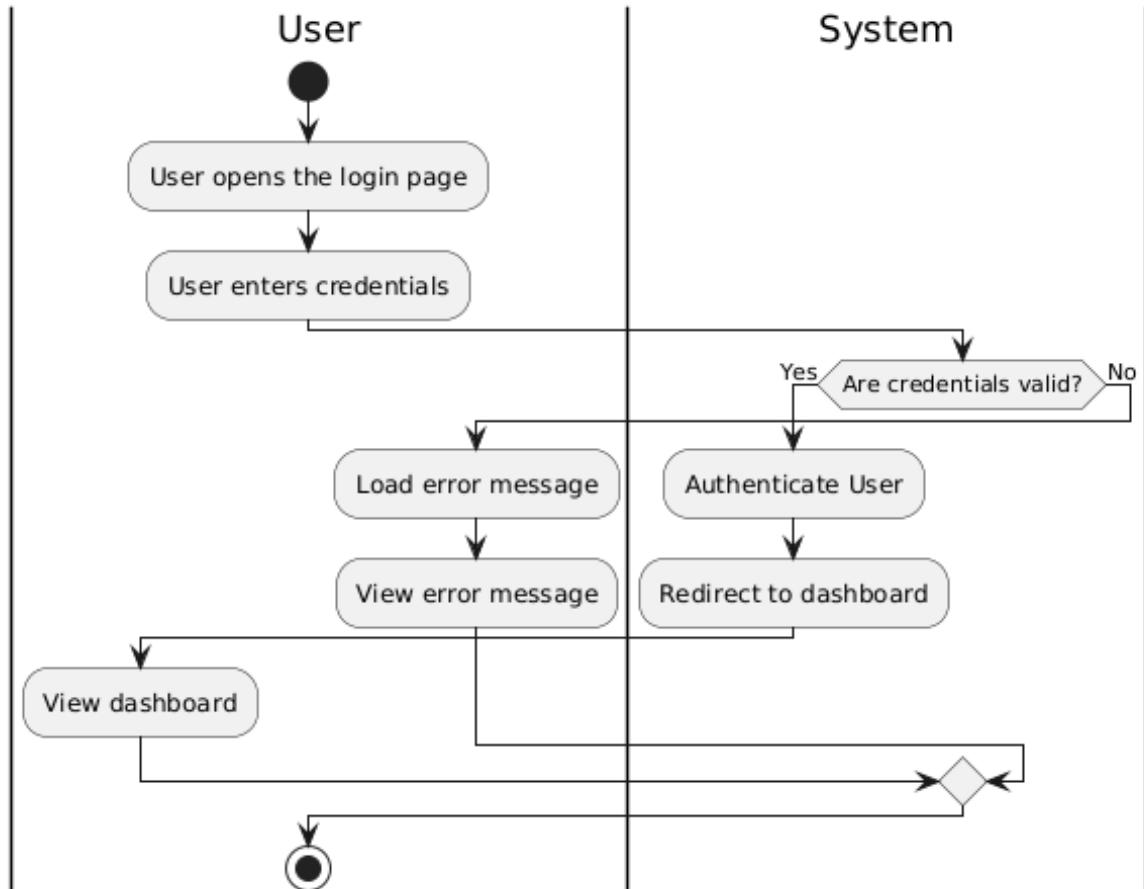


Figure 5.7: Activity Diagram - Login

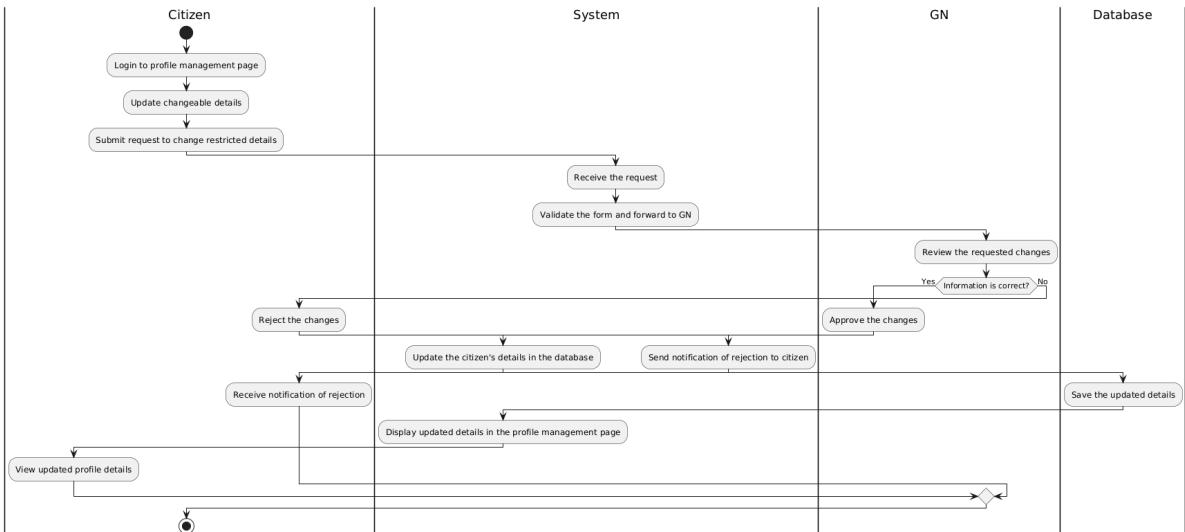


Figure 5.8: Activity Diagram - Change Citizen Details

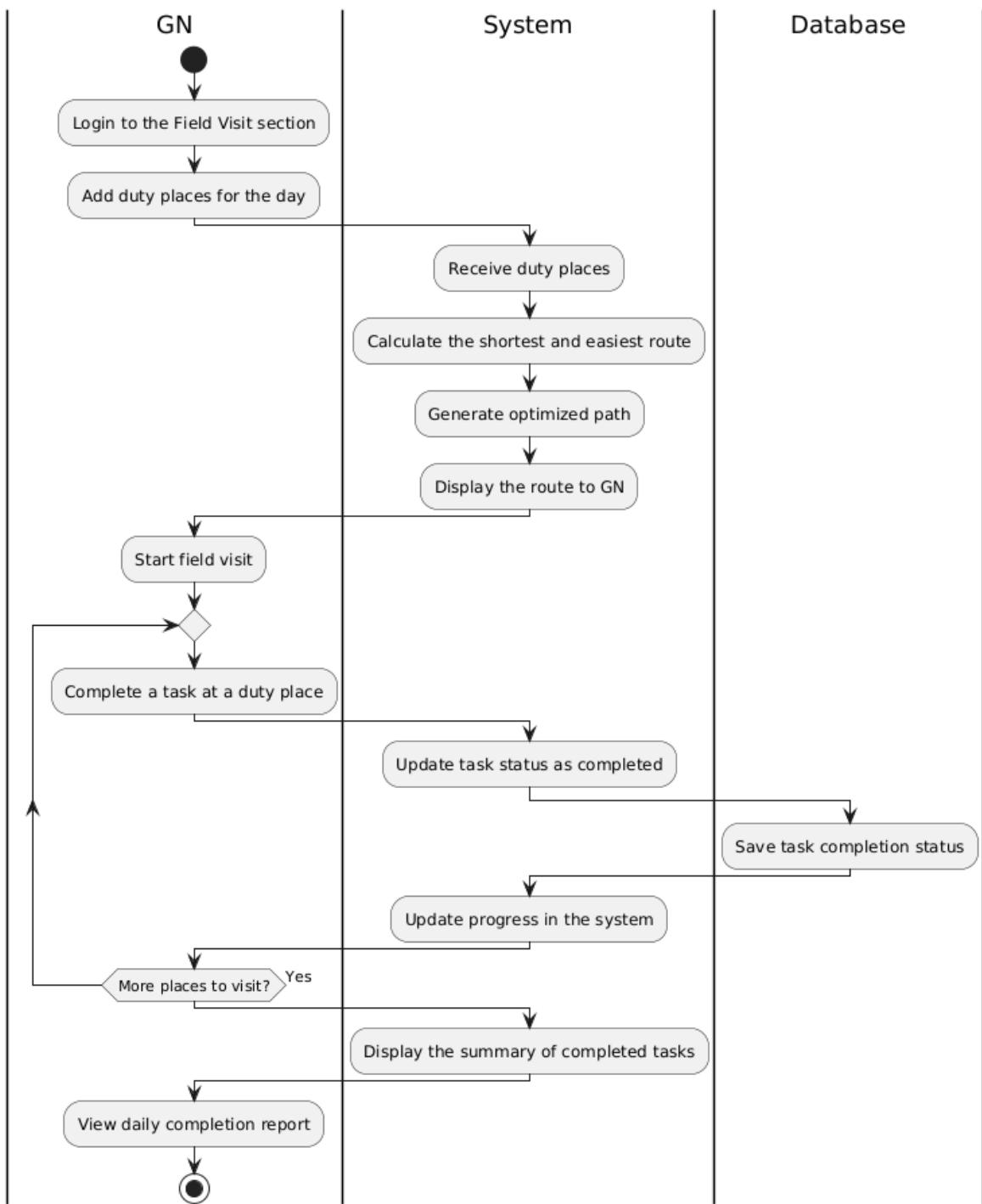


Figure 5.9: Activity Diagram - Generate Field Visit Route

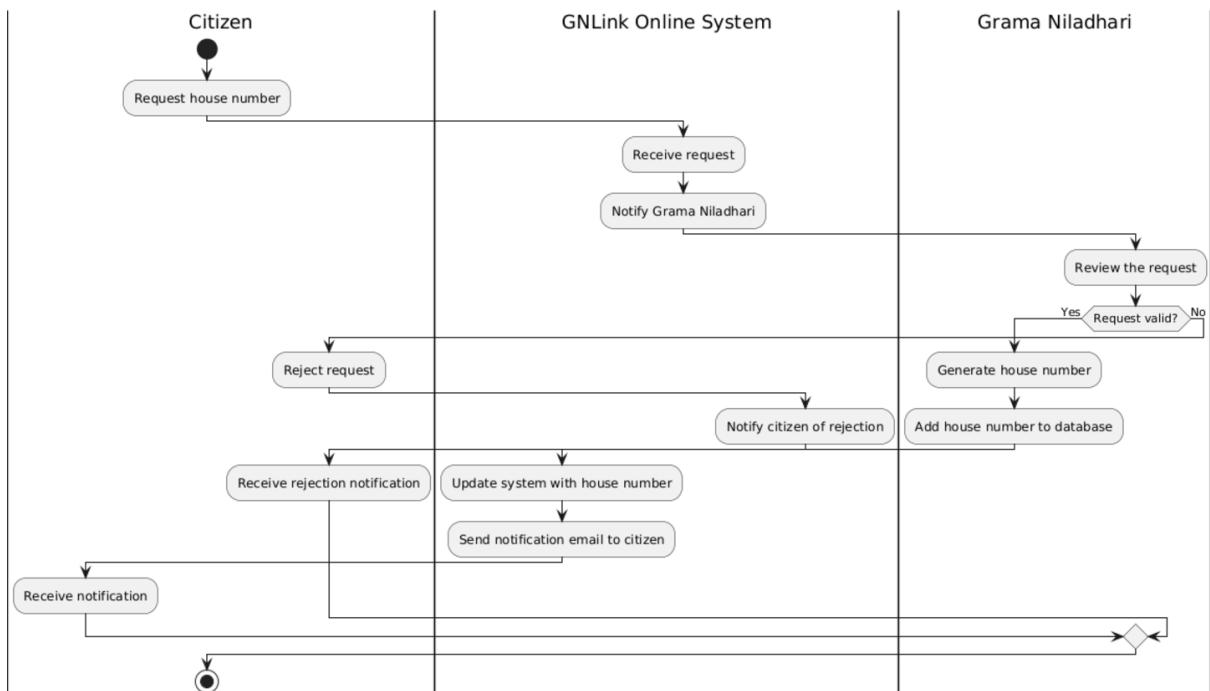


Figure 5.10: Activity Diagram - Generate House number

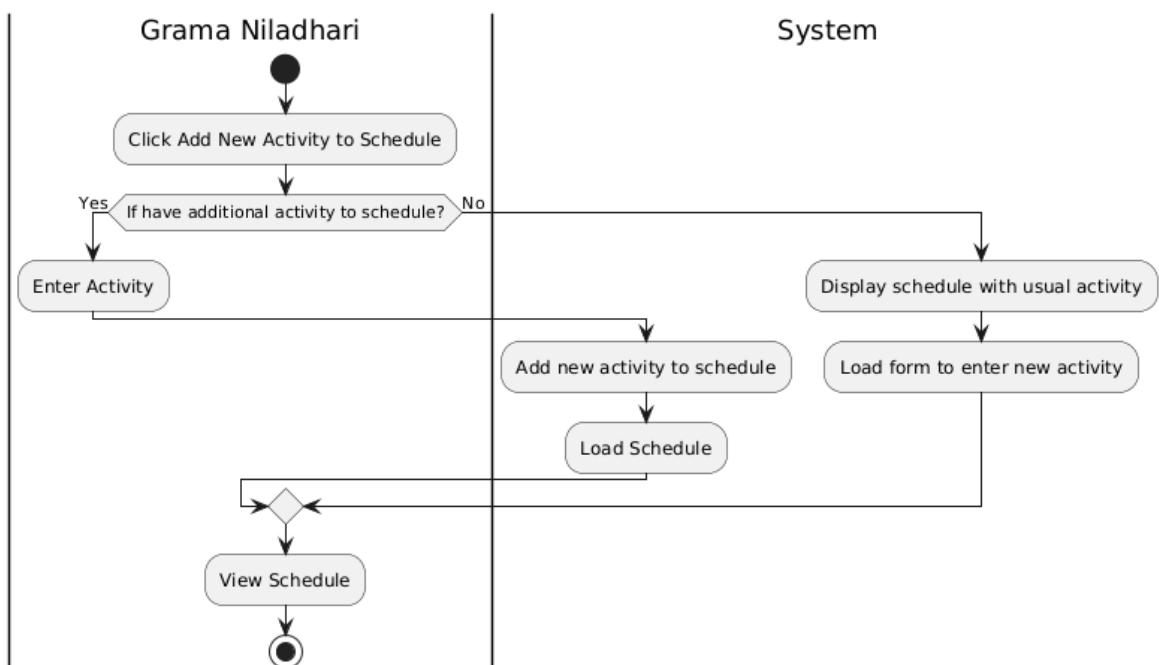


Figure 5.11: Activity Diagram - Generate Schedule

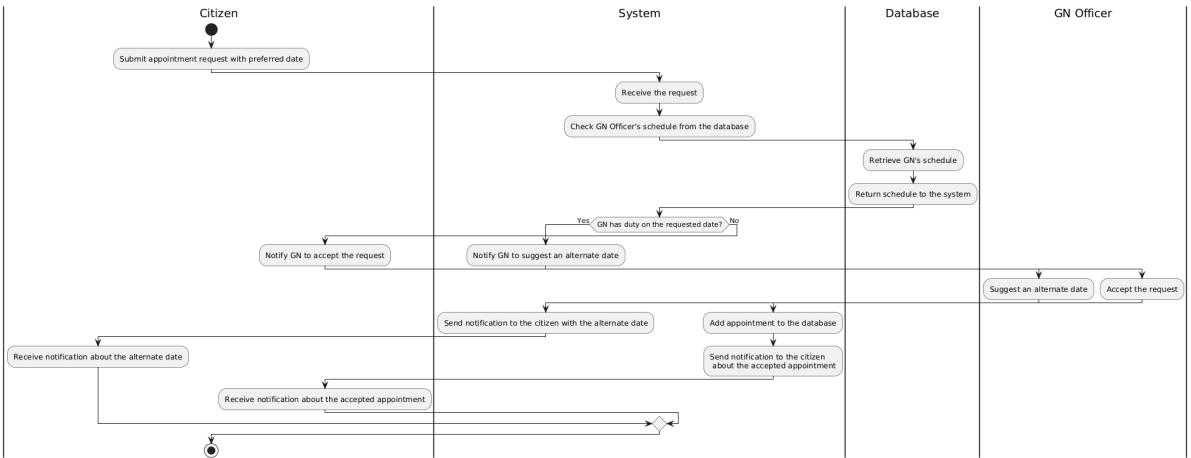


Figure 5.12: Activity Diagram - Make Appointment

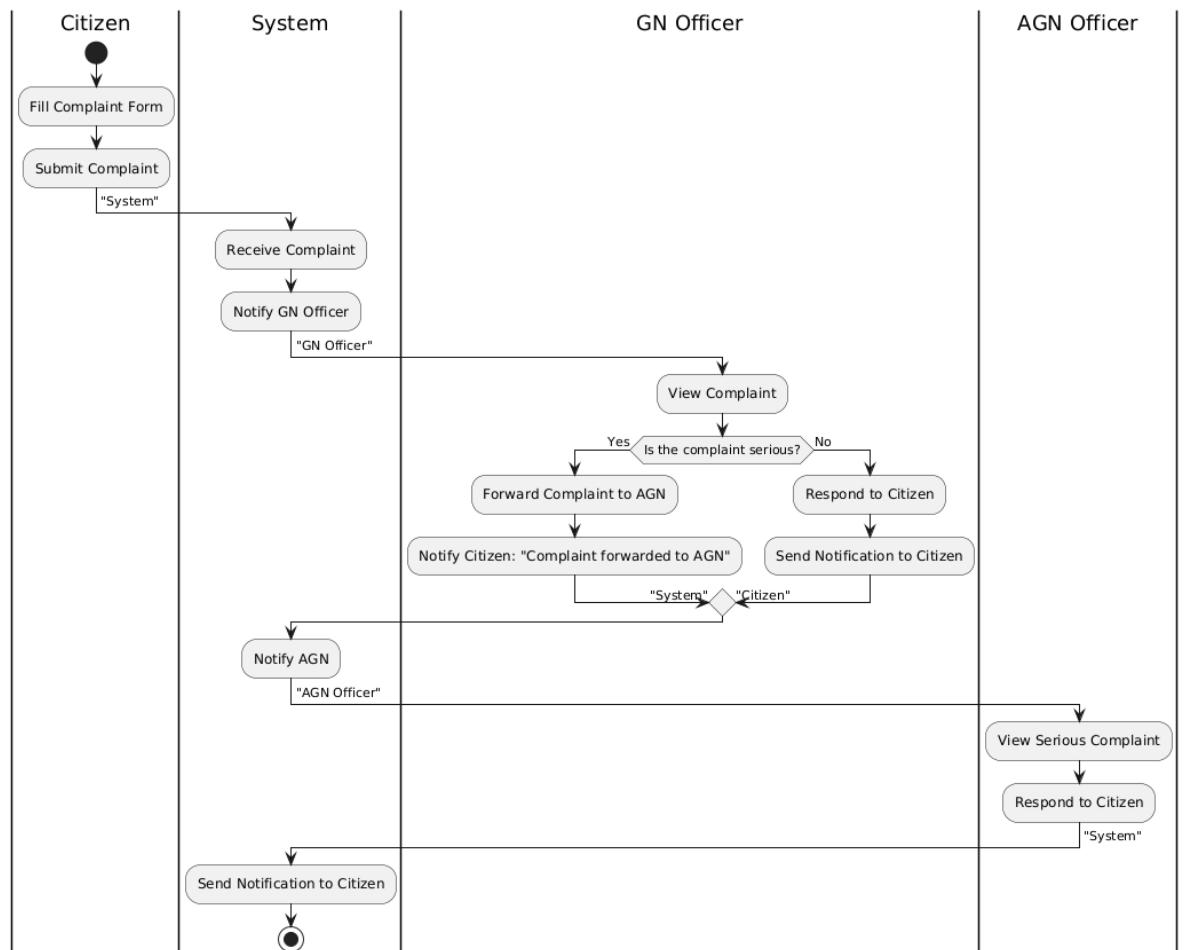


Figure 5.13: Activity Diagram - Manage Complaints

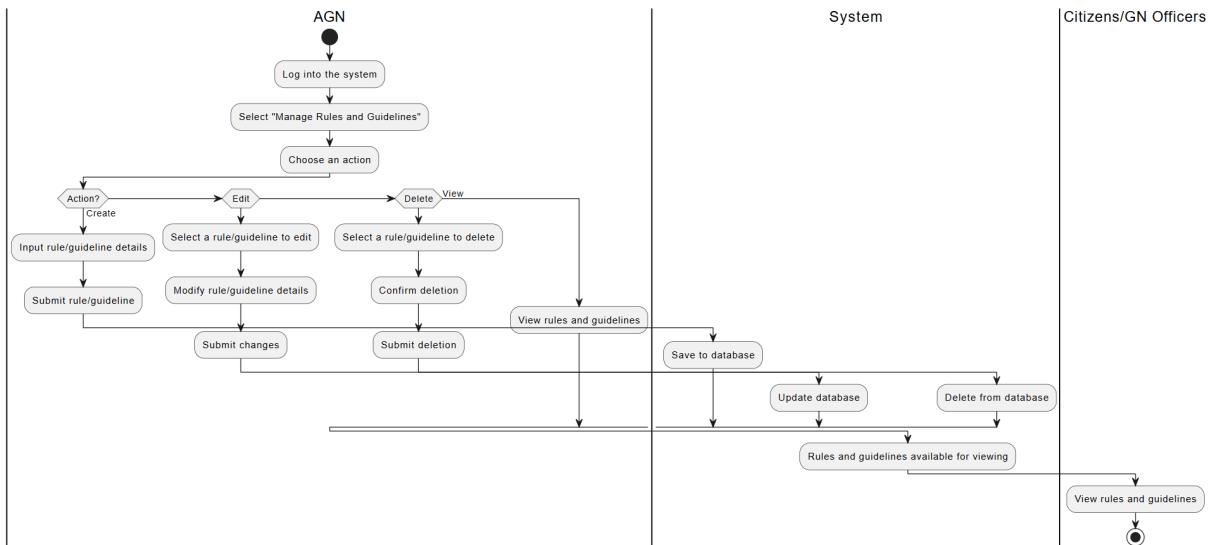


Figure 5.14: Activity Diagram - Manage Rules and Guidelines

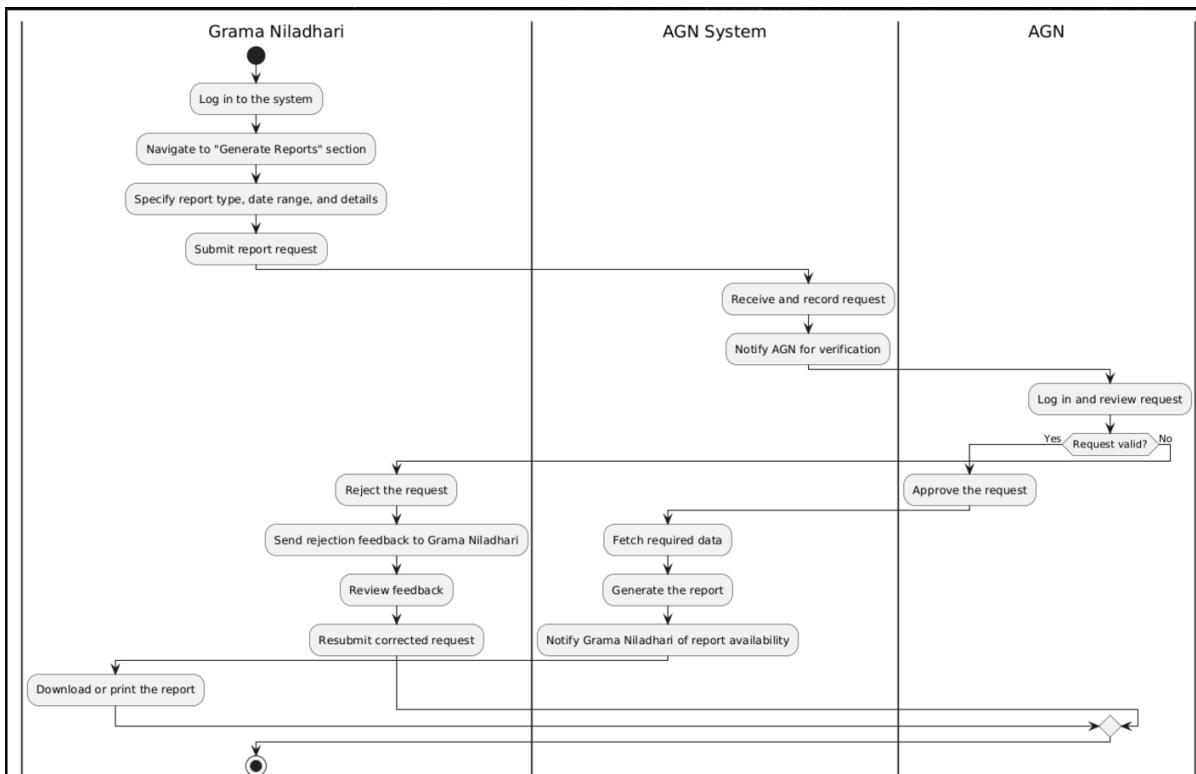


Figure 5.15: Activity Diagram - Generate Reports

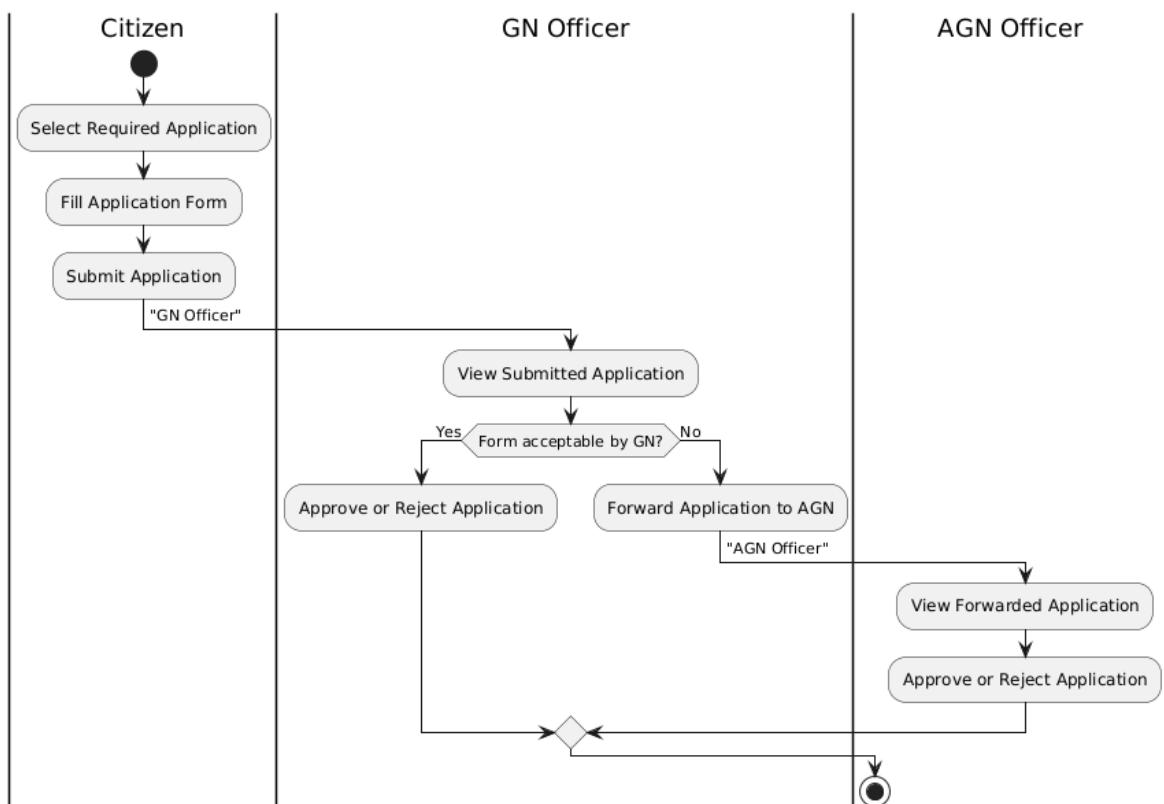


Figure 5.16: Activity Diagram - Submit Application

Chapter 6

Completeness of the Project

6.1 Functionalities completed

The development of the Grama-Link system is progressing steadily, with significant milestones achieved. Below is an overview of the progress:

