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Swell Wave Monitoring System

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Submitted to:
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Swell Wave Monitoring System

Portions of this software were developed as part of an academic project submitted to:
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Students:

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This software was developed for educational purposes to assist with real-time swell wave monitoring, aimed at improving disaster preparedness, navigation safety, and coastal resilience in the Philippines.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER I
INTRODUCTION

1. Background of the Project

Monitoring and predicting ocean swells is crucial for various coastal activities such as navigation, fishing, and marine operations. Ocean swells, which are generated by wind waves that propagate far from their point of origin, are present in more than 80% of ocean seas. These swells can significantly impact coastal activities particularly due to their often adverse effects on vessel stability and safety. However, the prediction of swell waves remains a challenge, with existing wave-forecast models frequently showing poor accuracy regarding both wave amplitude and arrival time (Babanin & Jiang, 2017).

A swell refers to a group of waves that have accumulated enough energy from the wind to mature and travel well beyond their place of origin (Pinto, 2024). Both dissipative and non-dissipative processes contribute to the attenuation or growth of swell waves. Additionally, the prediction of swell arrival time remains to be determined, with observed discrepancies of up to several hours between model forecasts and actual swell arrival times.

Given these challenges, a real-time monitoring and visualization system of swell waves is significant. The Swell Wave Monitoring System aims to address these gaps by providing an accessible platform for real-time tracking and visualization of ocean swell data. This system integrates data fetching from external APIs, stores the information in a structured database, and displays it through dynamic visualizations and maps, offering stakeholders, researchers, and coastal communities an invaluable tool for safety, planning, and research.

2. Objectives of the Project

The primary objective of this study is to develop a Swell Wave Monitoring System that provides real-time tracking and visualization of ocean swell data

across web, mobile, and desktop platforms. The following are the specific objectives of the study:

- To design and implement a PostgreSQL database for storing real-time, hourly, and geographic swell data.
- To develop a backend using Flask that retrieves swell data from an external API, processes it, and stores it in the database.
- To build web, mobile, and desktop applications that display real-time swell data using dynamic graphs and maps to visualize wave direction, period, and trends.
- To ensure that the system provides interfaces and responsive visualizations on all platforms.

3. Scope and Limitations of the Project

The scope of this study focuses on the development and implementation of the Swell Wave Monitoring System, which provides real-time tracking and visualization of ocean swell data. The system is designed to fetch data from external APIs, store it in a MySQL database, and display it through web, mobile, and desktop applications. The visualization aspect includes dynamic graphs and geographic maps, allowing users to monitor swell trends, wave directions, and other relevant data.

The primary geographic scope beneficiary of the system will be Siargao Island, Philippines, which is known as the surfing capital of the Philippines. The system will particularly serve surfers, fishermen, and tourists by offering real-time and hourly updates on ocean conditions. The system will be a tool for the fishers, and tourists, especially the surfers to check the conditions of the swell wave ocean. It will display the real-time and hourly for the geographic swell wave in the map.

However, several limitations are anticipated in this project. First, the system's real-time monitoring capabilities depend heavily on the availability and reliability of external API data. Any interruptions in the API services or inaccuracies in the data may affect the system’s performance. Second, while the system is designed for multi-platform use, the user experience may vary depending on device compatibility and internet connectivity, particularly in remote areas.

Furthermore, the system is focused solely on monitoring swell wave data, meaning it does not account for other oceanographic or meteorological factors such as wind speed, currents, or tides, which might also influence coastal activities. While the system aims to offer accurate visualizations of swell patterns, discrepancies may occur due to limitations in the predictive models used by external APIs. Finally, the system is not intended to replace formal maritime forecasting tools, but rather to complement them by providing additional, accessible insights for a broad user base.

4. Significance of the Project

The Swell Wave Monitoring System is designed to address the challenges in real-time tracking and visualization of ocean swell data, benefiting various stakeholders, particularly in coastal communities. The system will be particularly beneficial to the local communities in Siargao Island, Philippines, a location renowned for its surfing culture. By providing accurate, up-to-date data on swell conditions, this system will significantly aid surfers, fishermen, tourists, and maritime operators, enhancing their decision-making and safety.

For surfers, this tool offers an essential way to assess wave conditions, allowing them to optimize their surf sessions. Fishermen and coastal residents will also benefit from real-time information on swell patterns, enabling them to plan their activities more safely, and mitigating the risks posed by large and unpredictable waves.

Moreover, the system is not limited to professional or local use; researchers and environmental agencies can utilize the data for further studies on oceanographic patterns, coastal management, and the effects of climate change on wave dynamics. The ability to visualize wave direction, period, and trends across different platforms (web, mobile, and desktop) expands the accessibility and applicability of the system.

In addition, future researchers can also reference this work, as a foundation for further innovations in ocean monitoring systems.

CHAPTER II

TECHNICAL BACKGROUND

1. Integrated Development Environment

Visual Studio Code is a free, lightweight but powerful source code editor that runs on your desktop and on the web (Heller, 2022). It supports multiple programming languages and comes with built-in JavaScript, TypeScript, and Node.js, which help organize the codes, debug, and manage the Swell Wave system's backend processes.

2. Programming Language

Python is a high-level, interpreted programming language known for its simplicity and readability (Worsley, 2024). In the Swell Wave Monitoring System, Python will be employed to implement the data processing and retrieval functionalities of the system. The backend, with the Python framework **Flask**, will be responsible for fetching swell data from external APIs, processing it, as well as storing it in the database.

Web developers frequently utilize **JavaScript**, a lightweight programming language, to add dynamic interactions to servers, applications, and web pages (Alexandrea, 2024). In the Swell Wave Monitoring System, JavaScript will be used in the front end to create dynamic and responsive user interfaces. The language powers interactive elements such as data visualizations, graphs, and maps that will enable users to view real-time swell information.

Flutter is an open source framework developed and supported by Google. Frontend and full-stack developers use Flutter to build an application's user interface (UI) for multiple platforms with a single codebase (Flutter, n.d.).

3. Front-End Framework

With a variety of chart types available, **Chart.js** is powerful and known as a user-friendly JavaScript library that makes data visualization engaging and dynamic (Gordon, 2023). It supports various chart types, including line, bar, and

radar charts. In this project, Chart.js will be used to display swell data in a visual format thus, allowing users to track changes in swell height, direction, and period over time. The interactive charts will enhance user engagement by providing real-time updates on swell conditions.

Bootstrap is a free, open-source front-end framework used for developing websites and web applications. It is specifically designed to facilitate the creation of responsive, mobile-first sites and offers a variety of syntax options for template design (Zola, 2022). It allows developers to create attractive and uniform user interfaces quickly. In the Swell Wave Monitoring System, Bootstrap will be used to ensure the user interface is pleasing and functions properly on different devices, improving the overall user experience.

Leaflet.js is a popular and open-source JavaScript library that displays an interactive map on apps or websites (Helmy, 2021). The Swell Wave Monitoring System will utilize Leaflet.js to provide users with a geographical representation of swell data, enabling users to view the location and movement of swells on an interactive map.

4. Database Management System

PostgreSql is a flexible open-source object-relational database management system. PostgreSQL can handle a huge variety of use cases, from single machines to data warehouses to web services with many concurrent users. PostgreSQL uses and extends SQL (hence the name), and is broadly extensible to a range of use cases beyond mere transactional data (Aiven, n.d.). In the Swell Wave Monitoring System, PostgreSQL will be used to store ocean swell data, which includes parameters such as wave height, period, direction, and time. The database design will be optimized to handle large amounts of data efficiently, ensuring fast retrieval for real-time visualization.

5. Natural Language Processing (NLP) with Transformers

According to Ferrer (2024), A **transformer** model is a neural network that learns the context of sequential data and generates new data. Identified as a type of artificial intelligence model that can learn to understand and generate a human-like text by analyzing the patterns in large amounts of text data. In the

Swell Wave Monitoring System, a transformer-based NLP model from the hugging face transformers library, T5 will be utilized to analyze textual data from marine forecasts, weather reports, and other ocean-related sources. T5 transformers can perform various tasks, including text classification, translation, summarization, question-answering, and more, by rephrasing the problem as a text generation task (Malingan, 2023). This will enhance the Swell Wave Monitoring System by having predictive and explanatory information on expected swell patterns, allowing users to better anticipate changing ocean conditions. With that, the system can extract and generate relevant insights on ocean conditions, which will be displayed as the Swell AI Forecast in the system.

6. Authentication Service

Auth0, according to Pagel (2023), is a platform that companies and web developers use to verify a user's identity before giving them access to websites and applications. In the Swell Wave Monitoring System, Auth0 will handle user authentication during the log-in session, ensuring that only authorized users can access the system. The Auth0 service integrates with the system's components adding a security layer that protects the user data while maintaining the integrity of the system.

7. Hosting Platform

Render is a modern cloud application platform that simplifies deployment and scaling for developers and teams. It combines the flexibility of Infrastructure as a Service (IaaS) with the simplicity of Platform as a Service (Paabetween servers and clients using WebSockets technology, allowing developers to easily implement features like notifications, live updates, and chat systems without complex messaging infrastructure. Its event-driven architecture ensures instant updates based on predefined triggers, while support for web, iOS, and Android facilitates seamless cross-platform integration. With a scalable infrastructure, robust security measures, and reliable low-latency communication, Pusher is ideal for applications requiring immediate responsiveness, such as monitoring systems and collaborative tools.

S), providing an all-in-one solution for hosting web applications, databases, and

other backend services (Render, n.d.).

8. Real-time Communication

Pusher is a cloud-based platform that is mainly used to incorporate real-time communication features into web or mobile applications. It gives developers the tools they need to easily create and incorporate channels of real-time communication between clients (Educative, 2023). In the Swell Wave Monitoring System, **Pusher** sends notifications about changes in swell conditions. It provides real-time updates on wave height, direction, or period. Pusher works across all devices to ensure consistent notifications.

9. API Integration

According to Gillis et al. (2024), **API** is an application programming interface (API) that enables two software programs to communicate and facilitates the exchange of data, features and functionalities between software applications. In the Swell Wave Monitoring System, APIs will be utilized to fetch real-time swell data from external sources, such as gmarine_api and connect_ai from barmmdrr.com. The gmarine_api will provide essential swell data parameters like wave height, direction, period, and time, while connect_ai will handle text generation such as alert notification and for swell ai forecast.

CHAPTER III

METHODOLOGY

1. System Integration Architecture

The architecture of Swell Wave Monitoring comprises an integrated, multi-layered structure that combines data retrieval, processing, and real-time visualization across web, mobile, and desktop applications. This system is specifically designed to provide accessible and dynamic tracking of ocean swell data, supporting a wide range of users, surfers, fishers, and tourists. The Swell Wave Monitoring System ensures accurate, real-time updates on wave patterns, trends, and forecasts through seamless communication among data-fetching components, a PostgreSQL-backed storage system, and responsive visualization tools. The architecture enhances usability and reliability, offering coastal communities on Siargao Island a comprehensive tool for monitoring swell conditions.

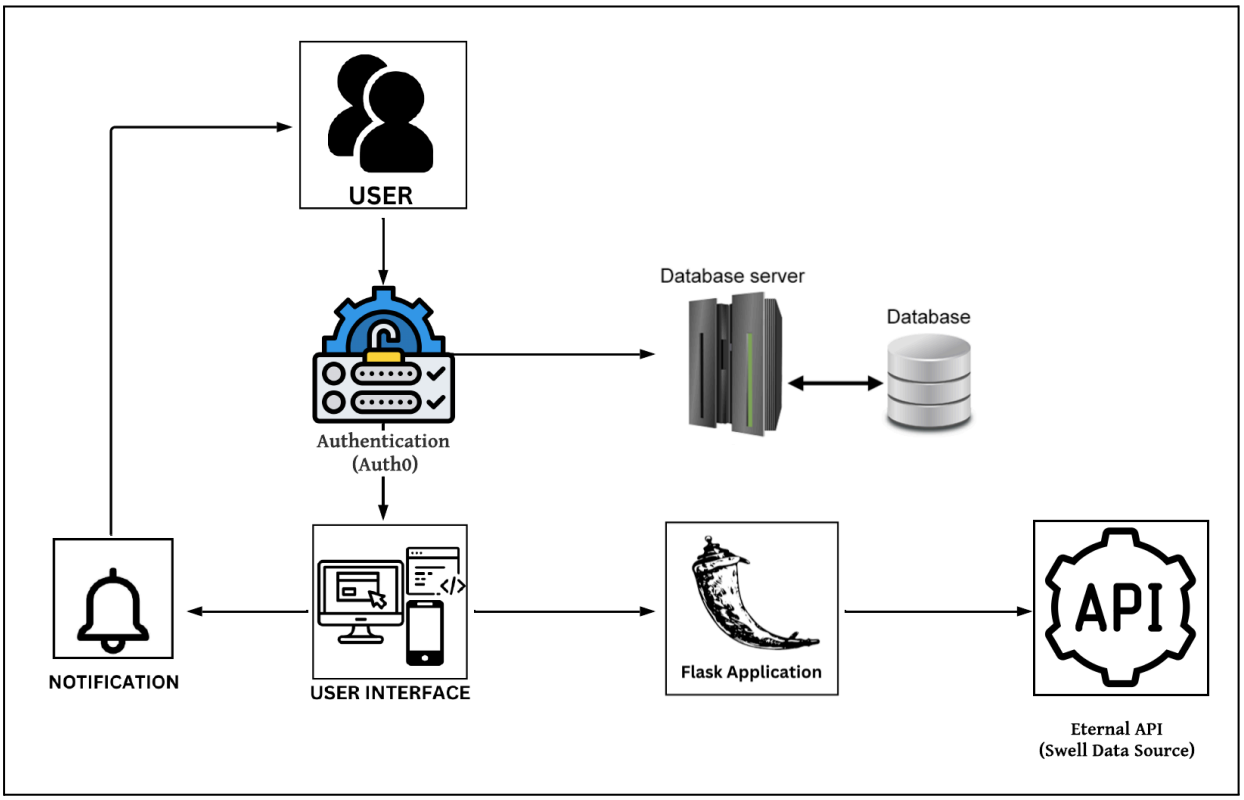

Figure 1. System Architecture of Swell Wave Monitoring System

As illustrated in Figure 1, the Swell Wave Monitoring System features a cohesive, multi-tiered framework integrating data acquisition, processing, and real-time visualization. This system facilitates seamless interaction between users and the backend components.

Users access the system through a secure authentication mechanism powered by Auth0, ensuring safe and personalized access to services. Data is sourced from an external swell data API and processed by a Flask-based application. The processed data is stored in a database for efficient management and retrieval. The system's user interface compatible with web, mobile, and desktop platforms delivers dynamic and interactive visualizations, providing real-time updates on wave patterns, forecasts, and trends. A notification feature alerts users to significant changes in swell conditions, enhancing safety and usability.

This architecture is designed to serve the coastal communities of Siargao Island, offering a reliable and comprehensive tool for monitoring swell conditions and supporting decision-making for activities such as fishing, surfing, and tourism.

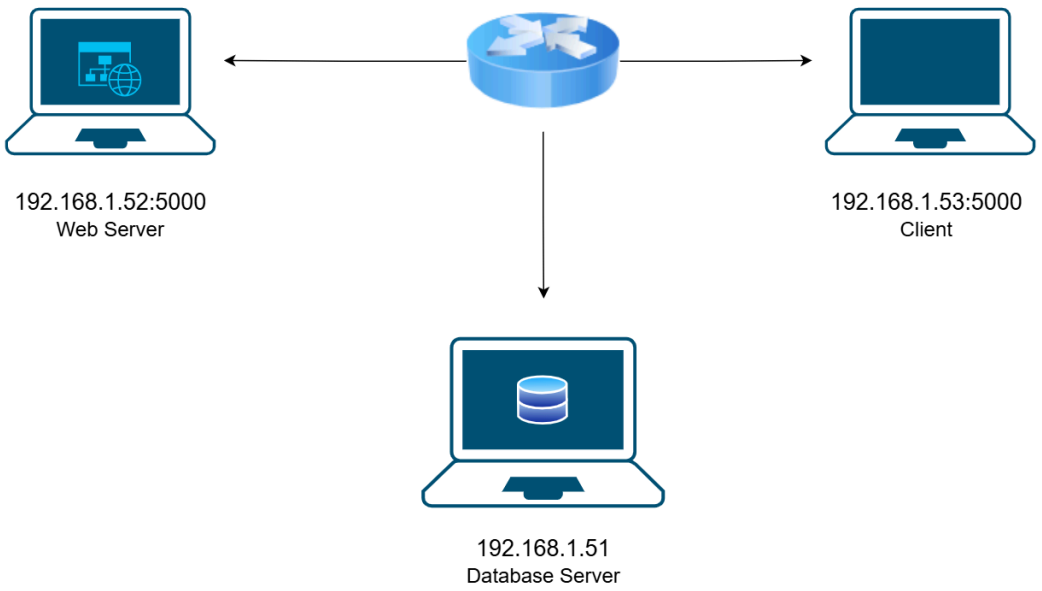

Figure 2. Distributed System of Swell Wave Monitoring System

The diagram illustrates the distributed system architecture of the swell wave monitoring system, where a Client communicates with a Web Server (IP address of the

device:5000) to request services or data. Then the web server acts as the intermediary, processing client requests and interacting with the Database Server to retrieve or store data. All components are connected through an ip address, enabling efficient communication.

2. System Development Methodology

The Swell Wave Monitoring System follows an agile approach to ensure flexibility, efficiency, and continuous improvement throughout the project. Using agile, the development team can work in small, manageable stages, called sprints, allowing for regular feedback from stakeholders like surfers, fishers, and tourists who will use the system. This method helps prioritize essential features such as real-time data retrieval, secure storage, and interactive visualizations while remaining open to adjustments. The agile approach ensures that each part of the system from planning to launch is tailored to meet the real needs of its users, making the system more effective and user-friendly.

