Detailed Software Requirements Specification for

Online Permit Approval System (ePermit)

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ePermit_0.1-permit approval system-DSRS-initial version

Document Revisions

Date	Version	Description	Author
03/06/2025	0.1	Initial version	Linali

Document Approval

Quality Software Corporation and Development and Planning Division at Millaniya Divisional Secretariat have reviewed this document and hereby agree that the contents herein are accurate. Any changes to this document must be communicated in writing and signed off by both parties.

Signature	Signature
Date: 03/06/2025	Date:
Name: Jayantha	Name:
Customer: Divisional Secretariat	Virtusa Corporation

1 Introduction

1.1 Purpose

This document lists requirements for Online Permit Approval System (ePermit). The purpose of this document is to identify the system requirements and obtain sign-off on all requirements before moving into the design phase. The engineering team will use this document as the basis for the system design.

After sign-off, requested changes to requirements will be documented including the effect on the project costs, scope and timelines and presented to Divisional Secretariat for approval.

These requirements were gathered during extended discussions with Divisional Secretariat on 03/06/2025 and from documents provided by Divisional Secretariat on 03/06/2025.

1.2 Summary

Online Permit Approval System (ePermit) is a digital platform designed to streamline the process of applying for, reviewing, and approving various types of government permits through an efficient, transparent, and user-friendly interface. This system is part of the broader e-governance initiatives aimed at reducing administrative delays, minimizing manual paperwork, and improving public service delivery across sectors such as land use, construction, environmental clearance, and business licensing.

The ePermit system allows applicants to submit permit applications online from any location with internet access, reducing the need for physical visits to government offices. Applicants can fill in standardized digital forms, upload scanned copies of required documents (such as land deeds, building plans, business registrations, etc.), and track the status of their application in real time. The system also provides automated notifications via SMS or email to keep the applicant updated throughout the process.

Overall, the ePermit system improves transparency, accountability, and service efficiency in the permit approval process. It reduces time delays, increases applicant satisfaction, and helps government institutions manage permits in a structured and organized manner. As more Divisional Secretariats and local authorities adopt this system, it has the potential to transform how citizens and businesses interact with public administration in Sri Lanka.

1.3 Company Overview

Quality software solutions (pvt) ltd was setup to complete the final project of Bachelor of Software Engineering course at Open University. Online Permit Approval System (ePermit) is the first project going to implement
by the company.
Our organization specializes in designing, developing, and implementing government-focused digital systems, including e-governance platforms, citizen service applications, and permit automation systems.

1.4 Project Overview

The ePermit Digital Permit Approval System is a centralized online platform designed to modernize and streamline the permit application and approval processes managed by Divisional Secretariats in Sri Lanka.

The system aims to simplify the submission of applications, automate internal reviews and inspections, support digital payments, and provide real-time tracking for citizens and businesses. The project envisions reducing the administrative burden on both applicants and public officers while ensuring regulatory compliance and data transparency. Through the use of digital tools such as GIS integration, document management, and automated communication, the ePermit system seeks to enhance efficiency, accountability, and citizen satisfaction in local governance.

Despite its many advantages, the implementation of ePermit faces certain challenges, including lack of digital literacy among some citizens, limited access to internet in rural areas, resistance to change among staff, and the need for comprehensive training. Security and data privacy also need to be strictly maintained to protect sensitive personal and legal information.

1.5 Project Background

The main purpose of this system is to digitize and simplify the process of applying for local permits such as, Business permits, Construction approvals, Event permissions, Street vending licenses.
Traditionally, permit approval processes at Divisional Secretariats are manual, paper-based, and require multiple in-person visits. Applicants are required to collect forms, attach numerous physical documents, and coordinate with various officers for site inspections and approvals. This process is often time-consuming, lacks transparency, and causes delays due to incomplete submissions, unclear requirements, or limited staff resources.

Many local government offices in Sri Lanka still rely on manual, paper-based systems for permit applications such as:

- ❖ Business and trade permits
- ❖ Construction and renovation approvals
- ❖ Event hosting licenses
- ❖ Temporary street vending permits
- ❖ These manual processes result in:
- ❖ Delays and inefficiencies
- ❖ Lack of transparency
- ❖ Inconvenience for citizens, especially in rural areas
- ❖ High workload on local government staff

In interviews conducted with Divisional Secretariat officials, several challenges were identified:

- Redundancy and inefficiency due to paperwork
- Delays in field inspections and document verifications
- Limited public understanding of required procedures and documents
- Lack of interdepartmental coordination
- No centralized tracking or digital record of applications

The proposed ePermit system is a response to these challenges and aims to bring uniformity, simplicity, and accessibility to public permit management.

Traditional Permit Approval Process (Offline)

1.Visit the Local Authority

- Go to the relevant office (e.g., Pradeshiya Sabha, Urban Council, or Divisional Secretariat) and ask for the required application form.

2. Fill Out the Application

- Provide personal details (name, NIC, contact)
- Describe the purpose (e.g., business registration, event hosting, building permit)
- Attach required documents (NIC copy, land documents, plans, etc.)

3. Submit Documents

- Submit the completed form to the relevant officer or desk. You may need to:
    - Pay an application or processing fee
    - Get a receipt as proof of submission

4. Application Review

- The application is usually reviewed by:
    - Technical officers (for building plans)
    - Public Health Inspectors (for food stalls, events)
    - Environmental or fire safety officers (if applicable)

5. Inspection (if needed)

- An officer may visit the site (e.g., construction site or event venue) to verify details.

