PAMANTASAN NG LUNGSOD NG MUNTINLUPA

A GEO-INTEGRATED WEB PLATFORM WITH REAL-TIME CITIZEN FEEDBACK AND SERVICE REQUEST MANAGEMNET FOR BARANGAY

A Capstone Project Presented to the Faculty of the College of Information Technology

and Computer Studies Pamantasan ng Lungsod ng Muntinlupa

In Partial Fulfilment of the Requirements for the

Degree Bachelor of Science in Information

Technology

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2025

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INTRODUCTION

PROJECT CONTEXT

All local Barangay's in the Philippines such as Manila, Alabang, Muntinlupa etc., faces challenges in efficiently managing citizen concerns. Traditional methods such as in-person visits, manual logbooks, and verbal reports often lead to delays, miscommunication, and a lack of transparency. These issues hinder timely responses to community needs and reduce citizen trust in local governance. Advancements in digital technology offer opportunities to transform these processes. By integrating Geographic Information Systems (GIS) with real-time feedback mechanisms, local governments can enhance service delivery, ensure transparency, and foster greater community engagement. a proposed geo-integrated web platform designed to enhance citizen engagement and service request management within Barangay Bayanan. The platform leverages geographic information system (GIS) technology to provide a spatially aware interface for reporting issues and tracking service requests. A geo-integrated web platform for Barangay Bayanan is a digital solution that combines geographic information systems (GIS) with real-time citizen feedback and service request management. It enables residents to report issues, request services, and access community information through an interactive map, enhancing engagement and governance. traditional methods often leave leaders piecing together disjointed reports:

weather forecasts from one service, news from scattered outlets, field updates from overstretched staff, and public sentiment from sporadic meetings.

These gaps breed delays, missteps, and eroded trust. The Geo-Insights Live Feed Tool was born to bridge this divide, drawing on the power of integrated data to streamline decision-making. Conceived as a digital command center, the web anchors its functionality in an interactive map, where every piece of information. Geographic Information Systems (GIS) to map out the barangay, allowing residents to visualize services, amenities, and issues in their locality. Utilizes Geographic Information Systems (GIS) to map out the barangay, allowing residents to visualize services. Enables residents to provide immediate feedback on services and report issues through the platform. Incorporates features like surveys and polls to gather community opinions on local governance and initiatives. Allows citizens to submit service requests directly through the platform. Streamlines the process of service requests, leading to faster response times and improved service delivery. Promotes transparency in local governance by allowing citizens to see how their feedback is being utilized.

allowing residents to easily submit service requests pothole repair, garbage collection, streetlight malfunction by pinpointing their location on a map. The system also facilitates real-time feedback on existing requests and the status of their resolution. Strategies, geographically, enabling barangay officials to prioritize and dispatch resources effectively. This spatial awareness improves response times and allows for better resource allocation. Many municipalities and cities utilize GIS-based platforms to manage public

services, track infrastructure, and engage citizens. These systems often include features for reporting issues, tracking progress, and visualizing data geographically. Several open-source GIS platforms provide the underlying technology for building custom applications like the one proposed. These platforms offer flexibility and customization options. Many governments maintain online portals that allow citizens to access services, submit requests, and track their progress. Some of these portals integrate GIS capabilities for spatial awareness. of modern marketing effectively and sustainably.

PURPOSE AND DESCRIPTION

The purpose of the study is to develop a Geo-Integrated Web Platform with Real Time Citizen Feedback and Service Request Management for "Bayanan". The system would monitor expenditures to provide a better web platform, which is intended to enhance problem analysis and benefit everyone. It would help them manage to help in planning in the future Implementing such a platform in Barangay Bayanan would not only modernize its operations but also foster a more engaged and resilient community. in proactive planning and resource management. Integrate hazard mapping and real-time monitoring to enhance the barangay's capability to respond to emergencies effectively. Visual representation of barangay assets, infrastructure, and reported issues, enabling officials to pinpoint problem areas accurately. Residents can submit reports or service requests through a web portal. Systematic tracking of service requests from submission to resolution, ensuring accountability and transparency. Comprehensive analytics tools

to monitor performance metrics, service response times, and community satisfaction levels. An online report management tool that allows residents to submit complaints and receive updates, improving responsiveness and transparency. An online report management tool that allows residents to submit complaints and receive updates, improving responsiveness and transparency. The purpose of the geo-integrated web platform for Barangay Bayanan is to enhance local governance and community engagement by providing a digital solution that

by allowing citizens to track the status of their requests and see how their feedback is being utilized.

