



University of Jordan
Department Of Computer Science
Software Engineering



Sawweb

Dareen Abu Hamra	2220788
Ayat Abueid	0229098
Shahd Habash	0227933
Sara Al hawamdeh	0221749
Reem Al Birawi	0222993

Supervisor: Prof. Mohammad Abushariah

Spring Semester 2025

5th June 2025

Executive Summary

This project presents the design and development of a government issue-reporting mobile and web application aimed at enhancing civic engagement and streamlining communication between citizens and municipal authorities. The application empowers citizens to report non-emergency issues such as potholes, broken streetlights, or sanitation concerns directly to the relevant governmental departments in a structured and trackable manner.

The platform consists of three primary user roles: Citizens, Employees, and Admins. Citizens can create accounts, submit complaints with optional media attachments, suggest improvements, receive updates, and manage their personal preferences. Employees are responsible for handling submitted complaints and suggestions, updating statuses, and ensuring timely resolutions. Admins oversee the overall system by managing employee accounts, handling complaint triage, assigning tasks, and ensuring operational integrity.

The app architecture is modular and follows a layered approach, separating concerns between user interface, business logic, and data access. Firebase and Firestore are leveraged for secure authentication, real-time database updates, and cloud storage. Additionally, audit logging ensures traceability of all admin and employee activities, reinforcing system accountability.

By digitizing and automating the issue-reporting process, this application promotes transparency, operational efficiency, and user satisfaction, ultimately contributing to smarter and more responsive local governance.

Table of Contents

Executive Summary	2
1.0 Project Initiation.....	8
1.1 Project Overview	8
1.2 Problem Definition	9
1.2.1 Problem Statement	9
1.2.2 Issues	9
1.2.3 Objectives	10
1.2.4 Requirements	10
1.2.5 Constraints	11
1.3 Feasibility Study.....	11
1.3.1 Technical Feasibility	12
1.3.2 Operational Feasibility	12
1.3.3 Economic Feasibility	13
1.3.4 Schedule Feasibility	14
1.3.5 Legal Feasibility	14
1.4 Recommended Solution and Expected Project Deliverables.....	16
1.5 Local and Global Impact of the Proposed Solution	17
1.5.1 Local Impact	17
1.5.2 Global Impact	18
1.6 Naming Conventions and Definitions.....	18
2.0 Project Management Plan.....	20
2.1 Project Organization.....	20
2.2 Roles and Responsibilities	20
2.3 Software Process Model.....	23
2.4 Tools and Techniques.....	23
2.5 Work breakdown	24
2.5.1 Initiation and planning	24
2.5.2 Requirement Analysis.....	27
2.5.3 System Design	28
2.5.4 Implementation (Development Phase).....	31
2.5.5 Testing & Quality Assurance	32
2.5.6 Deployment & Maintenance.....	34

2.6 Assigning Team Members to Tasks	35
2.7 Project Schedule.....	37
2.7.1 Tasks, Durations, and Dependencies	37
2.7.2 Pert Chart	39
2.7.3 Gantt Chart.....	39
2.8 Risk Analysis and Plans	40
2.9 Monitoring, Reporting, and Controlling Mechanisms.....	42
3.0 Software Requirements Specifications (SRS)	44
3.1 System Stakeholders and Requirements Sources	44
3.2.1 User Requirements Definition for Citizens.....	48
3.2.2 User Requirements Definition for Municipal Employees	50
3.2.2 User Requirements Definition for System Administrator	52
3.3 Use case Diagrams.....	54
3.4 System Functional Requirement Specification	57
3.5 Textual Description for Each Use Case.....	70
3.6 Non-Functional Requirements	98
3.6.1 Performance Requirements	98
3.6.2 Dependability Requirements	98
3.6.3 Security Requirements	98
3.6.4 Usability Requirements	99
3.6.5 Operational and Environmental Requirements	99
3.6.6 Maintainability Requirements.....	99
3.7 Data Requirements.....	100
4.0 Analysis and Design	101
4.1 Activity Diagram	101
4.2 Sequence Diagrams	102
4.2.1 Citizen Sequence Diagrams	102
4.2.2 Employee Sequence Diagrams	108
4.2.3 Administrator Sequence Diagrams	112
4.3 Class Diagram	120
4.4 Architecture Design	121
4.5.1 Graphical User Interface Design (Citizen)	122
4.5.2 Graphical User Interface Design (Employee)	124
4.5.3 Graphical User Interface Design (Admin).....	126
5.0 Implementation.....	128

5.1 Graphical User Interface Implementation	128
5.1.1 Graphical User Interface Implementation (Citizen)	128
5.1.2 Graphical User Interface Implementation (Employee)	131
5.2.3 Graphical User Interface Implementation (Admin)	133
5.2 Database implementation.....	136
5.2.1 Backend overview	136
5.2.2 Firebase authentication and user sign in method	136
5.2.3 Cloud Firestore database structure.....	136
6.0 User Manual	145
6.1 Citizen Guide	145
6.1.1 Citizen Frequently Asked Questions (FAQs).....	156
6.2 Employee Guide	157
6.2.1 Employee Frequently Asked Questions (FAQs).....	162
6.3 Administrator Guide.....	163
PAGEREF _Toc201016058 \h 6.3.1 Admin Frequently Asked Questions (FAQs)	170
7.0 References.....	171

List of Tables

Table 1-Employee Cost	13
Table 2-Hardware Cost.....	14
Table 3-Schedule Feasibility	14
Table 4-Feasibility Study.....	16
Table 5-Deliverables and milestones 1.2.....	26
Table 6-Resources needed 1.3	26
Table 7-Dependencies and Constraints 1.4	27
Table 8-Deliverables and Milestones 2.2	28
Table 9-Resources needed 2.3	28
Table 10-Dependencies and Constraints 2.4	28
Table 11-Deliverables and Milestones 3.2	30
Table 12-Resources needed 3.3	30
Table 13-Dependencies and Constraints 3.4	31
Table 14- Deliverables and Milestones 4.2	32
Table 15-Resources needed 4.3.....	32
Table 16-Deliverables and Milestones 5.2.....	33
Table 17-Resources needed 5.3.....	33
Table 18-Dependencies and constraints 5.4	34
Table 19-Deliverables and Milestones 6.2.....	34
Table 20-Resources needed 6.3.....	35

Table 21-Dependencies and constraints 6.4	35
Table 22-Assigning team members to tasks	37
Table 23-Project Schedule	39
Table 24-Security risk	40
Table 25-Technological risk.....	41
Table 26-Operational risk	41
Table 27-User – Related / Estimation Risk.....	42
Table 28-System Stakeholders	48
Table 29-User Requirements Definition for Citizens	50
Table 30-User Requirements Definition for Municipal Employees	51
Table 31-User Requirements Definition for System Administrator.....	53
Table 32-System Functional Requirement Specification	69
Table 33-Textual Description Register Account	71
Table 34-Textual Description Log In.....	72
Table 35- Textual Description Submit a complaint	73
Table 36-Textual Description Navigate Through the Application	74
Table 37-Textual Description Search Track Complaints	75
Table 38-Textual Description Use Chatbot Assistant	75
Table 39-Textual Description Notification system	76
Table 40-Textual Description Reset Password	77
Table 41-Textual Description Upload Multiple Media Files.....	78
Table 42-Textual Description Search Complaints	79
Table 43- Textual Description Submit Suggestions.....	80
Table 44-Textual Description Delete Complaints	81
Table 45-Textual Description Manage Settings and Preferences	82
Table 46-Textual Description Help and Support.....	83
Table 47-Textual Description View Complaints	84
Table 48-Textual Description View Profile Information.....	85
Table 49-Textual Description Set Issue Location	85
Table 50-Textual Description Logout Account.....	86
Table 51-Textual Description Rate Overall System	87
Table 52-Textual Description View Suggestions	88
Table 53-Textual Description Manage Employee Accounts	89
Table 54-Textual Description Manage Complaint	91
Table 55-Textual Description Manage Suggestion.....	94
Table 56-Update Complaint Status.....	95
Table 57-Upload Supporting Files to Complaints	95
Table 58-Rate Suggestion Submission Process.....	96
Table 59-Rate Complaint Submission Process.....	97
Table 60-Data Requirements	100
Table 61-Citizen fields.....	137
Table 62-User fields	138
Table 63 -Notification list fields	139
Table 64-Category fields	140
Table 65- Report fields.....	142
Table 66-Citizen fields.....	143

Figure 1-Work breakdown.....	24
Figure 2-Pert Chart	39
Figure 3-Gantt Chart.....	39
Figure 4-Use case Diagrams 1.....	54
Figure 5-Use case Diagrams 2.....	55
Figure 6-Use case Diagrams 3.....	56
Figure 7-Activity Diagram	101
Figure 8-Sequence Diagrams Use Chatbot	102
Figure 9-Sequence Diagrams Submit Complaint.....	103
Figure 10-Sequence Diagrams Submit Suggestion 1	104
Figure 11-Sequence Diagram Complaints Tracking	106
Figure 12-Sequence Diagram Navigation Through the Application	107
Figure 13-Sequence Diagram Update Complaint Status	108
Figure 14-Sequence Diagram View Suggestions	109
Figure 15-Sequence Diagram View Complaints	110
Figure 16-Sequence Diagram Upload Files.....	111
Figure 17-Sequence Diagram Manage Employee Account 1	112
Figure 18-Sequence Diagram Manage Employee Account 2	113
Figure 19-Sequence Diagram Suspend or Reactivate User Accounts	114
Figure 20-Sequence Diagram Manage Complaints 1	115
Figure 21- Sequence Diagram Manage Complaints 2	116
Figure 22-Sequence Diagram Manage Suggestions 1	117
Figure 23-Sequence Diagram Manage Suggestions 2	118
Figure 24-Sequence Diagram Upload Files.....	119
Figure 25- Class Diagram	120
Figure 26-Architecture Design 1.....	121
Figure 27-Architecture Design 2.....	121

List of Figures

1.0 Project Initiation

1.1 Project Overview

Sawweb is a user-friendly issue reporting app designed to enhance civic engagement and improve public service delivery in Jordan. It allows citizens to report non-emergency issues such as potholes, streetlight malfunctions, and public service complaints directly to the relevant government departments while tracking the status of their reports. With features like geolocation, real-time status updates, and integration with government agencies, Sawweb ensures efficient issue resolution. A built-in feedback and rating system enhances accountability. Additionally, a rule-based chatbot assists users in navigating the app, submitting reports, and accessing relevant information, making the process seamless and intuitive.

1.2 Problem Definition

1.2.1 Problem Statement

Jordanian citizens, when facing an issue, a pothole for example, often tend to get annoyed by it, complain about it, then ignore it. This is not because they are unbothered by the issue anymore, but rather because they struggle to report it.

There is a clear lack of accessible reporting systems making it difficult for citizens to submit their complaints. In many cases, citizens are uncertain about which government department is responsible for addressing their problem. Even when complaints are received, slow or no response from authorities leaves citizens frustrated and without a way to track their complaints, making them unaware of whether their issue is being addressed or not.

Sawweb aims to solve these challenges by providing a centralized, user-friendly platform to ensure efficiency, transparency, and accessibility.

1.2.2 Issues

Issue 1 – Inconvenience when reporting issues in person, due to challenges such as limited transportation options, long wait times in queues, office hours that do not accommodate citizens' schedules.

Issue 2 – Phone calls go undocumented, and paper-based reports get lost in government bureaucracy.

Issue 3 – Mis-categorizing issues and uncertainty about departments' responsibilities.

Issue 4 – Filing multiple complaints across different government departments is a hassle.

Issue 5 – Miscommunication due to slow or no response at all.

Issue 6 – No feedback from authorities about addressing the issues filed.

Issue 7 – Lack of important information and mistakes in reports.

1.2.3 Objectives

Objective for Issue 1 – Ensure that the system operates outside of government office hours to allow citizens to report issues anytime and anywhere.

Objective for Issue 2 – Develop a secure and centralized database, to ensure all complaints are documented and stored efficiently.

Objective for Issue 3 – Categorize issues by their type rather than by the responsible government department.

Objective for Issue 4 – Integrate all government departments to enable users to submit and track their complaints across multiple departments within a single platform.

Objective for Issue 5 – Implement a chatbot for automatic responses.

Objective for Issue 6 – Send notifications to provide users with feedback on the resolution progress of the issues they have filed.

Objective for Issue 7 – Simplify complaint forms and integrate validation checks

1.2.4 Requirements

1. Register a user and verify National ID
2. Log in and validate user account.
3. Control access based on user role (Citizen, Employee, Admin).
4. Browse complaints by category.
5. Submit a complaint with all required fields, including complaint type, submission date, description, attachments (media files/reports), and issue location
6. Track complaint status and view each complaint in one of three sections: Under Review, In Progress, or Resolved
7. Send real-time notifications about the complaint resolution progress.
8. Navigate through the Home, Notifications, Complaint Tracking, and Chatbot pages.
9. Interact with a chatbot that provides FAQs, step-by-step assistance, and official contact information
10. View user profile information, including National ID, Name, Email and phone number.
11. Edit user profile information, such as email address and phone number.
12. Manage user settings and preferences, password change, and notification preferences.
13. Search complaints using a search bar.

14. Reset password from the login page or via settings.
15. View recently resolved complaints.
16. Submit suggestions for service improvement using a text input.
17. Upload attachments, including media files and reports.
18. Redirect complaints to the appropriate government department
19. Review complaints assigned to employees or departments.
20. Assign complaints to the relevant employee.
21. Update complaint status
22. Log out of the user account.
23. Suspend or reactivate user accounts (Admin only).
24. Manage user accounts, including viewing, editing, or deactivating (Admin only).
25. View suggestions submitted by users (Employee and Admin only).
26. View resolved complaints (Employee and Admin only).
27. Search complaints using filters.
28. Manage complaints assigned to employees or departments (Admin only).
29. Access help and support resources via chatbot or dedicated help page. (Citizens only).
30. Rate the overall system.
31. Rate complaint and suggestion submission process.

1.2.5 Constraints

1. Cross-platform compatibility.
2. Availability, the application must be available 24/7 with minimal downtime to ensure uninterrupted access for users.
3. Scalability to handle increasing number of users.
4. High performance, fast load time and minimal response delay for complaint submission.
5. Maintainability, easy updates and modifications.
6. Data privacy and secure authentication.

1.3 Feasibility Study

For a summary of the Feasibility study refer to Table 4.

1.3.1 Technical Feasibility

1. Technological capabilities

Sawweb is a mobile app that has many possible choices for its technology stack, the choice landed on the following tools:

1. Frontend Development: Flutter and Dart

Flutter is used for developing high-performance, visually attractive, and responsive apps for iOS and Android, ensuring cross-platform compatibility. It allows integration with native device features like GPS, camera, and notification system

2. Backend development and Database: Firebase

Firebase offers scalable infrastructure to handle increasing number of users, and it supports secure authentication and real-time database features, ensuring system reliability and protecting the users data.

2. System Integration

1. Integration with E-Government Systems:

Sawweb is designed to seamlessly integrate into existing e-government systems, such as Sanad and other ministry-operated mobile services. This integration ensures interoperability with national digital services.

2. Data Integration:

I. Citizen Record access: For Sawweb to be employed usefully it must access official Government databases to verify and retrieve citizen information.

II. Countrywide Mapping data: Sawweb incorporates geospatial data covering the entire country of Jordan, enabling accurate issue and location tracking.

III. Bidirectional Database Interaction: The system not only retrieves information from government databases but also updates records to keep track of all important changes.

3. Security:

Sawweb ensures secure communication and data integrity via:

-Secure Network: Firewalls and encryption to protect user data.

-Validation mechanism: The system verifies reports to prevent misdirected efforts.

4. Scalability:

Scalability is the top priority for Sawweb. A nationwide system should be designed to scale well with the size of its user base. It is important to make sure Sawweb deals efficiently with traffic of usage and user volume.

1.3.2 Operational Feasibility

-User adoption: Sawweb is designed with a high standard of usability, ensuring an intuitive experience for all users. The clear and simple UI, featuring well-defined icons and easy navigation, allows citizens to access essential functions directly from the main screen. Additionally, the app follows familiar design patterns used in many popular applications, making it instantly recognizable and easy to use for the vast majority of users.

-Alignment with government rules: Sawweb is fully aligned with government regulations and instructions, particularly concerning security. The app adheres to stringent security protocols to ensure the protection of national data and infrastructure. By following government-established guidelines, Sawweb maintains national security standards and ensures that all user and system data is handled responsibly and safely.

-Resource availability: Sawweb requires minimal resources to operate efficiently. The key requirements include access to government databases and integration with existing e-government systems to ensure reports reach the appropriate institutions. Since the necessary digital infrastructure and governmental IT systems are already in place, the implementation of Sawweb is feasible.

1.3.3 Economic Feasibility

Employee costs: Sawweb requires a team of developers, database administrators, security specialists, and support staff to ensure smooth operation. Employee salaries cover development, maintenance, security, and project management, ensuring the system remains functional and up to date.

Role	Rate (JOD / hr)	Estimated hours	Total cost
Frontend developer	7	154	1,078
Backend developer	10	154	1,540
Database administrator	10	93	930
UI/UX designer	6	62	372
Support and maintenance	14	62	868
Project management	25	93	2,325
Security specialist	22	62	1,364
Total		8,477	

Table 1-Employee Cost

Hardware costs: Hardware expenses include networking equipment, testing devices, and servers to support Sawweb infrastructure. Essential components like routers, firewalls, and cloud hosting services ensure secure and stable operations.

Item	Quantity	Unit Cost (JOD)	Total Cost (JOD)
PCs/Laptops	5	710	3,550
Testing Devices	2	355	710
Enterprise Router	1	568	568
Network Switch	2	568	1,136

Firewall Appliance	1	1,065	1,065
Cloud Hosting	-	213	2,556/year
Total Annual cost		9,025	

Table 2-Hardware Cost

1.3.4 Schedule Feasibility

Phase ID	Phase Description	Duration (WD)
Phase 1	Initiation & Planning	19
Phase 2	Requirements Analysis	12
Phase 3	System Design	15
Phase 4	Implementation (Development Phase)	20
Phase 5	Testing & Quality Assurance	3
Phase 6	Deployment & Maintenance	8
Total		77

Table 3-Schedule Feasibility

1.3.5 Legal Feasibility

- Personal Data Protection:** Jordan's Personal Data Protection Law No. 24 of 2023 (PDPL) governs the processing of personal data. Effective from March 17, 2024, the PDPL mandates:
 - Consent:** Explicit and documented consent from individuals before processing their personal data.
 - Data Subject Rights:** Individuals have rights to access their data, withdraw consent, and be informed about data collection purposes.
 - Public Authorities:** Certain provisions allow public authorities to process data without prior consent if it's necessary for tasks entrusted to them by law.

2. **Cybercrime Regulations:** The Cybercrime Law No. 17 of 2023, effective from September 13, 2023, addresses online activities, including:
 - I. Unauthorized Access: Prohibitions against unauthorized access to information networks and government data.
 - II. Data Integrity: Penalties for data tampering, hacking, and spreading misinformation.
3. **Terms of Use and Legal Jurisdiction:** The use of e-government platforms is governed by Jordanian law. Any disputes arising from the use of such platforms are subject to the jurisdiction of Jordanian courts.
4. **Data Classification and Management Policy of Jordan**, approved in January 2020, establishes a structured framework for government entities to systematically classify and manage data. This policy aims to enhance data security, promote transparency, and facilitate the effective use of government data.

Feasibility Study Summary

Feasibility Study	Key Points	Assessment
Technical Feasibility	<ul style="list-style-type: none"> -Technological capabilities - System Integration - Security - Scalability 	Feasible
Operational Feasibility	<ul style="list-style-type: none"> - User adoption - Alignment with government rules - Resource availability 	Feasible
Economic Feasibility	<ul style="list-style-type: none"> -Employee costs -Hardware costs -Integration and maintenance costs 	Feasible

Schedule Feasibility	-Initiation and planning -Requirements analysis -Implementation - Testing and QA - Deployment and maintenance	Feasible
Legal Feasibility	-Personal data protection -Cybercrime regulations -Terms of use and legal jurisdiction -Data classification and management policies	Feasible

Table 4-Feasibility Study

1.4 Recommended Solution and Expected Project Deliverables

Sawweb is a mobile application that aims to address the daily challenges Jordanian citizens face when reporting public service issues. Sawweb provides a centralized, intuitive, and efficient platform to enhance transparency, accessibility, and government responsiveness.

1. User-Friendly Interface - Aligns with objectives 1,7 and 8

Sawweb ensures ease of registration and login, offers a simple complaint submission process, and supports both Arabic and English to overcome language barriers. Users can easily attach location details and photos to reports, minimizing incomplete submissions. The intuitive interface ensures accessibility for users of all technical skill levels.

2. Simple Complaint Submission with Media Support - Aligns with objective 7

The application allows users to submit complaints with descriptions, precise location details, and optional photo attachments. This helps ensure the accuracy and completeness of each report.

3. Real-Time Tracking System - Aligns with objective 6

Users receive live updates and can view the status of their complaints at any time. This increases transparency and ensures citizens are aware of the actions being taken on their reported issues.

4. Integration with Government Departments - Aligns with objectives 3 and 4

Complaints are categorized by issue type instead of by department, and the system automatically routes them to the appropriate government agency. This reduces confusion and simplifies the process for users.

5. Search Bar Functionality - Aligns with objectives 2 and 4

A search bar allows users to locate complaints using keywords, categories, or complaint IDs, making it easy to manage, reference, and track previous submissions. This replaces inefficient and undocumented communication channels.

6. Two-Way Communication System with Chatbot - Aligns with objective 5

The application includes a chat feature that allows citizens to communicate directly with officials. A built-in chatbot responds instantly to common inquiries, reducing waiting time and enhancing user satisfaction.

7. Availability - Aligns with objective 1

The system operates 24/7, allowing citizens to report issues without the constraints of office hours, transportation, or physical presence.

8. Secure Centralized Database - Aligns with objective 2

All complaints are digitally recorded and safely stored in a centralized database, ensuring that every submission is preserved and traceable by both users and government authorities.

1.5 Local and Global Impact of the Proposed Solution

1.5.1 Local Impact

1. Improved Civic Engagement:

Empowers citizens to report issues conveniently via a mobile app. Encourages public participation in community development. Strengthens trust between residents and local government.

2. Higher Quality of Life for Residents:

Quicker resolutions to urban issues, making cities more comfortable and convenient for residents.

3. Enhanced Government Responsiveness:

Reduces delays in addressing public infrastructure problems. Receive and process complaints in real-time.

4. Real-Time Issue Tracking and Notifications:

Provides users with real-time status updates on their complaints. Sends notifications when the issue is being processed, resolved, or requires additional information. Strengthens confidence in the government's ability to respond efficiently.

5. Optimized Resource Allocation:

Prevents wasteful spending by addressing urgent issues first. Reduces unnecessary site visits by centralizing issue reports and locations.

6. Better Urban Planning:

Supports data-driven decision-making for infrastructure development. Aids in prioritizing repairs and maintenance based on issue severity and frequency.

1.5.2 Global Impact

1. Economic Benefit:

Fixing problems early saves money. Proactive issue resolution (e.g., potholes, water leaks) reduces long-term repair costs. For example, the World Bank estimates that timely infrastructure maintenance can save governments up to 50% compared to emergency repairs. Sawweb's centralized reporting enables early intervention, optimizing public spending.

2. Environmental Sustainability:

The app supports SDG (Sustainable Development Goals) no.17 by enabling shared innovation and technology transfer. Empowering cities to address issues early and lower their environmental impact. Through cross-sector partnerships, countries can implement this solution to drive sustainable urban development and promote global cooperation.

3. Transparency Benchmarking:

Public complaint tracking and resolution metrics (e.g., response times) could improve Jordan's global governance rankings boosting international trust

4. Attracting Investment:

Sawweb positions Jordan as an innovator in digital governance. Successful implementation could attract investments in smart city projects, similar to Dubai's "Smart Dubai" or "FixMyStreet" UK.

1.6 Naming Conventions and Definitions

Terms

- **Issue:** An important problem or unsettled matter
- **Complaint:** A written statement about an issue, such as a problem with street infrastructure, water supply, power outages, etc.

- **Report:** A complaint submitted by a citizen to report an issue. Reports are submitted through the application and include details like photos and descriptions.
- **Report Details:** Information associated with a report, including the problem type (street, water, power, or farm), the description, the date and time of the report, the citizen's contact information, and any attached images or files.
- **User:** Individuals interacting with the application, including citizens who submit reports, government employees who process reports, and administrators who oversee the system's functionality.

Abbreviations / Acronyms

- **TBA:** To Be Announced
- **GMT:** Greenwich Mean Time
- **SLA:** Service Level Agreement
- **WD:** Workdays
- **BE DEV** – Backend developer
- **FE DEV** – Frontend developer
- **CYSS** – Cybersecurity specialist
- **UI:** User Interface
- **UX:** User Experience
- **API:** Application Programming Interface
- **QA:** Quality Assurance
- **PM** – Project manager
- **BA** – Business Analyst
- **DBA** – Database Administrator
- **TW** – Technical Writer
- **SW** – Software
- **HW** – Hardware

2.0 Project Management Plan

2.1 Project Organization

Sawweb is managed by a dedicated team, each with specific responsibilities to ensure smooth development, security, and integration with government systems. The team consists of the following key roles:

- **Project Manager:** Ayat Abueid (Leader), Shahd Habash, Dareen Abuhamra, Sara Alhawamdeh, Reem Birawi
- **Business Analysis:** Ayat Abueid (Leader), Shahd Habash, Dareen Abuhamra, Sara Alhawamdeh, Reem Birawi
- **UI/UX Designer:** Sara Alhawamdeh
- **Frontend Developer:** Sara Alhawamdeh, Dareen Abuhamra
- **Backend Developer:** Dareen Abuhamra
- **Database Administrator:** Ayat Abueid, Reem Birawi, Shahd Habash
- **Technical Writer:** Dareen Abuhamra, Ayat Abueid
- **Quality Assurance:** Reem Birawi
- **Security Specialist:** Ayat Abueid, Sara Alhawamdeh
- **System Architect:** Ayat Abueid

2.2 Roles and Responsibilities

1. Project manager:

- i. Manages team members, resolves conflicts, and takes a leading role in ensuring effective communication within the team.
- ii. Develops a project plan and ensures execution aligns with available time and resources.
- iii. Assigns tasks to team members based on their individual capabilities and expertise.

2. Business Analyst:

- i. Gathers requirements from stakeholders to understand project needs.
- ii. Analyzes the collected information to identify potential conflicts or gaps, then documents the requirements clearly, creating a blueprint for the project.
- iii. During implementation, monitors progress, ensures solutions are implemented according to plan, and adjusts as necessary.

3. UI/UX designer:

- i. Understands user needs, defines user flows, and creates wireframes and prototypes to guide the design process.
- ii. Designs intuitive user interfaces and conducts usability testing to ensure the design meets user expectations before moving into development.

4. Developer:

- i. Builds and implements the actual code for the system based on project requirements, making the developer a central component in constructing the software project.
- ii. Teams up with other project teams, project managers, designers, and other team members to ensure safe deployment of the software.

5. Database administrator:

- i. Ensures that the database systems used by the application are properly designed, optimized, and maintained throughout the development lifecycle.
- ii. Works closely with developers to implement efficient data models, manage access to data, and maintain the integrity, security, and performance of database operations during development, testing, and deployment phases.

6. QA engineer:

- i. Executes and analyses tests to ensure software quality.
- ii. Reviews requirements and designs test cases to validate functionality.
- iii. Develops scripts and tools to run automated tests during the development lifecycle.

7. Technical writer:

- i. Presents project information in a clear, readable format for users, creating user manuals that are easy to follow.
- ii. Writes and maintains documentation including system architecture, APIs, and integration details.
- iii. Collaborates with developers and security specialists to document best practices and security protocols.

8. Security specialist:

- i. Ensures secure communication between all technical teams by protecting internal networks and data exchanges.
- ii. Conducts security audits and vulnerability assessments to identify and fix weaknesses in the system.
- iii. Stays updated on the latest cybersecurity threats and updates security policies accordingly during the software development lifecycle.

9. System Architect

- i. Establishes the overall structure of the system, including hardware and software components, to meet specific project requirements.
- ii. Creates high-level design diagrams such as system architecture, component, deployment, and data flow diagrams to define the system's structure, interactions, and deployment strategy.
- iii. Provide guidance to development teams, ensuring that the system's design is implemented effectively.

2.3 Software Process Model

We chose the Waterfall Model, a plan-based software development approach, because it ensures a clear structure and predictable workflow, which is essential for coordinating with government systems and requirements.

By using a plan-based model, we can:

- i. Define all requirements early, allowing a clear vision of the project from the start.
- ii. Follow a structured and sequential process, which makes tracking progress and responsibilities easier.
- iii. Minimize unexpected changes, ensuring stability and consistency in development and integration with government infrastructure.

2.4 Tools and Techniques

- For Documentation the following tools are used:

1. Google docs
2. Microsoft word

- For Development the following tools are used:

1. IDE's
 - VS code
 - Xcode
 - Android Studio
2. Firebase
3. GitHub
4. Figma
5. Adobe Illustrator

- For Communication the following tools are used:

1. Discord. 2. Google Meets. 3. Microsoft Teams

2.5 Work breakdown

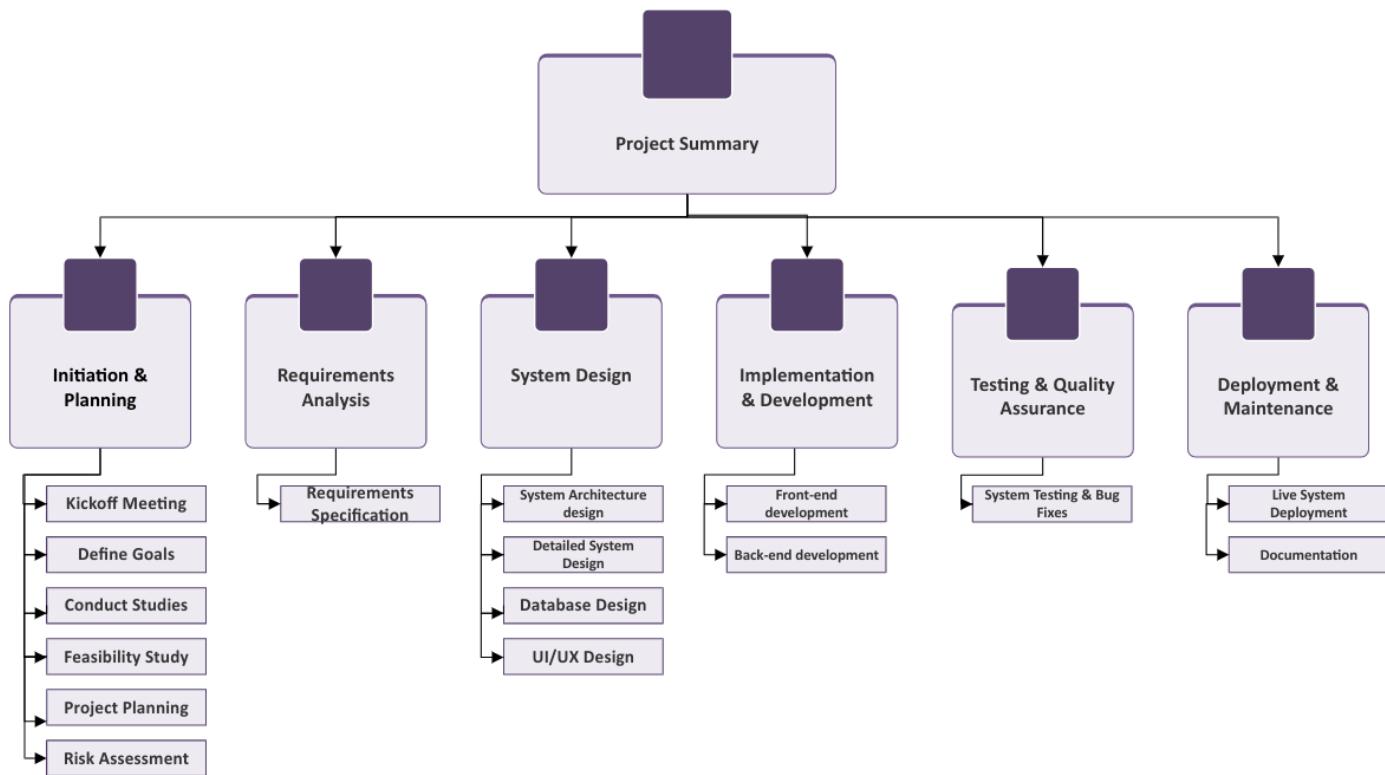


Figure 1-Work breakdown

2.5.1 Initiation and planning

Sub-tasks:

- Kickoff Meeting with Stakeholders (T1)
- Define goals (T2)
- Conduct studies (T3)
- Feasibility study (T4)
- Project planning (T5)
- Risk Assessment (T6)

2.5.1.1 Task Description

This phase involves setting the foundation for the project by aligning stakeholders, defining objectives, assessing feasibility, and formulating a structured plan. It includes conducting studies, analyzing potential risks, and ensuring that the project is viable before execution begins.

I. Kickoff Meeting with Stakeholders:

An initial meeting to align all key stakeholders, introduce the project team, clarify roles, discuss objectives, and establish communication channels.

II. Define Goals:

Identify and document the project's main objectives, desired outcomes, and success criteria to ensure a shared vision.

III. Conduct Studies:

Gather relevant data, analyze the current situation, and perform preliminary research to inform planning and decision-making.

IV. Feasibility Study:

Evaluate the project's viability from technical, financial, and operational perspectives to determine if it is achievable within constraints.

V. Project Planning:

Develop a detailed roadmap that includes timelines, resources, risk management, and deliverables to guide execution.

VI. Risk Assessment:

Risk assessment involves identifying, analyzing, and mitigating potential risks that could affect the success of the project. This includes security risks, technical challenges, compliance issues, and project-related uncertainties. The goal is to minimize vulnerabilities and ensure the system operates securely and efficiently. The risk assessment will focus on data security, system reliability, legal compliance, and operational risks, particularly for an e-government application handling sensitive citizen data.

2.5.1.2 Deliverables and Milestones

Deliverables	Milestones
None	<p>Milestone 1: Initiation & Planning Completed</p> <ul style="list-style-type: none"> • Work Breakdown Structure (WBS) – A hierarchical breakdown of tasks. • Gantt Chart & PERT Chart– Visual representation of milestones and deadlines • Feasibility Report – Covers technical, financial, operational, and legal feasibility. • Risk Assessment Report

Table 5-Deliverables and milestones 1.2

2.5.1.3 Resources Needed (Skills, HW, SW)

Skills Required	Hardware (HW) Requirements	Software (SW) Requirements
Technical knowledge for feasibility assessment.	Meeting Equipment: webcams and microphones.	Documentation & Collaboration Tools: Google Docs, Microsoft OneDrive
Analytical thinking and problem-solving.	Computers with Internet access.	Communication Tools: Microsoft Email, WhatsApp, Teams (Online Meetings)
Hard skills such as process modeling, software knowledge, and data analysis.		Data Analysis & Feasibility Tools: Google Sheets, Microsoft Word
Soft skills such as active listening and collaboration.		Diagramming & Planning Software: Microsoft Visio, GanttProject
Risk Management & Compliance		

Table 6-Resources needed 1.3

2.5.1.4 Dependencies and Constraints

Dependencies	Constraints
<ul style="list-style-type: none"> Define goals (T2) depends on Kickoff Meeting with Stakeholders (T1). Conduct Studies (T3) depends on approved Defined goals (T2). Feasibility Study (T4) depends on Conduct Studies (T3). Project Planning (T5) depends on Feasibility Study (T4). 	<ul style="list-style-type: none"> Budget limitations for feasibility studies. Tight deadlines for initial deliverables.
Risk Assessment (T6) depends on Project Planning (T5).	

Table 7-Dependencies and Constraints 1.4

Global Constraints (Applicable to All Phases):

Compliance with Jordanian e-government security/data privacy laws.

2.5.2 Requirement Analysis

Task:

- Requirements specification (T7)

2.5.2.1 Task description

The Requirements Analysis phase involves gathering, documenting, and validating the functional and non-functional requirements of the project. This ensures a clear understanding of what needs to be developed, aligning stakeholder expectations with technical feasibility. The process includes analyzing user needs, defining system capabilities, and preparing a detailed requirements specification document.

2.5.2.2 Deliverables and Milestones

Deliverables	Milestones
A formal document detailing functional and non-functional requirements.	Milestone 2: Initial Requirements Specification Completed. (M2)

	A formal document detailing functional and non-functional requirements.
--	---

Table 8-Deliverables and Milestones 2.2

2.5.2.3 Resources needed (Skills, HW, and SW)

Skills Required	Hardware (HW) Requirements	Software (SW) Requirements
Analytical thinking and problem-solving	Meeting Equipment: webcams and microphones.	Documentation & Collaboration Tools: Google Docs, Microsoft OneDrive
Requirements elicitation	Computers with Internet access.	Communication Tools: WhatsApp, Teams, Microsoft Email
Communication skills		

Table 9-Resources needed 2.3

2.5.2.4 Dependencies and Constraints

Dependencies	Constraints
<ul style="list-style-type: none"> • Requirements Specification (T7) depends on Milestone 1 (M1). 	<ul style="list-style-type: none"> • Ambiguous or conflicting stakeholders' requirements.

Table 10-Dependencies and Constraints 2.4

2.5.3 System Design

Sub-tasks:

- System architecture design (T8)
- Detailed system design (T9)
- Database design (T10)
- UI/UX design (T11)

2.5.3.1 Task Description

System design defines the overall structure and behavior of the Sawweb application. It ensures that the system meets functional and non-functional requirements, including security, performance, and scalability. This phase includes system architecture design, detailed system design, database design, and UI/UX design. The system design phase acts as a blueprint for development, ensuring alignment between stakeholders and technical teams.

I. System architecture design:

System Architecture Design involves defining the high-level structure, components, and interactions of a system to meet functional and non-functional requirements.

II. Detailed system design:

Detailed system design involves defining the technical architecture, data flow, and system components based on the initial system architecture. This task focuses on creating a comprehensive blueprint for developers, ensuring that all system components (frontend, backend, database, security, and integrations) work together efficiently. The design will cover data structures, API interactions, security protocols, and system scalability to support the functionalities of the e-government application. The system is designed using OOAD principles, including encapsulation, inheritance, and polymorphism.

III. Database design

Database design involves structuring the application's data storage system to ensure efficient data retrieval, security, and scalability. This task includes defining the database schema, designing relationships between data entities, optimizing queries for performance, and ensuring data integrity. Since the backend uses Firebase, the design will focus on Firestore's NoSQL structure.

IV. UI/UX design

UI/UX design focuses on creating a visually appealing and user-friendly interface that enhances the overall user experience. This involves designing prototypes, and high-fidelity UI elements based on user needs and accessibility standards. The process includes user research, iterative design

improvements, and usability testing to ensure a smooth, intuitive, and accessible interface. The final design will serve as a blueprint for front-end development.

2.5.3.2 Deliverables and Milestones

Deliverables	Milestones
None	<p>Milestone 3: Design & Architecture Completed. (M3).</p> <p>1. Activity Diagrams – Represent workflows or processes within the system, showing how users and components interact.</p> <p>2. Sequence Diagrams – Show the order of interactions between objects/components in a system.</p> <p>3. Class Diagram – Defines the structure of the system in terms of classes, attributes, methods, and relationships.</p> <p>4. Architecture Design – Describes the overall structure of the system, including components, modules, and how they communicate.</p> <p>5. Classes and Components Design – Defines software classes and how different system components interact.</p> <p>6. UI/UX Prototypes.</p>

Table 11-Deliverables and Milestones 3.2

2.5.3.3 Resources needed (Skills, HW, and SW)

Skills Required	Hardware (HW) Requirements	Software (SW) Requirements
Software Architecture & System Design	Development machines (Pcs/Laptops)	Design & Documentation: Microsoft Visio, Microsoft Word
Problem-solving abilities	Mobile devices (Android) for prototype testing	Database Management: Firebase Firestore
Database Modeling		Prototyping & UI/UX Tools: Figma
UI/UX Design Principles		

Table 12-Resources needed 3.3

2.5.3.4 Dependencies and Constraints

Dependencies	Constraints
<ul style="list-style-type: none"> System Architecture Design (T8) depends on the completion of Milestone 2: Requirements Analysis Completed (M2). Detailed System Design (T9) relies on approved System Architecture Design (T8). Database Design (T10) depends on Detailed System Design(T9). UI/UX Design (T11) depends on System Architecture Design (T8). 	<ul style="list-style-type: none"> Performance optimization for handling large-scale citizen reports

Table 13-Dependencies and Constraints 3.4

2.5.4 Implementation (Development Phase)

- Front-end user interface development (T12)
- Back-end development (T13)

2.5.4.1 Task Description

The Implementation (Development Phase) focuses on coding and building the application's core functionalities. This includes:

- Front-end UI development – Creating user interfaces that align with the UI/UX design specifications. This involves implementing interactive elements, ensuring responsiveness, and integrating with the backend services.
- Back-end development – Developing server-side logic, database interactions, API endpoints, and authentication mechanisms to ensure seamless data flow between the frontend and the database.

Both teams will collaborate closely to integrate the front-end with back-end services and ensure smooth system functionality.

2.5.4.2 Deliverables and Milestones

Deliverables	Milestones
None	Milestone 4: App development Completed (M4)

	<ul style="list-style-type: none"> • Functional front-end interface with essential screens and user interactions. • Back-end services with the app's core functionalities • Connection between frontend and backend for real-time communication • Code Documentation: Organized and well-documented Flutter code for future maintenance.
--	--

Table 14- Deliverables and Milestones 4.2

2.5.4.3 Resources Needed (Skills, HW, and SW)

Skills Required	Hardware (HW) Requirements	Software (SW) Requirements
Dart programming	Development machines (Laptops/PCs)	IDEs (Visual Studio Code, Xcode, Android Studio)
GitHub	Mobile devices for testing (Android)	Framework: Flutter
Full-Stack Development: Flutter & Firebase		Firebase services (Firestore)
		Flutter SDK (for development)
		Version control (GitHub)

Table 15-Resources needed 4.3

2.5.5 Testing & Quality Assurance

- System testing & bug fixes (T14)

2.5.5.1 Task Description

The Testing & Quality Assurance (QA) phase ensures that the application meets functional and performance requirements. This involves conducting integrated system testing to verify that all components (frontend, backend, and database) work together as expected. The team will identify, document, and fix any bugs or inconsistencies, ensuring a seamless user experience before deployment.

Key activities include:

- Performing functional, integration, and system testing

- Identifying and fixing bugs and performance issues
- Validating security, scalability, and usability.

