PRIMS: Patient Record & Interaction Management System

Project Documentation Submitted to the Faculty of the
School of Computing and Information Technologies

Asia Pacific College

In Partial Fulfillment of the Requirements for
Introduction to Systems and Design for CS/IT
MNTSDEV

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2024

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Executive Summary

A web-based system is being developed for Asia Pacific College's (APC) clinic to address several operational challenges. Currently, the clinic struggles with managing and storing physical medical records, preparing monthly summary reports, scheduling appointments effectively, and communicating schedule updates promptly. These inefficiencies lead to time consumption and potential schedule conflicts.

The primary objective of this project is to create and deploy a comprehensive system that facilitates student check-ins, manages medical records electronically, tracks medication inventory, and enables online appointment scheduling. By implementing these features, the clinic aims to streamline its processes and enhance the experience for both staff and patients.

The project is scheduled to span the academic year from the third term of A.Y. 2023-2024 in March 2024 to the third term of A.Y. 2024-2025 in June 2025. The target audience includes APC students, staff, faculty members, and guests. The expected outcomes include the successful development and deployment of the clinic system, ensuring it meets the needs and garners satisfaction from the entire APC community.

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I. Introduction

1.1 Project Context

The Patient Record and Interaction Management System, also known as PRIMS, project at Asia Pacific College's Clinic is designed to streamline healthcare access for students and faculty. By enabling effortless appointment scheduling with nurses and managing clinic inventory, PRIMS aims to enhance the efficiency and effectiveness of healthcare services on campus.

1.2 Statement of the Problem

The APC Clinic is currently facing several challenges:

1. **Slow retrieval of medical records:** Retrieving a specific medical record or document is cumbersome because all records are stored in a file cabinet and some cabinets are overloaded, leading to difficulties like said, finding a specific record.
2. **Difficulty in managing appointments**: Teams is the current channel for nurse Ana to communicate with patients and is not the most efficient platform for managing appointments. It is difficult to track appointment history, reschedule appointments, or receive appointment confirmations due to the limited features of teams.
3. **Time-Consuming Report Writing:** Writing monthly summary reports is labor-intensive as it involves gathering data from previous months, which are recorded on paper and often hard to locate.
4. **Absence of Inventory System:** Due to an absence of inventory system, our nurse always experiences stockouts. This also leads to potential harm for unchecked expired medications and increased costs due to overstocking

The team had an interview with the clinic, and these are the questions that we discussed:

1. Which processes in the APC Clinic need automation?
2. What would be the impact of automating these processes on the quality of patient care at the APC Clinic?
3. How can the clinic streamline the management and storage of medical records?
4. What solutions can improve the organization of the appointment scheduling system for physical check-ups and dental exams?
5. How can the process of writing monthly summary reports be made more efficient?
6. What methods can be implemented to ensure timely updates for users when their schedules or appointments are cancelled?

1.3 Objectives

This project's main aim is to develop an automated clinic system for the Asia-Pacific College (APC) Clinic. This system will streamline and digitalize the clinic's processes to improve efficiency, accuracy, and patient care. The key features and objectives of the system include:

1. To retrieve medical records faster.

2. Allow patients to schedule appointments online and receive timely notifications.
3. Generate summary of reports faster.
4. To track and manage the clinic's medication and supply inventory.

Specific Goals:

1. **Locate Medical Records in 2 Minutes:** By implementing an electronic health records (EHR) system, the project aims to reduce the time taken to locate a specific medical record to within 2 minutes. This will enhance the clinic's efficiency in handling patient information and providing timely care.
2. **Zero Conflicts in Schedule:** The online appointment scheduling system will ensure there are no conflicts in schedules by providing real-time updates and notifications to patients and healthcare providers. This system will help avoid double-booking and ensure smooth appointment management.
3. **Generate Monthly Summary Reports in About 2 Minutes:** The automated reporting tools will compile data from the clinic's operations and generate comprehensive monthly summary reports in approximately 2 minutes. This will significantly reduce the time and effort required for manual report generation, allowing staff to focus more on patient care.

1.4 Significance of the Project

This project is significant in its potential to revolutionize healthcare delivery at the Asia Pacific College (APC) Clinic, enhancing patient care and streamlining administrative processes. By achieving the outlined objectives, the project aims to improve the efficiency and accuracy of data management while maintaining order within the clinic. The benefits of this project extend to several key stakeholders:

APC Community. Students and faculty members will benefit from a more convenient and efficient appointment scheduling system. They can easily check the availability of the nurse and doctor and book appointments online without the need to visit the clinic in person. The system will also provide real-time updates on appointment statuses and available time slots, making healthcare services more accessible.

APC Clinic. The school nurse and doctor will have quick and easy access to medical records and patient data, allowing for more efficient management of patient care. The automated medication inventory system will ensure accurate tracking of medication supplies, reducing the risk of stockouts and overstocking. A digital database will facilitate the easy updating and retrieval of patient information, improving the overall organization and effectiveness of clinic operations.

Parents and APC Alumni. Guests, specifically parents and APC alumni, will also have access to this project. Much like the students and faculty members, they will be able to access the system and its features as well.

Future Researchers. This project will serve as a valuable foundation for future research efforts, providing a robust framework that can be modified and expanded. Future researchers can build on this system, incorporating additional features and systems to further enhance healthcare services at the APC Clinic.

1.5 Scope and Limitations

The project will focus on creating a system encompassing several key features including appointment scheduling, allowing the patients to book appointments online. Medical record management is also integrated, digitizing and securely storing patient health records for quick access by clinic staff. Inventory tracking is automated, updating stock levels in real-time and allowing the clinic staff to be aware of when medical supplies are low to prevent shortages or when the supplies are already near expiration The system can also generate monthly summary reports on clinic activities, such as patient visits, common health issues, and services/supplies utilization, which can aid in decision-making and planning of the clinic. Automated notification alerts are also included in the system to update and remind patients about their appointments. Lastly, to ensure the security and confidentiality of the information of the patients, our system will comply with HIPAA regulations and the Data Privacy Act of 2012. We will include strict access controls and data encryption to protect sensitive health information from unauthorized access and breaches.

Our clinic system will only be limited to individuals associated with Asia Pacific College. Only the students, parents, alumni, guests, faculty, and staff of APC can access the system. the system. Also, since our clinic system is web-based, the users will need an internet connection to access the system which can only be accessed through desktops, laptops, and mobile phones. The PRIMS project will undergo meticulous documentation and development spanning 12 months, equivalent to one academic year, commencing from the third term of the 2023-2024 school year and extending through the first to third terms of the 2024-2025 school year.

II. Review of Related Literature / Systems

The integration of digital technologies in healthcare has transformed how medical services are delivered and managed. Traditional school clinic systems often rely on paper records and manual processes, which can hinder efficiency and accuracy. A study by Bergado et al. on the implementation of a digitalized school clinic monitoring system highlighted several significant advantages. The system greatly enhanced the efficiency of updating patient records, generating reports, and maintaining high security standards for sensitive medical information [1]. This chapter will review studies that are related to this project and can solidify and justify our points in implementing a clinic system.

2.1 Automated Appointment Reminders

Users wanted to be notified about follow-ups and cancellations of appointments. Boone et al. conducted research on how scheduling systems with automated appointment reminders improve health clinic efficiency [2]. Their study demonstrated that these reminders significantly enhance clinic management by reducing no-shows and facilitating timely cancellations and rescheduling. This improvement in this project optimizes resource management and ensures timely medical attention, ultimately contributing to better health outcomes for students.

2.2 Web Based Appointment System for Outpatients

Long waiting registration times can affect a patient's overall clinic experience, especially in hospitals. It is one of the primary objectives of establishments since time quality is usually the indicators of how good the service can be. Cao et al. stated that promoting the implementation of online registration and a reminder system should be considered [3]. Patients wait for more than an hour so that they can feel that they are being ignored, forgotten, and treated unfairly. Clinics without online appointments average longer waiting times than a clinic with an online system [4].

2.3 Medical Records Management

In a case study by Joseph et al., the clinic at Federal University Wukari, which relies on paper-based records, faces significant issues such as the frequent misplacement of patient records, unnecessary duplication of records, and a lack of adequate backup and security measures [5].

The emergence of web-based systems has significantly improved ease of life by offering greater accessibility and increased productivity [6]. In the context of medical records management, these systems allow healthcare professionals to access patient information from computers at home or on mobile devices, ensuring that vital data is always within reach. Most importantly, web-based systems automate traditional processes, such as updating and retrieving patient records, thereby increasing productivity through substantial time savings. Additionally, these systems provide security features, such as encrypted data storage and automated backups, which mitigate the

risks associated with paper-based records, including misplacement, duplication, and lack of security.

2.4 Investigating the effectiveness of school health services delivered by a health provider: A systematic review of systematic reviews

Schools are the primary institution consistently engaging with most school-age children and adolescents worldwide. Despite at least 102 countries offering school health services, there exists a lack of robust, evidence-based recommendations regarding which of these services are effective and merit implementation within educational settings [7].

2.5 BluPHR

BluPHR [8], a medical system created by the University of Ateneo de Manila, is the university campus health monitoring and only contact tracing application, exclusively for the employees, students, and other affiliates of the university.

The BluPHR includes similar features that our project aims to implement in future deployment, such as the ability to freely view your medical history, create appointment bookings, receive timely notification schedules. Lastly, prioritize patient health care experience.

2.6 Outlook Calendar

Outlook Calendar [9] is the calendar and scheduling section of Microsoft Outlook. It allows the users to create appointments, events, and meetings with other users. In designing the prototype for our system, we were inspired by the seamless way of efficiently managing and organizing appointments of Outlook Calendar.

We plan to make the scheduling calendar's interface user-friendly for easy access of the patients and the clinic staff. We also want to display real-time availability of the clinic's schedule, so that the users will have an easier time finding suitable time slots for their appointments and consultations. Additionally, we also plan for our clinic system to send automated notifications and reminders to the patients just like how Outlook Calendars send automatic reminders to participants about upcoming meetings.

2.7 OCRA : Clinic System of UP Diliman

Online Consultation Request and Appointment System or known as OCRA [10], is a system developed by the Department of Industrial Engineering and Operations Research, College of Engineering in UP Diliman. OCRA features requisition of new consultation, view consultation requests, view appointments and ability to request medical documents.

Just like OCRA, we plan to include these features to allow a more efficient and faster way of setting up appointments, viewing personal medical records, and requesting medical documents.

III. Current Systems

3.1 Current System

The APC school clinic currently operates with manual processes: appointments are scheduled in person with Nurse Anna, patient information is recorded by hand and stored in a secure file cabinet, and medication inventory is managed through manual counting on shelves.

3.2 Technical Background

APC Clinic relies on manual processes where human effort is significant. These include processes like storing physical records in file cabinets, manual data entry, and manual scheduling by walk-in visits.

Here are some of the things that helps the current clinic:

A. Hardware

This is the list of hardware components and devices that the current system of the APC Clinic uses for the current processes.

- Desktop – This is a basic component the clinic uses to communicate with patients.
- Printer – This device allows the clinic to print templates and medical records made manually in a word processing software.
- Telephones – These are a necessity for the clinic since this is the way to communicate with other offices that also maintain the clinic's function. (Ex. Logistics office, finance, etc.)

B. Storage

These serve as storage where files and documents are stored in the current APC Clinic system.

- Steel file cabinets – These are the main storage for physical copies of medical records are stored.
- Drawer – These are the current storage for medical supplies and record entry paper for ease of access.

C. Software

These are the software that the current system uses to help them to process and make documents and compute data.

- Word Processing Software - These are necessary when making documents such as medical records and monthly summaries.
- Spreadsheet Software – These are used to list down inventory materials.

3.3 List of Processes

Table 1 contains the list of current processes being performed by the clinic.

Table 1 Clinic Processes

Process ID	Process Name	Process Details
P001	Creating Medical Record of Patient	1. The students and faculty members visit the clinic. 2. The nurse provides a form for the patients. 3. The patient fills out the said form. 4. The nurse medically examines the patient. 5. The nurse completes the form based on the medical exam.
P002	Storing the Record	1. The nurse compiles the filled-out forms. 2. The nurse staples the form. 3. The nurse files the forms in the cabinet.
P003	Updating the Record	1. The nurse gets the file out. 2. The nurse updates the record on a separate form. 3. The nurse staples the updated form on the outdated form. 4. The nurse places back the file in the cabinet.
P004	Scheduling an Appointment	1. The nurse looks up the requested day by the patient in the logbook to check if the said date is available. The nurse also looks up the possible nearest date if the requested day is not available. 2. The nurse records the schedule details.
P005	Informing the Patient	1. The nurse rechecks the schedule of the patient. 2. The nurse emails the patient to inform them of their schedule.