- **User Authentication** — Login for Citizens, GNs, AGNs
- **Appointment Management** — Citizens can book appointments; GNs manage them
- **Certificate and Permit Applications** — Citizens apply for certificates; GNs process applications
- **Complaints** — Citizens submit complaints; GNs process them
- **Field Visits** — GN schedule field visits; Citizen approves, then GN follows maps suggestion to complete tasks
- **Announcements** — GNs and AGNs post announcements
- **Citizen Profile Management** — Citizens can view and request to edit their profiles
- **Audit Logs** — Actions such as approvals and rejections are logged
- **Reports for AGN** — Appointment statistics and GN reports
- **Multilingual Interface (Basic)** — Website available in English and Sinhala
- **Mobile Responsiveness** — UI adapted for mobile devices

6.2 Functionalities Yet to Complete

- **Advanced Reporting (Graphs/Charts)** Backend completed, UI visualization pending
- **Data Backup Automation** Manual backup available, automation pending
- **Enhanced Search Filters** Basic search implemented, advanced multi-criteria search pending

6.3 Individual contribution of the team members

The contributions of the team members are as follows:

6.3.1 P.M.A.T. Srikantha (29%)

- Application(for certificate and permit) management (All Users FrontEnd and Back-End)
- Appointment management (All Users FrontEnd and BackEnd)
- Citizen management (All Users BackEnd)
- GN management (All Users BackEnd)
- Profile Management (All Users FrontEnd and BackEnd)

Test Cases

Field:	Appointment Booking(Citizen)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-APP-01	Book appointment with date, time selected	Select available date and time	Appointment created	Appointment confirmation message displayed and send through WhatsApp	Pass
TC-APP-02	Book empty appointment	Either date, time or service not selected	Appointment created	Error message displayed	Pass
TC-APP-03	Service type Other	Select date, time and service type Other but no additional details provided	Error: Additional details required	Error: Additional details required	Pass
TC-APP-04	Service type Other	Select date, time and service type Other and additional details provided	Appointment created	Appointment confirmation message displayed and send through WhatsApp	Pass