2.5.5.2 Deliverables and Milestones

Deliverables	Milestone
None	<p>Milestone 5: Testing Completed. (M5)</p> <ul style="list-style-type: none"> • Test plan and test cases covering all system functionalities • Bug reports and issue tracking documentation • Finalized, tested, and stable application ready for deployment

Table 16-Deliverables and Milestones 5.2

2.5.5.3 Resources needed (Skills, HW and SW)

Skills Required	Hardware (HW) Requirements	Software (SW) Requirements
Knowledge of testing frameworks/tools	Development/testing machines (PCs, laptops)	Testing frameworks (Flutter Test)
Bug tracking and debugging	Mobile devices (Android) for compatibility testing	Bug tracking tools (GitHub Issues)
Performance and security testing		Version control (GitHub)

Table 17-Resources needed 5.3

2.5.5.4 Dependencies and Constraints

Dependencies	Constraints
<ul style="list-style-type: none"> Integrated system testing & bug fixes (T14) depends on Milestone 4: App development Completed(M4) 	<ul style="list-style-type: none"> Meeting performance and security standards Time constraints for bug fixing before deployment

Table 18-Dependencies and constraints 5.4

2.5.6 Deployment & Maintenance

- Live System (T15)
- System Documentation (T16)

2.5.6.1 Task Description

The Deployment & Maintenance phase involves launching the application for end-users and ensuring its stability, performance, and security in a live environment. This phase includes preparing deployment documentation, executing the deployment process, and ensuring that the system functions as expected. Additionally, a project closure report, handover documentation, and a user manual will be prepared to facilitate future maintenance, system administration, and user onboarding.

2.5.6.2 Deliverables and Milestones

Deliverables	Milestones
Fully deployed live system (core functionalities for our system)	Milestone 6: System Deployed (M6).
Handover documentation.	
User manual detailing system usage.	

Table 19-Deliverables and Milestones 6.2

2.5.6.3 Resources Needed (Skills, HW, and SW)

Skills Required	Hardware (HW) Requirements	Software (SW) Requirements
System deployment and server management	Production servers or cloud services for hosting the system	Cloud or server infrastructure (Firebase Hosting)
Performance monitoring and troubleshooting	Monitoring tools to track system health and logs	Monitoring tools (Firebase Performance Monitoring)
Technical writing (documentation & user manual)		Documentation tools (Microsoft Word, Google Docs)

Table 20-Resources needed 6.3

2.5.6.4 Dependencies and Constraints

Dependencies	Constraints
<ul style="list-style-type: none">• Live system (T15) depends on Milestone 5: Testing completed (M5).• System documentation (T16) depends on Milestone 5: Testing completed (M5).	<ul style="list-style-type: none">• Server and infrastructure limitations (scalability, storage, bandwidth)• Ensuring minimal downtime during deployment• Compliance with security and legal requirements

Table 21-Dependencies and constraints 6.4

2.6 Assigning Team Members to Tasks

	handover documentation										
--	------------------------	--	--	--	--	--	--	--	--	--	--

Table 22-Assigning team members to tasks

2.7 Project Schedule

2.7.1 Tasks, Durations, and Dependencies

Task ID	Task Description	Duration (WD)	Dependencies	Assigned Team
T1	Kickoff Meeting with Stakeholders	1	None	Project Management team (All team members)
T2	Define goals	2	T1	Project Management, Business Analysis teams (All team members)
T3	Conduct studies	2	T2	Business Analysis team (All team members)
T4	Feasibility study	4	T3	Business Analysis team (All team members)
T5	Project planning	6	T4	Project Management team (All team members)
T6	Risk assessment	4	T5	Cybersecurity Specialist (Ayat) Project Management Team (All)
M1	Milestone 1: Initiation & Planning Completed		T1, T2, T3, T4, T5, T6	
T7	Requirements specification	12	M1	Business Analysis team (All team members)
M2	Milestone 2: Requirements Analysis Completed		T7	
T8	System architecture design	6	M2	System Architect (Ayat)

T9	Detailed system design	6	T8	System Architect (Ayat) Back-end Developer (Dareen)
T10	Database design	3	T9	Database Administrator (Shahd, Reem, Ayat) Back-end Developer (Dareen) System Architect (Ayat)
T11	UI/UX design	9	T8	Front-end Developer (Dareen, Sara), UI/UX Designer (Sara)
M3	Milestone 3: Design, Architecture Completed		T8, T9, T10, T11	
T12	Fron-end user interface development	19	M3	Front-end Developer (Dareen, Sara), UI/UX Designer (Sara)
T13	Backend development	20	M3	Back-end Developer (Dareen), System Architect (Ayat) Database Administrator (Shahd, Reem, Ayat)
M4	Milestone 4: App development Completed		T12, T13	
T14	System testing & bug fixes	3	M4	QA Engineer (Reem) Back-end Developer (Dareen) Front-end Developer (Dareen,Sara)
M5	Milestone 5: Testing Completed		T14	
T15	Live system	3	M5	Back-end Developer (Dareen)

				Project Management Team (All) Documentation specialist (Dareen, Ayat) Database Administrator (Shahd, Reem)
T16	System documentation	5	M5	Project Management Team (All) Documentation specialist (Dareen, Ayat)
M6	Milestone 6: System Deployed (M6)		T15, T16	

Table 23-Project Schedule

2.7.2 Pert Chart

Critical path = 77 days

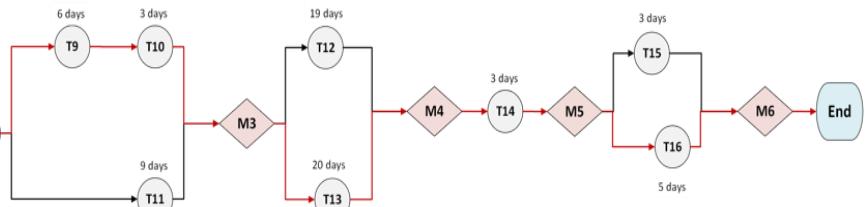


Figure 2-Pert Chart

2.7.3 Gantt Chart

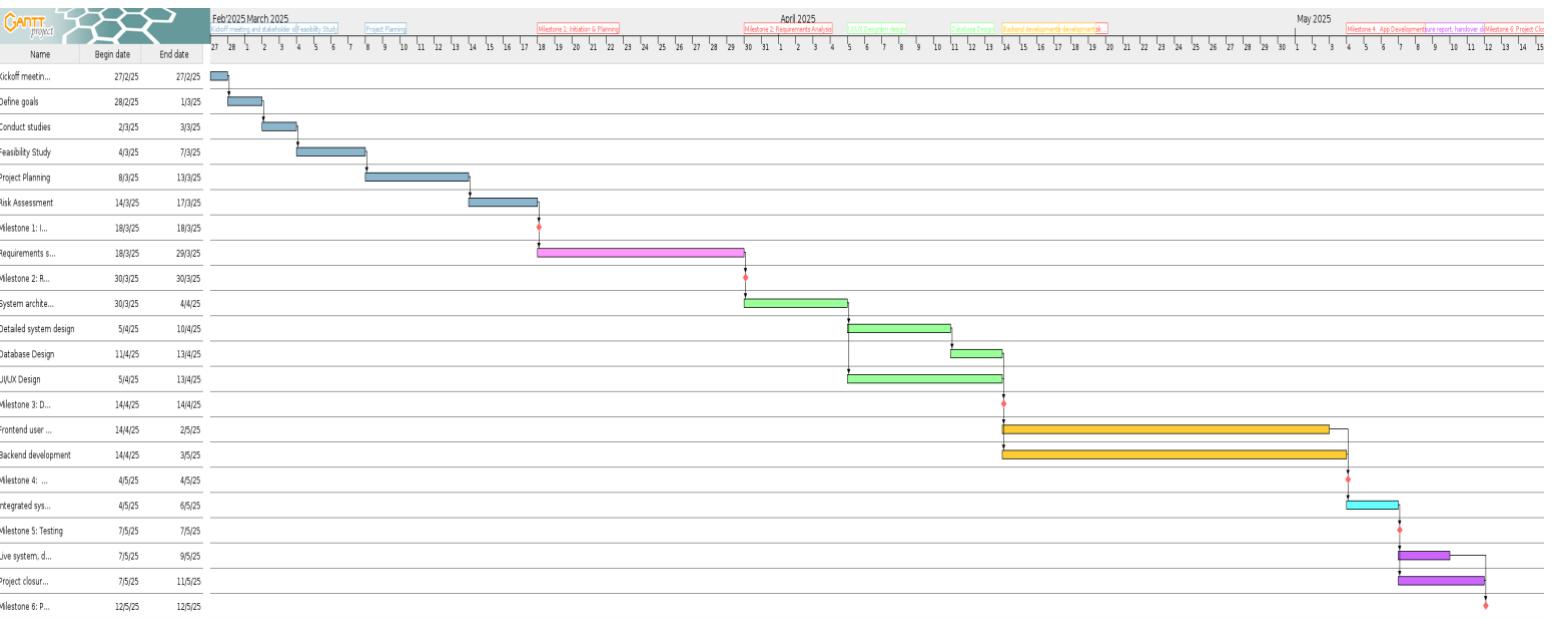


Figure 3-Gantt Chart

2.8 Risk Analysis and Plans

1. Security Risks

Risk	Probability	Effects	Mitigation Plan
Data Privacy Breach or Unauthorized access	Low	Catastrophic	Use encryption for sensitive data Conduct regular security checks and penetration testing Implement Multi-Factor Authentication (MFA) Session Timeouts & Auto-Logout Create an Incident Response Plan Enforce Strong Password Policies
Fake Reports (Photo Manipulation, Duplicate Report, Random Falus Error)	Moderate	Serious	AI-Based Image Verification – Using machine learning models to detect manipulated, duplicated, or outdated images. Report Merging System, if an issue is already reported, suggest merging it with an existing report instead of creating a new one Reputation System & Strike Policy – Implement a user score where repeated false reports lead to warnings, temporary bans, or permanent removal.

Table 24-Security risk

2. Technological Risks

Risk	Probability	Effects	Mitigation Plan
Server failure and lag	Moderate	Catastrophic	<ul style="list-style-type: none"> • Choosing Cloud Hosting. • Distribute software to multiple servers. • Redirect traffic to backup servers
Data Corruption	Low	Serious	<ul style="list-style-type: none"> • Automatic Database Backups

Table 25-Technological risk

3. Operational Risks

Risk	Probability	Effects	Mitigation Plan
Unclear Responsibility	Moderate	Serious	<ul style="list-style-type: none"> • Department-Based Issue Routing • Track Performance Metrics, monitor how long each department takes to resolve issues. • Regular Reporting & Audits, Provide reports to government officials on unresolved cases.
Slow Response Time	Moderate	Serious	<ul style="list-style-type: none"> • AI-Based Issue Classification – Using machine learning to automatically categorize reports and assign them to the right department faster. • Live Status Updates

Table 26-Operational risk

4. User - Related / Estimation Risks

Risk	Probability	Effects	Mitigation Plan
Low Adoption Rate	Moderate	Tolerable	Government Endorsement & Public Campaigns Easy Registration & Onboarding Simple UX with multi-language support transparency in issue resolution. Show a progress tracker so users know when their reports are being addressed.

Table 27-User – Related / Estimation Risk

2.9 Monitoring, Reporting, and Controlling Mechanisms

Monitoring Mechanisms

To track the progress of the project, the team uses several tools and strategies:

1. The Microsoft Planner is used to assign tasks, track their statuses (To Do, In Progress, Done), and visualize overall progress using percentage bars (e.g., 20%, 50%, 100%). Gantt charts are used to manage the timeline and task dependencies throughout the development phases.
2. Weekly internal meetings were held to assess the status of tasks, identify blockers, and reassign priorities if needed.
3. Progress updates are also communicated informally through group messages to ensure continuous synchronization among team members.

Reporting Mechanisms

1. Formal reporting is maintained using a shared Microsoft List, where all members are expected to update their task status regularly.
2. Team leads collect this information and document it to keep all stakeholders informed.

Controlling Mechanisms

1. Scope Management: Any scope changes are evaluated by the team based on timeline and resources. If necessary, tasks are reassigned or deadlines adjusted.
2. Issue Handling: In case of delays, tasks are reviewed in meetings and alternative solutions are proposed.
3. Quality Control:
 1. Documentation Review:
 - Team members regularly review milestone-related documents (e.g., requirement specifications, task lists, and design drafts) to ensure clarity, completeness, and alignment with project objectives.
 - Feedback is shared during meetings or via messaging to correct or update unclear information or resolve conflicts.
 2. Task Validation:
 - Completed tasks are reviewed by another team member before being marked as finalized to ensure they meet required standards.
 - Progress is tracked using a visual system (e.g., To Do / In Progress / Done) with percentage indicators to show completion status.
 3. UI/UX Review:
 - The user interface and overall design are reviewed collaboratively to ensure the application is intuitive, user-friendly, and aligned with the original design goals.
4. Adaptability: Team members are encouraged to log issues immediately so that solutions can be discussed during the next meeting or through instant communication channels.

3.0 Software Requirements Specifications (SRS)

3.1 System Stakeholders and Requirements Sources

ST-ID	Stakeholder	Description	Interest in the App:
ST-1	Dr. Mohammad Abushariah	A high-ranking government representative involved in oversight of digital transformation and public service delivery initiatives.	The official is invested in the success of the app as part of broader efforts to modernize government operations, increase transparency, and promote citizen engagement.
ST-2	Greater Amman Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of Amman.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in Amman.
ST-3	Greater Zarqa Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of Zarqa.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in Zarqa.
ST-4	Greater Jerash Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of Jerash.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in Jerash.
ST-5	Greater Irbid Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of Irbid.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in Irbid.
ST-6	Greater Ajloun Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of Ajloun.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in Ajloun.
ST-7	Greater Mafraq Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to

		public service delivery within the city of Mafraq.	urban maintenance issues & suggestions in Mafraq.
ST-8	Greater Balqa Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of Balqa.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in Balqa.
ST-9	Greater Madaba Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of Madaba.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in Madaba.
ST-10	Greater AlKarak Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of AlKarak.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in AlKarak.
ST-11	Greater Tafilah Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of Tafilah.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in Tafilah.
ST-12	Greater Ma'an Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of Ma'an.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in Ma'an.
ST-13	Greater Aqaba Municipality	Primary government entity responsible for urban management, infrastructure maintenance, and public service delivery within the city of Aqaba.	Aims to improve service efficiency, enhance citizen engagement, and ensure faster response times to urban maintenance issues & suggestions in Aqaba.

ST-14	Ministry of Public Works & Housing	A national-level authority responsible for planning, constructing, and maintaining public infrastructure and government buildings, including roads, bridges, housing projects, and related facilities.	MPWH is interested in leveraging the app as a supplementary channel for identifying infrastructure-related issues that fall under its jurisdiction, especially those on major roads, highways, or national projects.
ST-15	Civil Status and Passports Department	The CSPD is responsible for managing civil records such as births, deaths, marriages, national ID issuance, and passports for Jordanian citizens. While not directly responsible for urban infrastructure, it plays a vital role in citizen verification and digital identity management across government platforms.	CSPD's interest lies in supporting secure user authentication and identity verification within the app, ensuring that reports are submitted by legitimate citizens.
ST-16	Ministry of Digital Economy and Entrepreneurship (MoDEE)	MoDEE is the central government authority responsible for driving digital transformation, advancing e-government services, promoting digital infrastructure, and supporting innovation across Jordan's public and private sectors.	MoDEE sets national guidelines for digital services
ST-17	Maintenance Team	This team consists of software engineers, system administrators, and technical support staff responsible for maintaining the stability, performance, and security of the app.	The Maintenance Team is invested in keeping the app functional and secure.
ST-18	Testers	App Testers, or the Quality Assurance (QA) Team, are responsible for systematically testing the app to identify bugs, usability issues, and performance problems before deployment.	The QA team is committed to delivering a stable, secure, and user-friendly app by identifying flaws early and verifying that features work as intended.
ST-19	Ministry of Local Administration (System Owners)	As the system owner, the Ministry of Local Administration (MoLA) is the primary government body responsible for overseeing and governing the app. It acts as the central authority coordinating between municipalities, ensuring the system aligns with national policy and local governance frameworks.	MoLA views the app as a strategic tool to modernize local service delivery, promote citizen participation, and improve communication between residents and municipalities.

ST-20	IT staff	Municipal IT staff are the local technical support teams responsible for managing the app's day-to-day operations within their specific municipality.	These staff members ensure that the app functions properly at the local level and that municipal employees and departments can access and act on citizen reports without technical barriers.
ST-21	Record and archive Staff	Record and Archive Staff are responsible for organizing, storing, and managing digital and physical records related to citizen reports, maintenance activities, and municipal responses.	These staff members rely on the app to automatically generate and store structured data and logs about each reported issue. They are concerned with ensuring data integrity, proper classification, and compliance with record-keeping regulations.
ST-22	Training Personal	Training Personnel are responsible for educating and equipping users, like municipal employees and IT staff with the knowledge and skills needed to effectively use the app and its features.	They ensure successful onboarding, proper system usage, and user adoption by designing and delivering training programs tailored to different user roles.
ST-23	Integrating systems	These are external or internal government systems and platforms that need to be integrated with the app, such as national ID systems, GIS (Geographic Information Systems), and central government databases.	These systems must interact with the app reliably and securely to share data, enable services, and provide a seamless user experience.
ST-24	Citizens	End users are the primary audience of the app. This includes Jordanian citizens, who report non-emergency issues such as potholes, broken streetlights, or sanitation problems.	Citizens expect a user-friendly app that makes it easy to report issues and submit suggestions
ST-25	Municipal employees	Municipal employees, who use the app to receive, track, and respond to these reports.	Municipal employees expect a reliable, easy-to-use platform that allows them to efficiently review citizen reports, track resolutions, and maintain clear communication.
ST-26	System Administrator	System Administrators, who manage the overall Sawweb platform, including employee accounts, and system settings, to ensure smooth	The System Administrator is invested in the operational health, security, and scalability of the

		operation and data integrity across all municipal departments.	Sawweb system to enable effective citizen service delivery.
--	--	--	---

Table 28-System Stakeholders

3.2.1 User Requirements Definition for Citizens

UR-ID	User Requirements	User Requirements definition
UR-1	Register account	The citizen must be able to create an account by providing their National ID, Email, Phone number and a password.
UR-2	Login account	The citizen must be able to login into the system by providing their National ID and a password to use services provided by the system.
UR-3	Reset password	The citizen must be able to reset their password from the login page and from the account settings.
UR-4	Delete account	The citizen must be able to delete their account from the system, along with all associated personal data, upon confirmation.
UR-5	Submit complaint	The citizen must be able to submit a complaint form with all required fields, including complaint type, complaint date, description, multimedia attachments, and geolocation data.
UR-6	Submit Suggestion	The citizen must be able to suggest improvements or services by entering text into a suggestion box and attach any related images or files to the submission.
UR-7	Upload Multimedia Files	The citizen must be able to upload a photo and/or a video with a complaint.
UR-8	Search Complaints	The citizen shall be able to search for complaints using a search bar for quick access and browsing.

UR-9	Use Chatbot Help	The citizen shall be able to chat with a chatbot that offers help through FAQs, guided step-by-step assistance, and contact information for official government departments.
UR-10	Navigate Pages	The user shall be able to navigate between the home page, notifications page, tracking page, and chatbot by clicking the corresponding buttons on the screen.
UR-11	Get notified	The citizen shall receive notifications with real-time updates on the resolution progress of their submitted complaints.
UR-12	Track Complaints	The citizen must be able to track submitted complaints and view their details categorized by status: Under Review, In Progress, or Resolved.
UR-13	Delete submitted complaint	The citizen shall be able to delete a submitted complaint only while it is in the “In Progress” status.
UR-14	Set Issue Location	The citizen shall be able to set the location of a reported issue using automatic GPS detection or by manually selecting a point on an interactive map to ensure precise geolocation for response and resolution.
UR-15	View profile information	The citizen must be able to view their profile information, including National ID, name, email and phone number.
UR-16	Manage profile information	The citizen must be able to manage and update their profile information, email and phone number.
UR-17	Manage settings and preferences	The citizen must be able to manage their settings and preferences, including password change, and notification preferences.

UR-18	Logout account	The citizen must be able to log out of their account from any page within the system.
UR-19	Rate overall system	The citizen shall be able to rate their overall experience with the system and provide feedback for improvement.
UR-20	Upload files	The citizen shall be able to upload relevant files, documents, or reports associated with a complaint or a suggestion.
UR-21	Rate complaint process	The citizen shall be able to rate the process of submitting complaints.
UR-22	Rate suggestion process	The citizen shall be able to rate the process of submitting suggestions.
UR-23	Use Help and Support	The citizen must be able to access the Help and Support section from their profile, where they can view FAQs, contact information of government departments, and get guidance on how to use the application features.

Table 29-User Requirements Definition for Citizens

3.2.2 User Requirements Definition for Municipal Employees

UR-ID	User Requirements	User Requirements definition
UR-1	Login account	Municipal employees must be able to login into the system by providing their Employee ID and a password to use services provided by the system.
UR-2	Logout account	Municipal employees must be able to log out of their account from any page within the system.
UR-3	Upload files	Municipal employees must be able to upload relevant files, documents, or reports associated with a complaint or a suggestion, to support internal processing, investigation, or resolution.
UR-4	View Complaints	Municipal employees shall be able to view a list of submitted complaints, including key details such as type,

		submission date, status, to monitor and manage reported issues efficiently.
UR-5	Update Complaint Status	Municipal employees must be able to update the status of a complaint to (“Resolved”).
UR-6	View Suggestions	Municipal employees shall be able to view submitted suggestions from citizens, including the suggestion content, submission date, and sender details.
UR-7	View profile information	Municipal employees must be able to view their profile information, including National ID, Employee ID, name, Email, and phone number.
UR-8	Manage profile information	Municipal employees must be able to manage and update their profile information, email and phone number.
UR-9	Manage settings and preferences	Municipal employees shall be able to manage their settings and preferences, including language selection, password change, and notification preferences.
UR-10	Rate overall system	Municipal employees shall be able to rate their overall experience with the system and provide feedback for improvement.
UR-11	Update Suggestion Status	Municipal employees must be able to update the status of a suggestion to (“Resolved”).

Table 30-User Requirements Definition for Municipal Employees

3.2.2 User Requirements Definition for System Administrator

UR-ID	User Requirements	User Requirements definition
UR-1	Login account	The admin must be able to login into the system by providing their Employee ID and a password to use services provided by the system.
UR-2	Logout account	The admin must be able to log out of their account from any page within the system.
UR-3	Upload files	The admin must be able to upload relevant files, documents, or reports associated with a complaint or a suggestion, to support internal processing, investigation, or resolution.
UR-4	View Complaints and filter them by status	The admin must be able to view a list of issues, and be able to apply a filter to view issues by status (“Under Review”, “In-Progress”, “Resolved”, “Rejected”).
UR-5	Manage Employee accounts	The admin must be able to create, modify, and delete employees’ accounts in his department. The admin shall be able to temporarily deactivate or reactivate user accounts, such as those of municipal employees or citizens, if misuse or security issues arise.
UR-6	View profile information	The admin must be able to view their profile information, including National ID, Employee ID, Name, Email, Department name and Phone number.
UR-7	Manage profile information	The admin must be able to manage and update their profile information, email and phone number.
UR-8	Manage settings and preferences	The admin must be able to manage their settings and preferences including password change, and notification preferences.

UR-9	Rate overall system	The admin shall be able to rate their overall experience with the system and provide feedback for improvement.
UR-10	Manage complaints	The admin shall be able to view and manage complaints submitted by citizens. Admins can accept or reject complaints, assign them to employees, and track their status to ensure proper resolution.
UR-11	Manage suggestions	The admin shall be able to view and manage suggestions submitted by citizens. Admins can accept or reject suggestions, assign them to employees, and track their status.
UR-12	View Suggestions and Filter Them by Status	The admin must be able to view a list of suggestions and be able to apply a filter to view suggestions by status (“Under Review”, “In Progress”, “Resolved”, “Rejected”).

Table 31-User Requirements Definition for System Administrator

3.3 Use case Diagrams

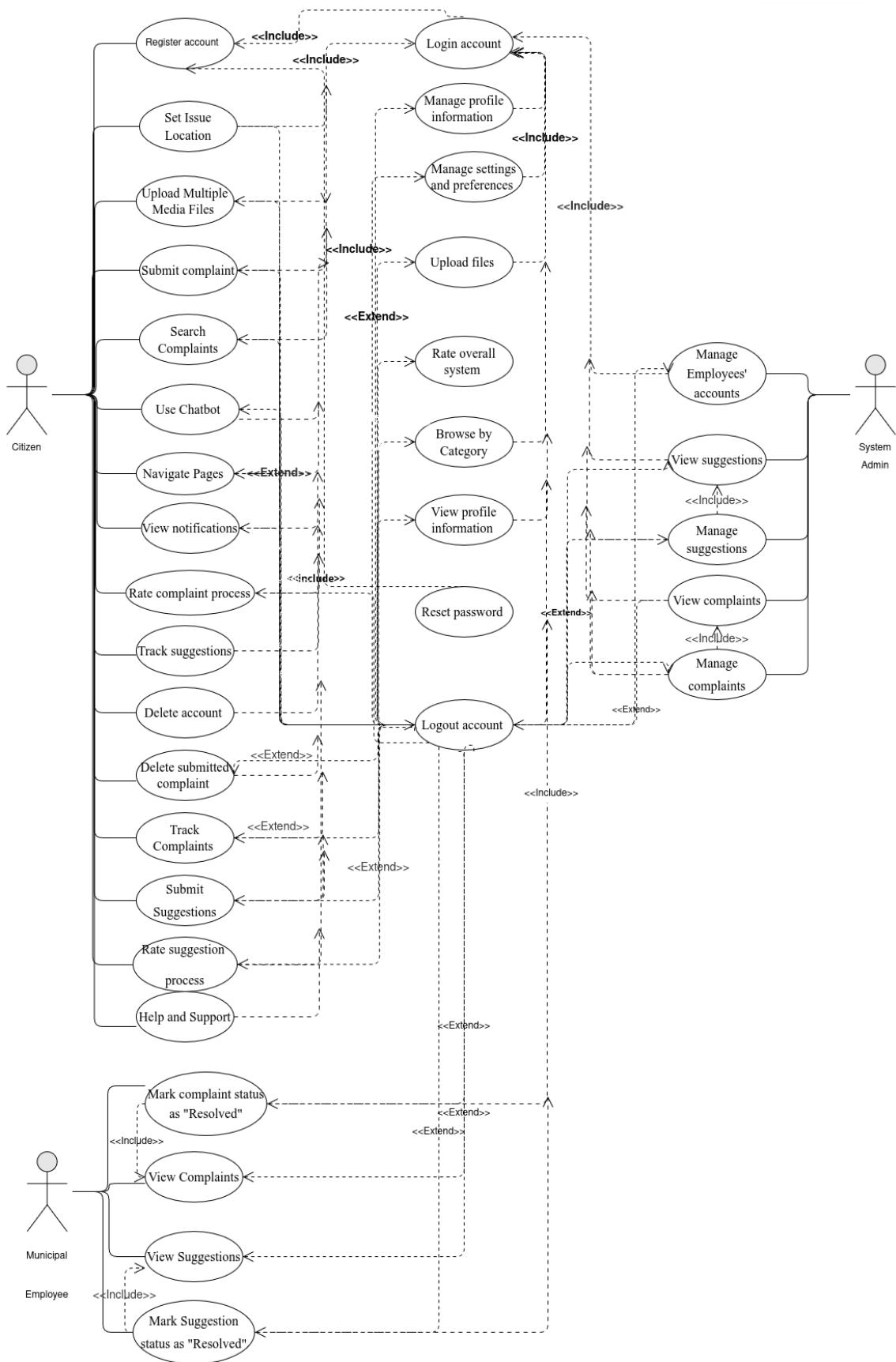


Figure 4-Use case Diagrams 1

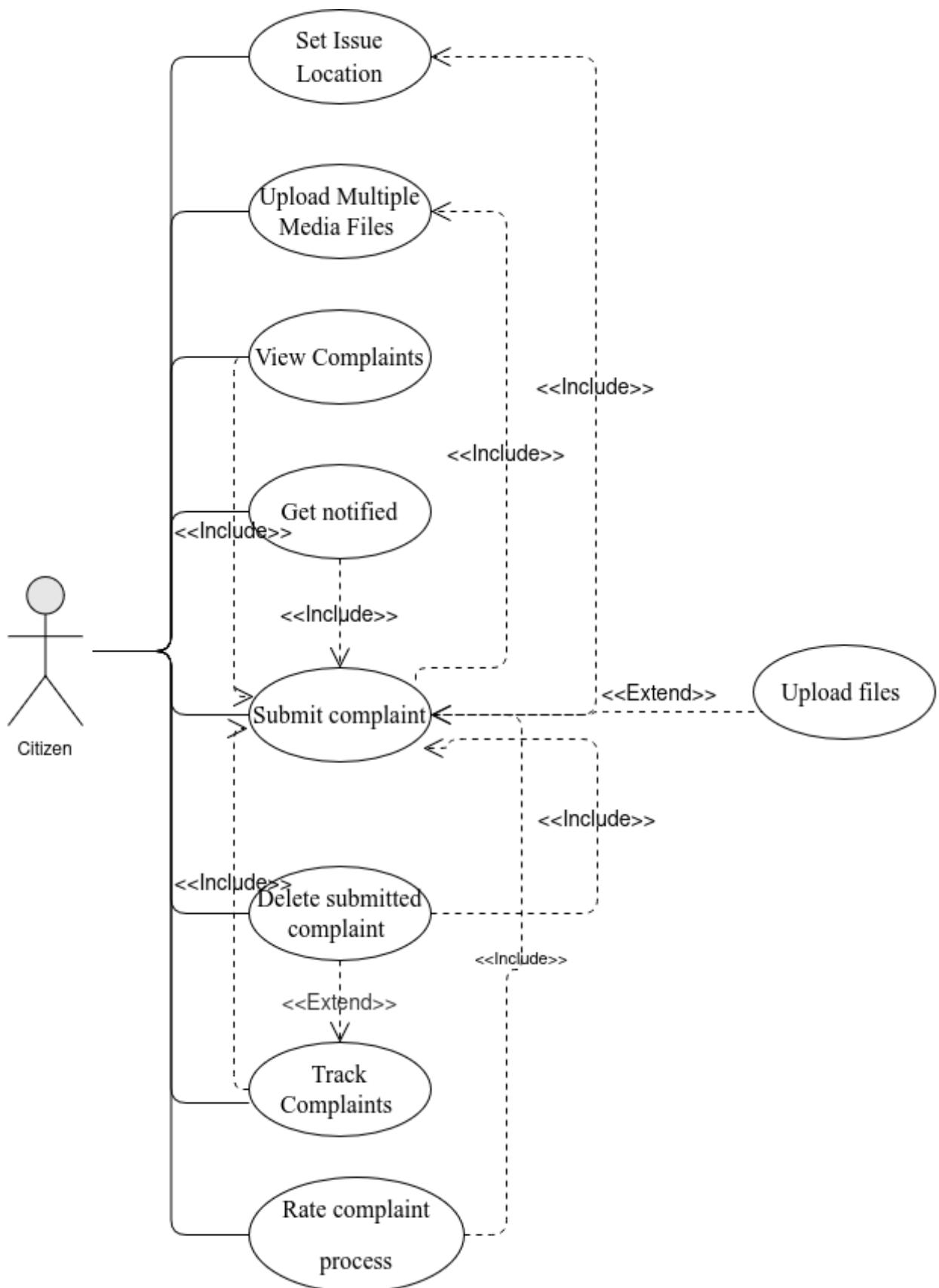


Figure 5-Use case Diagrams 2

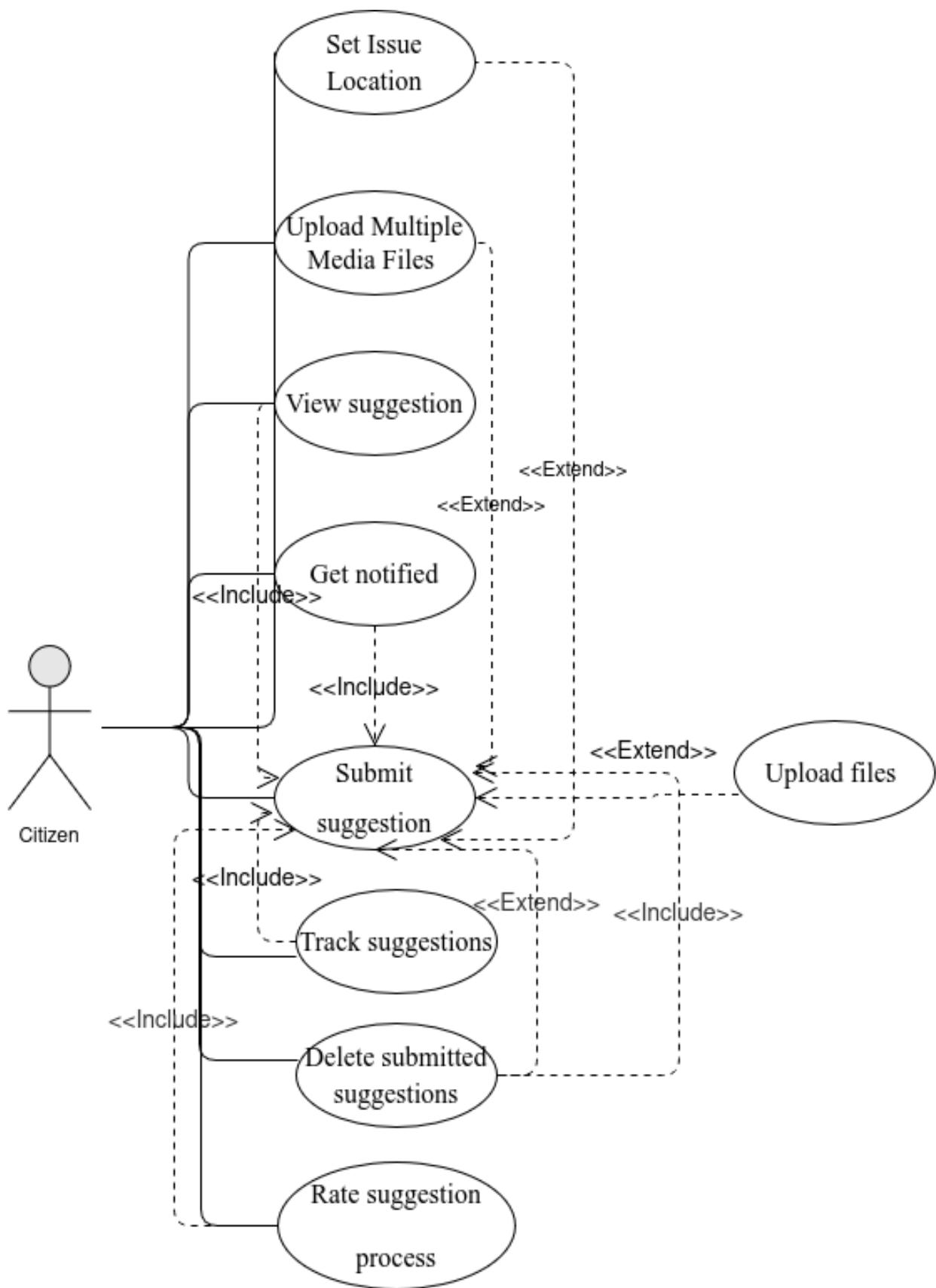


Figure 6-Use case Diagrams 3

3.4 System Functional Requirement Specification

FR-ID	Name	Description	Priority
FR-1	Sign up	<ol style="list-style-type: none"> 1. The citizen must create an account with the following attributes: <ol style="list-style-type: none"> i. A valid National ID ii. A valid email iii. A valid phone number iv. A valid password 2. The National ID must be verified against the government database. <ol style="list-style-type: none"> i. If the National ID is not found, the registration must be rejected, and the user must be prompted with a message “Enter a valid National ID”. 3. The password must fit the following criteria: <ol style="list-style-type: none"> i. Must not be empty ii. Must be at least 8 characters long iii. Must contain at least 1 digit (0-9) iv. Must contain at least 1 special character (!@#\$%^&*) 4. The email must fit the following criteria: <ol style="list-style-type: none"> i. Must not be empty ii. Must follow standard email format iii. Must be unique in the system (No duplicates allowed) 5. The phone number must fit the following criteria: <ol style="list-style-type: none"> i. Must not be empty ii. Must contain only digits (0-9) iii. Must be exactly 10 digits 	5
FR-2	Log in	<ol style="list-style-type: none"> 1. The user must login into a valid account with a valid National ID and the correct password. 2. If the National ID is not found or the password is incorrect, the system must reject the login, and the user must be prompted with a message “Wrong National ID and/or password”. 3. If both National ID and password are valid, the user must be successfully logged in and redirected to the Home page. 	5
FR-3	Submit a complaint	<ol style="list-style-type: none"> 1. In the home page, the user must be able to view and choose a category of complaints like – Roads, Electricity, Water, Waste, etc. – and only after selection they must be redirected to the complaint form page. 	5

		<p>2. In the complaint form page, the user must be able choose the type of complaint from a drop-down menu that shows only the relevant complaints to the selected category.</p> <p>3. The user must be able to choose the date of the complaint from a date-time picker.</p> <p>4. The user must be able to describe the problem using a text field.</p> <p>5. The user must be able to upload a photo or a video (up to 30 seconds) to support their complaint.</p> <p>6. The user must be able to upload the location using geolocation services.</p> <p>7. Once the type of complaint is selected, and location is chosen the responsible government department must be displayed to the user as a grayed-out text.</p> <p>8. After filling the form, the user must be able to submit the complaint form and shall be prompted that the submission is a success along with the rating.</p> <p>9. The following fields must be mandatory, and if any are empty, the form must not be submitted, and they will be highlighted in red.</p> <ul style="list-style-type: none"> • The type of complaint • The date of the complaint • The description of the problem • The location of the problem • A picture / video 	
FR-4	Navigate through the application (Navigation bar)	<p>1. The user must be able to view and choose from a navigation bar that navigates to the following pages.</p> <ul style="list-style-type: none"> • The home page • The Complaints tracking page • The Notifications page • The Chatbot page 	5
FR-5	Track Complaints	<p>The user must be able to view and choose from 3 sections.</p> <ol style="list-style-type: none"> 1. Under review – must display all the complaints submitted by the user that have been received by the government but not yet assigned to an employee. 2. In progress – must display all the complaints submitted by the user that have been assigned and are being handled by the government. 3. Resolved – must display all the complaints submitted by the user that are resolved by the government. 	4

FR-6	Notification system	<ol style="list-style-type: none"> 1. The user taps the bell icon on the navigation bar. 2. The system navigates to the Notifications Page. 3. The system displays a chronological list of notifications, each with: <ul style="list-style-type: none"> o An icon o Title or type of notification o Brief message summary 4. The user can scroll through the list to view all notifications. 	4
FR-7	Use chatbot	<ol style="list-style-type: none"> 1. The user must be able to start a chat with the chatbot and shall access it from the navigation bar. 2. The chatbot must answer frequently asked questions. 3. The chatbot must provide step-by-step guidance to navigate through the application and submitting complaints. 4. The chatbot must provide official government departments contact information for further assistance. 	4
FR-8	Reset password	<ol style="list-style-type: none"> 1. The user must be able to reset their password from the login page and from the account settings page. 2. The user must enter their email to send a Reset password email. 3. If the email is valid, the user must be able to reset their password from the link provided in the Reset password email 4. If the email is not valid, the user must be asked to enter a valid email. 	4
FR-9	Submit Suggestions	<ol style="list-style-type: none"> 1. The citizen must be able to click a button (e.g., "Submit a Suggestion") that navigates to a suggestion form. 2. The suggestion form must contain the following input fields: <ul style="list-style-type: none"> • Title (required) • Category (dropdown or selection list required). • Description (required, free text input). • File Upload (optional; supports common file types like Docx or PDFs). • Image upload (optional) • Location Selection (optional; user can pick a location from a map or dropdown). • 	5

		<p>3. The user must be able to submit the suggestion by clicking the "Submit" button.</p> <p>4. Display a confirmation message after sending it.</p> <p>5. If any required field is empty, the system must:</p> <ul style="list-style-type: none"> i. Highlight the field(s) in red. ii. Display relevant error messages: <ul style="list-style-type: none"> • For description: "Suggestion cannot be empty." • For title: "Title is required." • For category: "Please select a category." <p>6. The user must be able to enter free-text content for the suggestion description.</p>	
FR-10	Upload Multiple Media Files	<p>1. The user must be able to upload more than one media file (photos and/or videos) during the complaint or suggestion submission process.</p> <p>2. The user must be able to upload:</p> <ul style="list-style-type: none"> * Photos in common formats (e.g., JPG, PNG). * Videos in common formats (e.g., MP4, MOV) with a maximum duration of 30 seconds per video. <p>3. The system must display a preview or list of the selected files before submission.</p> <p>4. The user must be able to remove any uploaded media before submitting the complaint or suggestion.</p> <p>5. The system must validate file size and type restrictions before allowing upload.</p> <p>6. If the user attempts to upload an unsupported file type or oversized media, the system must display an appropriate error message.</p> <p>7. All valid media files must be uploaded along with the complaint or suggestion when the user clicks the "Submit" button.</p> <p>8. Upon successful submission, the user must be prompted with a message.</p>	5
FR-11	Search Complaints	<p>1. The user must be able to see a search bar at the top of the page.</p>	4

		<ol style="list-style-type: none"> 2. The system must filter and display the relevant complaints that match the keywords entered. 3. The search results must be updated dynamically or shown upon clicking the “Search” button. 4. The system must allow partial matches and be case-insensitive. 5. If no results are found, the system must display a message “Not found”. 	
FR-12	Manage Employee Accounts (Admin)	<ol style="list-style-type: none"> 1. Create New Employee Account <ul style="list-style-type: none"> o Admin can click an "Add New Employee" button. o A form will be displayed requiring: <ul style="list-style-type: none"> ▪ National ID (text field) ▪ Employee ID (text field) ▪ Full Name (text field) ▪ Phone Number (text field) ▪ Password (text field) o Upon submission, the new employee account is saved and added to the department's employee list. 2. View Employee Accounts <ul style="list-style-type: none"> o All existing employees are shown as cards containing: <ul style="list-style-type: none"> ▪ Full Name ▪ Employee ID ▪ Department ▪ Account Status (Active/Suspended) 3. Edit Employee Information <ul style="list-style-type: none"> o Admin can click “Edit” from a dropdown menu on an employee card. o Admin is redirected to an edit page to update: <ul style="list-style-type: none"> ▪ Name ▪ National ID ▪ Employee ID ▪ Phone Number o Changes are saved upon submission. 4. Suspend/Reactivate Employee Account <ul style="list-style-type: none"> o Admin can toggle an employee’s status between Active and Suspended using the dropdown menu on the employee’s card. 5. Delete Employee Account <ul style="list-style-type: none"> o Admin can choose “Delete” from the dropdown menu. o A confirmation dialog appears before deletion. o Deleted employees are removed from the system permanently. 	4
FR-13	Manage settings and preferences	<ol style="list-style-type: none"> 1. The user must be able to manage their settings and preferences, including password change, and notification preferences. 	3