3.4 Gap Analysis

Table 2 presents the SWOT analysis of the current clinic processes.

Table 2 SWOT Analysis

Strengths	Weaknesses
• The medical records are stored in a filing cabinet and can be accessed by the clinic staff without the need for computers or internet access. • Access to medical records is controlled by locking the file cabinets and limiting the number of people who can view sensitive information. • Paper records are not vulnerable to hacking, data breaches, or malware attacks. • Manual inventory management is straightforward and does not require additional software configurations.	• Managing records, appointments, and inventory manually is time-consuming. • Tracking and analyzing data manually is challenging and time-consuming as well. It can also be prone to errors. • Medical records will accumulate over the years and will take up a lot of space. • Retrieval of medical records can take a lot of time, which results in longer consultation time than necessary. • Paper records have the possibility of getting lost due to misplacement.
Opportunities	**Threats**
• The clinic can utilize a web application that will make appointment scheduling faster and easier with just a few clicks. • Storing the medical records in a cloud database will reduce the retrieval time of medical records. • The clinic can notify the patients about their appointment status through the system or via SMS. • The clinic can monitor health trends and enable data analytics with digital records. • The clinic can have a digitalized and automated inventory system providing real-time tracking, allowing the clinic to be promptly aware of the stock levels and expiration dates of medical supplies.	• There is a risk of permanent data loss since paper records are susceptible to damage such as water, fire, etc.

IV. Proposed Solution

4.1 Lean Canvas

Problem

1. Finding and storing physical copies of medical records is a hassle and is very time-consuming when finding a specific medical record or document
2. When a patient is required for a physical check-up and dental exams, there is no medium for appointment and notifications
3. Writing monthly summary reports is time consuming every month.
4. Users are having a hard time receiving updates on time when their schedule/appointment are canceled.

Solution

1. Storing new digital copies of medical records.
2. Create an appointment system that can book up to twenty people each day, including medical clearances, consultation notes, and first aid treatments.
3. Generating summary reports takes less than 1 minute to generate.
4. Integrating a push notification system.

Key Metrics

1. Is the time when doing consultations less than what it was before?
2. Is finding medical records easier and faster?
3. Does the clinic and the patients still experience some troubles when it comes to scheduling required physical and dental exams?
4. Do students still experience a hard time when receiving updates regarding cancellations?

Unique Value Proposition

1. Medical Certification after grad (valid 1 year)
2. AI Chat bot
3. Online Appointment System
4. Management of Electronic Medical Records
5. Tracking of Inventory
6. Management of Patient Check-ins

Customer Segment

1. Students
2. Staffs
3. Faculty
4. Guests – Parents and APC Alumni

Channels

1. Outlook
2. MS Teams
3. APC Domain

Revenue Streams

1. Cost savings on paper, printing, and storage space.
2. Minimize the amount of paper usage for the physical medical records by at least 70%.

Cost Structure

1. Web hosting cost
2. Cloud hosting services
3. AI services

Unfair Advantages

1. Provides database management system.

4.2 Product Vision

APC Clinic wants to save time on setting up appointments and an efficient way of managing and handling medical patient records. Thus, introducing PRIMS, a Patient Record & Interaction Management System that provides a record management and appointment scheduling system that fosters healthcare for their patients in Asia Pacific College.

4.3 Technology Specifications

This section discusses the project specifications that will build the components in completing this project, such as the software and hardware used. The following mentioned software, hardware and programs will be used throughout the project implementation.

1. MySQL Workspace
    - Also known as a tool for designing database layouts, it will be used as a database for storing almost every patient and medical record of the clinic.
2. Visual Studio Code
    - A source code editor software developed by Microsoft, this will be used as our primary code editor for creating and debugging the clinic system. We will be using programming languages such as HTML, CSS, and JavaScript.
3. Figma
    - The project developers will use Figma as their primary application for designing the system and creating the project's prototype.
4. Desktop Computer/Laptop
    - Desktops will be used for creating and testing the project.

4.4 Feasibility

4.4.1 Technical Feasibility

This section focuses on evaluating whether we have the necessary technological infrastructure, expertise, and resources to develop and deploy our proposed solution effectively.

Our team has prior experience with similar projects and is equipped to handle the integration of cloud services and database management. We have identified potential technical risks such as compatibility issues with older device models and plan to mitigate these through thorough testing on a range of devices and operating systems. This system is also designed to be scalable which means it works even when it's handling a large quantity of data. Lastly, in terms of problems that may appear during or after the implementation of the project, we'll make sure that these will be addressed quickly by providing a customer support manual and as well as direct contacts to us (which are the developers) to address any issues.

4.4.2 Operational Feasibility

This section defines how our system will be accepted and used by our client and users while implemented into the current system of the APC Clinic. Here are some questions that can help us check its vulnerability in terms of its operational capability:

1. **Will implementing a new clinic system require training for clinic staff?**
   - The system will require some training for the clinic staff since they will be transitioning from a traditional paper-driven clinic. This training aims to equip them with the necessary skills to operate and utilize the new system effectively.

2. **Is there support from the school administration for implementing a new clinic system?**
   - Our client, Nurse Ana Mae Torre, authorized us to proceed with developing the clinic system. We have collaborated closely with Nurse Ana to define the system features she requires. Also, approval for this initiative was granted by Nurse Ana's supervisor, Miss Jo Anne de la Cuesta, the Executive Director of Academic Affairs and Head of the APC Clinic.

3. **How does the system ensure the security and confidentiality of student health records?**
   - The system will be designed with security measures to ensure the confidentiality and integrity of patient health records, complying with the Health Insurance Portability and Accountability Act (HIPAA), the Data Privacy Act, and protecting Sensitive Personally Identifiable Information (SPII). The system will adhere to the relevant laws and regulations since we will implement strict access controls so that only authorized persons can access the patient health records. Additionally, we will require consent from the patients before collecting and processing their health information.

4. **How will the new system impact current clinic workflows and processes?**
   - For the appointment scheduling feature, the new system will reduce wait times by streamlining the scheduling process. Additionally, it will digitize the health records, making them easily accessible and significantly reducing the time spent on manual paperwork. Lastly, the system will reduce the chances of stockouts or overstocking since the automated inventory feature will simplify the process of tracking the medicine

supplies by automatically updating the stock levels as items are restocked or dispensed.

4.4.3 Economic Feasibility

This section outlines the analysis of the project's or business idea's potential to generate sufficient profit or benefit compared to the costs involved.

Development Cost

This project will not charge any cost for the system's development as it is part of the Project-Based Learning program of Asia Pacific College, which means this project will be provided to them free of charge.

Operational Cost

The operational costs as of now will be the fees for cloud hosting and cloud SQL Server since the system will handle information that is needed to be stored and managed and as well as a cloud hosting service where we can host our system.

Tangible benefits

By implementing this system to the APC Clinic, the Asia Pacific College will experience an increase in revenue and enrollment since this would advertise that APC focuses on the health and well-being of their students. This can also improve the overall productivity of our APC Clinic staff since this can speed up clerical tasks by 80% (which is 7 minutes reduced to almost 2 minutes in time). And lastly, by digitizing records, this will overall increase the space of the APC Clinic and will open opportunities for renovations and upgrades.

Intangible benefits

By implementing this system, this would improve the overall reputation of the APC Clinic and Asia Pacific College itself. This will also increase the retention of employees and satisfaction since this creates a positive and healthy environment. Along with this, it can also increase the customer’s trust and loyalty to other services of Asia Pacific College since this project gives a clear understanding that we intend to provide high quality services here in Asia Pacific College.

4.4.4 Schedule Feasibility

This section outlines the timeline for both the prototype development and the overall system implementation.

The development timeline for our system spans four terms within the academic calendar of Asia Pacific College. Initially, during the first term, our project began with the MNTSDEV course, where we laid the groundwork for the project. We began by looking for potential clients to collaborate on

creating an innovative web-based system. Once a client was secured, we engaged in detailed discussions or meetings to finalize the required features and functionalities of the system.

Following this foundational phase, we conducted a Lean Canvas exercise to identify critical aspects such as key problems, proposed solutions, key metrics, and more. Subsequently, we proceeded to design the system prototype using the Figma interface design tool, a process that took approximately 2 to 3 weeks. Each team member took on specific tasks to develop assigned components, resulting in the finalization of the high-fidelity wireframe for our prototype.

V. Requirements Analysis

5.1 User Stories

Table 3 presents the user stories for the clinic system.

Table 3 User Stories

User Stories				
ID	**As a..**	**I want to be able to…**	**So that…**	**Priority**

001	Nurse	Check scheduled appointments.	I would know if there were any conflicts with my schedule.	**Must**
002	Nurse	Notified when appointment is cancelled.	I'm not wasting my time waiting if someone will come or not.	**Should**
003	Patient	Schedule an appointment online and check real-time available slots to set an appointment.	I don't have to physically come to the clinic when setting up appointments and I would know the available time and date slots.	**Must**
004	Nurse	Manage medicine inventory.	I know when to request new stocks and to prevent overstocking of medicines.	**Should**
005	Nurse	Generate summary reports monthly and annually.	I can complete monthly and annual reports faster.	**Should**
006	Nurse	Edit the calendar.	I can let the patients know when the available time and dates are available.	**Must**

5.2 Use Case Diagram

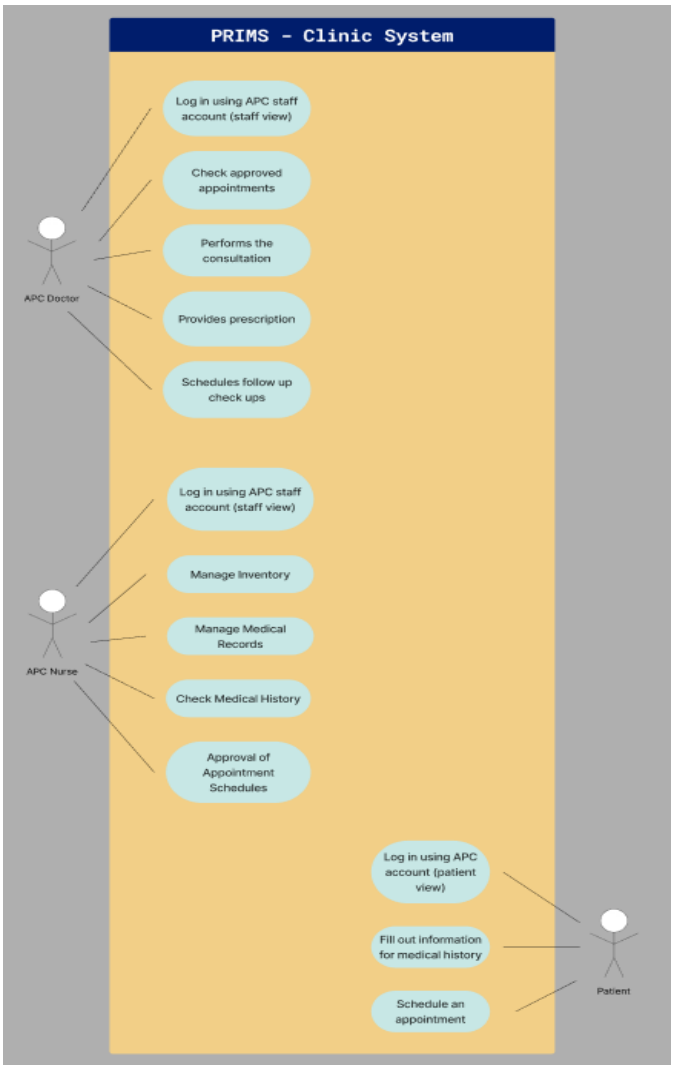

Figure 1 Use Case Diagram for PRIMS

Figure 1 illustrates the interactions between the patient, client, and system. PRIMS will serve as the primary communication platform between the patient and the nurse. The client will use the system to check the inventory of medical supplies, generate summary reports, verify appointment schedules, and notify patients of their appointments. Patients can use the system to make appointments, fill out medical records, and receive schedule notifications.

5.3 User Classes and Characteristics

Table 4 presents the user classes and characteristics for the clinic system.