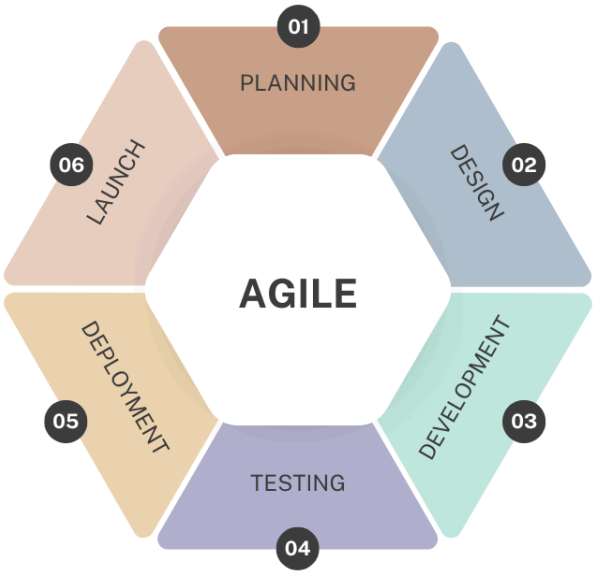

Figure 3. System Development Methodology

I. Planning

In the Planning phase, the project's scope, objectives, and key features are defined in collaboration with stakeholders, including potential users such as surfers, fishers, and local authorities in Siargao Island. Requirements are

gathered, prioritized, and organized into a product backlog, which lists features such as real-time data retrieval, dynamic visualizations, and notification alerts. The development team then creates an initial project roadmap and outlines the sprints, or iterations, to guide development. This phase sets a clear vision and establishes a flexible timeline for building the Swell Wave Monitoring System.

II. Design

The design stage focuses on creating wireframes, prototypes, and the overall system architecture. User interface (UI) and user experience (UX) design principles are applied to create intuitive, responsive layouts for web, mobile, and desktop platforms. The backend architecture, including data flow and security components, is also designed to support reliable data fetching, storage, and processing. This phase ensures that the system's structure is optimized for both functionality and ease of use.

III. Development

In the Development phase, the team begins building the system in iterative sprints, focusing on implementing specific features from the product backlog. The backend, built with Flask, is developed to handle data fetching from external APIs, process the data, and store it securely in the database. Simultaneously, frontend components for web, mobile, and desktop platforms are built, with real-time visualizations of swell data and user interfaces for accessing information. Regular sprint reviews are conducted to gather feedback, allowing for adjustments and continuous improvement of the system's core functionalities.

IV. Testing and Debugging

During the Testing and Debugging phase, each component undergoes rigorous testing to ensure the system is reliable, secure, and user-friendly. Functional testing verifies that features like data retrieval, visualizations, and notifications work as intended, while security testing checks the system's resilience against unauthorized access. Usability testing is conducted with stakeholders to ensure a smooth user experience across platforms. Any issues

or bugs identified during testing are addressed promptly, with fixes deployed in the following sprint, ensuring high-quality performance before launch.

V. Deployment

The Deployment phase involves setting up the production environment and deploying the Swell Wave Monitoring System for live use. The backend and frontend applications are configured for optimal performance, and necessary security measures, such as encryption and firewall protection, are activated. This phase may involve a soft launch, where the system is made available to a select group of users to gather additional feedback. Automated monitoring and logging systems are also put in place to track system performance and identify potential issues in real-time.

VI. Launch

In the Launch phase, the system is officially made available to all users, including surfers, fishers, tourists, and other stakeholders in Siargao Island. Training sessions or user guides are provided to help users navigate the system's features. Ongoing support is offered to handle user inquiries and address any emerging issues. Continuous feedback collection allows the team to plan for future updates and enhancements.

3. Unified Modeling Language Diagrams

I. Basic Notations

The Basic Notation Diagram for the Swell Wave Monitoring System offers a streamlined representation of its key components and their interactions. The diagram highlights the roles of users and administrators in managing the system and accessing its features.

Users, identified by their credentials, can view various swell-related data through an interface. This includes real-time swell data, hourly swell updates, AI-driven forecasts, and visualized swell data

on maps. Administrators manage user accounts, ensuring secure and efficient system operation.

This diagram serves as a foundational guide, illustrating the core structure and functionality of the system in a clear and concise manner.

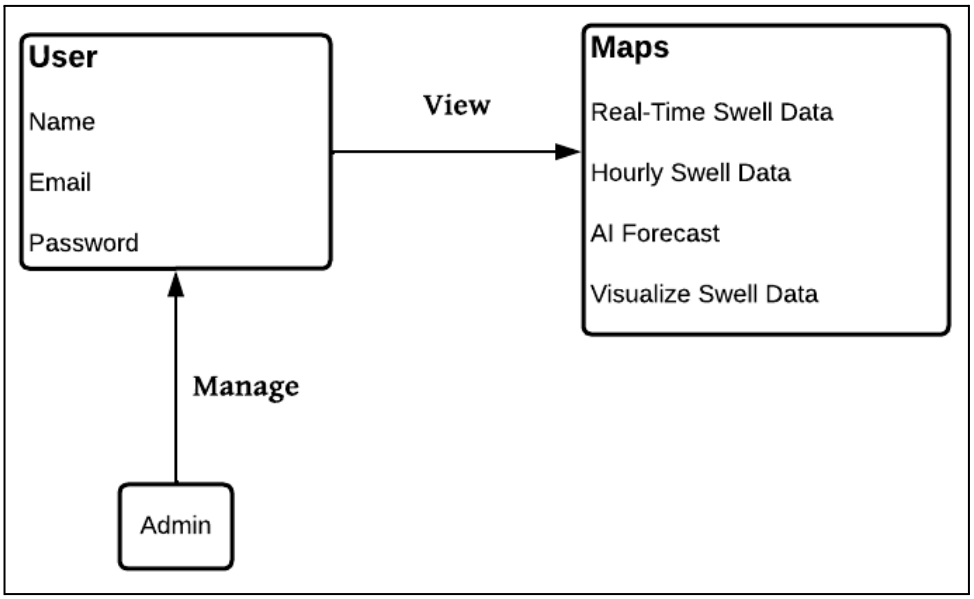

Figure 4. Basic Notations for Swell Wave Monitoring System

II. Use-Case Diagram

Figure 3 illustrates the use cases within the system. There are 2 actors involved, identified as User and Administrator, each representing use cases that the system utilizes. Users can log in, then when the map is clicked they can view real-time swell data, visualize swell data, view swell AI forecast, and receive a notification, then see the visualization of the swell data. Administrators, on the other hand, have the privilege of managing the system's database and user accounts. This diagram provides a clear overview of the system's capabilities and the different roles of its users.

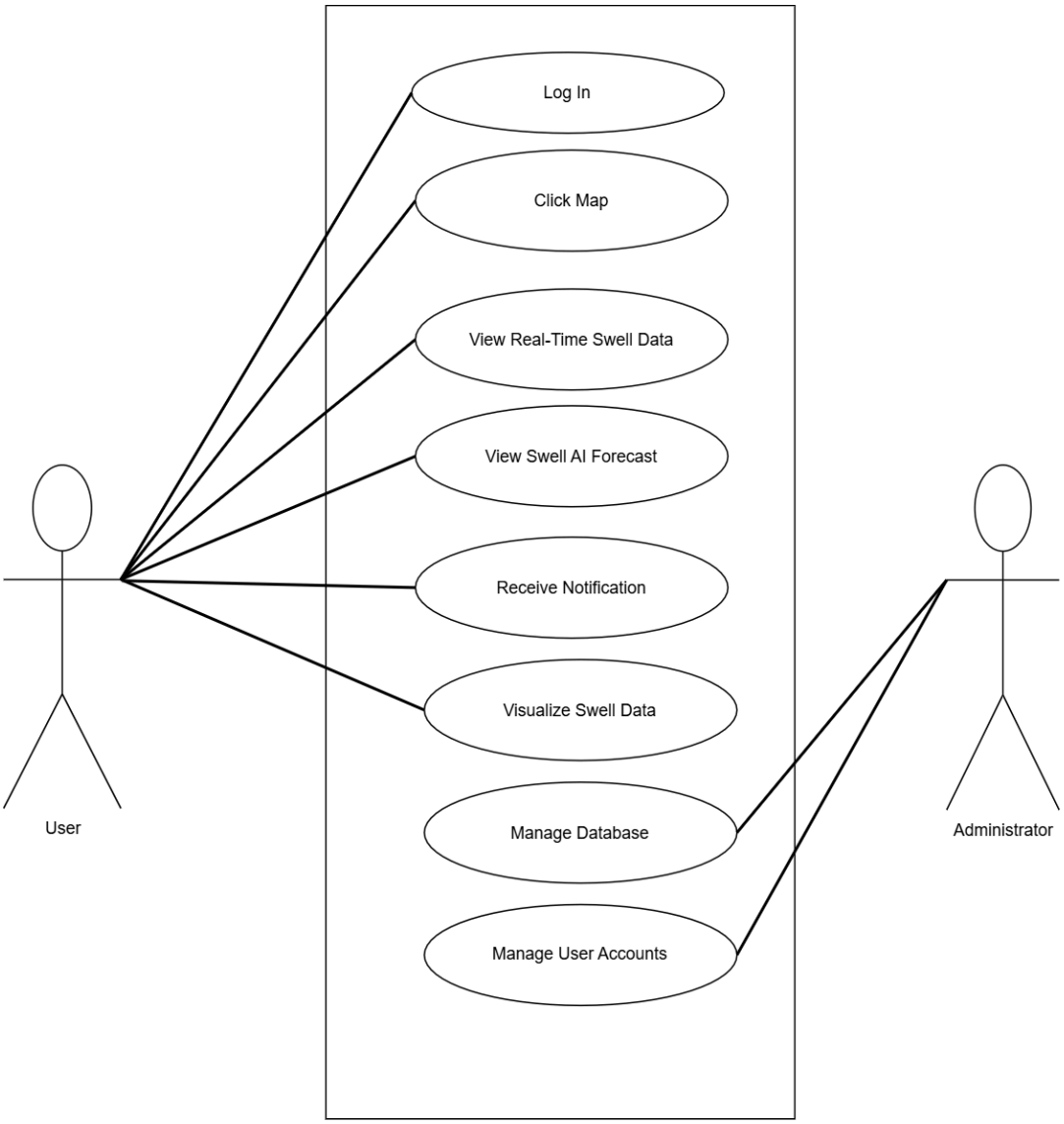

Figure 5. Use Case Diagram for Swell Wave Monitoring

III. Activity Diagram

Figure 4 illustrates the activity diagram within the system. The process begins with the user opening the application. If the user already has an account, they can log in; otherwise, they are directed to register, which includes authentication through Auth0. Once logged in, users can interact with the map to view real-time swell data. They can click specific locations on the map to access detailed swell information and an AI-generated swell forecast. The system processes the data and notifies the user if the conditions are safe or dangerous for surfing, displaying the results for Swell Data. Meanwhile, on the administrator side, the process starts with opening the admin panel, allowing the administrator to manage the

database by updating or deleting records. Additionally, the administrator can manage user accounts by adding new users or editing existing ones. The endpoints signify the completion of user and administrator activities.

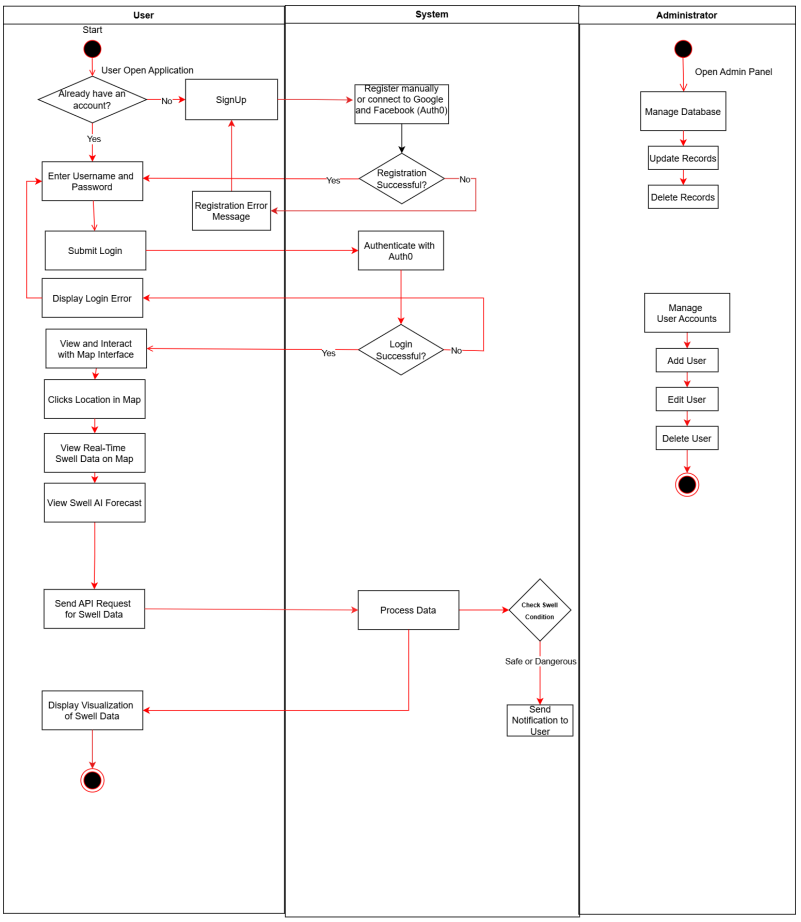

Figure 6. Activity Diagram for Swell Wave Monitoring

IV. Physical Data Model

The database diagram presents a swell wave monitoring system with five main tables: Users, Locations, Units, Current Swell, and Hourly Swell. The Users table stores information about each user, including identifiers and contact details, while Locations contains geographic information for each monitoring site, such as latitude, longitude, and elevation. The Units table defines standard measurement units for time intervals and swell attributes, ensuring data consistency. Current Swell and Hourly Swell tables record swell wave measurements, including height, direction, and period, linking each entry to a specific location via

location_id and timestamped by time. Connections between Locations and swell tables enable multiple records per location, supporting organized and efficient data storage for tracking real-time and historical swell conditions.

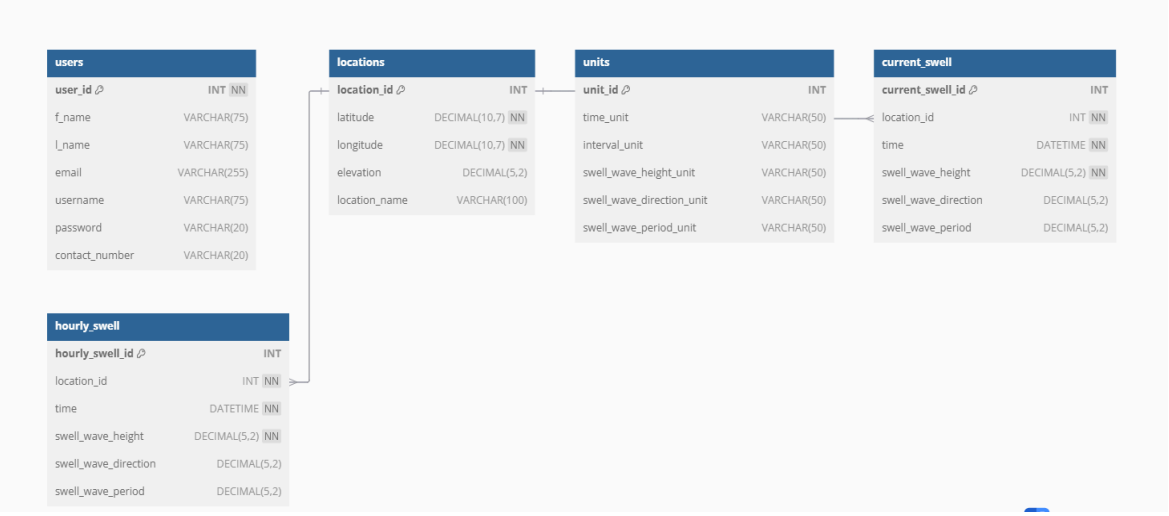

Figure 7. Physical Data Model Swell Wave Monitoring

IV. Sequence Diagram

For the Swell Wave Monitoring System, the Sequence Diagram presents the flow of interactions for key system functionalities.

The sequence begins with the user logging in to access real-time swell data. Upon request, the system processes the latest data retrieved from an external API and displays it to the user via dynamic maps. If monitored swell parameters exceed predefined thresholds, the system triggers an alert notification to ensure timely user awareness.

Administrators can log in to manage user accounts, configure system settings, and oversee overall system health. This sequence diagram provides a concise visualization of the system's core functionalities and user interactions, highlighting its responsiveness and administrative controls.

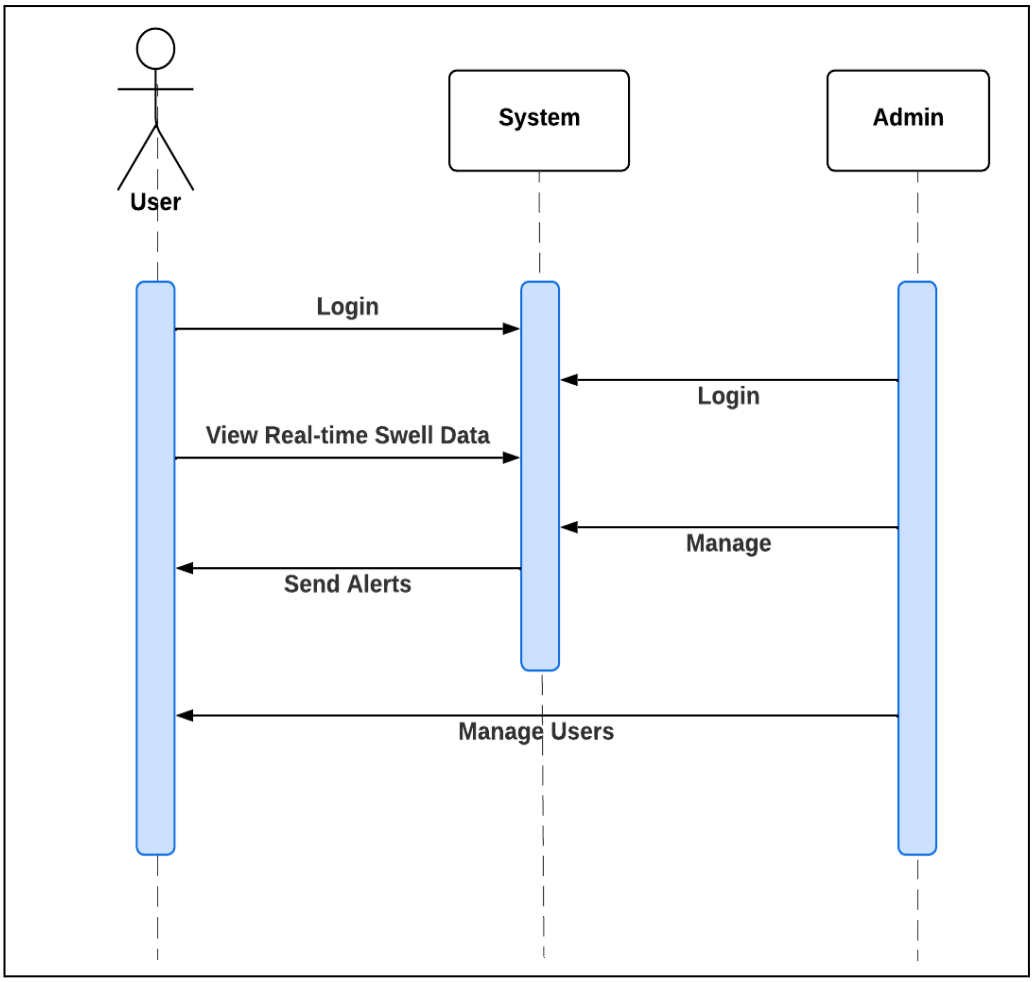

Figure 8. Sequence Diagram Swell Wave Monitoring

V. Component Diagram

The Swell Wave Monitoring System component diagram is composed of four key components. The first component is the **User Interface; it uses** CSS, Bootstrap, and JavaScript libraries (Chart.js and Leaflet.js) to create a responsive and interactive display. The second component is the **Software Logic. It utilizes** Python with Flask and a Transformer-based forecasting module to process data for SwellAI and make wave predictions. The third component is the **Database and the Backend** which depends on PostgreSQL for storing and managing data. Lastly, an **Authentication Service (Auth0**) ensures secure access, allowing only authorized users into the system.

