
WEB BASED HEALTH MANAGEMENT SYSTEM WITH DATA ANALYTICS AND RFID FOR CAMARINES SUR POLYTECHNIC COLLEGES CLINIC

A Capstone Project
presented to the Faculty of
College of Computer Studies
Camarines Sur Polytechnic Colleges

In Partial Fulfillment of the Requirements
for the degree Bachelor of Science in Information Technology

By

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Ike Renson S. Landong
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December 2025

APPROVAL PAGE

In partial fulfillment of the requirements for the degree of Bachelor of Science in Information Technology, this research entitled **WEB BASED HEALTH MANAGEMENT SYSTEM WITH DATA ANALYTICS AND RFID FOR CAMARINES POLYTECHNIC COLLEGES CLINIC** prepared and submitted by Ma.Diah G. Cambronero, Ike Renson S. Landong, Ian Jay Kyle D. Tipanero has been examined and is recommended for approval and acceptance.

IAN P. BENITEZ, DIT
Adviser

This research project entitled, **WEB BASED HEALTH MANAGEMENT SYSTEM WITH DATA ANALYTICS AND RFID FOR CAMARINES SUR POLYTECHNIC COLLEGES CLINIC**, in partial fulfillment of the requirements for the degree of Bachelor of Science in Information Technology has been examined and is recommended for acceptance and approval for ORAL EXAMINATION.

RESEARCH COMMITTEE:

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ABSTRACT

Title:	Web Based Health Management System with Data Analytics and RFID for Camarines Sur Polytechnic Colleges Clinic
Authors:	Ma.Diah G. Cambronero Ike Renson S. Landong Ian Jay Kyle D. Tipnaero
Number of Pages:	230
School:	Camarines Sur Polytechnic Colleges
Degree Conferred:	Bachelor of Science in Information Technology
Keywords:	Web Based System, Health Management, Data Analytics, RFID Technology, Medical Records, Appointment Scheduling, SMS Notification, Event Calendar Management, Black Box Testing

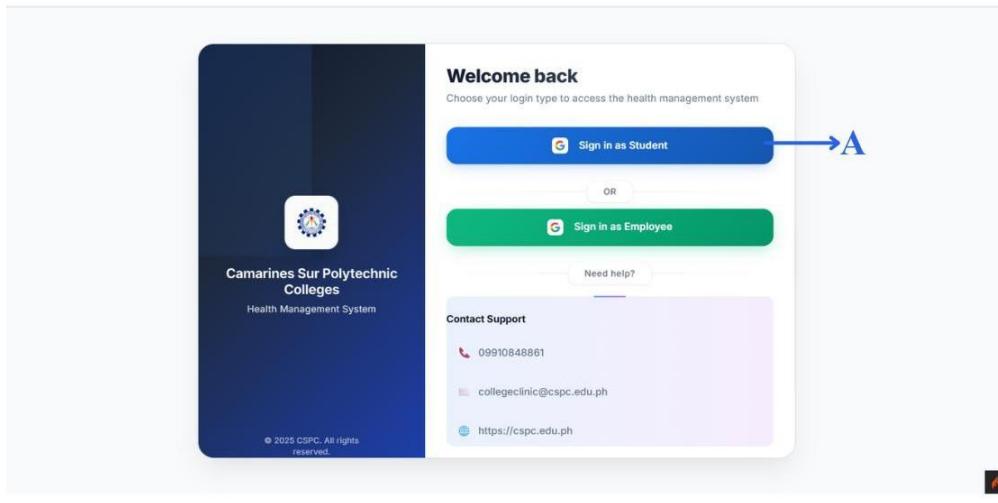
The Web-Based Health Management System with Data Analytics and RFID for Camarines Sur Polytechnic Colleges Clinic is an essential digital solution for institutional setting that restricts services provision based on manual processes. This platform changes the way the CSPC clinic functions by transferring manual processes with significant labor needs like record processing, appointment booking, and health report creation are being transferred to a safe, digital system. The system aims to enhance daily clinic efficiency for students, employees and staff by eliminating manual inefficiencies, service delays, and inaccurate data. The system uses an Agile Scrum model of flexibility, which has an eight-module structure. The RFID module, Medical/Dental Record Management, Appointment with SMS Notification, and Data Analytics and Reporting modules are the essential elements. These elements make operations digital, increase the accessibility of the records, and offer clinic administrators with the necessary data-driven health insights. System testing was done through rigorous procedures that ensured the system was operational and secure. Unit Testing had a high rating of 0.97, and Usability Testing gave the highest score of 1.0. OWASP scored 0.98 on Security Testing and Performance Testing demonstrated that the system could support many simultaneous users with a small amount of delay. Deployed in a cloud environment, the system provides CSPC digitized services, improved data accuracy, and easier healthcare access. This health management system is a digital hub of institutional healthcare that has shown the use of technology in enhancing the quality of services, health outcomes, and overall institutional effectiveness.

APPENDIX D

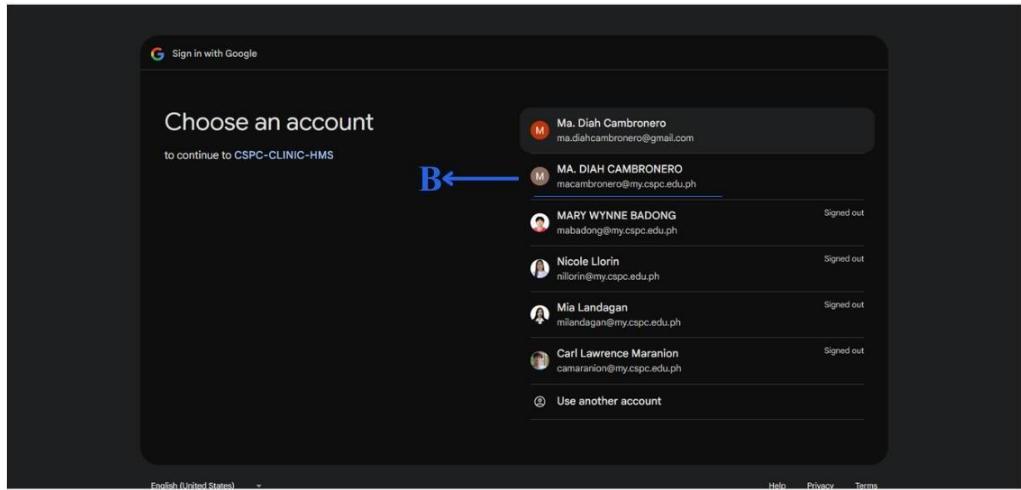
USER'S GUIDE

LOGIN

This is the browser for end user which is the students and employees in the CSPC



- A. Click the Google oAuth Login Button it depends upon if your student or employee



- B. Select an account or login into new account (use CSPC email only)

Fill up form to profile setup



CSPC CLINIC

Please complete your profile information to continue

Step 1 of 2: Personal Info

Complete Your Profile
Help us provide you with personalized healthcare services

Student ID *

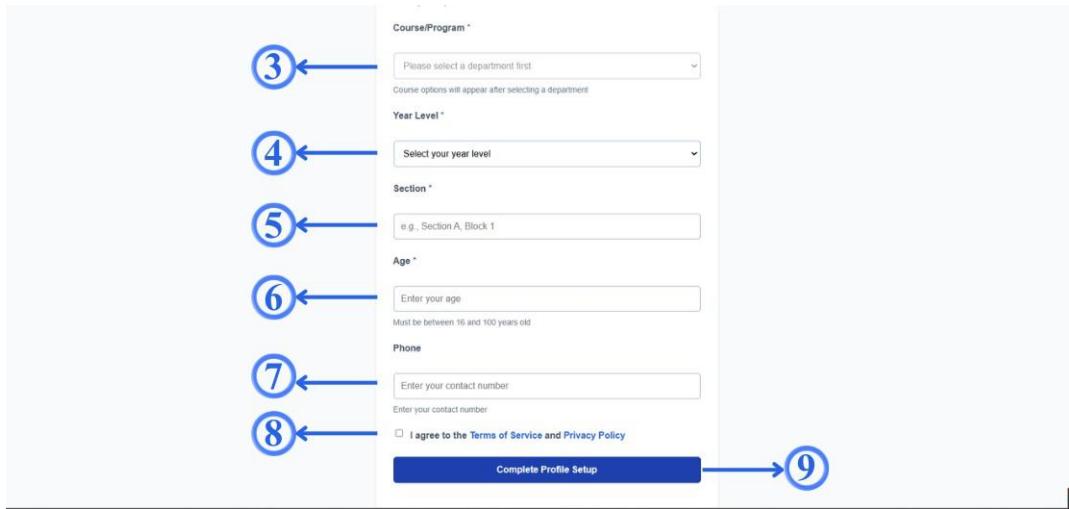
e.g., 221001344
Enter your student ID (8-15 digits)

Department *

CCS CEA CHS
CAS CTDE CTHBM

Select your department first.

1. Enter your Student ID
2. Select your department first



Course/Program *

Please select a department first

Course options will appear after selecting a department

Year Level *

Select your year level

Section *

e.g., Section A, Block 1

Age *

Enter your age

Must be between 16 and 100 years old

Phone

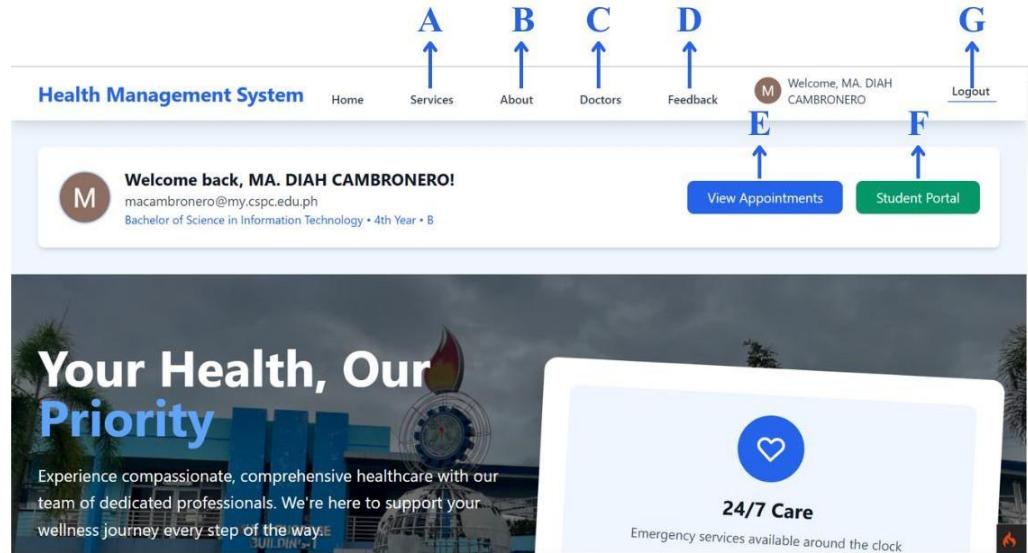
Enter your contact number

I agree to the [Terms of Service](#) and [Privacy Policy](#)

Complete Profile Setup

3. Select Program
4. Select Year Level
5. Input section
6. Input age
7. Input Contact Number
8. Check the Terms of service and privacy policy
9. Lastly, click the Complete Profile Setup to proceed in the landing page

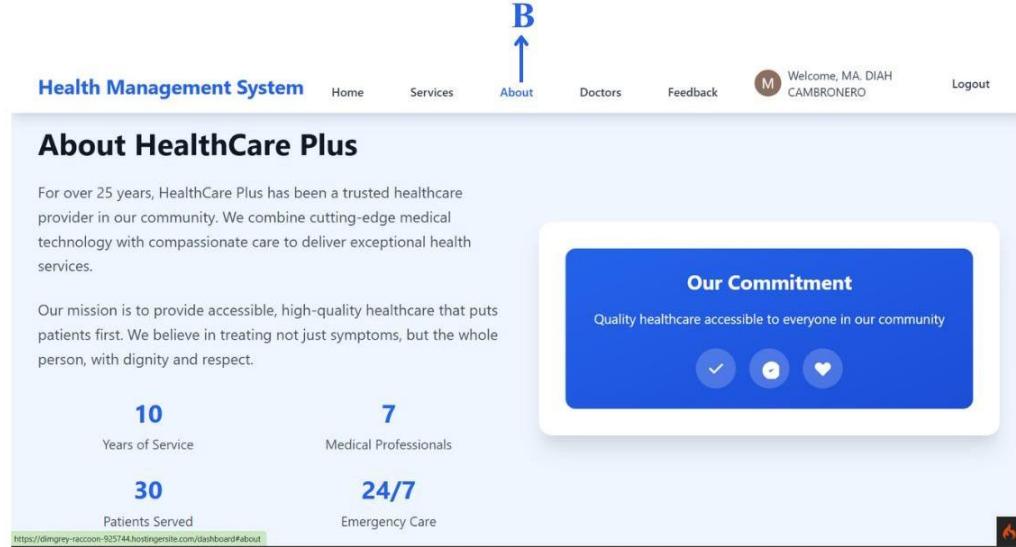
This is the landing page of students and employee's client for the web based health management system.



- A. Services button
- B. About Button
- C. Doctor Button
- D. Feedback Button
- E. View Appointment button
- F. Student Portal button that will direct to the user dashboard
- G. Logout button

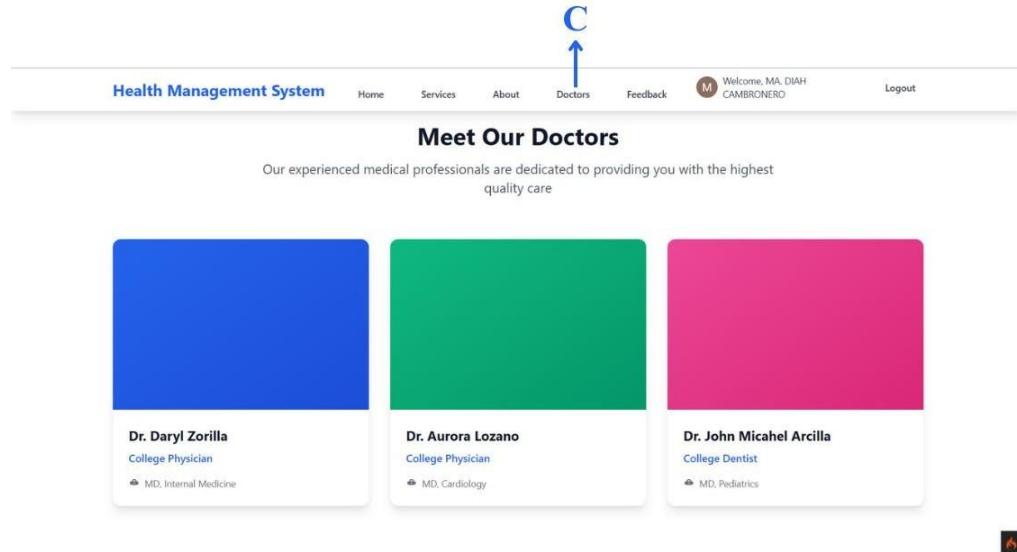
Service	Description	Learn More
General Medicine	Comprehensive primary care services for all ages, including preventive care, routine check-ups, and treatment of common illnesses.	Learn More →
Laboratory	Complete diagnostic laboratory services with fast, accurate results. Blood tests, imaging, and specialized diagnostics available.	Learn More →
Emergency	24/7 emergency medical services with trained professionals ready to handle urgent medical situations and trauma care.	Learn More →

- A. When you click the Services button, it will direct to the interface of that page



A screenshot of a web application titled "Health Management System". At the top, there is a navigation bar with links for "Home", "Services", "About", "Doctors", "Feedback", and "Logout". A user profile icon shows "Welcome, MA. DIAH CAMBRONERO". On the left, there is a sidebar with several statistics: "10 Years of Service", "7 Medical Professionals", "30 Patients Served", and "24/7 Emergency Care". In the center, there is a blue callout box with the heading "Our Commitment" and the text "Quality healthcare accessible to everyone in our community". An upward-pointing blue arrow labeled "B" is overlaid on the "About" link in the navigation bar.

B. When you click the About button, it will direct to the interface of that page



A screenshot of the "Meet Our Doctors" page from the "Health Management System". The page features a title "Meet Our Doctors" and a subtitle "Our experienced medical professionals are dedicated to providing you with the highest quality care". Below this, there are three colored boxes (blue, green, and pink) representing different doctors. Each box contains the doctor's name, title, and a small bio. An upward-pointing blue arrow labeled "C" is overlaid on the "Doctors" link in the navigation bar.