Table 4 User Classes and Characteristics

Roles	Description

APC Doctor	Executes the scheduled appointments and provides the correct prescription to the patients at the APC clinic.
APC Nurse	Assesses every check-up appointment and manages medical records and medication inventory at the APC clinic.
Patient	Patients, also known as students, faculty, and staff, are the ones who set the appointments for consultation.

5.4 Use Case Full Description

Table 5 Use Case: Check Medical History

Use Case Name	Check medical history
Use Case Number	UC-001
Description	The nurse checks the medical history of each patient.
Actors	APC Nurse
Triggers	**1. Scheduled Appointment** - When a patient has an appointment schedule, the nurse looks up their medical history. **2. Medication** - Each time a drug is prescribed, the nurse examines the patient's medical history.
Pre-conditions	- The nurse must log in on the admin view of the system. - The nurse must click on the Medical Records tab.
Post-conditions	- The nurse is directed to the Medical Records page.
Main Scenario	1. The nurse logs in on the admin view of the clinic system. 2. The nurse is directed to the dashboard. 3. The nurse clicks on the Medical Records tab on the left menu. 4. The system directs the nurse to the Medical Records page. 5. The Medical Records page shows a list of patients. 6. The nurse clicks on a patient to show their record.

Table 6 Use Case: Manage Medical Record

Use Case Name	Manage medical record
Use Case Number	UC-002
Description	The nurse updates the medical history of each patient when necessary.
Actors	APC Nurse
Triggers	**1. Medical Record Audits** - The nurse performs a regular audit to ensure accuracy of medical record.
Pre-conditions	- The nurse must log in on the admin view of the system. - The nurse must click on the Medical Records tab.
Post-conditions	- The nurse is directed to the Medical Records page. - The nurse manages the record and updates necessary changes.
Main Scenario	1. The nurse logs in on the admin view of the clinic system. 2. The nurse is directed to the dashboard. 3. The nurse clicks on the Medical Records tab on the left menu. 4. The system directs the nurse to the Medical Records page. 5. The Medical Records page shows a list of patients. 6. The nurse clicks on a patient to show their record. 7. The nurse clicks on the “Edit” button. 8. The nurse updates necessary changes. 9. The nurse saves the record.

Table 7 Use Case: Manage Medical Inventory and Supplies

Use Case Name	Manage inventory
Use Case Number	UC-003
Description	The nurse manages the medicine inventory and medical supplies.
Actors	APC Nurse
Triggers	**1. Prescription of Medicine**

	- The nurse manages the medicine supplies in the inventory if available when prescribing. **2. Routine Inventory Check** - The nurse manages the medical supplies weekly. - The nurse manages the medicine inventory for any expired medicines. **3. Audit** - The nurse manages the inventory for reports.
Pre-conditions	- The nurse must log in on the admin view of the system. - The nurse must click on the Inventory/Supplies tab.
Post-conditions	- The nurse is directed to the Inventory page.
Main Scenario	1. The nurse logs in on the admin view of the clinic system. 2. The nurse is directed to the dashboard. 3. The nurse clicks on the Inventory/Supplies tab on the left menu. 4. The system directs the nurse to the Inventory/Supplies page. 5. The Inventory/Supplies page shows a list of medicines. 6. The nurse clicks on a specific medicine to show its details. 7. The nurse edits the file for necessary updates.

Table 8 Use Case: Approval of Appointment Schedules

Use Case Name	Approval of Appointment Schedules
Use Case Number	UC-004
Description	The nurse approves or disapproves the schedules of appointments.
Actors	APC Nurse
Triggers	1. **Preparation** - The nurse checks the schedules appointed for the week. 2. **Notification** - The system prompts a notification that a patient has submitted an appointed schedule.

Pre-conditions	- The nurse must log in on the admin view of the system. - The nurse must click on the Calendar tab on the left bar or on the right side.
Post-conditions	- The system shows the calendar of the month containing scheduled appointments.
Main Scenario	1. The nurse logs in on the admin view of the clinic system. 2. The nurse is directed to the dashboard. 3. The nurse clicks on the Calendar tab on the left menu or on the right section. 4. The system directs the nurse to the Calendar page. 5. The Calendar page shows the scheduled appointments for the month. 6. The nurse can click the “Approve” or “Disapprove” button.

Table 9 Use Case: Schedule an Appointment

Use Case Name	Schedule an Appointment
Use Case Number	UC-005
Description	A patient schedules an appointment.
Actors	Patient
Triggers	1. **Request** - A patient requests to schedule an appointment through the system. 2. **Follow-up Appointment** - After their check-up appointment, the nurse advises the patient to schedule a follow-up examination.
Pre-conditions	- A patient must log in on the patient view of the system. - A patient must click on the Appointment button located on the home page.
Post-conditions	- The system shows the Appointment page consisting of date and time.
Main Scenario	1. A patient logs in on the patient's view of the clinic system. 2. The system shows the home page. 3. The patient clicks on the Appointment button. 4. The system directs the patient to the Appointment page. 5. The patient chooses a date and time for the appointment. 6. The patient states their reason for appointment. 7. The patient clicks the yes button. 8. The system pops up a prompt confirming the chosen date and time. 9. The system pops up another prompt thanking the patient. 10. The system directs the patient to another page with a pop-up asking to take a medical form.

Table 10 Use Case: Medical Form

Use Case Name	Fill out information for medical history
Use Case Number	UC-006
Description	A patient fills out information for medical history.

Actors	Patient
Triggers	1. **Appointment** - Before the check-up, the patient fills out a medical form for medical records.
Pre-conditions	- A patient must log in on the patient view of the system. - After booking an appointment, the patient fills out a medical form if they have no record yet or if necessary.
Post-conditions	- The system records the medical form for the nurse.
Main Scenario	1. A patient logs in on the patient's view of the clinic system. 2. The system shows the home page. 3. The patient clicks on the Appointment button. 4. The patient books an appointed schedule. 5. The system directs the patient to another page with a pop-up asking to take a medical form. 6. The patient selects the Now button. 7. The patient fills out the medical form. If the patient has a record already, the system can auto-fill their basic information. 8. The patient submits the form. 9. The system records the data of the medical record for the nurse.

5.5 Prototype

The following prototype that will be shown is developed by team PRIMS. It will showcase the system's features such as the log in page, appointment section, analytical dashboard, and inventory management system of the APC clinic.

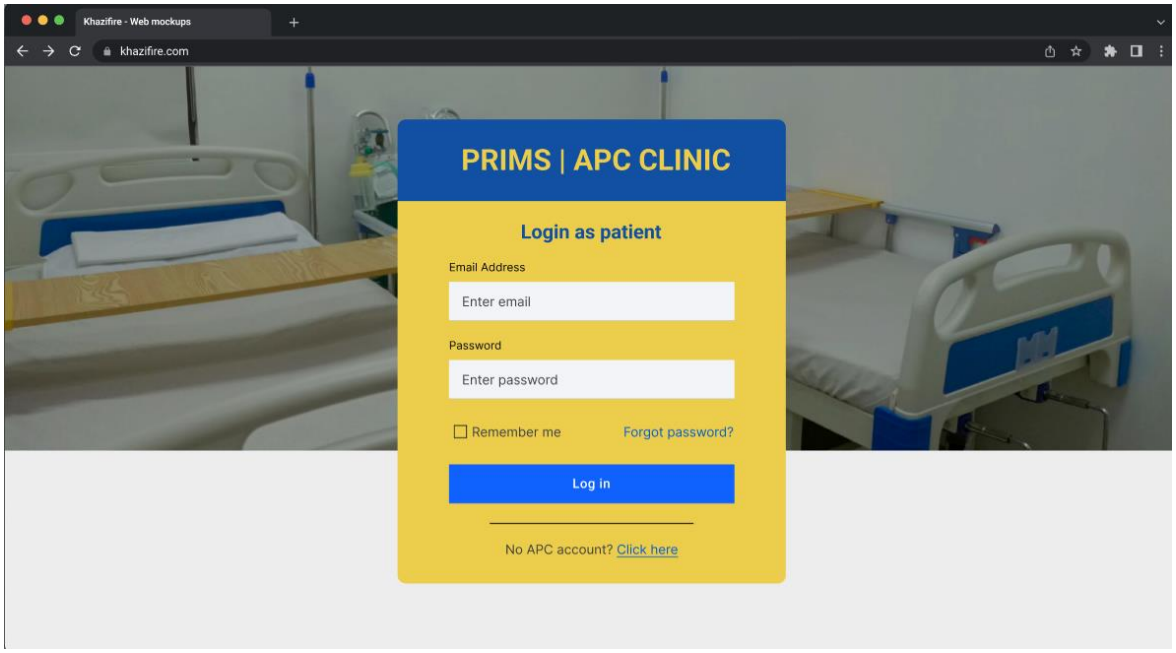

Figure 2 Log in Page of Patients

Figure 2 shows the log in page for patients of APC clinic. The patients will have to use their registered APC email and password when logging in. Visitors will also be able to click a link since they do not have an APC account.

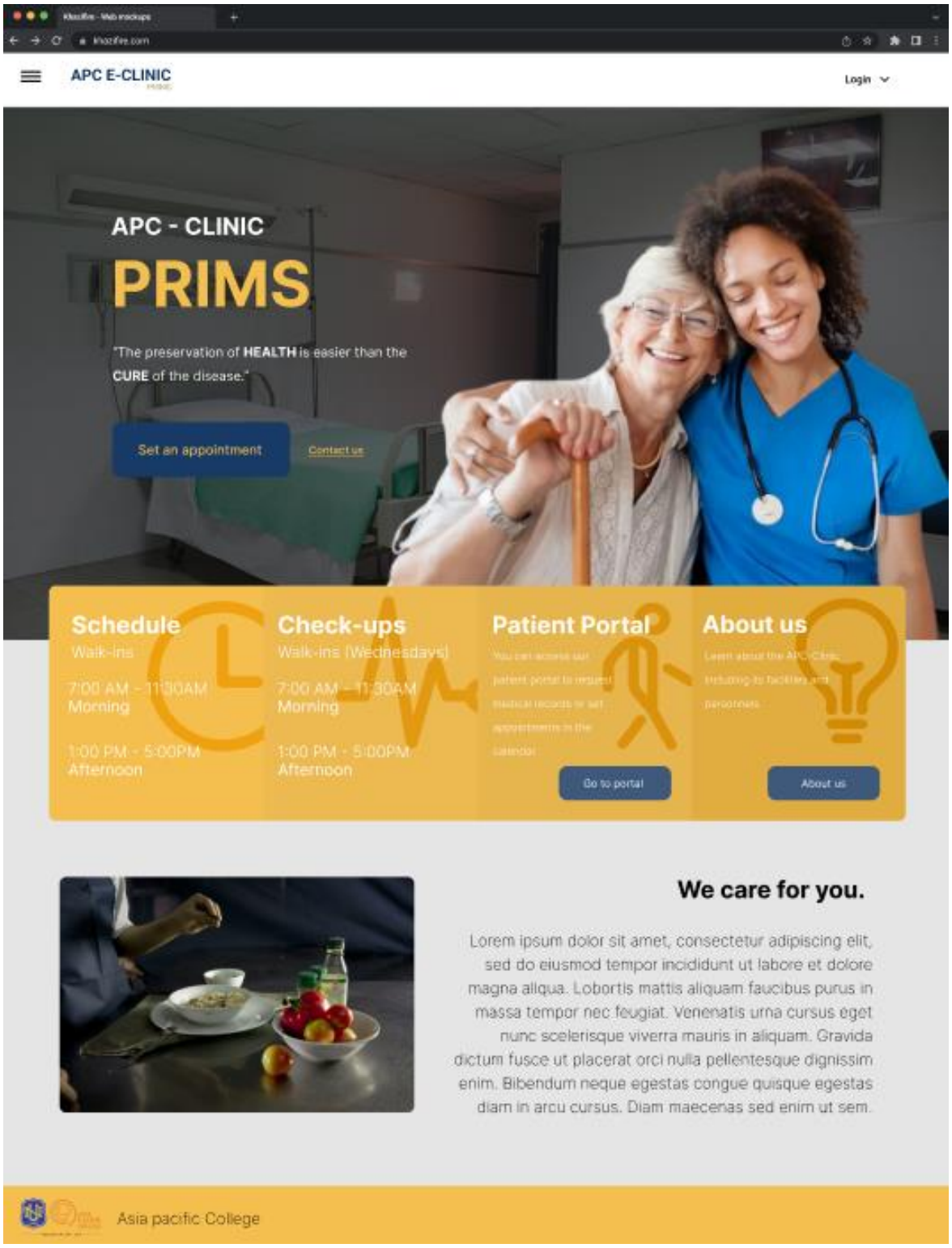

Figure 3 Home Page

Figure 3 shows the home page of the patients. In here, they will be able to read more about the vision of the clinic system, as well as know important information such as the clinic walk-in and check-up schedules.