Field:	Application/Permit Submit(Citizen)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-APL-01	Submit complete application	All fields of application filled	Application submitted successfully	Application submitted successfully	Pass
TC-APL-02	Submit incomplete application	Not all fields of application filled	Application submitted successfully	Application submitted successfully	Pass

Field:	Personal Detail Edit Request Submit(Citizen/GN)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-PDER-01	Submit correct file type	Submit an image file	Request submitted successfully	Request submitted successfully	Pass
TC-PDER-02	Submit incorrect file type	Submit a non-image file	Unsupported file type error	Unsupported file type error	Pass

Field:	Change Password(All Users)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-CPWDC-01	Submit valid change password details	Enter correct current password and new password and confirm password match	Password changed successfully	Password changed successfully	Pass
TC-CPWDC-02	Submit invalid change password details	Enter incorrect current password and new password and confirm password match	Current password incorrect	Current password incorrect	Pass
TC-CPWDC-03	Submit invalid change password details	Enter correct current password and new password and confirm password do not match	New password and confirm password do not match.	New password and confirm password do not match.	Pass

Field:	Appointment Handling (GN)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-APGN-01	Mark old appointment as completed	Select an appointment with a past date and click "Mark as Completed"	Appointment marked as completed successfully	Appointment marked as completed successfully	Pass
TC-APGN-02	Reject future appointment	Select an appointment with a future date and click "Reject"	Appointment rejected successfully	Appointment rejected successfully	Pass
TC-APGN-03	Attempt to mark future appointment as completed	Select a future appointment and click "Mark as Completed"	Error message: Cannot mark future appointments as completed	Error message: Cannot mark future appointments as completed	Pass
TC-APGN-04	Attempt to reject past appointment	Select a past appointment and click "Reject"	Error message: Cannot reject past appointments	Error message: Cannot reject past appointments	Pass