Below are the following Beneficiaries

1. Barangay bayanan   3. Barangay official

2. Streets   4. Clogged drainages

OBJECTIVE OF THE STUDY

General Objective

The general objective of the geo-integrated web platform with real-time citizen feedback and service request management for Barangay Bayanan is to enhance local governance and community engagement by providing a comprehensive digital solution that facilitates effective communication, efficient service delivery, and active participation of residents in the decision-making processes of their barangay.

the geo-integrated web platform to create a more responsive, participatory, and effective governance model for Barangay Bayanan, ultimately improving the quality of life for its residents.

Specific Objectives

1. To design the system using the following features:

a. Enable residents to actively participate in local governance by providing them with tools to submit feedback, report issues, and request services in real-time.

b. Streamline Service Requests: Develop an efficient service request system that allows residents to easily submit and track their requests problem, ensuring timely responses from local government officials in the barangay.

c. Enhance Transparency: Foster transparency in local governance by allowing citizens to view the status of their requests and feedback, thereby building trust between the community and local officials.

d. Facilitate Data-Driven Decision Making Collect and analyze data from citizen interactions to inform local government decisions, prioritize community needs, and improve service delivery based on real-time insights.

e. Promote Community Engagement: Create a platform that encourages residents

to engage with their community, participate in local initiatives, and stay informed about barangay activities and services.

f. Improve Accessibility: Ensure that the platform is user-friendly and accessible to all residents, including those with limited digital literacy, by providing a platform to help them with their problem in the opened canal

2. To develop the system using: HTML

3. To test and improved the system using Alpha and Beta Testing method

4. To evaluate the performance of the system using ISO/ IEC 25010: 2024-2025

5. To implement the system a geo integrated web platform with real time citizen feedback and service request management for Barangay Bayanan

SCOPE AND LIMITATION

The platform   GIS technology to provide an interactive map of Barangay Bayanan, displaying various community services, amenities, and reported issues like garbage, streetlight and the opened canal. Residents will have the ability to provide real-time feedback on local services, report issues, and participate in surveys and polls to express their opinions on community matters. The platform will facilitate the submission and tracking of service requests, such as maintenance, waste collection, and other community services, allowing residents to monitor the status of their requests. The

platform will be designed to be user-friendly and accessible, with a mobile responsive layout to ensure usability on various devices, including smartphones and tablets.

The platform may initially focus on specific services and issues relevant to Barangay Bayanan, limiting its applicability to broader community needs or services outside its initial scope. these limitations, the development and implementation of the geo-integrated web platform can be better tailored to address the needs of Barangay Bayanan while striving to enhance community engagement and governance

Chapter 2

REVIEW OF THE RELATED LITERATURE AND STUDIES

TECHNICAL BACKGROUND

Digital Literacy Evaluation is a geo-integrated online platform that employs real time citizen feedback to evaluate and enhance pupils' digital literacy through customized learning materials. Its features include a web-platform, feedback, and service request management, and it was constructed with HTML, CSS, JavaScript, and PHP with a MySQL database. Online tools and other fundamental computer uses are included in the curriculum. To increase usability for citizens and students working to improve their digital literacy skills, this system is compatible with a variety of devices.

RELATED LITERATURE

The development of a geo-integrated web platform with real-time citizen feedback and service request management for Barangay Bayanan is grounded in various fields, including e-governance, citizen engagement, and geographic information systems (GIS). This review highlights relevant literature and studies that inform the design and implementation of such a platform.