Doctor	Title	Bio
Dr. Daryl Zorilla	College Physician	MD, Internal Medicine
Dr. Aurora Lozano	College Physician	MD, Cardiology
Dr. John Michael Arcilla	College Dentist	MD, Pediatrics

C. When you click the About button, it will direct to the interface of that page

D. After clicking Feedback Button it will directly in this page

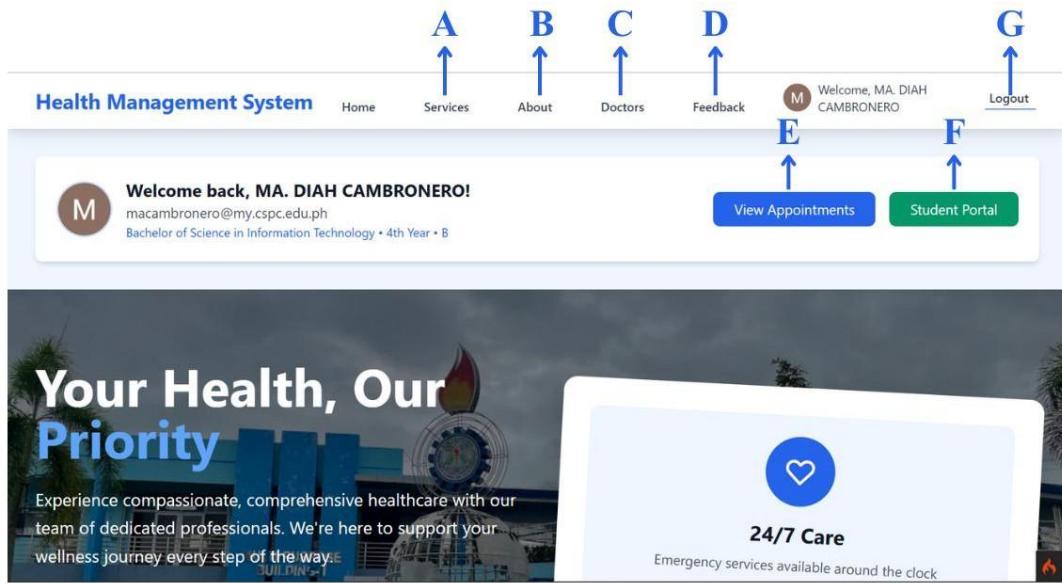


The screenshot shows a feedback submission form with the following steps numbered 1 through 8:

1. Input your Full Name (required)
2. Input Email Address (required)
3. You have rights to make your identity anonymous in this field
4. Select Category
5. Rate your overall rating using the star
6. Input the Concern
7. Input your feedback
8. Submit Your Feedback

1. Input your Full Name (required)
2. Input Email Address (required)
3. You have rights to make your identity anonymous in this field
4. Select Category
5. Rate your overall rating using the star
6. Input the Concern
7. Input your feedback
8. Submit Your Feedback

When you click the letter F. **Student Portal** this directly in the dashboard



The dashboard has the following navigation links labeled A through G:

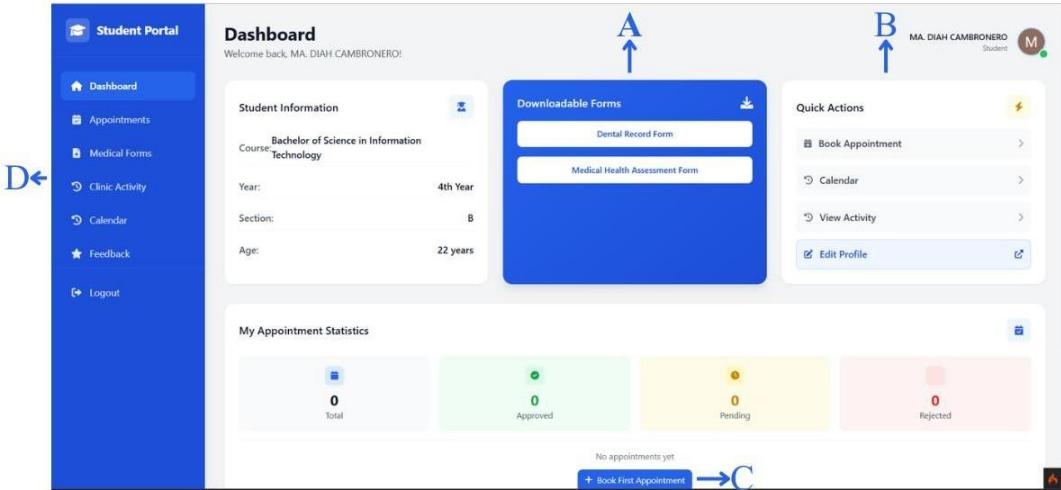
- A: Home
- B: Services
- C: Doctors
- D: Feedback
- E: View Appointments
- F: Student Portal
- G: Logout

The "Student Portal" button (F) is highlighted in green.

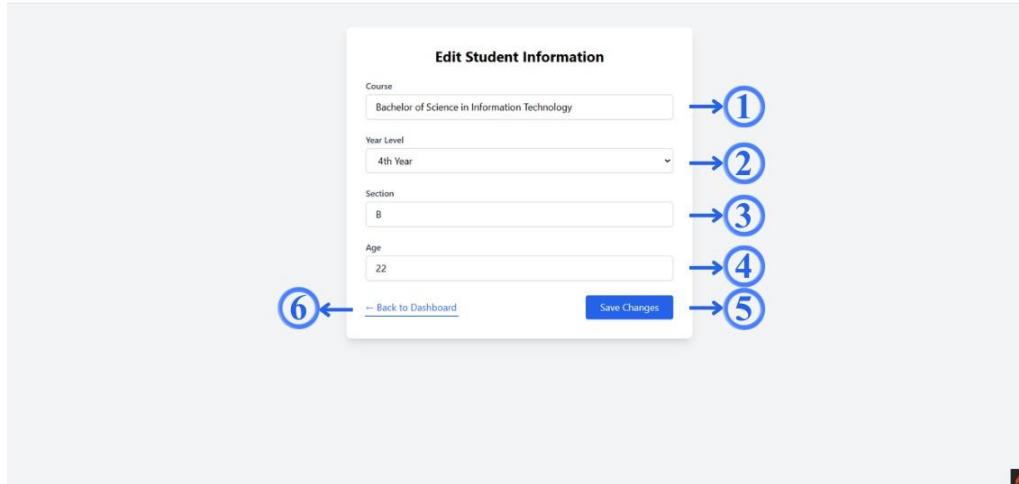
Key elements on the dashboard include:

- Welcome back, MA. DIAH CAMBRONERO!
- macambronero@my.cspc.edu.ph
- Bachelor of Science in Information Technology • 4th Year • B
- Your Health, Our Priority
- Experience compassionate, comprehensive healthcare with our team of dedicated professionals. We're here to support your wellness journey every step of the way.
- 24/7 Care
- Emergency services available around the clock

This is the **Dashboard** of students and employees after clicking the **Student Portal**



- A. Downloadable Forms
- B. Quick Actions
- C. Quick button for Booking Appointments
- D. Navigations buttons

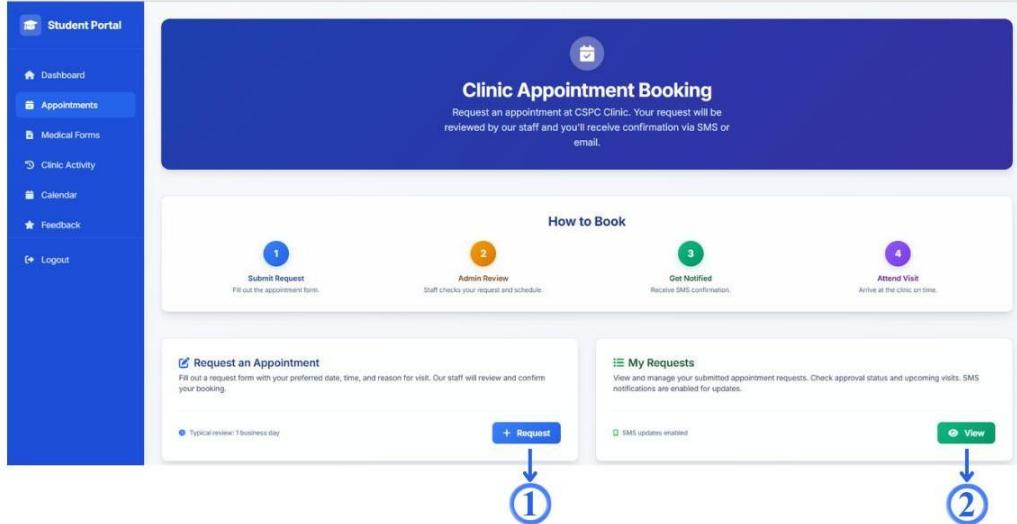


The form titled "Edit Student Information" contains fields for Course (Bachelor of Science in Information Technology), Year Level (4th Year), Section (B), and Age (22). It includes a "Save Changes" button and a "Back to Dashboard" link. Blue arrows numbered 1 through 6 point to each of these elements: 1 points to the Course field, 2 points to the Year Level dropdown, 3 points to the Section input, 4 points to the Age input, 5 points to the Save Changes button, and 6 points to the Back to Dashboard link.

This is the Edit Profile section

1. The Program which is fix
2. You could edit your Year Level
3. Section input field
4. Age input field
5. Save Changes button
6. Back to the Dashboard button

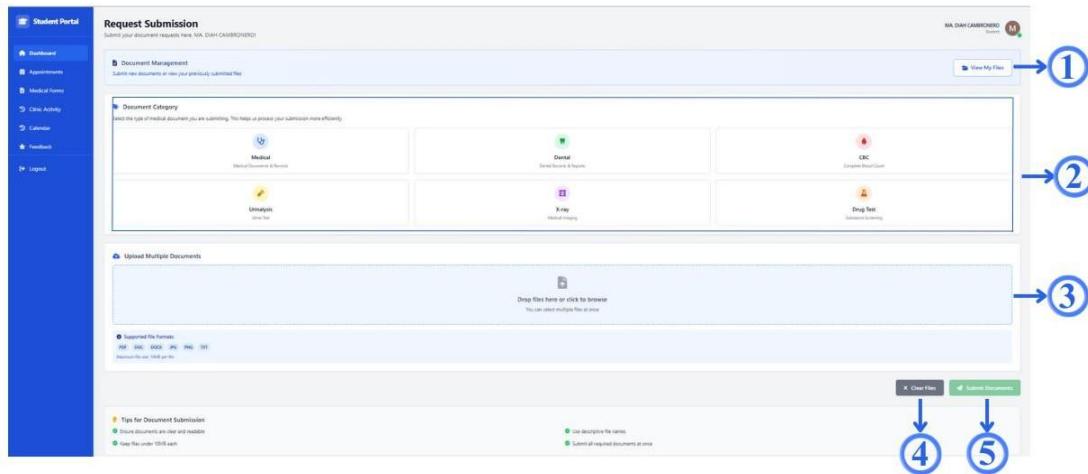
The **Appointments** interface after clicking the Appointments navigation button



1. Request button for booking an appointment

2. View button to track your appointment request and status

The **Forms Submissions** interface after clicking the Medical Forms navigation button



1. View My Files button for view status, manage, and download your submitted files

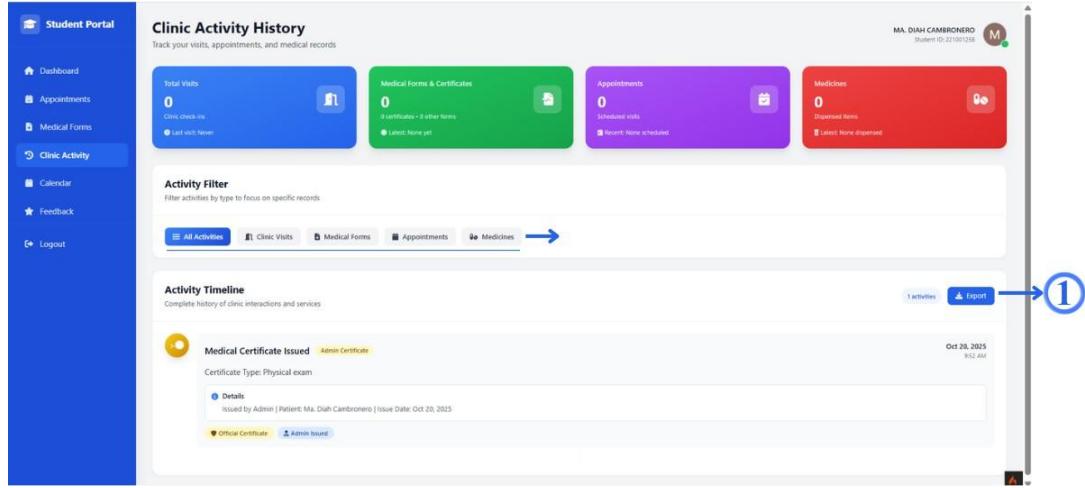
2. Document Category selection of what type of document uploading. Select first document

3. Upload the type of document category

4. Clear Files button

5. Submit Document button

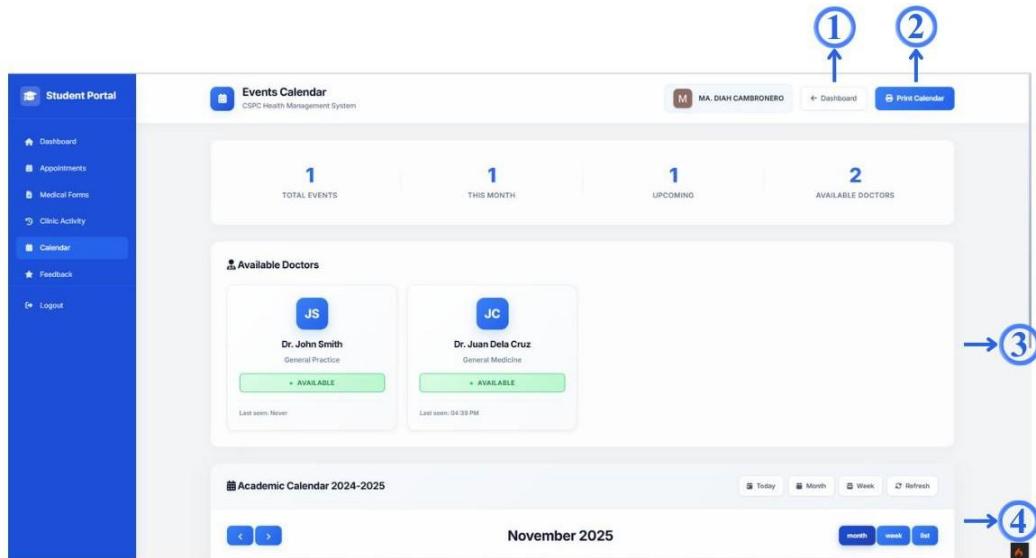
The **Clinic Activity** interface after clicking the Clinic Activity navigation button. You could see all your clinic activity history on your own interface.



The screenshot shows the 'Clinic Activity History' section of the Student Portal. It includes a summary of total visits (0), medical forms & certificates (0), appointments (0), and medicines (0). Below this is an 'Activity Filter' section with tabs for All Activities, Clinic Visits, Medical Forms, Appointments, and Medicines. An 'Activity Timeline' section displays a single entry: 'Medical Certificate Issued' on Oct 20, 2025, at 9:52 AM, issued by Admin to Patient: Ma. Diah Cambronero. There is a blue arrow labeled '1' pointing to the 'Export' button in the timeline section.

1. Export all your activity history

The **Calendar** interface after clicking the Calendar navigation button.

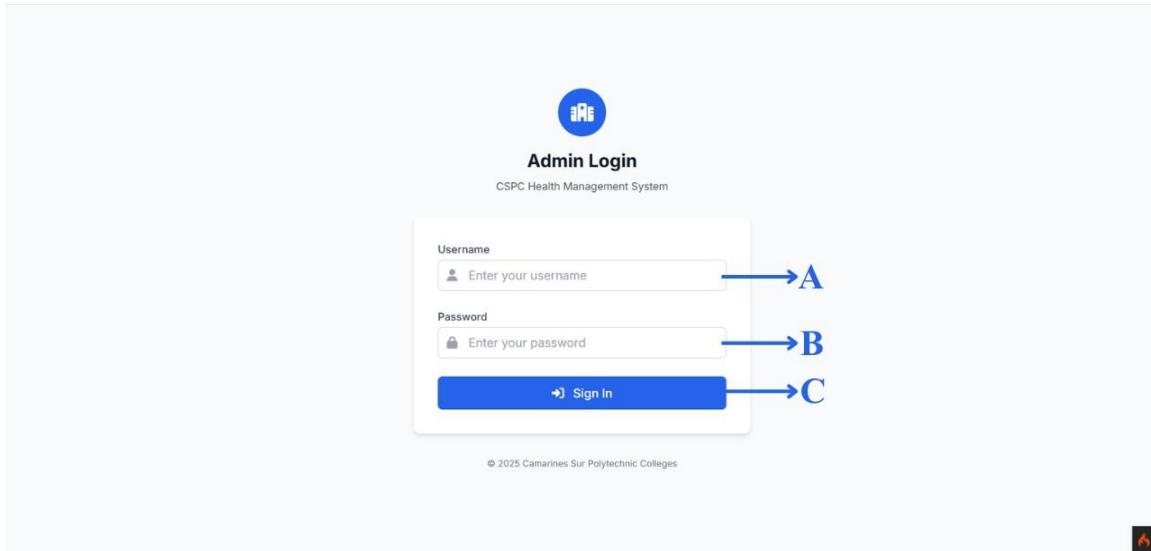


The screenshot shows the 'Events Calendar' section of the Student Portal. It displays statistics: 1 Total Events, 1 This Month, 1 Upcoming, and 2 Available Doctors. Below this is a 'Available Doctors' section showing Dr. John Smith (General Practice) and Dr. Juan Dela Cruz (General Medicine), both marked as available. At the bottom is an 'Academic Calendar 2024-2025' for November 2025. Blue arrows labeled 1 through 4 point to various features: 1 points to the 'Dashboard' button, 2 points to the 'Print Calendar' button, 3 points to the doctor availability section, and 4 points to the academic calendar.