6. Approval/ Rejection

- You'll be notified (usually by phone or letter):
    - Approved: You receive the permit
    - Rejected: You're told the reason and may resubmit

7. Collect Permit

- Return to the office to collect the physical permit or license.

1.6 Assumptions

- The scope of this project is restricted to support English Language only.
- Divisional Secretariats will have the minimum required infrastructure such as internet access, computers, and trained personnel to use the system.
- Both public officers and citizens are willing to adapt to digital systems, given adequate training and awareness.
- The project will be supported by relevant government policies and regulations. Project will have policy support facilitating digital signatures, online payments, and electronic document submission.
- Government institutions (such as UDA, CEA, and Land Registry) will be open to future data integration for seamless permit verification and validation.
- Necessary cybersecurity protocols will be followed.
- Digital system will ensure the protection of sensitive applicant and land information.

1.7 General Development

- The development language used in the system implementation phase will be C#.
- OpenCV framework & Eigen face technique used for face detection & recognition developments.
- Child forms will inherit the permission levels of the parent form.

1.8 Definitions, Acronyms and Terminology

Admin	Administration
DBMS	Data Base Management Systems
DFD	Data Flow Diagram
IDE	Integrated Development Environment
ILS	Integrated Library System
LIS	Library Information System
SDLC	System Development Life Cycle
SQL	Structured Query Language
QATP	Quality Assurance Test Plan
QATC	Quality Assurance Test Cases
N/A	Not Applicable
DDA	Disability Discrimination Act
UI	User Interface
F	Functional
SOW	Statement of Work.

1.9 References (Optional)

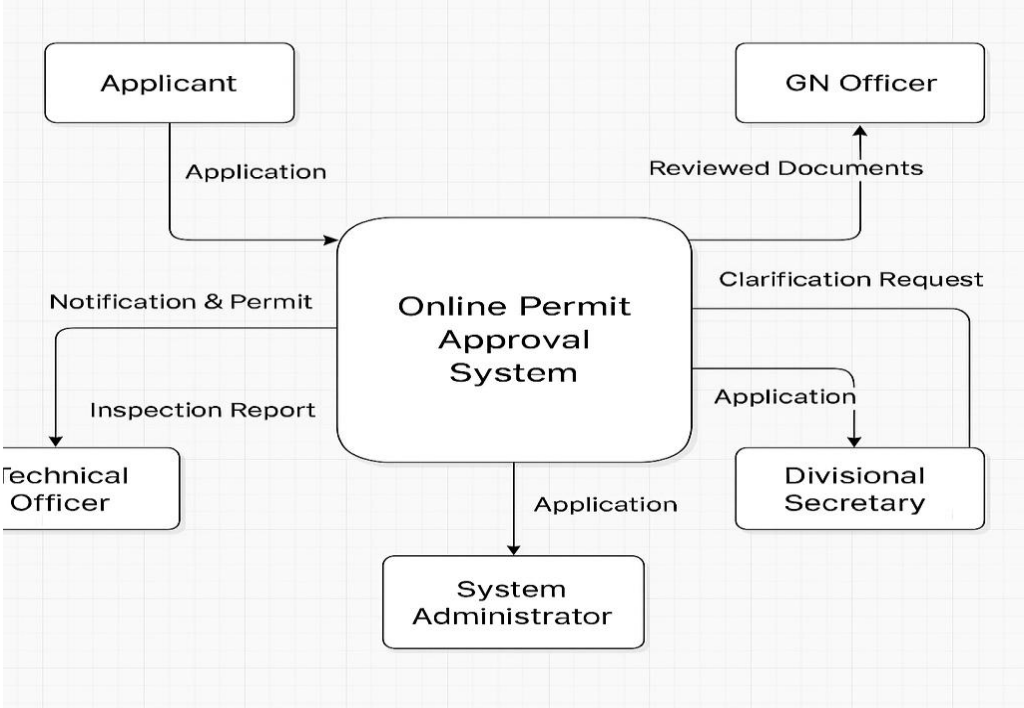
Common Required Documents (Example for Business Permit):

- Copy of NIC
- Business plan or purpose description
- Land ownership or lease document
- Photograph of premises
- Public health clearance (for food-related business)
- Fee receipt

2 Project Scope and Impact

The system will initially support common permit types such as building permits, land use approvals, and trade licenses, with the potential to scale to other permits in the future.

Context data flow diagram:



2.1 Scope Inclusions

In Scope

1. Permit Application Submission
2. Internal Workflow Management
3. Site Inspection Scheduling & Reporting
4. Status Tracking & Notifications
5. Payment Integration
6. Document Management System
7. Permit approval system

The following table depicts the pages that have been identified as in-scope for this project.

Page	Page Name	Description & Components
1	Home Page	Landing page with system overview, login/register options, and contact info.
2	User Registration Page	Form for citizens to create an applicant account.
3	Login Page	Secure login interface with role-based access.
4	User Dashboard	Overview of submitted applications, their statuses, and notifications.
5	Apply for Permit Page	Form to start a new permit application and upload required documents.
6	My Applications Page	List of all applications submitted by the user with filters and status info.
7	Application Detail Page	Detailed view of each permit application including uploads and review status.
8	Payment Page	Fee summary, payment options (online), and receipt generation.
9	Review Dashboard	Dashboard for officers to see all incoming applications assigned to them.
10	Inspection Scheduling Page	Tool for scheduling and assigning site visits.
11	Inspection Report Upload Page	Form for officers to upload notes, photos, and results of inspections.