E-Governance and Digital Platforms-governance refers to the use of information and communication technology (ICT) to enhance the delivery of government services, improve transparency, and foster citizen participation. According to Heeks (2021), e-governance can significantly improve the efficiency and effectiveness of public service delivery by providing citizens with easy access to information and services. [1]

Study by Bertot et al. (2019) emphasizes the importance of transparency and accountability in e-governance initiatives. The authors argue that digital platforms can facilitate citizen engagement by providing tools for feedback and communication, ultimately leading to improved governance outcomes. [2]

Citizen engagement is crucial for effective governance, as it fosters a sense of ownership and responsibility among residents. Fung (2020) discusses the concept of participatory governance, highlighting how digital platforms can empower citizens to contribute to decision-making processes. The study suggests that platforms enabling real-time feedback can enhance civic engagement and improve public trust in government. [3]

Research by McMillan and Hwang (2020) indicates that online platforms can facilitate greater participation by providing citizens with convenient channels to

express their opinions and report issues. This aligns with the objectives of the proposed platform for Barangay Ramos, which aims to create a space for active citizen involvement. [4]

GIS technology plays a vital role in enhancing the functionality of the proposed platform. Goodchild (2020) highlights the potential of GIS to improve spatial decision-making by providing visual representations of data. The integration of GIS in public service platforms allows for better resource allocation and planning, as it enables local governments to visualize community needs and service

locations. [5]

A study by Sui et al. (2020) explores the use of GIS in participatory planning, demonstrating how interactive maps can facilitate community engagement by allowing residents to identify and report issues in their neighborhoods. This supports the idea of incorporating GIS into the Barangay Ramos platform to enhance citizen feedback and service request management. [6]

Real-time feedback mechanisms are essential for responsive governance. Research by Kettunen and Kallio (2019) indicates that platforms allowing for immediate feedback can lead to quicker resolutions of issues and improved service delivery.

The study emphasizes the importance of user-friendly interfaces that encourage citizen participation. [7]

A study by Reddick (2019) examines the impact of online service request systems on citizen satisfaction. The findings suggest that real-time tracking of requests enhances transparency and accountability, leading to increased trust in local government. [8]

Research by Norris (2020) discusses the digital divide, emphasizing that disparities in access to technology can hinder the effectiveness of e-governance initiatives. Ensuring inclusivity and accessibility for all residents is crucial for the success of the Barangay Ramos platform. [9]

A study by Gil-Garcia and Pardo (2020) identifies data privacy and security as significant concerns in e-governance. The authors recommend implementing robust security measures to protect citizen information while maintaining transparency in data usage. [10]

The review of related literature and studies underscores the importance of integrating e-governance principles, citizen engagement strategies, GIS technology, and real-time feedback mechanisms in the development of the reintegrated web platform for Barangay Bayanan. By leveraging these insights, the platform can effectively enhance local governance, improve service delivery, and foster active participation

among residents. Addressing the identified challenges will be essential to ensure the platform's success and sustainability in the long term.

TECHNICAL TERMS

Barangay: The smallest administrative division in the Philippines, serving as a local government unit. A barangay is responsible for providing basic services and governance to its community, including public safety, health, and infrastructure.

Citizen Feedback: The immediate collection and processing of input from residents regarding local services, issues, and community needs. This feedback is gathered through digital channels, enabling local government to respond promptly to citizen concerns.

Data Analytics: The process of collecting, processing, and analyzing data to extract meaningful insights and inform decision-making. In the context of the platform, data analytics will be used to understand citizen feedback trends and service request patterns.

Data Privacy: The protection of personal information collected from users, ensuring that it is handled in compliance with relevant laws and regulations. Data privacy measures are critical for building trust between citizens and local government.

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Geo-Integrated Web Platform: A digital platform that combines geographic information systems (GIS) with web-based technologies to provide users with interactive maps and location-based services. It allows for the visualization of spatial data and facilitates community engagement through geographic context. **Real-Time**

Geographic Information System (GIS): A system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. GIS technology enables the visualization of data in map form, facilitating better decision-making and resource allocation.

User Interface (UI): The means by which a user interacts with a digital platform, including the layout, design, and elements such as buttons, menus, and forms. A user-friendly UI is essential for ensuring accessibility and ease of use.

User Authentication: The process of verifying the identity of a user attempting to access a digital platform. This typically involves the use of credentials such as usernames and passwords to ensure secure access to the system.