		<p>2. The user must be able to access the settings section from the application profile information.</p> <p>3. The user must be able to access the notification settings section from application profile information.</p> <p>4. The system must provide the following toggle options for the user:</p> <ul style="list-style-type: none"> • The user must be able to enable or disable all notifications using a master switch labeled “Allow All Notifications.” • The user must be able to enable or disable complaint update notifications independently. • The user must be able to enable or disable suggestion status notifications independently. <p>5. The user must be able to view clear labels for each notification type.</p> <p>6. The user must be able to see dependent toggles (complaint and suggestion notifications) disabled when "Allow All Notifications" is turned off.</p> <p>7. Changes to notification preferences must be saved immediately.</p> <p>8. The user must be able to change their password from the login page and from the account settings page.</p> <p>9. The user must be able to enter their current password for verification.</p> <p>10. The user must be able to enter and confirm a new password that meets the defined criteria.</p> <ul style="list-style-type: none"> 10.1. The password Must not be empty. 10.2. The password Must be at least 8 characters long. 10.3. The password Must contain at least 1 digit (0–9). 10.4. The password Must contain at least 1 special character. <p>11. Upon successful password change, the user must be prompted with the message: “Password changed successfully.”</p> <p>12. The user must be able to log in the app with the new password.</p>	
FR-14	Help and support	<p>1. The user must be able to access the Help and Support section from application profile information.</p>	5

		<p>2. The user must be able to view and initiate a support call, including seeing the support phone number and tapping the "Call Now" button.</p> <p>3. The user must be able to send an email to support the user.</p> <p>4. The user must be able to view the Privacy Policy, including how their data is collected, used, and protected.</p> <p>5. The user must be able to view the Rules for Usage (Terms of Service) outlining acceptable behavior and responsibilities.</p>	
FR-15	Delete Complaints (Citizens)	<p>1. Complaint Status Check</p> <ul style="list-style-type: none"> o Only complaints with the status "Under Review" can be deleted. o Delete option is not visible or accessible for complaints with status "In Progress", "Resolved". <p>2. Delete Action</p> <ul style="list-style-type: none"> o Citizen can view a list of their submitted complaints in the Track Complaints section. o If a complaint is in "Under Review," a Delete icon or button is shown next to it. o Upon clicking Delete, a confirmation dialog appears: o If the user confirms, the complaint is permanently deleted. <p>3. Post-Deletion Behavior</p> <ul style="list-style-type: none"> o The complaint is immediately removed from the user's complaint list. o confirms successful deletion: 	3
FR-16	View profile information	<p>1. The citizen must be able to access their profile section by clicking on the user icon on the top left side of the home page.</p> <p>2. The citizen must be able to view their profile information, including Full Name (read-only), Email Phone Number.</p> <p>3. The citizen must be able to edit the following fields: Email Address, Phone Number.</p> <p>4. The citizen must be able to click an "Edit" button to enable editing of the above fields.</p> <p>5. The Profile section must also provide navigation to: Notification Settings, Help and Support, Rate the overall system.</p> <p>6. The citizen must be required to log in to access and update profile information.</p>	5
FR-17	View Complaints (Employees & Admin)	<p>1. The system shall display a list view of submitted complaints accessible only to municipal employees after authentication.</p>	5

		<p>2. Each complaint entry shall display the following key details:</p> <ul style="list-style-type: none"> • Complaint Type (e.g., Roads, Water, Electricity) • Date of Submission. • Current Status (e.g., Under Review, In Progress, Resolved, Rejected). • Location. • Assigned Department. <p>3. The admin shall be able to sort or filter complaints based on status.</p>	
FR-18	View Suggestions (Employee & Admin)	<p>1. The system shall provide a dedicated interface or page for authorized municipal employees to view submitted suggestions.</p> <p>2. Each suggestion entry shall include the following key details:</p> <p>3. Suggestion Content (free text submitted by the citizen).</p> <p>4. Submission Date.</p> <p>5. Sender Information (e.g., name, contact, National ID).</p> <p>6. The list of suggestions shall support infinite scrolling if the total number exceeds a predefined limit (e.g., 6 entries).</p>	5
FR-19	Update Complaint Status	<p>1. The system shall allow municipal employees to update the status of any submitted complaint to “Resolved” once they click on “Done”</p> <p>2. The updated status shall be saved in the system and timestamped.</p> <p>3. The updated complaint status shall be visible to both employees and the citizen who submitted the complaint.</p> <p>4. Should show “Resolved” as the new status.</p>	5
FR-20	Upload Supporting Files to Complaints	<p>1. The system shall allow municipal employees to upload one or more files to a complaint record from the Complaint Details page.</p> <p>Supported file types shall include:</p> <p>*PDF *DOC/DOCX</p> <p>2. Uploaded files shall be stored securely and linked to the corresponding complaint by its unique identifier.</p> <p>3. The upload functionality shall be available when updating the complaint status or at any time from the complaint detail’s view.</p> <p>4. The system shall validate file size and type before accepting the upload (e.g., max file size per file = 10MB).</p> <p>5. Upon successful upload, the system shall display the uploaded file in the complaint’s attachments section.</p>	5
FR-21	Rate Suggestion	<p>1. Citizen fills out and submits the suggestion form.</p>	2

	Submission Process	<ol style="list-style-type: none"> 2. Upon successful submission, the system displays a popup with a 5-star rating interface. 3. The citizen selects a number of stars (1 to 5) to indicate their experience. 4. The citizen clicks “OK” to submit the rating. 5. The system stores the rating and closes the popup. 6. The citizen is redirected to the main app interface or previous page. 	
FR-22	Set Issue Location	<ol style="list-style-type: none"> 1. The citizen opens the complaint or suggestion form. 2. A map is displayed with a draggable location pin. 3. The citizen drags the pin to the desired location on the map. 4. The system automatically updates the selected coordinates. 5. A read-only address field reflects the selected location. 6. Upon form submission, the selected location is saved along with the complaint or suggestion. 	4
FR-23	Logout account	<ol style="list-style-type: none"> 1. The user must be able to log out from the Profile Information page. 2. The Profile Information page must include a “Logout” button. 3. When the user clicks “Logout” 4. The app must clear the user session/token from local storage or memory. 5. The user must be redirected to the Login or Welcome screen. 6. Any cached personal data should be cleared for privacy. 	5
FR-24	View profile information	<ol style="list-style-type: none"> 1. The users must be able to access their profile section by clicking on the user icon/ hamburger sign on the top left side of the home page. 2. The users must be able to view their profile information, including Full Name (read-only), Email Address, Phone Number, Employee ID (Admins and employee only). 3. The users must be able to edit the following fields: Email Address, Phone Number. 4. The users must be able to click an “Edit” button to enable editing of the above fields. 	5
FR-25	Rate overall system	<ol style="list-style-type: none"> 1. The user navigates to the "Rate App" option from settings or profile. 2. The user taps the “Rate the App” button. 3. The system opens the app’s page on the Google Play Store. 4. The user can select a star rating and optionally write a review. 5. The user returns to the app after rating (manually or via back navigation). 	3

FR-26	Rate Complaint Submission Process	<p>1.Citizen fills out and submits the complaint form.</p> <p>2.Upon successful submission, the system displays a popup with a 5-star rating interface.</p> <p>3.The citizen selects a number of stars (1 to 5) to indicate their experience.</p> <p>4.The citizen clicks “OK” to submit the rating.</p> <p>5.The system stores the rating and closes the popup.</p> <p>6.The citizen is redirected to the main app interface or previous page.</p>	4
FR-27	Manage complaints (Admin)	<p>1. Navigation to Complaint Management</p> <ul style="list-style-type: none"> • The admin shall access the Complaint Management page by clicking the hamburger menu in the top-left corner of the admin panel. • Upon selecting "Manage Complaint," the system shall redirect to the complaint management interface. <p>2. Viewing Complaints</p> <ul style="list-style-type: none"> • The system shall display complaint cards in a scrollable list/grid format. • Each card shall show brief information such as complaint title, type, submission date, and current status. <p>3. Filtering by Status</p> <ul style="list-style-type: none"> • The system shall allow the admin to filter complaints by the following statuses: • Under Review • In Progress • Resolved • Rejected <p>Upon selecting a filter, the displayed complaint list shall update accordingly.</p>	5

	<p>4. Viewing Complaint Details</p> <p>When the admin clicks on a complaint card with the status "Under Review," the system shall open a detailed view.</p> <p>The detailed view shall display:</p> <ul style="list-style-type: none"> • Complaint Title • Complaint Type • Date of Submission • Date of the Complaint • Submitted By (citizen name or ID) • Responsible Department • Complaint Description • Any uploaded attachments (images, videos, documents) <p>5. Accept or Reject Complaint</p> <ul style="list-style-type: none"> • The detailed complaint view shall include two buttons: • Reject: • Clicking "Reject" shall update the complaint's status to "Rejected" in Firestore. • The UI shall reflect the updated status immediately. • Accept: • Clicking "Accept" shall expand a new section in the UI. <p>6. Assign Complaint to Employee</p> <p>After accepting a complaint, a new section shall allow the admin to:</p> <ul style="list-style-type: none"> • Select an employee from a dropdown list. <p>The dropdown shall display: Employee Name - Department Name.</p> <ul style="list-style-type: none"> • Optionally write internal notes or instructions. Click: Confirm: <p>Assign the complaint to the selected employee. Update complaint status to "In Progress". Record assignment details (employee ID, admin notes, timestamp).</p> <p>Cancel: Close the assignment section without applying changes.</p>	
--	---	--

FR-28	Manage suggestions (Admin)	<p>1. Navigation to Suggestion Management</p> <ul style="list-style-type: none"> • The admin shall access the Suggestion Management page by clicking the hamburger menu in the top-left corner of the admin panel. • Upon selecting "Manage Suggestion," the system shall redirect to the suggestion management interface. <p>2. Viewing Suggestion:</p> <ul style="list-style-type: none"> ▪ The system shall display suggestion cards in a scrollable list/grid format. ▪ Each card shall show brief information such as suggestion title, type, submission date, and current status. <p>3. Filtering by Status</p> <p>The system shall allow the admin to filter suggestions by the following statuses:</p> <ul style="list-style-type: none"> • Under Review • In Progress • Resolved • Rejected <p>Upon selecting a filter, the displayed suggestion list shall update accordingly.</p> <p>4. Viewing suggestion Details</p> <p>When the admin clicks on a suggestion card with the status "Under Review," the system shall open a detailed view.</p> <p>The detailed view shall display:</p> <ul style="list-style-type: none"> • suggestion Title • suggestion Type • Date of Submission • Date of the suggestion • Submitted By (citizen name or ID) • Responsible Department • Suggestion Description 	5
-------	----------------------------	---	---

	<ul style="list-style-type: none"> • Any uploaded attachments (images, videos, documents) <p>5. Accept or Reject Suggestion</p> <ul style="list-style-type: none"> • The detailed suggestion view shall include two buttons: • Reject: Clicking "Reject" shall update the suggestion's status to "Rejected" in Firestore. • The UI shall reflect the updated status immediately. • Accept: Clicking "Accept" shall expand a new section in the UI. <p>6. Assign Suggestion to Employee</p> <ul style="list-style-type: none"> ○ After accepting a suggestion, a new section shall allow the admin to: ○ Select an employee from a dropdown list. ○ The dropdown shall display: Employee Name - Department Name. ○ Optionally write internal notes or instructions. Click: ○ Confirm: Assign the suggestion to the selected employee. Update suggestion status to "In Progress". Record assignment details (employee ID, admin notes, timestamp). ○ Cancel: Close the assignment section without applying changes. 	
--	--	--

Table 32-System Functional Requirement Specification

3.5 Textual Description for Each Use Case

Use Case	Register Account
Actor	Citizen, System, Government Verification API
Objective	Allow citizens to create a valid user account by entering and verifying their National ID, email, phone number, and password.
Description	This use case describes how a citizen registers for an account in the system. The registration process involves validating input fields and verifying the National ID against a government database. The system ensures that all required fields meet predefined security and formatting criteria before the account is created.
Preconditions	<ul style="list-style-type: none"> The citizen is not already registered in the system. The citizen has a valid National ID. The government ID verification service is available.
Normal Flow	<ol style="list-style-type: none"> The citizen navigates to the registration page. The citizen enters the following required information: <ol style="list-style-type: none"> National ID Email address Phone number Password The system performs the following validations: <ol style="list-style-type: none"> Checks that all fields are not empty. Verifies the format and uniqueness of the email. Validates the phone number contains only digits and is exactly 10 digits long. Validates the password: <ol style="list-style-type: none"> Minimum 8 characters Contains at least 1 digit

	<p>3.4.3. Contains at least 1 special character</p> <ol style="list-style-type: none"> 4. The system checks the National ID against the government database. 5. If all validations pass, the account is created. 6. The citizen is redirected to the login screen with a success message.
Postconditions	<ul style="list-style-type: none"> • A new citizen account is created and stored in the system. • The citizen can log in and use the system features.
Alternative Flow	<ol style="list-style-type: none"> 1. If the national ID already exists, the system displays an error and asks the user to log in instead. 2. Invalid National ID: <ul style="list-style-type: none"> a. If the ID is not found in the government database, registration fails. 3. Invalid Email Format or Duplicate: <ul style="list-style-type: none"> a. If the email is incorrectly formatted or already exists, the system prompts the citizen to enter a valid and unique email. 4. Invalid Password: <ul style="list-style-type: none"> a. If the password does not meet the required criteria, the system shows a specific error message (e.g., "<i>Password must contain at least 8 characters, 1 digit, and 1 special character.</i>") 5. Invalid Phone Number: <ul style="list-style-type: none"> a. If the phone number includes non-digit characters or is not exactly 10 digits, the system prompts for correction.

Table 33-Textual Description Register Account

Use Case	Log In
Actor	Citizen, System
Objective	Allow a citizen to securely log in using their National ID and password to access the system.
Description	This use case enables a registered citizen to access their account by providing valid credentials. The system verifies the credentials and either grants access or returns an error.

Preconditions	<ul style="list-style-type: none"> The user has an existing registered account. The system is connected to the user database.
Normal Flow	<ol style="list-style-type: none"> The user opens the login page. The user enters their National ID and password in the login fields. The system checks whether the National ID exists. The system verifies if the entered password matches the stored password. If both credentials are valid, the system logs the user in and redirects them to the Home page.
Postconditions	User is authenticated and redirected to the main interface.
Alternative Flow	<ul style="list-style-type: none"> If the National ID is not found or the password is incorrect: <ol style="list-style-type: none"> The system displays an error message: "Wrong National ID and/or password." The user remains on the login page and may retry.

Table 34-Textual Description Log In

Use Case	Submit a complaint
Actor	Citizen, System
Objective	Allow a citizen to submit a complaint with necessary details, supporting media, and location information.
Description	This use case enables a citizen to report an issue by selecting a category, filling out a detailed complaint form, and submitting it with attachments and geolocation data.
Preconditions	The user must be logged in.
Normal Flow	<ol style="list-style-type: none"> The user accesses the Home page. The user selects a complaint category (e.g., Roads, Electricity, Water, Waste). The system redirects the user to the complaint form page. On the form page, the user: <ul style="list-style-type: none"> Selects a complaint type from a dropdown showing only complaints related to the selected category.

	<ul style="list-style-type: none"> ○ Selects the date and time of the incident using a date-time picker. ○ Enters a description of the problem in a text field. ○ Uploads a photo or a video (maximum 30 seconds). ○ Selects the issue location using geolocation services or manual map pin. <ol style="list-style-type: none"> 5. Once the complaint type and location are selected, the system displays the responsible government department in grayed-out text. 6. The user submits the form by clicking the “Submit” button. 7. The system validates the form and, if successful, saves the complaint. 8. A confirmation message appears, notifying the user that the complaint was submitted successfully along with the rating.
Postconditions	<ul style="list-style-type: none"> • The complaint is recorded in the system with all related data and media. • The user is informed of the successful submission.
Alternative Flow	<ol style="list-style-type: none"> 1. If any required field is left empty: <ol style="list-style-type: none"> a. The system prevents form submission. b. The empty fields are highlighted in red. c. The following specific error messages are shown: <ol style="list-style-type: none"> i. Complaint Type: “Please select a complaint type.” ii. Date: “Please select the date of the issue.” iii. Description: “Description cannot be empty.” iv. Location: “Please choose a location.” v. Media: “Please upload a photo or video.”

Table 35- Textual Description Submit a complaint

Use Case	Navigate Through the Application (Navigation Bar)
Actor	User, System

Objective	Allow the user to easily navigate between key pages of the application using the navigation bar.
Description	This use case enables a user to access main sections of the app by selecting options from a persistent navigation bar.
Preconditions	<ul style="list-style-type: none"> The user is logged in. The navigation bar is visible on the screen.
Normal Flow	<ol style="list-style-type: none"> The user views the navigation bar displayed on the screen. The user selects one of the following navigation options: <ol style="list-style-type: none"> Home Page Complaints Tracking Page Notifications Page Chatbot Page The system navigates to the selected page accordingly.
Postconditions	<ul style="list-style-type: none"> The user is successfully directed to the chosen page and can interact with its features.
Alternative Flow	<ul style="list-style-type: none"> If a page fails to load due to a network issue: <ul style="list-style-type: none"> The system displays an error message: "Unable to load page. Please check your internet connection."

Table 36-Textual Description Navigate Through the Application

Use Case	Track Complaints
Actor	Citizen, System
Objective	Allow the user to view the status of their submitted complaints by selecting from different tracking sections.
Description	This use case enables a user to track the progress of their complaints by choosing among three categories: Under Review, In Progress, and Resolved.
Preconditions	<ul style="list-style-type: none"> * The user is logged in. * The user has submitted at least one complaint.
Normal Flow	<ol style="list-style-type: none"> The user navigates to the Complaints Tracking page. The user selects one of the following sections to view complaints: <ol style="list-style-type: none"> Under Review: Displays complaints received by the government but not yet assigned.

	<p>b. In Progress: Displays complaints assigned to employees and currently being handled.</p> <p>c. Resolved: Displays complaints that have been resolved by the government.</p> <p>3. The system displays the complaints matching the selected status.</p>
Postconditions	The user can view the list of complaints filtered by the selected status
Alternative Flow	<p>1. If there are no complaints in a selected section, the system displays no complaints.</p>

Table 37-Textual Description Search Track Complaints

Use Case	Use Chatbot Assistant
Actor	Citizen, System
Objective	Enable the user to interact with a chatbot for assistance, FAQs, and guidance.
Description	This use case allows the user to start a chat session with the chatbot to get answers to FAQs, receive navigation help, and obtain government contact details.
Preconditions	The user is logged in
Normal Flow	<p>1. The user taps the Chatbot icon on the navigation bar.</p> <p>2. The system opens the chat interface with the chatbot.</p> <p>3. The user types a question or selects from quick replies.</p> <p>4. The chatbot responds with:</p> <ul style="list-style-type: none"> a. Answers to frequently asked questions. b. Step-by-step guidance for app navigation and complaint submission. c. Official contact information for government departments if needed.
Postconditions	The user receives relevant assistance through the chatbot interface.
Alternative Flow	If the chatbot cannot answer a question, it suggests contacting support or provides alternative help options.

Table 38-Textual Description Use Chatbot Assistant

Use Case	Notification system
Actor	Citizen, System
Objective	Allow users to view a list of their notifications in a clear and accessible way.
Description	This use case enables a user to access and review all notifications by tapping the bell icon, which opens a page displaying notifications in chronological order.
Preconditions	<ul style="list-style-type: none"> • The user must be logged in. • The system must be configured to send notifications. • The user must have access to the navigation bar.
Normal Flow	<ol style="list-style-type: none"> 1. The user taps the bell icon on the navigation bar. 2. The system navigates the user to the Notifications Page. 3. The system displays a list of notifications sorted by date/time (most recent first). 4. Each notification entry includes: <ul style="list-style-type: none"> ◦ An icon representing the notification type ◦ A title or type label ◦ A brief summary message 5. The user can scroll through the list to view all notifications.
Postconditions	<ul style="list-style-type: none"> • The user views the list of notifications.
Alternative Flow	<ul style="list-style-type: none"> • If there are no notifications: <ul style="list-style-type: none"> ◦ The system shows no notifications.

Table 39-Textual Description Notification system

Use Case	Reset Password
Actor	User, System
Objective	Allow users to securely reset their account password either from the login page or from account settings.
Description	This use case enables a user to reset their password by either clicking a “Forgot Password?” link on the login page or navigate to the password change option in the account settings. The process includes verifying their identity and creating a secure new password.
Preconditions	<ul style="list-style-type: none"> • The user must be registered with the system. • For resetting from settings: the user must be logged in.

Normal Flow	<ol style="list-style-type: none"> 1. The user initiates the password reset process by clicking the “Forgot Password?” link from either the login page or the account settings page. 2. The system displays a form prompting the user to enter their email address. 3. The user enters their email address and submits the request. 4. The system checks whether the provided email is associated with an existing account: <ul style="list-style-type: none"> - If valid, the system sends a password reset email containing a secure reset link. - If invalid, the system displays an error message prompting the user to enter a valid email address. 5. The user clicks the link in the password reset email and is redirected to a password reset page. 6. The system prompts the user to enter and confirm a new password. 7. The system validates the new password: <ol style="list-style-type: none"> 7.1. It is not empty 7.2. It is at least 8 characters long 7.3. It includes at least one digit (0–9) 7.4. It includes at least one special character (e.g., !@#\$%) 8. If the new password meets the criteria, the system updates the user’s password in the database. 9. The system displays a confirmation message: “Password changed successfully.”
Postconditions	The user’s password is updated and can be used for future logins.
Alternative Flow	<ul style="list-style-type: none"> • If the new password does not meet the criteria, the system highlights the issue and prompts the user to re-enter it.

Table 40-Textual Description Reset Password

Use Case	Upload Multiple Media Files
Actor	User, System
Objective	Allow users to upload multiple photos and videos during the complaint and suggestion submission process.
Description	This use case enables a citizen to attach multiple media files—photos and short videos—when submitting a complaint or a suggestion. The system provides previews, validates file types and sizes, and includes the media with the complaint or suggestion upon submission.
Preconditions	<ul style="list-style-type: none"> The user must be logged in. The user must be on the complaint or suggestion form.
Normal Flow	<ol style="list-style-type: none"> The user accesses the complaint/suggestion submission form. The user selects the option to upload media files. The user chooses one or more media files from their device: <ul style="list-style-type: none"> Photos in JPG or PNG format Videos in MP4 or MOV format (maximum 30 seconds each) The system displays a preview or list of selected files. The user may choose to remove any file before submitting it. The user clicks the “Submit” button to submit the complaint/suggestion. The system validates all files (format, duration, and size). The valid files are uploaded along with the complaint or suggestion. The system displays a confirmation message: <ul style="list-style-type: none"> “Complaint submitted successfully.” Or “Suggestion submitted successfully.”
Postconditions	<ul style="list-style-type: none"> The complaint or suggestion and their valid media attachments are submitted to the system. A confirmation message is shown to the user.
Alternative Flow	<ul style="list-style-type: none"> If the user uploads an unsupported file type: <ul style="list-style-type: none"> The system displays: “Unsupported file type. Please upload JPG, PNG, MP4, or MOV files.” If a video exceeds 30 seconds: <ul style="list-style-type: none"> The system displays: “Video exceeds the 30-second limit.” If a file exceeds the maximum allowed size: <ul style="list-style-type: none"> The system displays: “File too large. Please upload smaller media files.”

Table 41-Textual Description Upload Multiple Media Files

Use Case	Search Complaints
Actor	Citizen, System
Objective	Allow users to search for complaints using keywords.
Description	This use case enables a citizen to search through complaints using a keyword-based search bar. The system filters and displays relevant results dynamically or after the search is submitted.
Preconditions	The user must be logged in. The search bar must be visible on the complaints page. The system must have at least one complaint in the database.
Normal Flow	<ol style="list-style-type: none"> 1. The user navigates to the Complaints page. 2. The user enters a keyword or phrase into the search bar located at the top of the page. 3. The user either presses Enter or clicks the “Search” button. 4. The system processes the keyword and retrieves matching complaints. 5. The search results are displayed, showing complaints that match the entered keyword. 6. Results may include partial matches and are case-insensitive.
Postconditions	A list of matching complaints is shown to the user.
Alternative Flow	<ul style="list-style-type: none"> • If no complaints match the keyword: <ul style="list-style-type: none"> ◦ The system displays the message: “Not found.” • If the search input is empty and the user tries to search: <ul style="list-style-type: none"> ◦ The system shows all complaints or prompts the user to enter a keyword, depending on implementation. • If there is a network error: <ul style="list-style-type: none"> ◦ The system displays: “Unable to retrieve results. Please try again later.”

Table 42-Textual Description Search Complaints

Use Case	Submit Suggestions
Actor	Citizen, System
Objective	Allow citizens to submit suggestions through a dedicated form in the application.

Description	This use case enables citizens to provide suggestions by filling out a form that includes required and optional fields. The system validates the input and confirms submission.
Preconditions	The citizen is logged in.
Normal Flow	<ol style="list-style-type: none"> 1. The user clicks on the "Submit a Suggestion" button. 2. The system navigates the user to the suggestion submission form. 3. The user fills in the following fields: <ul style="list-style-type: none"> Title (required) Category (required dropdown or selection list) Description (required free-text field) File Upload (optional – supports .docx, .pdf, etc.) Image Upload (optional – image files) Location Selection (optional – via map) 4. The user clicks the "Submit" button. 5. The system validates the required fields. 6. If all required fields are valid, the system saves the suggestion and displays a confirmation message along with the rating.
Postconditions	<ul style="list-style-type: none"> • The suggestion is recorded in the system and linked to the user's account. • A confirmation message is displayed to the user along with the rating.
Alternative Flow	<ul style="list-style-type: none"> • If any required field is missing: • The system highlights the missing fields in red. • Displays relevant error messages: <ul style="list-style-type: none"> ○ "Title is required." ○ "Please select a category." ○ "Suggestion cannot be empty." • If the user attempts to upload an unsupported file type, the file will not be uploaded.

Table 43- Textual Description Submit Suggestions

Use Case		Delete Complaints
Actor	Citizen, System	
Objective	To allow a citizen to delete their submitted complaints only if the status is "Under Review."	
Description	This use case outlines the conditions and flow under which a citizen can delete a complaint they have submitted. Only complaints that have not yet been acted upon (i.e., still "Under Review") can be deleted.	
Preconditions	<ul style="list-style-type: none"> • The user is logged into the system. • The complaint is submitted by the currently logged-in user. • The complaint status is "Under Review." 	

	<p>1. Complaint Status Check</p> <p>1.1. The system checks each complaint's status in the Track Complaints section.</p> <p>1.2. Only complaints with status "Under Review" display a Delete icon or button.</p> <p>1.3. Complaints marked as "In Progress" or "Resolved" do not show a delete option and are locked from deletion.</p>
Normal Flow	<p>2. Delete Action</p> <p>2.1. The citizen opens the Track Complaints page.</p> <p>2.2. A list of submitted complaints is shown.</p> <p>2.3. For complaints in "Under Review", the system displays a Delete icon/button next to the item.</p> <p>2.4. The user clicks Delete.:</p> <ul style="list-style-type: none"> • The system permanently deletes the complaint from the database. <p>3. Post-Deletion Behavior</p> <p>3.1. The complaint is immediately removed from the user's complaint list UI.</p>
Postconditions	The deleted complaint is no longer accessible or visible in the user's list.
Alternative Flow	If the complaint status changes to "In Progress" or "Resolved" before the user clicks "Delete", the system disables the delete option.

Table 44-Textual Description Delete Complaints

Use Case	Manage settings and preferences
Actor	Users, System
Objective	Allow users to manage personal account settings, including password changes and notification preferences.
Description	This use case enables users to access and modify their app settings such as changing their password and configuring notification preferences.
Preconditions	The user must be logged in.
Normal Flow	<ol style="list-style-type: none"> 1. The user navigates to Profile Information from the app menu. 2. The user accesses Notification Settings and is presented with toggle options: <ul style="list-style-type: none"> ○ Allow All Notifications (master switch) ○ Complaint Update Notifications ○ Suggestion Status Notifications 3. The user can: <ul style="list-style-type: none"> ○ Enable or disable all notifications via the master switch. ○ Enable or disable individual notifications when the master switch is ON. 4. When the Allow All Notifications, toggle is OFF, the dependent toggles are disabled. 5. All changes are saved automatically upon toggle action.

	<p>6. The user can navigate to Change Password from settings or login screen.</p> <p>7. The user enters:</p> <ul style="list-style-type: none"> o Current password o New password o Confirmation of new password <p>8. The system validates the new password:</p> <ul style="list-style-type: none"> o Not empty o At least 8 characters o Contains at least 1 digit (0–9) o Contains at least 1 special character <p>9. If valid, the system updates the password and shows a success message: “Password changed successfully.”</p> <p>10. The user can now log in using the new password.</p>
Postconditions	<ul style="list-style-type: none"> • Updated notification preferences are saved. • Password is successfully changed and active for future logins.
Alternative Flow	<p>If the new password fails validation, the system:</p> <ul style="list-style-type: none"> • Blocks submission. • Displays relevant error messages. <p>If the current password is incorrect, the system shows a message: “Incorrect current password.”</p>

Table 45-Textual Description Manage Settings and Preferences

Use Case	Help and support
Actor	Citizen, System
Objective	Allow users to access support options, contact help services, and view key policy documents from within the application.
Description	This use case enables a citizen to access the Help and Support section via their profile information. It allows them to initiate a support call, send an email to the support team, and review important legal and policy documents such as the Privacy Policy and Terms of Service.
Preconditions	<ul style="list-style-type: none"> • The user must be logged in. • The Help and Support section must be accessible from the profile information page.
Normal Flow	<ol style="list-style-type: none"> 1. The user navigates to the Profile Information page. 2. The user selects the “Help and Support” section. 3. The system displays the following options: <ol style="list-style-type: none"> 3.1.Support Call <ol style="list-style-type: none"> 3.1.1. The user views the support phone number. 3.1.2. The user taps the “Call Now” button to initiate a support call using the device's dialer. 3.2.Email Support

	<p>3.2.1. The user taps a button to send an email to the support team.</p> <p>3.2.2. The system opens the device's default email app with the support email address pre-filled.</p> <p>3.3. Privacy Policy</p> <p>3.3.1. The user selects "Privacy Policy".</p> <p>3.3.2. The system displays a document outlining how user data is collected, used, and protected.</p> <p>3.4. Rules for Usage (Terms of Service)</p> <p>3.4.1. The user selects "Rules for Usage".</p> <p>3.4.2. The system displays the terms of service outlining acceptable behavior, user responsibilities, and legal disclaimers.</p>
Postconditions	The user successfully views support options, policies, or initiates contact with the support team.
Alternative Flow	<ul style="list-style-type: none"> • If the device cannot make calls (e.g., on a tablet without call capabilities): <ul style="list-style-type: none"> ◦ The system displays: "Calling is not supported on this device." • If the device has no email app installed, the system displays: <ul style="list-style-type: none"> ◦ "No email app available to send support email." • If the system fails to load policy documents: <ul style="list-style-type: none"> ◦ The system displays: "Unable to load content. Please try again later."

Table 46-Textual Description Help and Support

Use Case	View Complaints
Actor	Municipal Employee, Admin, System
Objective	To enable municipal employees and administrators to view and manage a list of submitted citizen complaints after authentication.
Description	This use case defines how authenticated employees and administrators access and interact with complaint data, including filtering and viewing relevant complaint details.
Preconditions	<ul style="list-style-type: none"> • The user is authenticated as a municipal employee or admin. • Complaints have already been submitted by citizens and stored in the database.
Normal Flow	<p>1. Accessing the Complaints List</p> <p>1.1. The employee/admin logs into the system.</p> <p>1.2. The system displays a "Complaints" menu or section in the navigation.</p> <p>1.3. Upon selection, the system navigates to the Complaint List View page.</p> <p>2. Viewing Complaint Entries</p> <p>2.1. The system displays complaints in a scrollable list or table view.</p> <p>2.2. Each complaint entry includes the following fields:</p>

	<ul style="list-style-type: none"> • Complaint Type (e.g., Roads, Water, Electricity) • Date of Submission • Current Status (e.g., Under Review, In Progress, Resolved, Rejected) • Location (address or coordinates) • Assigned Department (based on complaint type or manual assignment) • <p>3. Filtering and Sorting</p> <p>3.1. The admin can sort or filter the list of complaints using status filters:</p> <ul style="list-style-type: none"> • Under Review • In Progress • Resolved • Rejected <p>3.2. Upon selecting a filter, the complaint list updates accordingly to display only matching results.</p>
Postconditions	<ul style="list-style-type: none"> • The user can view complaint data appropriate to their access level. • Complaints are presented in an organized and actionable manner.
Alternative Flow	<ul style="list-style-type: none"> • If no complaints exist, the system displays no complaints. • If filters return no results, the system shows no results.

Table 47-Textual Description View Complaints

Use Case		View Profile Information
Actor	Users, System	
Objective	Allow users to view and update their profile information.	
Description	This use case allows all users to access their profile details and make limited updates. Employees and admins can also view their Employee ID, while citizens do not have this field.	
Preconditions	The user must be logged in to the application.	
Normal Flow	<ol style="list-style-type: none"> 1. The user clicks the User Icon/ hamburger icon on the top left corner of the home page. 2. The system navigates to the Profile Information page. 3. The user views their profile information: <ul style="list-style-type: none"> ○ Full Name (read-only) ○ Email Address ○ Phone Number ○ Employee ID (visible only to employees and admins) 4. The user clicks the Edit button to enable editing. 5. The user updates Email Address and/or Phone Number. 6. The system validates and saves the updated information. 	

Postconditions	<ul style="list-style-type: none"> The user's updated profile information is saved and displayed. The user can access related settings from the profile page.
Alternative Flow	<ul style="list-style-type: none"> If the user is not logged in, they are redirected to the login screen. If the email or phone number is invalid, the system displays appropriate validation messages: <ul style="list-style-type: none"> “Please enter a valid email address.” “Please enter a valid phone number.” If the system fails to save changes, it displays: <ul style="list-style-type: none"> “Unable to save changes. Please try again.”

Table 48-Textual Description View Profile Information

Use Case	Set Issue Location
Actor	Citizen, System
Objective	Allow citizens to specify the location of a complaint or suggestion using an interactive map.
Description	This use case enables a citizen to select a location by dragging a pin on a map embedded within the complaint or suggestion form. The selected coordinates are recorded and submitted along with the submission.
Preconditions	<ul style="list-style-type: none"> The citizen must be logged in. The user must have opened the complaint or suggestion submission form.
Normal Flow	<ol style="list-style-type: none"> The user opens the Complaint or Suggestion form. The system displays an interactive Map with a draggable pin. The user drags the pin to the desired location. The system updates the selected latitude and longitude coordinates. A read-only address field is automatically populated based on the selected location. When the user submits the form, the selected location is saved and submitted with the complaint or suggestion.
Postconditions	The issue location is successfully recorded and linked to the submitted form.
Alternative Flow	If the user does not select a location, and the location field is required, the system will show “Please choose a location” next to the field.

Table 49-Textual Description Set Issue Location

Use Case		Logout Account
Actor	Citizen, Employee, Admin, System	
Objective	Allow users to securely log out of the application and clear personal data from the device.	
Description	This use case describes how any logged-in user (citizen, employee, or admin) can log out of their account through the Profile Information page, ensuring their session is securely ended and data is cleared.	
Preconditions	<p>The user must be logged in.</p> <p>The user has navigated to the Profile Information page.</p>	
Normal Flow	<ol style="list-style-type: none"> 1. The user navigates to the Profile Information page. 2. The user taps the “Logout” button. 3. The system performs the following: <ul style="list-style-type: none"> o Clears the user session/token from local storage or memory. o Clears any cached personal data (e.g., user details, recent activity). o Redirects the user to the Login or Welcome screen. 	
Postconditions	<ol style="list-style-type: none"> 1. The user is logged out and navigated to the login page. 2. All sessions and personal data are cleared up for privacy. 	
Alternative Flow	<p>If the session fails to clear due to an error, the system displays an error message:</p> <p>“Logout failed. Please try again.”</p>	

Table 50-Textual Description Logout Account

Use Case		Rate Overall System
Actor	Citizen, System	
Objective	Allow citizens to rate their overall experience with the system and provide feedback to help improve the platform.	
Description	This use case allows users to access the app's Google Play Store/Apple Store page to leave a rating and optional review, helping improve system feedback and credibility.	
Preconditions	<ul style="list-style-type: none"> - The user must be logged in as a Citizen. - The app must be installed from the Google Play Store/Apple Store. 	
Normal Flow	<ol style="list-style-type: none"> 1. The user navigates to Settings or Profile Information. 2. The user selects the “Rate the App” option. 3. The system redirects the user to the app’s page on the Google Play Store. 4. The user selects a star rating and may optionally write a review. 5. The user returns to the app (manually or using back navigation). 	

Postconditions	The app is rated by the user on the Google Play Store/Apple Store.
Alternative Flow	If the Play Store/Apple Store cannot be opened, display an error message: “Unable to open Play Store/Apple Store. Please check your connection or try again later.”

Table 51-Textual Description Rate Overall System

Use Case	View Suggestions
Actor	Municipal Employee, Admin, System
Objective	To allow authenticated employees and administrators to view citizen-submitted suggestions in a dedicated, organized interface.
Description	This use case describes how municipal staff access and review suggestions submitted by citizens.
Preconditions	<ul style="list-style-type: none"> The user must be authenticated as an employee or admin. Suggestions have been submitted by citizens and stored in the system database.
Normal Flow	<ol style="list-style-type: none"> Accessing Suggestions Page <ol style="list-style-type: none"> The employee or admin logs into the application. The system displays a menu option or tab labeled “Suggestions” or “Manage Suggestions.” Upon selecting this option, the system redirects the user to the Suggestions List Page. Viewing Suggestions <ol style="list-style-type: none"> The system retrieves and displays a list of suggestions. Each suggestion entry includes the following key details: <ul style="list-style-type: none"> Suggestion Content (as entered by the citizen in free-text form) Submission Date Sender Information (e.g., full name, contact number, National ID) Handling Large Data Volumes <ol style="list-style-type: none"> If the number of suggestions exceeds a predefined threshold (e.g., 6 entries), the system shall implement: <ul style="list-style-type: none"> Infinite scrolling (automatic loading of more entries as the user scrolls)
Postconditions	The user successfully views all relevant suggestions submitted by citizens.

Alternative Flow	<ul style="list-style-type: none"> • If no suggestions exist, display a message: “No suggestions submitted yet.” • If suggestions fail to load, display an error message: “Unable to load suggestions. Please try again later.”
------------------	---

Table 52-Textual Description View Suggestions

Use Case	Manage Employee Accounts
Actor	Admin, System
Objective	Allow the admin to create, view, edit, suspend/reactivate, and delete employee accounts within their department.
Description	This use case allows the admin to manage employee accounts to maintain accurate staffing and access control in the system.
Preconditions	<ul style="list-style-type: none"> • Admin must be logged into the system. • Admin must belong to the department they’re managing.
Normal Flow	<ol style="list-style-type: none"> 1. Create New Employee Account <ol style="list-style-type: none"> 1.1. Admin clicks the “Add New Employee” button. 1.2. A form appears prompting the admin to enter: <ul style="list-style-type: none"> ◦ National ID ◦ Employee ID ◦ Full Name ◦ Phone Number ◦ Password 1.3. Admin submits the form. 1.4. System saves the employee details and adds the new employee to the department list. 2. View Employee Accounts <ol style="list-style-type: none"> 2.1. Admin opens the Employee Account Management page. 2.2. System displays all employees as cards containing: <ul style="list-style-type: none"> ◦ Full Name ◦ Employee ID ◦ Department ◦ Account Status (Active/Suspended) 3. Edit Employee Information <ol style="list-style-type: none"> 3.1. Admin clicks the three-dot menu on an employee card and selects

	<p>"Edit."</p> <p>3.2. Admin is redirected to an edit page to update:</p> <ul style="list-style-type: none"> ○ Name ○ National ID ○ Employee ID ○ Phone Number <p>3.3. Admin submits the changes.</p> <p>3.4. System saves the updates.</p> <p>4. Suspend or Reactivate Employee Account</p> <p>4.1. Admin clicks the three-dot menu on an employee card.</p> <p>4.2. Admin toggles account status (Active/Suspended).</p> <p>4.3. System updates the status and reflects it on the card.</p> <p>5. Delete Employee Account</p> <p>5.1. Admin selects “Delete” from the employee card menu.</p> <p>5.2. A confirmation dialog appears.</p> <p>5.3. Admin confirms deletion.</p> <p>5.4. System permanently deletes the employee from the database.</p>
Postconditions	<p>* The employee list is updated based on admin actions.</p> <p>* New employees are added; edits are saved; suspended/reactivated accounts show updated status; deleted accounts are removed.</p>
Alternative Flow	<ol style="list-style-type: none"> 1. If required fields are missing during account creation or editing, the system shows validation errors. 2. If the admin cancels any action (e.g., delete or edit), the system returns to the previous state without changes.

Table 53-Textual Description Manage Employee Accounts

Use Case	Manage Complaint
Actor	Admin, System
Objective	To allow the admin to view, filter, review, accept/reject, and assign submitted complaints to appropriate employees.
Description	This use case allows administrators to oversee and manage incoming citizen complaints by reviewing complaint details, filtering by status, rejecting invalid complaints, or assigning valid ones to employees for resolution.
Preconditions	<ul style="list-style-type: none"> • The admin must be logged into the system.

	<ul style="list-style-type: none"> • There must be at least one submitted complaint in the system.
Normal Flow	<ol style="list-style-type: none"> 1. Navigation to Complaint Management <ul style="list-style-type: none"> • The admin clicks the three-dot menu at the top-left of the admin panel. • The admin selects "Manage Complaint". • The system redirects to the Complaint Management interface. 2. Viewing Complaints <p>The system displays complaints as cards in a scrollable list or grid.</p> <p>Each card shows:</p> <ul style="list-style-type: none"> • Complaint Title • Complaint Type • Submission Date • Current Status 3. Filtering by Status <p>The admin selects a complaint status to filter the view:</p> <ul style="list-style-type: none"> • Under Review • In Progress • Resolved • Rejected <p>The complaint list updates to show only matching complaints.</p> 4. Viewing Complaint Details <p>The admin clicks on a complaint card (with status "Under Review").</p> <p>The system opens a detailed view showing:</p> <ul style="list-style-type: none"> • Complaint Title • Complaint Type • Submission Date • Date of Complaint • Submitted By (citizen name or ID) • Responsible Department

	<ul style="list-style-type: none"> • Complaint Description • Uploaded Attachments (images, videos, documents) <p>5. Rejecting a Complaint</p> <ul style="list-style-type: none"> • The admin clicks the “Reject” button. • The system updates the complaint status to "Rejected" in Firestore. • The UI immediately reflects the updated status. <p>6. Accepting and Assigning a Complaint</p> <ul style="list-style-type: none"> • The admin clicks the “Accept” button. • A new section expands in the UI. • The admin: • Selects an employee from a dropdown list (format: <i>Employee Name - Department Name</i>). • Optionally enters internal notes or instructions. <p>Clicks “Confirm”:</p> <ul style="list-style-type: none"> • The complaint is assigned to the selected employee. • Complaint status updates to "In Progress". • Assignment details (employee ID, notes, timestamp) are recorded. <p>Or clicks “Cancel” to close the section without saving changes.</p>
Postconditions	<ul style="list-style-type: none"> • The complaint status is updated to either "In Progress" or "Rejected." • Assignment information is stored if the complaint was accepted. • Rejected complaints are removed from the "Under Review" list.
Alternative Flow	<ul style="list-style-type: none"> • If no complaints exist for a selected filter, the system shows: “No complaints found for this status.” • If the admin loses connection or there is a Firestore error, an error message is displayed, and no changes are made.