12	Approval Decision Page	Interface for officers to approve, reject, or request changes on applications.
13	Notifications Page	Displays all system notifications, alerts, and messages.
14	Admin Panel	Control panel for system configuration, user management, and reporting.
15	Reports & Analytics Page	Visual dashboards and reports on application statistics, timeframes, etc.
16	FAQs & Help Page	Resource page with frequently asked questions and user support materials.
17	Contact Us Page	Page for users to contact support or the Secretariat.
18	Logout Page	Redirect page to confirm logout and exit securely.

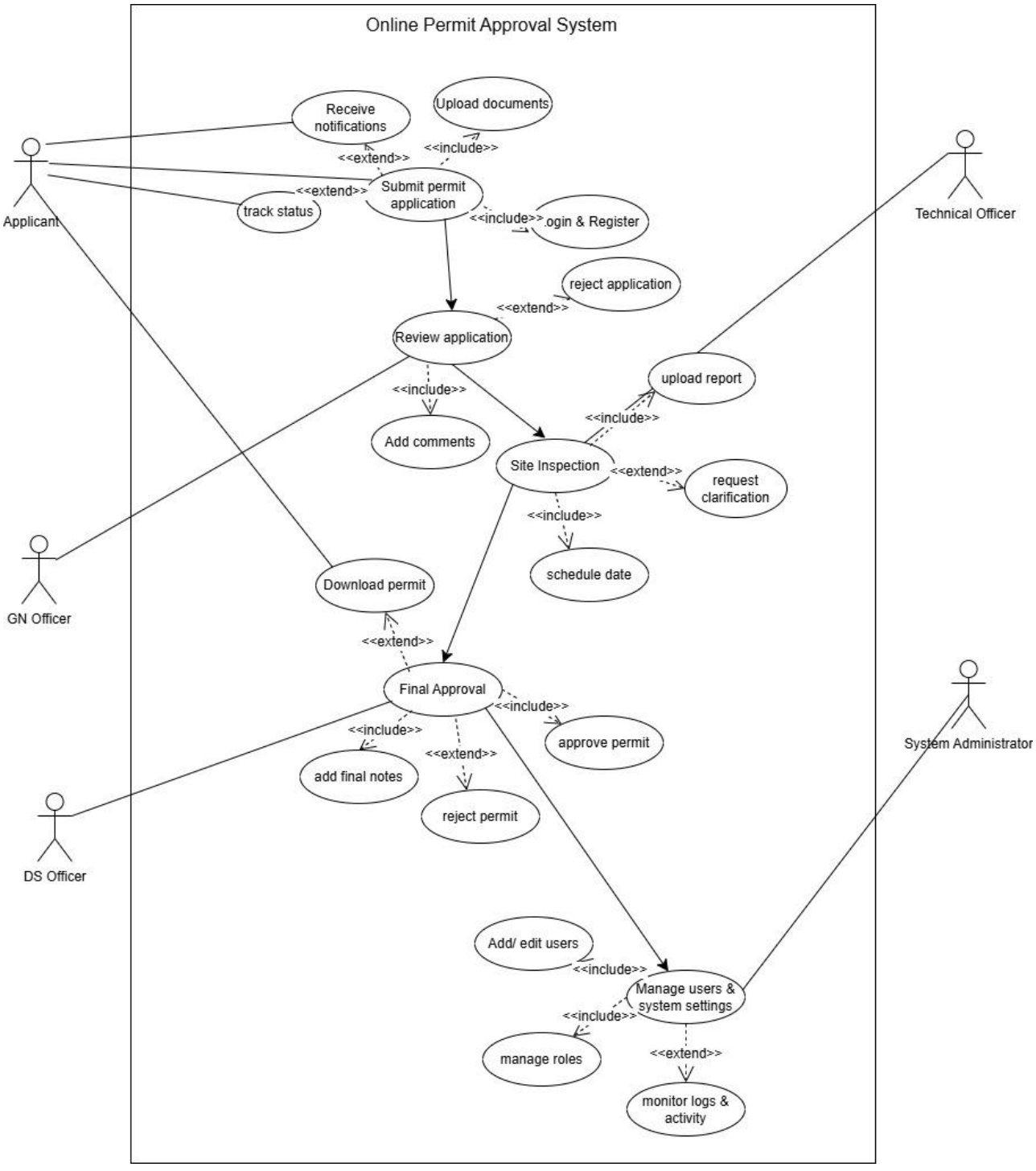
2.2 Scope Exclusions

Out of Scope

- A responsive web interface will be provided.
- The use of biometric verification or digital certificate-based e-signatures is excluded for now.
- real-time API connectivity is not included in this phase.
- The system will require internet access and will not function offline.
- The system will notify users of rejection reasons.
- The system will not handle legal appeals or third-party dispute resolution.
- Tamil language support is excluded in the initial rollout but can be added later.
- Integration to external systems.
- Workflow functionality for the contact us form is considered out of scope.
- Creating a Secure Login area is considered out of scope.
- Online payment