OPERATIONAL TERMS

Data Analytics Dashboard: A visual representation of data collected from user interactions, service requests, and feedback specific to Barangay Bayanan.

Feedback Submission: The process by which users provide comments, suggestions, or reports about local services or issues within the community.

Geospatial Mapping: The process of visualizing geographic data on an interactive map within the platform. This feature allows users to see the locations of services, reported issues, and community resources specific to Barangay Bayanan.

Notification Alerts: Automated messages sent to users to inform them about important updates related to their service requests, feedback, or community announcements.

Request Tracking: The feature that allows users to monitor the status of their submitted service requests in real-time.

Service Categories: The classification of different types of services available for request on the platform, such as waste management, street maintenance, public safety, and community events relevant to Barangay Bayanan.

Chapter 3
METHODOLOGY

This chapter presents the requirement analysis which includes the user requirements that show the action that can be done by the user. In addition to that, this chapter also includes the functional requirements which show the functions needed in developing and using the system.

REQUIREMENT ANALYSIS

Analyzing the requirements for the project "A Geo Integrated Web Platform with Real-Time Citizen Feedback and Services Request Management". Surveys and interviews were carried out with beneficiaries in barangay Bayanan to gain insight into their views on the Web Platform and the difficulties they encounter while trying to effectively use technology. The analysis revealed a need for an interactive evaluation tool to the beneficiary, the Web Platform system should be. The system design should be web-compatible, offer a user-friendly interface, ensure data confidentiality, and enable real-time responses. These specifications were employed in the creation and development of a platform that assesses and supports the enhancement of digital skills through tailored learning journeys for the beneficiary
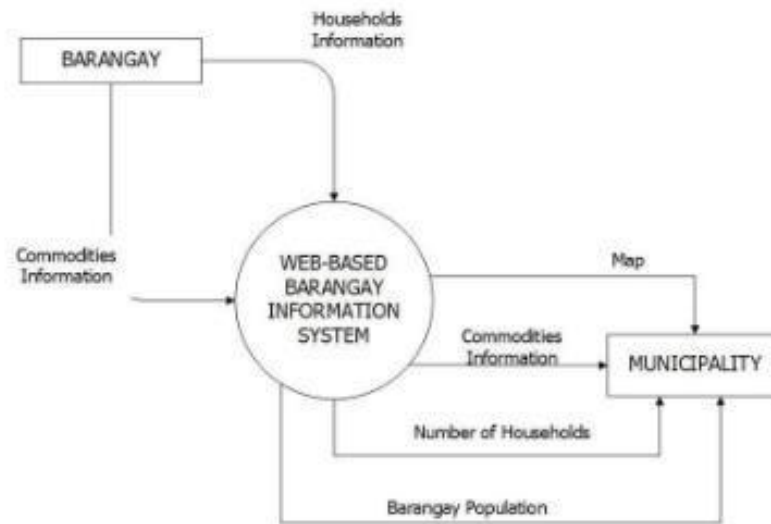
Figure 1. Context Diagram