1. Back to the Dashboard button
2. Print Calendar
3. View real time availability doctor presence in the clinic
4. View all of the activities of school clinic

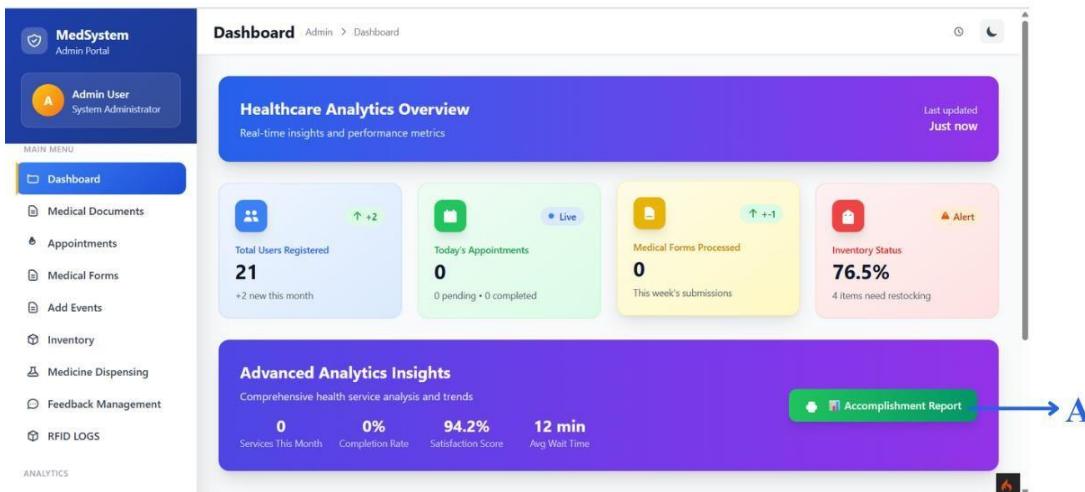
ADMIN SIDE BROWSER

LOGIN



A. Input for Username

- B. Input for Password
- C. Sign In button to direct to dashboard of admin

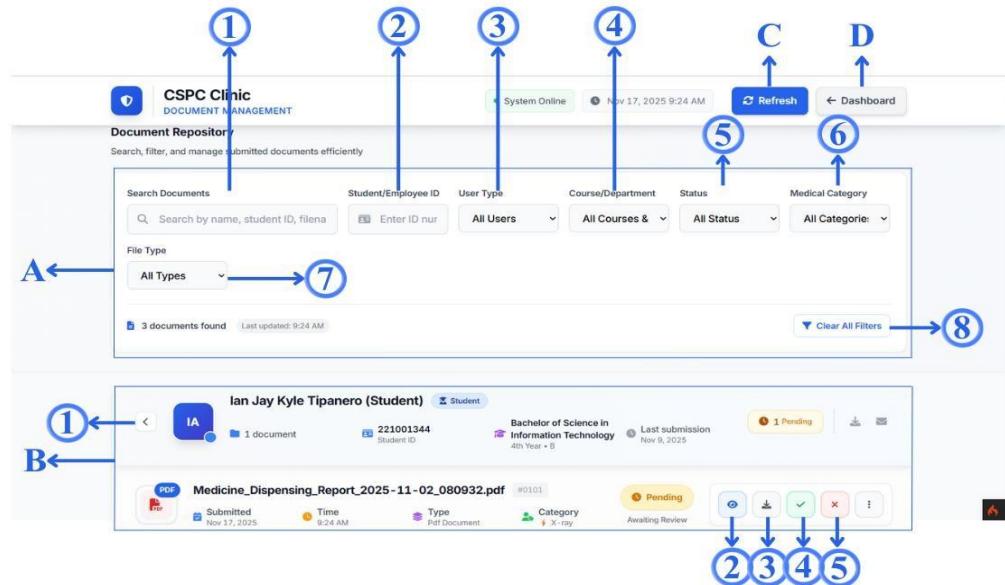


Admin dashboard interface consist of sidebar navigation buttons and analytics overview

- A. Accomplishment Report button



Admin interface after clicking the Medical Documents buttons

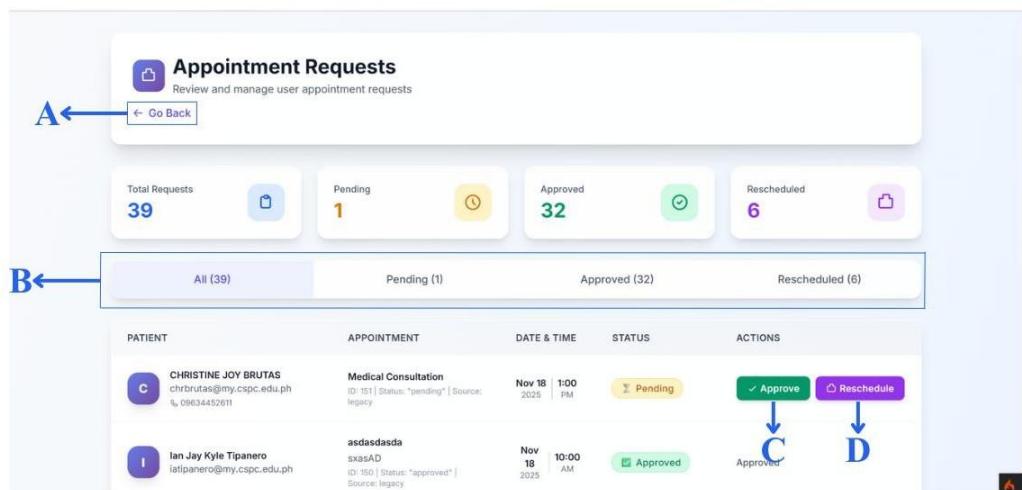


A. Document settings

1. Input name, student ID etc then click enter
2. Input ID number
3. Select user type
4. Select Department
5. Select status
6. Select type of category
7. Select file type
8. Clear all Filter button

- B. Students or Employees File
 - 1. Dropdown button to view the file submitted by the user
 - 2. Preview button to view the file clearly and expand
 - 3. Download button
 - 4. Approved button
 - 5. Rejected button
- C. Refresh button
- D. Back to the dashboard button

Click **Appointments** button to go to the appointment interface

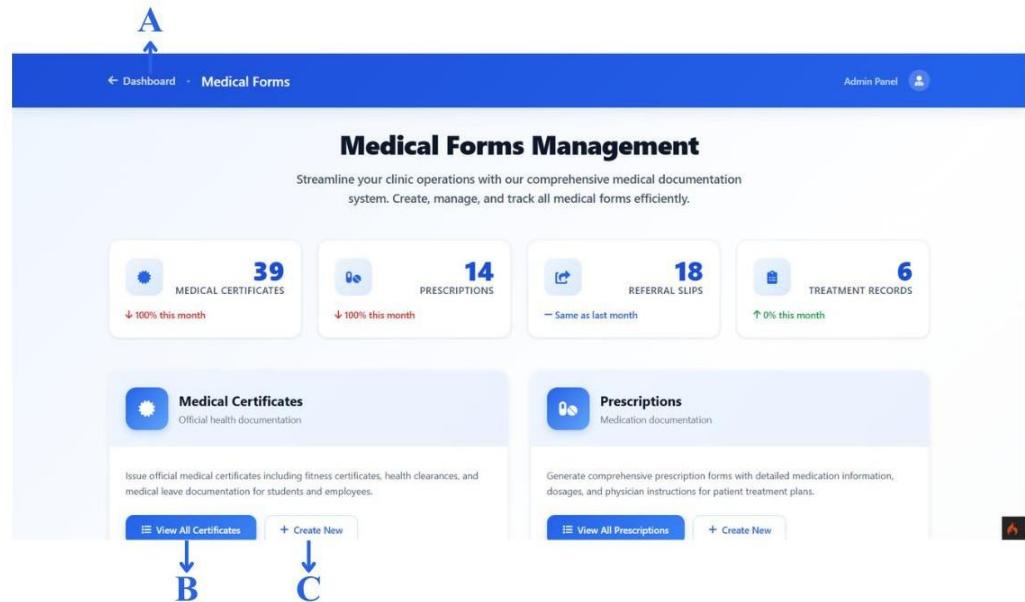
- A. Back to the Dashboard button
- B. Navigation buttons of the appointments transactions
- C. Approved button
- D. Reschedule button

D. Reschedule buttons

Click **Medical Forms** button to go to the medical forms interface



The screenshot shows the MedSystem Admin Portal. On the left, there's a sidebar with a blue header 'MedSystem Admin Portal' and a yellow 'Admin User System Administrator' button. Below the header are sections for 'MAIN MENU' (Dashboard, Medical Documents, Appointments, Medical Forms), 'ANALYTICS' (Add Events, Inventory, Medicine Dispensing, Feedback Management, RFID LOGS), and a 'Last updated Just now' message. A blue arrow labeled 'C' points from the 'Medical Forms' button in the sidebar to the 'Medical Forms Management' section on the right. The main area is titled 'Dashboard Admin > Dashboard' and contains two sections: 'Healthcare Analytics Overview' and 'Advanced Analytics Insights'. The 'Healthcare Analytics Overview' section includes cards for Total Users Registered (21), Today's Appointments (0), Medical Forms Processed (0), and Inventory Status (76.5%). The 'Advanced Analytics Insights' section displays metrics for Services This Month (0), Completion Rate (0%), Satisfaction Score (94.2%), and Avg Wait Time (12 min). A green button labeled 'Accomplishment Report' is also present.



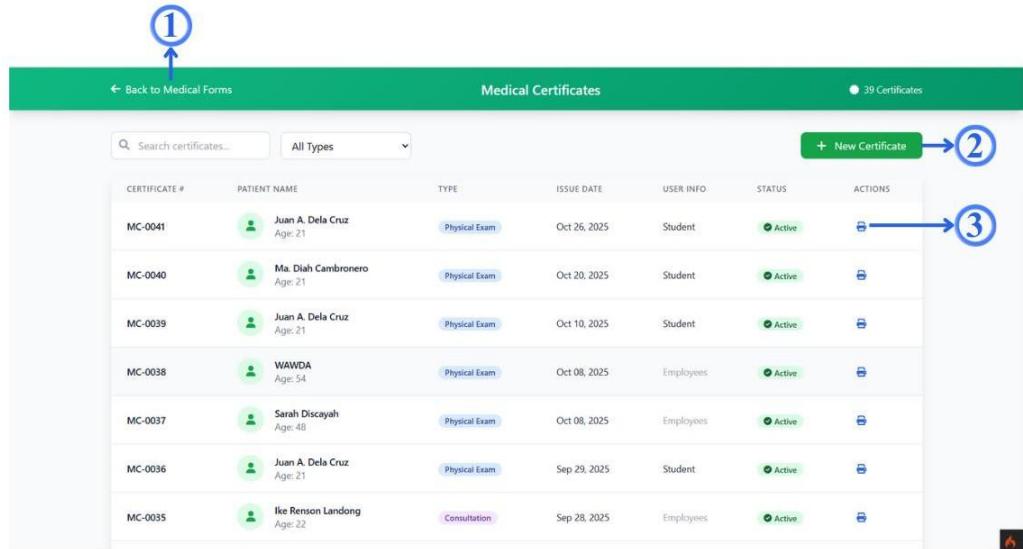
The screenshot shows the 'Medical Forms Management' interface. At the top, there's a blue header with a back arrow, the text '← Dashboard - Medical Forms', and an 'Admin Panel' button. Below the header, the title 'Medical Forms Management' is centered. A sub-header says 'Streamline your clinic operations with our comprehensive medical documentation system. Create, manage, and track all medical forms efficiently.' There are four cards showing counts: 'MEDICAL CERTIFICATES' (39, down 100% this month), 'PRESCRIPTIONS' (14, down 100% this month), 'REFERRED SLIPS' (18, same as last month), and 'TREATMENT RECORDS' (6, up 0% this month). Below these are two sections: 'Medical Certificates' (Official health documentation) and 'Prescriptions' (Medication documentation). Each section has a 'View All' button and a '+ Create New' button. A blue arrow labeled 'A' points from the top navigation bar to the 'Medical Forms' section. Blue arrows labeled 'B' and 'C' point down to the 'View All Certificates' and '+ Create New' buttons respectively.

Medical Forms Management interface contains all the certificates and forms are here.

A. Back to the Dashboard button

B. Button to view all the certificates that been made

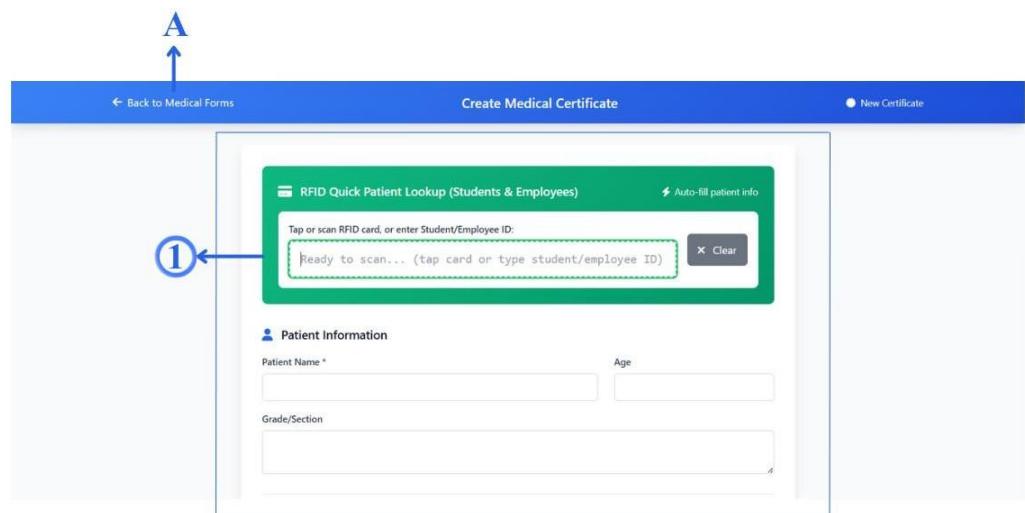
C. Create New button to make a digital certificate



← Back to Medical Forms Medical Certificates 39 Certificates

CERTIFICATE #	PATIENT NAME	TYPE	ISSUE DATE	USER INFO	STATUS	ACTIONS
MC-0041	Juan A. Dela Cruz Age: 21	Physical Exam	Oct 26, 2025	Student	Active	
MC-0040	Ma. Diah Cambronero Age: 21	Physical Exam	Oct 20, 2025	Student	Active	
MC-0039	Juan A. Dela Cruz Age: 21	Physical Exam	Oct 10, 2025	Student	Active	
MC-0038	WAWDA Age: 54	Physical Exam	Oct 08, 2025	Employees	Active	
MC-0037	Sarah Discaya Age: 48	Physical Exam	Oct 08, 2025	Employees	Active	
MC-0036	Juan A. Dela Cruz Age: 21	Physical Exam	Sep 29, 2025	Student	Active	
MC-0035	Ike Renson Landong Age: 22	Consultation	Sep 28, 2025	Employees	Active	

1. Button for Back to Medical Forms interface
2. Button to create New Certificate to the patient
3. Download button to the specific file of patient



← Back to Medical Forms Create Medical Certificate New Certificate

RFID Quick Patient Lookup (Students & Employees) Auto-fill patient info

Tap or scan RFID card, or enter Student/Employee ID:
Ready to scan... (tap card or type student/employee ID)