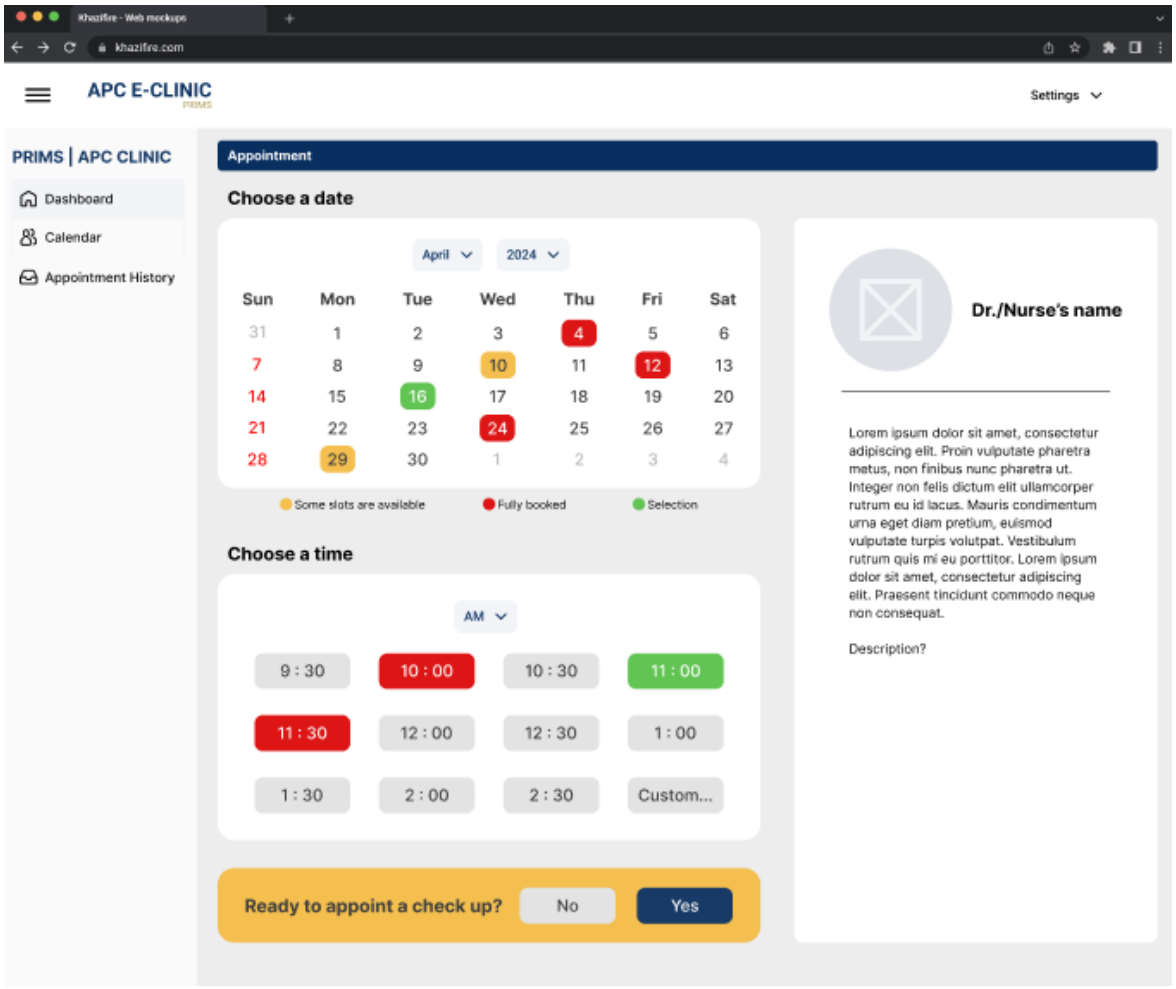

Figure 4 Schedule Appointment Page

Figure 4 shows the appointment page of the clinic system. The patient freely chooses their schedule depending on the date and time available. Green means it is the selected time and date, color red indicates that there are no available appointments due to fully booked schedules, and lastly yellow marks that there are booked schedules but there are still available slots in the meantime.

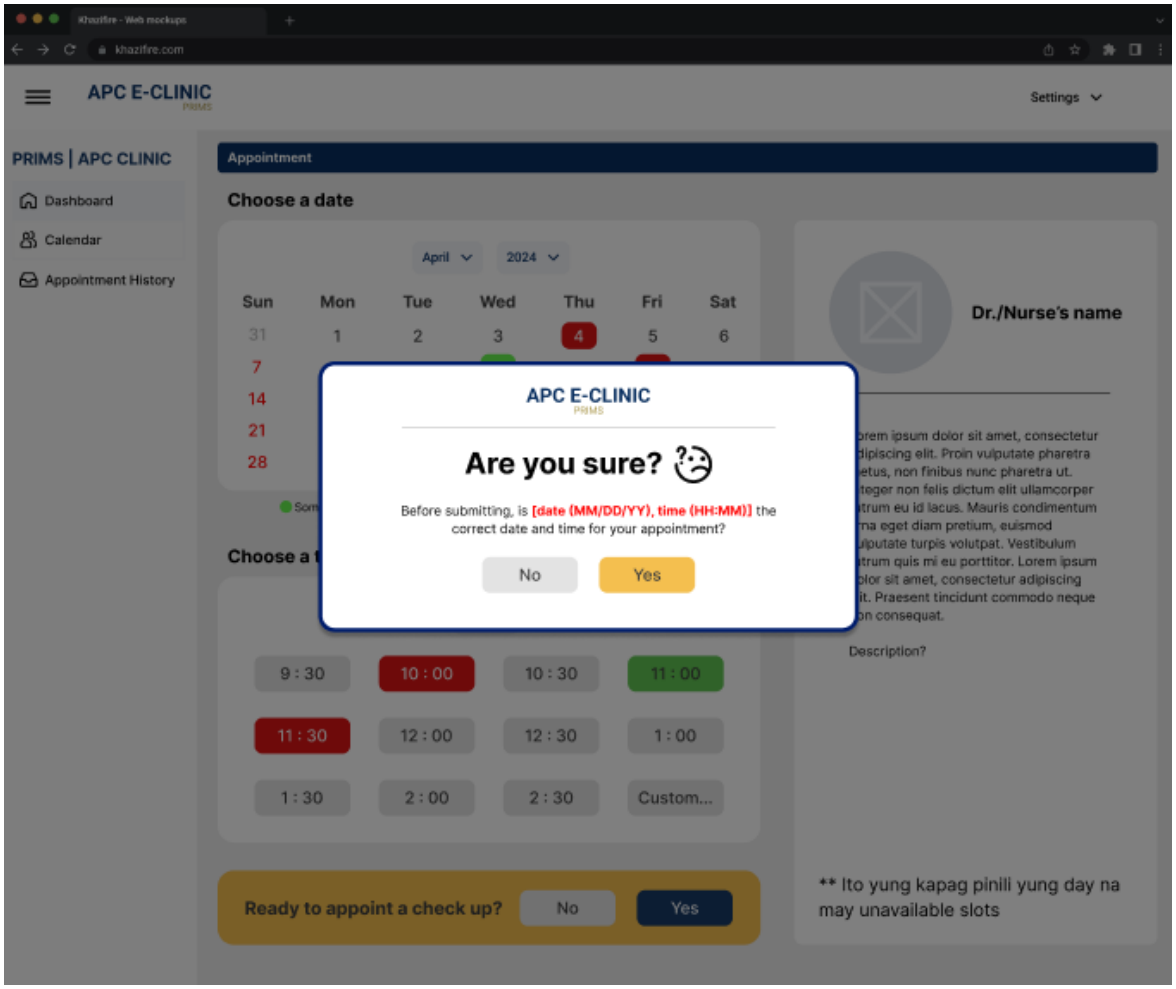

Figure 5 Confirmation of Appointment

Figure 5 shows a pop-up screen for confirmation of the chosen date and time. This is to ensure that the patient is booking correctly.

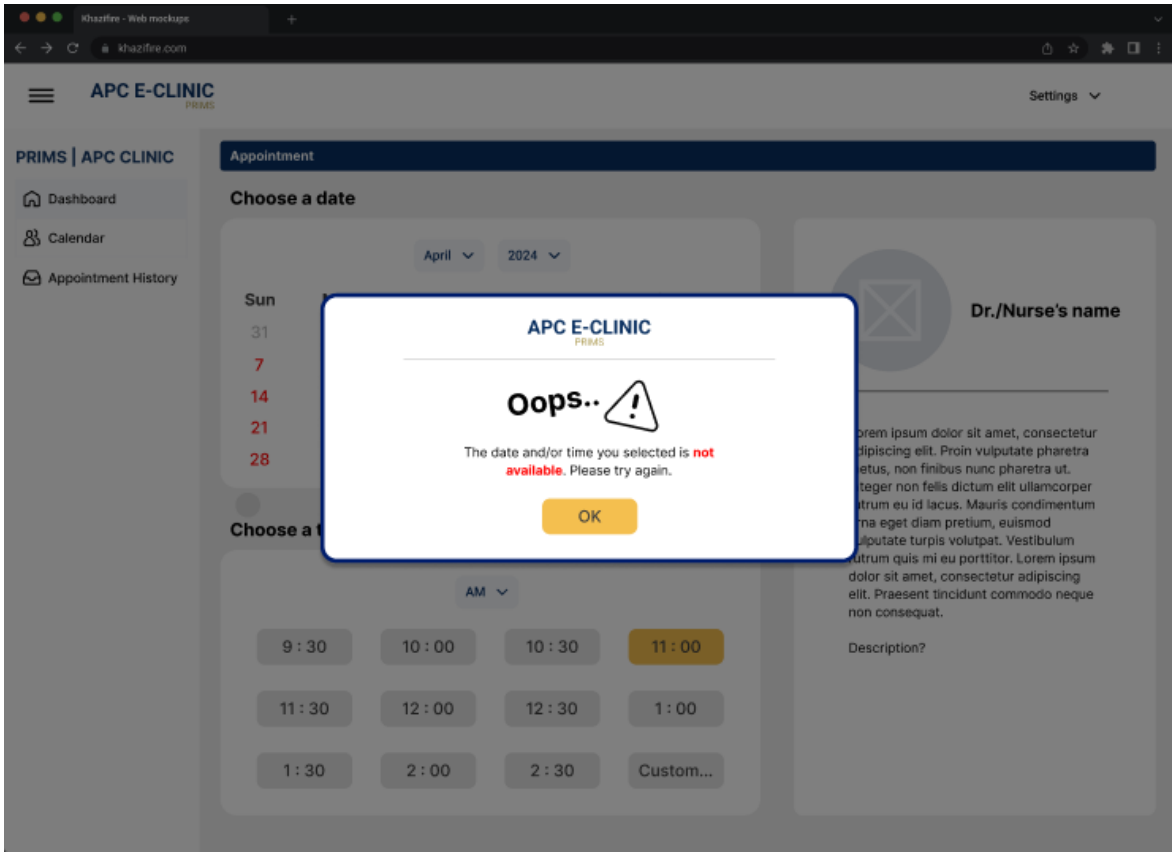

Figure 6 Unavailable Date and Time

In Figure 6, there is a prompt saying that the chosen date and/or time is not available. This warns the patient to choose another date and time.