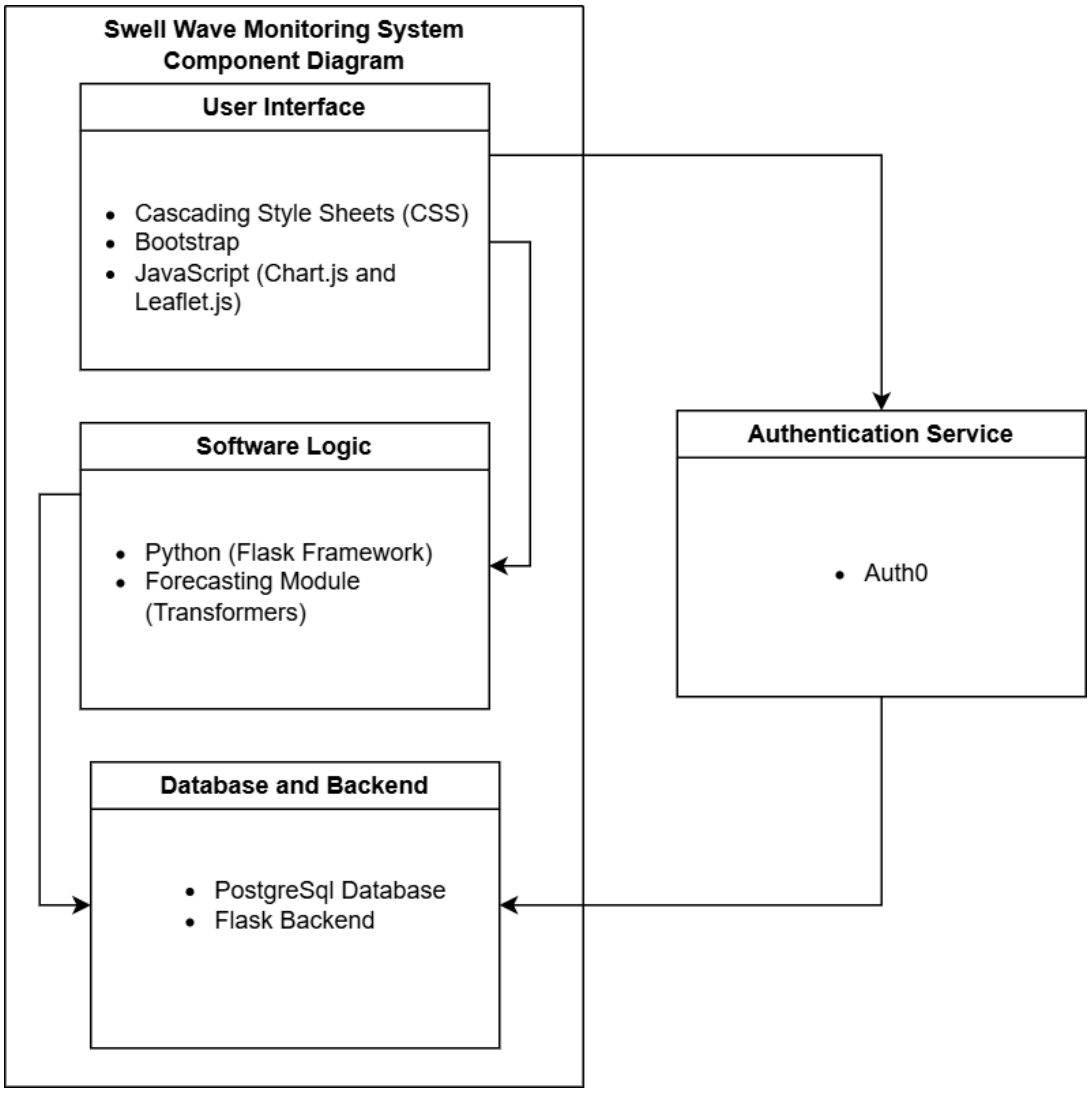

Figure 9. Component Diagram Swell Wave Monitoring

VI. Deployment Diagram

The deployment diagram illustrates the distribution of software and hardware components in the swell wave monitoring system, showing how servers, databases, and client devices interact. It is composed of three primary nodes, the database node, web services node, and web services client node.

The database node is responsible for handling data storage and retrieval. This node serves as the central repository for information, which the Flask application accesses to respond to the client request. The web services node is where the Flask app, running on Render.com using Gunicorn, operates as the server. This node handles incoming client

HTTP requests, processes the required operations, and returns appropriate responses. Moreover, the web Services Client Node represents the users' browsers, mobile apps, or third-party systems that interact with the Flask app. These clients send requests to the app through HTTP methods like GET or POST. The Flask app then processes these requests and provides the necessary responses, such as JSON data or web pages.

Therefore the diagram presents a flow from users (via clients) to send requests to the Flask app (the server), which communicates with the database as needed and returns the results ensuring a delivery of services and data to users across different platforms.

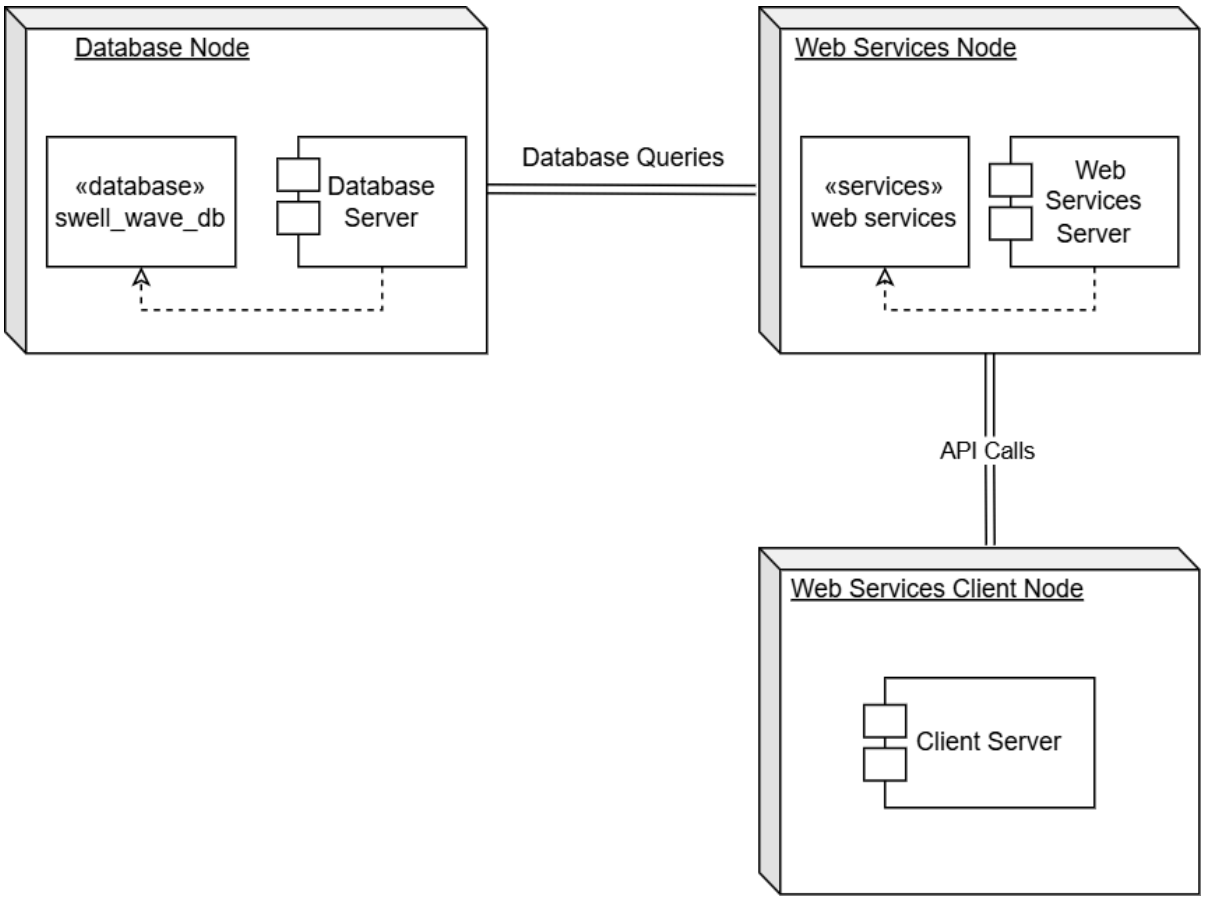

Figure 10. Deployment Diagram for Swell Wave Monitoring System

4. Implementation of the System

The implementation phase focuses on setting up the swell wave monitoring system. The following parts are the implementations of production servers: website application integration, desktop application integration, and mobile application integration.

I. Production Server

In our server environment, the figure illustrates the setup and configuration of the server environment, which is important for maintaining consistent data access and reliable performance for web, mobile, and desktop platforms. Each server component handles specific tasks: data fetching, API management, and real-time database updates—that keep the system responsive and accessible for all users.

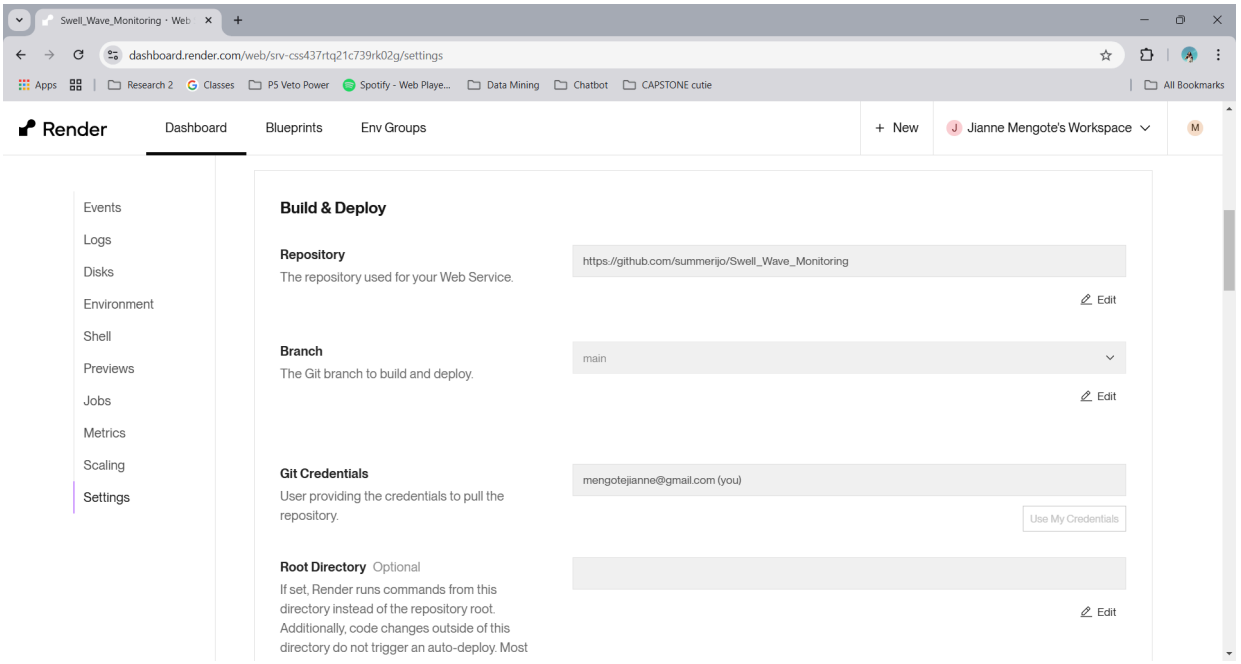

Figure 11. Render General Page

This figure shows the Render dashboard platform, where the Swell Wave Monitoring System is hosted. It shows the deployment setup for the Swell_Wave_Monitoring web service, including its name, and URL (https://swell-wave-monitoring.onrender.com). It is linked to a GitHub repository and deployed using the main branch on a free instance. This platform provides a visual

overview of the active services, allowing developers to monitor the application's performance, manage deployments, and troubleshoot issues efficiently.

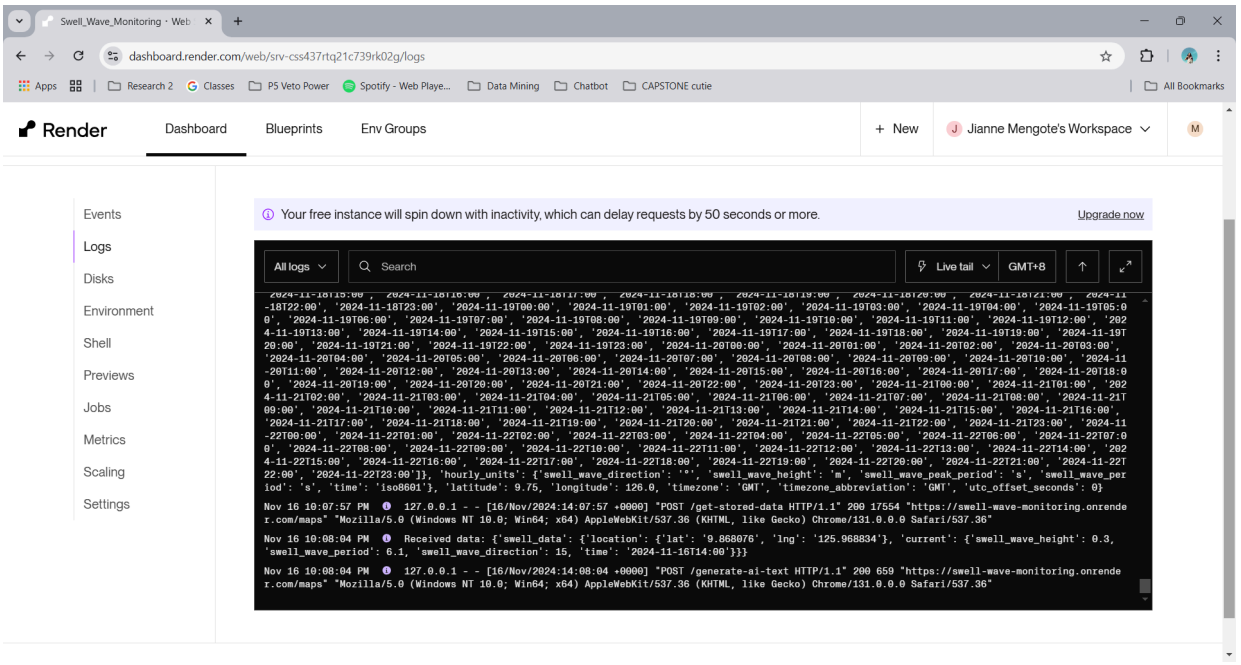

Figure 12. Render Logs Page

This figure displays the live status and logs of the Swell Wave Monitoring System on Render. It provides real-time information on application health, uptime, and recent activities, helping the team monitor the system's stability and respond quickly to any unexpected issues.

II. Web Application Integration

In our server environment, the web application is designed to provide users with accessible, real-time visualizations of swell wave data. The interface includes essential components like a login page for secure access, a home page displaying dynamic data charts, and an interactive map created with Leaflet.js for tracking swell patterns geographically. Users can view real-time data on wave height, direction, and period through these visual tools, allowing them to make informed decisions on coastal activities.

The Render server hosts the web application, enabling seamless data processing and retrieval through its backend, which uses Flask. Render ensures

consistent uptime and responsiveness for the application, allowing users to monitor swell data from any device with internet access.

User Side

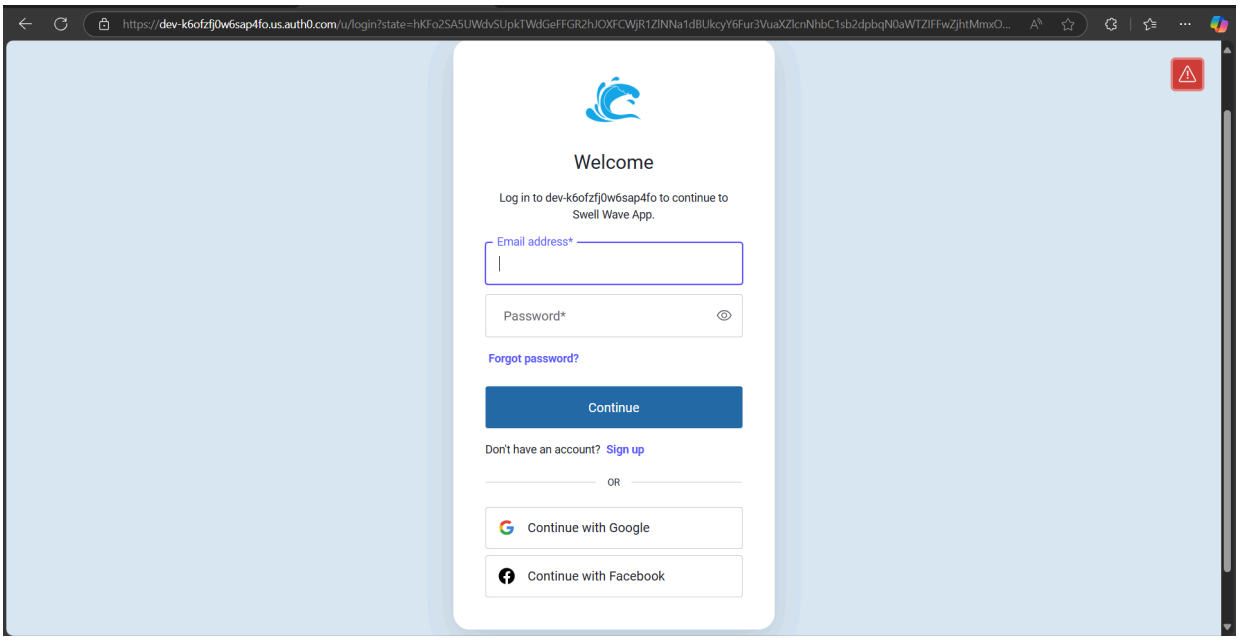

Figure 13. Login Page

This figure shows the login page, where users securely access the Swell Wave Monitoring System. Users enter their credentials to start a session utilizing Auth0, ensuring that data access is secure.