2.3 User classes and Characteristics

User Classes	**Characteristics**
Applicant	General public user; applies for permits; minimal technical knowledge.
Grama Niladhari (GN) Officer	Local admin with knowledge of local regulations.
Technical Officer	Government-appointed inspector.
Divisional Secretary (DS) Officer	High-level administrator
System Administrator	IT personnel



2.3.1 Impact on other systems

- Automating manual processes will reduce turnaround time and administrative burden for both applicants and officers.
- Standardized workflows, digital records, and audit trails will promote accountability and reduce the risk of corruption or favoritism.
- Citizens will benefit from a simpler, faster, and more transparent application process, accessible from home.
- Authorities can access analytics to identify bottlenecks, track departmental performance, and improve service delivery.
- Reduction in paper usage and unnecessary travel to government offices will contribute to eco-friendly governance practices.
- The system can be adapted by other Divisional Secretariats across the country, setting a national standard for digital permit processing.

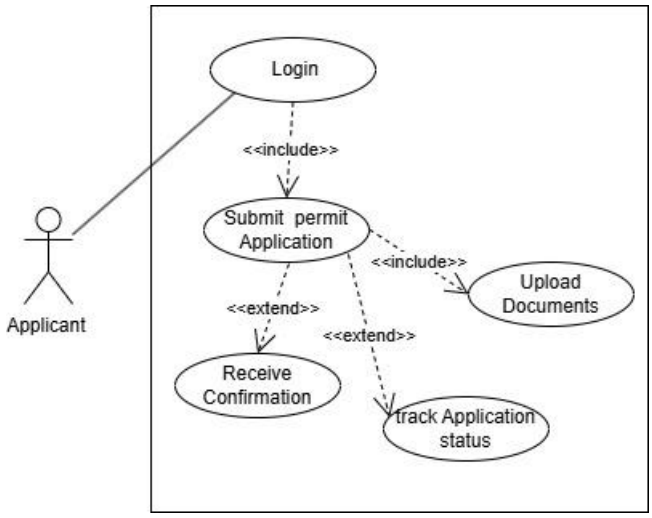
3 Functional Requirements

This section captures the functional requirements of the system. This section outlines the use cases for each of the active users separately. Each function will be explained in detail including process flows. It will also include validity checks on inputs, and responses to abnormal situations including: overflow, communication facilities, error handling and recovery.

3.1.1 Use Case: **Submit Permit Application**

In this use case, the applicant registers or logs into the ePermit platform and begins a new permit application. The system guides the user to fill in all details and upload documens. Once submitted, the system generates a tracking number and sends a confirmation notification. This submission initiates the permit approval workflow by sending the application to the GN Officer for review.

Diagram:



Brief Description:
Enables an applicant to digitally submit a request for a permit through the ePermit system.

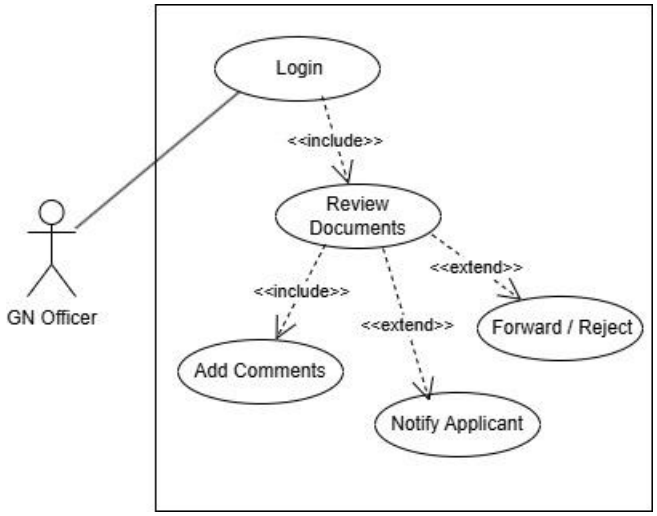
Initial Step-By-Step Description:

1) Applicant logs into the ePermit portal.
2) Applicant selects "Apply for New Permit".
3) System presents a digital form requiring: Name, address, contact information, Land details and type of construction or activity
4) Applicant uploads supporting documents (e.g., land deeds).
5) System performs form validation (checks for missing/invalid data).
6) Applicant proceeds to review and confirm the application.
7) System generates a summary for the applicant to confirm.
8) Applicant submits the form.
9) System stores the data and sends it to the GN Officer for review.
10) Applicant receives email/SMS confirmation with tracking ID.

3.1.2 Use Case: **Review Application**

The GN Officer logs into the ePermit system to review pending applications, checking the applicant's data and documents for completeness. If all is in order, the application is forwarded to the Technical Officer. If there are issues, the officer can request revisions or reject the application with reasons. The applicant is then notified of the decision and next steps.

Diagram:



Brief Description:
The Grama Niladhari (GN) Officer reviewing the submitted application.