The context diagram of the evaluator for Geo Integrated web platform with real time citizen feedback and service request management. The central system has interconnected to the beneficiary and the administrator as the two external entities. The researchers, entering some data into this system in the form of their responses, personal profiles, and digital activity. In return, they obtain their evaluation results reflecting the level of web
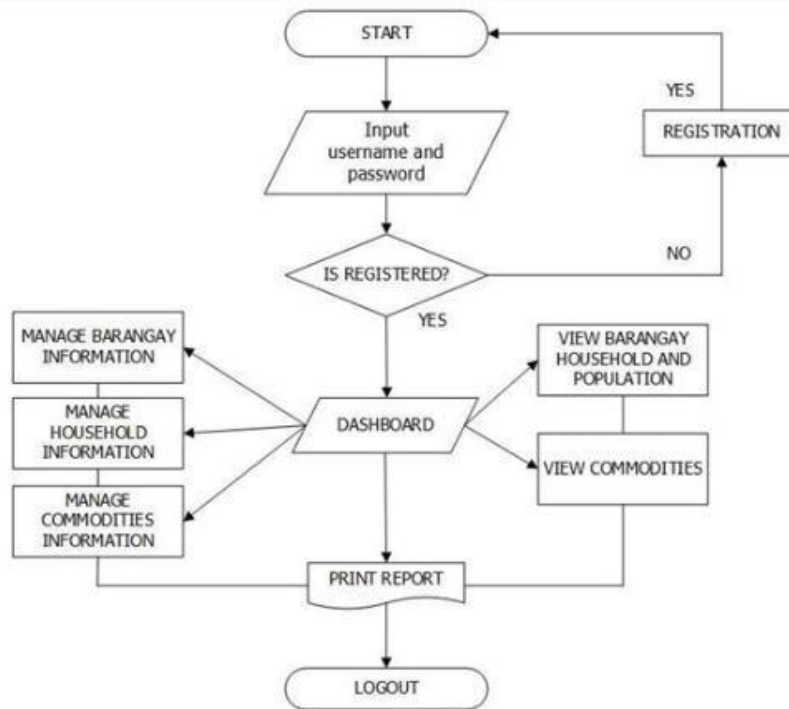
Figure 2. Flowchart for Existing System Diagram

The system lets administrator input username and password if it's registered direct to the dashboard. In the dashboard it loads all the module and operations of administrator in the system. The administrator has the authority to access the entire operations of the system
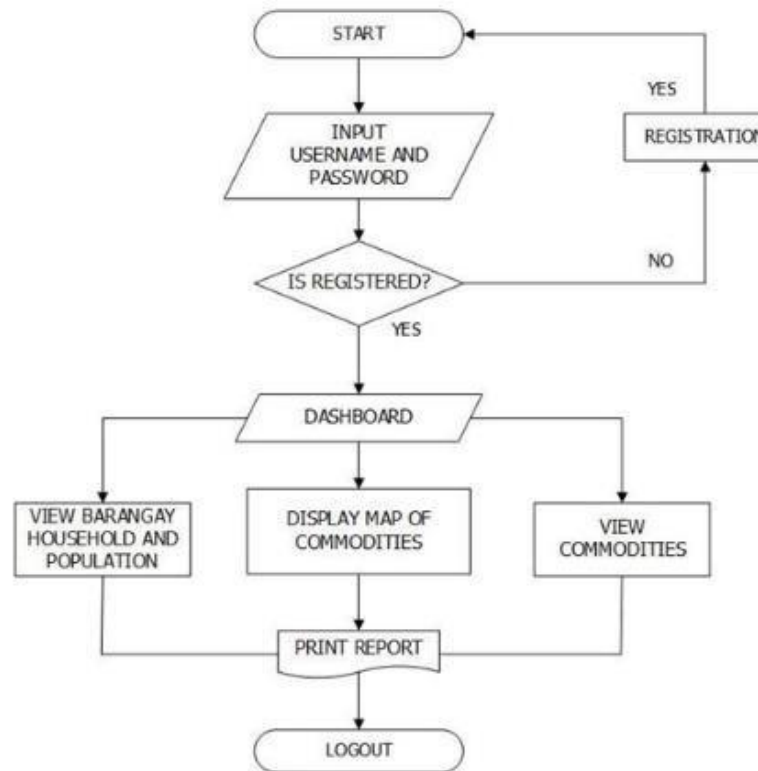
Figure 3. Data Flow Diagram