Table 54-Textual Description Manage Complaint

Use Case	Manage Suggestion
Actor	Admin, System
Objective	Allow the admin to view, filter, and manage submitted suggestions, including assigning them to employees or rejecting them.
Description	This use case enables the admin to access and manage user-submitted suggestions through a dedicated interface, including filtering by status, reviewing suggestion details, and assigning suggestions to employees.
Preconditions	<ul style="list-style-type: none"> The admin must be logged into the system. There must be at least one submitted suggestion in the system.
Normal Flow	<ol style="list-style-type: none"> Navigation to Suggestion Management <ol style="list-style-type: none"> 1. Admin clicks the hamburger menu in the top-left corner of the admin panel. 2. Admin selects “Manage Suggestion” from the menu. 3. System redirects the admin to the Suggestion Management interface. Viewing Suggestions <ol style="list-style-type: none"> 1. The system displays suggestion cards in a scrollable list or grid layout. 2. Each card includes: <ul style="list-style-type: none"> Suggestion Title Suggestion Type Submission Date Current Status (e.g., Under Review, In Progress) Filtering by Status <ol style="list-style-type: none"> 1. Admin can apply a filter to view suggestions by: <ul style="list-style-type: none"> Under Review In Progress Resolved Rejected 2. Upon filter selection, the suggestion list updates to show only those with the selected status. Viewing Suggestion Details

	<p>4.1. Admin clicks a suggestion card with the status "Under Review".</p> <p>4.2. System opens a detailed view of the suggestion, showing:</p> <ul style="list-style-type: none"> • Suggestion Title • Suggestion Type • Date of Submission • Date of Suggestion • Submitted By (Citizen Name or ID) • Responsible Department • Suggestion Description • Uploaded Attachments (e.g., images, videos, documents) <p>5. Accept or Reject Suggestion</p> <p>5.1. The detailed view contains two action buttons: "Accept" and "Reject."</p> <ul style="list-style-type: none"> • Reject: <ul style="list-style-type: none"> ◦ Admin clicks "Reject". ◦ System updates the suggestion status to "Rejected" in Firestore. ◦ UI reflects the updated status instantly. • Accept: <ul style="list-style-type: none"> ◦ Admin clicks "Accept", and a new section for assignment expands. <p>6. Assign Suggestion to Employee</p> <p>6.1. The assignment section allows the admin to:</p> <ul style="list-style-type: none"> • Select an employee from a dropdown list (formatted as: <i>Employee Name – Department Name</i>) • Optionally add internal notes or instructions <p>6.2. Admin performs one of the following:</p> <ul style="list-style-type: none"> • Confirm: <ul style="list-style-type: none"> ◦ System assigns the suggestion to the selected employee. ◦ Updates the suggestion status to "In Progress" ◦ Records assignment metadata (employee ID, admin notes, timestamp).
--	---

	<ul style="list-style-type: none"> Cancel: <ul style="list-style-type: none"> Closes the assignment section without applying any changes.
Postconditions	<ul style="list-style-type: none"> The suggestion status is updated to either "In Progress" or "Rejected." Accepted suggestions are tracked and assigned to relevant personnel. Rejected suggestions are excluded from further processing.
Alternative Flow	<ul style="list-style-type: none"> If no suggestions exist for a selected filter, the system shows no suggestions. If the admin loses connection or there is a Firestore error, an error message is displayed, and no changes are made.

Table 55-Textual Description Manage Suggestion

Use Case		Update Complaint Status
Actor	Municipal Employee, System	
Objective	To enable municipal employees to update the status of a submitted complaint to "Resolved" upon completion of the work.	
Description	This use case describes the process by which a municipal employee marks a complaint as resolved.	
Preconditions	<ul style="list-style-type: none"> The employee must be authenticated and authorized to manage complaints. The complaint must currently have the status of "In Progress." 	
Normal Flow	<ol style="list-style-type: none"> Access Complaint Details <ol style="list-style-type: none"> The employee logs into the application and navigates to the Complaints section. The employee selects a complaint with status "In Progress." The system displays the complaint's detailed view, including a "Done" button. Update Complaint Status <ol style="list-style-type: none"> The employee clicks the "Done" button. The system updates the status of the complaint to "Resolved." A timestamp of the status update is automatically recorded by the system. The updated complaint is saved in the database. Display Updated Status <ol style="list-style-type: none"> The complaint is now labeled with the status "Resolved." This updated status is visible to: <ul style="list-style-type: none"> The employee who handled the complaint. The citizen who submitted the complaint, in their Track Complaints section. 	
Postconditions	<ul style="list-style-type: none"> The complaint's status is successfully updated to "Resolved." 	

	<ul style="list-style-type: none"> The citizen is notified or sees the new status during tracking.
Alternative Flow	If the complaint is already marked as Resolved or Rejected, the “Done” button should be hidden.

Table 56-Update Complaint Status

Use Case		Upload Supporting Files to Complaints
Actor	Municipal Employee, System	
Objective		To enable municipal employees to update the status of a submitted complaint to “Resolved” upon completion of the work.
Description		To enable municipal employees to upload supporting documents (PDF, DOC/DOCX,) to a complaint record via the complaint detail view.
Preconditions		<ul style="list-style-type: none"> The employee must be logged into the system. The employee must have access to the Complaint Details view.
Normal Flow		<ol style="list-style-type: none"> Access Complaint Details <ol style="list-style-type: none"> The employee navigates to the Complaints section. The employee selects a specific complaint to open its Complaint Details view. Upload Files <ol style="list-style-type: none"> The system displays an option to “Upload Supporting Files.” The employee clicks the upload option and selects one or more files from their device. The system validates the selected files for: <ul style="list-style-type: none"> File type: PDF, DOC, DOCX File size: ≤ 10MB per file File Storage and Linking <ol style="list-style-type: none"> Upon passing validation, the selected files are uploaded to secure storage. Each uploaded file is linked to the complaint by its unique identifier. The file metadata (name, type, size, upload date) is stored in the system. Display Uploaded Files <ol style="list-style-type: none"> The system displays a list of uploaded files in the Attachments section of the complaint. The employee can view, download, or remove the files as needed.
Postconditions		<ul style="list-style-type: none"> The uploaded files are securely stored and associated with the complaint. Files are visible in the Attachments section of the Complaint Details view.
Alternative Flow		<ul style="list-style-type: none"> Invalid File Type or Size: <ul style="list-style-type: none"> If the selected file type or size does not meet the requirements, the file won’t be uploaded

Table 57-Upload Supporting Files to Complaints

Use Case		Rate Suggestion Submission Process
Actor	Citizen, System	
Objective	To allow citizens to provide feedback on their experience submitting a suggestion through a quick star rating interface.	
Description	This use case describes the process by which a citizen can rate their experience immediately after submitting a suggestion via the in-app form.	
Preconditions	The citizen is authenticated and has successfully submitted a suggestion using the suggestion form.	
Normal Flow	1. Submit Suggestion 1.1. The citizen completes the Suggestion Form and clicks the “Submit” button. 1.2. The system processes and confirms successful submission. 2. Display Rating Interface 2.1. A popup appears on the screen containing a 5-star rating interface. 2.2. The system prompts the citizen with: <i>“Please rate your experience submitting a suggestion.”</i> 3. Submit Rating 3.1. The citizen selects a rating between 1 to 5 stars. 3.2. The citizen clicks the “OK” button. 3.3. The system records the selected rating and stores it with the user's ID and timestamp. 4. Completion 4.1. The popup closes. 4.2. The system redirects the citizen to the main app interface or returns them to the previous page.	
Postconditions	<ul style="list-style-type: none"> • The citizen's rating is saved in the system. 	
Alternative Flow	<ul style="list-style-type: none"> • Citizen Dismisses the Rating Prompt: <ul style="list-style-type: none"> ◦ If the citizen closes the popup without selecting a rating, no data is stored and they are redirected as usual. • System Fails to Store Rating: <ul style="list-style-type: none"> ◦ If rating submission fails due to a technical error, the system silently dismisses the popup and redirects the citizen without storing feedback. 	

Table 58-Rate Suggestion Submission Process

Use Case		Rate Complaint Submission Process
Actor	Citizen, System	
Objective	To allow citizens to provide feedback on their experience submitting a complaint through a quick star rating interface.	
Description	This use case describes the process by which a citizen can rate their experience immediately after submitting a complaint via the in-app form.	
Preconditions	The citizen is authenticated and has successfully submitted a complaint using the complaint form.	
Normal Flow	<ol style="list-style-type: none"> 1. Submit Complaint <ol style="list-style-type: none"> 1.1. The citizen completes the Complaint Form and clicks the “Submit” button. 1.2. The system processes and confirms successful complaint. 2. Display Rating Interface <ol style="list-style-type: none"> 2.1. A popup appears on the screen containing a 5-star rating interface. 2.2. The system prompts the citizen with: <i>“Please rate your experience submitting a suggestion.”</i> 3. Submit Rating <ol style="list-style-type: none"> 3.1. The citizen selects a rating between 1 to 5 stars. 3.2. The citizen clicks the “OK” button. 3.3. The system records the selected rating and stores it with the user's ID and timestamp. 4. Completion <ol style="list-style-type: none"> 4.1. The popup closes. 4.2. The system redirects the citizen to the main app interface or returns them to the previous page. 	
Postconditions	The citizen's rating is saved in the system.	
Alternative Flow	<ul style="list-style-type: none"> • Citizen Dismisses the Rating Prompt: <ul style="list-style-type: none"> ◦ If the citizen closes the popup without selecting a rating, no data is stored and they are redirected as usual. • System Fails to Store Rating: <ul style="list-style-type: none"> ◦ If rating complaint fails due to a technical error, the system silently dismisses the popup and redirects the citizen without storing feedback. 	

Table 59-Rate Complaint Submission Process

3.6 Non-Functional Requirements

3.6.1 Performance Requirements

1. Fast Load Time: The system should ensure that 95% of all pages and components load within 2 seconds under standard network conditions.
2. Low Submission Delay: The system must respond to complaint submissions in less than 1 second on average.
3. Scalability: The system should be capable of supporting at least 100,000 registered users and 5,000 concurrent sessions with no more than 5% degradation in performance.
4. Real-Time Updates: The system must deliver real-time notifications regarding complaint status updates within 5 seconds of any change.
5. Concurrent User Support: The system should support up to 5,000 concurrent users without a drop in functionality or performance.
- 6.

3.6.2 Dependability Requirements

1. High Availability: The system must achieve 99.9% uptime per month, allowing for a maximum of 43.2 minutes of downtime.
2. Cross-Platform Compatibility: The system should be compatible with major platforms, including web, Android (v8.0 and above), and iOS (v12.0 and above).
3. Stable Operation: The system should maintain operational stability and responsiveness in at least 95% of peak load scenarios.

3.6.3 Security Requirements

1. Secure Authentication: The system must restrict access to authorized users only, using secure authentication protocols such as OAuth 2.0.
2. Password Recovery/Reset: Users should be able to reset their passwords via phone number or email.
3. Role-Based Access Control: The system must enforce access restrictions based on at least two defined user roles: citizen, Employee and administrator.
4. Data Integrity: The system must prevent unauthorized modification or deletion of data, ensuring 100% integrity through encryption and audit logging.

3.6.4 Usability Requirements

1. Search Functionality: The system should provide a search bar capable of returning relevant results within 1.5 seconds, with an accuracy of 90% or higher.
2. Straightforward Complaint Form: The system should provide a complaint form that at least 95% of first-time users can complete without external assistance.
3. Customizable Preferences: The system must allow users to update settings such as password, and notifications with a 98% success rate.
4. Feedback Rating System: The system should enable citizens to rate the resolution of their complaints, aiming for a minimum 85% participation rate.
5. Accessible Help System: The system must include built-in help features capable of resolving at least 90% of common user issues.
6. Convenient User Interface: The complaint categories (Roads, Electricity, Water, etc.) must be clearly displayed.
- 7.

3.6.5 Operational and Environmental Requirements

1. Device Compatibility: The system should function correctly on 90% of smartphones and tablets with screen sizes between 4.5" and 10".
2. Network Adaptability: The system should perform reliably under varying network conditions (e.g., 3G, 4G, Wi-Fi).
3. Dark Mode Support: The application shall support a dark mode or low-light display option to ensure usability in dark environments

3.6.6 Maintainability Requirements

1. Modular Architecture: The design should allow easy integration of new features or components without affecting existing functionality.
2. Ease of Updates: The system must support efficient deployment of updates, with zero downtime in at least 90% of release cycles using CI/CD pipelines.
3. Code Readability: The codebase shall be clear, concise, and well-structured to ensure ease understanding and modification by current and future team members.
4. Well-done Documentation: The system must include comprehensive documentation covering at least 80% of modules, including user guides and developer references.

5. User Adaptability: The system should be easily modifiable to support new user roles with development effort not exceeding 3 days per new role.

3.7 Data Requirements

Requirement title	Description
Citizen Data	The system will collect and store basic citizen information, including name, contact details, national ID number, and location. This data will be essential for identifying the reporter and enabling follow-ups. All data will be encrypted and stored securely.
Problem Report Data	“Sawweb” will store detailed reports of issues submitted by users, including issue category, description, location, time of report, and any attached images. This data helps route problems to the correct authority.
Location and map data	The system will use location data to pinpoint and classify the reported issues. Integration with national map databases will ensure accurate geospatial referencing.
Government Response Data	The system will store responses from various government institutions, including response times, actions taken, and status updates. This data supports transparency and enables follow-up by users.
Usage and feedback data	User feedback on the service and its ease of use will be collected to help improve the app over time. This includes survey responses, ratings, and app usage patterns.

Table 60-Data Requirements

4.0 Analysis and Design

4.1 Activity Diagram

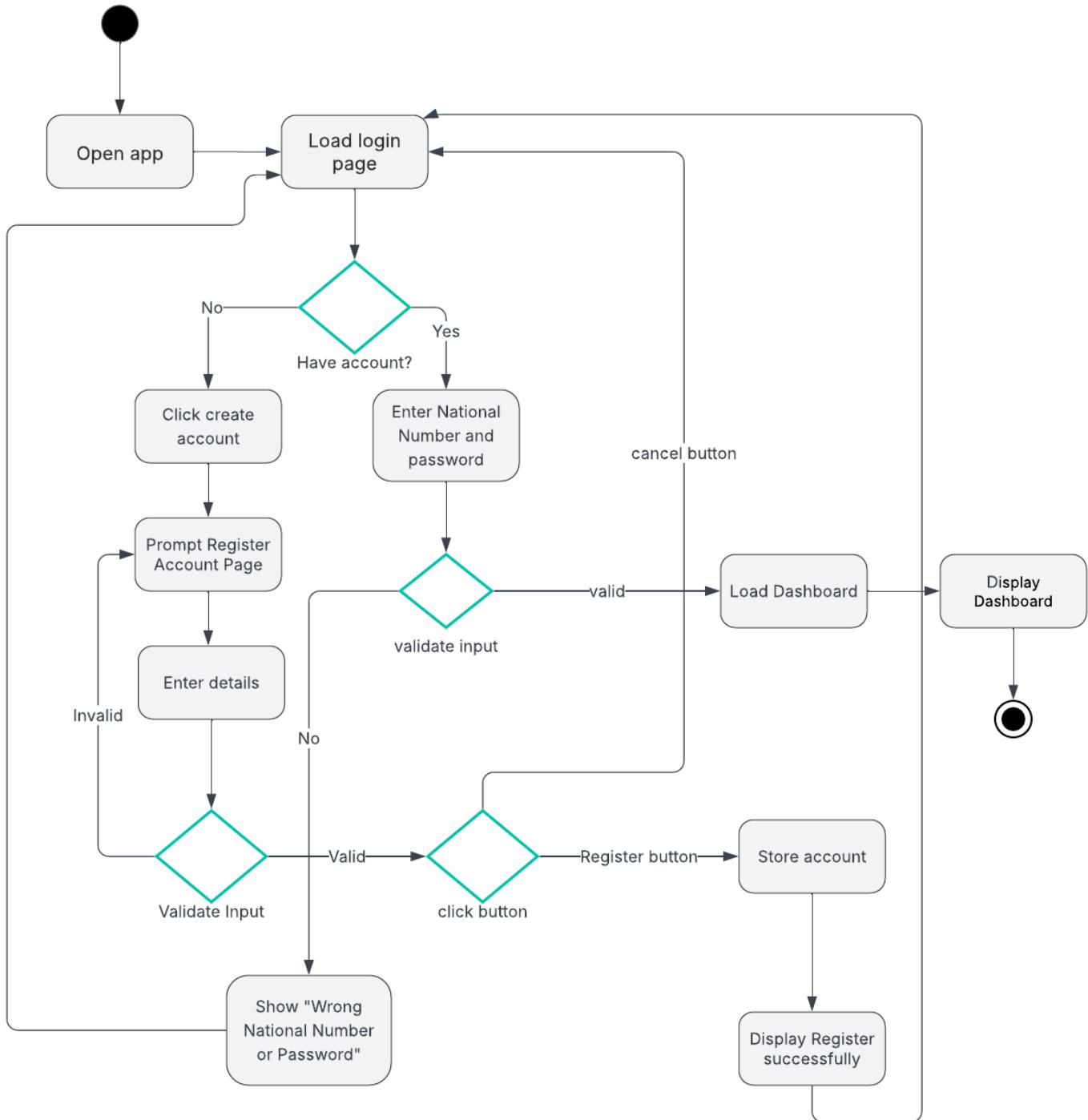


Figure 7-Activity Diagram

4.2 Sequence Diagrams

4.2.1 Citizen Sequence Diagrams

4.2.1.1 Use Chatbot

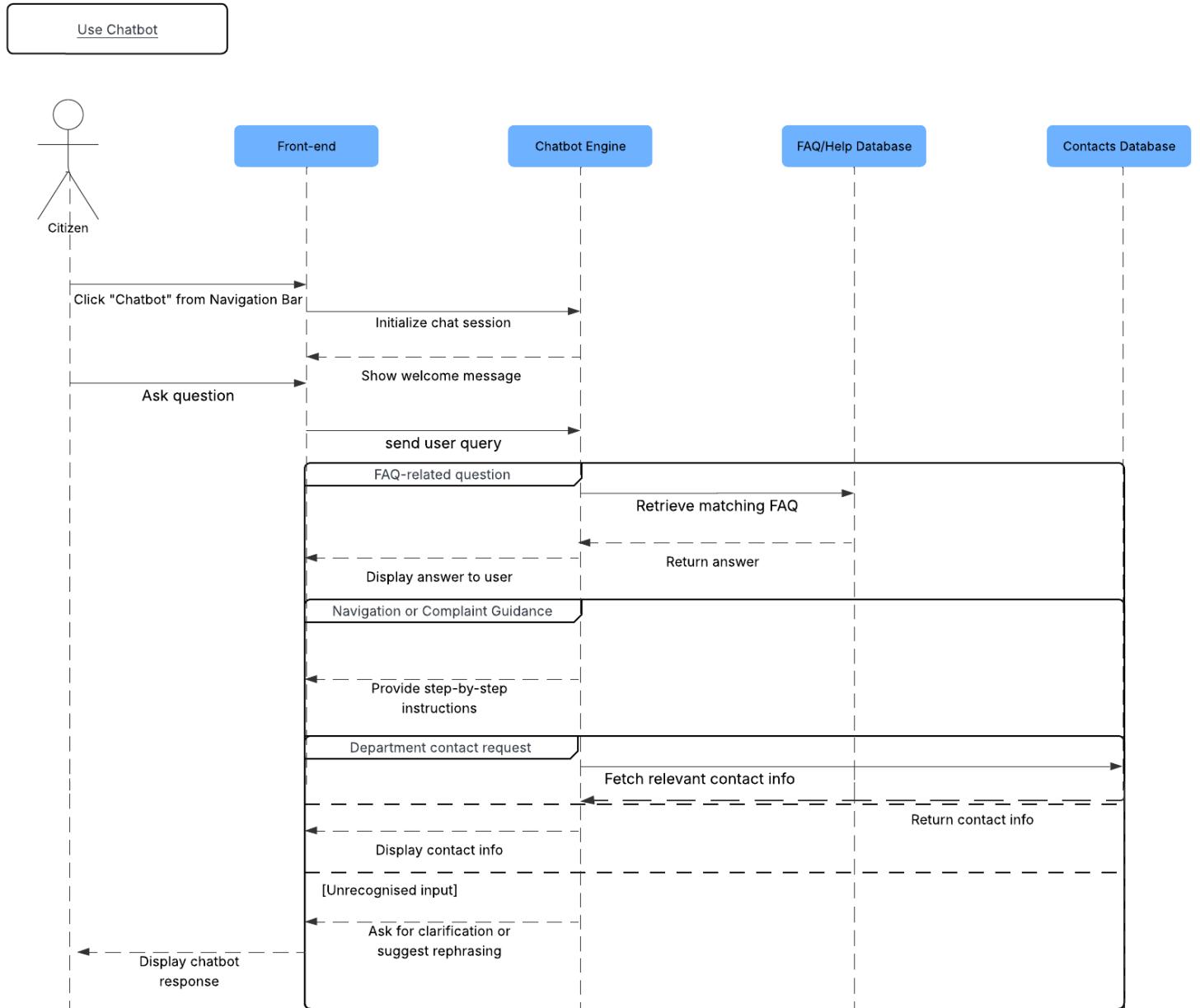


Figure 8-Sequence Diagrams Use Chatbot

4.2.1.2 Submit Complaint

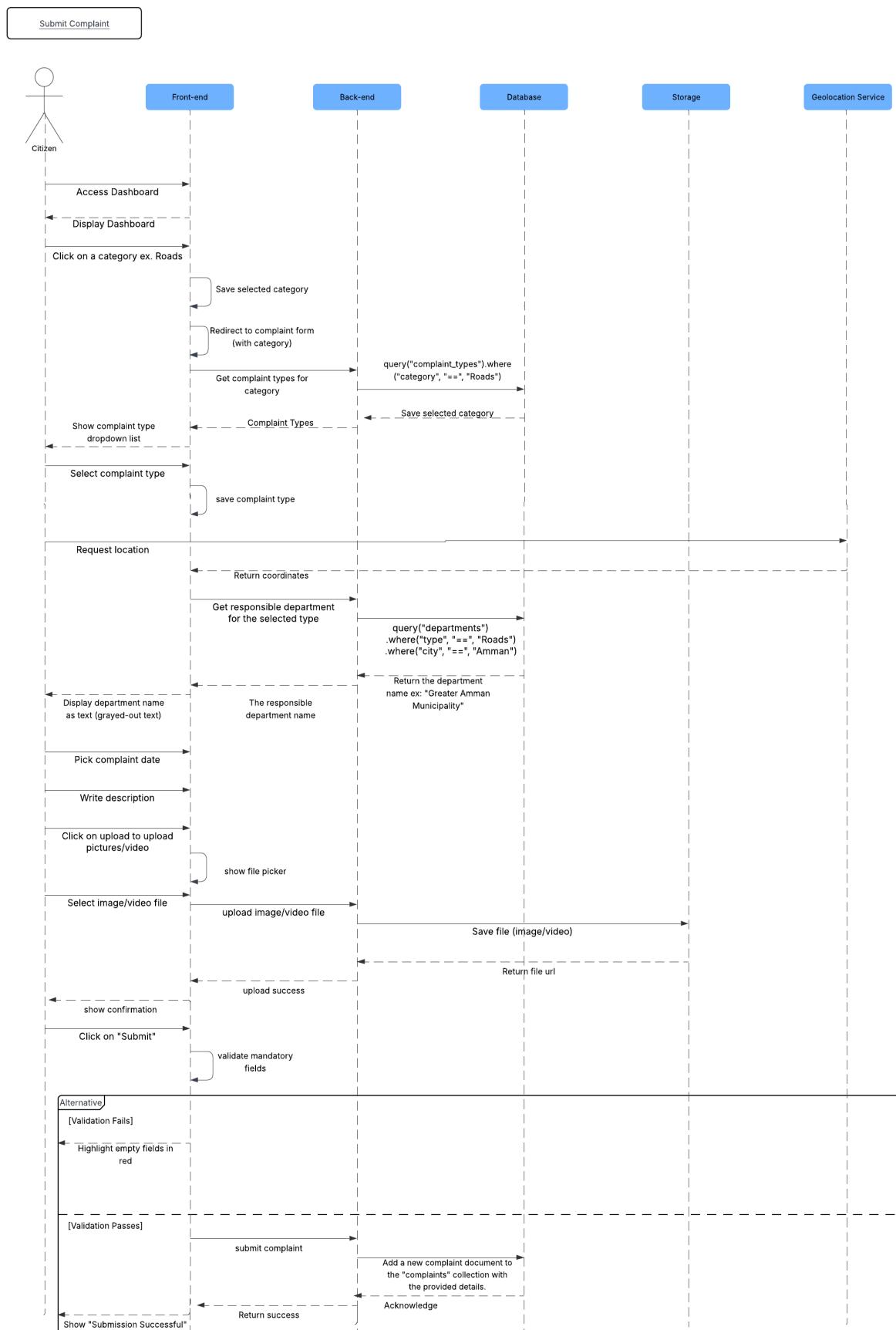


Figure 9-Sequence Diagrams Submit Complaint

4.2.1.3 Submit Suggestion

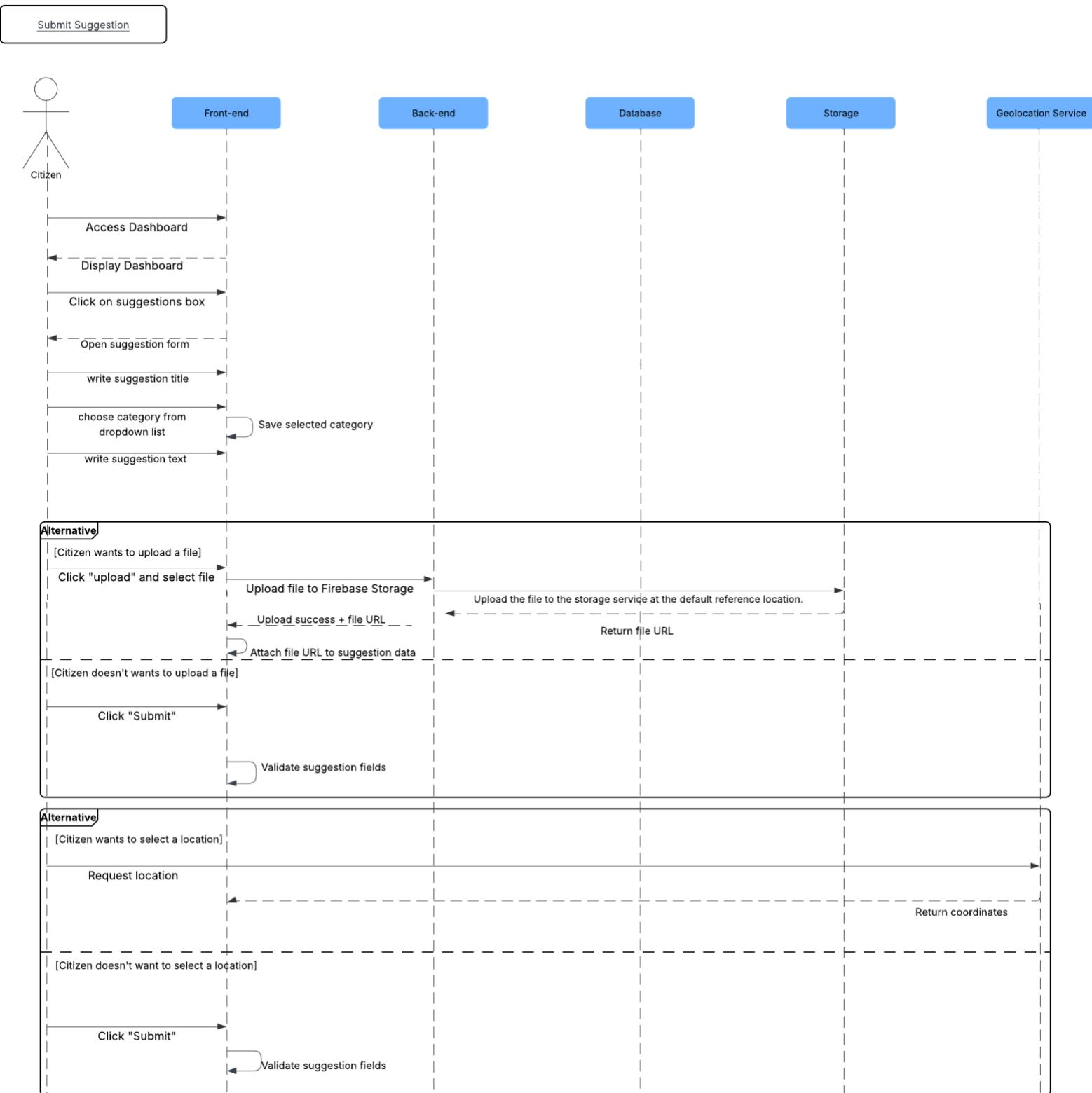
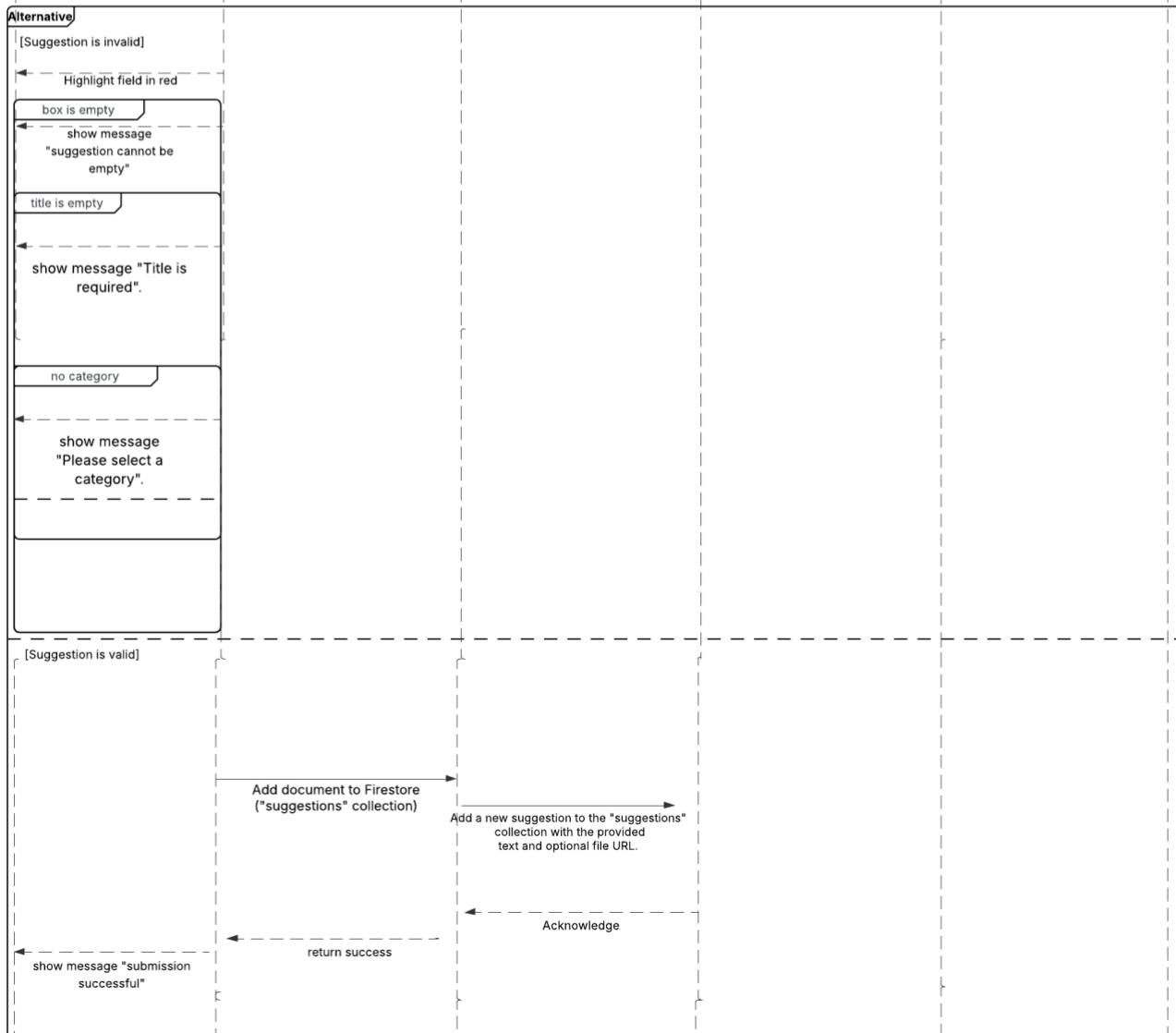
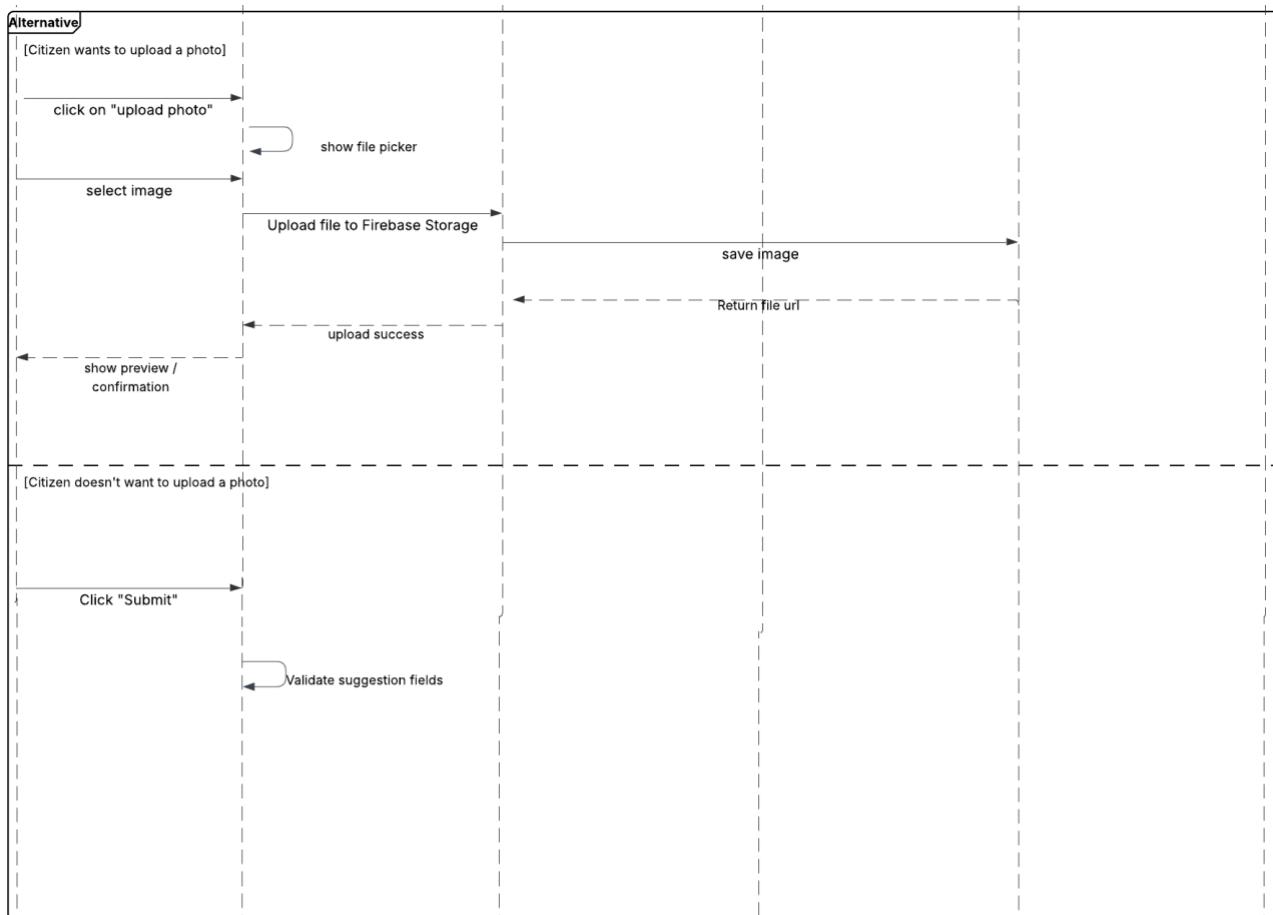