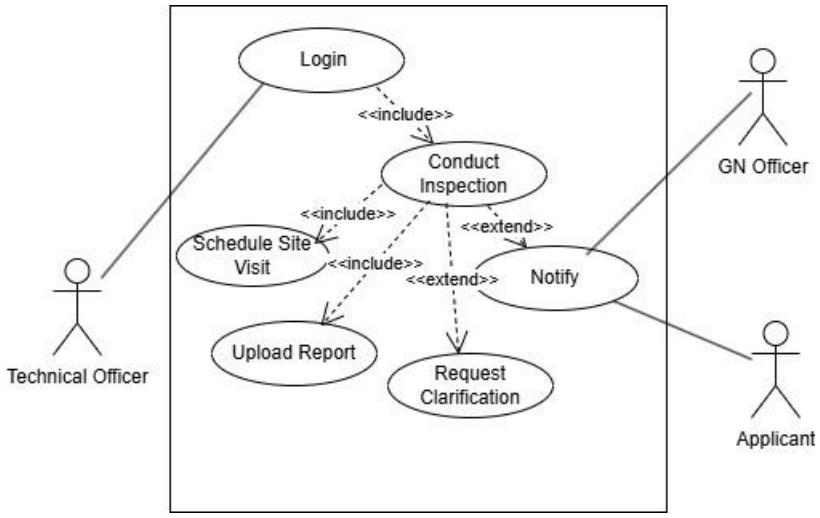
Initial Step-By-Step Description:

1) GN Officer logs into the ePermit system with credentials.
2) GN Officer navigates to “Pending Applications.”
3) Officer selects an application from the list.
4) System displays all submitted data and documents (e.g:land deed).
5) If required, the officer may conduct a site visit or check physical records.
6) Officer may add remarks or request minor clarifications.
7) Forward to Technical Officer, request revision from applicant or reject with a reason
8) Officer submits the selected action.
9) Status changes to "Forwarded to Technical Officer", "Rejected", or "Revision Requested".
10) Applicant is automatically notified via email/SMS of the update.

3.1.3 Use Case: **Conduct Site Inspection**

In this step technical Officer schedules an on-site inspection using the ePermit system. They visit the site, evaluate the physical aspects, take notes/photos, and later upload a detailed inspection report. Based on the findings, the officer will approve, reject, or request modifications. This is important for the Divisional Secretary's final decision.

Diagram:



Brief Description:
Enables the Technical Officer to conduct a physical site inspection to verify the alignment of the land and building plans with local zoning and structural regulations.

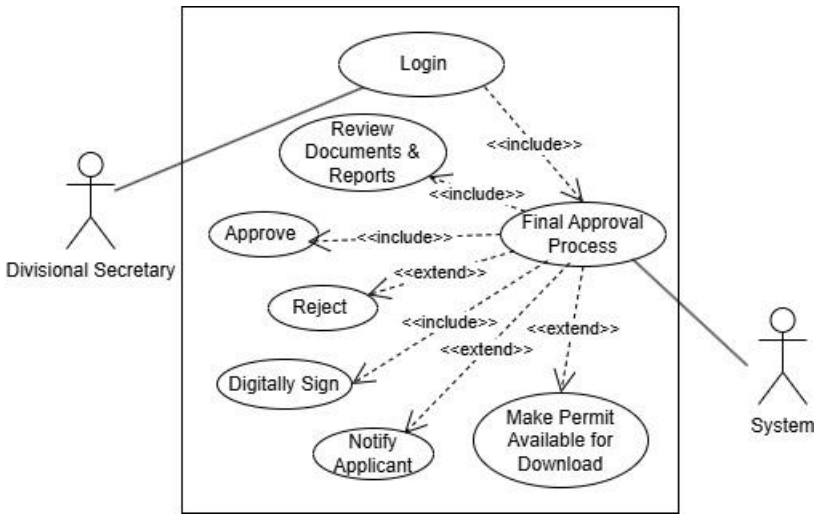
Initial Step-By-Step Description:

1) Technical Officer logs into the ePermit system using secure credentials.
2) Navigates to "Applications Assigned for Inspection."
3) Officer selects a specific application forwarded by GN Officer.
4) Officer download and reviews the documents.
5) Officer schedule a date and time for the on-site inspection.
6) Applicant is notified of the scheduled inspection via email/SMS.
7) Conduct site visit
8) Log and upload the inspection findings
9) After selecting approve, reject, or request modifications submits the report
10) Application moves to "Pending Divisional Secretary Approval."
11) All actions are logged in the system with timestamps.
12) Applicant receives update about inspection results or further actions needed.

3.1.4 Use Case: **Final Approval**

In the last step the Divisional Secretary logs into the ePermit system to review the application package. If satisfactory, they approve and digitally sign the permit, making it downloadable for the applicant. If not, the system records the reasons and notifies the applicant.

Diagram:



Brief Description:
The GN Officer and Technical Officer either approve the application and digitally issue the permit or reject it with a documented reason.

Initial Step-By-Step Description:

1) Divisional Secretary logs into the ePermit system using secure credentials.
2) Navigates to “Pending Applications for Final Approval.”
3) View all application in previous use cases
4) If all requirements are met, selects **“**approve**”** and if critical issues are found, selects “reject” and enters the reason.
5) Approves the permit using a secure digital signature or verification PIN.
6) Status changes to **“**Approved” or “Rejected**”** in the system.
7) Approved application is converted to a downloadable pdf permit document.
8) System sends an email/SMS to the applicant with the decision.
9) If approved, applicant receives a link to download the digital permit.
10) Application, reports, and permit are stored in the central database.