A

1

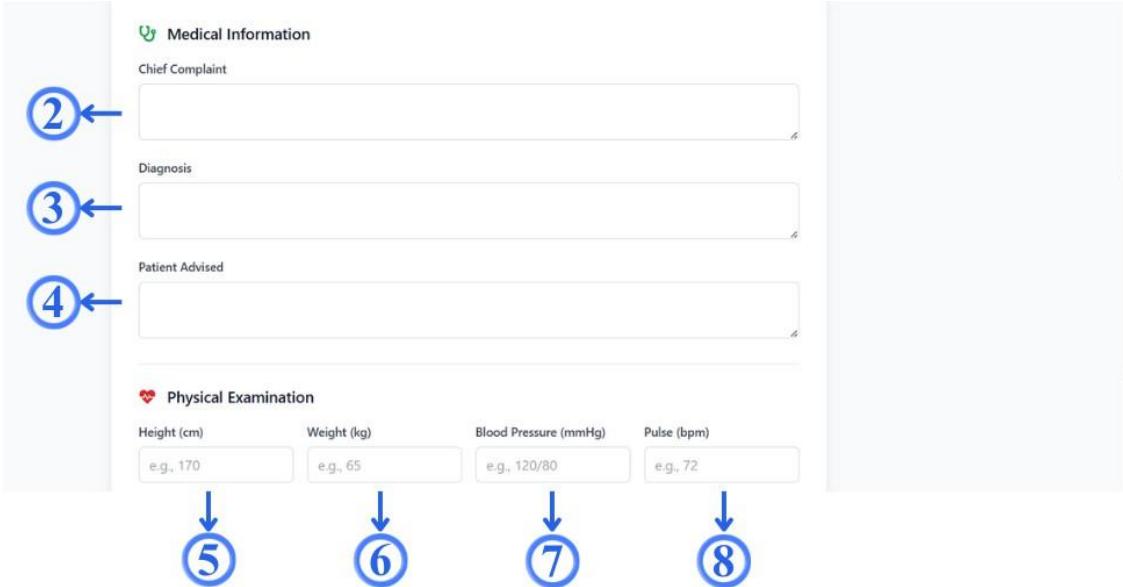
Patient Information

Patient Name * Age

 Grade/Section

- A. Button for Back to Medical Forms interface

1. After the RFID tap of the patient this section would auto fill up the patient information to make the transaction more faster



Medical Information

Chief Complaint

Diagnosis

Patient Advised

Physical Examination

Height (cm) e.g., 170

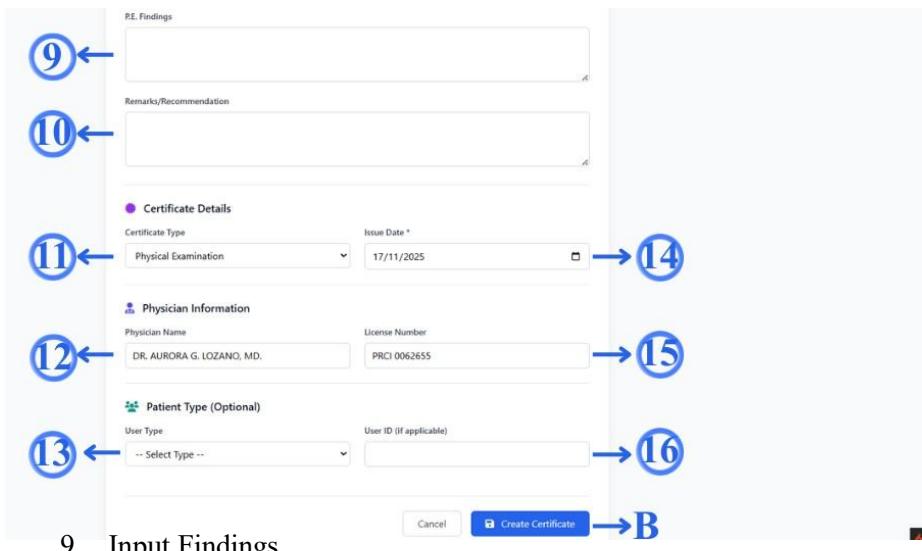
Weight (kg) e.g., 65

Blood Pressure (mmHg) e.g., 120/80

Pulse (bpm) e.g., 72

The admin would be fill up this section since every patient has different medical information.

2. Input the chief complain
3. Input the Diagnosis
4. Input Patient Advised
5. Input the Height
6. Input Weight
7. Input Blood Pressure
8. Input Pulse



P.E. Findings

Remarks/Recommendation

Certificate Details

Certificate Type: Physical Examination

Issue Date: 17/11/2025

Physician Information

Physician Name: DR. AURORA G. LOZANO, MD.

License Number: PRCI 0062655

Patient Type (Optional)

User Type: -- Select Type --

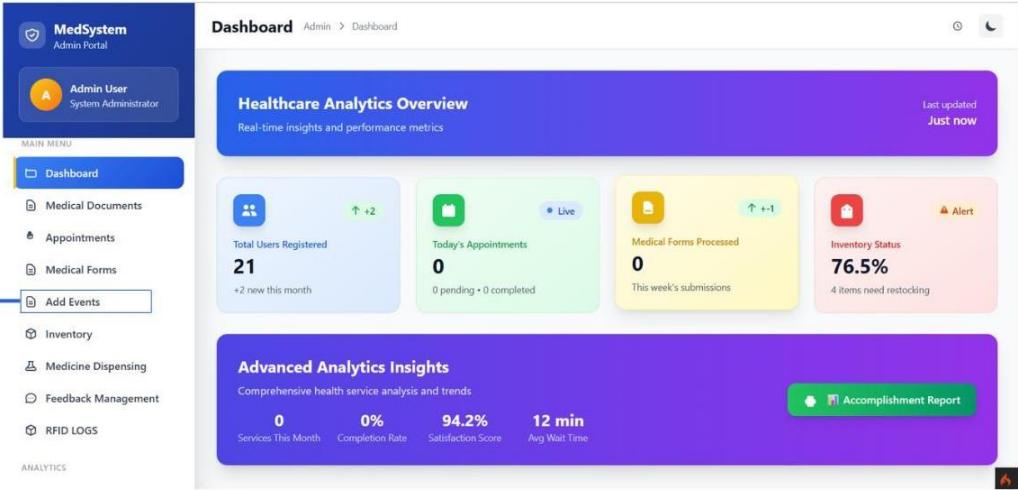
User ID (if applicable):

Create Certificate

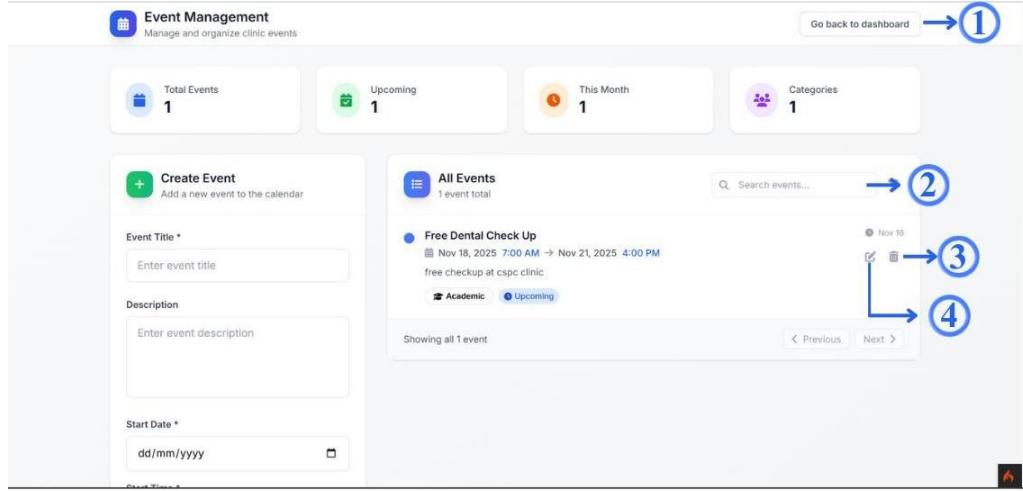
9. Input Findings

10. Input Remarks/Recommendations
11. Input type of certificate
12. Input Physician Information
13. Input Patient Type which is optional
14. Input Issue date of certificate
15. Input Licensed number of the Physician
16. Input user ID if applicable
17. Lastly, Create Certificate button to proceed to Download or print.

Click Add Events button to go to the Add events to the calendar interface



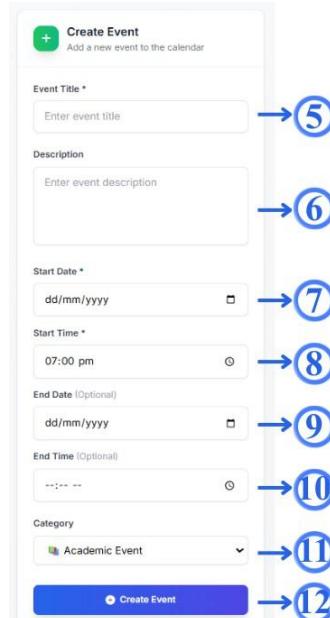
The screenshot shows the MedSystem Admin Portal dashboard. On the left, there's a sidebar with a main menu and an 'Add Events' button highlighted with a blue arrow labeled 'D'. The main area displays a 'Healthcare Analytics Overview' section with four cards: 'Total Users Registered' (21), 'Today's Appointments' (0), 'Medical Forms Processed' (0), and 'Inventory Status' (76.5% restocked). Below this is an 'Advanced Analytics Insights' section with metrics like 'Services This Month' (0), 'Completion Rate' (0%), 'Satisfaction Score' (94.2%), and 'Avg Wait Time' (12 min).



The screenshot shows the Event Management interface. At the top, there's a header with a 'Create Event' button and a link to 'Go back to dashboard' with a circled '1'. Below this, there are four summary boxes: 'Total Events' (1), 'Upcoming' (1), 'This Month' (1), and 'Categories' (1). To the right, there's a list of events under 'All Events'. One event is listed: 'Free Dental Check Up' on Nov 18, 2025, from 7:00 AM to 4:00 PM, categorized as 'Academic' and 'Upcoming'. A search bar is above the event list. At the bottom, there are navigation buttons for 'Previous' and 'Next'. Four numbered arrows point to specific features: '2' points to the search bar; '3' points to the delete icon next to the event entry; '4' points to the 'Upcoming' filter button.

1. Button to back the Dashboard
2. Search bar to search the events created
3. Delete Button that created

4. Edit button to the event created



The form is titled "Create Event" with the sub-instruction "Add a new event to the calendar". It contains the following fields:

- Event Title ***: An input field with a placeholder "Enter event title" and a blue arrow labeled **5** pointing to it.
- Description**: An input field with a placeholder "Enter event description" and a blue arrow labeled **6** pointing to it.
- Start Date ***: A date input field with a placeholder "dd/mm/yyyy" and a blue arrow labeled **7** pointing to it.
- Start Time ***: A time input field with a placeholder "07:00 pm" and a blue arrow labeled **8** pointing to it.
- End Date (Optional)**: A date input field with a placeholder "dd/mm/yyyy" and a blue arrow labeled **9** pointing to it.
- End Time (Optional)**: A time input field with a placeholder "...:... am" and a blue arrow labeled **10** pointing to it.
- Category**: A dropdown menu with "Academic Event" selected and a blue arrow labeled **11** pointing to it.
- Create Event**: A blue button at the bottom with a blue arrow labeled **12** pointing to it.

Fill up for creating event in the school clinic calendar

5. Input the Event title that will create
6. Input description to understand more what are that events
7. Input start date
8. Input start time
9. Input end date
10. Input end time
11. Input category of events
12. Lastly, click the Create Event button to officially created and shown up to the user side

Click **Inventory** button to go to the Inventory interface

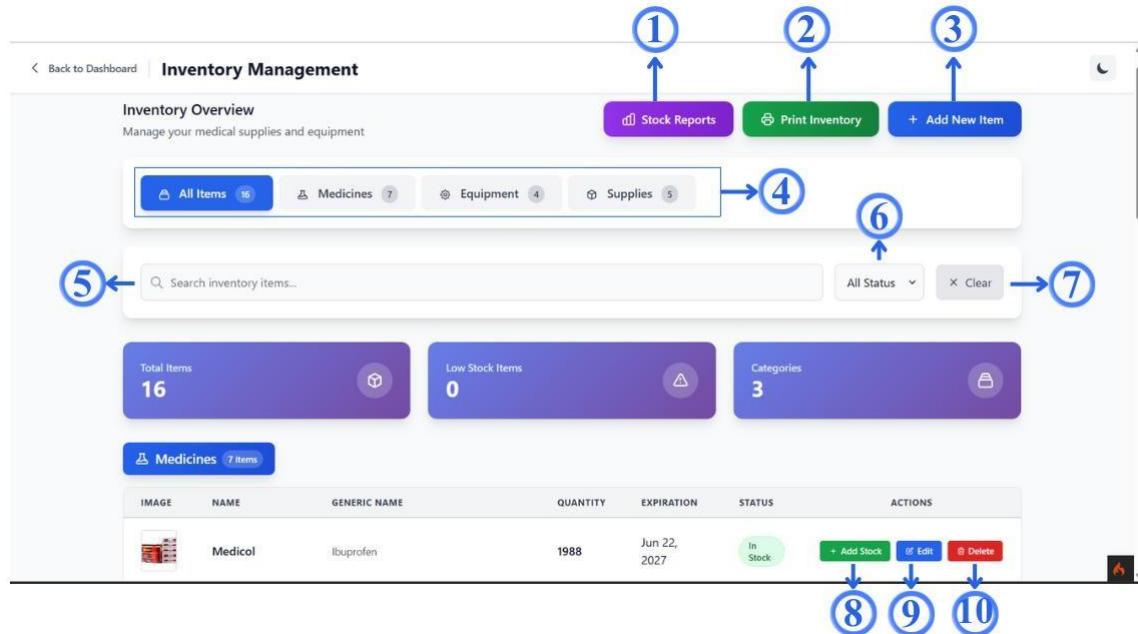


The dashboard is titled "Dashboard" and shows the following sections:

- Healthcare Analytics Overview**: Real-time insights and performance metrics. Includes cards for Total Users Registered (21), Today's Appointments (0), Medical Forms Processed (0), and Inventory Status (76.5%).
- Advanced Analytics Insights**: Comprehensive health service analysis and trends. Includes metrics: Services This Month (0), Completion Rate (0%), Satisfaction Score (94.2%), and Avg Wait Time (12 min). A green button labeled "Accomplishment Report" is visible.

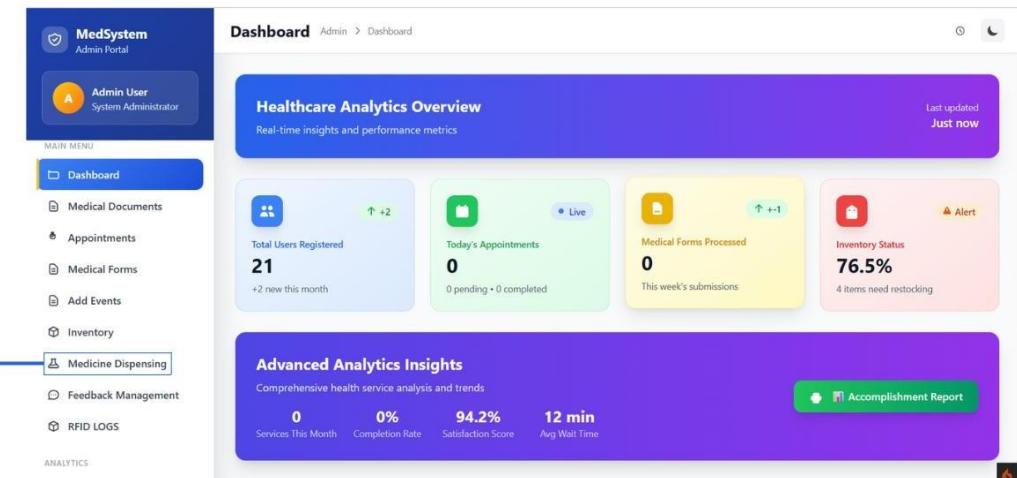
A vertical sidebar on the left is titled "MedSystem Admin Portal" and includes the following menu items:

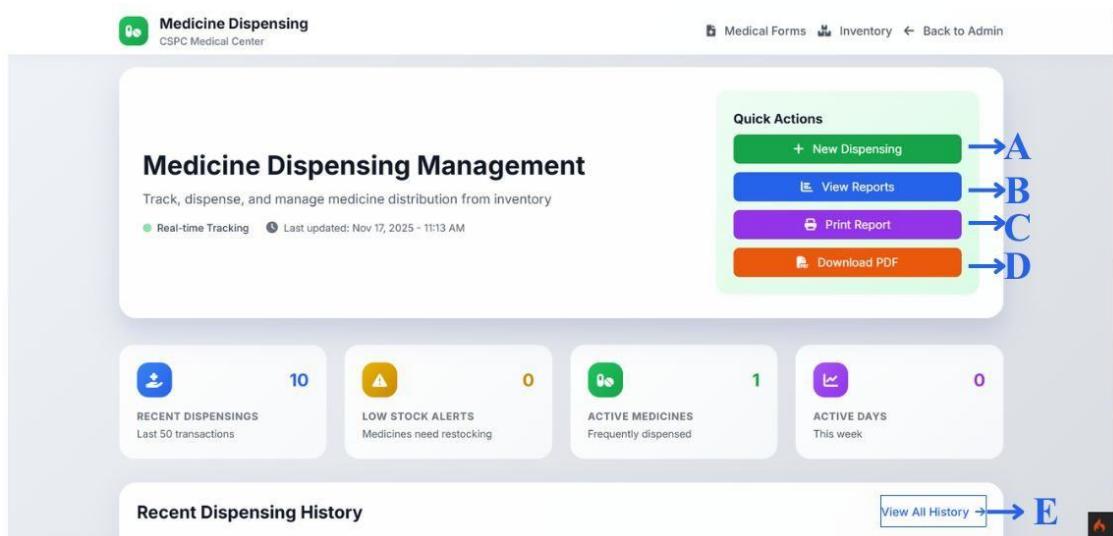
- MAIN MENU: Dashboard, Medical Documents, Appointments, Medical Forms, Add Events.
- ANALYTICS: Inventory (highlighted with a blue arrow labeled E), Medicine Dispensing, Feedback Management, RFID LOGS.