Figure 10-Sequence Diagrams Submit Suggestion 1



4.2.1.4 Complaints Tracking

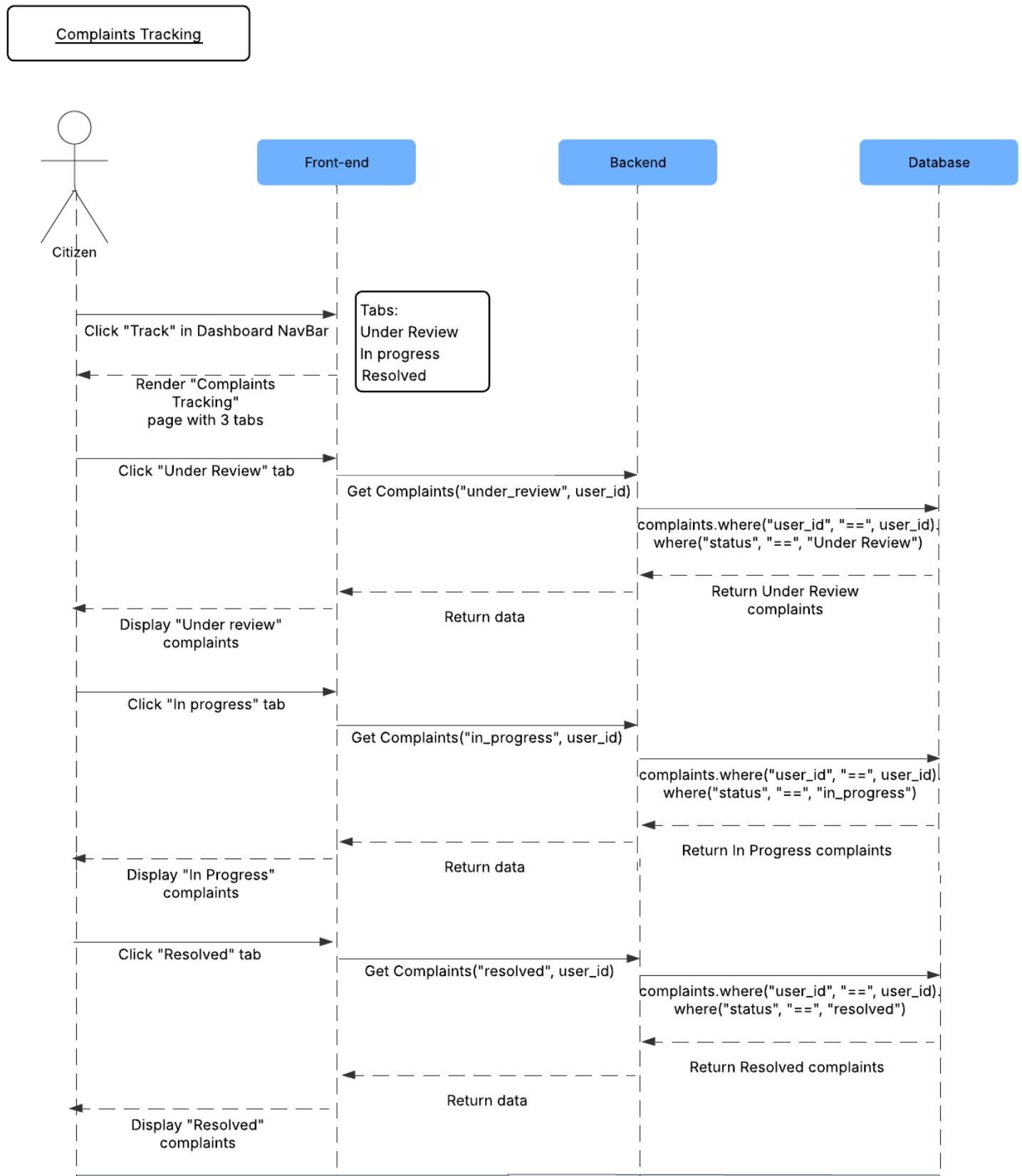


Figure 11-Sequence Diagram Complaints Tracking

Navigating through the application

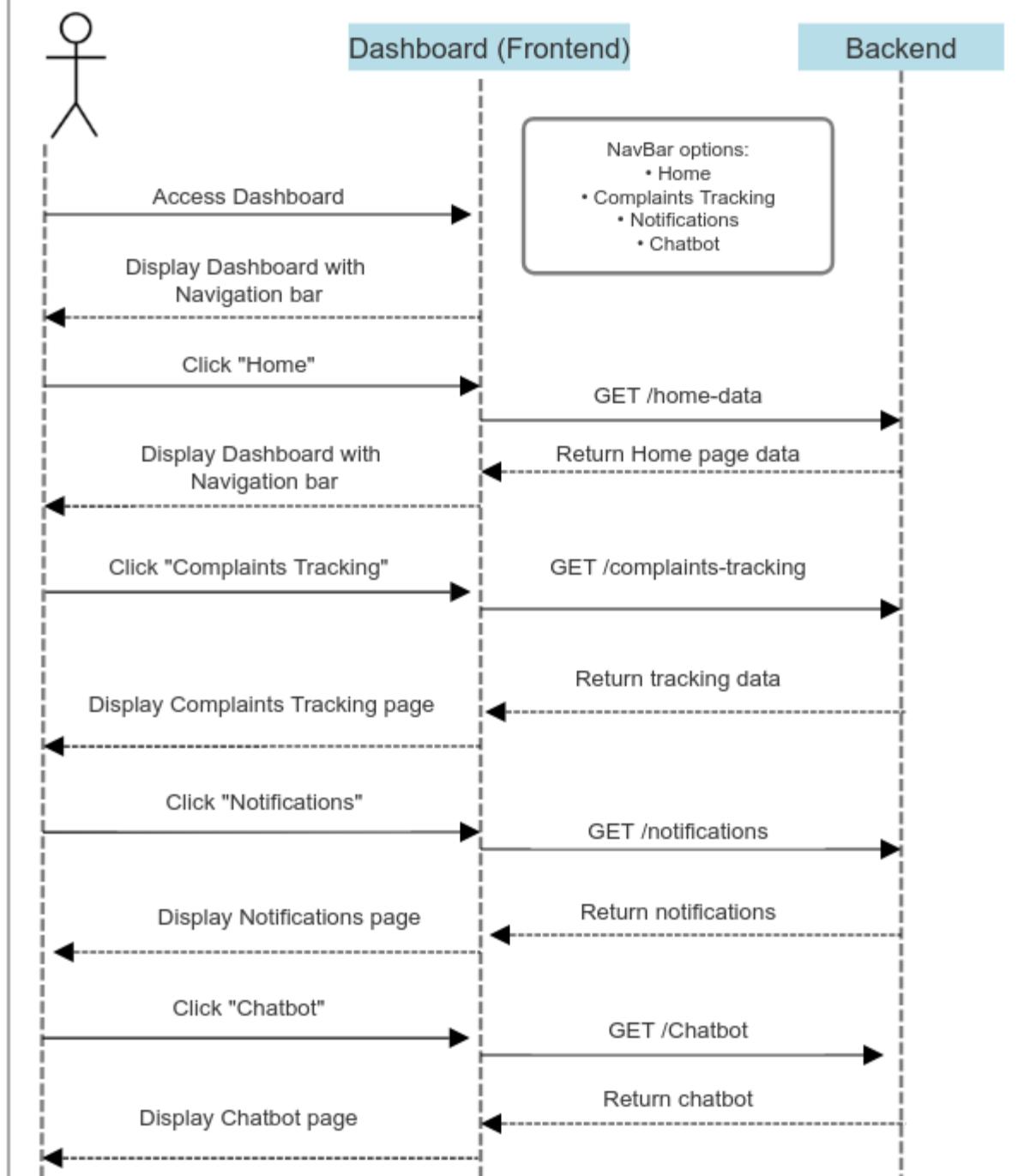


Figure 12-Sequence Diagram Navigation Through the Application

4.2.2 Employee Sequence Diagrams

4.2.2.1 Update Complaint Status

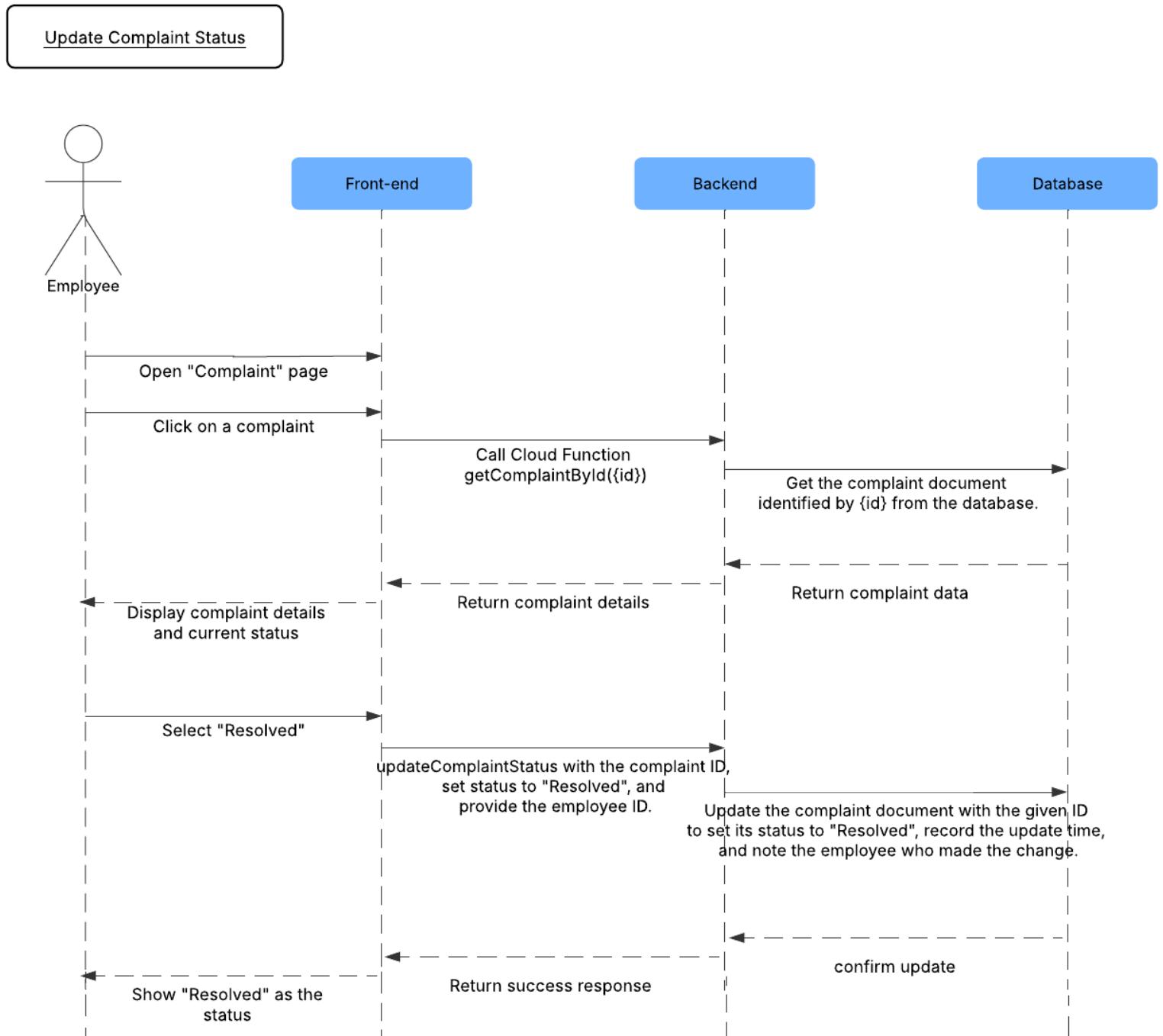


Figure 13-Sequence Diagram Update Complaint Status

4.2.2.2 View Suggestions

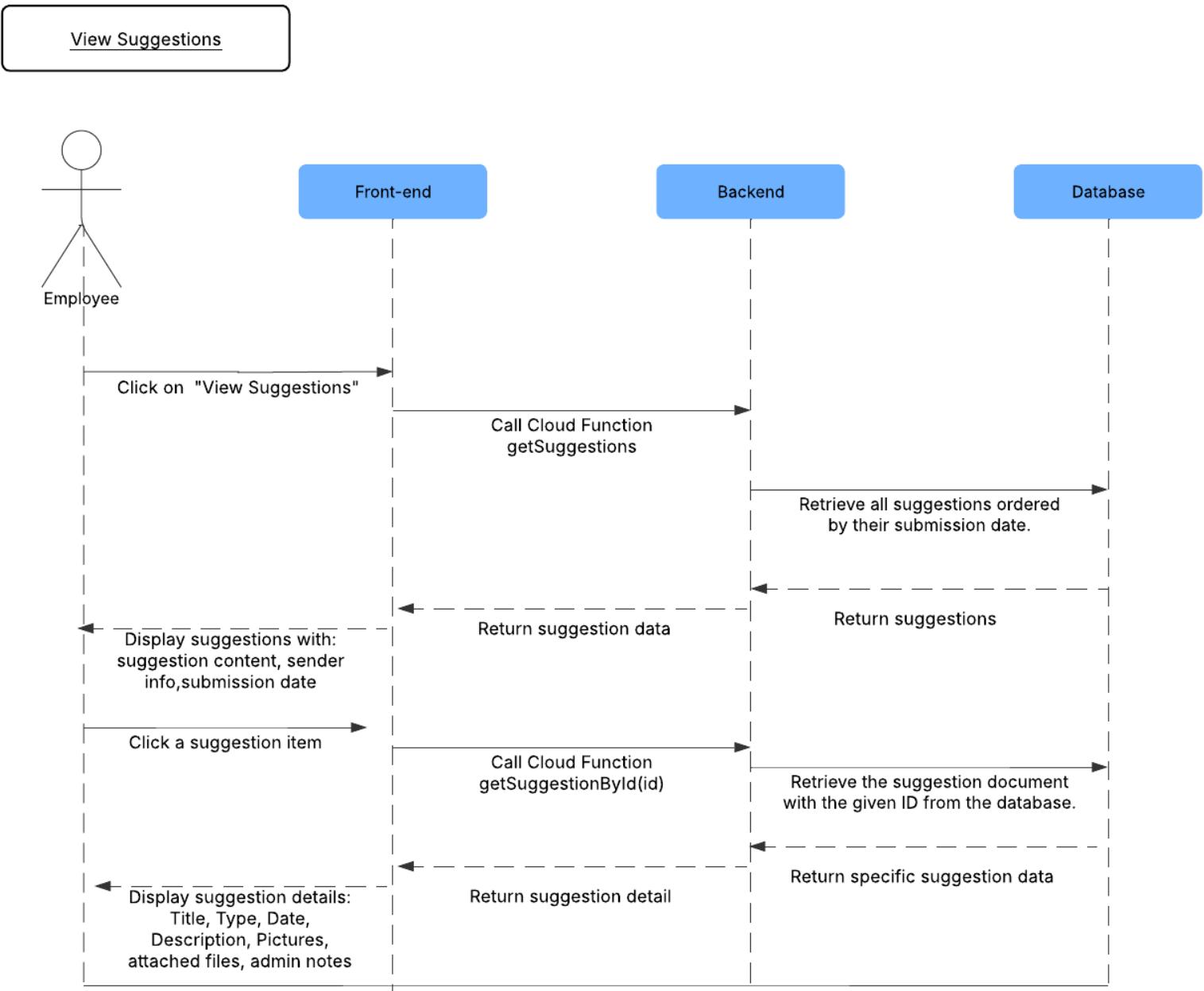


Figure 14-Sequence Diagram View Suggestions

4.2.2.3 View Complaints

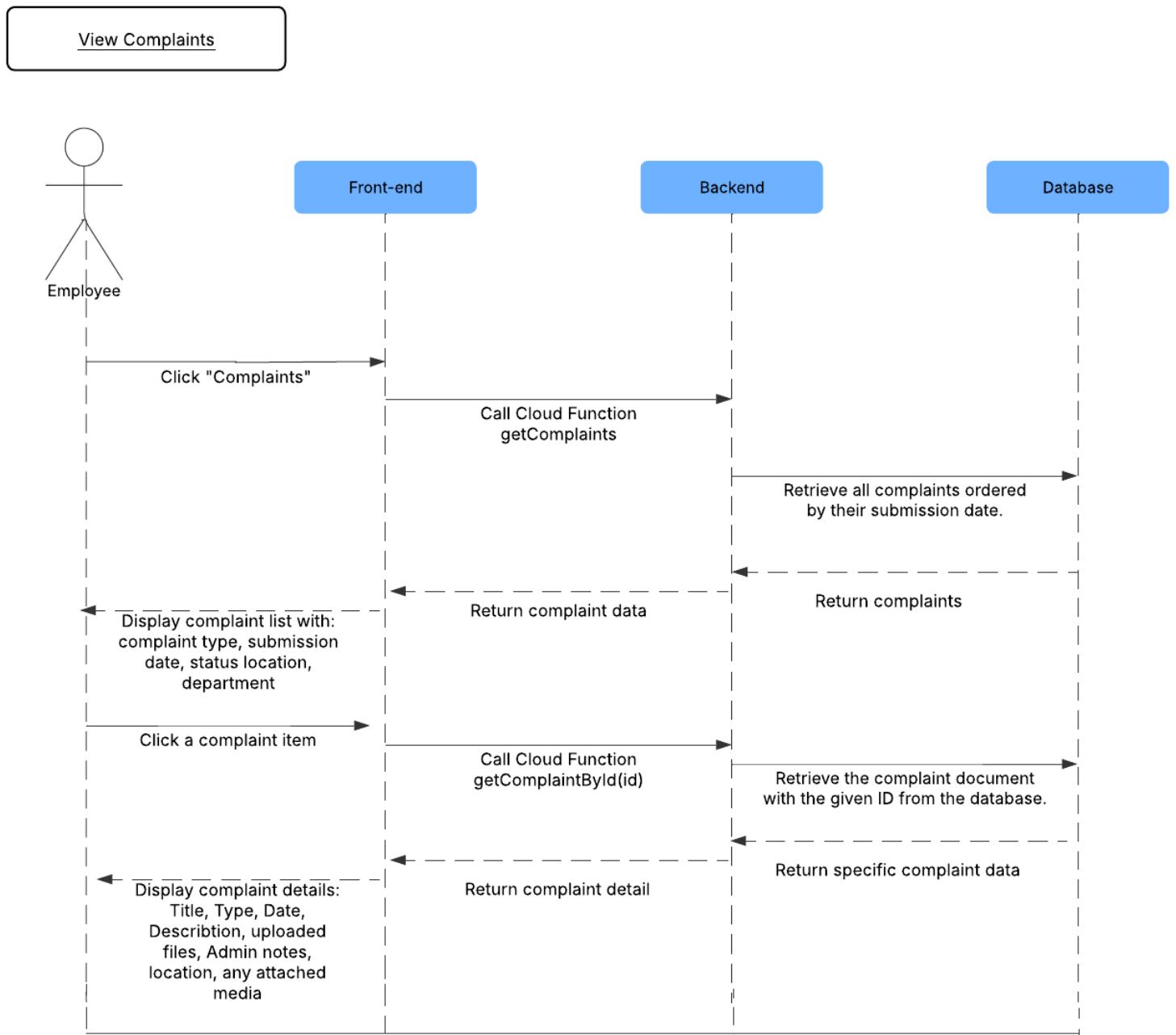


Figure 15-Sequence Diagram View Complaints

4.2.2.4 Upload Files

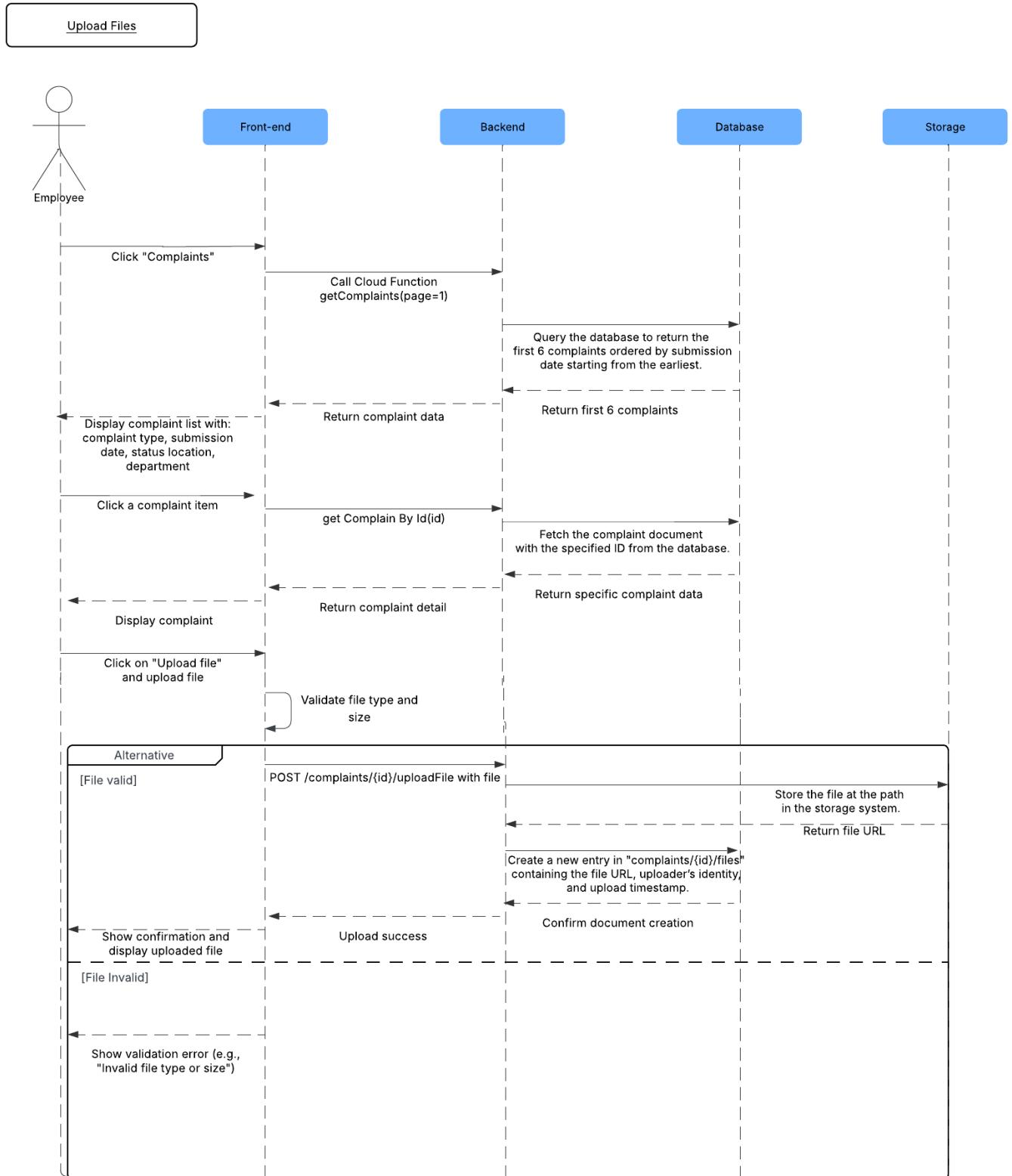


Figure 16-Sequence Diagram Upload Files

4.2.3 Administrator Sequence Diagrams

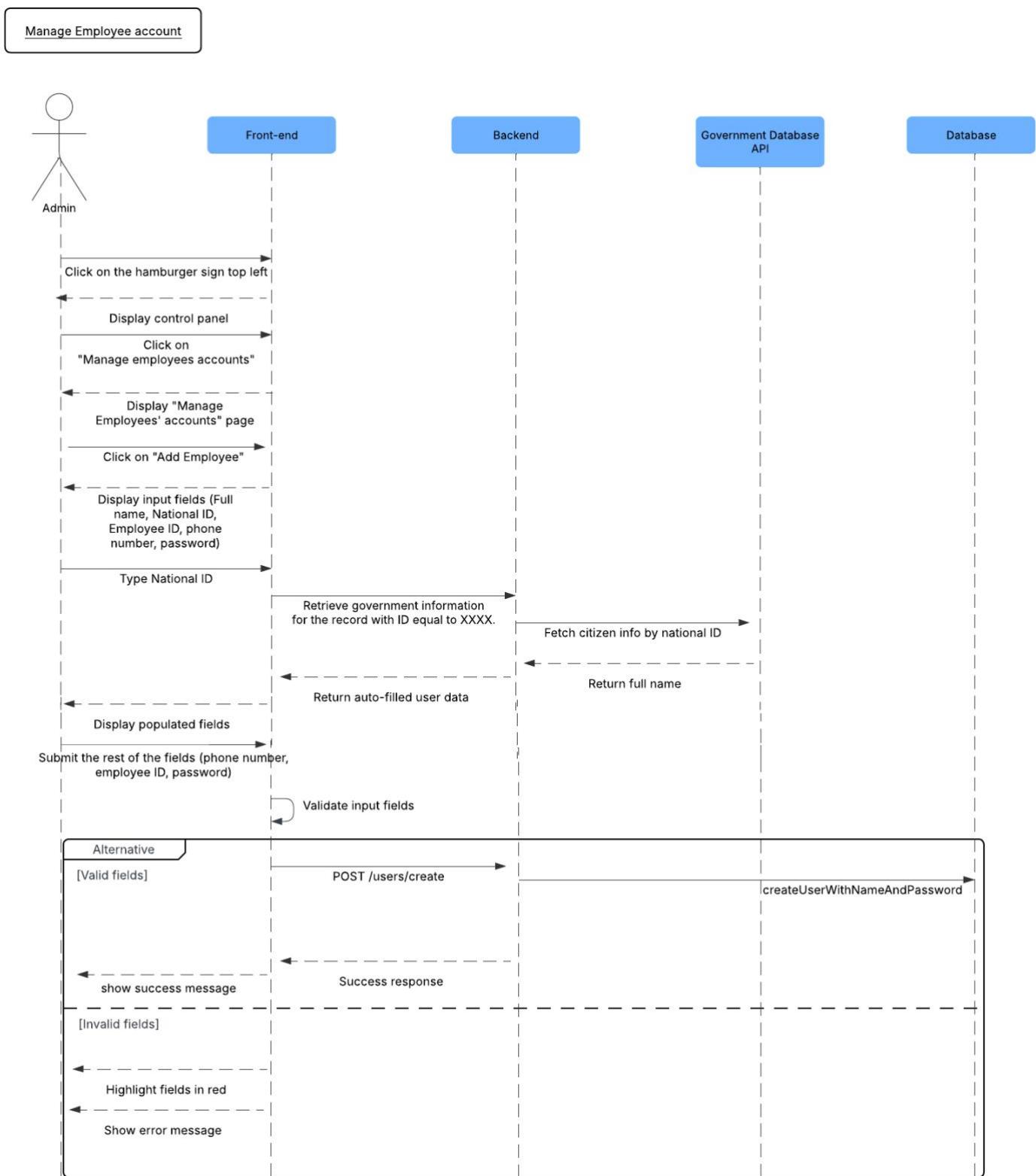


Figure 17-Sequence Diagram Manage Employee Account I

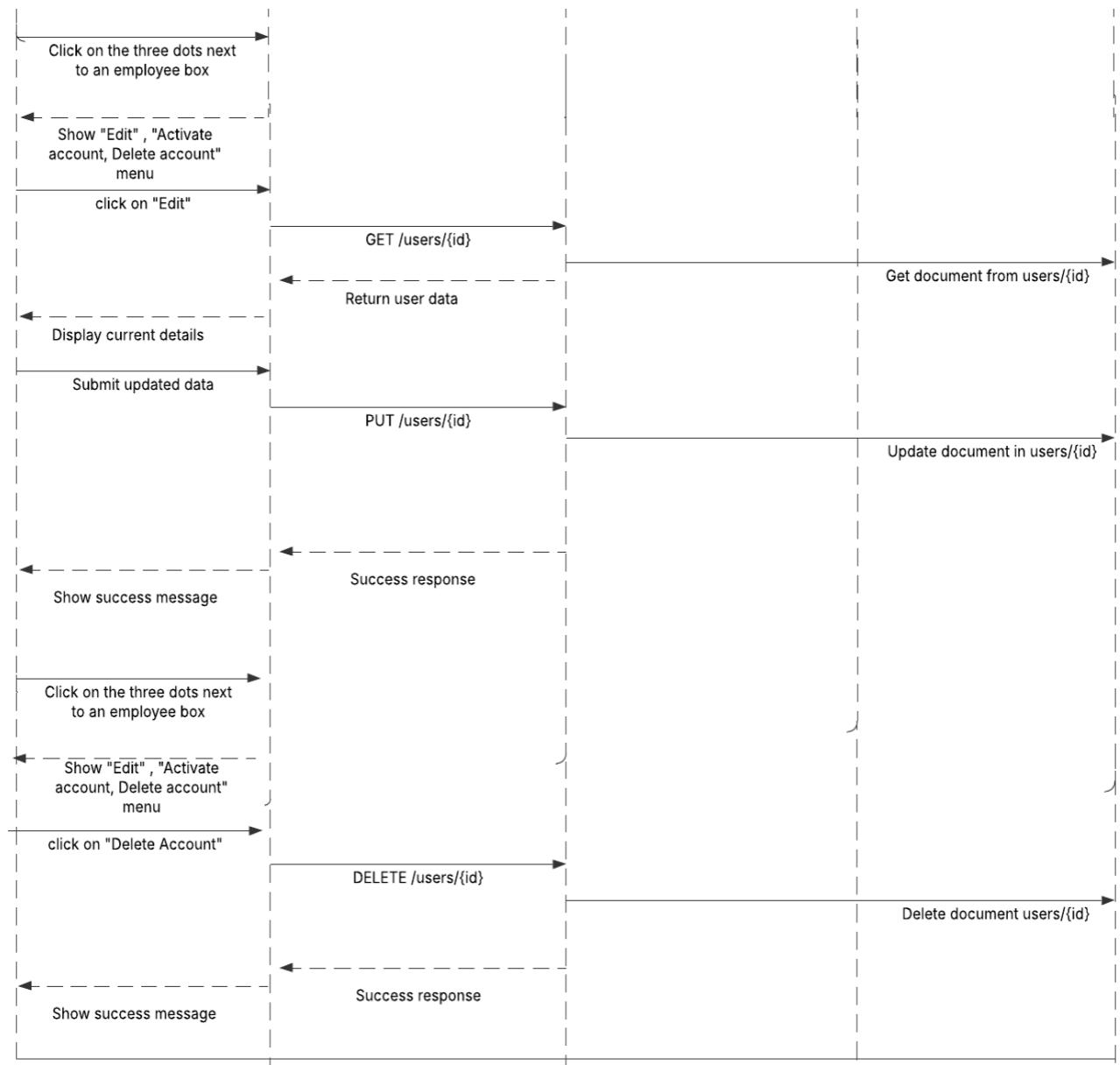


Figure 18-Sequence Diagram Manage Employee Account 2

4.2.3.2 Suspend or Reactivate User Accounts

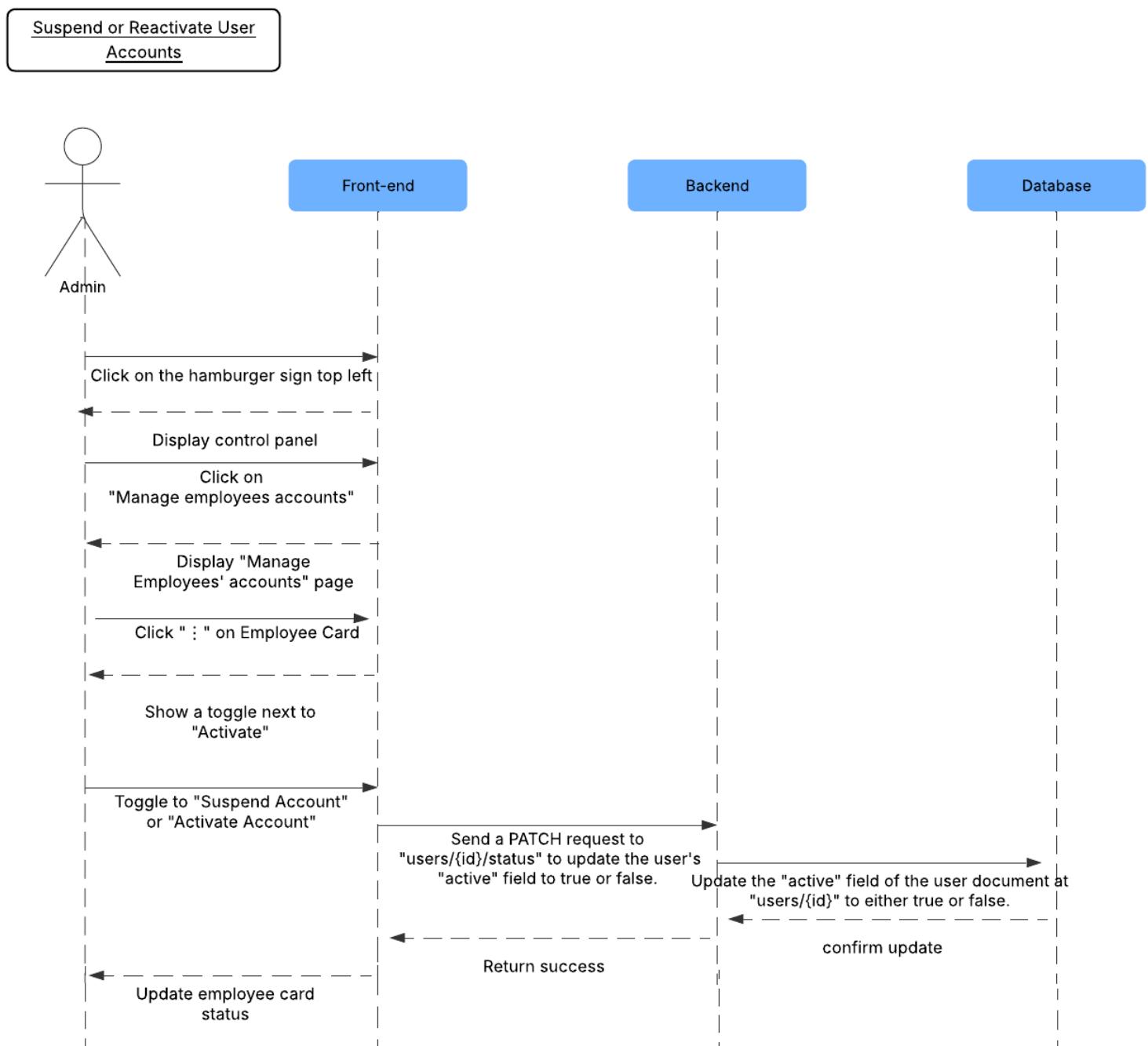


Figure 19-Sequence Diagram Suspend or Reactivate User Accounts

4.2.3.3 Manage Complaints

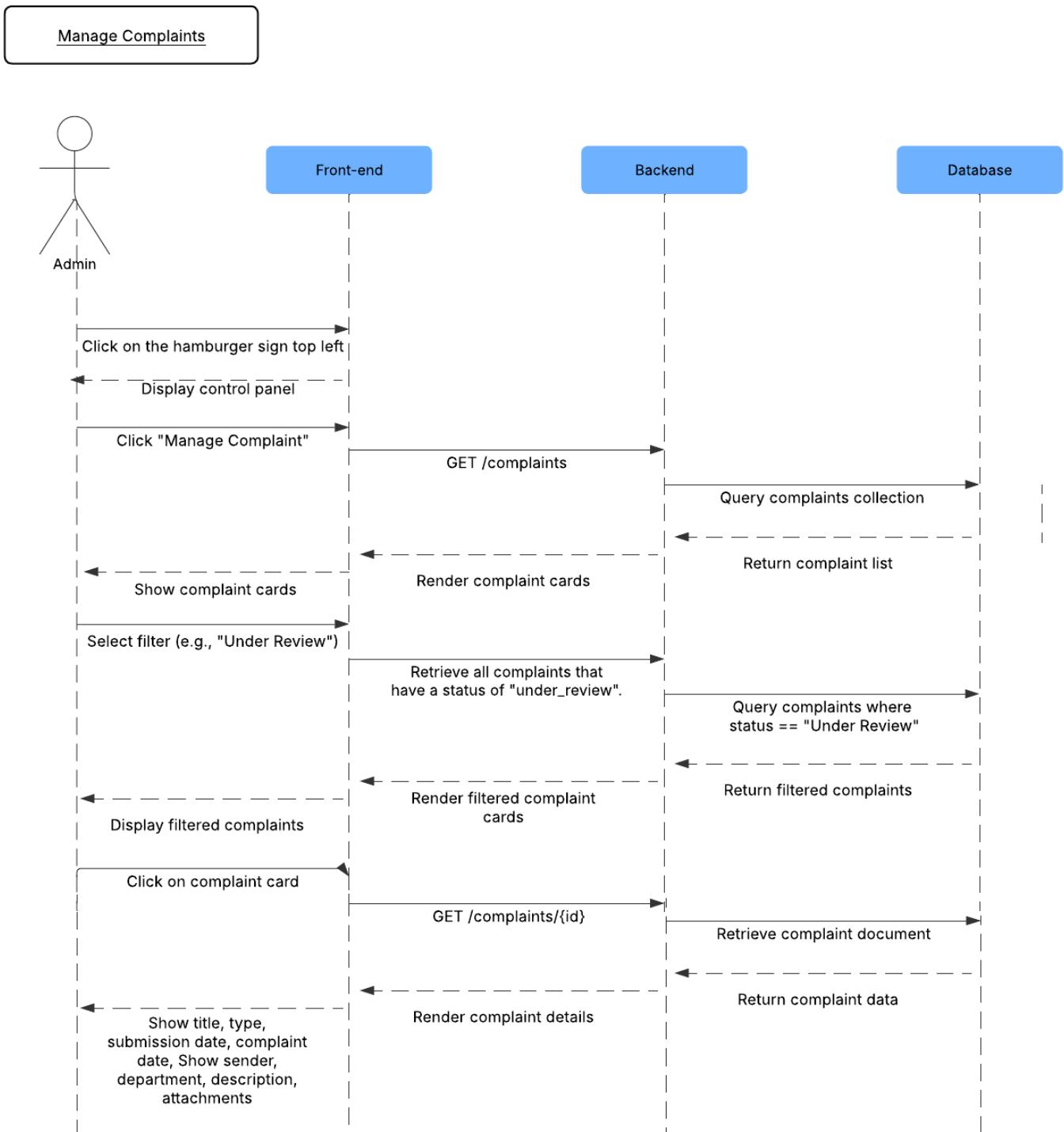


Figure 20-Sequence Diagram Manage Complaints 1

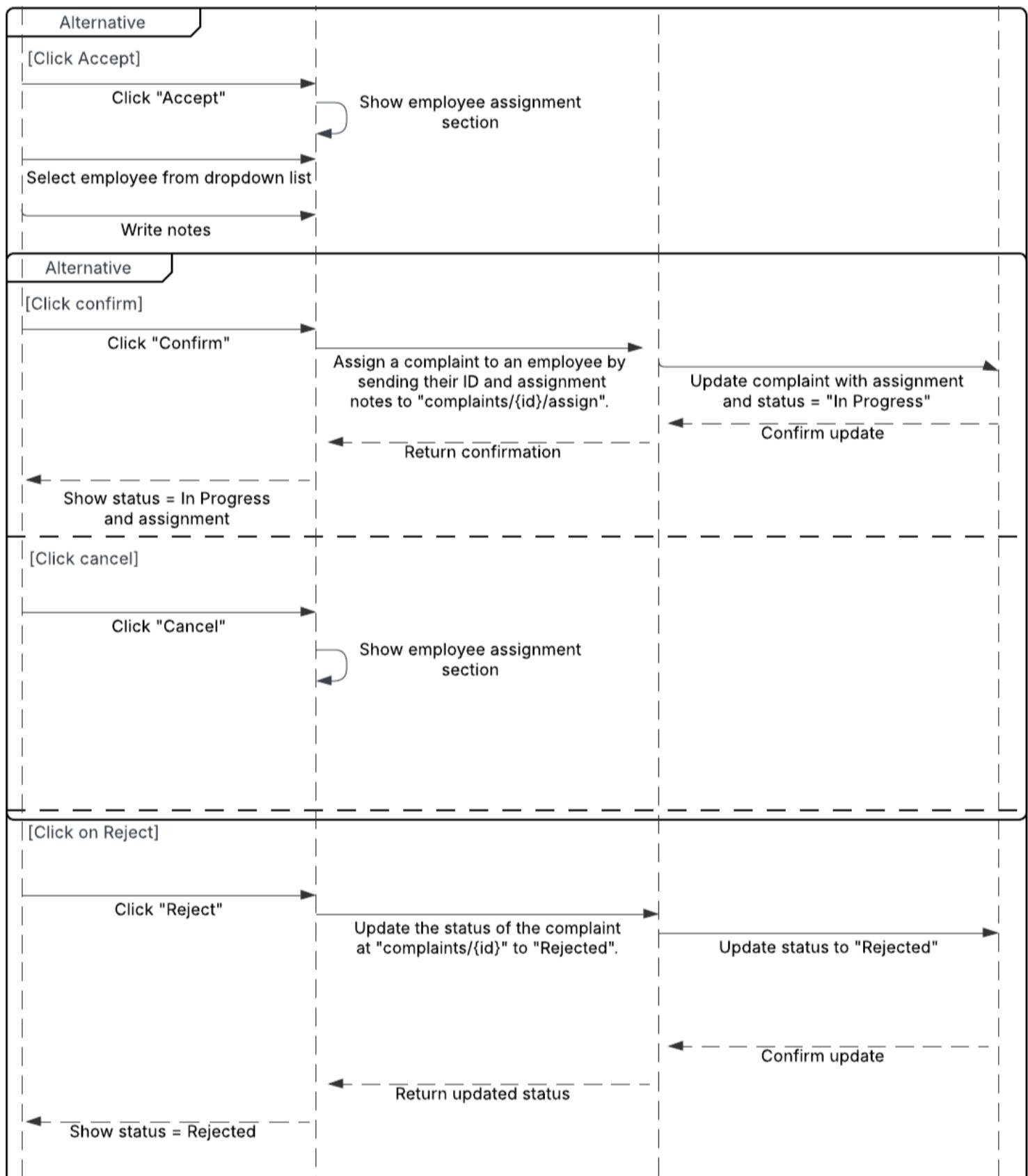


Figure 21- Sequence Diagram Manage Complaints 2

4.2.3.4 Manage Suggestions

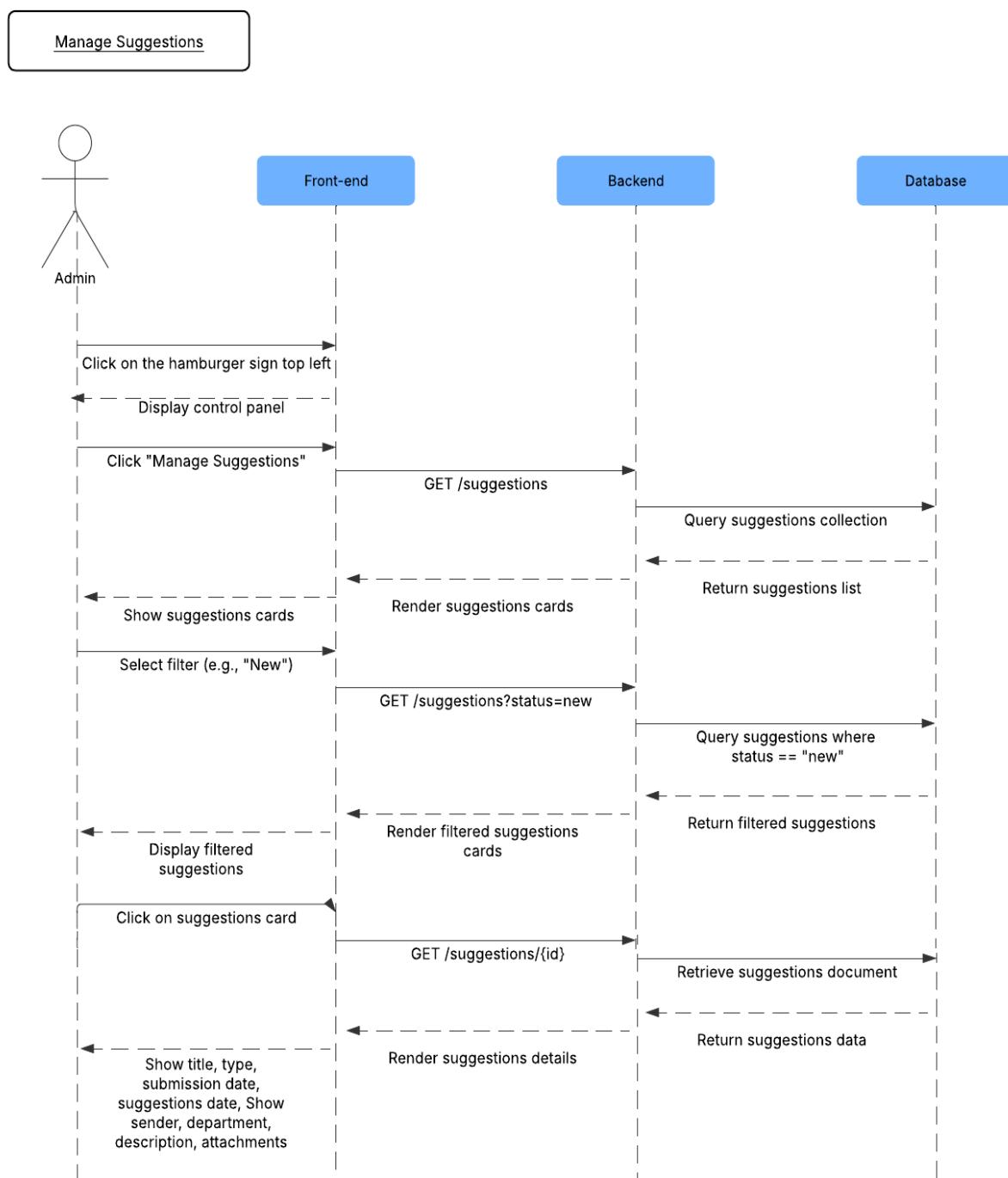


Figure 22-Sequence Diagram Manage Suggestions 1

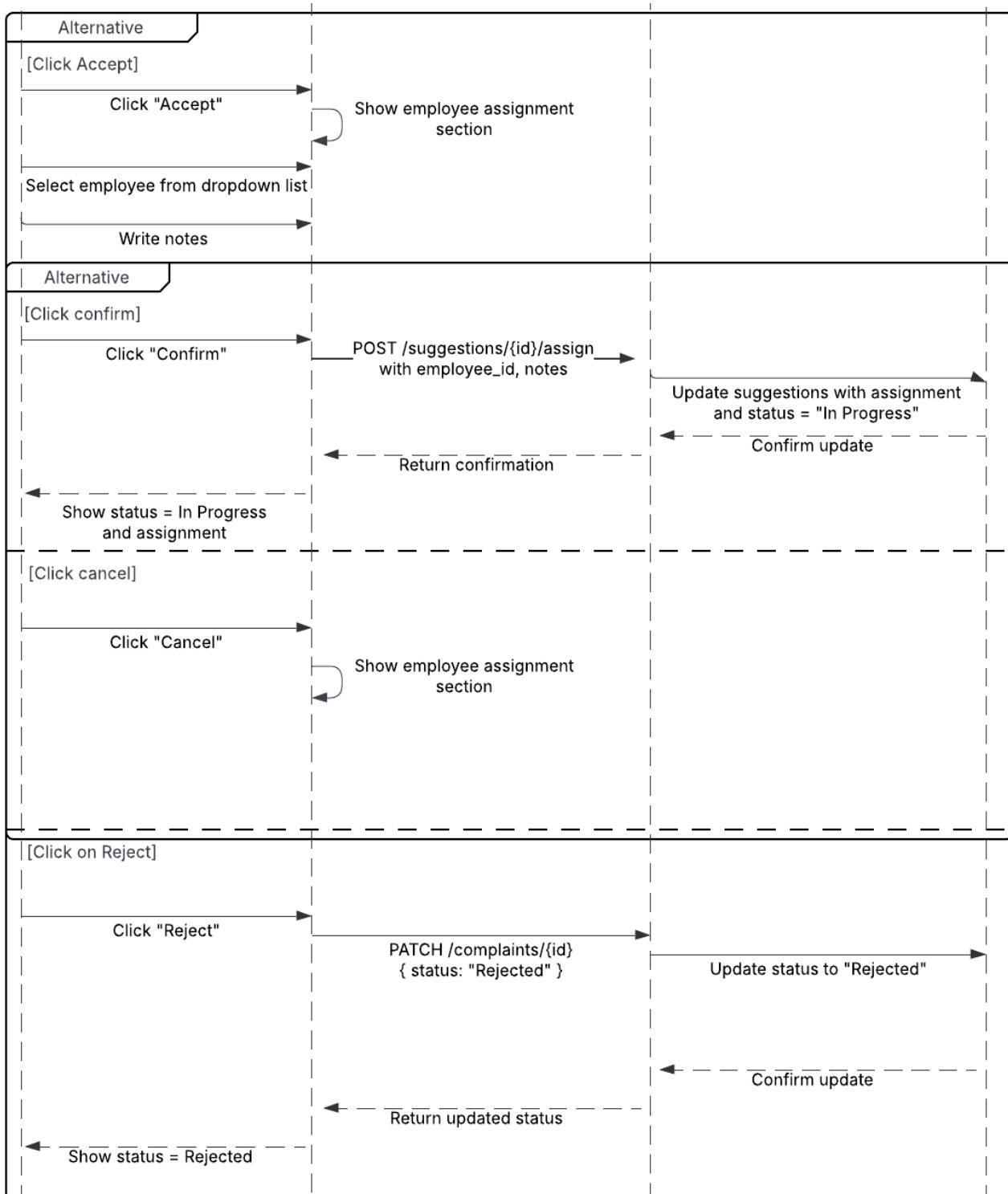


Figure 23-Sequence Diagram Manage Suggestions 2

4.2.3.5 Upload Files

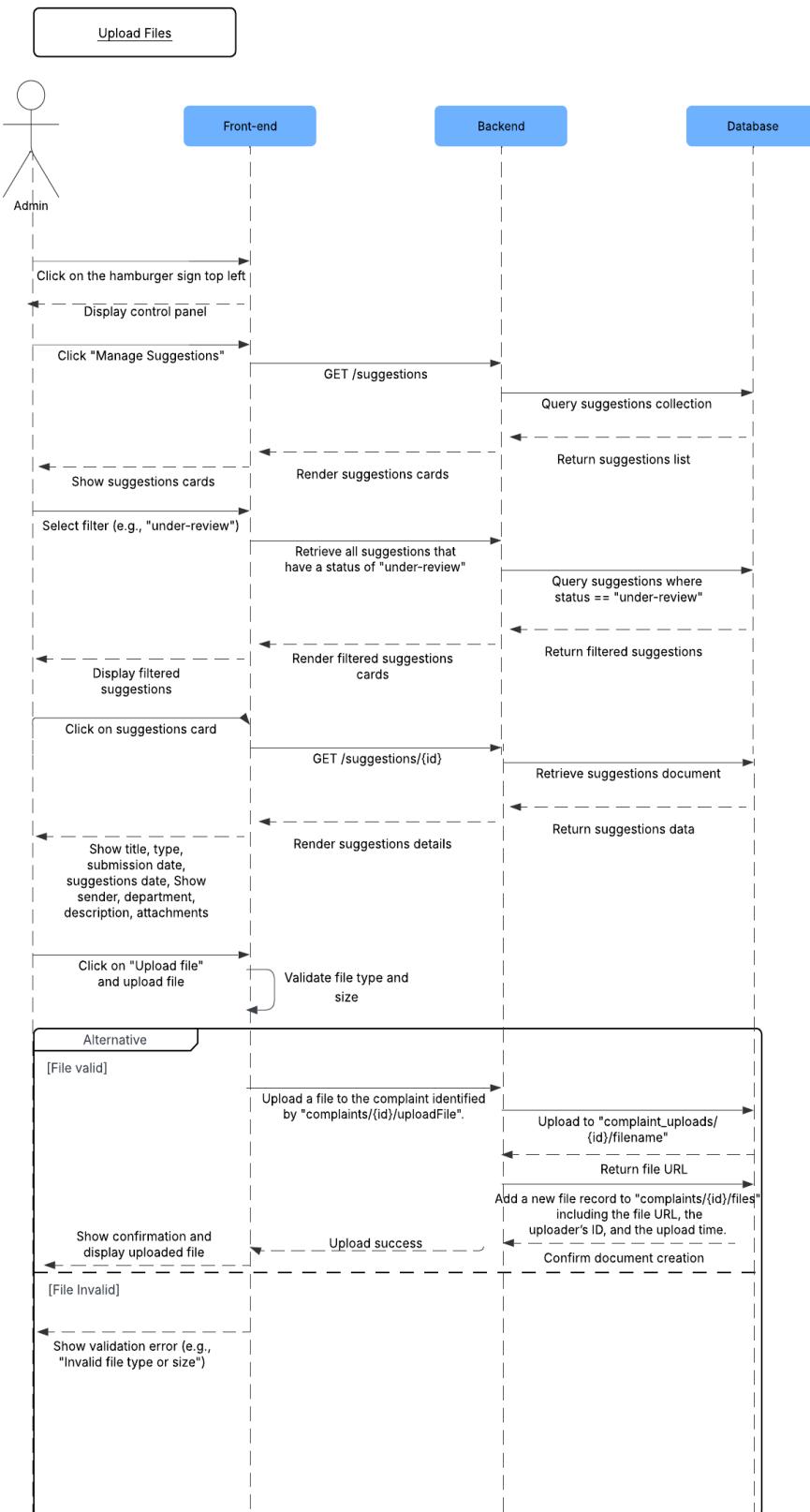


Figure 24-Sequence Diagram Upload Files

4.3 Class Diagram

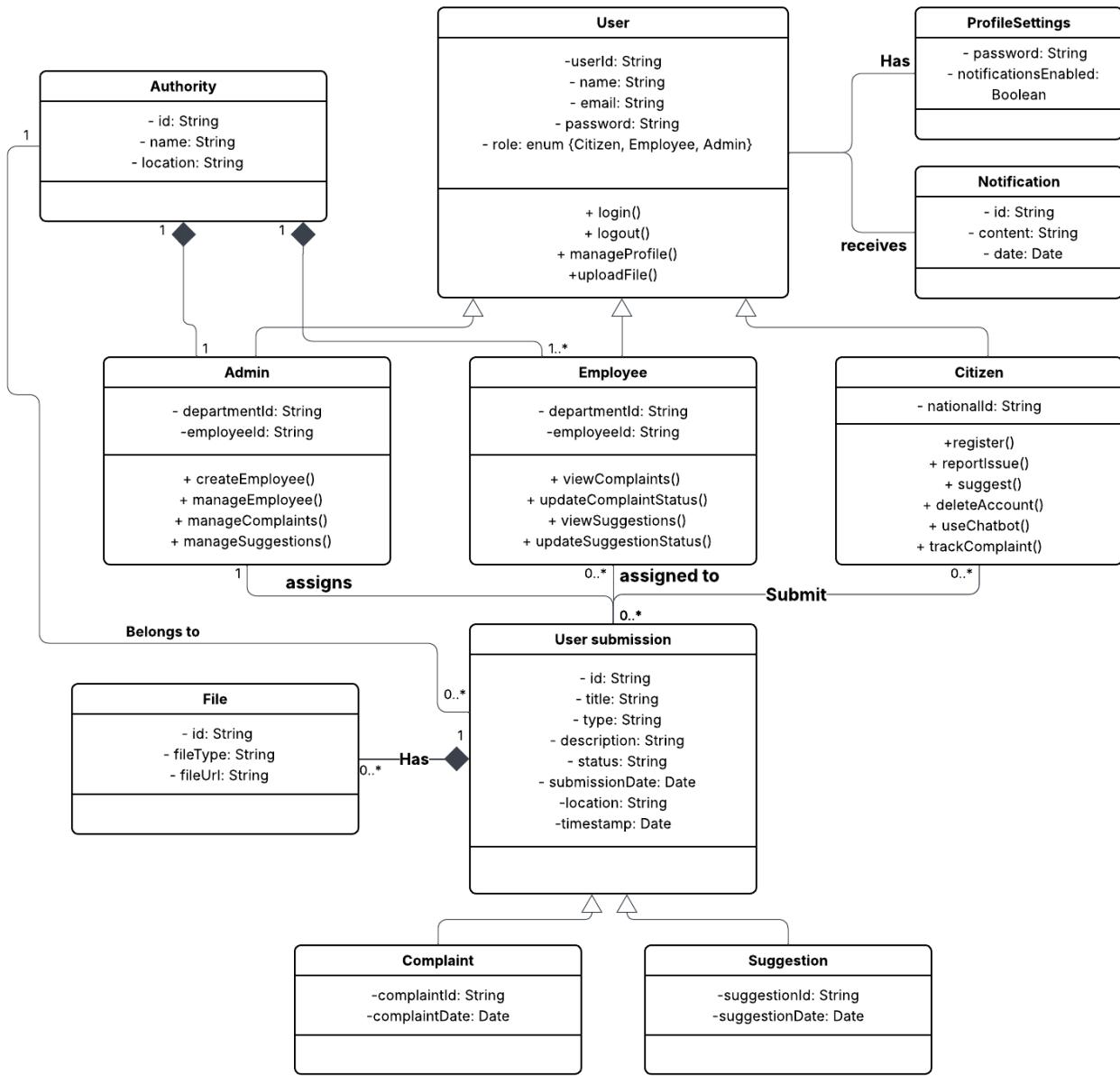


Figure 25- Class Diagram

4.4 Architecture Design

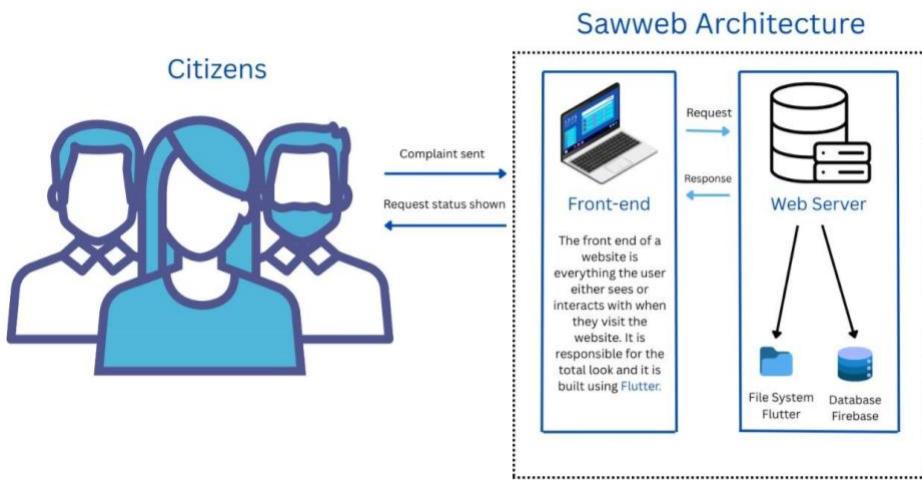


Figure 26-Architecture Design 1

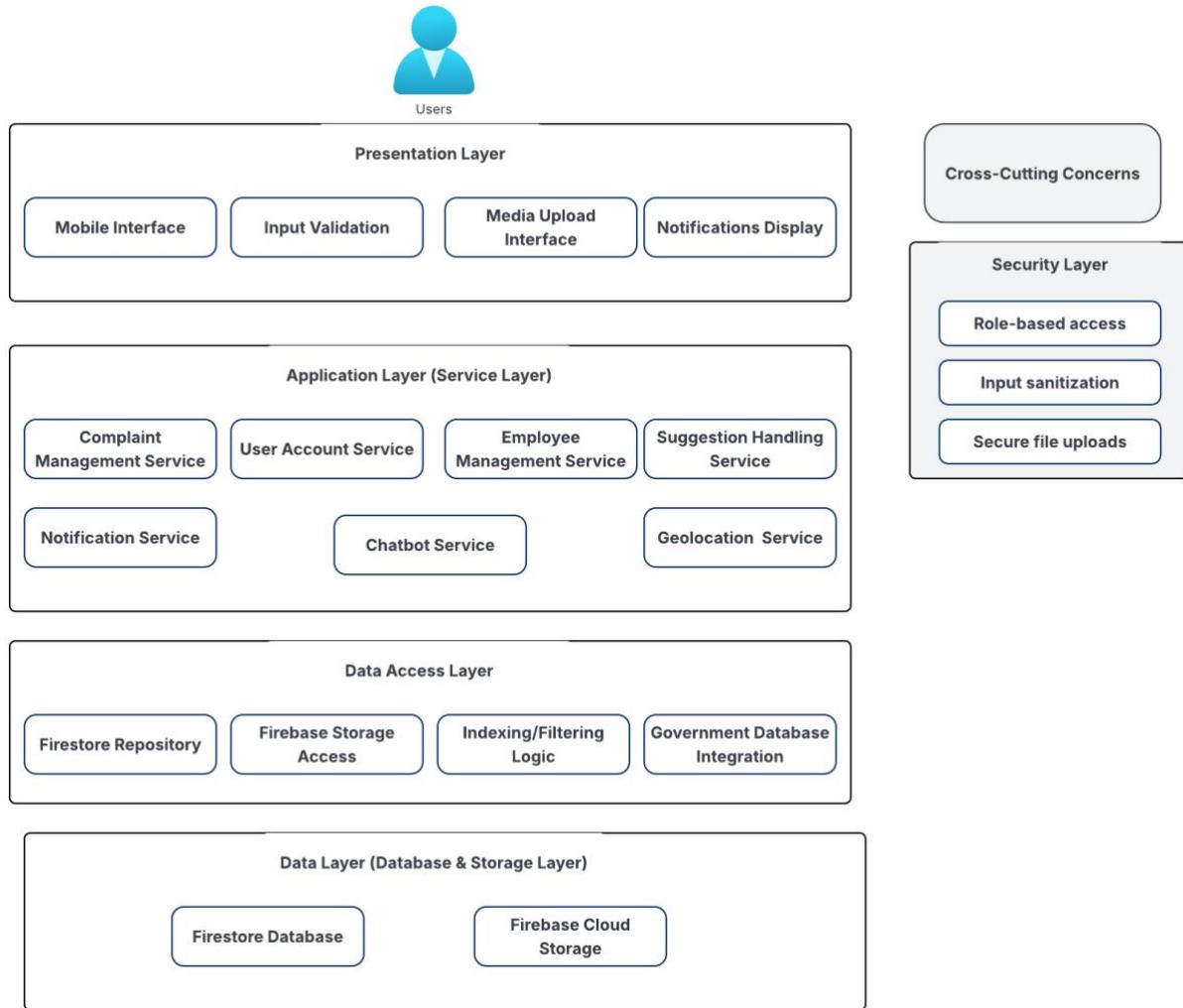
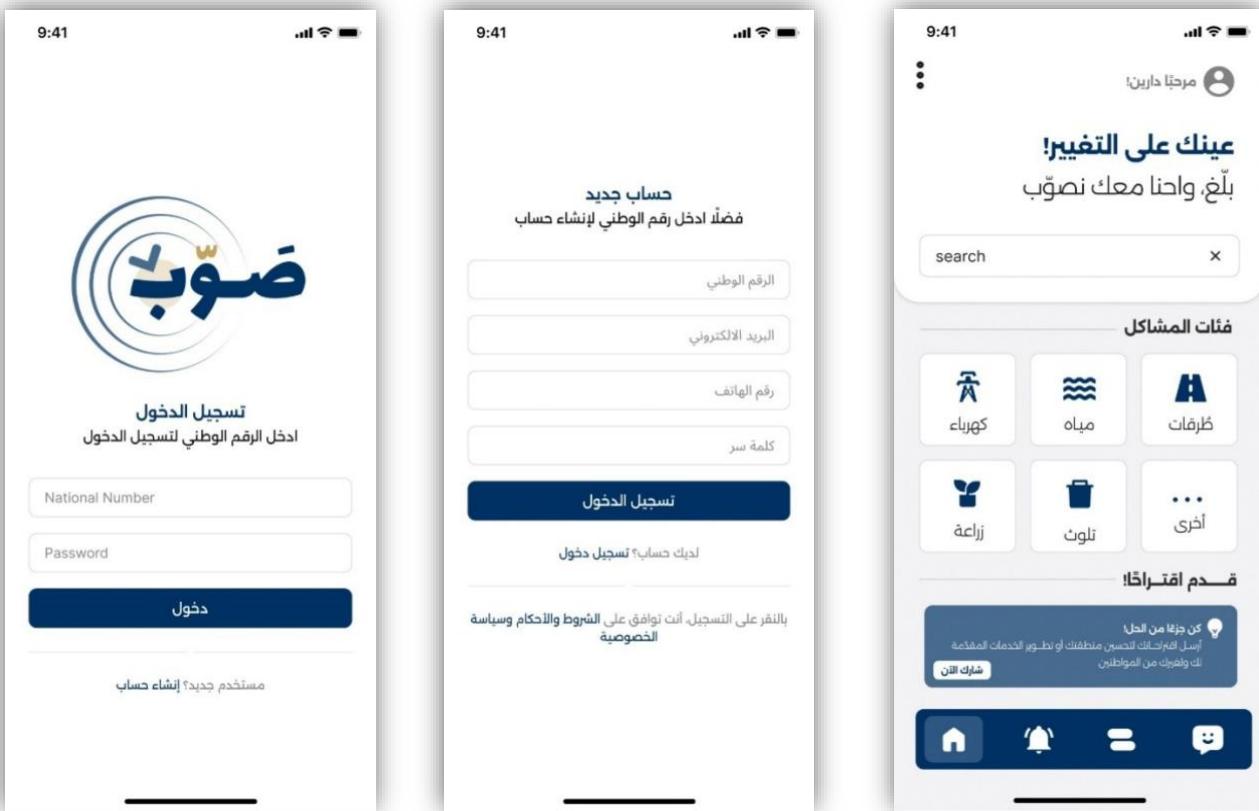


Figure 27-Architecture Design 2

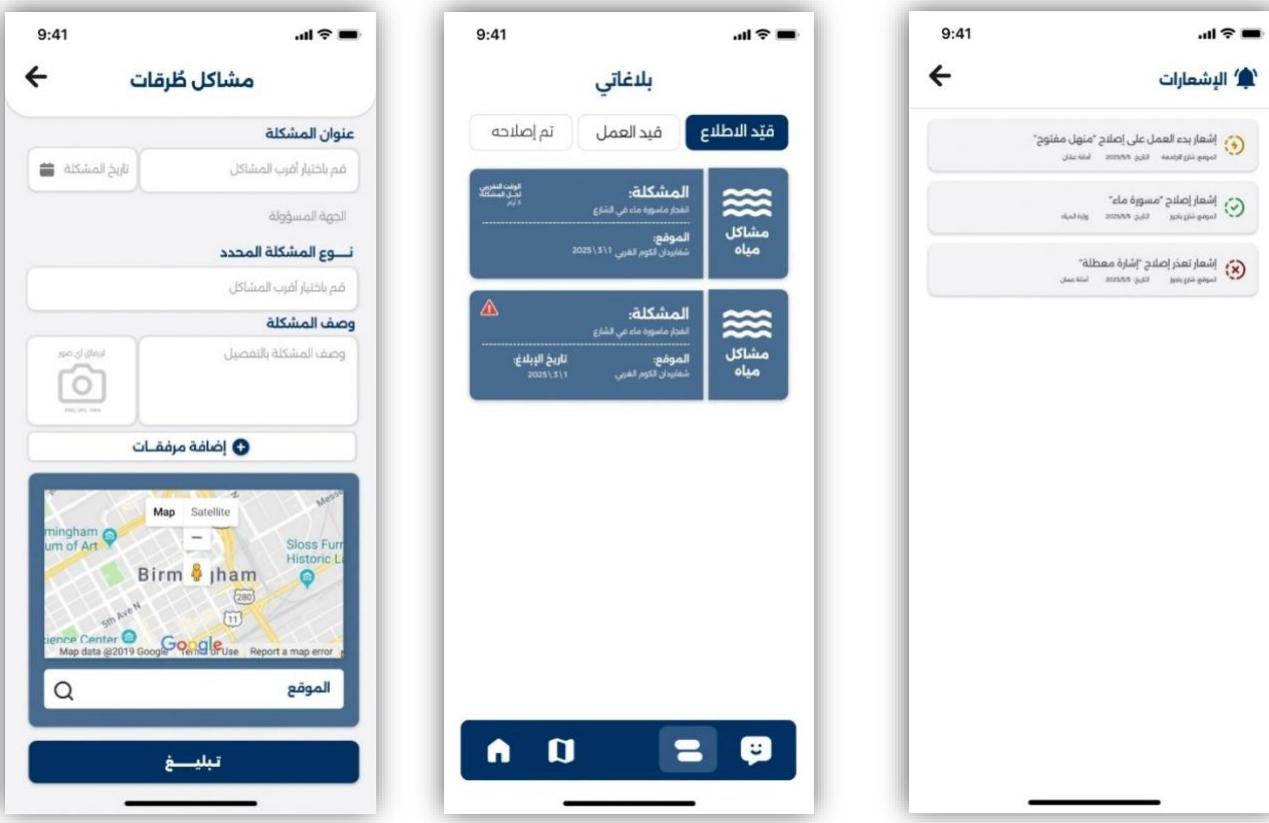
4.5.1 Graphical User Interface Design (Citizen)



Login page

Register account

Home page / Dashboard



File a complaint

Complaint tracking

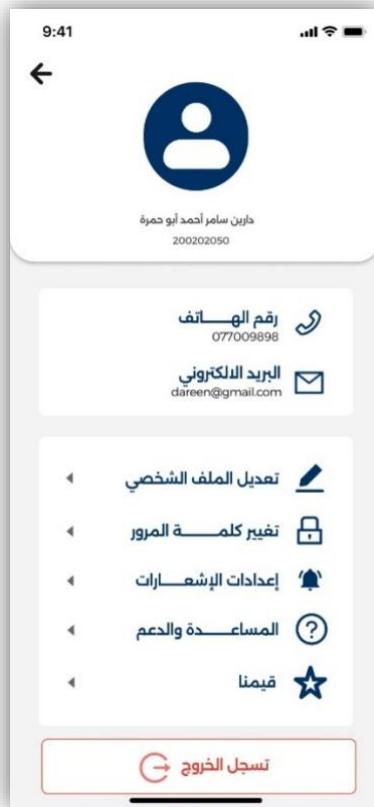
Notifications



File a suggestion



Notifications settings

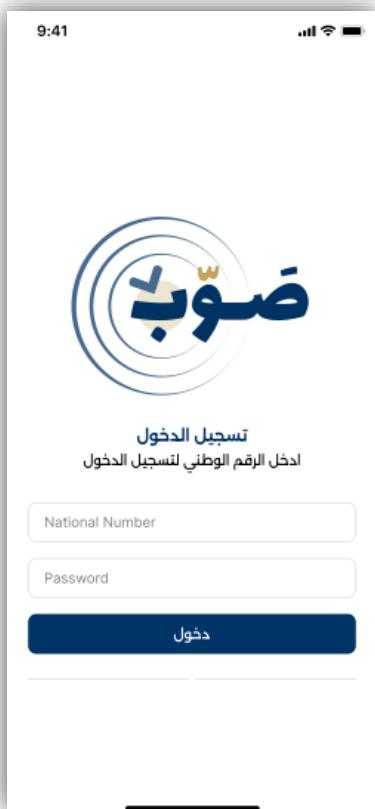


Profile

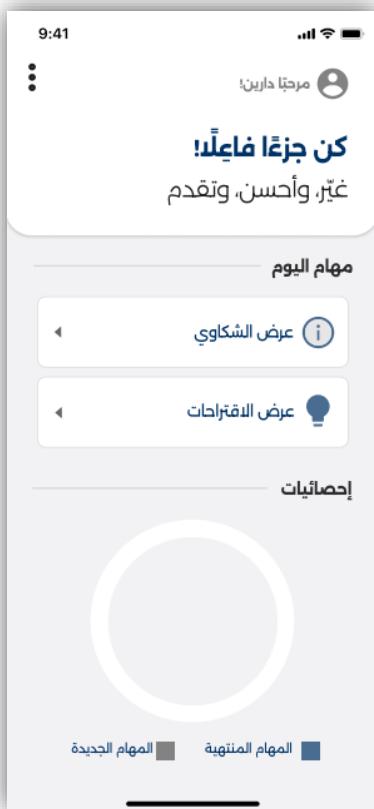


Chatbot

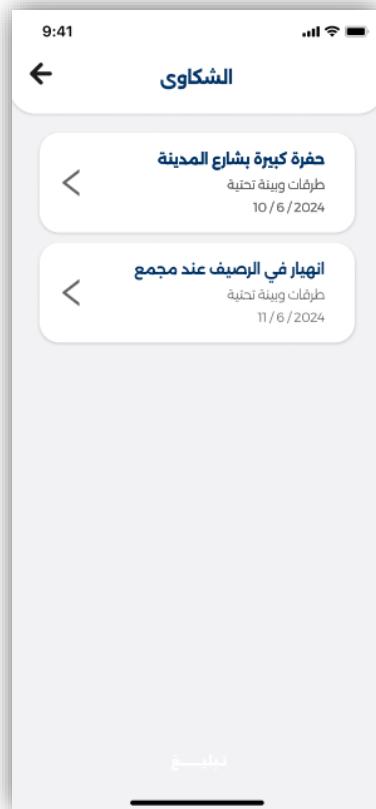
4.5.2 Graphical User Interface Design (Employee)



Login page



Dashboard



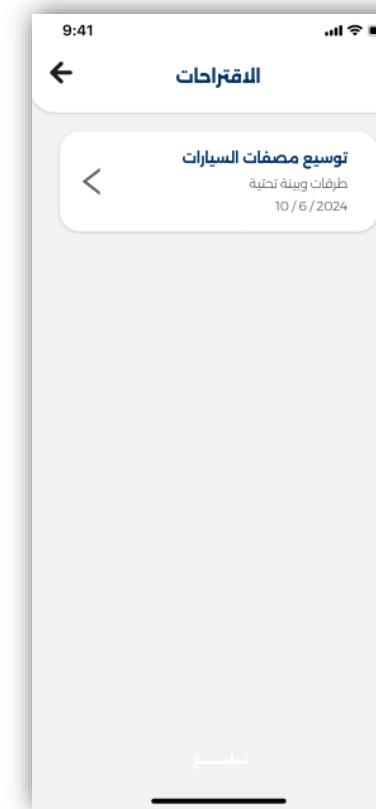
View complaints



Check a complaint



Mark a complaint as solved



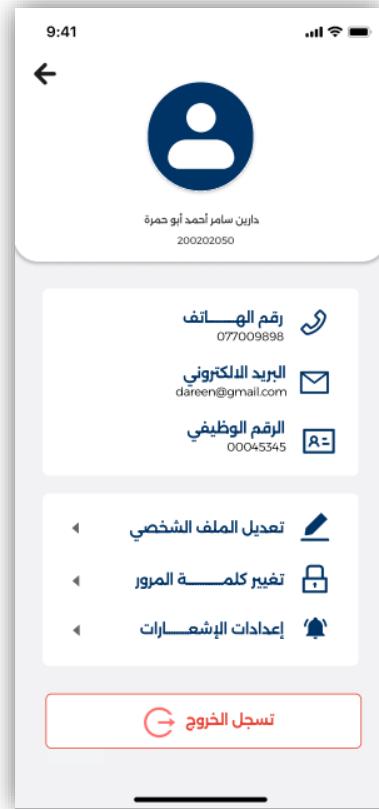
View suggestions



View a complaint



Mark as “Resolved”

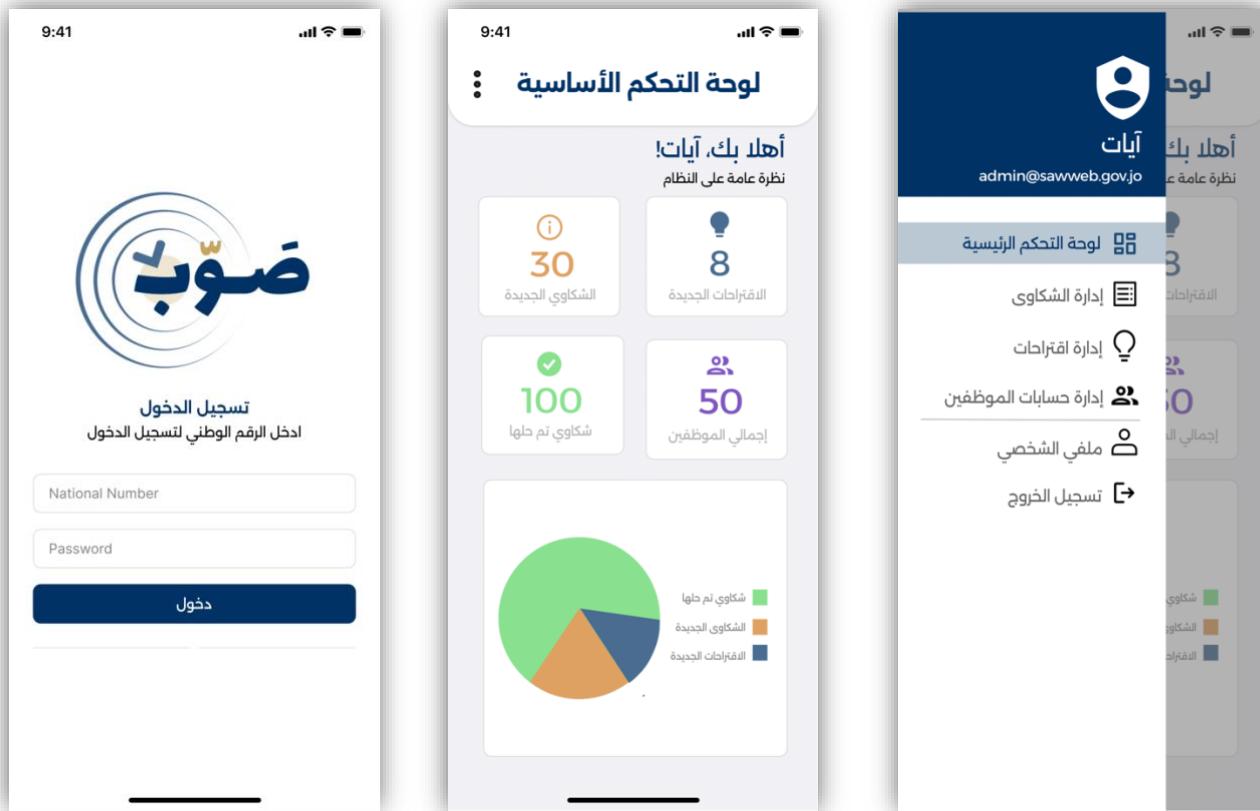


View profile



Manage notifications

4.5.3 Graphical User Interface Design (Admin)



Login page

Dashboard

Control page

Manage
employees'
accounts

Suspend or
Reactivate
employees'

Create employee account



Manage complaints



View complaints



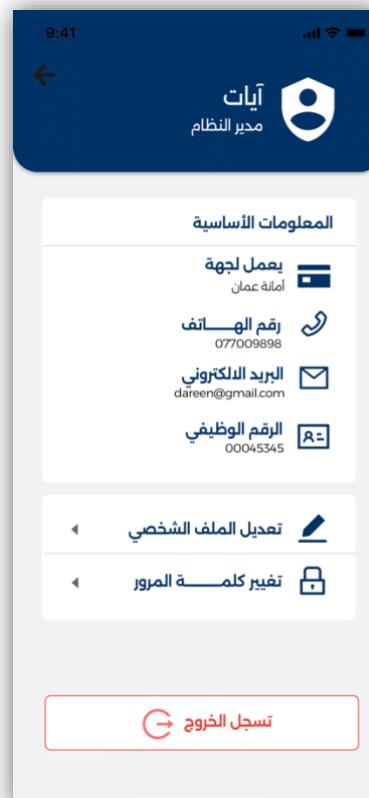
Manage complaint



Accept/Reject complaints



Manage suggestions



View profile

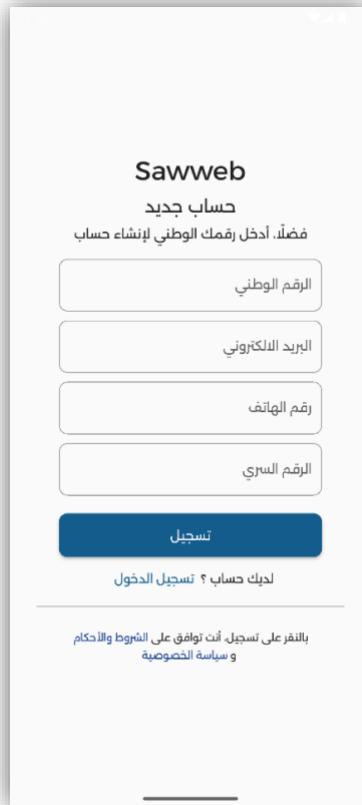
5.0 Implementation

5.1 Graphical User Interface Implementation

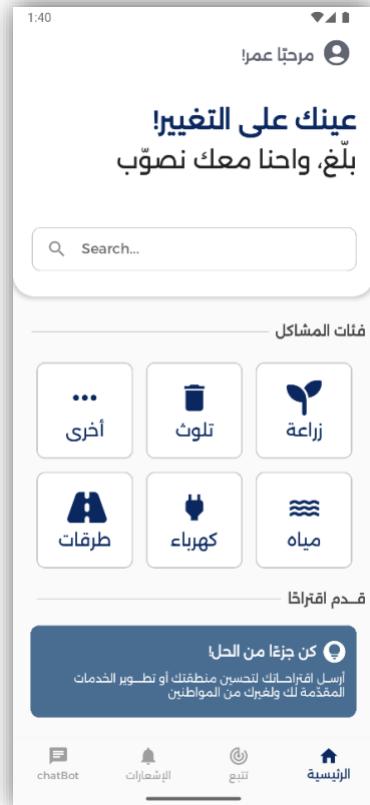
5.1.1 Graphical User Interface Implementation (Citizen)



Login Page



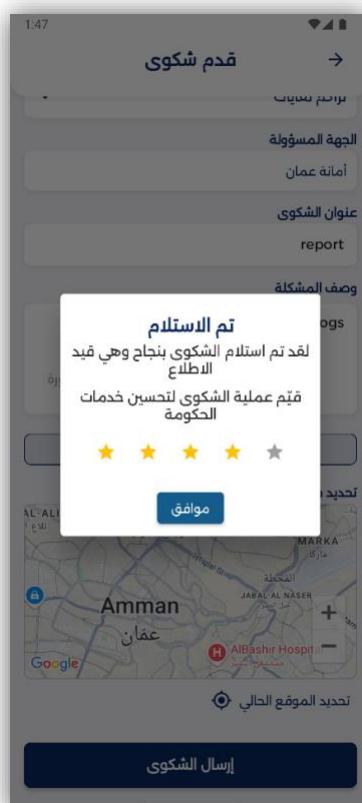
Register Account



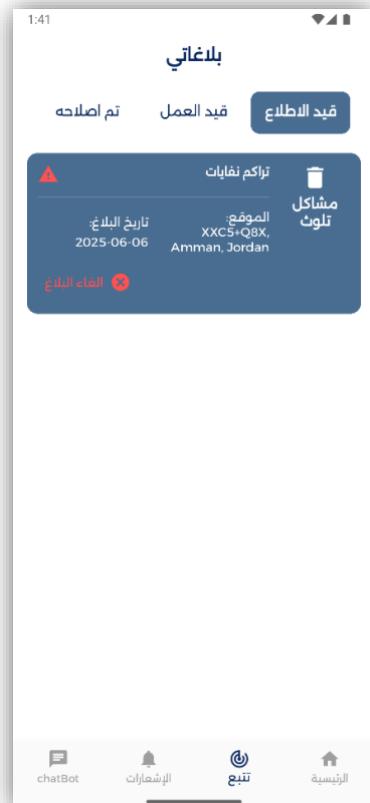
Home Page / Dashboard



File a complaint



Rate complaint process



Complaint tracking



Notifications



File a suggestion



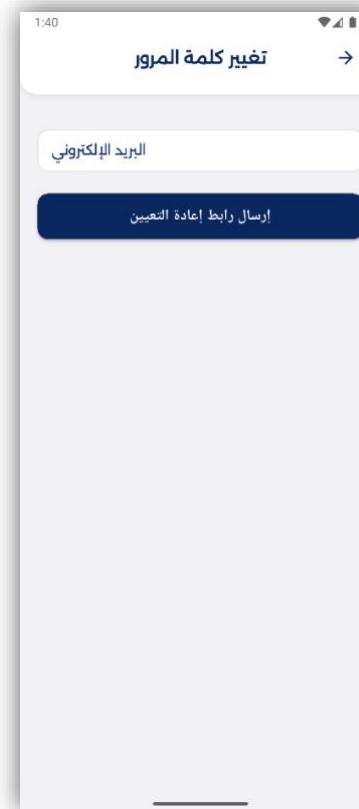
Notifications settings