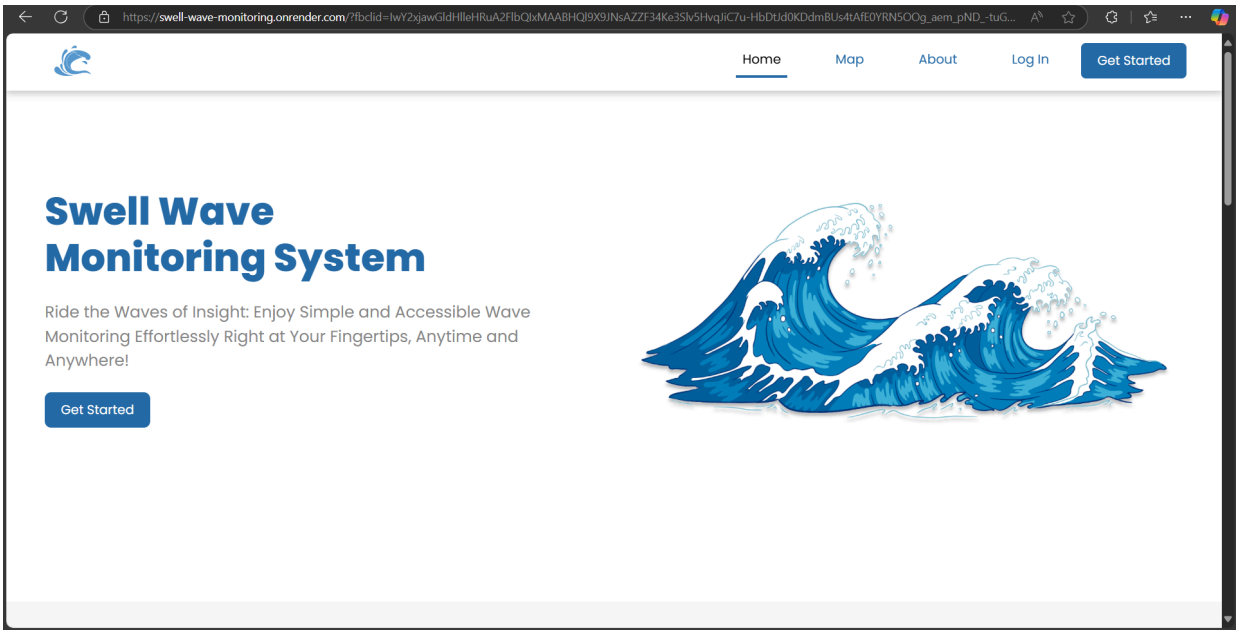

Figure 14. Landing Page / Homepage

This figure displays the landing page, which provides an overview of the swell wave monitoring system. This page serves as the entry point for users. There are 4 sections Home, Map, About, and Login.

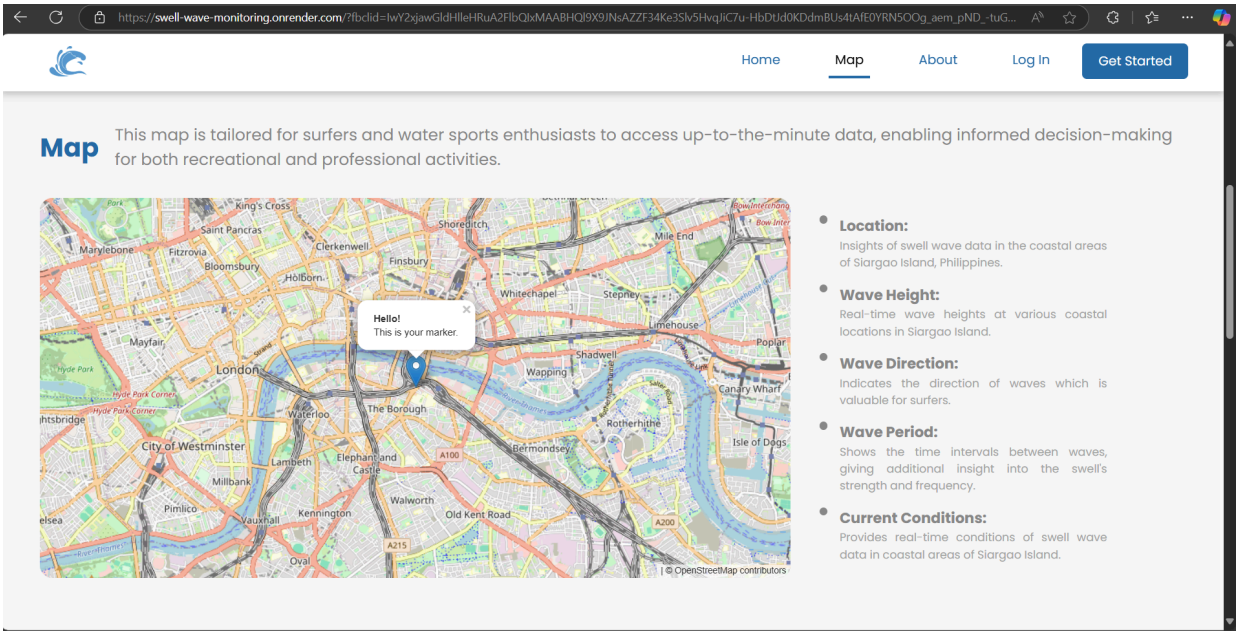

Figure 15 . Map Section

The map section on the landing page here enables users to interact with the map interface, which includes Zoom, which enables users to navigate to specific areas.

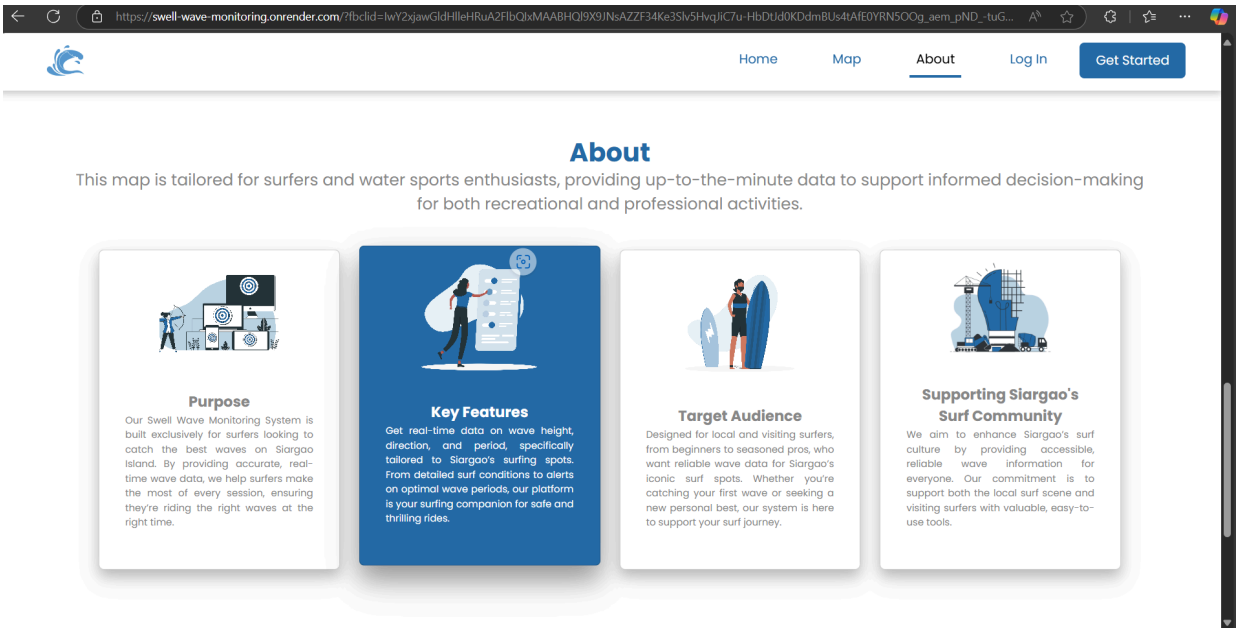

Figure 16. About

The About section gives users an overview of the project's goals, this includes purpose, key features, target audience, and campaigns.

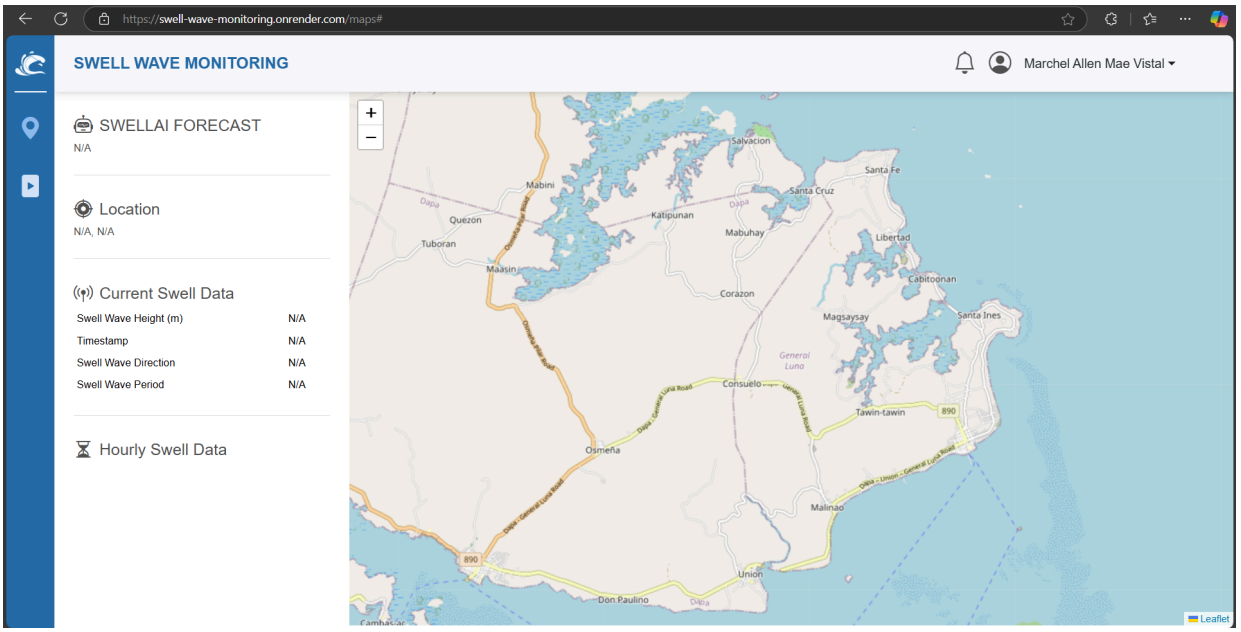

Figure 17. Map Page

After logging in the user will be redirected to the map page, the map page figure enables users to interact with the full map interface, which includes Zoom, click for location, then view Swellai forecast as well as View Current Swell Data and visualization for hourly swell data.

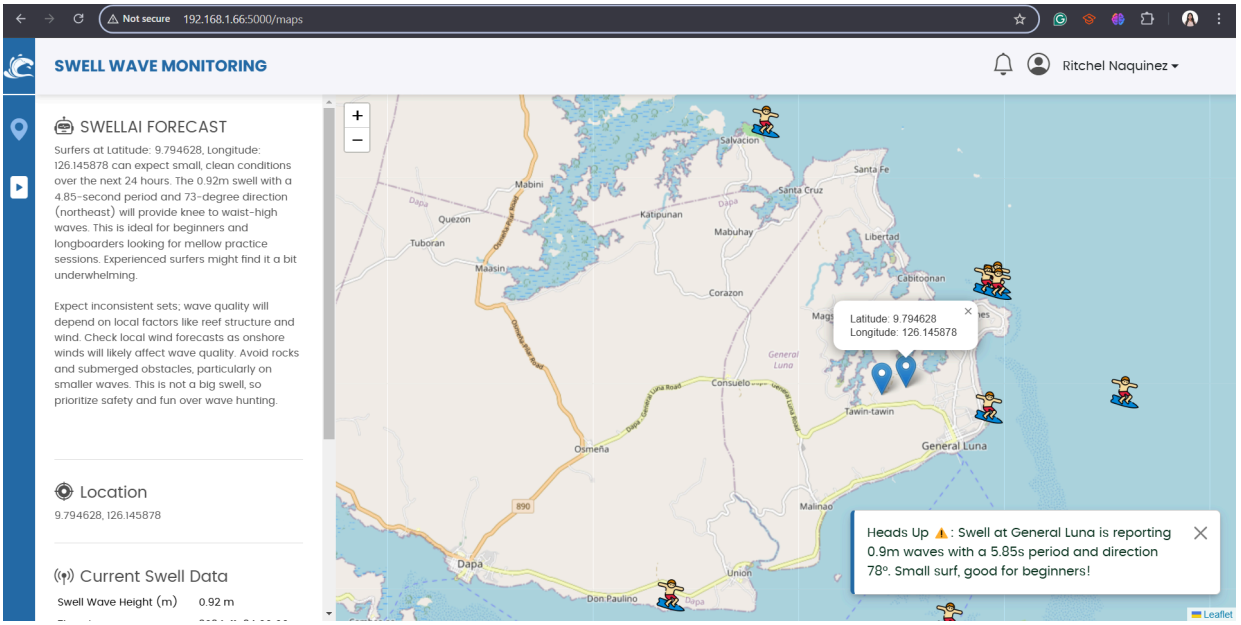

Figure 18. Notification Alert

The notification alert displays alerts related to wave conditions, allowing users to receive updates on significant changes in swell activity. This will help users monitor if it is safe to do surfing activities in specified areas chosen on the map.

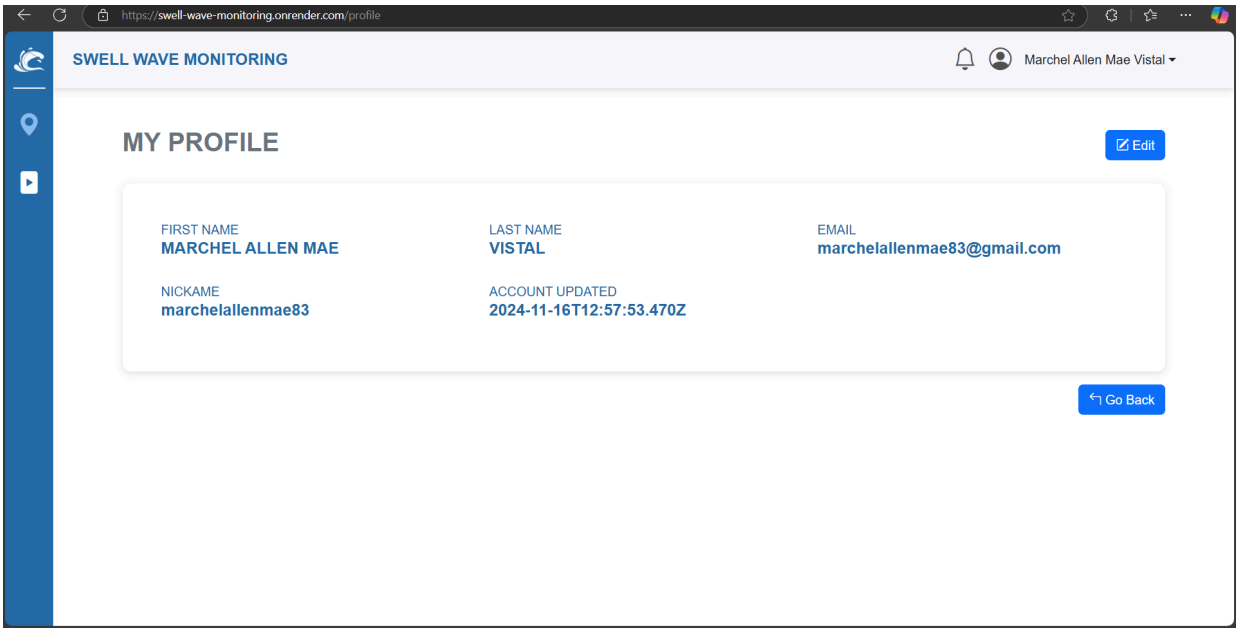

Figure 19. User Profile Page

The User Profile Page displays user details such as first name, last name, email, nickname, and account update. The user can also edit or update their information.

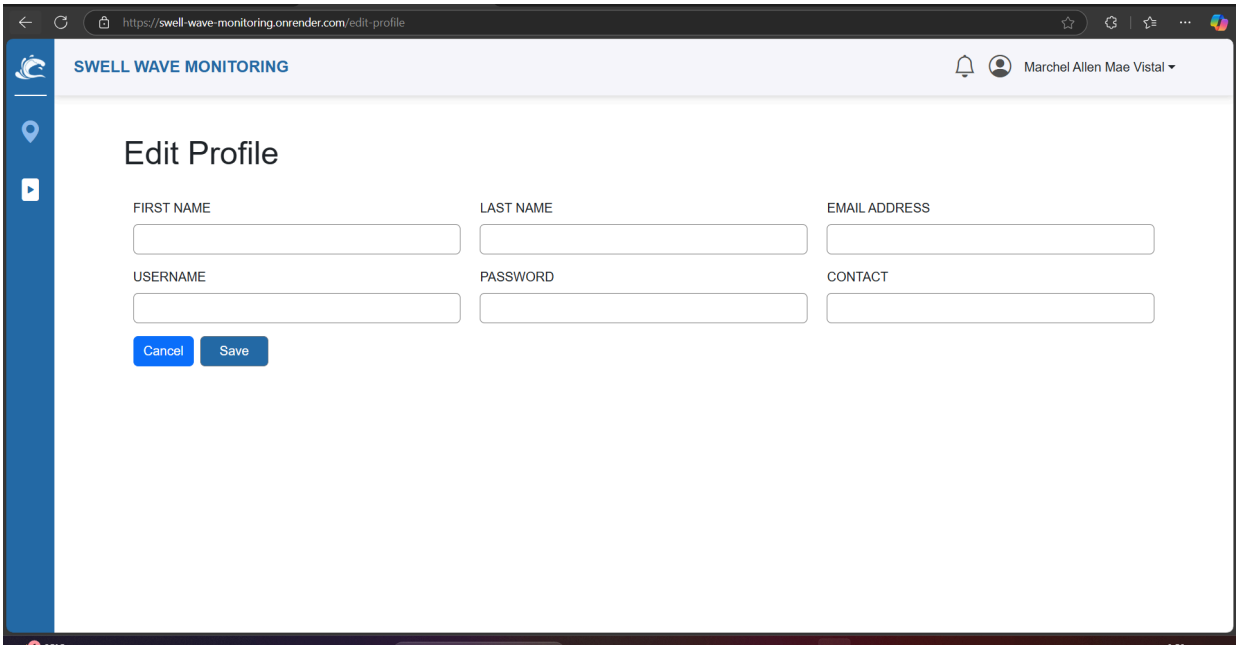

Figure 20. User Edit Profile

This figure shows the User Edit Page Profile this is where they can edit or update their information.