1. Stock Report button it contains the history of stocking of inventory
2. Print Inventory button to print all reports in the inventory
3. Add new Item button to create new item in inventory list
4. Buttons for all transactions in the Inventory Management
5. Search bar for inventory items
6. Drop down selector to the status
7. Clear buttons for the search and status
8. Add stock button that contains current stock, quantity input field, new total display, notes, cancel button and add stock button.
9. Edit button. One of the action buttons
10. Delete button. One of the action buttons

Click **Medicine Dispensing** button to go to the Medicine Dispensing interface

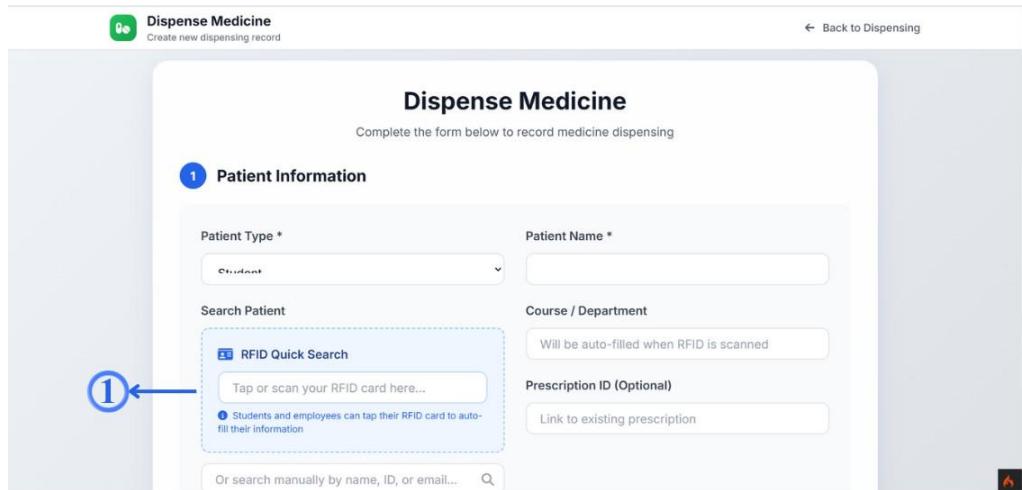




The screenshot shows the 'Medicine Dispensing Management' interface. At the top right, there are links for 'Medical Forms', 'Inventory', and 'Back to Admin'. On the right, a 'Quick Actions' panel contains five buttons: '+ New Dispensing' (A), 'View Reports' (B), 'Print Report' (C), 'Download PDF' (D), and 'View All History' (E). Below the quick actions are four summary cards: 'RECENT DISPENSINGS' (10 transactions), 'LOW STOCK ALERTS' (0 alerts), 'ACTIVE MEDICINES' (1 active), and 'ACTIVE DAYS' (0 days). At the bottom left is a 'Recent Dispensing History' section.

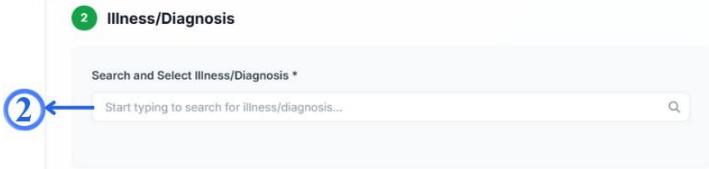
- A. New Dispensing button
- B. View Reports button
- C. Print Report button
- D. Download PDF button
- E. View all History button

When you click letter A. **New Dispensing** button the interface is this:



The screenshot shows the 'Dispense Medicine' form. At the top, it says 'Dispense Medicine' and 'Create new dispensing record'. On the right, there is a 'Back to Dispensing' link. The form has a header '1 Patient Information'. It includes fields for 'Patient Type *' (dropdown: Student), 'Patient Name *' (text input), 'Search Patient' (button: 'RFID Quick Search'), 'Course / Department' (text input), and 'Prescription ID (Optional)' (text input). A callout arrow labeled '1' points to the 'RFID Quick Search' button.

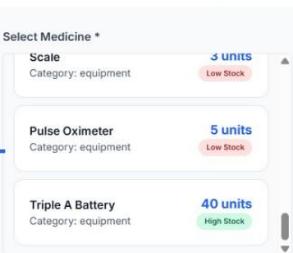
1. After the RFID tap of the patient this section would auto fill up the patient information to make the transaction more faster to dispense the medicine in a formal way to the patient



2 Illness/Diagnosis

Search and Select Illness/Diagnosis *

(2) Start typing to search for illness/diagnosis... 🔍



3 Medicine Selection

Select Medicine *

Scale Category: equipment	3 units Low Stock	Quantity to Dispense *
Pulse Oximeter Category: equipment	5 units Low Stock	Dosage *
Triple A Battery Category: equipment	40 units High Stock	Frequency *

(3) Scale (3 units, Low Stock)

(4) Available stock: Select a medicine first

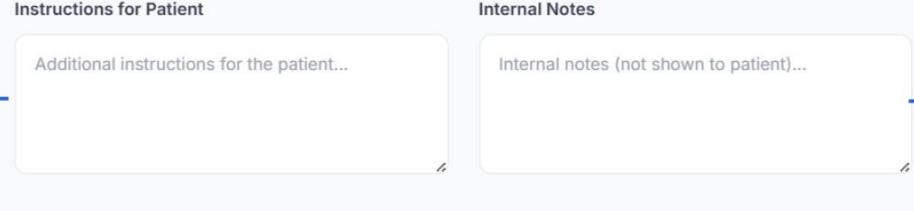
(5) e.g., 500mg, 1 tablet

(6) Select frequency

(7) Select duration

2. Search bar for types of diagnosis of the patient
3. Selection of medicine to dispose to the patient
4. Input field of quantity of medicine that will dispose
5. Input Dosage also to know
6. Input frequency
7. Input duration on how long did take that medicine

4 Additional Information



Instructions for Patient

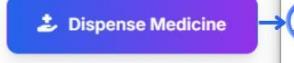
Additional instructions for the patient...

(8) Additional instructions for the patient...

Internal Notes

Internal notes (not shown to patient)...

(9) Internal notes (not shown to patient)...



← Cancel

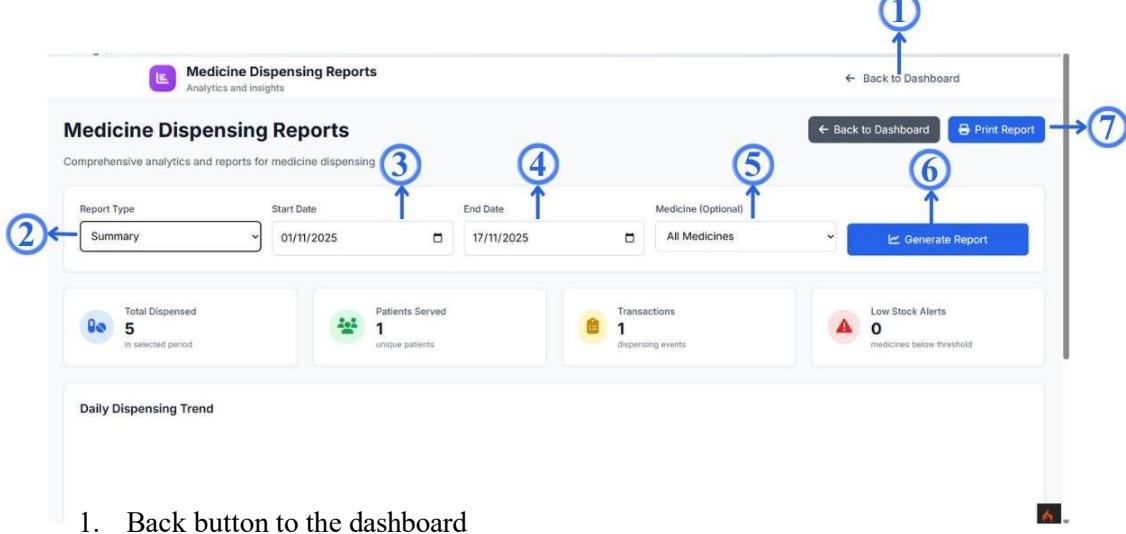
Dispense Medicine

(10) ← Cancel

(11) Dispense Medicine

8. Input field of instruction to the patient
9. Input the internal notes
10. Cancel button
11. Lasty, Dispense button

When you click letter B. **View Reports** button the interface is this:



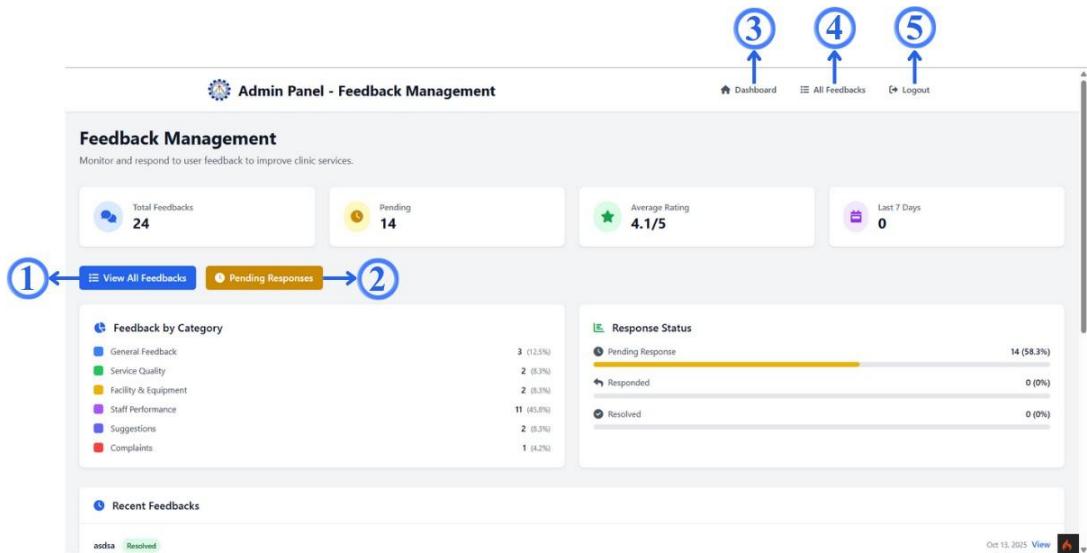
The screenshot shows the 'Medicine Dispensing Reports' interface. At the top, there's a header with the title 'Medicine Dispensing Reports' and a subtitle 'Analytics and insights'. Below the header is a search bar with dropdowns for 'Report Type' (set to 'Summary'), 'Start Date' (set to '01/11/2025'), 'End Date' (set to '17/11/2025'), and 'Medicine (Optional)' (set to 'All Medicines'). To the right of the search bar are two buttons: 'Generate Report' and 'Print Report'. The main area displays four summary cards: 'Total Dispensed' (5), 'Patients Served' (1), 'Transactions' (1), and 'Low Stock Alerts' (0). Below these cards is a section titled 'Daily Dispensing Trend'.

1. Back button to the dashboard
2. Dropdown button for the recent type
3. Selecting start date
4. Selecting end date
5. Dropdown button for medicine
6. Button to generate the reports in medicine
7. Print button to directly print the reports in medicine

Click **Feedback Management** button to go to the Feedback Management interface



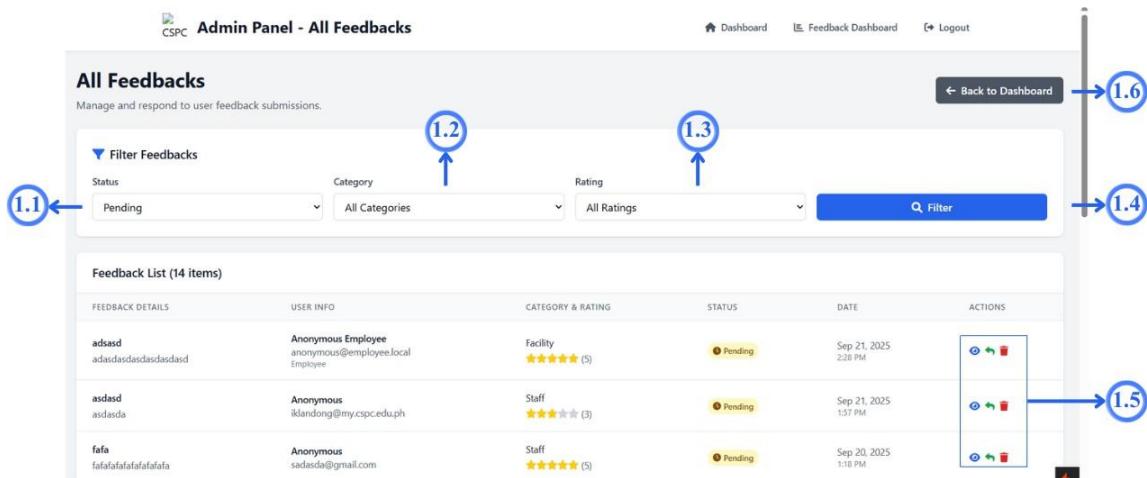
The screenshot shows the 'Feedback Management' interface. On the left is a sidebar with a navigation menu under 'MedSystem Admin Portal'. The menu items include 'Dashboard', 'Medical Documents', 'Appointments', 'Medical Forms', 'Add Events', 'Inventory', 'Medicine Dispensing', 'Feedback Management' (which is highlighted with a blue arrow), and 'RFID LOGS'. Below the menu is a section labeled 'ANALYTICS'. The main content area is titled 'Dashboard' and shows 'Admin > Dashboard'. It features a 'Healthcare Analytics Overview' section with four cards: 'Total Users Registered' (21), 'Today's Appointments' (0), 'Medical Forms Processed' (0), and 'Inventory Status' (76.5%). Below this is an 'Advanced Analytics Insights' section with four metrics: 'Services This Month' (0), 'Completion Rate' (0%), 'Satisfaction Score' (94.2%), and 'Avg Wait Time' (12 min). A green button at the bottom right says 'Accomplishment Report'.



The screenshot shows the Admin Panel - Feedback Management interface. At the top, there are four cards: Total Feedbacks (24), Pending (14), Average Rating (4.1/5), and Last 7 Days (0). Below these are two main sections: 'Feedback by Category' and 'Response Status'. The 'Feedback by Category' section shows counts for General Feedback, Service Quality, Facility & Equipment, Staff Performance, Suggestions, and Complaints. The 'Response Status' section shows Pending Response (14, 58.3%), Responded (0, 0%), and Resolved (0, 0%). At the bottom, there's a 'Recent Feedbacks' section with a 'View All' button and a timestamp of Oct 13, 2025.

1. View all Feedbacks button
2. Pending Responses button that will directly go to Pending responses
3. Back to the Dashboard button
4. Back to all feedbacks
5. Logout button

After clicking the 1. View All Feedbacks it will directly go to this interface:



The screenshot shows the Admin Panel - All Feedbacks interface. It features a 'Filter Feedbacks' section with dropdowns for Status (Pending), Category (All Categories), and Rating (All Ratings), along with a 'Filter' button. The main area displays a 'Feedback List (14 items)' table with columns for FEEDBACK DETAILS, USER INFO, CATEGORY & RATING, STATUS, DATE, and ACTIONS. The table lists three feedback entries. At the bottom right, there's a 'Back to Dashboard' button.

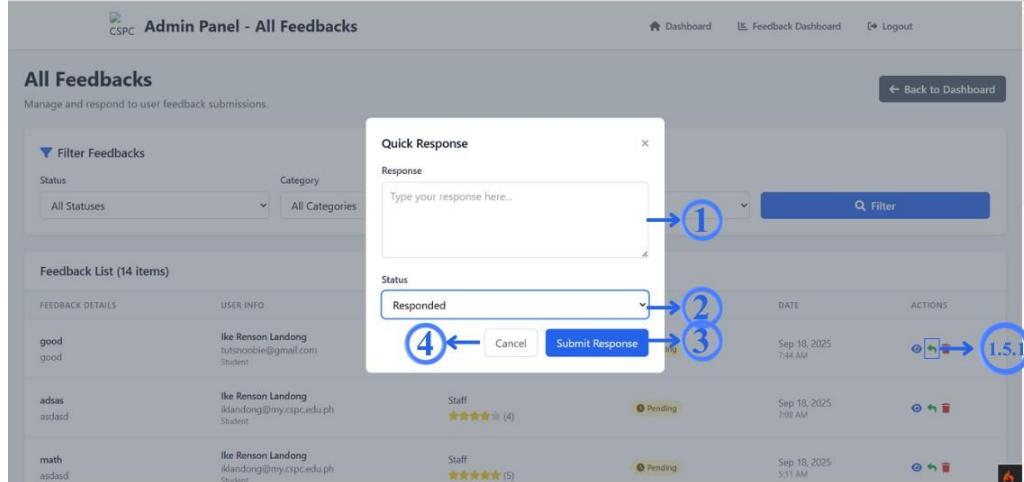
- 1.1 Dropdown button to select the different status
- 1.2 Dropdown button to select what category of the feedback
- 1.3 Dropdown button to select what rating
- 1.4 Back to Dashboard button
- 1.5 Actions button for selected row
- 1.6 Back to Dashboard button

1.4 Filter button to apply the status, category and rating.

1.5 Actions button of every feedback

1.6 Back to the dashboard button

In all feedbacks interface when you click one of the action buttons. The middle one like the arrow it will pop up a dialog box that quick response to the feedback.