Profile



Edit profile



Change password

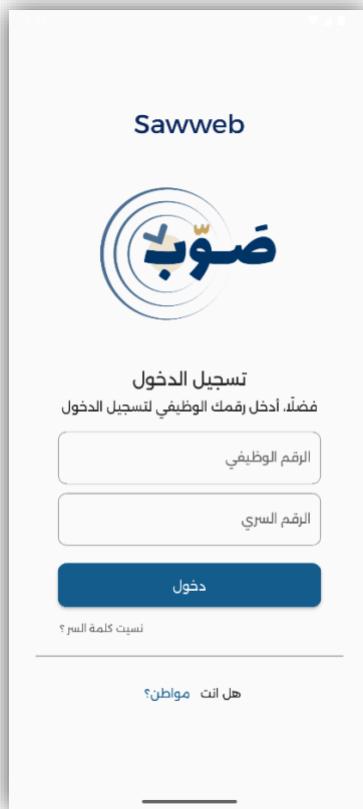


Help and Support



Chatbot

5.1.2 Graphical User Interface Implementation (Employee)



Login page



Dashboard



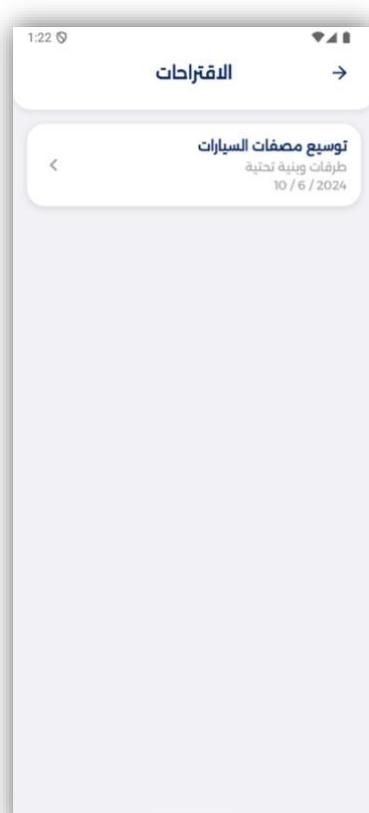
Complaints



View complaint



Mark as “Resolved”



View Suggestions



View suggestions



Mark as “Resolved”

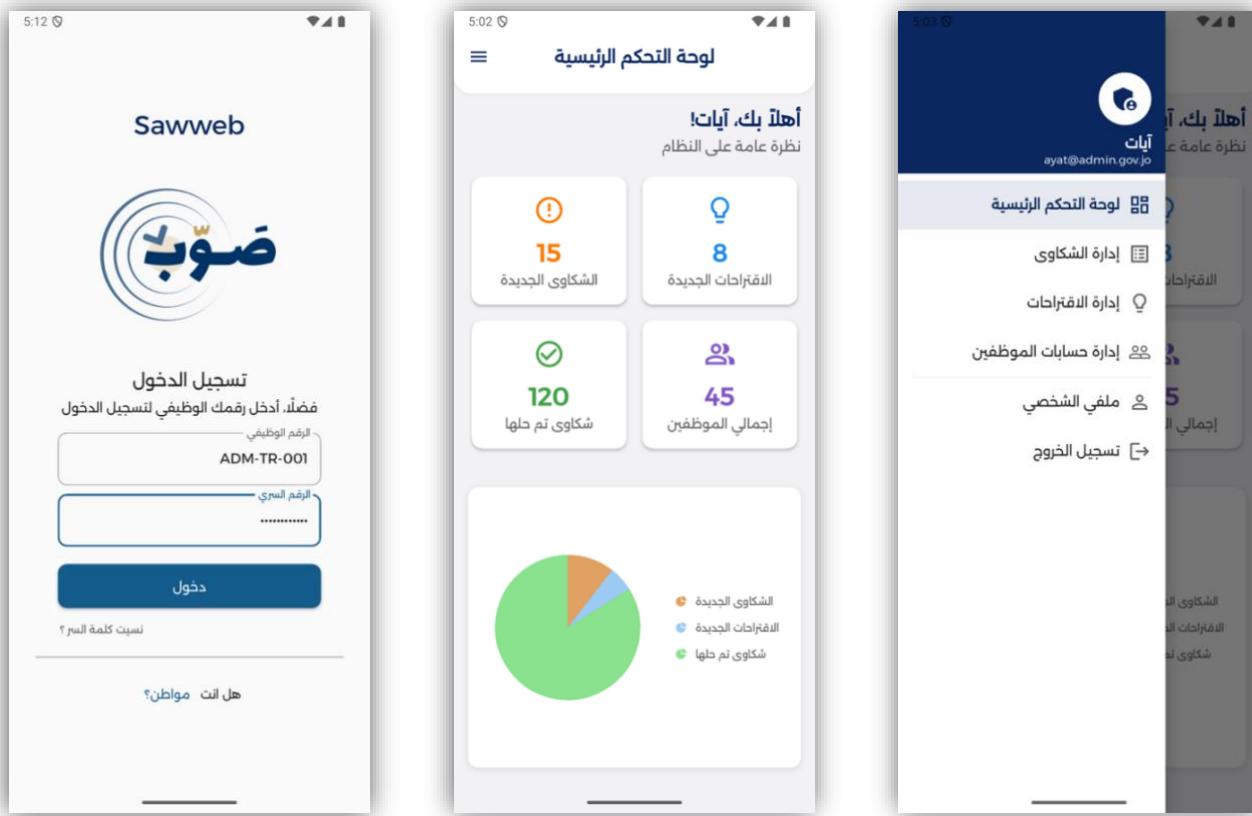


Notifications



View profile

5.2.3 Graphical User Interface Implementation (Admin)



Login page

Dashboard

Control panel



Manage employees' accounts



Suspend or
Reactivate
employees'



Create employee account



Edit employee account



Manage complaints



Filter complaints



View complaints



Accept/Reject complaints



Assign complaints to employees



Manage suggestions



Accept/Rject suggestions



Assign suggestions to employees

5.2 Database implementation

5.2.1 Backend overview

The backend for the Sawweb is built using **Firebase**, a scalable, serverless backend platform offering real-time database capabilities and seamless integration with Flutter. It manages user authentication, data storage, file/media uploads, role-based access control, and real-time updates.

The core of the system is Firebase Core, which initializes the connection between the flutter app (frontend) and the firebase project (backend). The Firebase core layer ensures that all the firebase services- such as Firestore, Authenticaon, and Storage – are properly configured and accessible.

Core Firebase services used:

- Firebase Core – Initializes Firebase and loads configuration from google services for both Android and iOS.
- Firebase Authentication – Handles secure sign up and login using email and password, with verification against National ID data.
- Cloud Firestore – Services as the main NoSQL database for storing users, reports, suggestions, categories, and more.

5.2.2 Firebase authentication and user sign in method

For Sawweb, we use Firebase authentication to manage user access securely and efficiently. The sign in method is Email/Password, where each user has an email, password, and a user unique identifier (UID). A UID is a permanent, unique string automatically generated by Firebase upon user creation. The UID acts as a primary key across the system to identify users and associate their data.

5.2.3 Cloud Firestore database structure

In Firestore database, Data is organized into collections, which contains documents each of which can store multiple fields of various datatypes or even subcollections. In Sawweb, we have multiple collections which are:

1. Citizens

“citizen” represents a mock dataset of citizen records, simulating a government database. It is **read-only** and used for validating national ID data during sign-up.

Document ID – Citizens’ National ID.

Fields

Field name	Data type	description
“first_name”	string	Citizens’ first name
“second_name”	string	Citizens’ second name
“middle_name”	string	Citizens’ middle name
“last_name”	string	Citizens’ last name
“birth_date”	timestamp	Citizens’ date of birth

Table 61-Citizen fields

The screenshot shows the Google Cloud Firestore interface. On the left, there's a sidebar with navigation links: Home, citizens, 2208062758, + Start collection, admins, category, citizens, employees, reports, suggestions, and users. The main area displays the "citizens" collection. A document with the ID "2208062758" is selected. The document details are shown on the right: birth_date: 8 April 2004 at 00:00:00 UTC+3, first_name: "دارين", last_name: "أبو حمزة", middle_name: "أحمد", and second_name: "سامر". There are also buttons for + Start collection and + Add field.