Admin Side

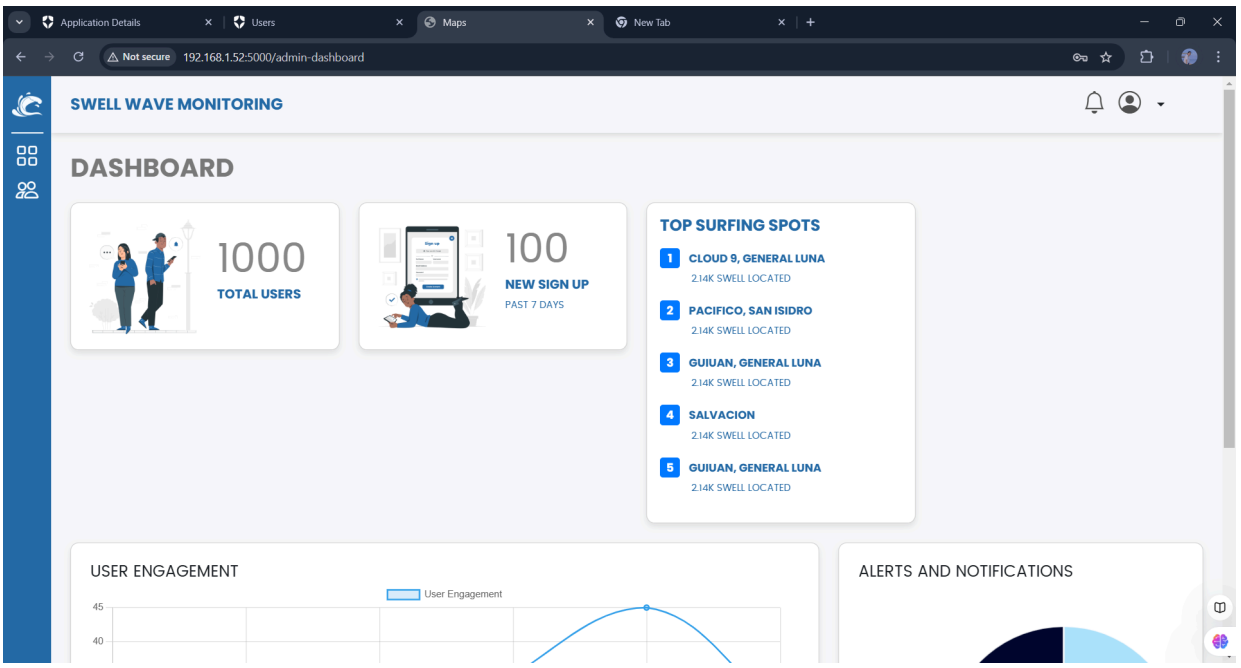

Figure 21. Admin Dashboard

The figure shows the admin dashboard. This includes counts for total users, and sign up as well as top surfing spots. Visualization for user engagement and alerts and notifications.

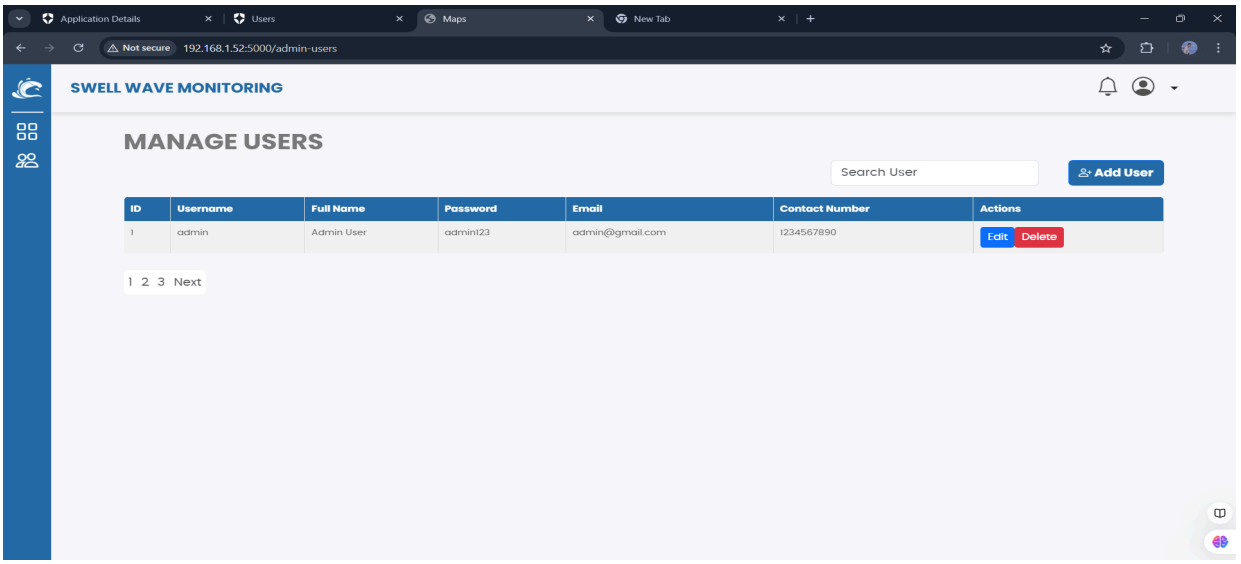

Figure 22. Manage Users

The figure shows the managed users page. This is where the admin can search users, add users, edit, and delete users.

III. Mobile Application Integration

The mobile application offers the same functionality as the web platform but is optimized for mobile devices, enabling real-time data access even while on the move. In mobile application integration, flutter is used to wrap the web to integrate it into mobile apk. The mobile app's interface includes easy navigation between real-time data, forecast visualizations, and the interactive map. Each component has been adapted to maintain usability on smaller screens, ensuring that users can check wave conditions quickly and efficiently from any location. Hosted on Render, the mobile app relies on real-time data updates processed by the Flask backend and supported by Render's scalable infrastructure. This setup ensures that the mobile app remains responsive and reliable for users with different connectivity levels.

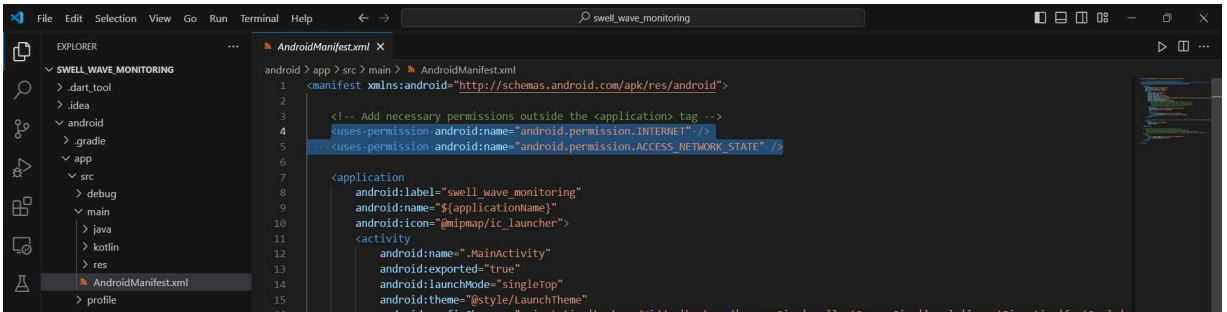

Figure 23. AndroidManifest.xml

The figure shows a highlighted part of the AndroidManifest.xml file that is used to grant the app permissions to access the internet **(INTERNET)** and check the device's network state **(ACCESS_NETWORK_STATE)**. These are essential for enabling network communication and monitoring connectivity, ensuring seamless functionality for online features.

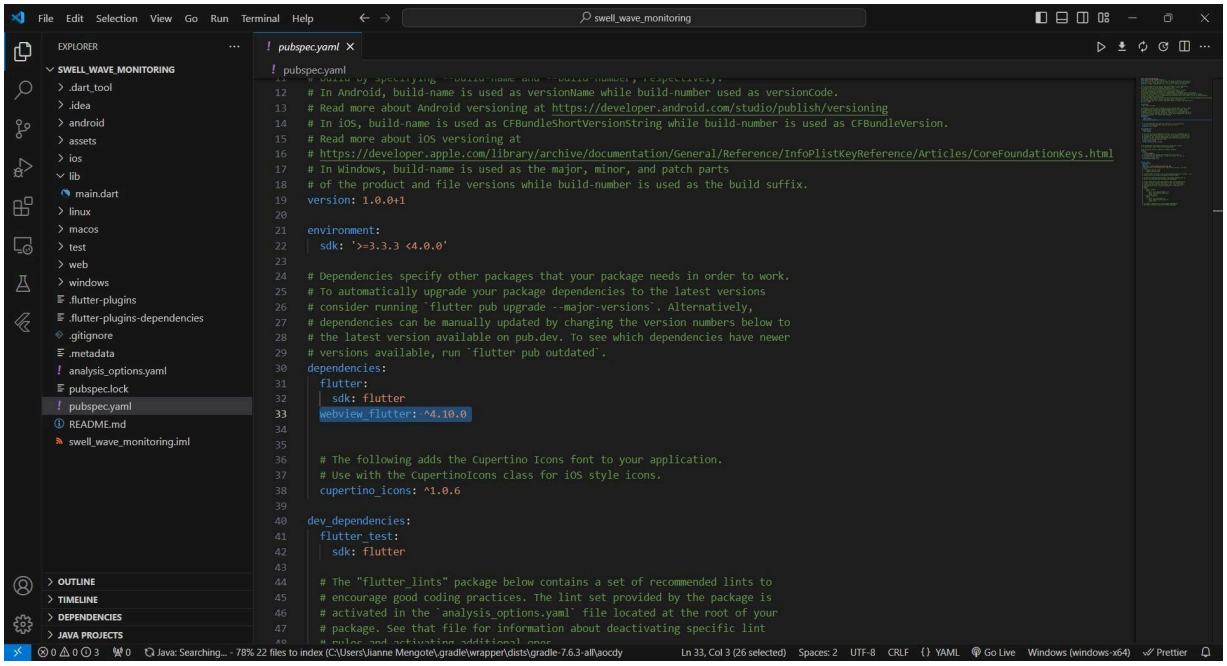

Figure 24. pubspec.yaml

The figure shows the highlighted section in the pubspec.yaml file that specifies the dependencies required for the Flutter application. The Mobile Swell Wave Monitoring System is using **webview_flutter: ^4.10.0**. This dependency integrates a WebView widget, enabling the app to display web content directly within the Flutter application.

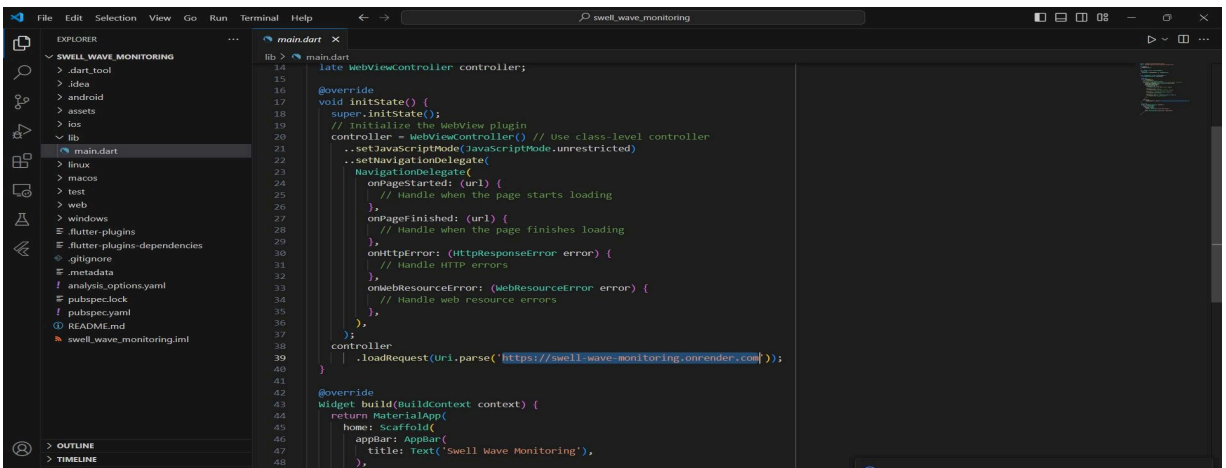

Figure 25. main.dart

The figure shows the main.dart code highlighting the part of code that is used to display the **https://swell-wave-monitoring.onrender.com** website inside a mobile app, allowing users to view and interact with it directly within the app.

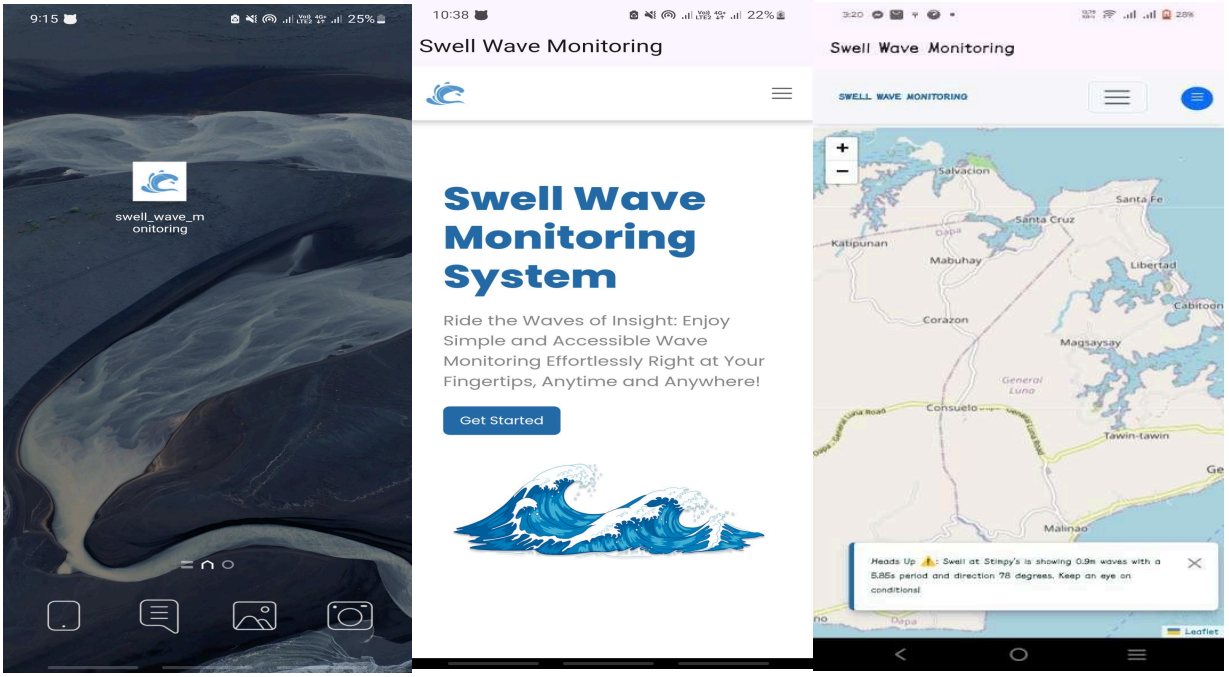

Figure 26. Swell Wave apk, Landing Page, Notification Alert

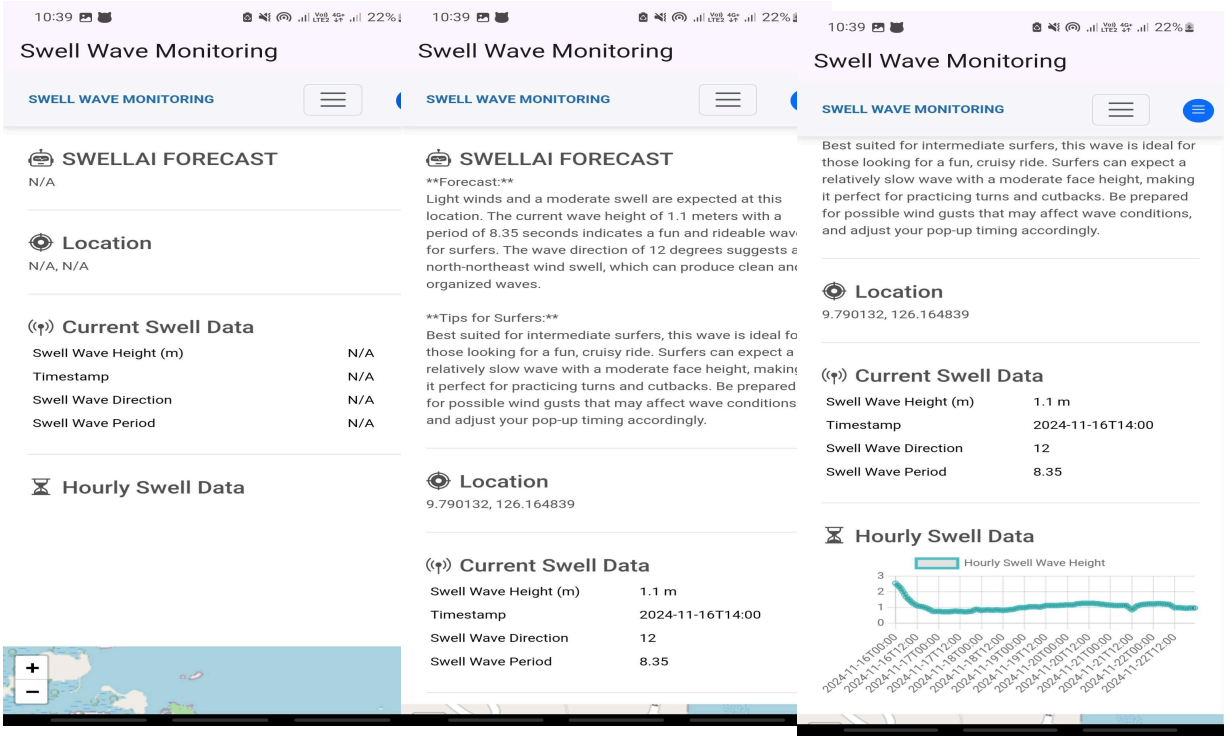

Figure 27. Homescreen, SwellAI forecast, Hourly Swell Data

IV. Desktop Application Integration

The desktop application provides a desktop view of the Swell Wave Monitoring System, optimized for users who require detailed data visualization and more screen space. The desktop version includes all core functionalities such as real-time data, wave forecast displays, and map interactions allowing users to monitor swell patterns and trends more comprehensively.