4 Functional Requirements & Non-Functional Requirements

4.1 Functional Requirements (User Stories)

- As an **Applicant**, I want to fill out and submit permit applications online so that I can apply without visiting the office.
- As a **GN Officer,** I want to verify the applicant's details and approve or reject the initial submission so that only valid requests proceed.
- As a **Technical Officer**, I want to conduct field inspections and upload reports so that the Divisional Secretary has valid site data.
- As a **DS Officer**, I want to review all previous stages and give final approval so that the permit process is legally completed.
- As a **System Admin**, I want to manage system configurations and users so that the system runs smoothly and securely.

4.2 Non-Functional Requirements

4.2.1 Performance and Load Requirements

Current User Load	50 users
Expected Growth	100 max
Number of concurrent users	20 max
Transaction Size (files sizes etc.)	2–5 MB
Maximum Average Transaction Time Acceptable	Permit application submission: ≤ 5 seconds Page load time: ≤ 3 seconds.

4.2.2 Compatibility Requirements

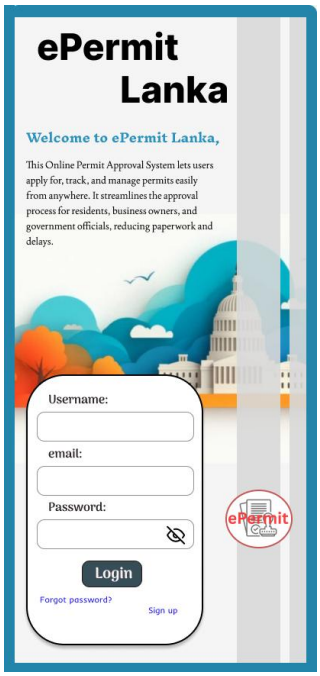
HTML Versions to be supported	HTML5
Browser Versions to be supported	Latest versions of Google Chrome, Firefox, Microsoft Edge
Database Versions to be supported	MySQL 8.0
Communication Protocol	HTTPS (SSL/TLS), RESTful API
Platform Version to be supported	Cloud-hosted
Any other external systems or standards	

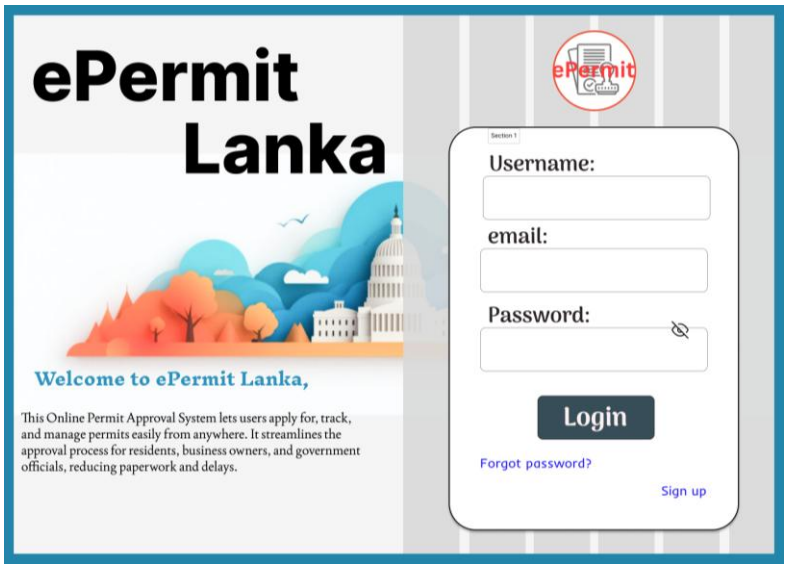
4.2.3 External Interface Requirements

This section defines how the ePermit system communicates with external systems and services. Interfaces must support secure communication and enable extensibility for future government integration.

4.2.3.1 User Interfaces

These define how end-users interact with the system. HTML5-compliant responsive web interface for desktop and mobile browsers. Compliance with WCAG 2.1 for accessibility (screen readers, keyboard support).





4.2.3.2 Hardware Interfaces

These are physical or device-based components with which the system may interact. Standard input devices and On-premise or cloud-hosted servers with minimum 8 GB RAM, SSD storage.

4.2.3.3 Software Interfaces

MySQL 8.0+ , Optional integration with national digital ID or eGov services (API-based) , File Format (DF, JPEG, PNG, DOCX)

4.2.3.4 Communications Interfaces.

System uses external gateway services for sending alerts and permit status updates. To allow modular system communication it uses Internal and external APIs. Also RESTful API to integrate with e-payment service.

4.2.4 Security and Authentication requirements

4.2.4.1 Data Storage Security

MSSQL server use sqlserver authentication when connecting to the DB. User passwords are also encrypted when saving to the DB. All sensitive data (user credentials, personal details, permit documents) is encrypted using **AES-256** encryption in the database and file system. Also Replicated storage in case of system failure or disaster.

4.2.4.2 Data Communication Security

HTTPS, External APIs are accessed using OAuth 2.0 tokens **,** uploads are scanned for malware and viruses , CAPTCHA / Bot Protection , Two-Factor Authentication

4.2.5 Quality Assurance Requirements

While leveraging our best practices from multiple projects and extensive experience in testing, we aim to align our QA Services to meet organizational and business requirements. Following are the key phases QA team will go through during each cycle of testing.