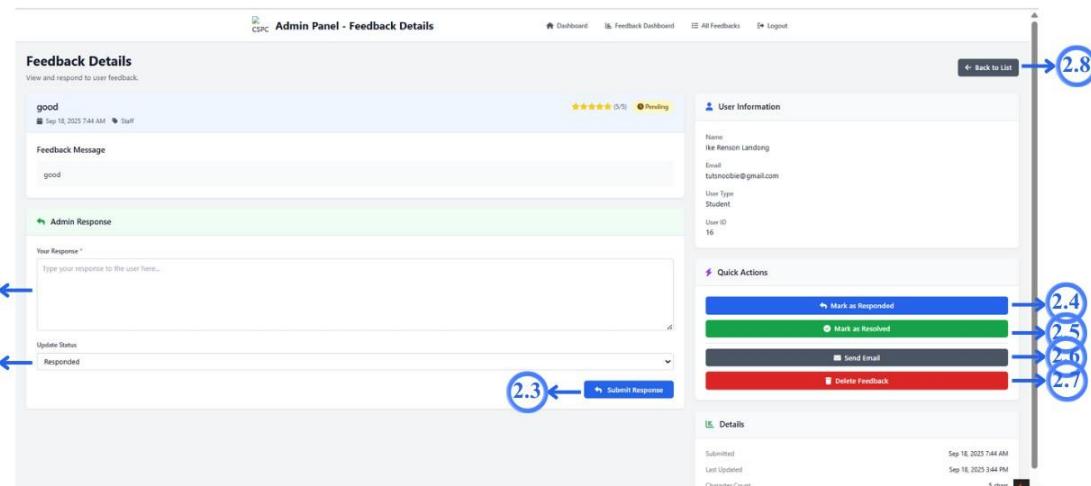


The screenshot shows the 'Admin Panel - All Feedbacks' page. On the left, there's a sidebar with a 'Filter Feedbacks' section containing dropdowns for 'Status' (set to 'All Statuses') and 'Category' (set to 'All Categories'). Below this is a 'Feedback List' table with 14 items. The first item in the list has a status of 'good' and a user info row for 'ike Renson Landong'. A 'Quick Response' dialog box is overlaid on the page, containing a text input field labeled 'Response' with the placeholder 'Type your response here...', a 'Status' dropdown set to 'Responded', and two buttons: 'Cancel' and 'Submit Response'. Blue numbered arrows point to specific elements: 1 points to the 'Response' input field; 2 points to the 'Status' dropdown; 3 points to the 'Submit Response' button; 4 points to the 'Cancel' button. To the right of the dialog, another numbered arrow 1.5.1 points to the 'Actions' column for the same feedback item.

1.5.1 Quick response button

1. Input field of response to the client
2. Dropdown box to put the status
3. Submit Response button
4. Cancel button

On the other hand if you click the eye button this be the page



The screenshot shows the 'Admin Panel - Feedback Details' page. At the top, there's a 'Feedback Details' section with a message 'View and respond to user feedback.' Below it is a 'Feedback Message' area containing the text 'good'. To the right, there's a 'User Information' panel with details for 'ike Renson Landong' (Email: tutu newbie@gmail.com, User Type: Student, User ID: 16). Further down is a 'Quick Actions' panel with four buttons: 'Mark as Responded' (blue), 'Mark as Resolved' (green), 'Send Email' (grey), and 'Delete Feedback' (red). Blue numbered arrows point to various elements: 2.1 points to the 'Your Response' input field; 2.2 points to the 'Update Status' dropdown set to 'Responded'; 2.3 points to the 'Submit Response' button; 2.4 points to the 'Mark as Responded' button; 2.5 points to the 'Mark as Resolved' button; 2.6 points to the 'Send Email' button; and 2.7 points to the 'Delete Feedback' button. At the very top right, there's a 'Back to List' button.

2.1 Input field of response to the client

2.2 Dropdown box to put the status

2.3 Submit Response button

2.4 Mark as Respond button

2.5 Mark as Resolve button

2.6 Send Email button

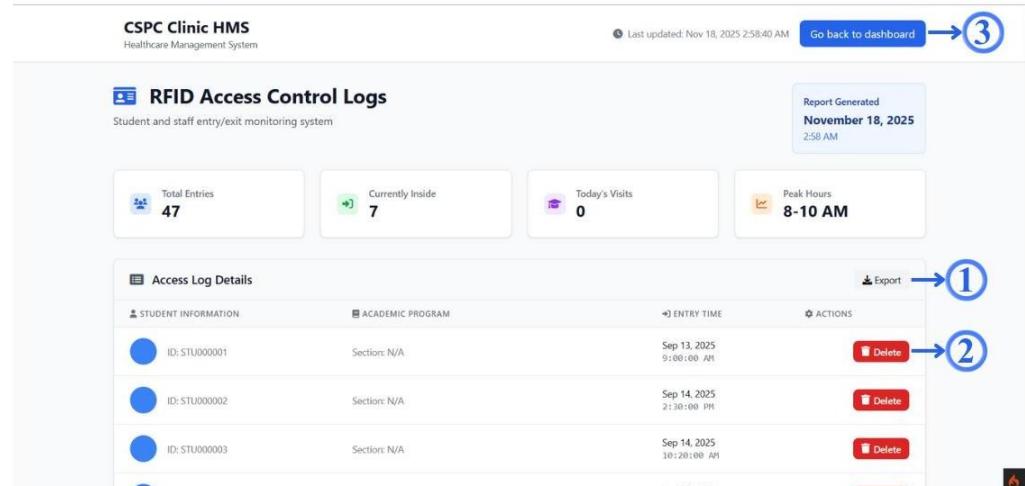
2.7 Delete Feedback

2.8 Back to the dashboard button

Click **RFID LOGS** button to go to the RFID LOGS interface



The screenshot shows the MedSystem Admin Portal Dashboard. On the left, there's a sidebar with a 'MAIN MENU' containing 'Dashboard', 'Medical Documents', 'Appointments', 'Medical Forms', 'Add Events', 'Inventory', 'Medicine Dispensing', and 'Feedback Management'. Below this is a 'RFID LOGS' button with a blue arrow pointing to it. The main content area has two sections: 'Healthcare Analytics Overview' and 'Advanced Analytics Insights'. The 'Healthcare Analytics Overview' section includes four cards: 'Total Users Registered' (21), 'Today's Appointments' (0), 'Medical Forms Processed' (0), and 'Inventory Status' (76.5% with an alert). The 'Advanced Analytics Insights' section displays metrics: 'Services This Month' (0), 'Completion Rate' (0%), 'Satisfaction Score' (94.2%), and 'Avg Wait Time' (12 min). A green button labeled 'Accomplishment Report' is also present.



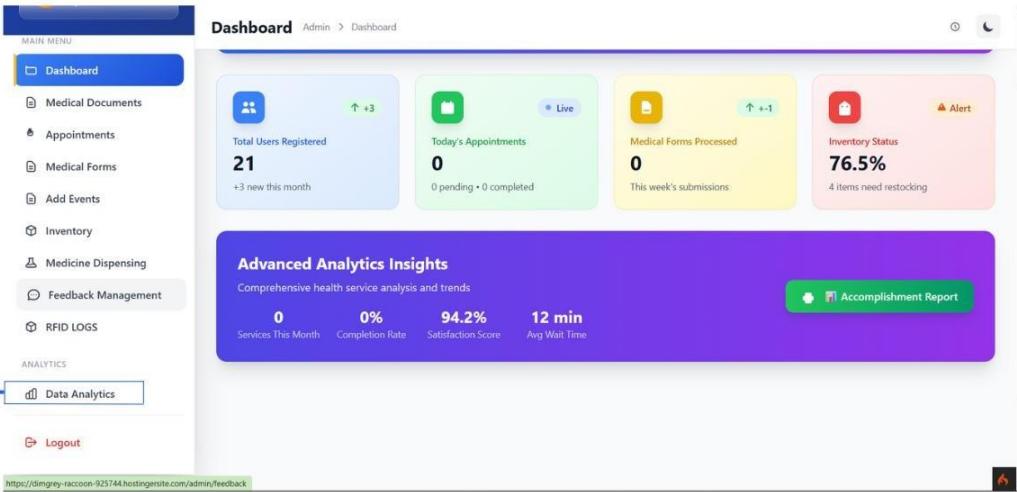
The screenshot shows the CSPC Clinic HMS RFID Access Control Logs interface. At the top, it says 'CSPC Clinic HMS Healthcare Management System' and 'Last updated: Nov 18, 2025 2:58:40 AM'. There's a 'Go back to dashboard' button with a circled '3'. Below that, it says 'Report Generated November 18, 2025 2:58 AM'. The main area is titled 'RFID Access Control Logs' and describes it as a 'Student and staff entry/exit monitoring system'. It shows summary statistics: 'Total Entries' (47), 'Currently Inside' (7), 'Today's Visits' (0), and 'Peak Hours' (8-10 AM). Below this is a table titled 'Access Log Details' with columns for 'STUDENT INFORMATION', 'ACADEMIC PROGRAM', 'ENTRY TIME', and 'ACTIONS'. Three rows of data are shown:

STUDENT INFORMATION	ACADEMIC PROGRAM	ENTRY TIME	ACTIONS
ID: STU000001	Section: N/A	Sep 13, 2025 9:00:00 AM	→ 2
ID: STU000002	Section: N/A	Sep 14, 2025 2:30:00 PM	
ID: STU000003	Section: N/A	Sep 14, 2025 3:00:00 PM	

RFID Access Control Logs interface consists of:

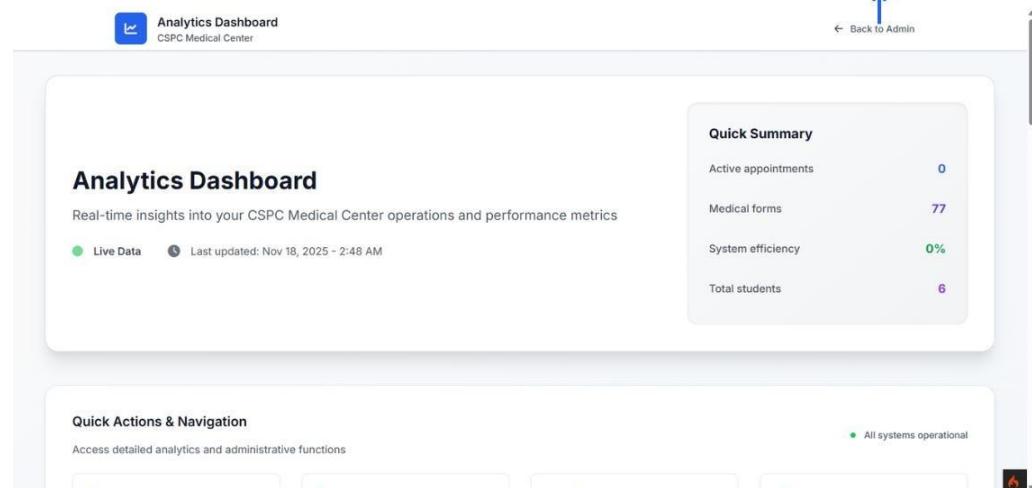
1. Export button that will download the access log details
2. Delete button which is the only action button
3. Back to the dashboard button

Click DATA ANALYTICS button to go to the DATA ANALYTICS interface



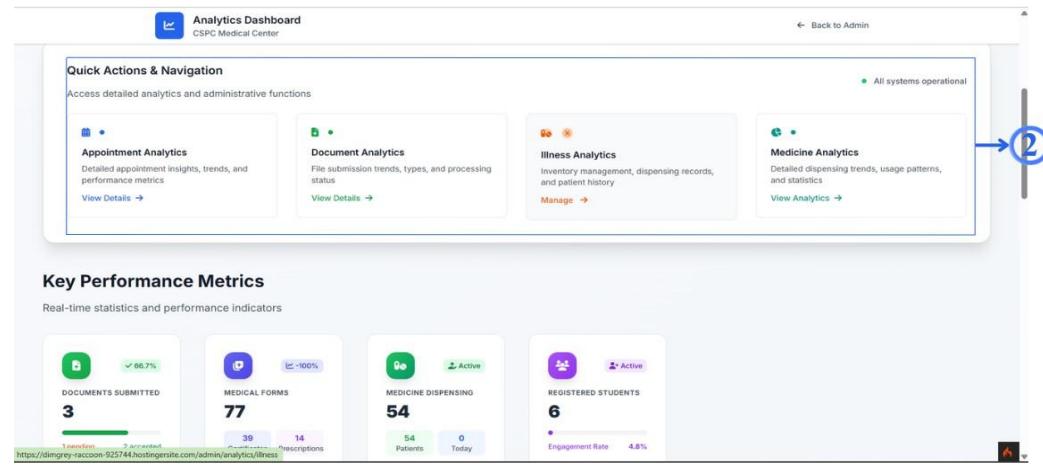
The screenshot shows a web-based dashboard titled "Dashboard" under "Admin > Dashboard". The left sidebar includes links for Medical Documents, Appointments, Medical Forms, Add Events, Inventory, Medicine Dispensing, Feedback Management, and RFID LOGS. A blue arrow points from the "Data Analytics" link in the sidebar to the main content area. The main area displays four cards: "Total Users Registered" (21), "Today's Appointments" (0 pending), "Medical Forms Processed" (0), and "Inventory Status" (76.5% restocked). Below these is a purple box titled "Advanced Analytics Insights" containing metrics: "Services This Month" (0), "Completion Rate" (0%), "Satisfaction Score" (94.2%), and "Avg Wait Time" (12 min). A green button labeled "Accomplishment Report" is visible.

This is the Dashboard of Data Analytics in Health Management System.



The screenshot shows the "Analytics Dashboard" for "CSPC Medical Center". It features a "Quick Summary" section with metrics: Active appointments (0), Medical forms (77), System efficiency (0%), and Total students (6). Below this is a "Analytics Dashboard" header with a "Live Data" indicator and a timestamp of "Last updated: Nov 18, 2025 - 2:48 AM". A blue arrow labeled "1" points from the "Back to Admin" link at the top right to the "Back to Admin" link in the top right corner of the dashboard. A "Quick Actions & Navigation" bar is shown below, with a green "All systems operational" status indicator.

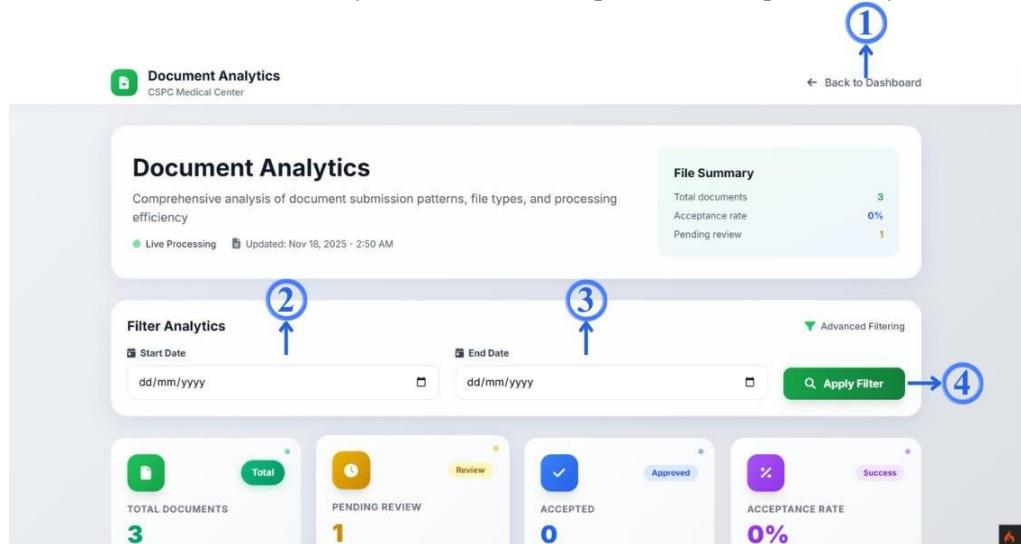
1. Back to the admin dahsboard



The screenshot shows the "Analytics Dashboard" for "CSPC Medical Center". It features a "Quick Actions & Navigation" bar with four sections: Appointment Analytics, Document Analytics, Illness Analytics, and Medicine Analytics. A blue arrow labeled "2" points from the "View Details" link in the Medicine Analytics section to the "View Details" link in the same section. Below this is a "Key Performance Metrics" section with four cards: DOCUMENTS SUBMITTED (3 submitted, 2 accepted, 66.7%), MEDICAL FORMS (77 pending, -100%), MEDICINE DISPENSING (54 patients, 0 today, Active), and REGISTERED STUDENTS (6 students, Engagement Rate 4.8%). A green "All systems operational" status indicator is present.