The system validates the username and password by comparing the input username and password from the database, if it was verifying, it checks the user privilege then if municipal personnel has found, it loads the Municipal Personnel module and its operations within the system
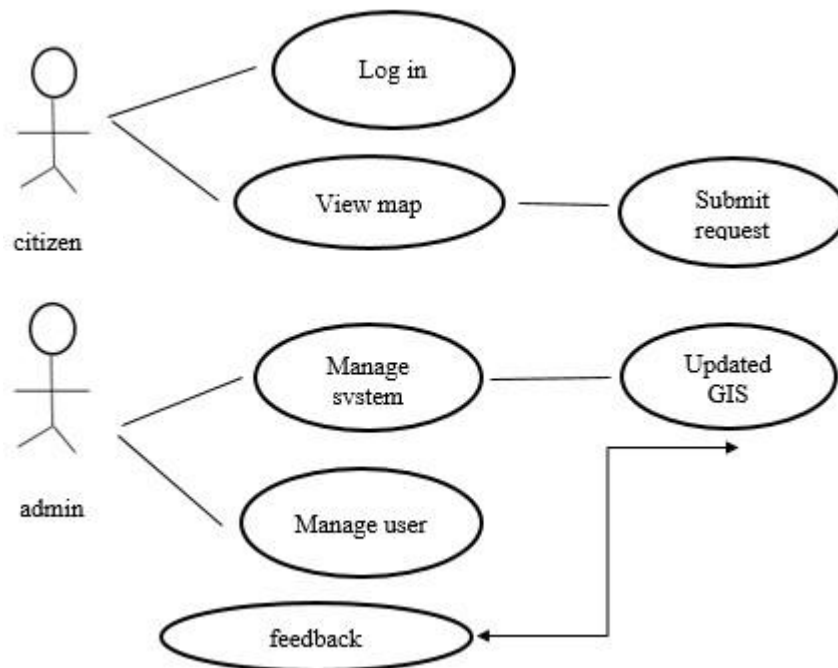
Figure 4 Use Case Diagram

The use case diagram shows how the system "Geo Integrated web platform with real time citizen" interacts with the main users. There are three primary actors. The citizen, and the Admin. can perform include Register/Login, view map, manage system and manage user. The submit request viewing progress updated feedback. The Admin is basically in charge of Managing Content This diagram summarizes the functional coverage of the system and shows how different users interact with some of its major functions.

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REQUIREMENT DOCUMENTATION

The need analysis documentation this document is to provide a comprehensive set of requirements for the development of a Geo-Integrated Web Platform that facilitates real-time citizen feedback and service request management. This platform aims to enhance communication between residents and local government officials, improve service delivery, and foster community engagement. The Geo-Integrated Web Platform will be a web-based application accessible via desktop and mobile devices. It will integrate geospatial mapping to visualize service requests and feedback, allowing for efficient resource allocation and response.
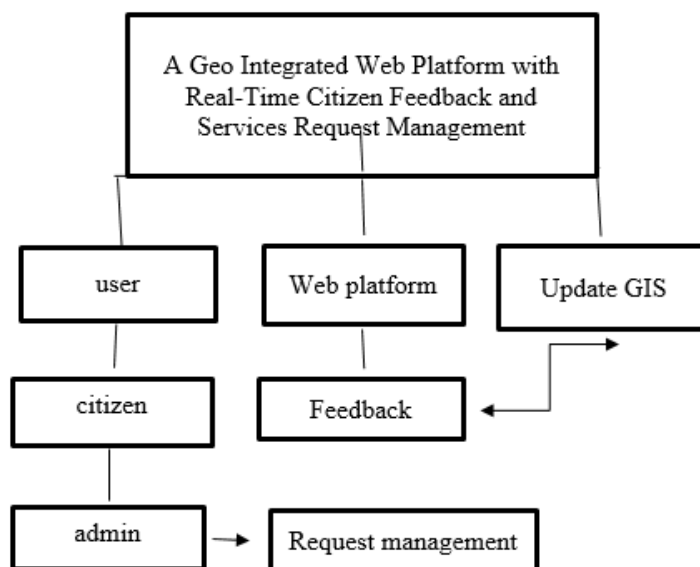

Figure 5 Analysis

DESIGN OF SOFTWARE, SYSTEMS, PRODUCT, AND/OR PROCESS

The Digital Literacy Evaluator with Smart Adaptive Learning System is designed to make the entire exercise user-friendly, accessible, and intuitive. The software architecture is a modular, web-based client-server model. Accessibility on browsers and mobile devices makes it an eye-catcher. On the front end, there is HTML, CSS, and JavaScript for a responsive UI/UX, and the back end is powered by PHP or Python with MySQL or Firebase for data storage and user management.