Planning	Plan the purpose and goals of testing within the scope of the project and devise a business-oriented approach to testing
Designing	Collaboratively formulate test methods, processes and techniques to carry out testing tasks effectively and efficiently in line with the devised strategy
Execution	The day-to-day test operation with metric base monitoring
Reporting	Measure and analyze results with the intention of identifying further improvements

4.2.5.1 QA Test Scope

Type of Testing

- Smoke Testing
- Functional Testing
- Regression Testing
- Performance Testing

In the test execution phase plan to follow the above mentioned test types with the process of running test cases against the released software build modules to verify that the actual results meet the expected results. Once the module released smoke test execute to check whether the product is up to the standard to go on with functional testing . QA team accept build with at least developed up to 80% of the module. Defects discovered during the testing cycle shall be logged & forwarded to development team. Once a defect is fixed by a developer, the fixed code shall be incorporated into the application and regression tested.

4.2.5.2 QA Environment

The QA environment is a replica of the production environment and includes both software and hardware components used to execute tests.

OS	Ubuntu Server 20.04 LTS, Windows Server 2019
Database	PostgreSQL 14 / MySQL 8 with test dataset clones
Application Server	Node.js / Apache / Nginx depending on stack
Testing Tools	Selenium (UI automation), JMeter (load testing), Postman (API testing), OWASP ZAP (security testing)
Issue Tracking	JIRA or GitHub Issues for bug tracking and task management
Source Control	Git (GitHub or GitLab) for version control and test code branching
Browsers for Testing	Chrome, Firefox, Edge (latest versions) to ensure cross-browser compatibility
Devices	Desktop, tablet, and mobile emulators/simulators for responsive UI Testing

4.2.5.3 QA Data

- User Roles
- Permit Application Data
- Document Uploads
- Payment Transactions
- Inspection Data
- Integration Mocks
- Security Testing Data

4.2.6 Development Requirements

4.2.6.1 Development Environment

Type	Name
Software	Python 3.10+
	MySQL 8
	React.js or Vue.js
	Docker (for containerization)
	GitHub or GitLab
	Windows 10 / Ubuntu 20.04+
Tools	Visual Studio Code
	Postman
	OpenAPI
	Jira or Trello (for task and sprint management)
	Selenium or Cypress (for automated testing)
Hardware	i5 or Ryzen 5 Processor
	Linux or Windows Server
	router or firewall device

4.2.6.2 Development Data

- User (Applicant, GN Officer, Technical Officer, DS Officer, Admin)
- Permit Application (ID, status, date, type)
- Verification Records
- Inspection Reports
- Approval Status Logs
- Payment Records
- National ID verification API (if available)
- Government land registry database (for location verification)
- GIS (Geographic Information System)

4.2.6.3 Development Process

Phase 1: **Planning** (2 week)

- Meet with local council to list needed permit types
- simple mockups using paper or tools like Figma/Canva

Phase 2: **Development** (2–4 weeks)

Build using tools like:

- Frontend: HTML/CSS + JavaScript or React/Vue
- Backend: PHP/Laravel or Node.js (Express)
- Database: MySQL or Firebase
- Use Bootstrap for quick responsive design
- Integrate a free SMS API (or simulate via email)

Phase 3: **Testing and Launch** (1 week)

- Test with a few local citizens and staff
- Fix bugs and train staff to use the admin panel
- Launch pilot in one GN Division before wider rollout

4.2.6.4 Future Add-ons

Online payment for permit fees , GIS-based map of approved sites (e.g., for stalls) and Integration with police station or PHI office for certain event permits

4.2.7 Deployment Requirements

4.2.7.1 Installation Packaging Requirements

The Online Permit Approval System will be packaged using modern deployment tools depending on the environment.
(Web-Based System – Docker , Local or On-Premise Setup – InstallShield**,** MSI)

4.2.7.2 Deployment Requirements

The system will be deployed in a centralized or cloud-based environment.

4.2.8 Documentation requirements

Technical Documentation - System Architecture Document , Database Schema and API , Deployment and Maintenance Guide

User Documentation - User Manuals , Quick Start Guides , FAQ and Troubleshooting Instructions

Training Materials - PowerPoint Presentations , workflow documents

Compliance Documentation - Data Security and Privacy Policy , Access Control Policy

4.2.8.1 Special Documentation Requirements

- Legal Disclaimers
- Copyright Notices
- Trademarks and Logos
- Warranties
- Security Compliance

4.2.9 Applicable Standards

- ✓ Legal and regulatory: FDA, UCC
- ✓ Communications standards: TCP/IP, HTTPS
- ✓ Platform compliance standards: Windows, Linux (Ubuntu)
- ✓ Quality and safety standards: ISO, CMM

5 Non-Functional Requirements

- Mobile-friendly interface (most rural users access via phone)
- Multilingual support(Sinhala & Tamil at minimum)
- Basic security (HTTPS, login auth, file size limits)
- Lightweight server usage (can run on shared or VPS hosting)

5.1 User Stories …..

- As a **planner**, I want the system to support annual growth of up to 25% more users so that we scale without performance loss.

- As an **Applicant**, I want the system to respond within 5 seconds, so I don't face delays while submitting forms.

- As an **admin**, I want the system to handle at least 100 concurrent users so that peak times do not crash the application.

- As a **GN Officer**, I want the system to be available 24/7, so I can access applications any time.

- As a **Technical Officer**, I want the interface to be simple and intuitive, so I can enter field data quickly.