Field:	Add Citizen(GN)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-ADCZ-01	Add citizen with all required fields	Enter all required fields correctly (NIC, Name, Address, etc.) and unique NIC	Citizen added successfully	Citizen added successfully	Pass
TC-ADCZ-02	Add citizen with missing required fields	Leave one or more required fields empty and submit	Error message: Please fill all required fields	Error message: Please fill all required fields	Pass
TC-ADCZ-03	Add citizen with existing NIC	Enter NIC that already exists in database with other details	Error message: Citizen already exists	Error message: Citizen already exists	Pass

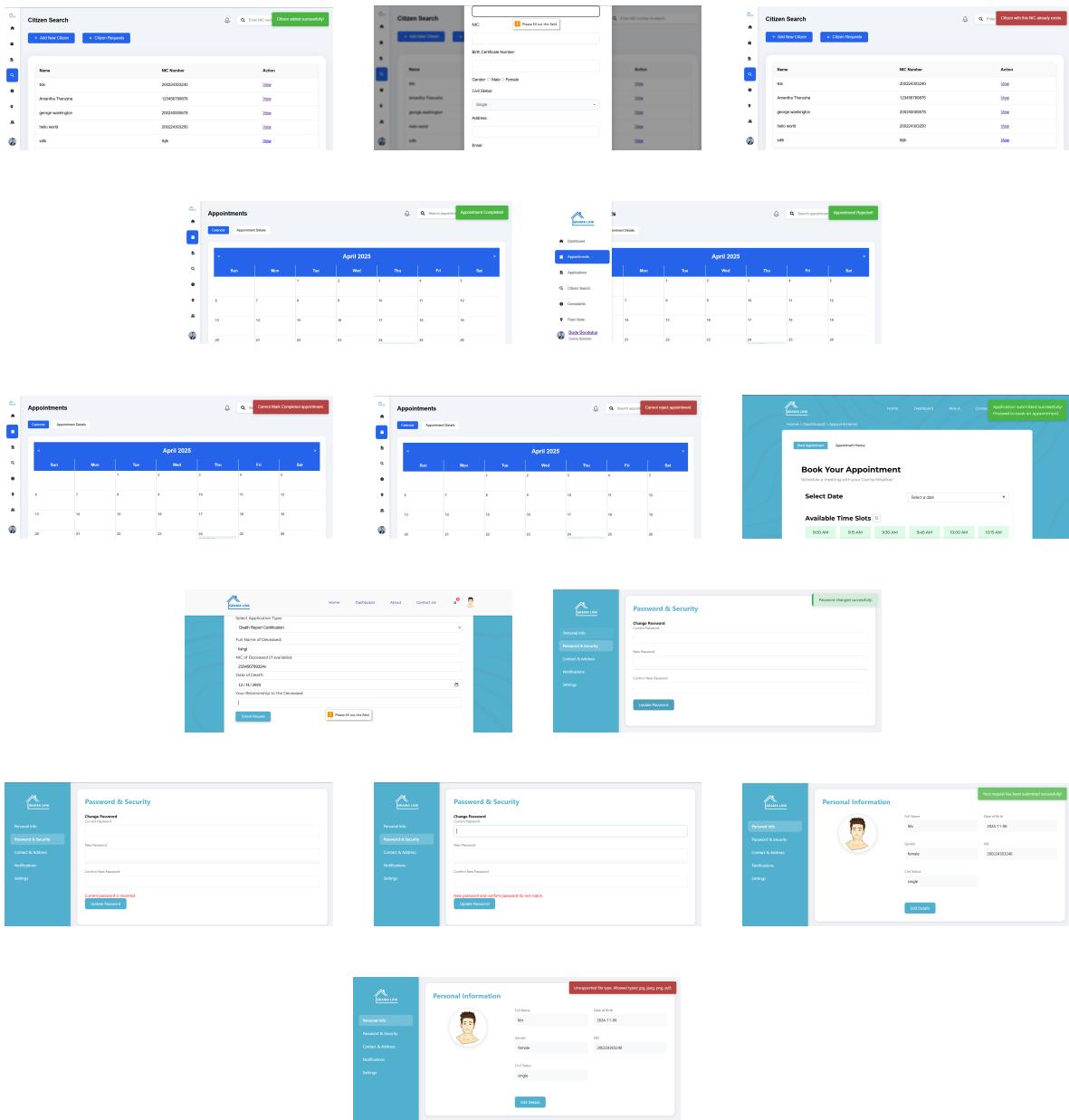


Figure 6.1: Test Case Proofs 01

6.3.2 D.N. Kodithuwakku (29%)

- Complaint Management (All Users FrontEnd and BackEnd)
- Field Visit Management (All Users FrontEnd and BackEnd)
- Password Recovery (Common BackEnd)
- Report Generation (GN/AGN BackEnd)
- Multilanguage Support (BackEnd)

Test Cases

Field:	Complaint Submit(Citizen)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-COM-01	Check phone number that have exactly 10 numbers	Enter letters and numbers and enter less than or greater than 10 numbers or letters	Complaint submit successful message	Invalid phone number format message	Pass
TC-COM-02	Check phone number that have exactly 10 numbers	Add 10 numbers	Complaint submit successful message	Complaint submit successful message	Pass

Field:	Complaint Display(Citizen)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-COMDIS-01	Display Complaint or Not	Empty Complaint table in Database	Display Complaints	No Complaint found message	Pass
TC-COMDIS-02	Display Complaint or Not	Add complaint to complaint table	Display Complaints	Display Complaints	Pass

Field:	Complaint Display(GN)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-COMDISGN-01	Complaint Mark as resolved	Click resolved button	Come complaint resolved successful alert	Come complaint resolved successful alert	Pass
TC-COMDISGN-02	Complaint Mark as resolved	Click reject button	Come complaint rejected successful alert	Come complaint rejected successful alert	Pass

Field:	Add Field Visit Request(GN)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-FVRADD-01	Check selected visit date past or future	Choose a past date as visit date	Visit request send successfully	Display alert as can't select past date for the visit please choose valid date	Pass
TC-FVRADD-02	Check selected visit date past or future	Choose a today or future date as visit date	Visit request send successfully	Display Field visit request submitted successfully	Pass
TC-FVRADD-03	Send visit request to the Citizen	Not select any citizen	Visit request send successfully	Display Fail to submit field visit message	Pass

Field:	Today Schedule(GN)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-TS-01	Display route for visit addresses	No today visit	Display current location	Display current location	Pass
TC-TS-02	Display route for visit addresses	Add addresses for today visit	Display visit add successful message and route in map	Display visit add successful message and route in map	Pass