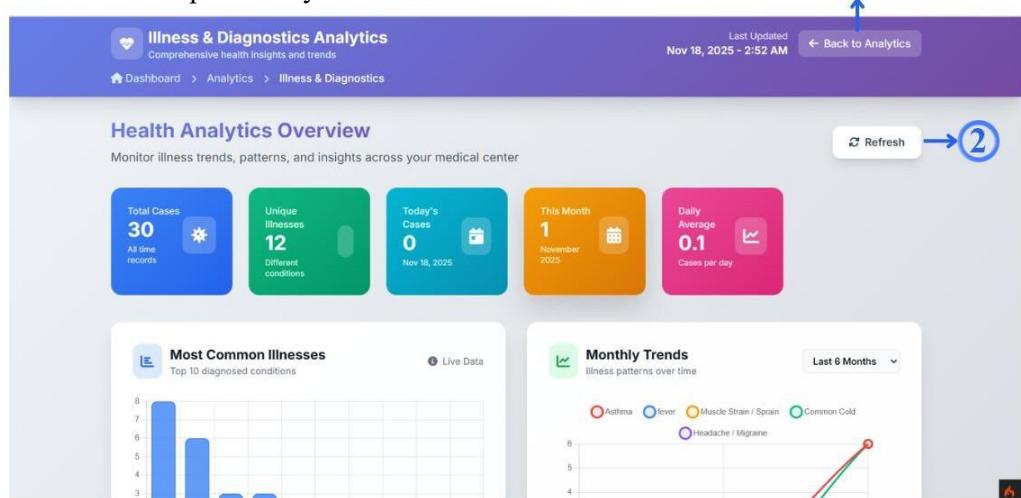
2. Quick Actions & Navigations to the Analytics

This is the Document Analytics dashboard composed of Descriptive Analytics and Filter



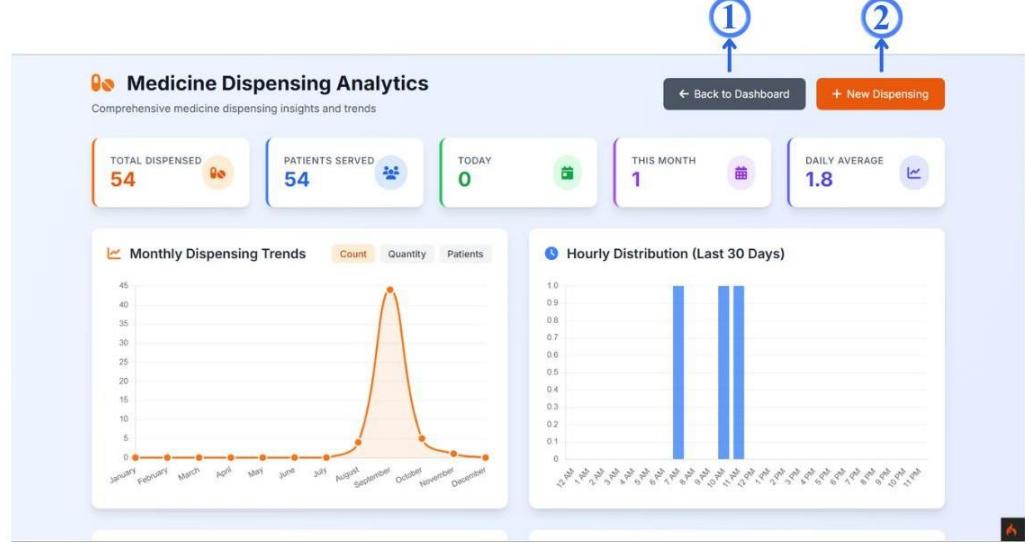
1. Back to the dashboard button
2. Input of start date want to filter
3. Input end date want to filter
4. Then, click the apply filter button

This is the Illness & Diagnostic Analytics in the health management system composed of descriptive analytics.



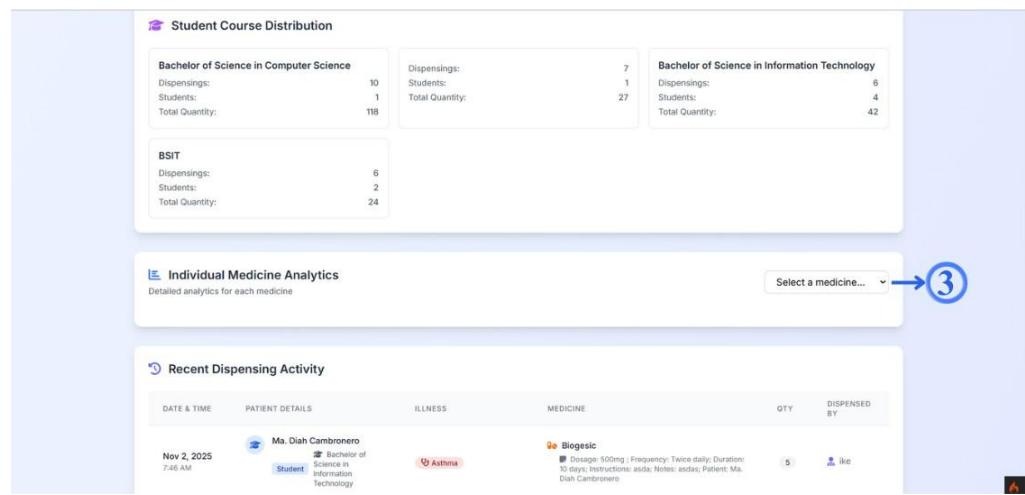
1. Back to the dashboard button
2. Refresh button of the interface

Medicine Dispensing Analytics interface that consist also the graphs of the data from the patients.



1. Back to the dashboard button
2. New Dispensing Button to create new dispense medicine to the patient

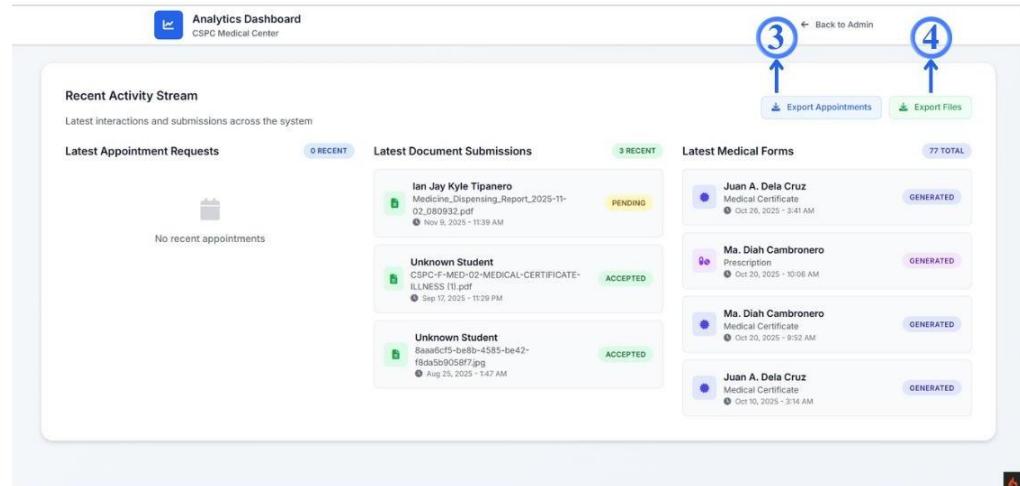
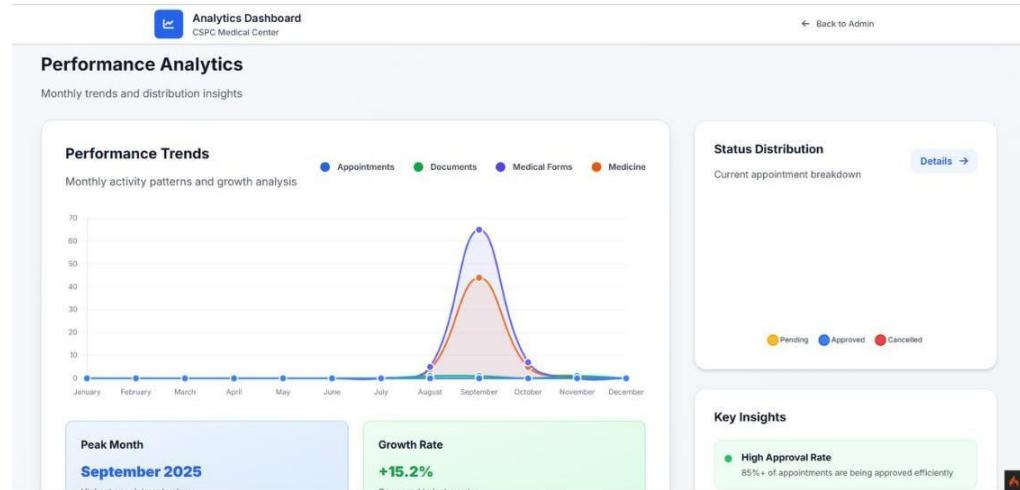
One of the interfaces on the dashboard of Data Analytics module.



3. Dropdown box to select medicine to view the detailed medicine analytics of the specific medicine

One of the interfaces on the dashboard of Data Analytics module.

It show all the Performance Trends in every month



3. Export Appointments button which means the data will be added in analytics

4. Export Files button to download the Files

APPENDIX B
DOCUMENTATION
Title Defense



This frame represents the project defense, which is a very critical experience with the panel. The proponents combined their skills with unflinching determination and the challenges of the examiners were overcome and the viability of our proposed Web- Based Health Management System was proven.



Researchers consult again to discuss what are their other needs or suggestions that will be put in the system



System consultation with head of the clinic and nurse to gain insights regarding the proposed system to improved functionality.



System consultation with consultant to gain more insights and suggestion to make the system user friendly and all the clients needs are in there.



The researchers consulted with the IT Experts. They provided technical details about how such a system would behave in various conditions, and how technical problems that the developers have experienced can be resolved.

System Testing for Employees



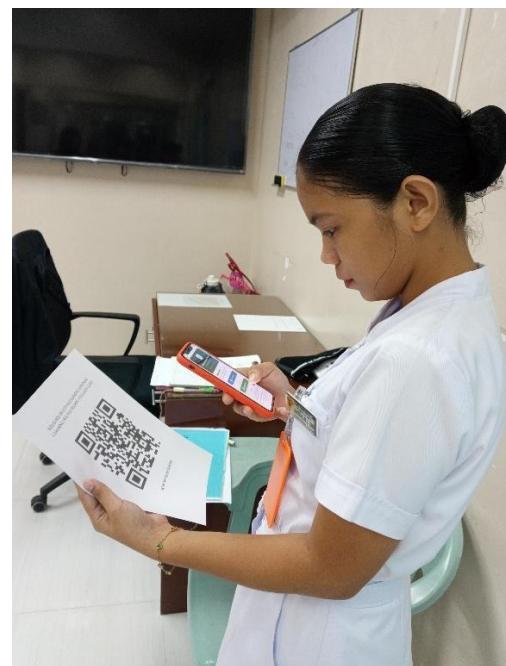
System Testing for Students

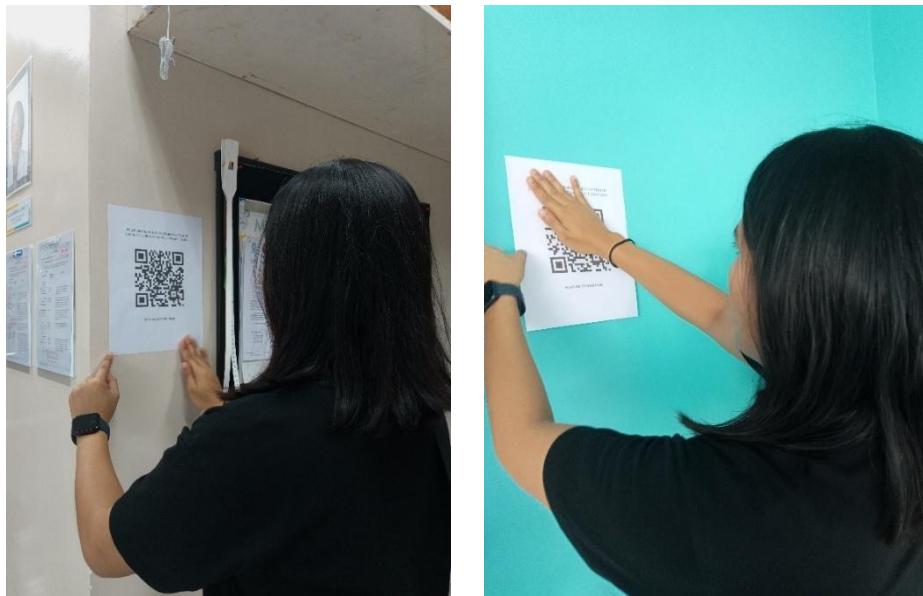




To test the functionality of the system as well as to do more iterations and optimization, a series of tests and real-time simulations were developed in cooperation with the target client.

Deployment





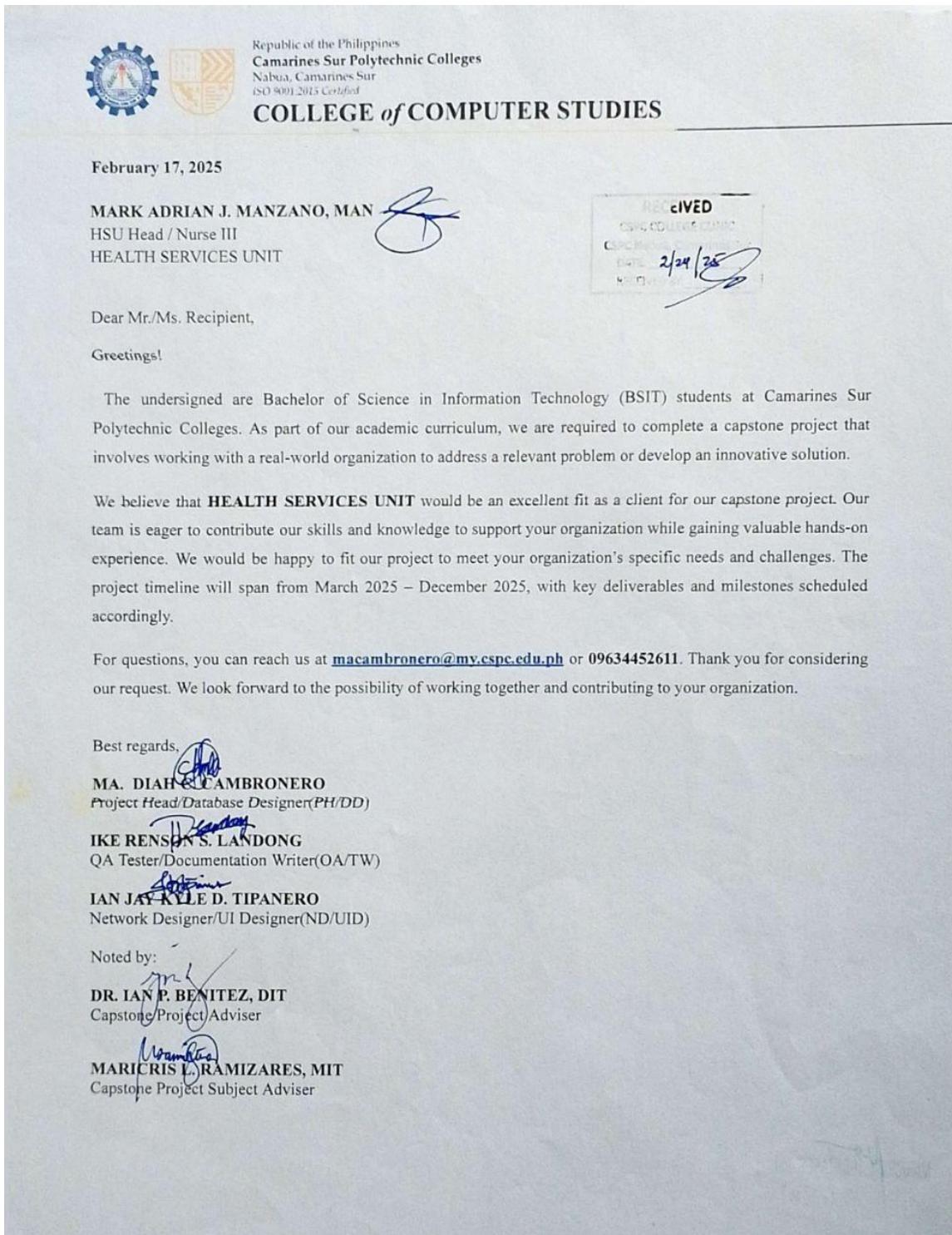


CLIENTS CLINIC OFFICE



Capstone Defended!