CONCEPTUAL FRAMEWORK

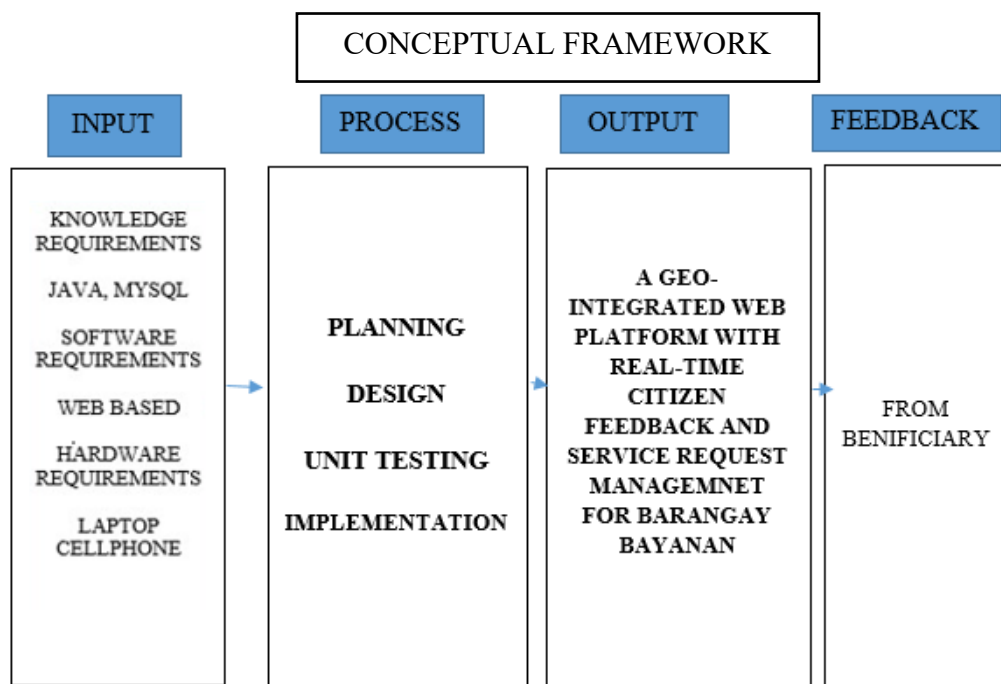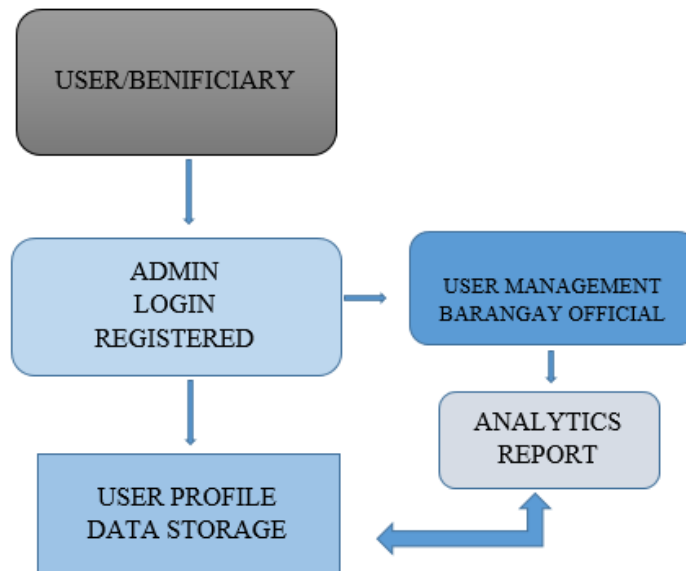| INPUT	PROCESS	OUTPUT	FEEDBACK
KNOWLEDGE REQUIREMENTS JAVA, MYSQL SOFTWARE REQUIREMENTS WEB BASED HARDWARE REQUIREMENTS LAPTOP CELLPHONE	PLANNING DESIGN UNIT TESTING IMPLEMENTATION	A GEO-INTEGRATED WEB PLATFORM WITH REAL-TIME CITIZEN FEEDBACK AND SERVICE REQUEST MANAGEMNET FOR BARANGAY BAYANAN	FROM BENIFICIARY