Field:	Reset Password(All Users)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-RPWD-01	Get password change link to the email	Enter Email that not available in database	Password Reset Link send successfully	Email not found message	Pass
TC-RPWD-02	Get password change link to the email	Enter Email that available in database	Password Reset Link send successfully	Password Reset Link send successfully message and Email come to the entered email address	Pass

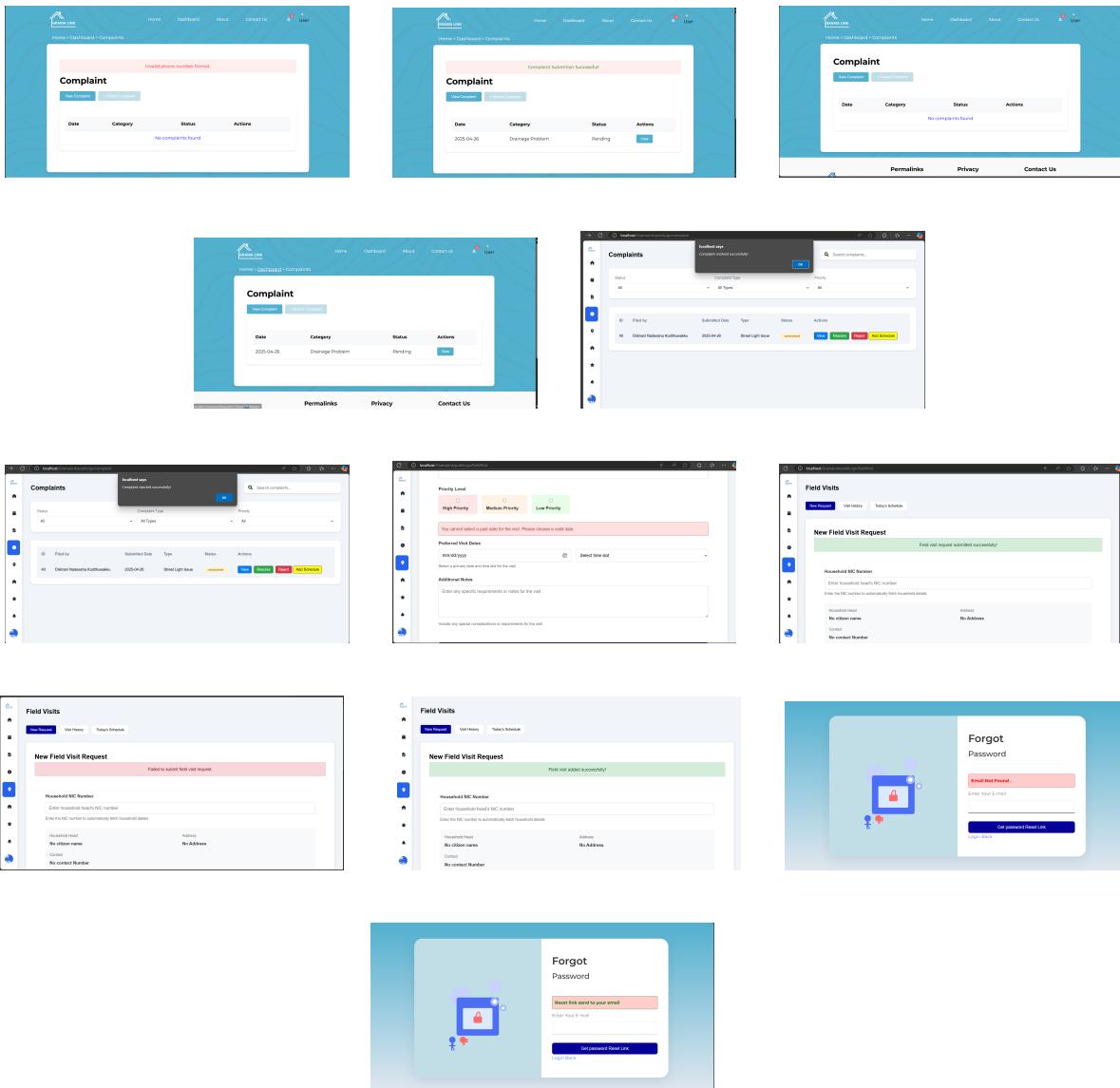


Figure 6.2: Test Case Proofs 02

6.3.3 J.M.C.K. Jayathilake (21%)

- User authentication management (Common FrontEnd and BackEnd)
- Notice Management (All Users FrontEnd and BackEnd)
- Notification Management (FrontEnd)
- Multilanguage Support (FrontEnd)
- Other Citizen and AGN FrontEnd

Test Cases

Field:	Login(All Users)				
Test Case ID	Feature	Input	Expected Output	Actual Output	Status
TC-AUTH-01	Valid Login	Correct user-name + password	Redirect to dashboard	Dashboard page displayed successfully	Pass
TC-AUTH-02	Invalid Password	Valid user-name + wrong password	Error: "Invalid user-name or password"	Error message "Invalid username or password" displayed	Pass
TC-AUTH-03	Invalid User-name	Wrong user-name + valid password	Error: "Invalid user-name or password"	Error message "Invalid username or password" displayed	Pass
TC-AUTH-04	Remember Me	Valid login + "Remember Me" checked	Session persists after browser restart	User remained logged in after restarting browser	Pass
TC-AUTH-05	Password Visibility Toggle	Password entered + click eye icon	Password toggles between hidden/visible	Password visibility toggled successfully	Pass

The figure consists of two side-by-side screenshots of a web-based login form for 'GRAMA-LINK'. Both screenshots show the same interface with a red error bar at the top indicating an invalid login attempt.

Screenshot 1 (Left):

- Header: 'GRAMA LINK' logo and 'Welcome back to GRAMA-LINK'.
- Form Fields:
 - Username: 'Dude'
 - Password: '*****'
- Message Bar: 'Invalid username or password'.
- Buttons: 'Forgot password?' and a large blue 'Login' button.

Screenshot 2 (Right):

- Header: 'GRAMA LINK' logo and 'Welcome back to GRAMA-LINK'.
- Form Fields:
 - Username: 'Dude'
 - Password: '.....'
- Message Bar: 'Invalid username or password'.
- Buttons: 'Forgot password?' and a large blue 'Login' button.