To create the desktop application, **Node.js** and **Nativefier** are utilized. After installing Node.js, run the command **npm install -g nativefier** to install Nativefier globally, then execute the following command in the command line: **nativefier --electron-version 25.2.0 --internal-urls ".*" --honest "https://swell-wave-monitoring.onrender.com/"**

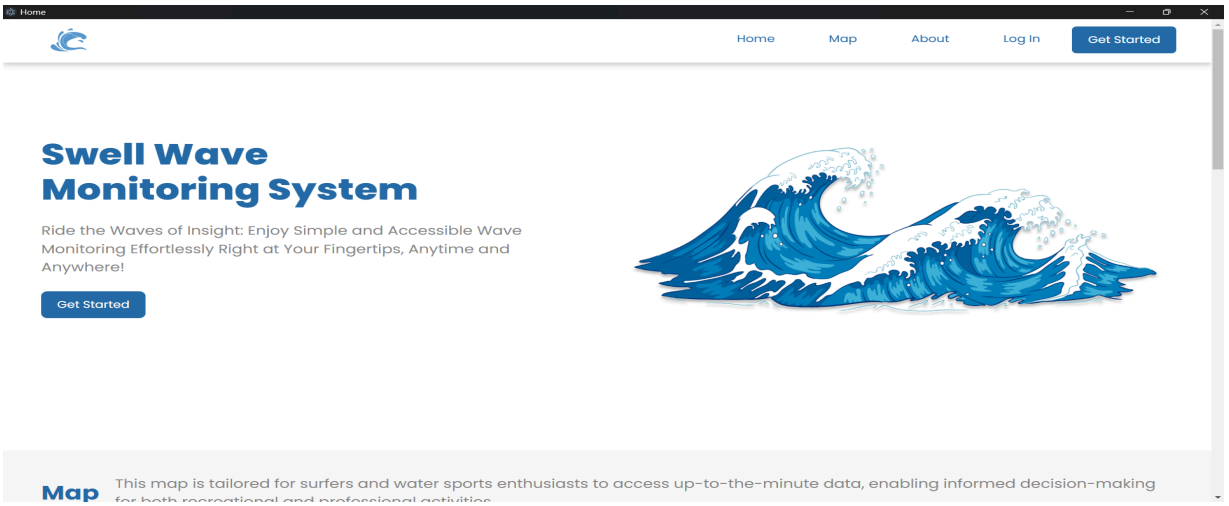

Figure 28. Home

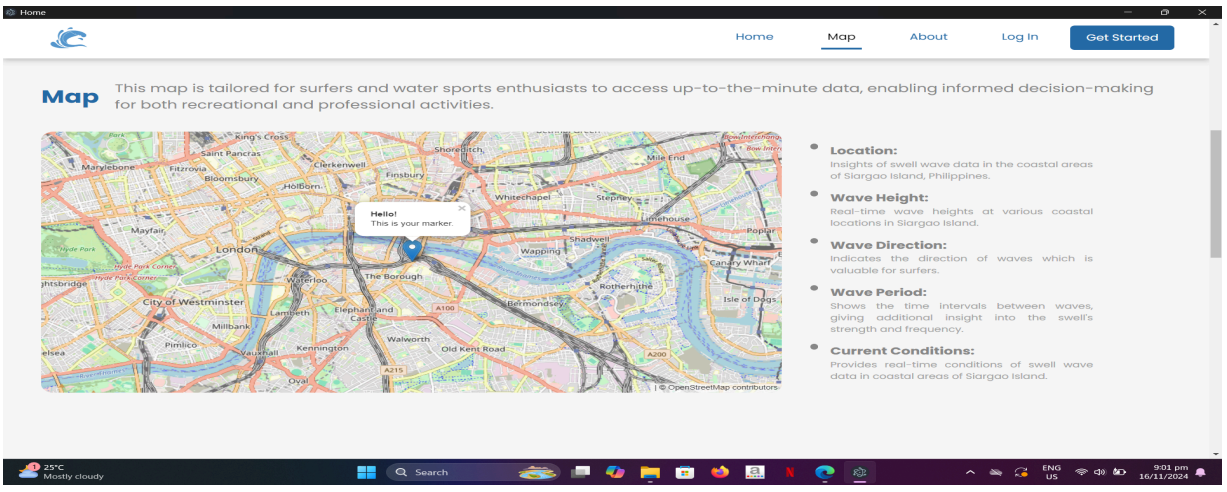

Figure 29. Map

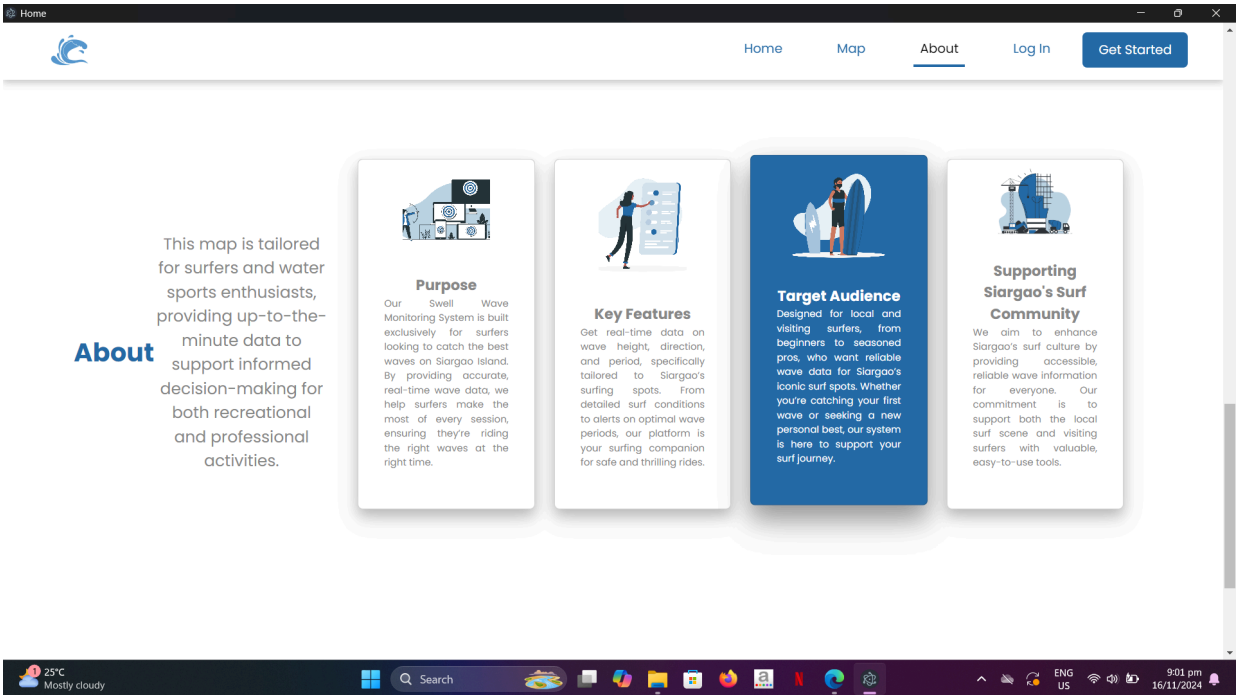

Figure 30. About

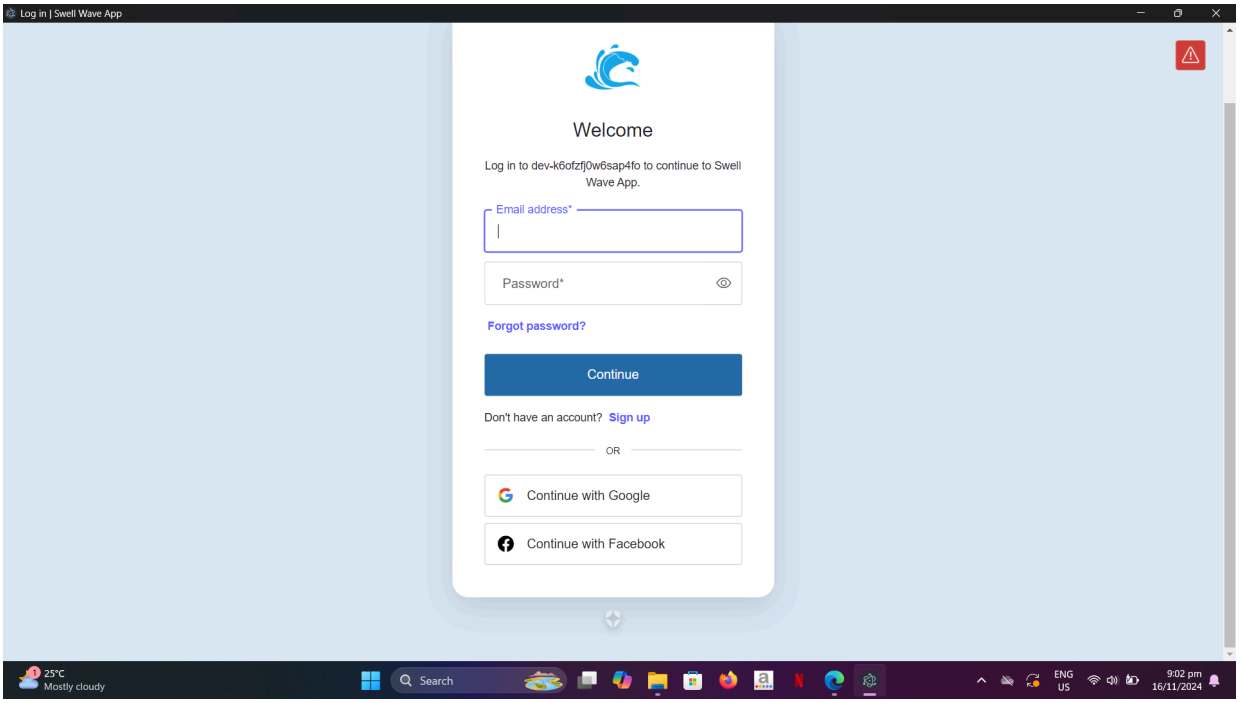

Figure 31. Login Page

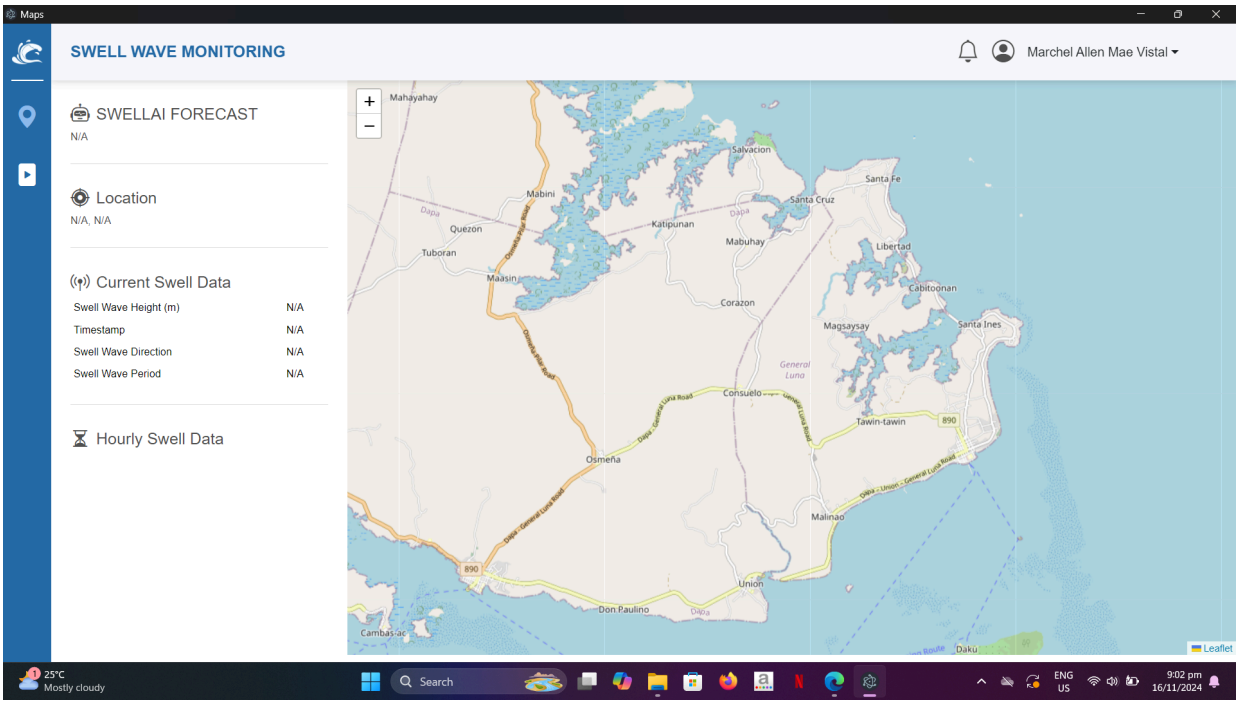

Figure 32. Map Page

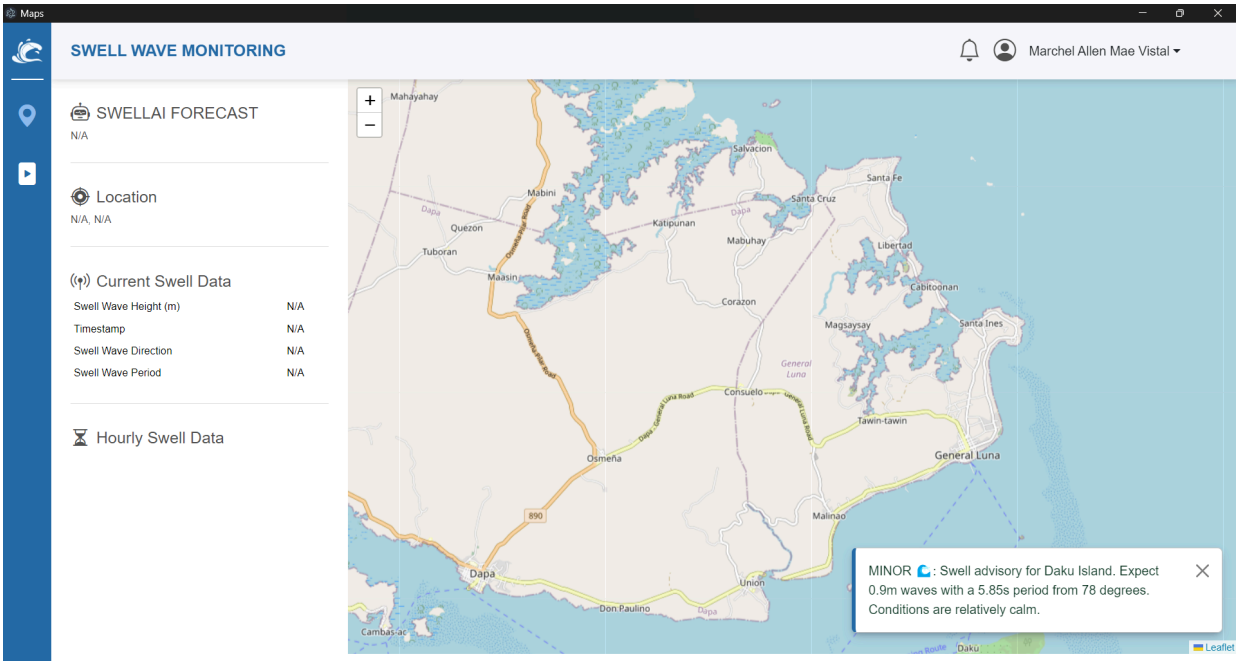

Figure 33. Notification Alert

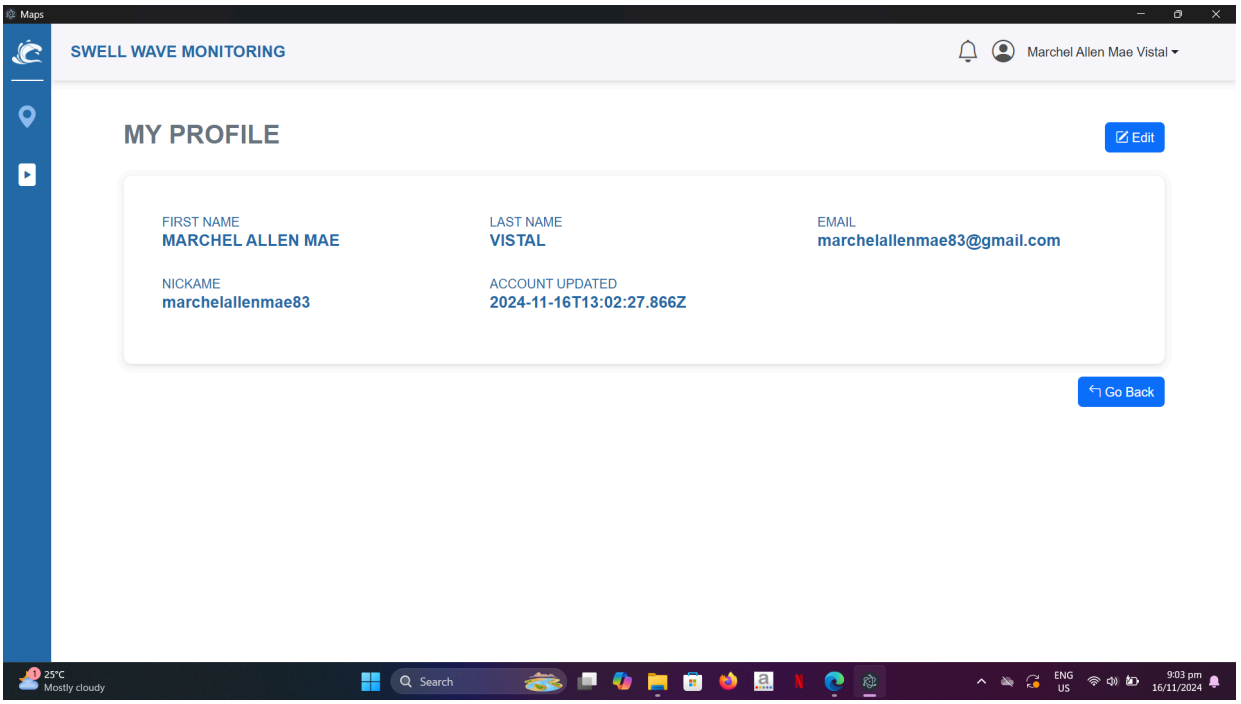

Figure 34. User Profile Page

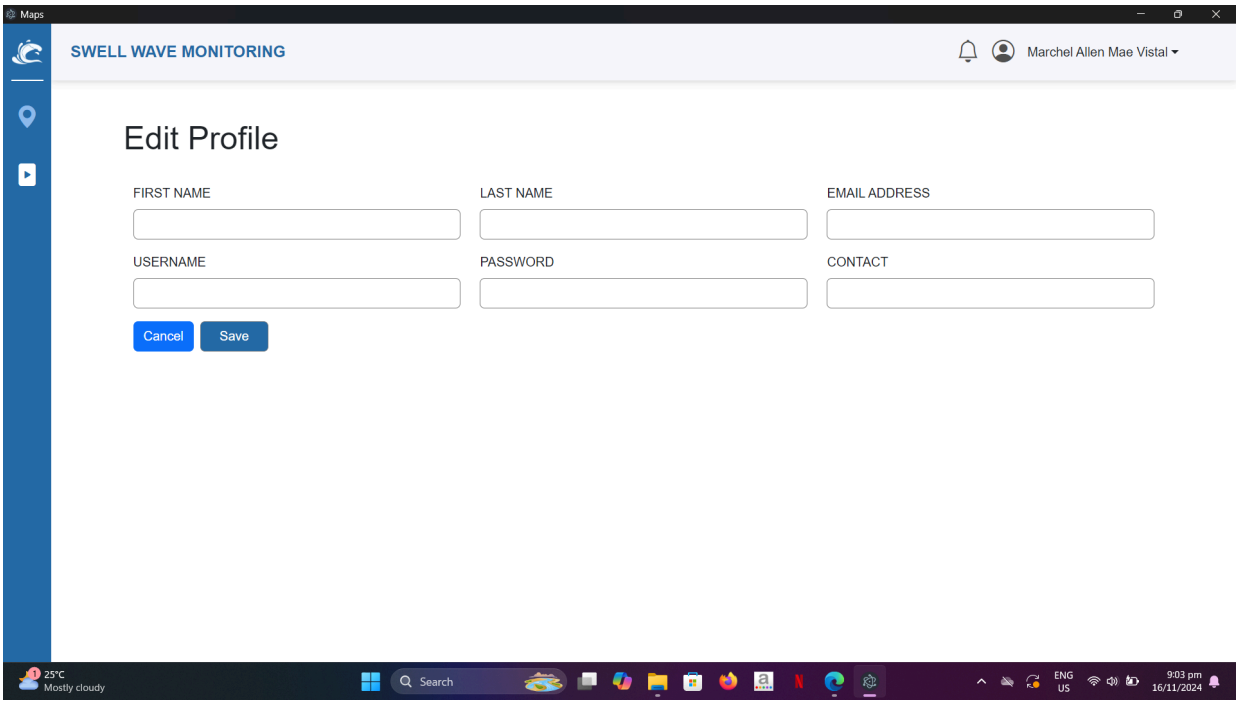

Figure 35. User Edit Profile

CURRICULUM VITAE

PERSONAL INFORMATION

Name: Dustin Kyle Labrador

Birthdate: May 19, 2003

Sex: Male

Address: Purok 1-South Poblacion, Maramag, Bukidnon

Contact: 09178962013

Email Address: s.labrador.dustinkyle@cmu.edu.ph

EDUCATIONAL BACKGROUND

Elementary: Maramag Central Elementary School

Junior High School: Bukidnon National School of Home Industries

Senior High School: Systems Technology Institute Valencia

College: Central Mindanao University

Course and Specialization: Bachelor of Science in Information Technology major in Data Network

SKILLS

Backend Development	• Flask (Framework), PHP, CodeIgniter3(Framework)
Frontend Development	• HTML5, JavaScript • Bootstrap
Database Management	• MySQL, PostgreSQL
Other Expertise	• Network Design & Architecture • Configuration of Routers & Switches(CISCO)

	● Protocols such as TCP/IP, OSPF, VLANs

OTHER INFORMATION

Role: Network Administrator

Task:

- Ensuring that the connection of the network is secured.
- Setting up the connection between the database server and the web server.

Contribution: Setting up the connection between the two devices for the web server and database server, ensuring that the connection between the two is functional and good to use.

PERSONAL INFORMATION

Name: Jianne Merijo E. Mengote

Birthdate: November 19, 2002

Sex: Female

Address: 220 Paterno Street, Dapa, Surigao del Norte

Contact: 09514589121

Email Address: s.mengote.jiannemerijo@cmu.edu.ph

EDUCATIONAL BACKGROUND

Elementary: Don Enrique Navarro Memorial School

Junior High School: Siargao National Science High School

Senior High School: Siargao National Science High School

College: Central Mindanao University

Course and Specialization: Bachelor of Science in Information Technology major in Information Management

Technical Skills

Backend Development	• Flask (Framework)
Frontend Development	• HTML5, CSS3, JavaScript • Bootstrap, Figma
Database Management	• MySQL, PostgreSQL, MongoDB
Development Frameworks	• Flask
Artificial Intelligence & Machine Learning	• Natural Language Processing (NLP) • Transformers Models (e.g., BERT, mT5, RoBERTa) • Machine Learning, Deep Learning

Other Expertise	● OpenAI Model Integration

OTHER INFORMATION

Role: System Developer

Task:

- Designed and implemented the backend logic of the system, ensuring efficient and scalable data processing.
- Integrated the front end with the back end.
- Integrated the Swell Wave API into the system, delivering accurate and real-time wave data.
- Deployed the web application to a web hosting platform, making it accessible across web, mobile, and desktop devices.

Contribution: Designed and implemented the backend, integrated the Swell Wave API for real-time data, connected the front end and back end, and deployed the system for multi-platform accessibility.

PERSONAL INFORMATION

Name: Ritchel M. Naquinez

Birthdate: November 18, 2002

Sex: Female

Address: Bayugan City, Agusan del Sur

Contact: 09120067100

Email Address: s.naquinez.ritchel@cmu.edu.ph

EDUCATIONAL BACKGROUND

Elementary: Bayugan West Central Elementary School

Junior High School: Bayugan National Comprehensive High School

Senior High School: Bayugan National Comprehensive High School

College: Central Mindanao University

Course and Specialization: Bachelor of Science in Information Technology major in Information Management

SKILLS

Technical Skills

Backend Development	• Python
Frontend Development	• HTML5, CSS3, JavaScript • Figma
Database Management	• MySQL, PostgreSQL
Development Framework	• ASP Classic • Flask
Artificial Intelligence & Machine Learning	• Machine Learning, Deep Learning, Computer Vision,

	Natural Language Processing (NLP) ● Transformers Models

OTHER INFORMATION

Role: Documenter

Task:

- Preparing initial drafts of project documentation.
- Organizing and compiling information from team members.
- Reviewing documents for grammatical and technical accuracy.
- Verifying consistency in technical details and terminology.
- Formatting documentation according to project guidelines.
- Creating diagrams for system workflows based on the developers accomplishments.

Contribution: Ensured accurate and detailed documentation of project milestones, and system design, facilitating effective team collaboration and successful project delivery.

PERSONAL INFORMATION

Name: Richard I M. Paculob

Birthdate: July 18, 2003

Sex: Male

Address: Don Carlos, Bukidnon

Contact: 09958475663

Email Address: s.paculob.richard@cmu.edu.ph

EDUCATIONAL BACKGROUND

Elementary: Don Carlos Fundamental Baptist Church Inc.

Junior High School: Loyola High School

Senior High School: Central Mindanao University

College: Central Mindanao University

Course and Specialization: Bachelor of Science in Information Technology Major in Information Management

SKILLS

Technical Skills

Backend Development	• Flask (Framework)
Frontend Development	• HTML, CSS, JavaScript • Figma
Database Management	• MySQL, PostgreSQL
Artificial Intelligence & Machine Learning	• Machine Learning, Deep Learning, Computer Vision, Natural Language Processing (NLP) • Transformers Models

OTHER INFORMATION

Role: Communication Officer

Task: Documentation and Communication to the team.

Contribution: Communication with the team to ensure the requirements are met in a given time.

PERSONAL INFORMATION

Name: Grace Claire Patac

Birthdate: August 20, 2002

Sex: Female

Address: Langcataon, Pangantucan, Bukidnon

Contact: 09979461506

Email Address: s.patac.graceclaire@cmu.edu.ph

EDUCATIONAL BACKGROUND

Elementary: Langcataon Central Elementary School

Junior High School: Langcataon National High School

Senior High School: Langcataon National High School

College: Central Mindanao University

Course and Specialization: Bachelor of Science in Information Technology major in Data Network

SKILLS

Backend Development	Python
Frontend Development	HTML, CSS, JavaScript
Database Management	MySQL
Network Management Tools	Cisco Packet Tracer
Other Expertise	• Network Design • Configuration of Routers & Switches(CISCO)

OTHER INFORMATION

Role: Documenter

Task: Creating and organizing detailed project documentation, including specifications, guidelines, user manuals, and progress reports.

Contribution: Ensuring that all aspects of the project are well-documented, facilitating clarity for team members, stakeholders, and future users.

PERSONAL INFORMATION

Name: Marchel Allen Mae M. Vistal

Birthdate: March 16, 2003

Sex: Female

Address: Palma, Kibawe, Bukidnon

Contact: 09525475337

Email Address: s.vistal.marchelallenmae@cmu.edu.ph

EDUCATIONAL BACKGROUND

Elementary: West Kibawe Elementary School

Junior High School: Stella Matutina Academy

Senior High School: Stella Matutina Academy

College: Central Mindanao University

Course and Specialization: Bachelor of Science in Information Technology major in Information Management

SKILLS

Backend Programming	Python
Frontend Programming	• HTML • CSS • Javascript • Bootstrap

Database Management Tools	• MySQL • PostgreSQL
Development Frameworks	• Flask • ASP Classic
Intelligent System	• Machine learning and Deep Learning Architectures Models • NLP • Computer Vision

OTHER INFORMATION

Role: Project Manager

Task:

- Update the the progress and about new requirements
- Testing the system functionalities
- Create a comprehensive report about the project's progress, outcomes, and challenges.