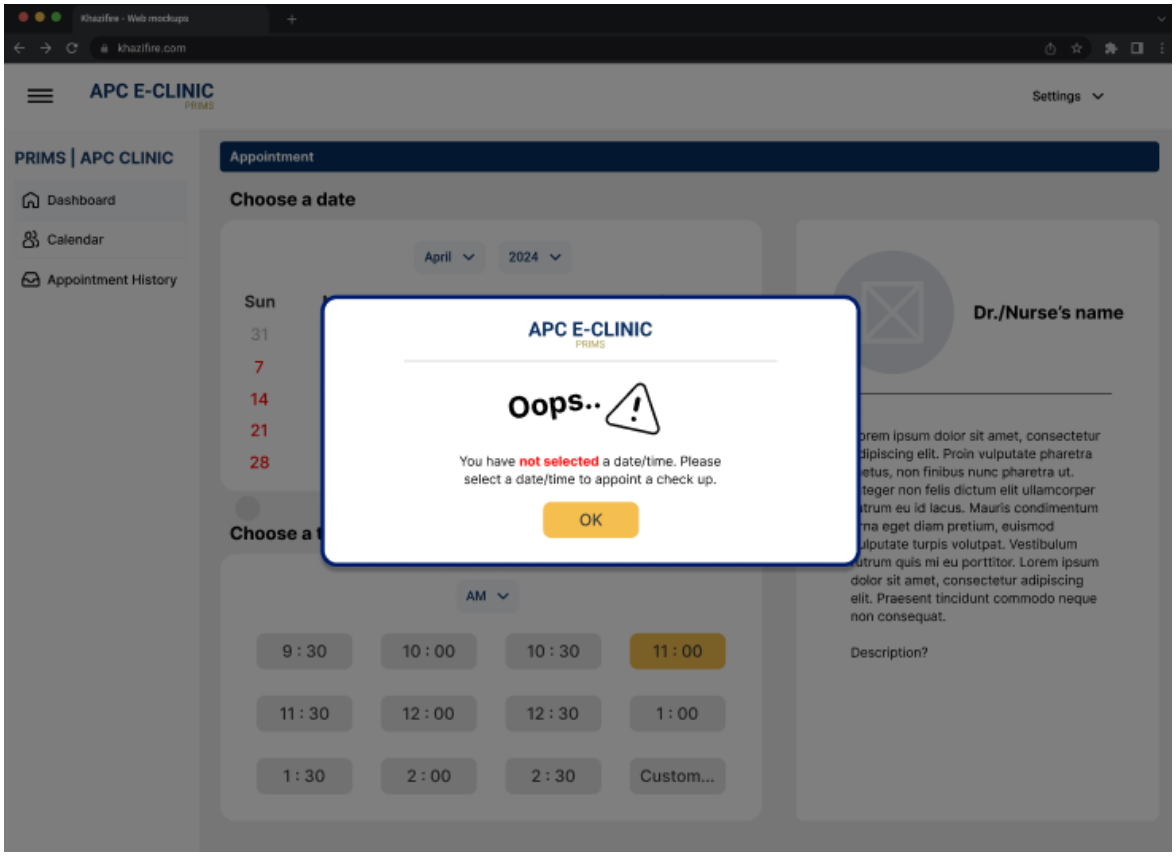

Figure 7 No Selection of Date and Time

Figure 7 shows a prompt when a patient has not selected a date.

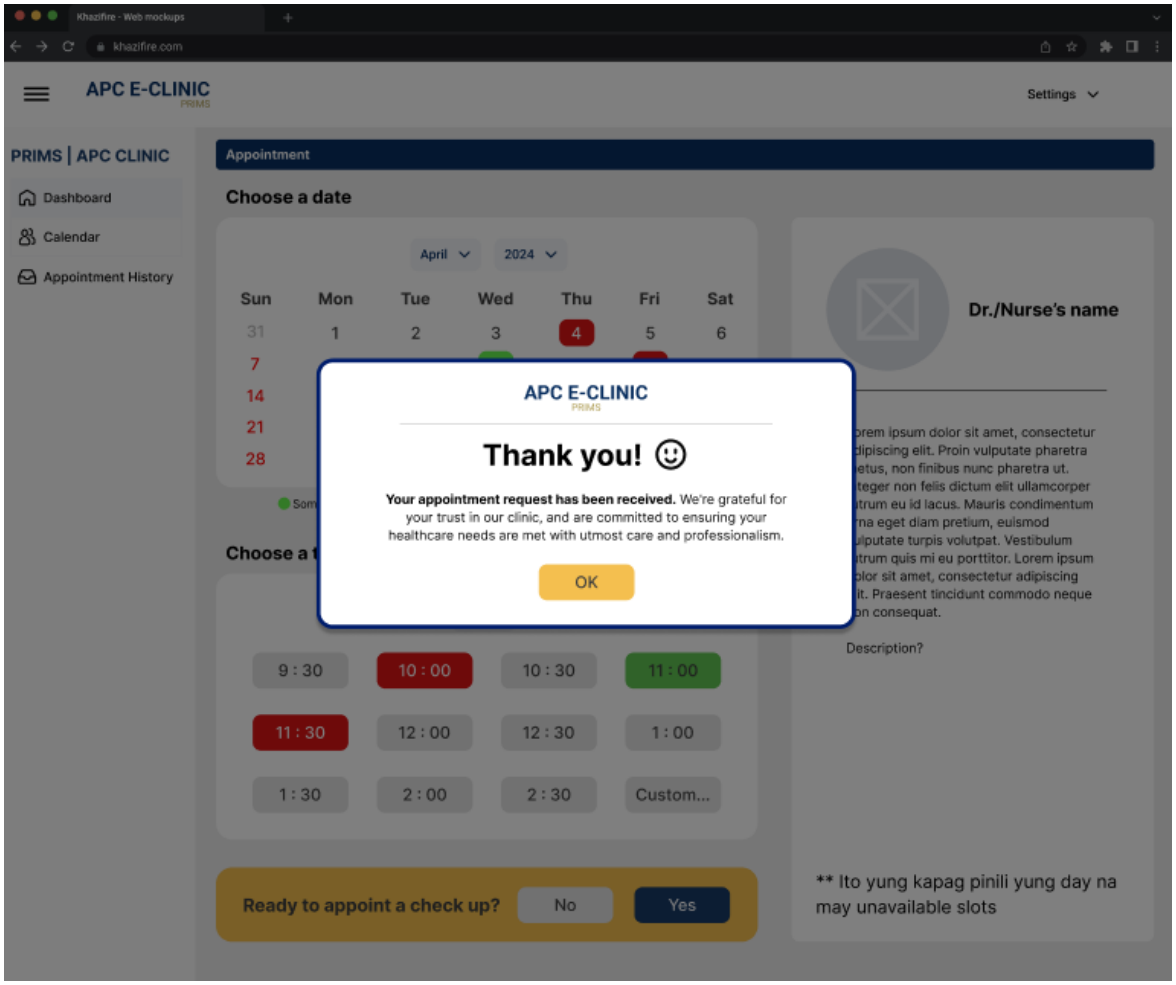

Figure 8 Successful Appointment

Figure 8 shows a prompt confirming that the appointment request has been received and processed.

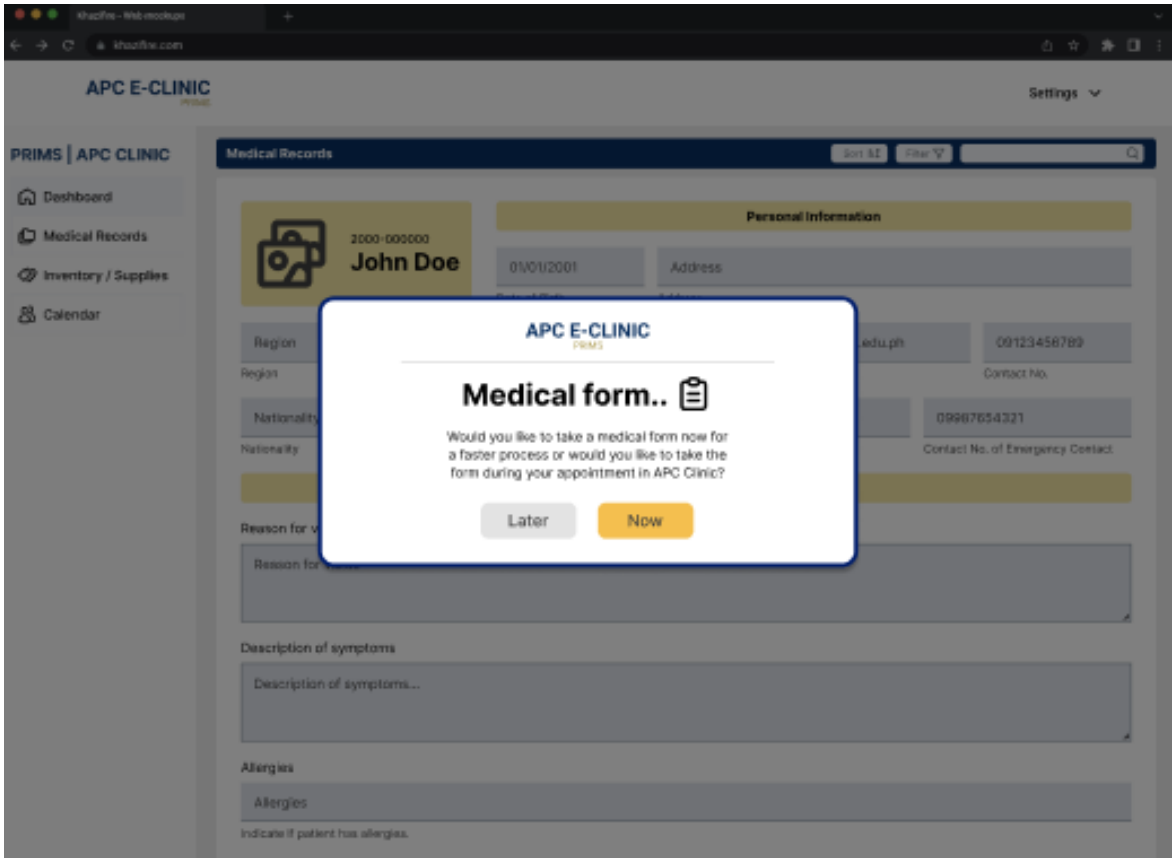

Figure 9 Medical Form Prompt

Figure 4 shows the medical form the patient will fill in after choosing their schedule on the appointment page. The patient can choose whether to complete their medical form physically or online.

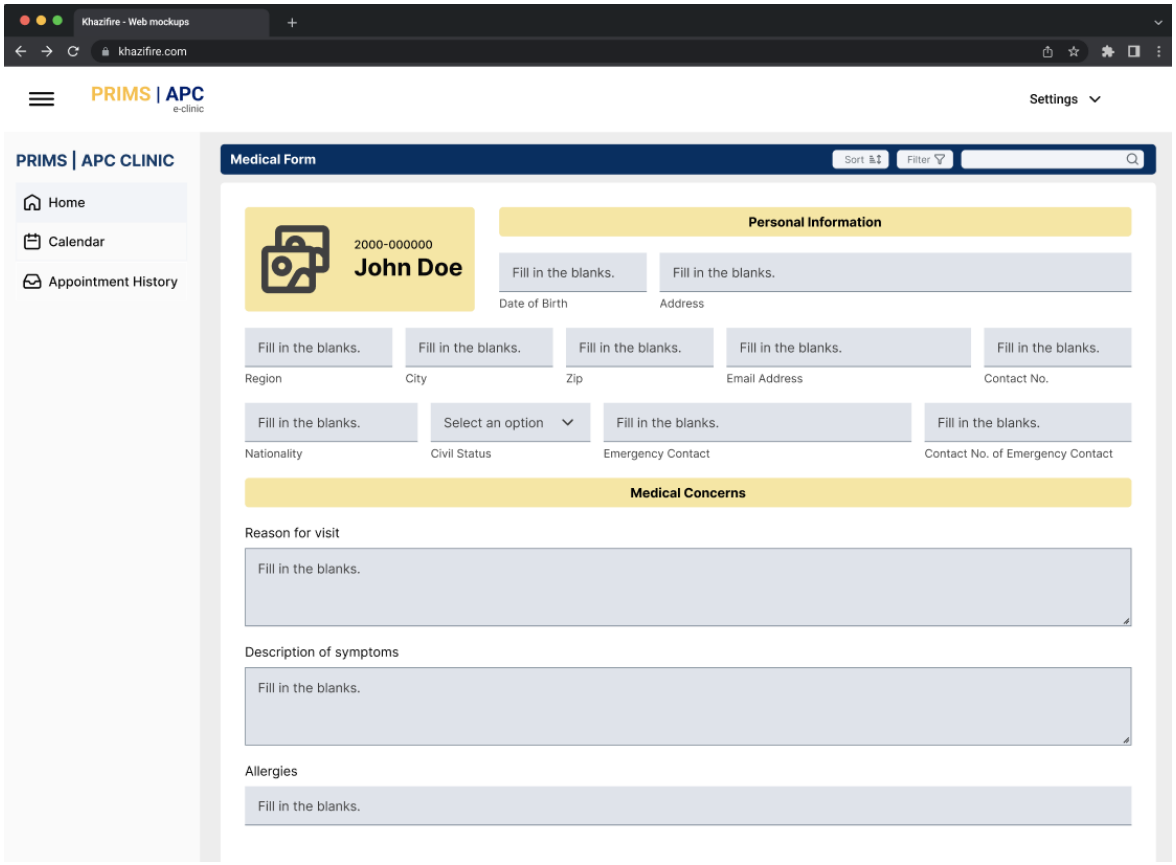

Figure 10 Medical Form

If the patient wants to fill in the survey form online, they must fill in each information honestly.