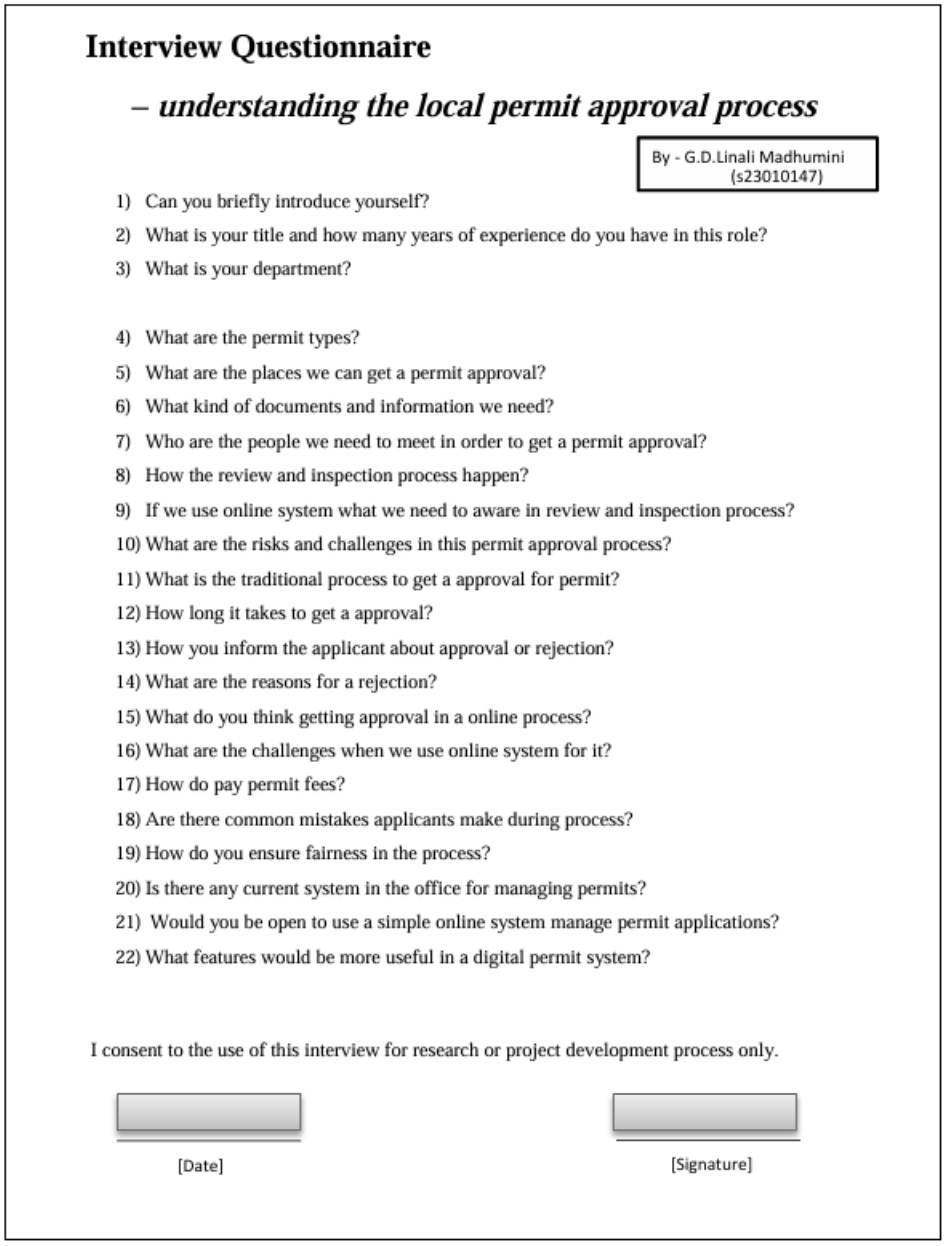
- As a **Divisional Secretary**, I want the data to be secured and encrypted, so that no sensitive information is leaked.

- As a **System Administrator**, I want the system to support multiple browsers and devices, so all users have access regardless of their platform.

- As a **web user**, I want the system to support modern browsers like Chrome, Edge, Firefox so that I don't face issues.

- As a **mobile user**, I want the application to render properly on Android and iOS browsers so that I can use it on the go.

6 Appendix –



Interview Questionnaire

– understanding the local permit approval process

By - G.D.Linali Madhumini
(s23010147)

1) Can you briefly introduce yourself?
2) What is your title and how many years of experience do you have in this role?
3) What is your department?

4) What are the permit types?
5) What are the places we can get a permit approval?
6) What kind of documents and information we need?
7) Who are the people we need to meet in order to get a permit approval?
8) How the review and inspection process happen?
9) If we use online system what we need to aware in review and inspection process?
10) What are the risks and challenges in this permit approval process?
11) What is the traditional process to get a approval for permit?
12) How long it takes to get a approval?
13) How you inform the applicant about approval or rejection?
14) What are the reasons for a rejection?
15) What do you think getting approval in a online process?
16) What are the challenges when we use online system for it?
17) How do pay permit fees?
18) Are there common mistakes applicants make during process?
19) How do you ensure fairness in the process?
20) Is there any current system in the office for managing permits?
21) Would you be open to use a simple online system manage permit applications?
22) What features would be more useful in a digital permit system?

I consent to the use of this interview for research or project development process only.

[Date] [Signature]