Figure 6.3: Test Case Proofs 03

6.3.4 L.H.L.S. Darshana (21%)

- Election Management (Citizen/GN FrontEnd and BackEnd)
- Password Management (FrontEnd)
- Multilanguage Support (FrontEnd)
- Other GN FrontEnd

Test Cases

Field:	Add Election Date(GN)				
Test Case ID	Feature	Input	Expected Output	Actual Output	Status
TC-EADD-01	GN can add Next Election Date and Election Type for view the Citizen.Check the Date.GN can't add Previous Date	Add Yesterday Date as Date feild and Election Type	When click the Update date button Not update the Date.Show Error Message	Show Error Message	Pass
TC-EADD-02	GN can add Next Election Date and Election Type for view the Citizen	Add Next Month date as the Date feild and Election Type	When click the Update date button Update the Date with Nearest today.	Update the date With nearest Date with today	Pass

Field:	Add Polling Center(GN)				
Test Case ID	Feature	Input	Expected Output	Actual Output	Status
TC-PADD-01	GN can add New Polling Centers with it details and Citizen can view that Polling Centers. Can't add a existing Center Name	Add a Existing Center Name,Center Ad-dress,Center Contact Number with 10 digits	When Click Update Polling Cen-ter,Not Update the Count.Show Error Mes-sage	Show Error Message	Pass

Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-PADD-02	GN can add New Polling Centers with it details and Citizen can view that Polling Centers. Can't add a existing Center Name	Add a New Center Name,Center Address,Center Contact Number with 10 digits	When Click Update Polling Center,show the count of Polling Center added by Gn.	Update the Count of Polling Center	Pass
TC-PADD-03	GN can add New Polling Centers with it details and Citizen can view that Polling Centers. Can't add a existing Center Name and also Can't add Invalid Numbers as the Contact Number	Add a New Center Name,Center Address,Center Contact Number with 12 digits	When Click Update Polling Center,Show Error Message.Because number is invalid	Show Error Message	Pass
TC-PADD-04	GN can add New Polling Centers with it details and Citizen can view that Polling Centers. Can't add a existing Center Name and also Can't add Invalid Numbers as the Contact Number	Add a New Center Name,Center Address,Center Contact Number with 10 digits	When Click Update Polling Center,show the count of Polling Center added by Gn.No Any Error Message	Update the Count of Polling Center	Pass

Field:	Filter By Status of Action(GN)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-FIL1-01	GN can view the Voter details who Submit the form for register as a Voter in the Election.Default Status is Show as Pending.GN can Reject or Register citizen depend on their user details.	Click All,Pending,Regis tered,Rejected Button to view Only that status details.	Show the Selected Status details.	Show Cor-rectly,Expected Output	Pass
TC-FIL1-02	GN can view the Voter details who Submit the form for register as a Voter in the Election.Default Status is Show as Pending.GN can Reject or Register citizen depend on their user details.	Click All,Pending,Regis tered,Rejected Button to view Only that status details.But it database is empty	There are no registered/rejected selection section.	No data to Show	Pass

Field:	Show Search Results(Citizen)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-SSR-01	When Citizen Register for the Election as a Voter beyond that form Citizen Can view Polling Centers' details, They can search details of specific polling center name by search it using Search bar	Enter Existing Polling Center Name	Show the Name, Contact Number and Address of it	Give the Expected Output	Pass
TC-SSR-02	When Citizen Register for the Election as a Voter beyond that form Citizen Can view Polling Centers' details, They can search details of specific polling center name by search it using Search bar	Enter Name, But it didn't add by GN as a Polling Center	No Records, Because Not a record from this enter name.	Empty Record with message.	Pass

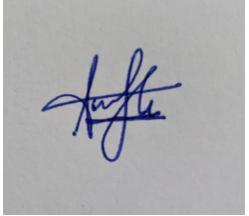
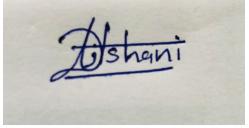
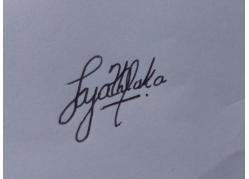
Field:	Register as a Voter(Citizen)				
Test Case ID	Feature	Input	Expected Output	Actual Out-put	Status
TC-RV-01	Citizen can register for the upcoming Elections with filling the registration form with correct details.	Filling form with correct and expected data.But Citizen already registered for the election once.	Show Error Message,Because Citizen Can't register more than one time with same NIC	Show Error message	Pass
TC-RV-02	Citizen can register for the upcoming Elections with filling the registration form with correct details	Filling form with correct and expected data.NIC not use before.	Submit Success and redirect to Verify Page	Submit Success and redirect to Verify Page	Pass

The figure displays a collection of 12 screenshots from an election management system, arranged in a grid. The screenshots illustrate various features and user interactions:

- Top Row:**
 - Screenshot 1: Shows a list of voters with columns: NIC, Voting Method, Name of Head of Household, Relationship to Head of Household, Status, and Actions.
 - Screenshot 2: Shows a dashboard with counts: 12 Voters, 2025-05-06 Next Election, and 5 Polling Centers.
 - Screenshot 3: Shows a list of voters with similar columns as Screenshot 1.
- Middle Row:**
 - Screenshot 4: Shows a list of voters with columns: NIC, Voting Method, Name of Head of Household, Relationship to Head of Household, Status, and Actions.
 - Screenshot 5: Shows a 'Polling Centers' page with fields for Name, Address, and Contact, and a note: 'No Polling Center Found.'
 - Screenshot 6: Shows a dashboard with counts: 12 Voters, 2025-05-06 Next Election, and 4 Polling Centers.
- Bottom Row:**
 - Screenshot 7: Shows a 'Residence Verification' form with fields for Current Residence Address, Duration of Residence, and Upload Proof of Residence. It includes a note: 'Please provide your current residence details for verification.'
 - Screenshot 8: Shows a 'Polling Centers' page with a table for Polling Center details.
 - Screenshot 9: Shows a 'Voter Registration' form with fields for Voting Method, NIC Number, Name of Head of Household, and Relationship to Head of Household. It includes a note: 'Error: Voter with this NIC already exists.'
 - Screenshot 10: Shows a 'Voters' list with columns: NIC, Voting Method, Name of Head of Household, Relationship to Head of Household, Status, and Actions.
 - Screenshot 11: Shows a 'Voters' list with columns: NIC, Voting Method, Name of Head of Household, Relationship to Head of Household, Status, and Actions.
 - Screenshot 12: Shows a 'Voters' list with columns: NIC, Voting Method, Name of Head of Household, Relationship to Head of Household, Status, and Actions.

Figure 6.4: Test Case Proofs 04

6.4 Group Members

Name	Index Number	Signature
P.M.A.T. Srikantha	22001956	
D.N. Kodithuwakku	22000925	
J.M.C.K. Jayathilake	22000771	
L.H.L.S. Darshana	22000305	