2. Users

The “users” collection contains registered app users. When a citizen signs up, the app verifies their national_id against the citizens collection. If valid, their data is fetched, and a new account is created.

Document ID – user UID

Fields:

Field name	Type	Description
“national_id”	string	Citizens’ National ID – from “citizens” collection
“first_name”	string	Citizens’ first name – from “citizens” collection
“second_name”	string	Citizens’ second name – from “citizens” collection
“middle_name”	string	Citizens’ middle name – from “citizens” collection
“last_name”	string	Citizens’ last name – from “citizens” collection
“email”	string	Citizens’ email – entered by the user in sign up
“phone_number”	string	Citizens’ phone – entered by the user in sign up

Table 62-User fields

Field	Type	Value
email	String	dareeabuhamra@hotmail.com
first_name	String	دارين
last_name	String	أبو حمزة
middle_name	String	أحمد
national_id	String	2208062758
phone_number	String	0796406942
second_name	String	سامر
uid	String	2FlwFJUIoUgHPqc8sXQK6Phjlcg1

Subcollection:

“notificationList” to store user-specific notifications about report status and suggestions.

Document ID – Auto-generated

Fields:

Field name	Data type	Description
“title”	string	Title of the notification
“body”	string	Body of the notification
“location”	string	Location of the report or suggestion
“timestamp”	timestamp	Time of the notification
“read”	Boolean	Flag to indicate if the notification has been read or not
“icon”	string	The icon displayed in the notification
“color”	string	The color of the icon

Table 63 -Notification list fields

The screenshot shows the Google Cloud Firestore interface. On the left, there's a navigation tree: Home > users > 2FlwFJUloUgHPqc8sXQK6Phjlcg1 > notificationList > 7CiEzUonHgjL9... . On the right, there's a "More in Google Cloud" dropdown and a vertical ellipsis. The main area displays a document in the notificationList collection with the key 7CiEzUonHgjL91vh9MV2. The document contains the following fields and their values:

body : "شكراً على تقديم الشكوى، تم ارسالها إلى أمانة عمان للابلاغ"
color: "Amber"
icon: "sync"
location: "Ibn Al-Alaa St. 12, Amman, Jordan"
read: false
timestamp: 8 June 2025 at 22:38:11 UTC+3
title: "تم تقييم شكوى إزالة مطبات اسمنته عشوائية"

Below the document, there are sections for "Start collection" and "Add field". The "Start collection" section shows a "notificationList" collection with a single document "7CiEzUonHgjL91vh9MV2". The "Add field" section lists several fields with their current values:

- email: "dareeabuhamra@hotmail.com"
- first_name: "ذارين"
- last_name: "أبو حمزة"
- middle_name: "أحمد"
- national_id: "2208062758"
- phone_number: "0796406942"
- second_name: "سامر"
- uid: "2FlwFJUloUgHPqc8sXQK6Phjlcg1"

3. Category

The category collection defines available complaint categories and their associated issues. It is used to dynamically populate options in the complaint submission form and in search.

Document ID – Category name

Fields:

Field name	Data type	Description
“icon”	string	Icon of the category displayed
“issues”	list of maps	A list of issues of the same category
- “issue”	- string	- The issue name
- “responsible_department”	- string	- The responsible department of the issue

Table 64-Category fields

4. Reports

“reports” collection stores all under review, in progress, and resolved complaints submitted by all users.

Document ID – Auto-generated

Fields:

Field name	Data type	Description
“national_id”	string	The national ID of the citizen that submitted the complaint
“full_name”	string	The full name of the citizen that submitted the complaint
“type”	string	The category of the issue – from “category” collection document ID
“issue”	string	The name of the issues – from “category” collection “issue” field
“authority”	string	The responsible department – from “category” collection “responsible_department” field
“title”	string	The title of the issue – entered by the user
“description”	string	The description of the issues – entered by the user
“issue_time”	timestamp	The time of the issue – emtered by the user
“timestamp”	timestamp	The time of submitting the complaint
“photo_path”	string	The path of the photo – attached by the user
“attachments”	string	The path of the file – attached by the user
“state”	string	The status of the complaint – “under review” when submitted
“rate”	number	The rating of the complaint submission process – entered by the user

“location”	map	The coordinates of the location of the issue – pinned by the user using google maps
- “lat”	- number	- The latitude of the location
- “lng”	- number	- The longitude of the location

“place_name”	string	A textual address or place name derived from the coordinates using reverse geocoding
---------------------	--------	--

Table 65- Report fields

The screenshot shows a Google Cloud Firestore interface. On the left, there's a sidebar with collections: admins, category, citizens, employees, reports (selected), suggestions, and users. The main area shows a document in the 'reports' collection with the ID 'zxpG9iCLr5Yh99NuJXg7'. The document contains the following fields:

- authority: "دائرة الشؤون الاجتماعية"
- description: "أود تقديم شكوى بخصوص سوء حالة أرضية الملعب الرياضي في الحديقة العامة بمنطقة وسط البلد. الأرضية غير مستوية ويستوي على تشققات واضحة مما يشكل خطراً على المستخدمين، خصوصاً الأطفال."
- full_name: "زينب علي وسميم الريماوي"
- issue: "صيانة ملائمة رياضية"
- issue_time: "2025-06-05T00:00:00.000"
- location:
 - lat: 31.955501386233703
 - lng: 35.93330170959234
- national_id: "2726494924"
- photo_path: null
- place_name: "Hashem Al-Kheir St. 65, Amman, Jordan"
- rate: 3
- state: "قيد الاطلاع"
- timestamp: 6 June 2025 at 19:38:46 UTC+3
- title: "الحاجة لصيانة أرضية الملعب في الحديقة العامة"
- type: "آخر"

5. Suggestions

“suggestions” collection stores all submitted suggestion by all users.

Document ID – Auto generated

Fields:

Field name	Data type	Description
“national_id”	string	The national ID of the citizen that submitted the suggestion
“full_name”	string	The full name of the citizen that submitted the suggestion
“title”	string	The title of the suggestion – entered by the user
“category”	string	The category of the suggestion – choosen by the user
“description”	string	The description of the suggestion – entered by the user
“photo_path”	string	The path of the photo – attached by the user
“attachments”	string	The path of the file – attached by the user
“timestamp”	timestamp	The time of submitting the suggestion
“location”	map	The coordinates of the location of the suggestion – pinned by the user using google maps
- “lat”	- number	- The latitude of the location
- “lng”	- number	- The longitude of the location
“place_name”	string	A textual address or place name derived from the coordinates using reverse geocoding

Table 66-Citizen fields

Home > suggestions > Mupbqn4BXWR...

More in Google Cloud

(default)	suggestions	Mupbqn4BXWRA1jy6qcb5
+ Start collection	+ Add document	+ Start collection
admins	0OCw3E4I4I3PfIDZpcgP	category: "النظافة"
category	2MpSJm4RvD8PAmnYZZj0	description: "للحظ وجود نقص في صناديق القمامة في بعض الأماكن العامة مثل الحدائق والأسواق، مما يؤدي إلى تراكم النفايات على الأرض. يقترح تركيب عدد إضافي من الصناديق لتسهيل التخلص من النفايات والحفاظ على النظافة العامة."
citizens	Mupbqn4BXWRA1jy6qcb5	full_name: "عمر يوسف خالد القراء"
employees	RQbjD4sc2ja5TsJ5o7Vq	location
reports	RvYAkjKjctMYelQQdauU	latitude: 31.96122385436813
suggestions	vzLzP5K6quRcYEKz35qi	longitude: 35.92714469879866
users		national_id: "2225883409"
		photo_path: null
		place_name: "Moulinex Commercial Complex Khalid Bin Al Walid St 80 Amman, Amman, Jordan"
		rate: 3
		timestamp: 6 June 2025 at 19:16:34 UTC+3
		title: "توفير صناديق قمامة إضافية في المناطق ذات الكثافة العالية"

6.0 User Manual

6.1 Citizen Guide

1. Sign up and Login Pages

1. If you don't have an account yet, go to the **Sign-up** page.
2. Enter your **National ID**, **Email**, **Phone number**, ,and **Password**. Then click on the Sign-up button to create an account then go to the **Login** page.

The image consists of two side-by-side screenshots of a mobile application interface. Both screenshots show a white background with a header and several input fields.

Screenshot 1 (Left): Sign-up Page

- Header:** Sawweb
- Text:** حساب جديد
فضلاً، أدخل رقمك الوطني لإنشاء حساب
- Input Fields:**
 - الرقم الوطني (National ID): An empty text input field.
 - البريد الإلكتروني (Email): omar.karaleh.2225@email.com
 - رقم الهاتف (Phone number): 0790000001
 - الرقم السري (Password): An empty text input field.
- Buttons:**
 - A large blue "تسجيل" (Sign Up) button at the bottom.
 - A smaller link "لديك حساب؟ تسجيل الدخول" (Already have an account? Log in) below it.
- Footer:** By clicking on registration, you agree to the [Terms and Conditions](#) and [Privacy Policy](#).

Screenshot 2 (Right): Login Page

- Header:** Sawweb
- Text:** حساب جديد
فضلاً، أدخل رقمك الوطني لإنشاء حساب
- Input Fields:**
 - الرقم الوطني (National ID): 2225883409
 - البريد الإلكتروني (Email): omar.karaleh.2225@email.com
 - رقم الهاتف (Phone number): 0790000001
 - الرقم السري (Password): An empty text input field.
- Buttons:**
 - A large blue "تسجيل" (Sign Up) button at the bottom.
 - A smaller link "لديك حساب؟ تسجيل الدخول" (Already have an account? Log in) below it.
- Footer:** By clicking on registration, you agree to the [Terms and Conditions](#) and [Privacy Policy](#).

3. In the **login** page. Enter your **National ID** and **password** in the provided fields.
4. Click on the **Login** button to access the main system features.

The image consists of two side-by-side screenshots of a mobile application's login screen. Both screenshots feature the 'Sawweb' logo at the top and a large circular icon with the word 'صوب' (Job) in the center.

Left Screenshot (Initial State):

- Time: 8:20
- Signal: LTE
- Text: تسجيل الدخول (Login)
- Text: فضلاً، أدخل رقمك الوطني لتسجيل الدخول (Please enter your national ID to log in)
- Text: الرقم الوطني (National ID) - Placeholder: الرقم الوطني
- Text: الرقم السري (Password) - Placeholder:|.....
- Large blue button: دخول (Log In)
- Links: نسيت كلمة السر؟ (Forgot password?) and مستخدم جديد؟ إنشاء حساب (New user? Create account?)
- Text: هل أنت موظف؟ (Are you an employee?)

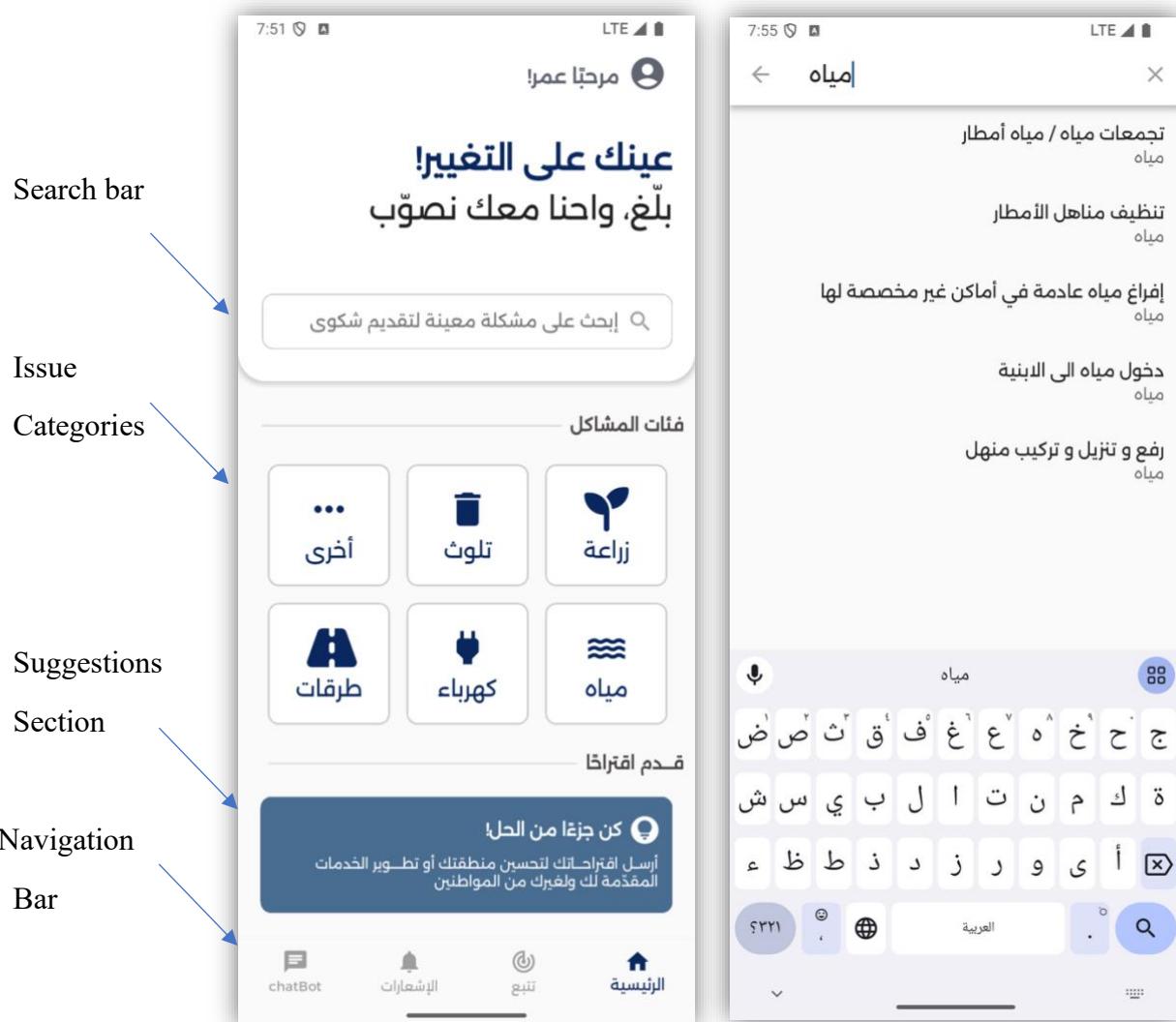
Right Screenshot (After Input):

- Time: 7:50
- Signal: LTE
- Text: تسجيل الدخول (Login)
- Text: فضلاً، أدخل رقمك الوطني لتسجيل الدخول (Please enter your national ID to log in)
- Text: الرقم الوطني (National ID) - Value: 2225883409
- Text: الرقم السري (Password) - Placeholder:|.....
- Large blue button: دخول (Log In)
- Links: نسيت كلمة السر؟ (Forgot password?) and مستخدم جديد؟ إنشاء حساب (New user? Create account?)
- Text: هل أنت موظف؟ (Are you an employee?)

2. Home Page.

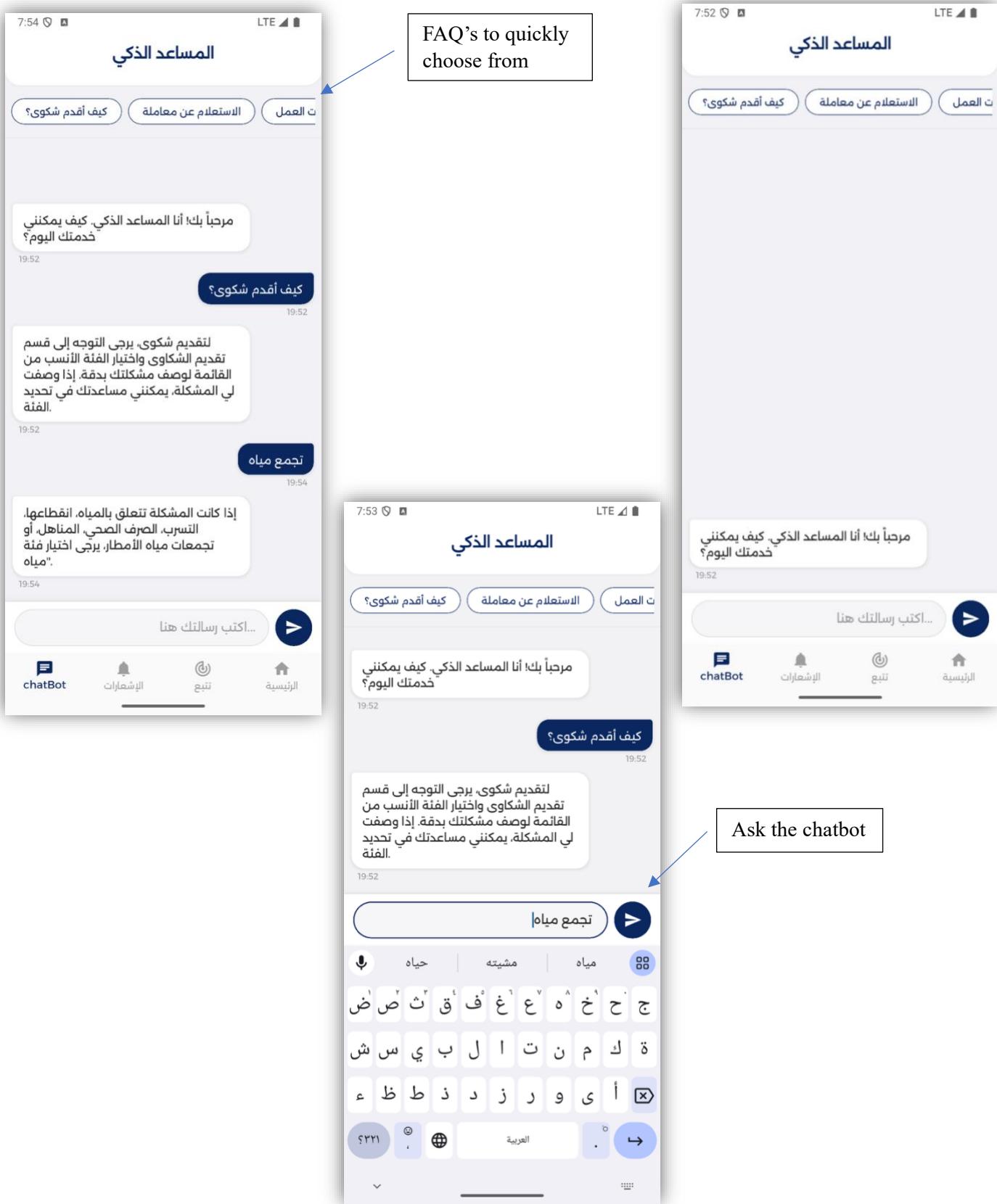
The home page is the first main page you'll see after logging in. It includes the following sections:

1. **Search Bar:** At the top, there's a search bar where you can look for specific complaints type.
 2. **Issue Categories:** Below the search bar, you'll find different categories that group issues by type, making it easier to browse and report.
 3. **Suggestions Section:** Here, you can submit your own suggestions to help improve public facilities and services.
 4. **Navigation Bar:** At the bottom, there's a navigation bar that lets you move between the **Home page**, the **tracking page**, the **notifications page**, and the **chatbot page**.



3. Chatbot Assistance

Sawweb includes a built-in chatbot that helps you with common questions and guides you through the app's features. It offers instant support, making it easier to report issues and submit suggestions.



4. Filing a Suggestion

To submit a suggestion, click the "Suggestion" button to open the form. Fill in the required fields: Title, Category, and a short Description of your idea. You can also upload a file (like an image or PDF) and choose a location if needed.

Once everything is filled out, click "Submit".

The image displays two screenshots of a mobile application interface for submitting a suggestion. Both screenshots show a header with the text "قدم اقتراحاً" (Submit a suggestion) and a back arrow icon.

Screenshot 1 (Left):

- 1: "عنوان الاقتراح" (Title of the suggestion) input field.
- 2: "اكتب عنوان الاقتراح" (Write the title of the suggestion) placeholder text.
- 3: "تصنيف الاقتراح" (Category of the suggestion) dropdown menu with the option "اختر تصنيفًا" (Select a category).
- 4: "وصف الاقتراح" (Description of the suggestion) input field.
- 5: "ارفق صورة" (Attach a photo) button with a camera icon.
- 6: "إضافة ملفات أخرى" (Add other files) button with a paperclip icon, labeled "(pdf, doc, ..)".

A map of Amman, Jordan, is displayed below the input fields, showing landmarks like "AlBashir Hosp" and "JABAL AL NASE". A blue button at the bottom reads "تحديد الموقع الحالي" (Current location).

Screenshot 2 (Right):

- 1: "عنوان الاقتراح" (Title of the suggestion) input field.
- 2: "وضع لوحات تنبيهية قبل الإشارات الضوئية" (Place warning signs before the traffic lights) placeholder text.
- 3: "تصنيف الاقتراح" (Category of the suggestion) dropdown menu with the option "طرق" (Roads).
- 4: "وصف الاقتراح" (Description of the suggestion) input field.
- 5: "ارفق صورة" (Attach a photo) button with a camera icon.
- 6: "إضافة ملفات أخرى" (Add other files) button with a paperclip icon, labeled "(pdf, doc, ..)".
- 7: "اقرر وضع لوحات إرشادية قبل الإشارات الضوئية في التقاطعات المزدحمة بمسافة لا تقل عن 100 متر، وذلك لتلبية السائقين بوجود إشارة ضوئية" (I agree to place advisory signs before traffic lights in crowded intersections at a distance of no less than 100 meters, to meet drivers with a traffic light signal) explanatory text.

The map in the right screenshot shows a red dot indicating the suggested location. A blue button at the bottom reads "إرسال الاقتراح" (Send suggestion).

5. Filing a Complaint

To file a complaint:

1. In the **Home Page**, start by selecting a **category** (e.g., Roads, Electricity, Water, Waste). You'll be redirected to the complaint form based on your selection.
2. Or click on the search bar, and search for a certain issue and choose it from the results. You'll be redirected to the complaint form, and the type of complaint will be chosen automatically.
3. In the **Complaint Form Page**:
 - o Choose the **type of complaint** from a dropdown. Only types related to your selected category will be shown.
 - o The system will automatically display the **responsible department** for the complaint (grayed out).
 - o Select the **date of the issue** using the calendar.
 - o Write a short **description** of the problem.
 - o You can also **upload a photo or a short video** (up to 30 seconds) to support your complaint.
 - o Pin the **location** of the issue on the map.

These field will be automatically selected based on what category/type of issue you chose from the homepage. You could rechoose the **category** and/or the **type of complaint** if you changed your mind!

قدم شكوى

فترة المشكلة الرئيسية تاريخ المشكلة

نوع المشكلة

جمعيات مياه / مياه أمطار

الجهة المسئولة

أمانة عمان

عنوان الشكوى

اتكتب عنواناً موجزاً للشكوى

وصف المشكلة

يرجى وصف المشكلة بالتفصيل هنا...

إرفاق صورة

إضافة ملفات أخرى (pdf, doc, ..)

تحديد موقع المشكلة

Amman عمان

قدم شكوى

فترة المشكلة الرئيسية تاريخ المشكلة

نوع المشكلة

تجمعات مياه / مياه أمطار

الجهة المسئولة

أمانة عمان

عنوان الشكوى

تسرب مياه في شارع الاستقلال

وصف المشكلة

شارع الاستقلال، مما يؤدي إلى إغبار كهرباء كبيرة من المياه وترافقها على جانب الطريق. التسرب مستمر منذ يومين وأ يؤثر على حركة المأور والمار.

إرفاق صورة

إضافة ملفات أخرى (pdf, doc, ..)

تحديد موقع المشكلة

Amman عمان

1

2

3

4

5

6

7

4. Once all required fields are filled, click **Submit**.

8

قدم شكوى

تجمعات مياه / مياه امطار

الجهة المسؤولة
أمانة عمان

عنوان الشكوى
تسرب مياه في شارع الاستقلال

وصف المشكلة

إرفاق صورة

[إضافة ملفات أخرى]

تحديد موقع المشكلة

تحديد الموقع الحالي

إرسال الشكوى

9

تم الاستلام

لقد تم استلام الشكوى بنجاح وهي قيد
الاطلاع

قيمت عملية الشكوى لتحسين خدمات
الحكومة

★★★★★ موافق

تم الاستلام

تحديد الموقع الحالي

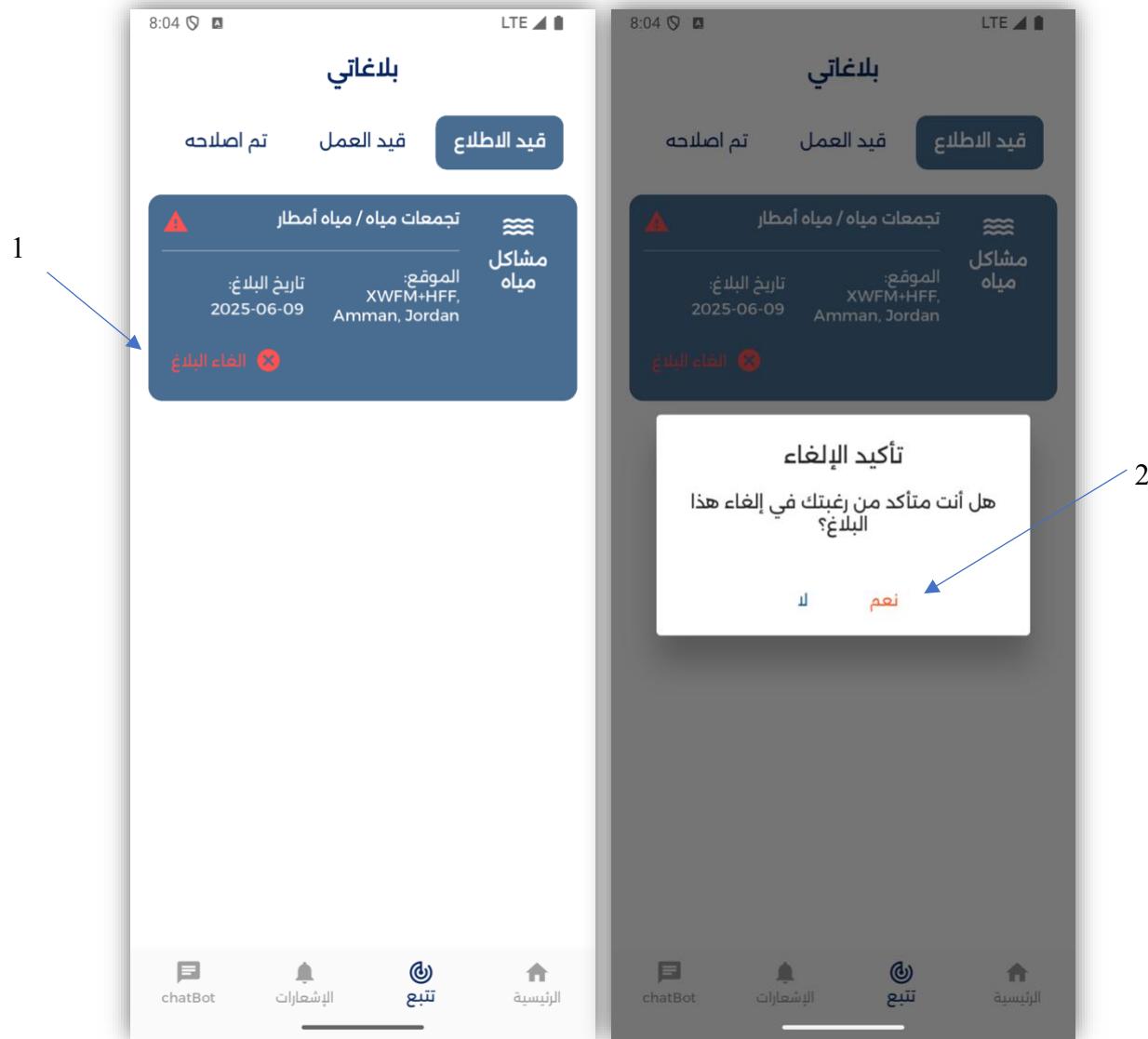
إرسال الشكوى

6. Tracking Reports

After submitting a complaint, you can **track the status** of your report to see updates and progress. The system will show whether it's **under review, in progress, or resolved**.



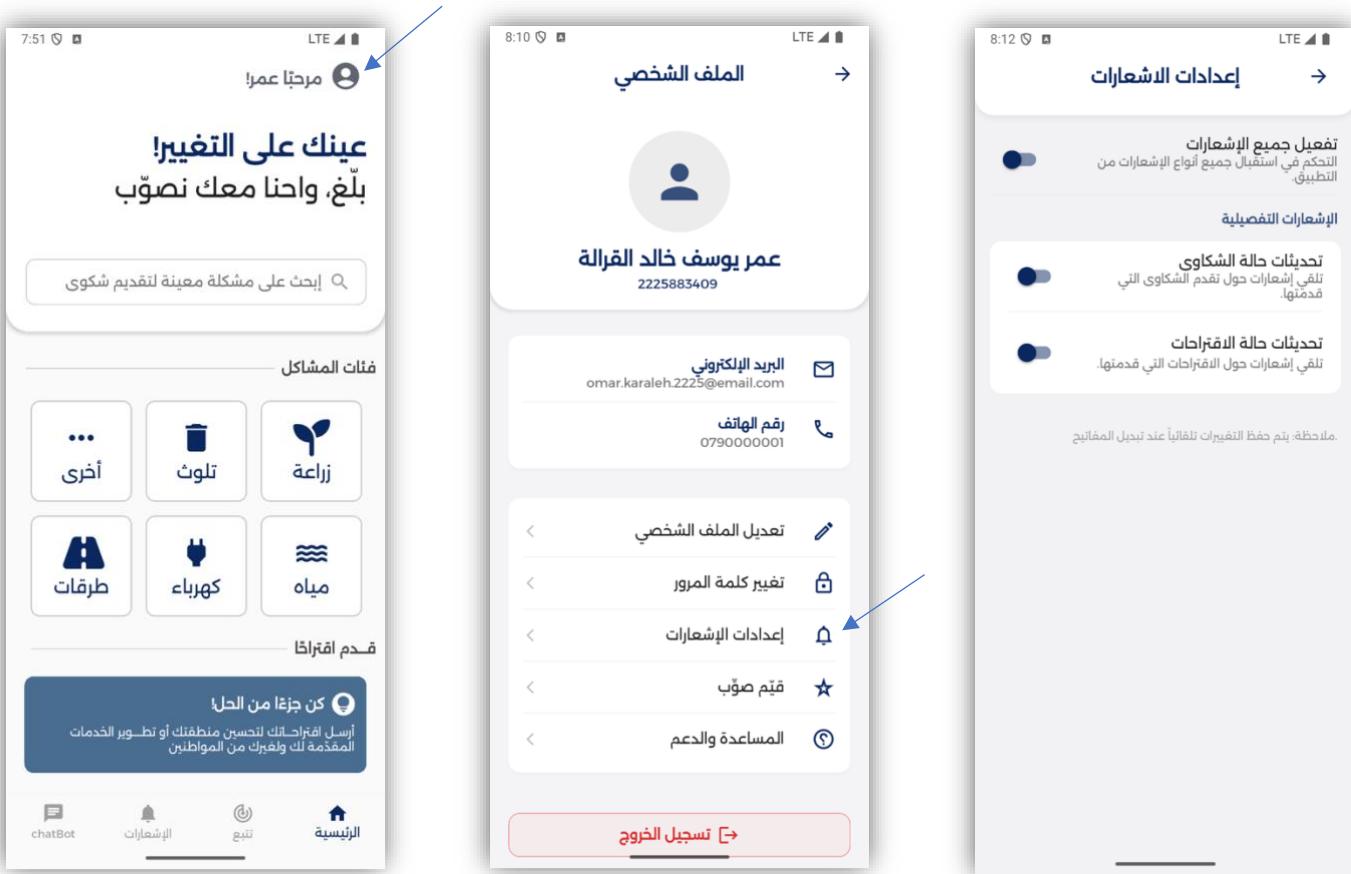
You can **delete** a complaint that is **under review**



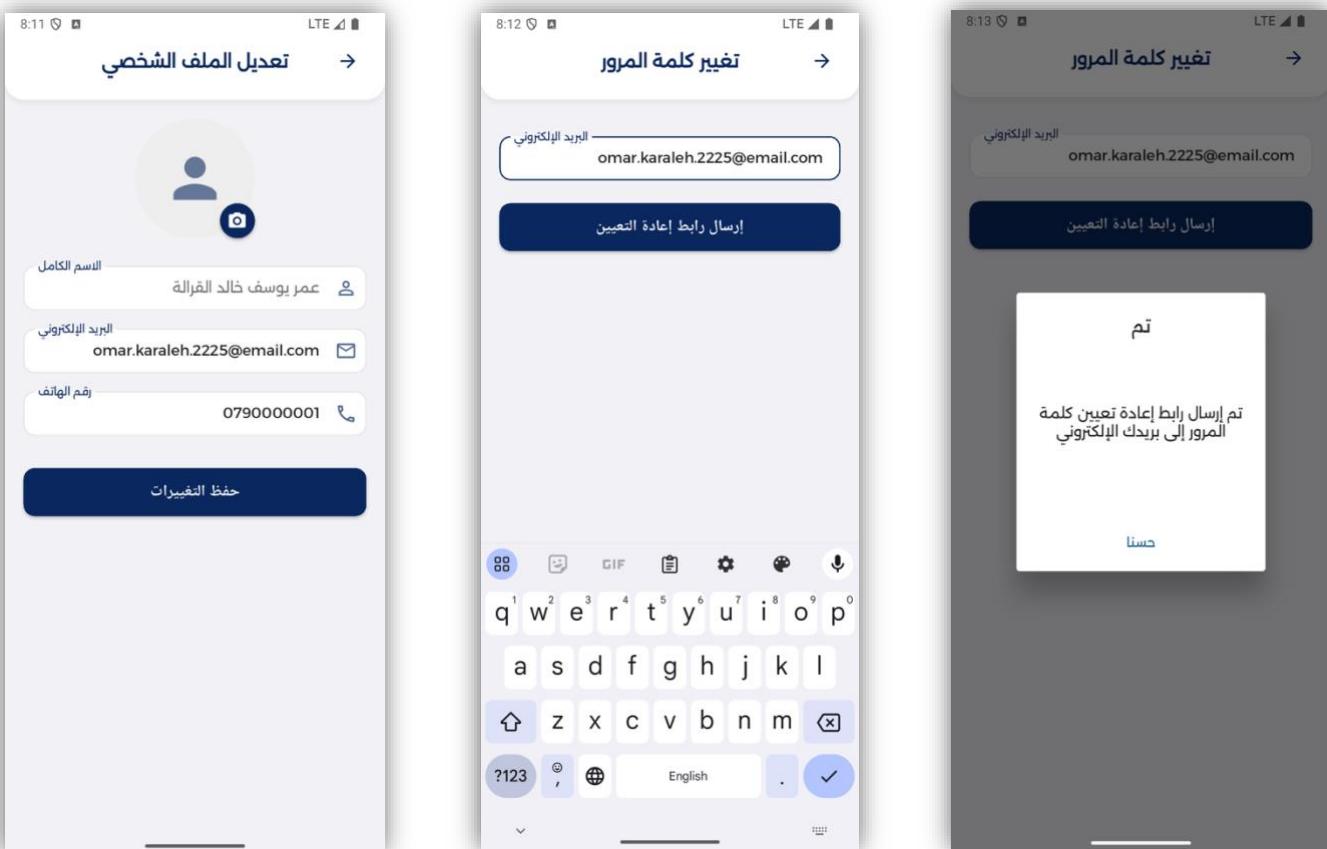
You'll receive notifications about your complaint's status, and you can view all past notifications on the Notification Page.



You can change your notification settings in profile:



You can view and update your profile information—including email, and phone number, and change your password on the Profile Page:



6.1.1 Citizen Frequently Asked Questions (FAQs)

1. How do I log in to the system?

You can log in using your National ID and password on the login page. If you don't have an account yet, you'll be redirected to the signup page.

2. How do I submit a suggestion?

Click the "Submit a Suggestion" button on the home page, fill in the required fields like title, category, and description, then click Submit. You can also upload a file or choose a location if you want.

3. How do I file a complaint?

Start by selecting a complaint category on the home page. Then, fill out the complaint form by choosing the type of complaint, date, description, and location. You can also upload a photo or short video to support your complaint.

4. Can I track my complaint after submitting it?

Yes! After submitting, you can track the status of your complaint on the tracking page. You'll see updates like "Received," "In Progress," or "Resolved."

5. Will I receive updates about my complaint?

You'll get notifications about your complaint's progress. You can view all your notifications on the Notification Page, and you can change your notification settings anytime.

6. How do I update my profile information?

Go to the Profile Page to view or edit your username, email, phone number, and other profile details.

7. What should I do if I forget my password?

If you forget your password, use the "Forgot Password" link on the login page to reset it by following the instructions.

8. What types of files can I upload when submitting a complaint or suggestion?

You can upload common file types such as images (JPEG, PNG) and PDFs. For complaints, you can also upload short videos up to 30 seconds.

9. How do I select the location for my complaint or suggestion?

You can add the location by either using the geolocation feature on your device or by selecting a location from the map or dropdown list provided in the form.

6.2 Employee Guide

Getting Started with the System. -Employee-

1. Login Page

Make sure to go to the **Employee's login page**. Enter your **Employee ID** and **password** in the provided fields, then click the **Login** button to access the main system features.

The figure consists of three side-by-side screenshots of a mobile application interface for 'Sawweb' (صوب). Each screenshot shows a large logo at the top and a title 'تسجيل الدخول' (Login) in the center. Below the title are two input fields: 'الرقم الوظيفي' (Employee ID) and 'الرقم السري' (Password). A blue 'دخول' (Login) button is at the bottom. At the bottom of each screen, there are links for 'نسيت كلمة السر؟' (Forgot password?) and 'مستخدم جديد؟ إنشاء حساب' (New user? Create account). A question 'هل أنت موظف؟' (Are you an employee?) is also present with an upward arrow.

Screenshot 1: Shows the initial state where both input fields are empty. An upward arrow points to the 'الرقم الوظيفي' field.

Screenshot 2: Shows the 'Employee ID' field filled with 'EMP-TR-001'. An upward arrow points to the 'الرقم السري' field.

Screenshot 3: Shows both the 'Employee ID' and 'Password' fields filled. An upward arrow points to the 'دخول' button.