Figure 6 Conceptual Framework

findings of this analysis, personalized learning paths are created, while web platform adaptive content is being provided as the system continuously tracks

progress. From here, the process is directed toward the Output phase, which generates detailed reports on the literacy level, tailored learning recommendations, real-time feedback in the barangay, and progress graphs. Lastly, Feedback was integrated within the system to deliver citizen response on inconvenience,

SYSTEM ARCHITECTURE

Designing a Geo-Integrated Web Platform for real-time citizen feedback and service request management involves a multi-tiered architecture that ensures scalability, responsiveness, and user engagement

DEVELOPMENT AND TESTING

This development procedure provides a structured approach to creating a Geo-Integrated Web Platform with Real-Time Citizen Feedback and Service Request Management. By following these phases, the project team can ensure that the platform meets the needs of its users and stakeholders while maintaining high standards of quality and security.

Figure7. Agile Methodology

- **Planning –** A plan for a geo-integrated web platform with real-time citizen feedback and service request management requires a multi-faceted approach encompassing, service, issue, reports, suggestions from the beneficiary

- **Designing –** Conduct design brainstorming with team members to create initial designs.

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- **Development –** Use pair programming and collaborative coding practices to enhance code quality and knowledge sharing.

- **Testing –** Conduct manual testing to validate user stories and ensure the application meets user requirements.

- **Releasing –** Ensure quick, reliable, and can be rolled back, if necessary, deployments.

- **Feedback –** Incorporate feedback and reflective insights into future planning and continuous improvement of the application.

Web platform	key activities
Management System	To validate secure login, account creation, and access control features.
User | Management System	To test the uploading, editing, and organization of digital literacy materials.
Notification System	To ensure that alerts, reminders, and feedback messages are delivered correctly.
Mobile and Web Interface	To verify that the system is responsive and functional across devices and browsers.
Web platform	accurately evaluate digital skills.
Barangay/ citizen	To ensure learning paths adjust dynamically based on assessment results.
User Dashboard	To test the correct update GIS,
Admin	To confirm proper user management, content uploading, and system monitoring.

Participants and Sample Size

A total of 15 to 20 participants from the barangay community will be involved. The participants will be divided as follows:

5 staff in the barangay– to evaluate administrative functions such as managing users, assigning learning paths, .

-10 to 15 respondents within the area of barangay bayanan – to test end-user features such as accessing learning modules, receiving personalized training suggestions, and viewing their learning progress.

Evaluation Instrument

The researchers will utilize a standardized evaluation questionnaire with a 5-point Likert Scale, ranging from:

Table 2. Likert Scale and Description

Scale	Description
5	Strongly Agree
4	Agree
3	Neutral
2	Disagree

Tool	Purpose
HTML/CSS/JavaScript	To develop the front-end interface of the web-platform system for user interaction in bayanan.
PHP / Python	To handle server-side scripting, logic processing, and database connectivity.
MySQL / Firebase	To store and manage user data, assessment results, and learning content.
Google Forms / MS Forms	To gather user feedback and conduct surveys during requirements analysis and testing.

Table 3 tool and purpose

Activity	Description	Duration
System Setup and Installation	Deploy the system on web and mobile platforms; configure the database.	1 weeks
User Account Creation	Register citizen in the barangay bayanan	1 week
Orientation and Training	Conduct orientation sessions for users on how to use the system.	2week
Pilot Testing	Select admin for initial system use; gather feedback and monitor performance.	2 week
System Refinement	Apply changes based on pilot feedback; fix any issues or bugs.	2week
Full Deployment	Launch the system in the barangay too make it accessible to all targeted users.	1 week
Monitoring and Support	Provide tech support and monitor system performance continuously.	processing

Table 5 Implementation duration

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IMPLEMENTATION PLAN

The rollout strategy for "A Geo web based platform" will be presented to the relevant users in stages to guarantee ongoing and seamless deployment as well as user adaptation during the introduction. The first phase includes integrating the system into online platforms and creating the database support for student records and assessments. In the second phase, user accounts will be established for barangay and faculty members, followed by a brief orientation on the system's general usage. A pilot test will then take place with chosen users to evaluate the accuracy of the assessment engine and the effectiveness of the adaptive feedback; insights gained from this initial phase will be utilized to improve the platform

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