Contribution: Worked as a Frontend Developer, developing desktop applications and presented detailed progress reports on the system's development and performance.

Instructor’s Biography

Eric P. Lozarita is a leading technology executive, consultant, educator, and author with over 24 years of experience in IT systems development, network architecture, and distributed systems. As CEO of Greppoo Technology Solutions, he has been instrumental in driving strategic growth, enhancing operational efficiency, and implementing innovative software solutions. Eric's technical contributions have gained international recognition, particularly from Sun Microsystems, for his expertise in Java-based systems and software architecture.

Professional Achievements

- Chief Executive Officer, Greppoo Technology Solutions (2017-Present): In this role, Eric has significantly expanded the company's client base by 30%, focusing on cloud server management, network security, and application development. He oversees the strategic direction, manages high-performing teams, and delivers comprehensive technology solutions that meet industry standards.

- ERP and Business Intelligence Consultant, Nissan Davao and NPI (2017-Present): Eric has been responsible for ERP systems' financial and operational configurations, optimizing financial software for companies. His work includes customizing business intelligence analytics, financial reporting, and security setup to meet clients' unique needs.

- Java Trainer and Industry Consultant: Eric has been a key trainer for Java technologies across multiple institutions and industries. He has delivered specialized training in Java Standard Edition (J2SE) and Java Enterprise Edition

(J2EE) for IT professionals, students, and academic professors. His workshops have covered web application development, object-oriented programming, and system architecture, benefiting companies like Bayan Telecommunications, Dole Philippines, and educational institutions such as Ateneo de Davao University and the University of Mindanao.

Notable Recognition

In March 2006, Eric received international recognition from Sun Microsystems as part of the Java Studio Enterprise Heroes program. His work in the development of robust software architectures, using Sun Java Studio Enterprise 8 and NetBeans, earned him this acknowledgement. Eric and his team at Greppoo utilized these tools to design efficient applications for the U.S. Army's Pathfinder system, enhancing data mining and visualization for intelligence analysts.

Educational Contributions

Eric's passion for technology extends to academia. He has served as an instructor and assistant professor at various institutions, including Aksum University in Ethiopia and the University of Immaculate Conception in Davao. His focus has been on advanced IT concepts, such as system integration, architecture, and network security. Currently, he is a part-time instructor at Central Mindanao University, where he teaches Systems Integration and Architecture as well as Integrative Programming and Technology.

Technical Expertise

- Programming Languages: Java, SQL, C/C++, Python, and Microsoft C#
- Development Frameworks: Java Persistence API (JPA), JSP, JSF, Bootstrap, Java MVC
- Server Management: Apache Tomcat, GlassFish, MySQL, PostgreSQL, and MSSQL
- Network Security and Connectivity: VPN, Firewall configurations, WAN, LAN, TCP/IP
- Cloud and Distributed Systems: Expertise in cloud server setup, data synchronization, and web services using Enterprise Java Beans (EJB) and Java WebSocket.

Research and Publications

Eric is a published author with several technical books available on Amazon, covering topics such as Java programming and business strategies for technology entrepreneurs. His research projects have included AI-assisted disaster alert systems, GPS mapping for disaster risk reduction, and responsive web development frameworks. His efforts to develop user-friendly financial software for SMEs have empowered businesses in sectors like construction, lending, and real estate.

Education

Eric holds a DIT honorary degree and two Master's degrees in Information Technology from the University of Immaculate Conception in Davao, where his thesis on wireless sensor networks received accolades for its innovative use of AI in distributed systems. He has also completed specialized training in networking, cloud solutions, and enterprise systems from institutions in Japan and the United States.

Community Involvement

Eric is actively involved in the IT community, participating as a resource speaker in technology seminars and workshops. His presentations have spanned topics from Java development to network security, often collaborating with local and international IT professionals to promote advanced learning and skill development. His efforts have contributed to the widespread adoption of Java and NetBeans technologies in the Philippines, earning him recognition within the tech community.

Eric Lozarita's career is a testament to his dedication to technological advancement, educational empowerment, and the development of innovative IT solutions. His international recognition and hands-on contributions in the field continue to inspire both professionals and aspiring technologists alike.

Skills

- Marketing
- Management
- Business Strategy
- Web Development
- Mobile Development

ERIC P. LOZARITA, MIT, MSIT

frxbit@gmail.com

Nationality: Filipino

Birth date: June 21, 1977

Mobile: 09161307496

Instructor's Profile

PROFILE

With over 24 years direct experience in project systems development, systems architect, analysis and design. Proficient in web N/3 tier and or distributed systems architecture, design, programming, development and deployment. Central Mindanao University (cmu.edu.ph) instructor of System Integration and Architecture, Integrative Programming Technology.

Book Publication, Author and Co Author

Java Programming publish in Amazon.com

Technology Entrepreneur and Traditional Business Success

Created Web/Mobile app based financial accounting software subscription for SME businesses such as: House/Building Construction, Lending Company, Realty and Leasing, Playroom and Playschool.

Proficient in Operating System

Cloud Server based OP Systems, Sun Solaris, Linux, and Windows Server

Proficient in IDE Programming tool

Eclipse, Netbeans, Visual Studio Code, Android Studio

Proficient in UML modeling tool

Java Studio Enterprise

Proficient in Programming Language

JAVA 2, J2EE and Android, SQL ANSI, Microsoft C#, C/C++, Python

Proficient in Other Programming Standards and Frameworks

Bootstrap Framework, JAVA Persistence API (JPA), JSP, Servlet and JSF Frameworks, Java Model View Controller (MVC)

Proficient in Application Server Configurations and Deployment

Apache Tomcat and Glassfish

Proficient in Distributed Systems/WebServices Programming, Development and Configurations

Enterprise Java Beans with Java Persistence API (JPA) and Web Service

Enterprise Java Beans with SQL ANSI and Web Service

Async/Syschornuous programming/deployment/configurations (Service Oriented Architecture - SOA)

Proficient in java WebSocket/TCP/IP Programming

SMS/GPRS/3G/4G/5G data sending and receiving

GPS coordinates parsers and api web services

Google Maps java API integration services

Proficient in Database Server

MySQL, Postgre SQL and MSSQL

Proficient in Java Reporting Tool

iReport and JasperSoft

Proficient in Server Deployment and Configuration

Web and Mail Servers: apache and Apache tomcat web server for Linux and Microsoft, *Database Servers:* MySQL server for Linux and Windows, *Portals and Java Glass Fish Application Servers:* for Windows and Linux

Proficient in Local/Public/Remote Cloud Server Management and Configuration

Setting up Linux Cloud Server for customer including FTP, Http, Java Tomcat web server, MySql Database, Integrated Development Environment (IDE) tool and Java Web Mobile apps programs.

Other Proficient in Programming Language

HTML5, CSS3 and Java script, JQuery, HTML, XML-SOAP

Proficient in Network Connectivity and Security

Wide Area Network (WAN), Local Area Network (LAN), Virtual Private Network (VPN), Wireless 802.11 series, Firewall setup including Intrusion Prevention System (IPS/IDS) from local to country to country defense system.