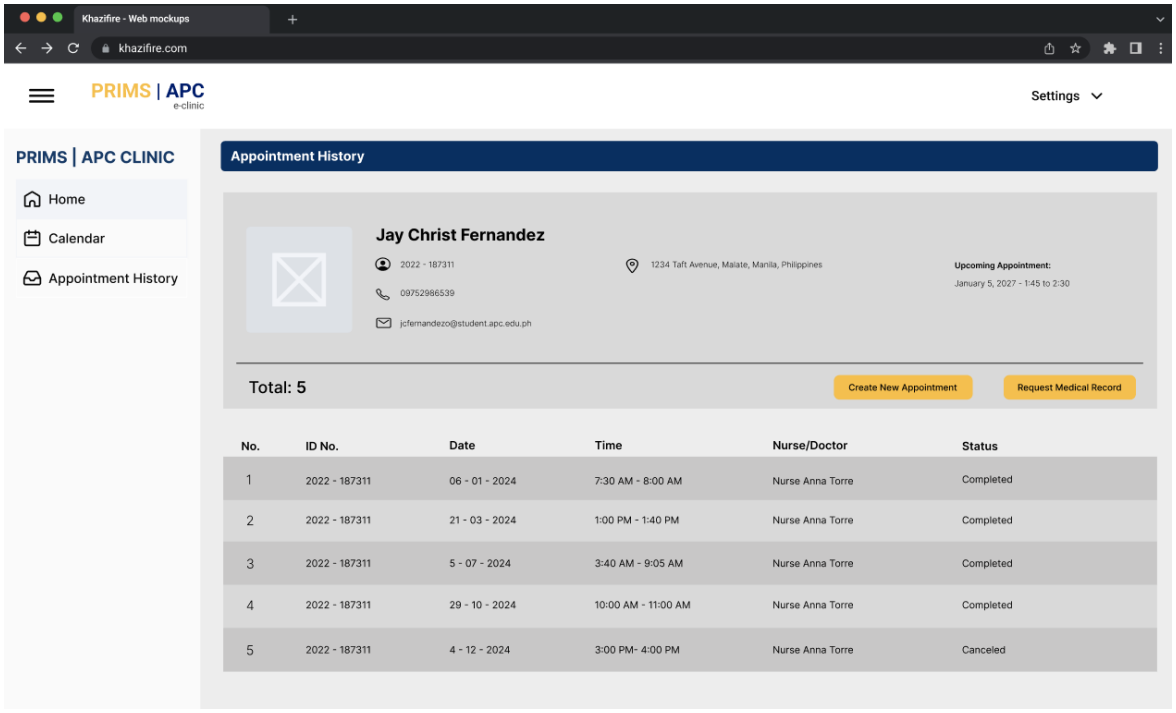

Figure 11 Appointment History

Figure 11 shows the appointment history of the student at the APC clinic. It will show basic information such as the number of appointments that patient had, it will also show what the date, time, status, and name of the consultant are.

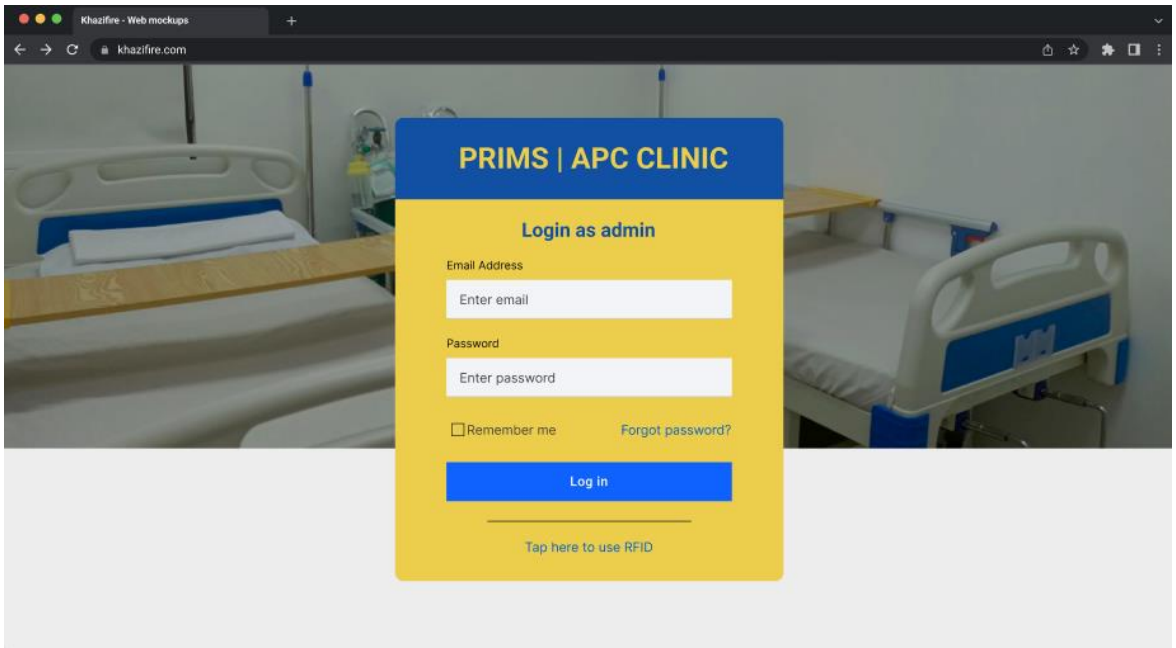

Figure 12 Log in Page of Admin

Figure 12 displays the log in page of the clinic staff. Their APC email addresses and passwords should be entered before they are granted access.

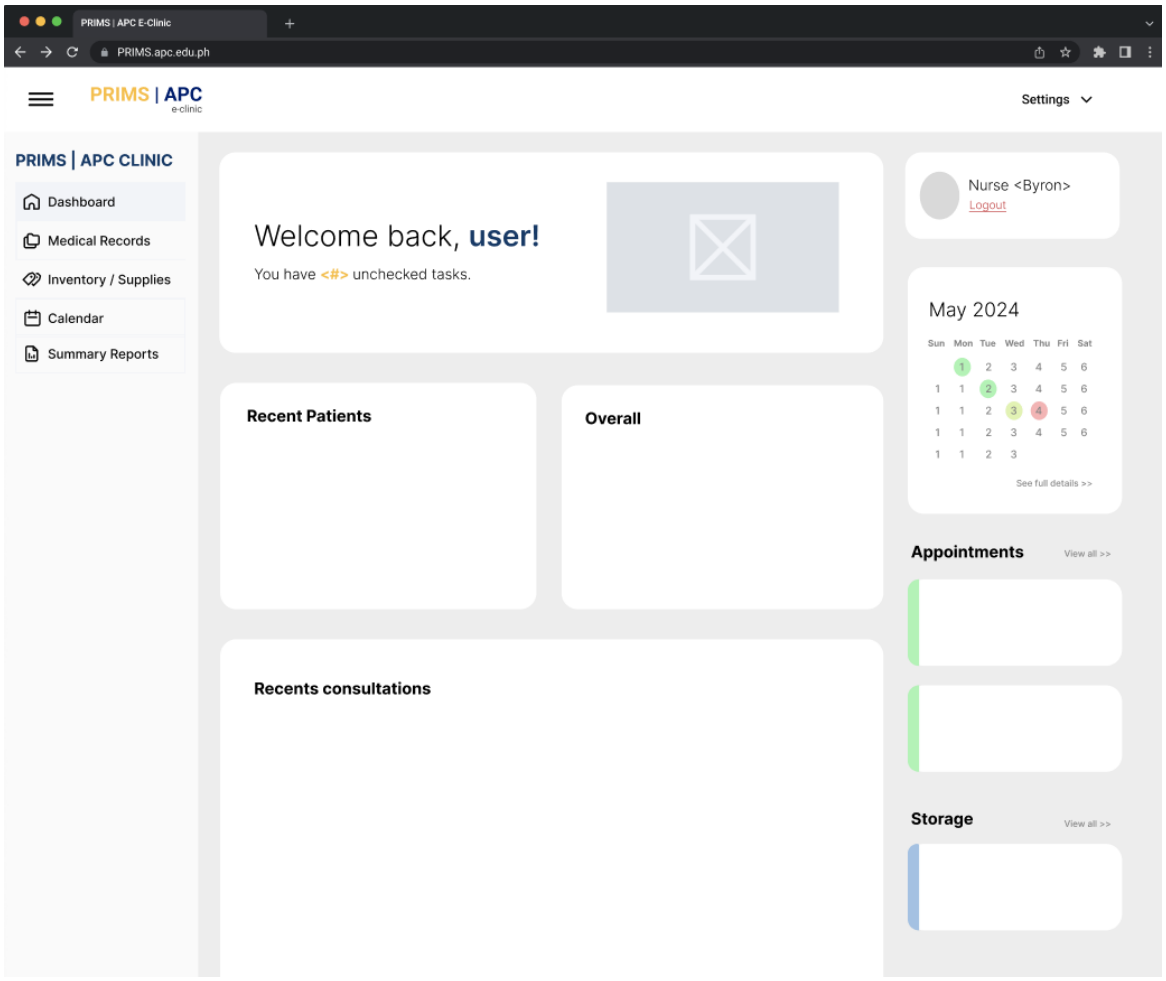

Figure 13 Admin Dashboard

Figure 13 shows the dashboard or basically the homepage of the clinic staff. This page provides an overview of the clinic operations, such as the names of the recent patients, overall statistics of the visitor categories, recent consultations, upcoming appointments, and the status of the medical supply stocks.

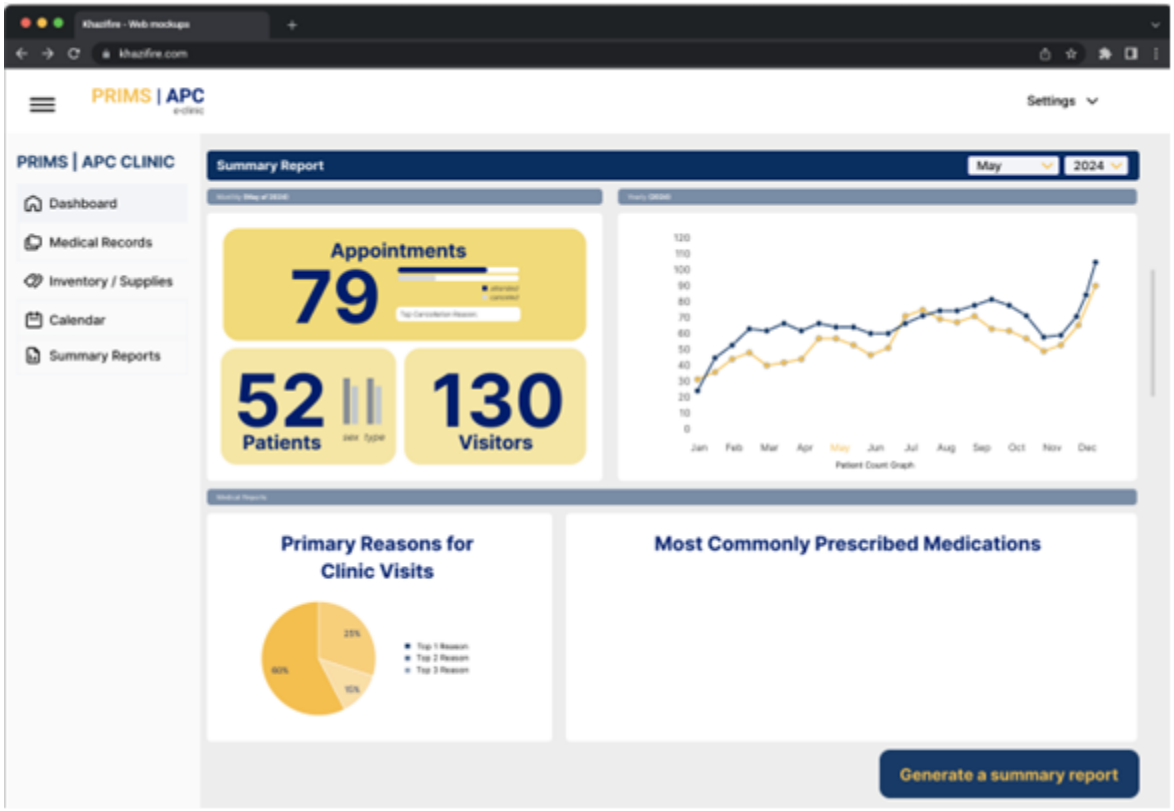

Figure 14 Summary Reports

Figure 14 shows the analytics page of the clinic system. This is where the admins will be able to see data such as the number of appointments, patients, and visitors for the selected month. It will

also display statistics such as the primary reasons for clinic visits and the most prescribed medications.

