Web Based Integrated Equipment Scheduling, Print Request + user profiling for SK of Barangay Sto. Domingo

This project is submitted in **partial fulfillment of the course requirement** for **System Integration and Architecture 1**, as part of the **Project Documentation** for the first semester of the academic year 2025–2026.

The system was developed by the following group members:

Jan Aryas, Project Team Leader

Kenneth Galvan, Technical Leader

Alen James Mamansag, Assurance Leader

Miyabi Alvero, Documentation Leader

This document is respectfully submitted to:

Prof. Ernanie M. Carlos Jr.

Section

A

Date of Submission:

November 6, 2025

CHAPTER 2

Requirements Specification

This chapter presents a comprehensive overview of the requirements and specifications necessary for the successful development and implementation of the system. It outlines both functional and non-functional requirements, provides detailed use cases, and describes the technical, operational, and business aspects that guide the system design. By establishing a clear understanding of the system's expectations, constraints, and operational environment, this chapter serves as a blueprint for ensuring that the final product meets stakeholder needs and performs reliably under expected conditions.

2.1 Functional Requirements

2.1 Functional Requirements

ID	Requirement Description	Priority
FR1	The system shall allow users to add new students.	High
FR2	The system shall enable users to update student information.	High
FR3	The system shall generate academic transcripts.	High
FR4	The system shall notify residents of approval, rejection, or completion of requests.	High
FR5	The system shall enable staff to post announcements and project updates.	Medium
FR6	The system shall allow residents to submit anonymous feedback to the admin.	Medium
FR7	The system shall allow the admin to respond to feedback and oversee all transaction.	High
FR8	The system shall display transparency dashboards showing project progress and service logs.	High
FR9	The system shall maintain bottle ledger records for each resident.	High
FR10	The system shall allow admins to manage user accounts (add, update, deactivate).	High

2.1.1 Functional Requirements Descriptions

Item	Description
Req ID	FR2
Description	Residents can request printing, borrowing, or computer use services through the online portal.
Priority	High
Functional Requirement Description	The system provides forms for submitting service requests. Each request includes the type of service, schedule, and number of bottles offered. The staff will verify bottle submissions before approval.
Acceptance criteria	Residents can submit a request with valid input fields. - The system stores the request in the database. - Staff can view, approve, or reject the request. - Residents receive a notification of status update.

2.2 Non-Functional Requirements

Item	Description
Req ID	FR2
Description	Residents can request printing, borrowing, or computer use services through the online portal.
Priority	High