1

2

3

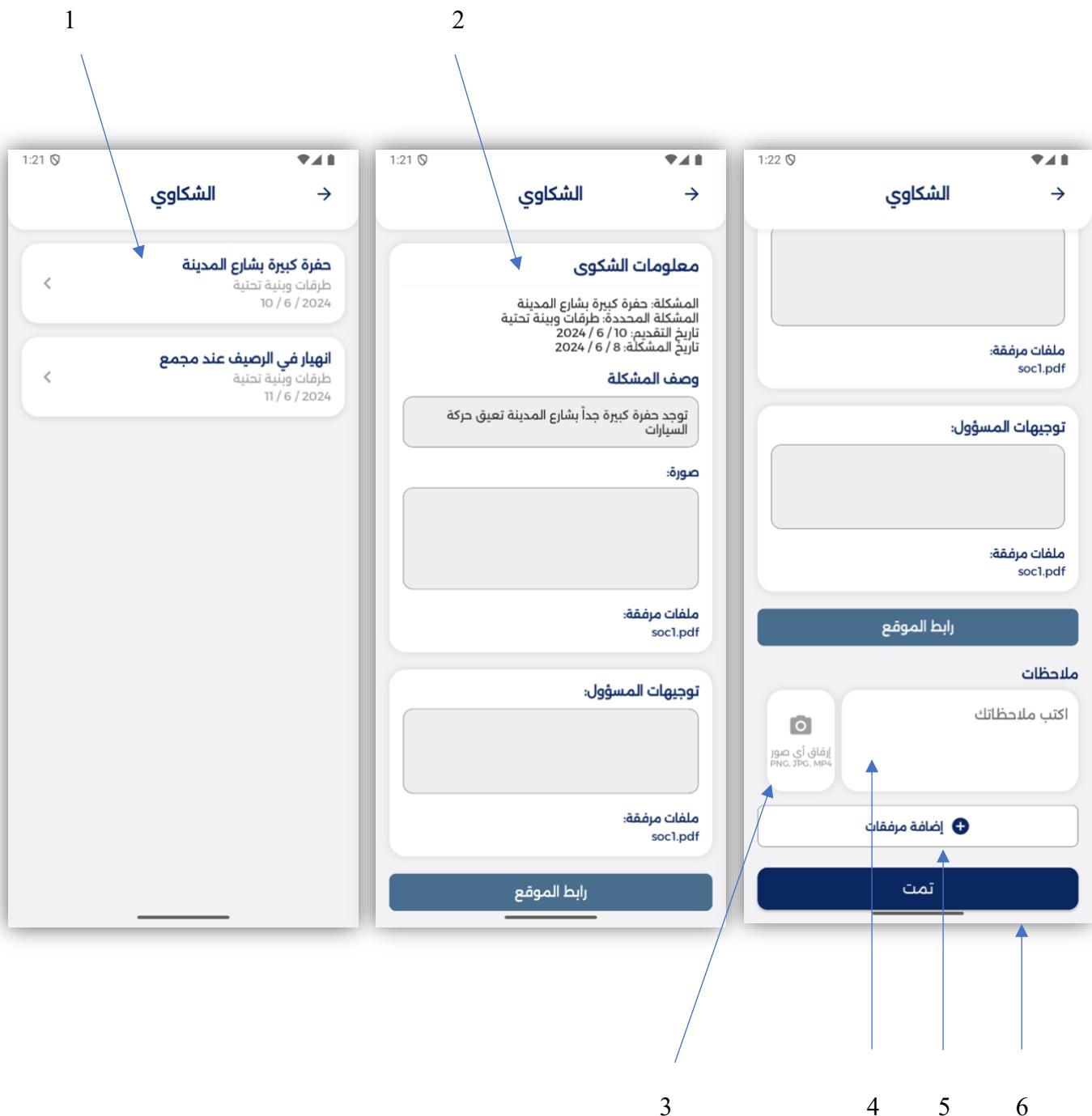
2. Home Page

When you log in, you'll see the home page with:

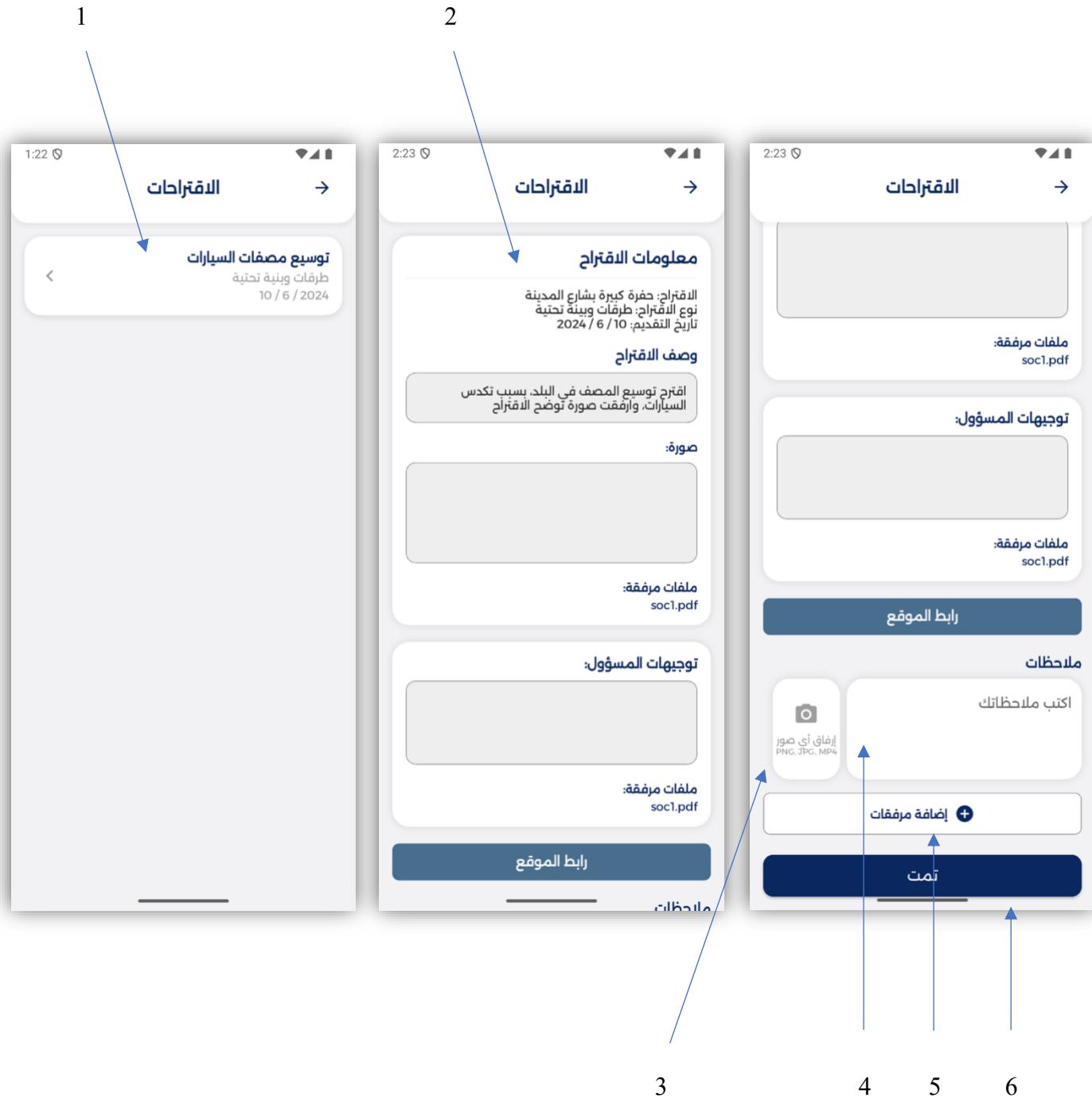
- 1. Profile and settings:** By clicking on the icon you access your profile
 - 2. View Complaints:** By clicking, you will be redirected to a page with a list of all complaints assigned to you .
 - 3. View Suggestions:** By clicking, you will be redirected to a page with a list of all suggestions assigned to you
 - 4. Statistics:** A pie chart to summarize your work progress



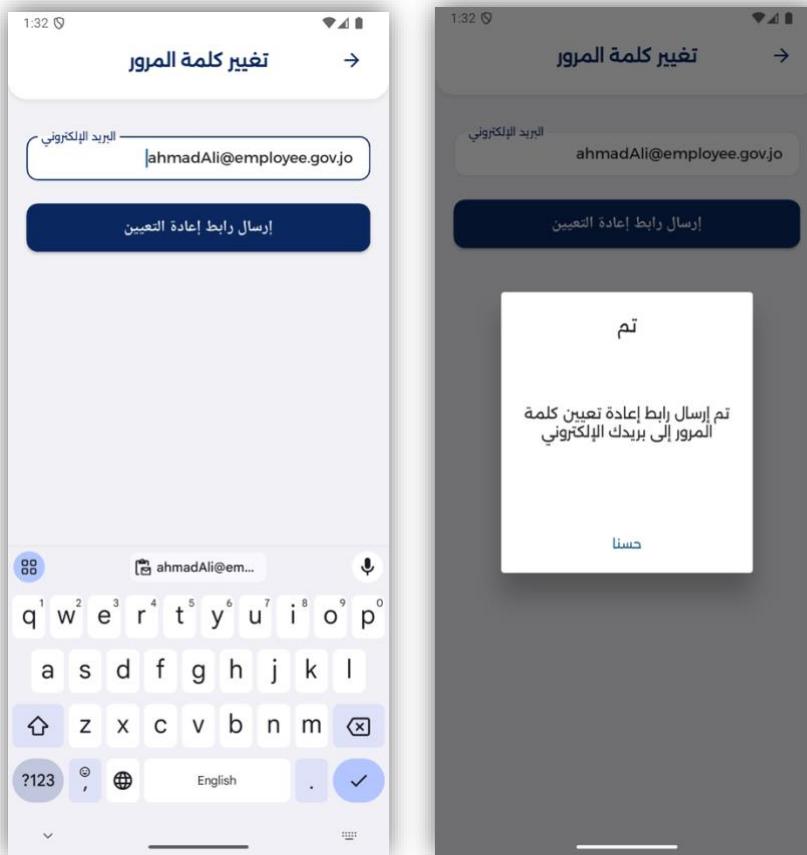
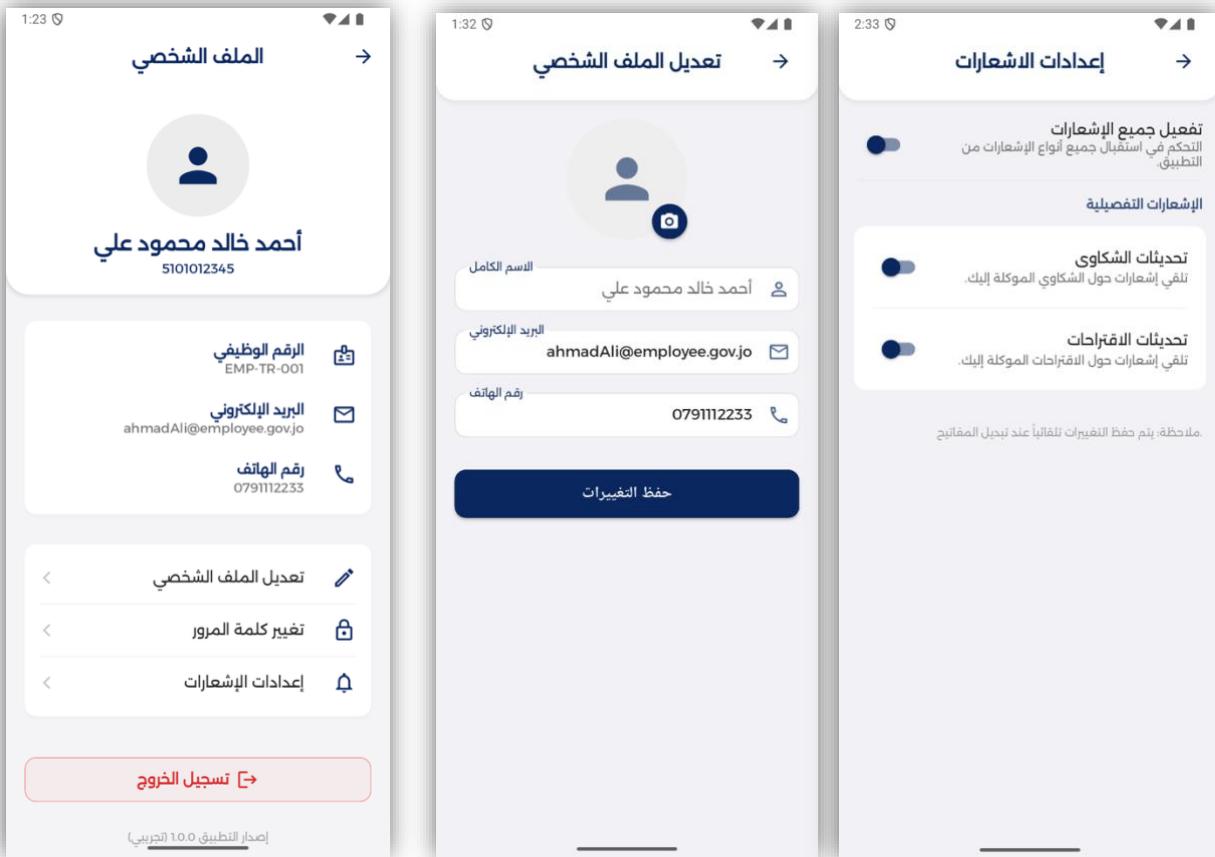
When you click on **view complaints**, you will view all complaints that are assigned to you. When you click on a complaint, you'll see all its details, including any admin notes and uploaded files. You can add your notes, multimedia, and files. After you've worked on the complaint, click “**Done**” to change its status to “**Resolved**.”



When you click on **view suggestions**, you will view all suggestions that are assigned to you. When you click on a complaint, you'll see all its details, including any admin notes and uploaded files. You can add your notes, multimedia, and files. After you've worked on the complaint, click “**Done**” to change its status to “**Resolved**.”



You can view and update your profile information—including email, and phone number, and change your password in the profile page. You can change your notifications settings as well.



6.2.1 Employee Frequently Asked Questions (FAQs)

1. How do I log into the system as a municipal employee?

You can log in using your Employee ID and password on the login screen. Ensure you enter your credentials correctly. If you forget your password, use the “Forgot Password” option to reset it.

2. How do I upload files related to a complaint?

While viewing or updating a complaint, use the "Upload Files" button to attach relevant documents, images, or reports. Accepted formats typically include PDF, DOCX, JPG, and PNG.

3. How can I view and update my profile information?

Click on your profile icon or navigate to the “Profile” section to view your National ID, Employee ID, and name. You can update your email and phone number under “Edit Profile.”

4. What system settings can I customize?

Under “Settings & Preferences,” you can change your password, update your notification preferences.

5. How do I safely log out of my account?

Click the “Logout” option in the menu. You can log out from any page in the system to securely end your session.

6. How to mark a complaint as “Resolved”?

Click on the complaint, scroll down then click on “Done”

7. How do I view suggestions submitted by citizens?

Navigate to the “Suggestions” tab from the main menu. You’ll see a list of all submitted suggestions along with the submission date, category, and citizen details.

8. What should I do if I encounter a technical issue while using the system?

Use the “Help & Support” section to report the issue or contact technical support via the provided email or phone number. Make sure to include screenshots or a description of the problem.

9. Is my profile information visible to other employees or citizens?

No, your personal and profile information (like National ID) is kept confidential and is only accessible to you and authorized administrative users.

10. Can I receive notifications for updates or assigned complaints?

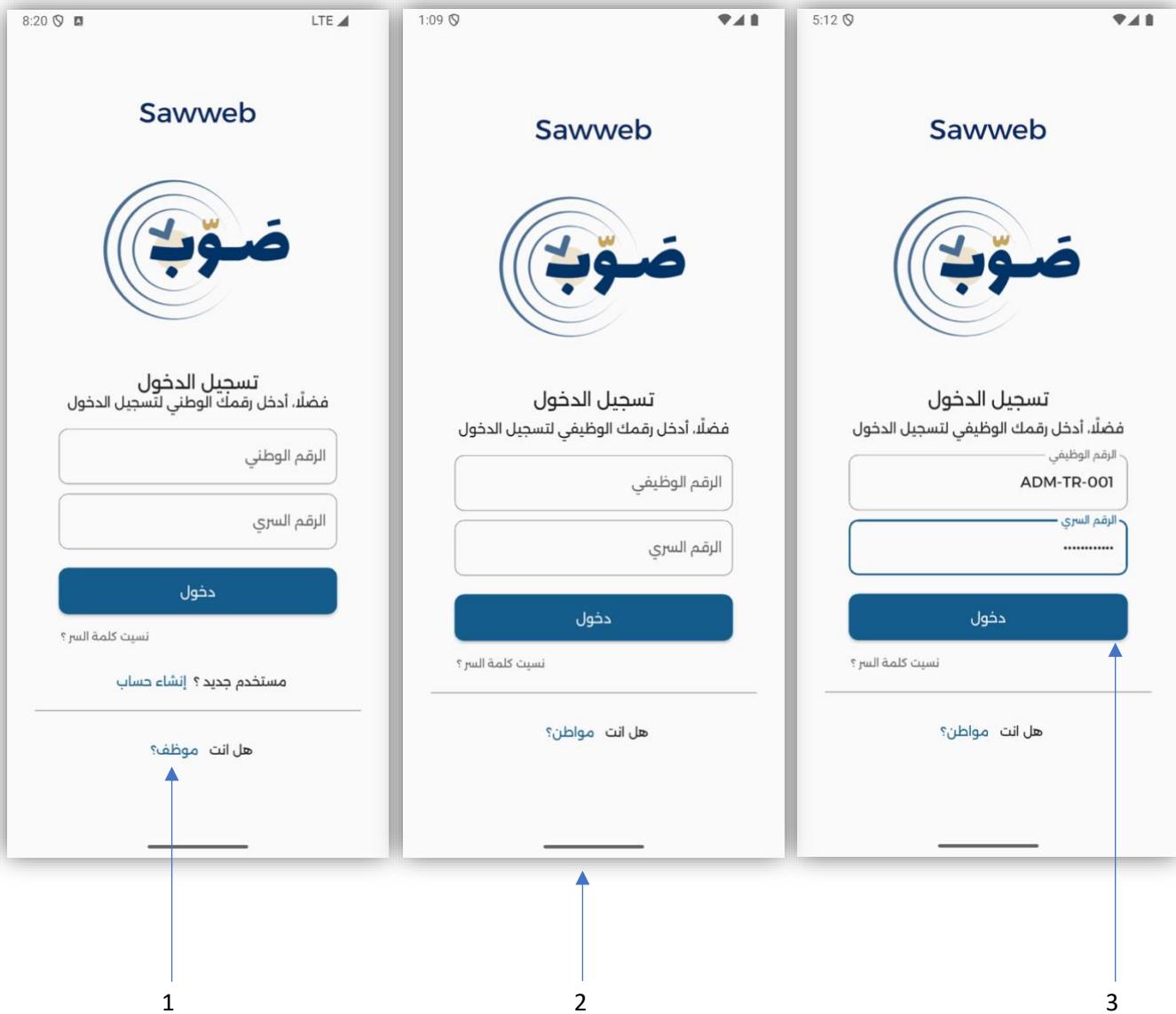
Yes, make sure notifications are enabled in your account settings. You’ll receive in-app alerts for newly assigned complaints, status updates, and important announcements.

6.3 Administrator Guide

Getting Started with the System. - Administrator -

1. Login Page

Make sure to go to the **Employee's login page**. Enter your **Employee ID** and **password** in the provided fields, then click the **Login** button to access the main system features.



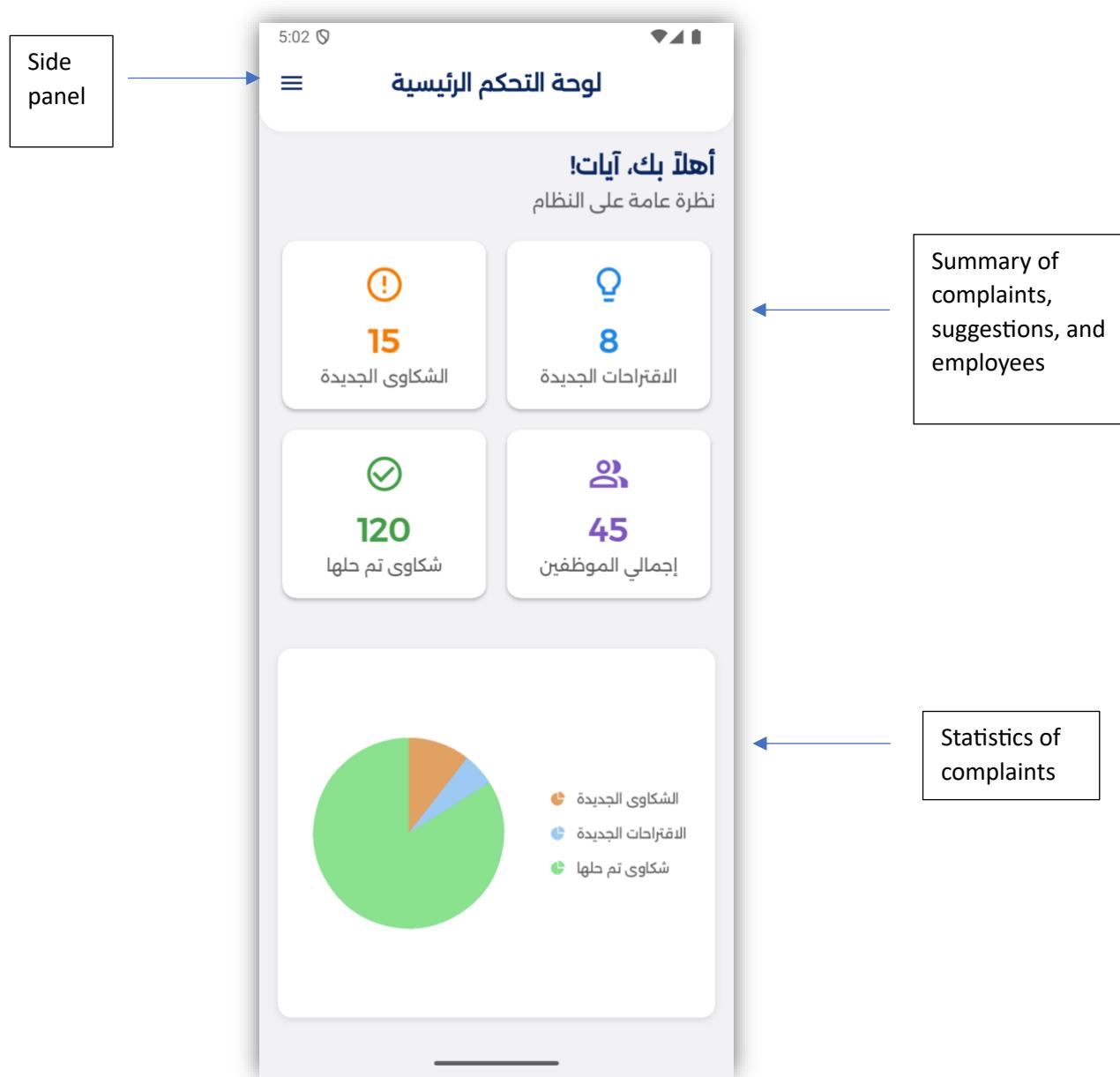
2. Home Page

Once you log in, you will be taken directly to the Dashboard. This is the home page where you can quickly view key system statistics.

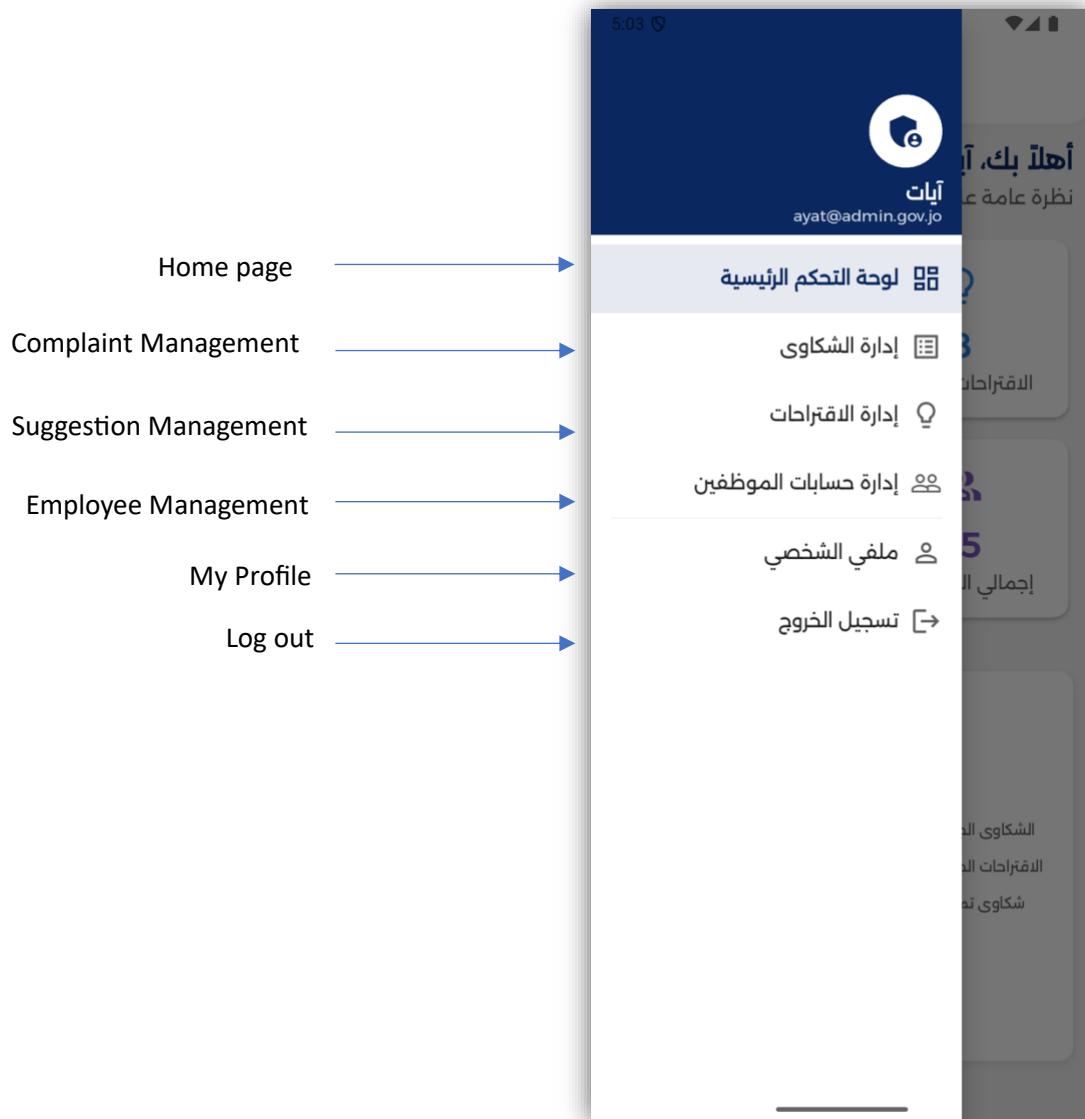
You will see summary cards showing:

- The number of new complaints
- The number of new suggestions
- The number of resolved complaints and suggestions
- The total number of employees

Use this page to get a quick overview of current activity in the system before navigating to other sections.

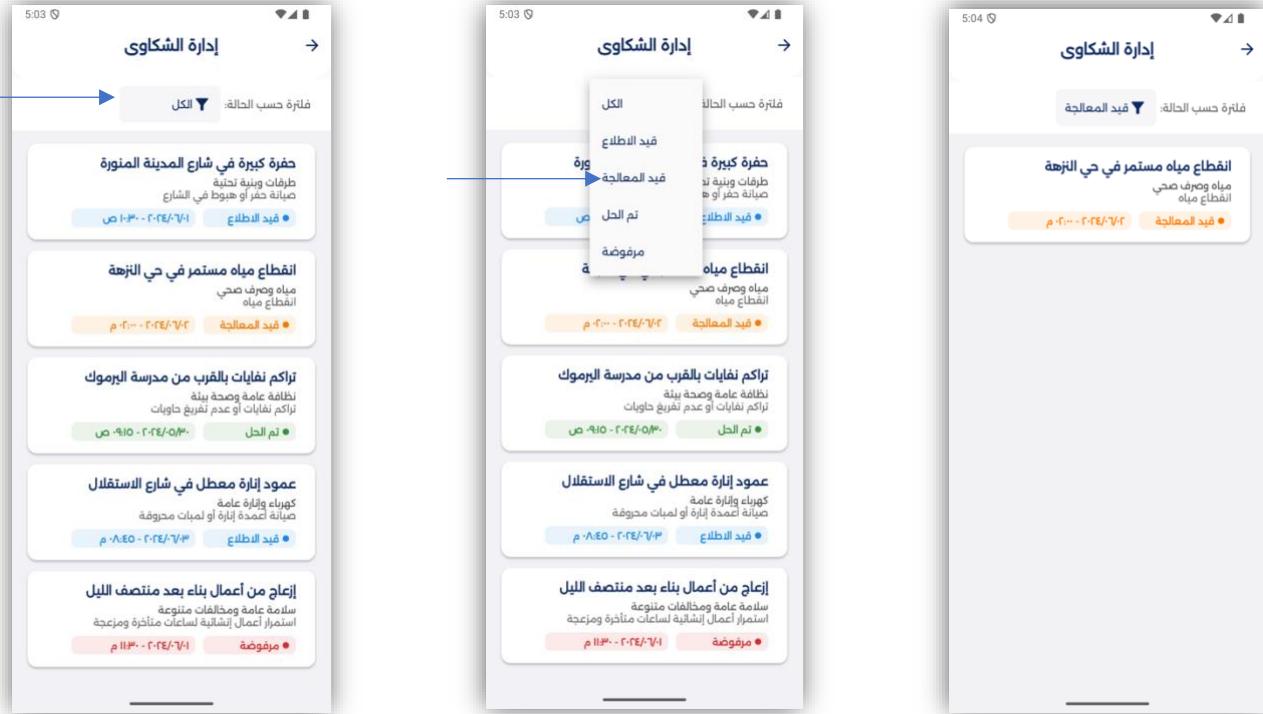


To access more options, tap the hamburger menu icon; a side panel will appear with links to Complaint Management, Suggestion Management, Employee Account Management, My Profile, and Logout.

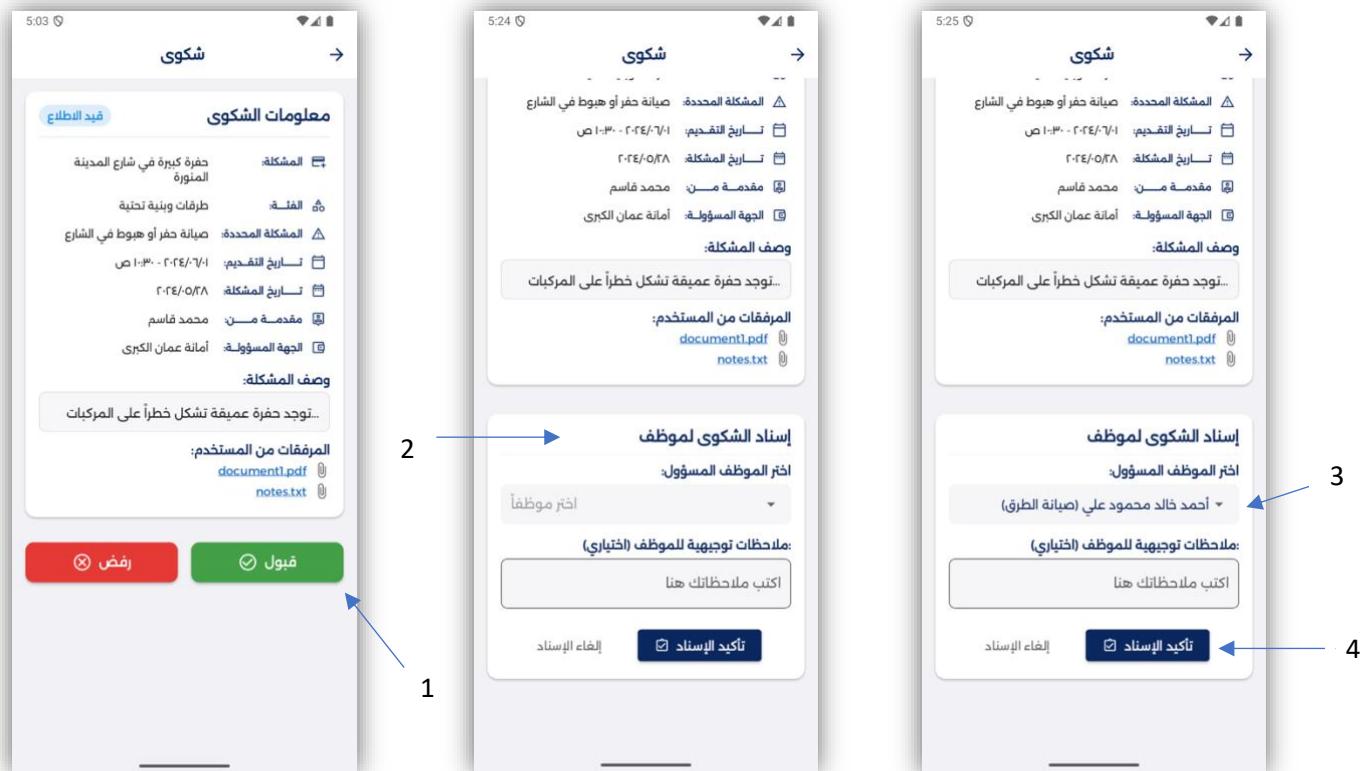


3. Complaint Management

In Complaint Management, you can view all complaints and filter them by status. Tap on any complaint to open a detailed view on a separate page.

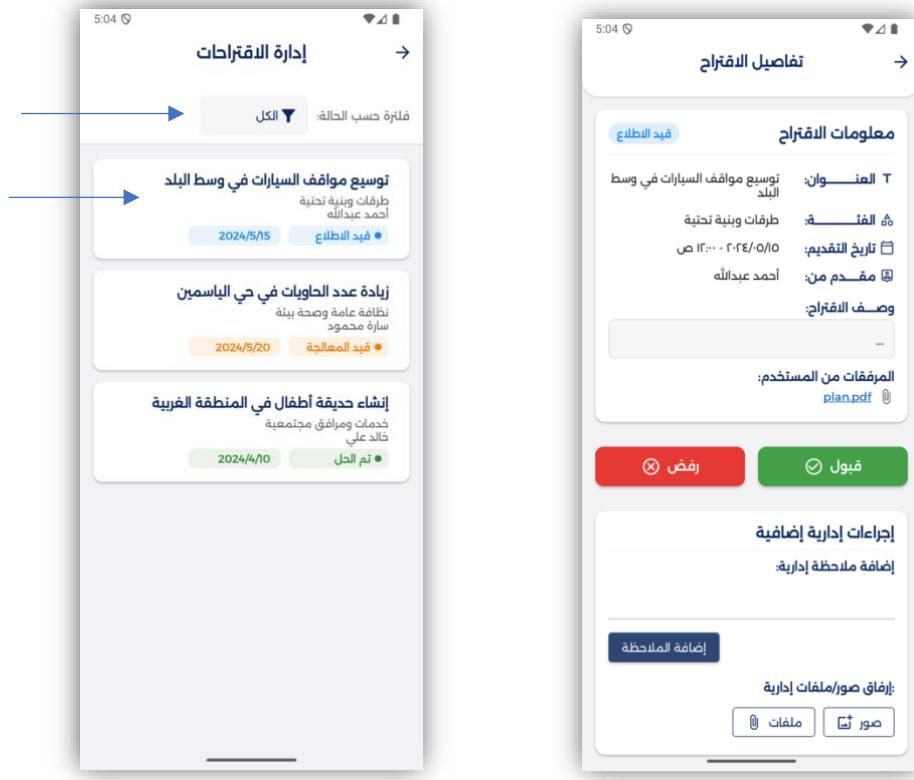


When you click on a complaint marked as Under Review, you'll see all its details and any attached files. You'll also see Accept and Reject buttons. If you choose Accept, additional options will appear to assign the complaint to an employee, add notes, and upload supporting files.

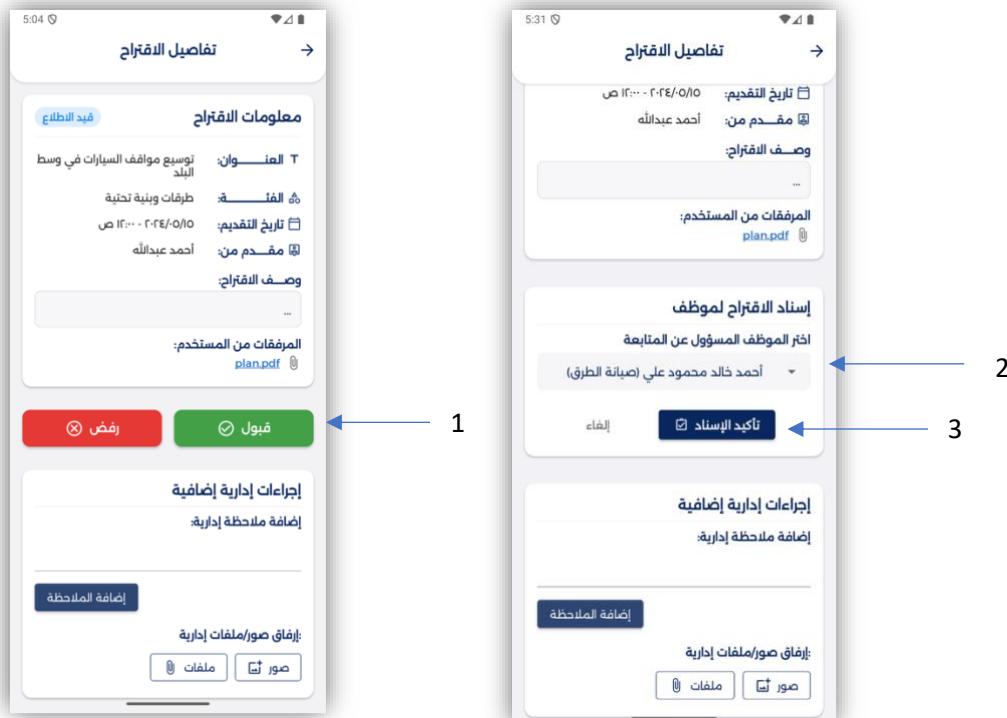


4. Suggestions Management

In Suggestions Management, you can view all suggestions and filter them by status. Tap on any suggestion to open a detailed view on a separate page.

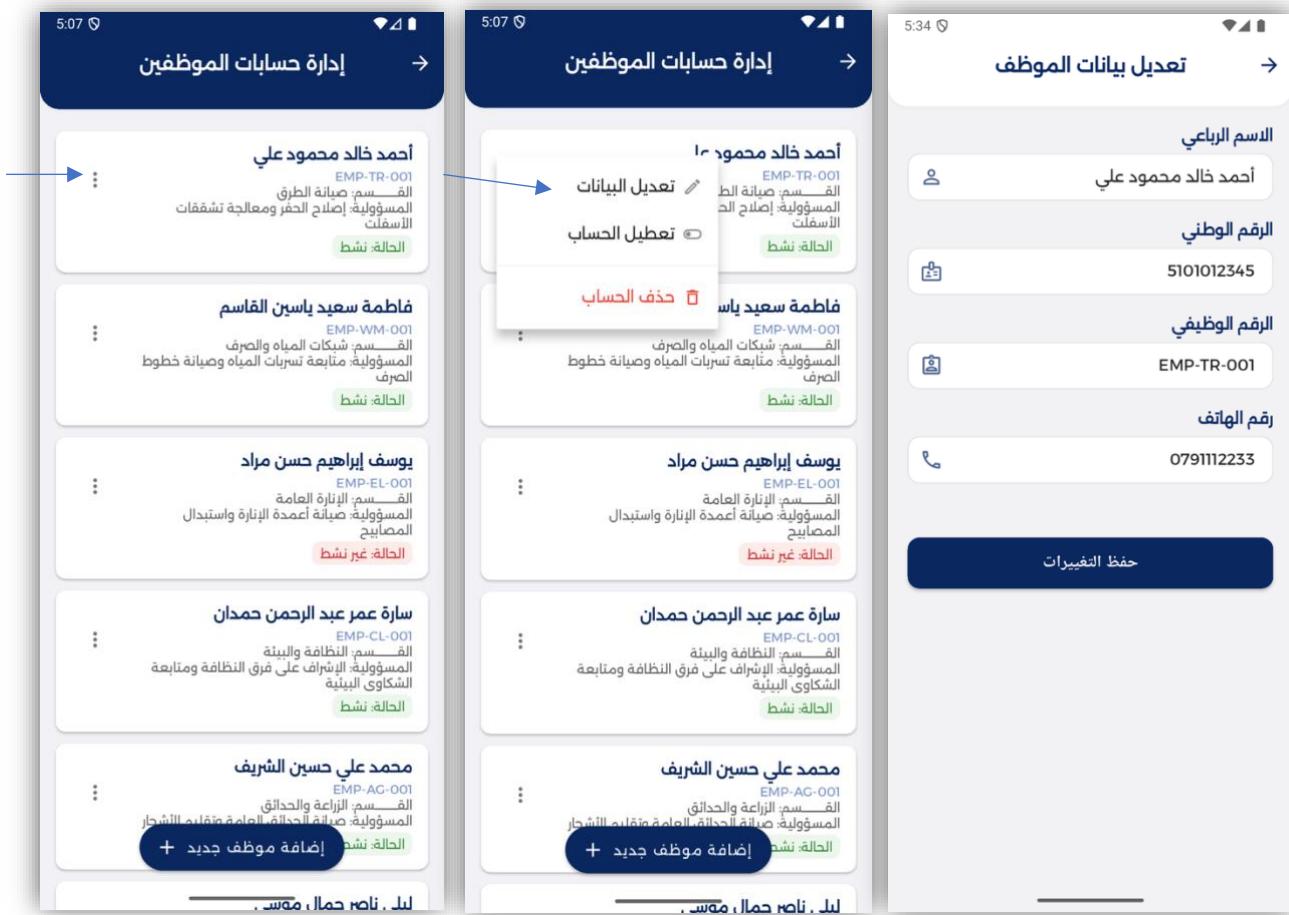


When you click on a suggestion marked as Under Review, you'll see all its details and any attached files. You'll also see Accept and Reject buttons. If you choose Accept, additional options will appear to assign the complaint to an employee, add notes, and upload supporting files.

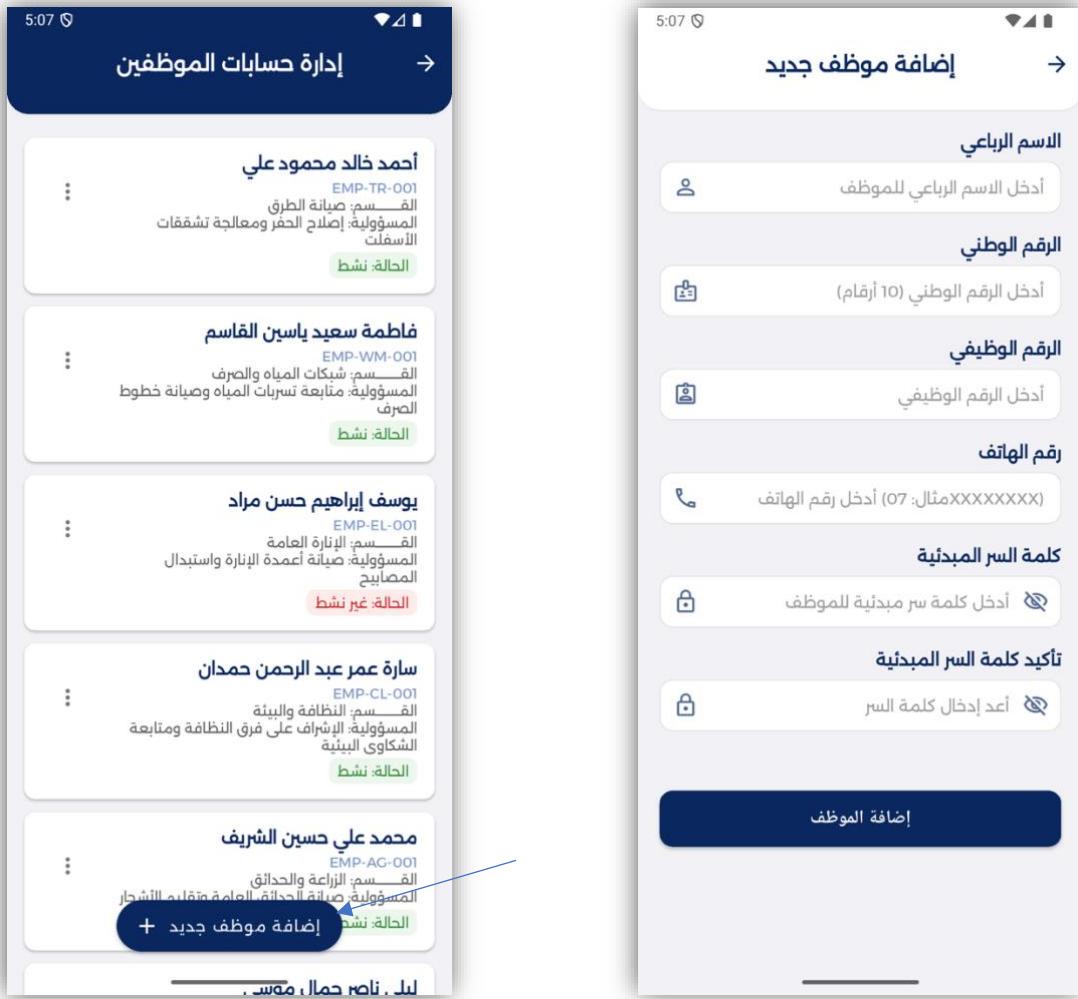


5. Employees' Accounts Management

When you open Employee Account Management, you'll see all employees displayed as cards. Each card shows the employee's name, employee ID, department, and whether their account is active or suspended. When you click the three dots at the top left of an employee card, a menu will appear with options to edit employee info, suspend or reactivate the account, and delete the account. If you click on **Edit Employee**, you'll be taken to a new page where you can update the employee's name, National ID, Employee ID, and phone number.



At the bottom, there is an **Add New Employee** button. Clicking it opens a new page where you can fill out the employee's information (National ID, Employee ID, full name, phone number, and password) to create their account.



6.3.1 Admin Frequently Asked Questions (FAQs)

1. How do I log in to my admin account?

To log in, enter your Admin ID and password on the login page, then click **Login** to access the admin dashboard.

2. How do I upload files related to complaints or reports?

While viewing a complaint look for the **Upload** button to attach relevant files or documents.

3. How do I manage my profile information?

Click on **My Profile** from the menu to view or update your details like email, and phone number

4. Can I manage other user accounts?

Yes, go to **User Account Management** to add, edit, suspend, or reactivate user accounts.

5. How do I log out of my admin account?

Click the **Logout** option from the side menu to safely exit your session from any page.

6. How can I manage my notification preferences?

In your **Settings**, you can choose how and when you'd like to receive notifications, including email alerts for new complaints or system issues.

7. How do I add a new employee to the system?

Click the **Add New Employee** button in the User Management section. Fill in the employee's details, set a password, and click **Create** to finish.

7.0 References

1. <https://modee.gov.jo>
2. <https://www.mpwh.gov.jo>
3. <https://www.ammancity.gov.jo/ar/gameservices/eservices.aspx>
4. [Software Engineering 9th edition Ian Sommerville](#)
5. [Software Project Management 5th edition Bob Hughes & Mike Cotterell](#)