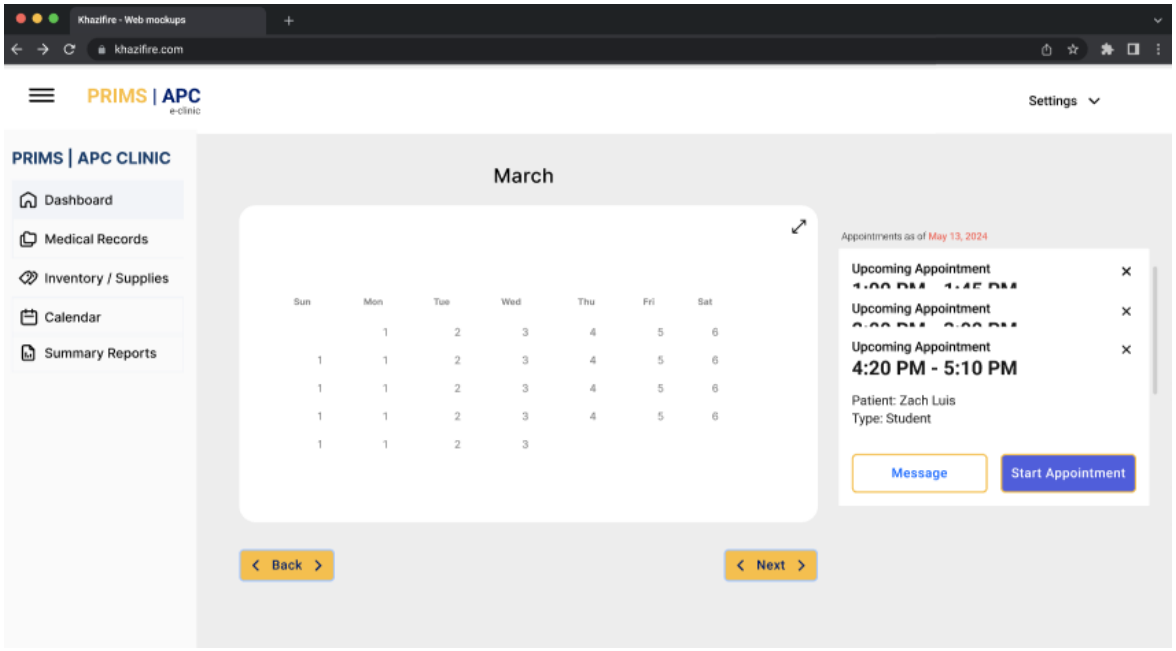

Figure 15 Calendar/Appointment Section

Figure 15 shows the Calendar section of the system. The calendar will mark all the appointments scheduled by color depending on the day. The right side is more like a heads up, it will show any upcoming appointments of the day, admins will have the option to message the patient or start the consultation.

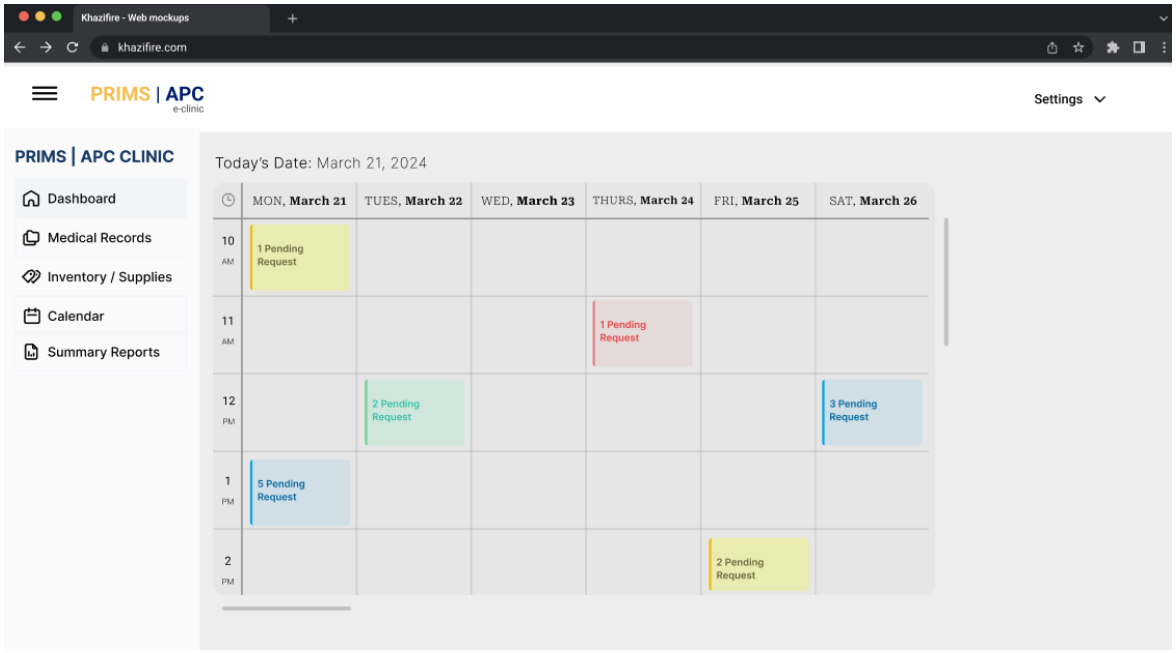

Figure 16 Scheduling System (Detailed)

Figure 16 shows the more detailed view of the appointment system. For easy navigation since the school uses Microsoft applications, we referenced the Calendar view of Microsoft Teams.

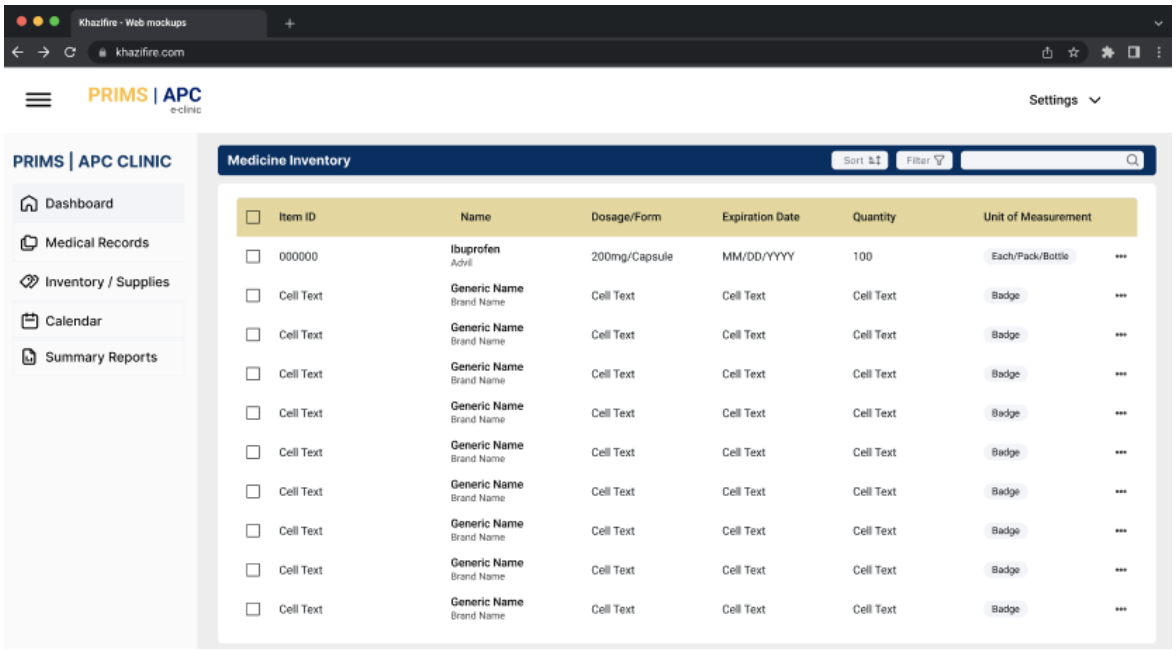

Figure 17 Inventory System

Figure 17 provides a detailed view of the medical supply stocks. The admin can easily track each medicine by its generic and brand name, dosage, expiration dates, and current quantity.

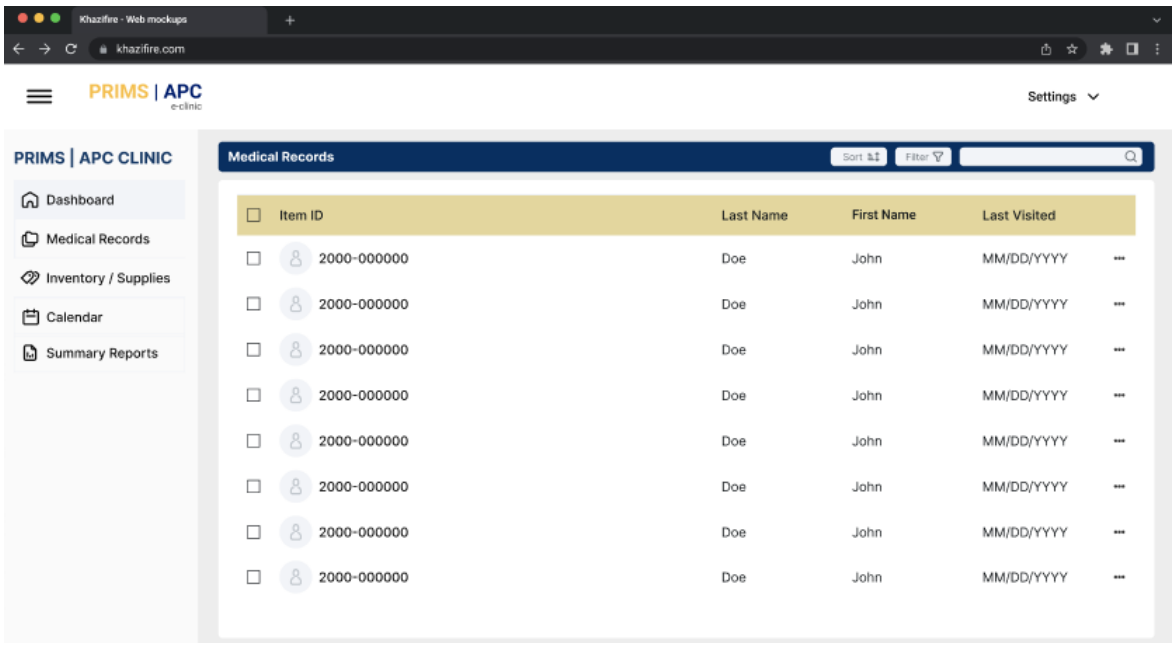

Figure 18 Medical Records

Figure 18 shows a tabled view of the patients' medical records. It will display data such as the ID of each patient's medical record, their name details, and the date they last visited the clinic.