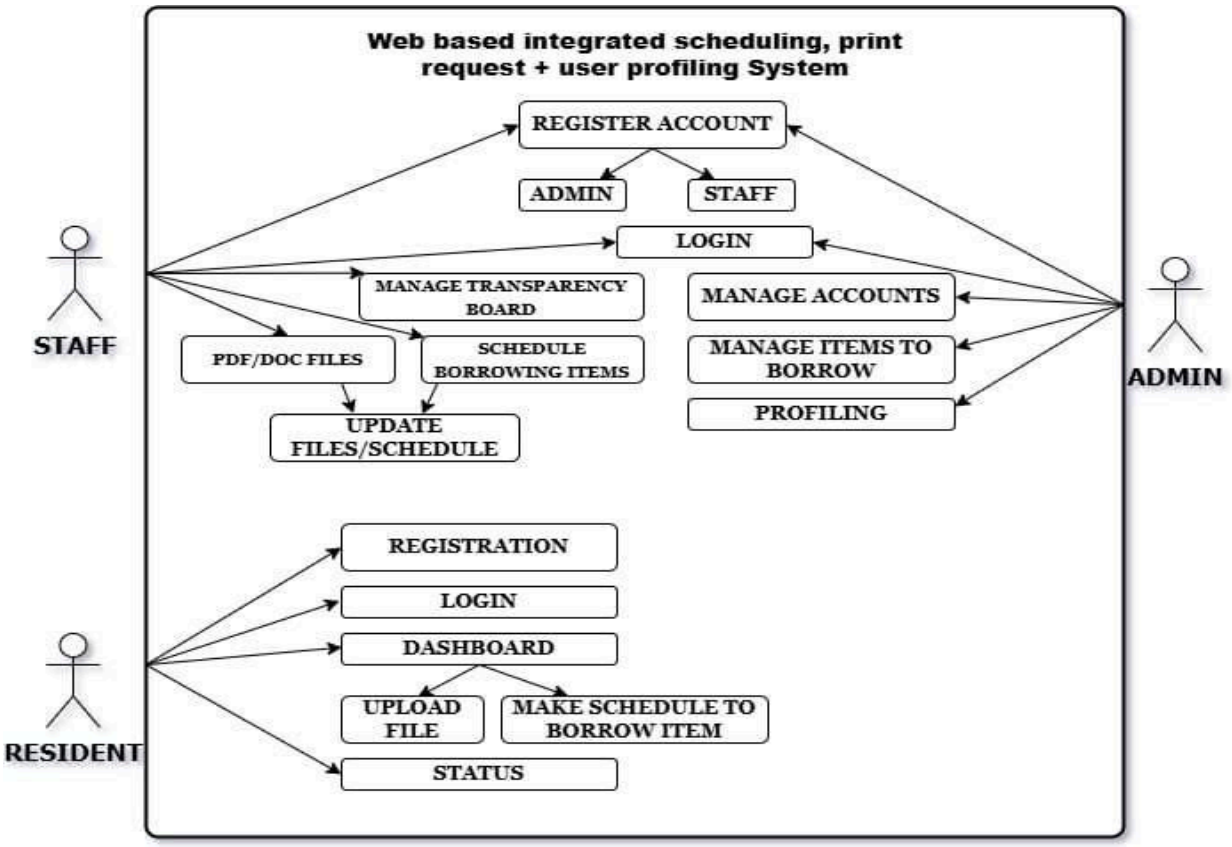
Functional Requirement Description	The system provides forms for submitting service requests. Each request includes the type of service, schedule, and number of bottles offered. The staff will verify bottle submissions before approval.
Acceptance Criteria	Residents can submit a request with valid input fields. - The system stores the request in the database. - Staff can view, approve, or reject the request. - Residents receive a notification of status update.