Proficient in Network Communication Devices and Complex Setup

NetGate/OPNsense/PFsense Gateway Firewall, Ubiquiti Gateway firewall, Ubiquiti Air Fiber, Ubiquiti Unifi and TP-Link Omada Gateway Firewall

Knowledgeable in Network Deployment and Configuration

Long distance Point to Point antenna network configuration setup and bridge mode. VoIP and SIP access configuration for both Android mobile and SIP phone. Virtual Private Network (VPN) deployment using Ubuiquiti, NetGate, Linksys, Net Screen and 3com routers via satellite internet connection to DSL broadband connection. Security deployment: establish firewall defense for pattern hacking, internet protocol address filters and Mac address filtering. Wireless LAN access point and bridge connection configurations.

WORK EXPERIENCE

CHIEF EXECUTIVE OFFICER

Greppoo Technology Solutions

Talomo, Davao City

May 2017 to Present

- Led the strategic direction and overall management of Greppoo Technology Solutions, driving growth and profitability.
- Developed and implemented company policies, goals, and procedures, ensuring compliance with regulations.
- Fostered a culture of innovation, accountability, and continuous improvement within the organization.
- Managed financial operations, including budgeting, forecasting, and financial reporting, ensuring fiscal responsibility.

Built and maintained relationships with key stakeholders, including clients, partners, and investors.

Oversaw the recruitment, training, and development of high-performing teams, ensuring alignment with company objectives.

Provided expert advice and solutions to clients on various technology-related projects, enhancing their operational efficiency.

Conducted in-depth assessments of client needs, identifying opportunities for improvement and recommending appropriate solutions.

Developed and presented comprehensive project proposals, outlining scope, timelines, and budget requirements.

Collaborated with cross-functional teams to ensure the successful implementation of client projects.

Monitored project progress, ensuring timely delivery and adherence to quality standards.

Designed and delivered training programs on various technical topics, including network solutions, system integration, and software development.

Conducted workshops and seminars to enhance the technical skills and knowledge of employees and clients.

Created training materials, manuals, and guides, ensuring clarity and accessibility.

Assessed training effectiveness through feedback and performance metrics, continuously improving training methodologies.

Mentored junior staff and interns, providing guidance and support for their professional development.

Conducted comprehensive market research to identify emerging trends, opportunities, and competitive threats in the technology sector.

Analyzed data and market insights to inform strategic decision-making and business development initiatives.

Developed detailed market reports and presentations, communicating findings to the executive team.

Collaborated with the marketing team to develop targeted strategies for market penetration and customer acquisition.

Engaged with industry stakeholders, attending conferences and networking events to stay abreast of market developments.

Oversaw day-to-day operations, ensuring efficient workflow and resource allocation across departments.

Implemented project management methodologies to streamline processes and improve project delivery.

Managed client relationships, ensuring satisfaction and addressing any issues or concerns promptly.

Developed and monitored performance metrics, setting benchmarks and goals for teams and individuals.

Coordinated with the finance department to manage budgets, optimize costs, and ensure financial sustainability.

Key Achievements:

Successfully expanded Greppoo Technology Solutions' client base, increasing revenue by 30% over three years.

Implemented innovative training programs that improved employee performance and client satisfaction.

Led several high-profile consulting projects, delivering solutions that significantly enhanced client operations.

Conducted market research that identified new business opportunities, contributing to strategic growth initiatives.

Fostered a collaborative and productive work environment, resulting in high employee retention and engagement.

ERP Financial Accounting and Business Intelligence Consultant

Nissan Davao and NPI

Davao City, Philippines

October 2017 to ***Present***

ERP Financial Software and Business Intelligence Analytic Implementation:

Financial Programming and customized new features

Financial and Accounting setup/configurations such as Sales, Accounts Receivable, Accounts Payable, Cash/Check Disbursement, Inventory, General Ledger, FS:Balance sheet and Income statement, user security, access role setups per department
Parts inventory configuration and setups
Vehicle Service Centers configuration and setups
MSSQL Server configuration and backups
DNS, FTPs and Email servers configuration and setups
Firewall and security gateways configuration and setups
Employees and Technicians e-Learning server installation, setups and configurations.
Local and remote back-up cloud servers setups and configurations
Linux File server setups and configurations
Network security and configurations setups

Part-time Instructor
Central Mindanao University
University Town, Musuan
Maramag, Bukidnon Philippines
2020 to Present

Part-time Instructor
Teaching Systems Integration and Architecture
Teaching Integrative Programming and Technology
Prepare advanced concepts modules for project development, real server deployment and presentation to IT students according to approved curriculum.
Prepare advanced topic for their group activities.
Teach the IT students of a systematic research and group collaboration.
Teach the IT students how to become more effective in project presentation.

Assistant Professor
Aksum University

Ethiopia, Africa
2016 to 2017

Assistant Professor in Graduate Studies

Teaching IT Professionals

Prepare advanced concepts modules for presentation to IT professionals according to approved curriculum.

Prepare advanced topic for their group studies.

Teach the IT professionals of a systematic research and group collaboration.

Teach the IT professionals how to become more effective in research presentation.

Lead the IT professionals to promote high level standards in advanced learning and skills training from basic theory to advanced applied theory

Thesis project consultant

IT Project Manager

Greppoo, Inc

Davao City, Philippines

December 2006 to ***Present***

Project Manager/Cloud Server Management and Apps Deployment (2014 to Present)

Linux Cloud Server FTP and Http configuration

Tomcat Server configuration

MYSQL Server Cluster configuration

Java Web and Mobile Apps programming, development and deployment

Project Manager/Advanced Developer (2012 July. to Present)

Current Projects handled and develop: Responsive Web Financials Accounting platform for mobile/tablet and Desktop

Project Manager/Advanced Developer (2012 Jan. to June)

Comic and Book content android mobile/tablet and web app portal

Project Manager/Advanced Developer (2011 Jan. to 2011 to Dec.)

E-learning Application

Student management

Course management

Enroll management

Project Manager/Advanced Developer (2009 to 2010)

GPS Web Portal Application

Google maps, gauges and graph analytics and API integrations

Client web-service driven

TCP/IP data pooling services

Professors Trainer (2008 to present)

J2EE Web Application and Service Oriented Architecture (SOA) Implementation and Web Services API Programming

J2SE fundamentals core foundation and swing programming

Project System Application Architect & Advanced Developer (2007)

J2EE web N-Tier application

Private messaging with approved/disapproved and process flow capability

IT Professor

University of Immaculate Conception

Davao City, Philippines

October 2006 to April 2007

IT Professor in Graduate Studies

Teaching IT Professionals

Prepare advanced concepts modules for presentation to IT professionals according to approved curriculum.

Prepare advanced topic for their group studies.

Teach the IT professionals of a systematic research and group collaboration.

Teach the IT professionals how to become more effective in research presentation.

Lead the IT professionals to promote high level standards in advanced learning and skills training from basic theory to advanced applied theory

IT Professor in College Degree

Teaching in Advanced Java Web Application Programming

Prepare modules and outlined course for presentation to students according to approved curriculum.

Teach students using a systematic sequence of lessons, discussions and collaboration, LCD projector visual presentation.

Lead students in activities to promote their physical, mental and social development and their school readiness.
Evaluate the progress of students and discuss results with students, parents and school officials.

Business Systems Analyst
Segworks Technologies Corporation
Davao I.T. Incubation Center
Brokenshire College, Madapo
Davao City, Philippines
January 2003 to November 2006

Project System Application Designer and Developer (2006)
J2EE web tier application and architecture
Hospital and Health application and architecture
Project System Application Coordinator & Configurator (2005)
Seglegal ASP (Application Service Provider)
Trubank 11 branches Virtual Private Network Deployment (VPN)
Project Research Coordinator (2004) in network Protocol such as:
GPRS (General Radio Packet Service)
GSM (Global System Mobile)
Wireless 802.11 series
Internet Satellite
System designer with latest approach and methodology using UML tools
Physical Configuration of Operating System and Servers such as:
Sun Solaris 10
Microsoft Advance Server
Red Hat Linux

Computer Programming Consultant
Southeastern Mindanao Institute of Technology
109 Lim Metodio Building Magallanes Street
Davao City, Philippines
March 2001 to Present

Computer system analyst and technical consultant of software implementation.
Designing systematic program for accounting procedure in computer like:
IT Support of centralized database servers.

Computer System Maintenance
V.P Ventures
55A Salisi Street Nova Tierra Village, Lanang
Davao City, Philippines
January 1999 to Feb 2001

Microsoft access database analyst
Internetworking maintenance
Local area network (LAN) maintenance
File transfer protocol maintenance
Computer server configuration maintenance and security
Web technician

OTHER ACTIVITIES

Personal Book Publish and Co-author @ Amazon.com

https://www.amazon.com/Java-Made-Easy-reference-beginners/dp/1540353672
https://www.amazon.com/JSP-MySQL-Made-Easy-programming-ebook/dp/B06XJ8N1T7
https://www.amazon.com/Basic-Research-Guide-BaReGu-Beginners-ebook/dp/B07Q7GZC8G
https://www.amazon.com/Success-Through-Entrepreneurship-Labial-Senara/dp/1539981010
https://www.amazon.com/Catering-Essentials-Dr-Rodelo-Salburo-ebook/dp/B01MRHLX11

Book writing

Volunteer Course Pack Writers in the Fundamentals of Programming / Computer Programming (CHEDRO XI , 2020)

Volunteer Course Pack Writers in the Advanced Database Systems (CHEDRO XI, 2020)

Java Fundamentals and simple mobile application programming

Java Mobile Programming Modules for Philippine TESDA vocational course

Research and Development

Advance Satellite GPS Maps, Weather Forecast and Disaster Alert Notification System: An AI assisted Web/Mobile Application Platform for Disaster Risk Reduction (DRR), Public Safety, Agriculture, Fishing, Land-air-sea travel and Business environment conditions, etc.

Advance AI assisted time-series reading of complex scientific data from weather and other sensors

Responsive front-end framework platform development using HTML5, CSS3 and JavaScript

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EDUCATION

06-2009-3- 2009 **Masters of Science in Information Technology**
Masters Degree
University of Immaculate Conception
Bonifacio St., Davao City, Philippines
Best in thesis “Wireless Sensor Network-Based Distributed Data System: Application to Artificial Intelligence”

11-2003-4- 2006 **Master in Information Technology**
Masters Degree
University of Immaculate Conception
Bonifacio St., Davao City, Philippines

6-2002-8- 2002 **Computer Technician**
Regional Training Center (TESDA),
Buhisan, Tibungco, Davao City, Philippines

3-2000-4-2002 **Information Technology**
Southeastern Mindanao Institute of Technology
3rd Flr Lim Bldg.,Magallanes St.
Davao City, Philippines.

6-1998-3-1999 **Programming**
Special Course Certificate/Diploma
Selga Computer Center, Magallanes Street,
Davao City, Philippines. Computer

6-1994-10-1998 **Bachelor of Science in Accountancy (BSA**)
University of Mindanao
Bolton Street, Davao City, Philippines

TRAININGS & SEMINARS

Trainings/Seminars

Business Process Management (BPM)
Greppoo Office, Matina
Davao City, Philippines
February 2013

International Trainings

IT Project Management Instructor
AOTS Nagoya, Japan
February 2009

Advanced Online Training Course

CCNA Networking

University of Immaculate Conception
Davao City, Philippines
April 19, 2005

Wireless and Mobility Solutions
3COM University, USA
June 8, 2004

Marketing 3Com Solutions to Small Offices
3COM University, USA
June 6, 2004

Enterprise Core Network Solutions
3COM University, USA
June 4, 2004

Cost-effective Networks
3COM University, USA
June 4, 2004

Enterprise Workgroup/Desktop Switching Solutions
3COM University, USA
June 4, 2004

How to Sell and Position 3Com Security Products
3COM University, USA
June 4, 2004

Benefits of Wireless Networking
3COM University, USA
May 7, 2004

Wireless LANs: A Technology Overview
3COM University, USA

May 7, 2004

3Com Security Strategy And Solutions
3COM University, USA
May 7, 2004

3Com Network Management Solutions
3COM University, USA
May 7, 2004

Seminars

Networking,
Held at SMIT Computer Laboratory
Davao City on October 4, 2001

3Com University
Held at Grand Menseng Hotel
Davao City on November 14 to 15, 2002

Java in Cebu
Held at Water Front Hotel
Cebu City on August 22, 2006

Participations:

Resource Speaker of Business Strategies for eCommerce Seminar
Davao Doctors College
Davao Doctors College Audio Visual Room (AVR)
Malvar St., Davao City on February 3, 2007

Resource Speaker of Java Seminar Workshop

Davao Doctors College

Davao Doctors College Internet Laboratory

Malvar St., Davao City on October 31, 2006

BS Computer Science Curriculum Review

Davao Doctors College

Davao Doctors College HM Function Hall

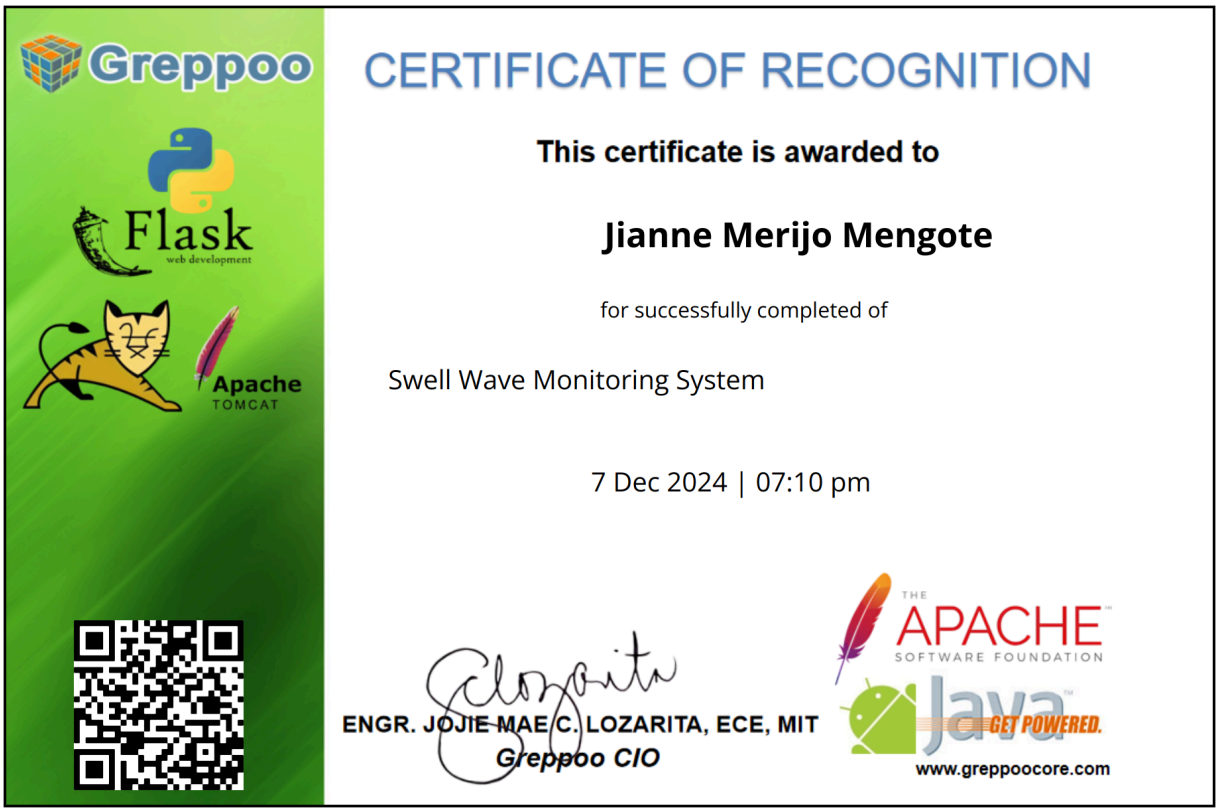
Malvar St., Davao City on March 31, 2006

Sun Microsystems Developers Recognition worldwide

Digital Reasoning Selects the Java Studio Enterprise to Speed Development of Intelligence System Component

March 14, 2006

CERTIFICATES



Greppoo

CERTIFICATE OF RECOGNITION

This certificate is awarded to

Ritchel Macose Naquinez

for successfully completed of

Swell Wave Monitoring System

7 Dec 2024 | 07:17 pm

ENGR. JOJIE MAE C. LOZARITA, ECE, MIT
Greppoo CIO

www.greppoocore.com

Greppoo

CERTIFICATE OF RECOGNITION

This certificate is awarded to

Richard I M. Paculob

for successfully completed of

Swell Wave Monitoring System

9 Dec 2024 | 03:44 pm

ENGR. JOJIE MAE C. LOZARITA, ECE, MIT
Greppoo CIO

www.greppoocore.com

Greppoo

CERTIFICATE OF RECOGNITION

This certificate is awarded to

Grace Claire Patac

for successfully completed of

Swell Wave Monitoring System

5 Dec 2024 | 06:43 pm

ENGR. JOJIE MAE C. LOZARITA, ECE, MIT
Greppoo CIO

www.greppoocore.com

Greppoo

CERTIFICATE OF RECOGNITION

This certificate is awarded to

MARCHEL ALLEN MAE MAGAMAY VISTAL

for successfully completed of

Swell Wave Monitoring System

5 Dec 2024 | 05:47 pm

ENGR. JOJIE MAE C. LOZARITA, ECE, MIT
Greppoo CIO

www.greppoocore.com

REFERENCES

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Pinto, L. M. (2024, June 3). What is a swell? *Surfertoday*. https://www.surfertoday.com/surfing/what-is-a-swell

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Helmy, H. (2021, December 13). Getting started with Leaflet.js - Harum Helmy - Medium. *Medium*. https://medium.com/@harumhelmy/getting-started-with-leaflet-js-7f96a3c7ea5a

Kaliske, M., & Schmidt, B. (2024). Analysing the directional dependence of wind and wave interactions for offshore wind turbines using environmental contours. *Journal of Marine Science and Engineering*, *12*(7), 1116. https://doi.org/10.3390/jmse12071116

Marin-Perianu, M., Chatterjea, S., Marin-Perianu, R., Bosch, S., Dulman, S., Kininmonth, S., & Havinga, P. (2009). Wave monitoring with wireless sensor networks. In *Proceedings of the International Conference on Intelligent Sensors, Sensor Networks and Information Processing* (pp. 611–616). IEEE. https://doi.org/10.1109/ISSNIP.2008.4762057

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Render. (n.d.). Render Documentation. Retrieved November 17, 2024, from https://render.com

Worsley, S. (2024, July 30). *What is Python? Everything You Need to Know to Get Started*. https://www.datacamp.com/blog/all-about-python-the-most-versatile-programming-language

Zola, A. (2022, August 3). *Bootstrap*. WhatIs. https://www.techtarget.com/whatis/definition/bootstrap