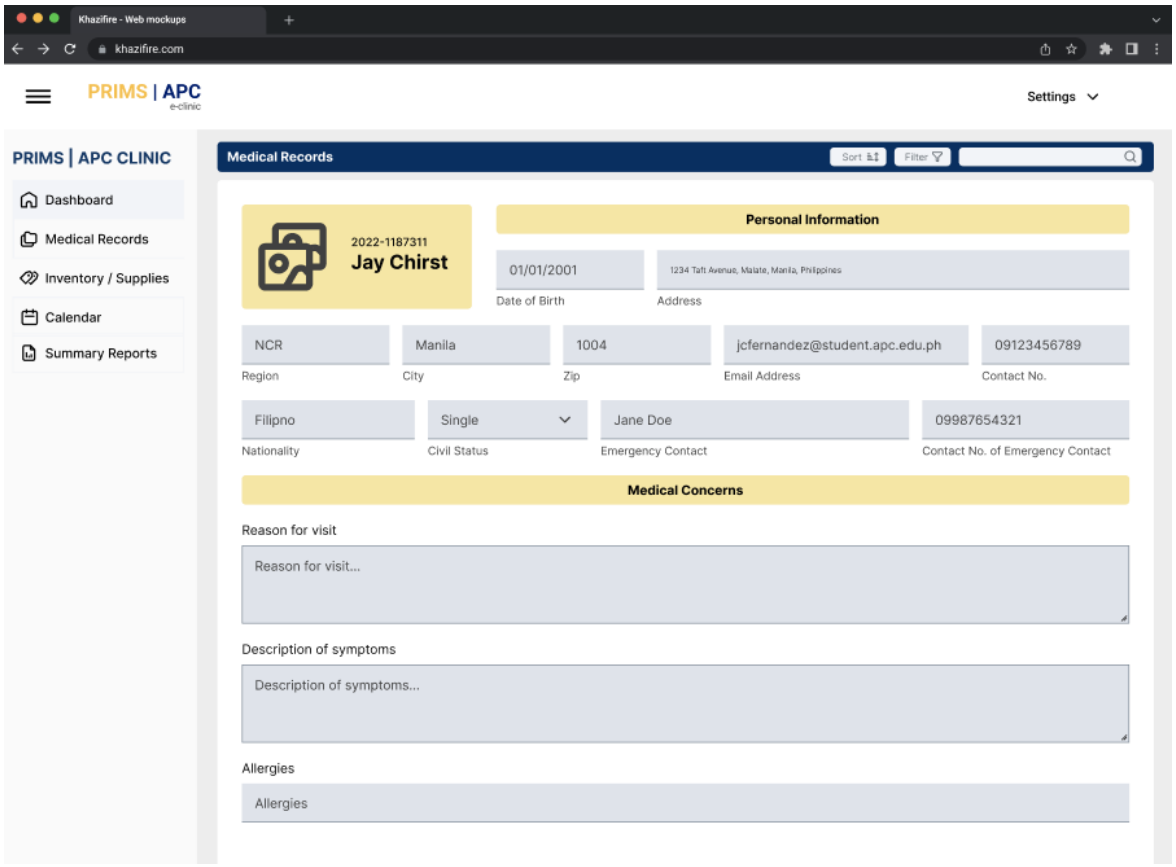

Figure 19 Medical Record (Detailed)

Figure 19 shows the medical record of the selected student. The medical record will show all the necessary information about the patient to the doctor and clinic staff.

5.6 Release Plan

Target Group: Asia Pacific College Clinic

Goal: Automate and digitize various processes of the school clinic.

Needs: A web-based system accessible to everyone within the APC community.

Value: The system will help reduce the time and effort required to schedule appointments, retrieve patients' medical records, and generate monthly summary reports. It will also provide an efficient

way to track the stocks of medical supplies and notify the patients about the statuses of their appointments.

Key Features: User Log in, Appointment Scheduling, Medical Records Database, Inventory System, Notification Alerts

Release Plan:

Our team's release plan will be divided into three sections.

Phase 1

High Fidelity Prototype (Snapshots)

Research Documentation/Paper

Presentation Deck

Phase 2

High Fidelity Prototype (Functional)

System Design

Model Diagrams

Phase 3

Deployed System

Quality Assurance Testing

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[6] O. Technologies, “The advantages of web-based systems over traditional software,” LinkedIn, https://www.linkedin.com/pulse/advantages-web-based-systems-over-traditional-software-/ (accessed May 30, 2024).

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[10] PGH Online Consultation Request and Appointment System, https://pghopd.up.edu.ph/ (accessed Jun. 24, 2024).

Appendices

Appendix A: Project Vision

APC Clinic wants to save time on setting up appointments and an efficient way of managing and handling medical patient records. Thus, Introducing PRIMS, a Patient Record & Interaction Management System that provides a record management and appointment scheduling system that fosters healthcare for their patients in Asia Pacific College.

Appendix B: Schedule/Release Plan

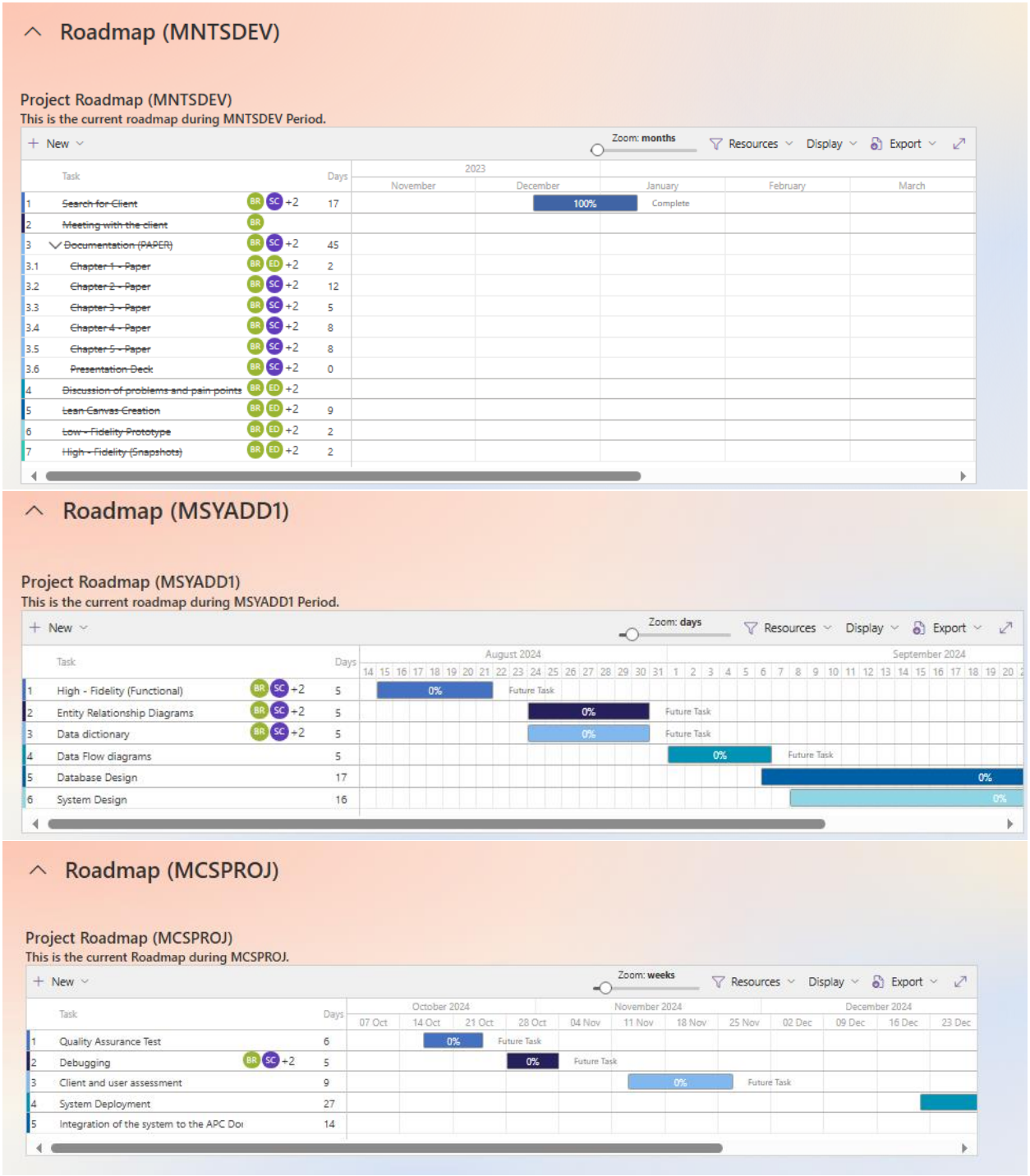


Figure 20 Gantt Charts

Appendix C: Product Roadmap

Table 11 Product Roadmap

MNTSDEV	MSYADD1	MCSPROJ
Client • Search for possible clients • Meetings with the client • Discussion of problems and pain points • Lean canvas creation **Project Proposal** • High-fidelity prototype (design) • Documentation paper (Chapter 1 to 5) • Presentation deck	**Design and Modeling** • High-fidelity prototype (functional) • Entity Relationship Diagrams • Data Dictionary • Data Flow Diagrams • System Design • Database Design	**Testing** • Quality assurance • Debugging • Client and user assessment **Deployment** • System deployment • Integration of the system to the APC domain

Appendix D: Meetings

Onsite Meetings

Date: April 22, 2024

Agenda: First meeting with Client **|** *Problems and Pain points* **|** *Solutions analyzed by the previous project proposal*

Screenshot:

Minutes of the meeting (This was based on the memo recorded):

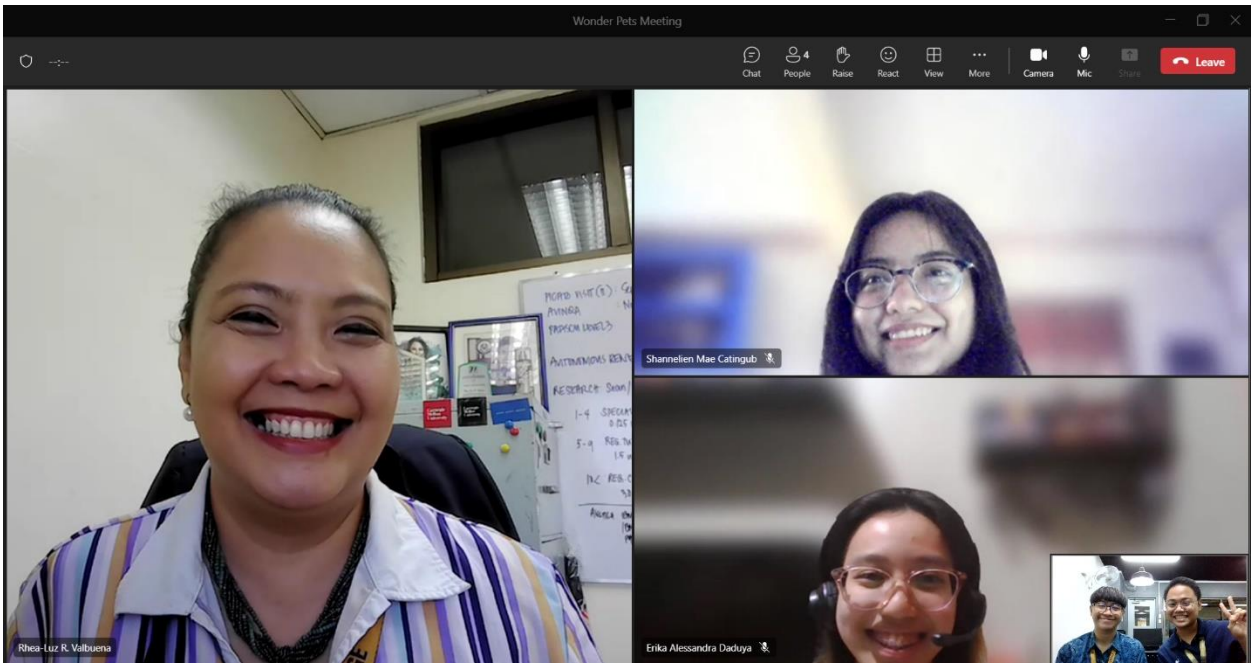
Discussion	***Contents***
What is APC Clinic and its services?	***Client: "****APC Clinic is a school clinic that is based on the institution of Asia Pacific College. We offer dental, physical examination, and immediate health inquiries."*
Why is there a need for a system?	***Client: "****First of all, APC Clinic's clerical tasks are manual. I'm not saying it's a problem, but since I write every document, it slows down the process of booking appointments, cancelling appointments, writing summary of reports, and even the checkup itself. I want to automate some of the functions and digitize the medical records to save up space in the clinic for the incoming renovation and to also have an easier way of finding them without looking into a cabinet full of them."*
What were the proposals of the previous group?	***Client: "****They have created a working prototype already, but they haven't shown up since October. They have functions like the appointment system itself and the notification via SMS."*

Teams Meetings

Date: April 29, 2024

Agenda: First meeting adviser and introduction of the whole group.

Screenshot:



Date: April 22, 2024 *****change this to the specific date*****

Agenda: Consultation of the presentation deck as well as the lean canvas.