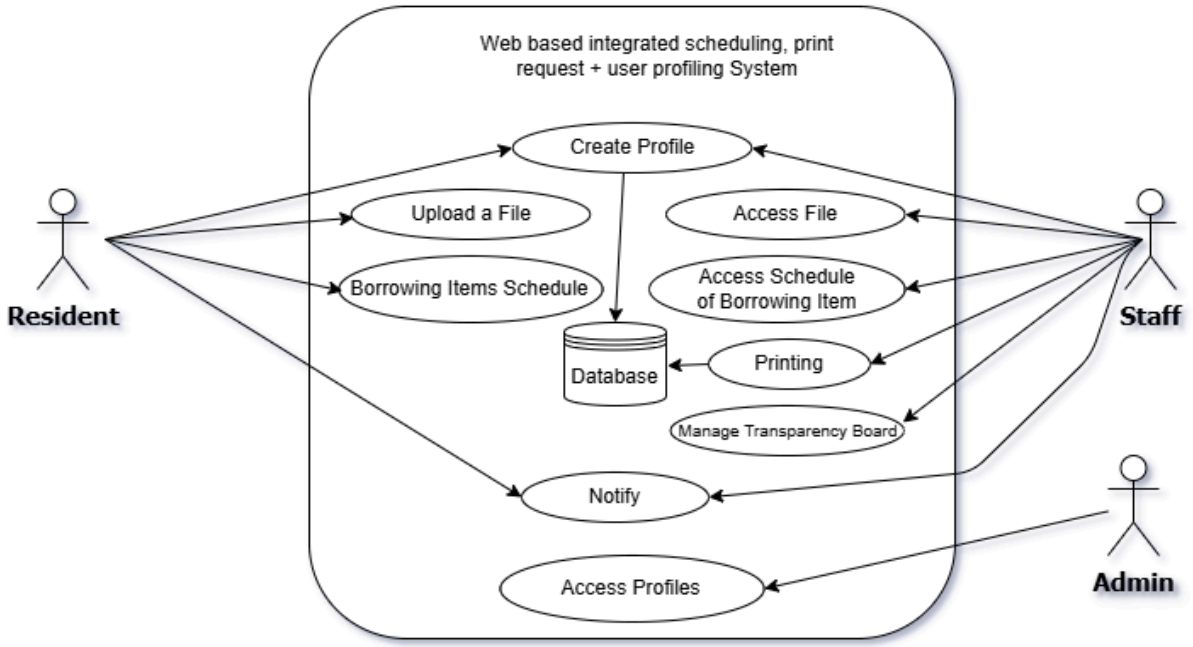
f

2.3 Use Cases

Use Case ID	Name	Description	Actors
NFR-001	Cloud Hosting and Uptime	The system shall be deployed in the cloud with at least 99.5% uptime ensured through managed hosting services.	System Administrator, Developer
NFR-002	Scalability	The system shall automatically scale to handle increased traffic or additional barangays using cloud auto-scaling features.	System Administrator, Developer
NFR-003	Usability	The UI shall be optimized for all devices and browsers, supporting offline caching for key pages.	Resident, Staff, Admin
NFR-004	Security	The system shall use HTTPS, JWT authentication, and data encryption. Admin accounts must have 2FA for cloud access.	Admin, Developer
NFR-005	Backup and Recovery	Daily cloud database backups with automated restore points to prevent data loss	System Administrator,
NFR-006	Performance	All API endpoints shall respond within 2 seconds under normal load.	Developer, System Administrator
NFR-007	Maintainability	Modular architecture for easy updates and scalability (frontend and backend independently updatable).	Developer
NFR-008	Compatibility	The web system must function across all major browsers and mobile devices	Resident, Staff, Admin, Developer
NFR-009	Localization	Must support both English and Filipino interfaces.	Resident, Staff, Admin, Developer

2.3.1 Use Case Diagrams





Web-Based Integrated Scheduling, Print Request, and User Profiling System. The system integrates scheduling, file management, and user profiling for residents, staff, and administrators. Residents can create profiles, upload files, and schedule borrowing of items. Staff can access and manage files, handle printing, and update the transparency board, while admins oversee user accounts, profiles, and system data. The diagrams show both user interactions and process flow, highlighting how the system streamlines operations, improves transparency, and ensures efficient management across all user roles.

Main Actors:

- Resident
- Staff
- Admin

Core Interactions:

- Resident → Submit Requests, Send Feedback, View Updates
- Staff → Verify Bottles, Approve Requests, Post Announcements
- Admin → Manage Users, View Feedback, Generate Reports

2.4 System Requirements

Hardware Requirements

- Minimum Server: 2 vCPU, 4GB RAM, 10GB SSD (cloud-hosted Node.js + MySQL)
- Client Devices: Any smartphone, tablet, or computer with internet browser
- Internet Connection: Stable connection for real-time updates

Software Requirements

- Frontend: React + Vite
- Backend: Node.js with Express.js
- Database: MySQL
- Hosting: Cloud provider (AWS, Render, or Google Cloud)
- Authentication: JWT and HTTPS

2.5 Business Rules

Rule ID	Rule Description
BR1	1 plastic bottle = 1 black & white print page or 30 minutes of computer use.
BR2	All service requests require bottle verification by staff before approval.
BR3	Residents must have an active account to submit any request.
BR4	Admin has the sole authority to deactivate accounts and respond to feedback.

BR5	Completed transactions automatically deduct bottle credits from the resident’s balance.
BR6	Borrowed equipment must be returned as scheduled; overdue returns are logged in the system.

2.6. Constraints

- Must comply with the **Data Privacy Act of 2012**.
- Limited development budget; focus on essential features first.
- Requires SK staff presence for physical bottle verification.
- Relies on barangay internet connectivity for smooth operation.
- Local hosting resources may limit uptime compared to enterprise solutions.

2.7 Assumptions

- Residents will actively participate in the bottle exchange program.
- Staff can use the system for verification and approvals.
- The barangay provides stable internet access and electricity.
- Residents have access to smartphones or computers.
- All stakeholders will support the eco-friendly “bottle-to-service” initiative.

2.8 Dependencies

- Successful integration of React (frontend), Node.js (backend), and MySQL (database).
- Reliable cloud hosting or barangay server deployment.

- Consistent bottle collection and verification process.
- Active maintenance by SK staff to keep announcements and project statuses updated.
- Collaboration with local recycling partners for bottle validation and collection.