APPENDIX E
COMMUNICATION LETTERS



APPENDIX F

NON-DISCLOSURE AGREEMENT FORM

Non-Disclosure Agreement Form

EFFECTIVE DATE: February 28, 2025
(TD submission date)

This Agreement sets forth the terms and conditions under which confidential, proprietary and other private information shall be disclosed between the College of Computer Studies- Camarines Sur Polytechnic Colleges and **IAN P. BENITEZ, DIT** here in after referred to as "Expert."

By signing below, the parties acknowledge and accept the terms and conditions herein.

1. The Expert authorized to disclose and receive the confidential information is:
IAN P. BENITEZ, DIT
Capstone Project Adviser

On behalf of the College of Computer Studies- Camarines Sur Polytechnic Colleges:
MS. ROSEL O. ONESA, MIT
OIC Dean, CCS

2. The confidential information disclosed under this Agreement is described as:
Contents of the TCP by:

Cambronero, Ma. Diah G., Landong, Ike Renson S., Tipanero, Ian Jay Kyle D.

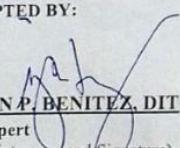
which is entitled:

Development of Health Management System with Data Analytics in Camarines Sur Polytechnic Colleges Clinic

3. The confidential information shall be used by the Expert only for the purpose of examination of TCP as part of the requirements of the Bachelor Program in which the student named above is enrolled.
4. This Agreement controls only confidential information, which is disclosed between the effective date and one year following the date of the TCP submission.
5. The obligations imposed upon an Expert hereunder shall apply only to information which at the time of disclosure is:
 - a. marked as confidential if such information is disclosed in a physical form as the content of the TCP named above, and the oral defense, if any, of this same TCP, or
 - b. if disclosed in some other form or manner is identified as confidential, and which identification is subsequently confirmed in a written notice delivered to the Expert specified in item 1 within thirty (30) days of disclosure.
6. The Expert agrees to take all action reasonably necessary to protect the confidentiality of the confidential information, including without limitation, implementing and enforcing operating procedures to minimize the possibility of unauthorized use or copying of the confidential information. Without limiting the foregoing, the Expert agrees to utilize the same degree of care, to avoid unauthorized disclosure or use of the confidential information of the discloser that the Expert would normally use with respect to its own confidential information.
7. The obligations imposed upon an Expert hereunder do not apply to information:

- a. which is or becomes publicly available without breach of this Agreement;
- b. which is already known to the Recipient prior to its disclosure hereunder;
- c. which is independently developed by the Expert.
8. The parties acknowledge that any technology, product or other intellectual property identified as confidential information and provided hereunder is provided on an "as is" basis without warranty of any kind whether express or implied and that the implied warranties of merchantability and fitness for a particular purpose are expressly disclaimed. In particular, the Expert shall not be liable for any direct, indirect, special or consequential damages in connection with or arising out of the performance or use of any portion of the confidential information.
9. Nothing in this Agreement shall be construed to preclude the Expert from using, marketing, licensing, and/or selling any independently developed technology, product or other intellectual property that is similar or related to the confidential information disclosed hereunder.
10. Neither Party:
 - a. acquires any intellectual property rights under this Agreement except the limited right to use the confidential information as specified in Paragraph 3;
 - b. has an obligation hereunder to purchase or otherwise acquire any service or item from the other;
 - c. has an obligation hereunder to commercially release any products or services using or incorporating the confidential information.
11. Upon the Camarines Sur Polytechnic Colleges written request, the Expert shall immediately return any Confidential Information and the physical media on which it was received or destroy all copies of the Confidential Information and certify in writing to the Camarines Sur Polytechnic Colleges that it has destroyed all copies made of the Confidential Information. Such certification shall be delivered within five (5) days of the Camarines Sur Polytechnic Colleges' request.
12. All modifications or amendments to this Agreement must be in writing and must be signed by both parties.
13. The parties are independent contractors and this Agreement does not establish any relationship of agency, partnership or joint venture.
14. This Agreement shall be governed by the laws of the Nabua, Camarines Sur and the laws of the Philippines therein.

ACCEPTED BY:


IAN P. BENITEZ, DIT
Expert
(Print name and Signature)

DATE: 02-28-2025

CAMARINES SUR POLYTECHNIC COLLEGES


MS. ROSEL O. ONESA, MIT
CSPC Representative
(Print name and Signature)

DATE 03/04/25

Non-Disclosure Agreement Form

EFFECTIVE DATE: March 3, 2024
(TD submission date)

This Agreement sets forth the terms and conditions under which confidential, proprietary and other private information shall be disclosed between the College of Computer Studies- Camarines Sur Polytechnic Colleges and PHILIP ALGER M. SERRANO, MIT hereinafter referred to as "Expert."

By signing below, the parties acknowledge and accept the terms and conditions herein.

1. The Expert authorized to disclose and receive the confidential information is:
PHILIP ALGER M. SERRANO, MIT
Capstone Project Consultant

On behalf of the College of Computer Studies- Camarines Sur Polytechnic Colleges:
MS. ROSEL O. ONESA, MIT
OIC DEAN, CSS

2. The confidential information disclosed under this Agreement is described as:
Contents of the TCP by:

Cambronero, Ma. Diah G., Landong, Ike Renson S., Tipanero, Ian Jay Kyle D.

which is entitled:

Development of Health Management System with Data Analytics in Camarines Sur Polytechnic Colleges Clinic

3. The confidential information shall be used by the Expert only for the purpose of examination of TCP as part of the requirements of the Bachelor Program in which the student named above is enrolled.
4. This Agreement controls only confidential information, which is disclosed between the effective date and one year following the date of the TCP submission.
5. The obligations imposed upon an Expert hereunder shall apply only to information which at the time of disclosure is:
 - a. marked as confidential if such information is disclosed in a physical form as the content of the TCP named above, and the oral defense, if any, of this same TCP, or
 - b. if disclosed in some other form or manner is identified as confidential, and which identification is subsequently confirmed in a written notice delivered to the Expert specified in item 1 within thirty (30) days of disclosure.
6. The Expert agrees to take all action reasonably necessary to protect the confidentiality of the confidential information, including without limitation, implementing and enforcing operating procedures to minimize the possibility of unauthorized use or copying of the confidential information. Without limiting the foregoing, the Expert agrees to utilize the same degree of care, to avoid unauthorized disclosure or use of the confidential information of the discloser that the Expert would normally use with respect to its own confidential information.
7. The obligations imposed upon an Expert hereunder do not apply to information:

- warranty of any kind whether express or implied and that the implied warranties of merchantability and fitness for a particular purpose are expressly disclaimed. In particular, the Expert shall not be liable for any direct, indirect, special, or consequential damages in connection with or arising out of the performance or use of any portion of the confidential information.
9. Nothing in this Agreement shall be construed to preclude the Expert from using, marketing, licensing, and/or selling any independently developed technology, product or other intellectual property that is similar or related to the confidential information disclosed hereunder.
10. Neither Party:
- a. acquires any intellectual property rights under this Agreement except the limited right to use the confidential information as specified in Paragraph 3;
 - b. has an obligation hereunder to purchase or otherwise acquire any service or item from the other;
 - c. has an obligation hereunder to commercially release any products or services using or incorporating the confidential information.
11. Upon the Camarines Sur Polytechnic Colleges written request, the Expert shall immediately return any Confidential Information and the physical media on which it was received or destroy all copies of the Confidential Information and certify in writing to the Camarines Sur Polytechnic Colleges that it has destroyed all copies made of the Confidential Information. Such certification shall be delivered within five (5) days of the Camarines Sur Polytechnic Colleges' request.
12. All modifications or amendments to this Agreement must be in writing and must be signed by both parties.
13. The parties are independent contractors, and this Agreement does not establish any relationship of agency, partnership or joint venture.
14. This Agreement shall be governed by the laws of the Nabua, Camarines Sur and the laws of the Philippines therein.

ACCEPTED BY:

**CAMARINES SUR POLYTECHNIC
COLLEGES**

PHILIP ALGER M. SERRANO, MIT

Expert
(Print name and Signature)

DATE: 03/03/2025

MS. ROSEL O. ONESA, MIT

CSPC Representative
(Print name and Signature)

DATE: 03/05/2025

APPENDIX G

JOINT AFFIDAVIT OF UNDERTAKING

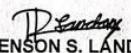
Joint Affidavit of Undertaking

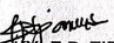
We, MA.DIAH G. CAMBRONERO, of legal age, single and a resident of MALAWAG, NABUA, CAMARINES SUR, IKE RENSON S. LANDONG, of legal age, single and a resident of DIVINA PASTORA, BATO, CAMARINES SUR, IAN JAY KYLE D. TIPANERO, of legal age, single and a resident of MASOLI, BATO CAMARINES SUR after having been sworn to in accordance with law, do hereby take oath and state :

- (i) That, we are officially enrolled for the thesis/capstone project on the topic titled WEB BASED HEALTH MANAGEMENT SYSTEM WITH DATA ANALYTICS AND RFID FOR CAMARINES SUR POLYTECHNIC COLLEGES CLINIC in the COLLEGE OF COMPUTER STUDIES of CAMARINES SUR POLYTECHNIC COLLEGES.
- (ii) That, the contents of our thesis/ capstone project submitted to the Camarines Sur Polytechnic Colleges, for award of BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY Degree are original and our own work, and is not plagiarized.
- (iii) That, if, after completing the thesis/ capstone project, are found copied or come under plagiarism, we will be solely responsible for it and College shall have sole right to cancel my research work ab-initio.
- (iv) That, this work has not been submitted for the award of any other Degree/Diploma in any other University/ Institute.
- (v) That, we shall be responsible for any legal dispute/case(s) for violation of any provisions of the Copyright Act relating to our thesis/ capstone project.

IN WITNESS WHEREOF, I have hereunto set my name this DEC 09 2025 day of 2025 in
NABUA, CAMARINES SUR, Philippines.


MA.DIAH G. CAMBRONERO
Affiant


IKE RENSON S. LANDONG
Affiant


IAN JAY KYLE D. TIPANERO
Affiant

SUBSCRIBED AND SWORN TO before me this DEC 09 2025 day of _____ at NABUA, CAMARINES SUR, Philippines, affiants exhibiting to me their competent proofs of identity above stated.

Doc. No. 107
Page No. 89
Book No. XV


ATTY. FEROZA ADELIA CASTRO SIMBULAN
NOTARY PUBLIC
Commission No. IR-174 valid until 31 December 2025
Roll of Attorneys No. 87451
PTR No. 3761925 / 01-06-2025 / Nabua, Camarines Sur
IBP No. 499309 / 01-06-2025 / Camarines Sur
2nd flr, Mequene Abe Commercial
San Francisco, Nabua, Camarines Sur, 4434

APPENDIX H

PROJECT TEAM ASSIGNMENT FORM

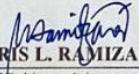
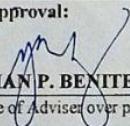
PROJECT TEAM ASSIGNMENTS FORM

Team Alias	Betta Splendens
Course Code	IT 3211
Subject adviser/ CaPSA	MARICRIS L. RAMIZARES, MIT

Name and Signature	Project Role	Email address and mobile#(s)
Ma.Diah Cambronero	Project Head/Database Designer (PH/DD) Software Engineer/Programmer(SE/P)	macambronero@my.cspe.edu.ph ph 09634452611
Ike Renson S. Landong	QA Tester/Documentation Writer(QA/TW) Software Engineer/Programmer(SE/P)	iklandong@my.cspe.edu.ph 09274982643
Ian Jay Kyle D. Tipanero	Network Designer/UI Designer(ND/UJD) Software Engineer/Programmer(SE/P)	iatipanero@my.cspe.edu.ph 09514979533

APPENDIX I

FINAL PROJECT TITLE FORM

FINAL PROJECT TITLE FORM	
Proponents/Researchers:	
1. Ma.Diah G. Cambronero 2. Ike Renson S. Landong 3. Ian Jay Kyle D. Tipanero	
Proposed Thesis/ Capstone Project Title:	
Web Based Health Management System with Data Analytics and RFID for Camarines Sur Polytechnic Colleges Clinic	
Submitted by:  MA. DIAH G. CAMBRONERO (Signature of Project Head over printed name)	Noted by:  MARICRIS L. RAMIZARES, MIT (Signature of Subject adviser over printed name)
Date: <u>08-29-2025</u>	Date: <u>09-02-2025</u>
Recommending Approval:  DR. IAN P. BENITEZ, DIT (Signature of Adviser over printed name)	Approved:  ROSEL O. ONESA, MIT OIC DEAN, CCS
Date: <u>08-29-2025</u>	Date: <u>9-2-2025</u>

APPENDIX J
CAPSTONE HEARING FORM (TD, POD, FOD)

CAPSTONE PROJECT HEARING FORM

Date Filed: April 23, 2025 Title Proposal Pre-Oral Final Oral

Date of Hearing: May 7, 2025 Time: 3:00 – 5:00 Venue: Open Laboratory

Department: **COLLEGE OF COMPUTER STUDIES (CCS)**

Research Title:

**DEVELOPMENT OF HEALTH MANAGEMENT SYSTEM WITH DATA ANALYTICS FOR
CAMARINES SUR POLYTECHNIC COLLEGES CLINIC**

Proponent/s:

MA.DIAH G. CAMBRONERO

IAN JAY KYLE D. TIPANERO

IKE RENSON S. LANDONG

Recommended by:

IAN P. BENITEZ, DIT
Capstone Project Adviser

CERTIFICATION

The undersigned members comprising the panel for oral examination hereby agree to the schedule of hearing for the above research.

JOCELLE B. MONREAL, DIT
PANEL MEMBER 1

JEREMY JIREH S. NEO
PANEL MEMBER 2

ICHELLE F. BALUIS, MSIT
PANEL CHAIR

NOTED BY:
MARICRIS L. RAMIZARES, MIT
Subject Adviser

APPROVED:
ROSEL O. ONESA, MIT
OIC Dean, CCS

APPENDIX K

PANEL RSC (TD, POD, FOD)



Republic of the Philippines
 Camarines Sur Polytechnic Colleges
 Nabua, Camarines Sur
 ISO 9001:2015 Certified
COLLEGE of COMPUTER STUDIES

Title : **Development of Health Management System with Data Analytics for Camarines Sur Polytechnic Colleges Clinic**
 Alias : BRANTA CANADENSIS
 Date : MAY 7, 2025, 3:00 PM – 5:00 PM TD POD FOD
 Secretary : JOHNMIR ISAAC

MANUSCRIPT			
CHAPTER	PAGE NO.	RECOMMENDATIONS, SUGGESTIONS AND COMMENT (RSC)	ACTION TAKEN
	QUESTIO NNAIRE	<ul style="list-style-type: none"> State what is the specific purpose of the questionnaire Who will be the respondents What SO will be addressed Revise based on new SO 	Created a new Test Cases Questionnaires for clients for SO3
		WEB BASED HEALTH MANAGEMENT SYSTEM WITH DATA ANALYTICS AND RFID FOR CAMARINES SUR POLYTECHNIC COLLEGES	Put as a new study title
		<ul style="list-style-type: none"> How this study differs with the study last 2021 entitled: CLINICAL RECORD MANAGEMENT AND CONSULTATION SCHEDULING SYSTEM 	The 2021 study focused on developing a web-based system to address the fundamental problems of manual record-keeping, consultation scheduling, and report generation at the CSPC clinic while this study have Data Analytics incorporates the use of descriptive analytics to examine patient data, retrieve health trends, monitor illnesses, and make decisions. The feature will enable the clinic to become more active in its health programs and services. The focus of the 2021 study was the production of simplified reports but not analysis of the data in search of patterns and RFID Technology includes Radio Frequency Identification (RFID) technology to ensure fast verification of identity and efficient retrieval of patient information. It is also a way of enabling doctors to track and show their real-time availability on calendars in the clinic with the help of RFID IDs. The study of 2021 did not refer to RFID technology or a doctor availability tracker.
1	1	<ul style="list-style-type: none"> Avoid personal pronoun (ALL CHAPTERS) Have citations Cite examples of organizations that implement digital transformation Cite the previous study about CSPC clinic Ensure present and future tense All stated facts should be supported by source/s 	Removed all personal pronoun, had citations, cited international study the Cleveland Clinic which uses telemedicine and local study this digital transformation the EHR, cited previous study about CSPC clinic in page 3, ensured present and future tense, all stated facts supported by source/s and already past tense.
	2	<ul style="list-style-type: none"> Remove irrelevant context of the project Cite existing study 2021 	Removed all irrelevant context of the project and cited the existing study of 2021 in pages 3.
	4	<ul style="list-style-type: none"> Emphasize the uniqueness of the project 	Emphasized the uniqueness of the project that doesn't have the previous study.
	5	<ul style="list-style-type: none"> Specific objective 	Changed and created new specific objectives according to the RSC


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 Nabua, Camarines Sur
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COLLEGE of COMPUTER STUDIES

		<ul style="list-style-type: none"> ○ Verify appointment procedures & substantial reports needed for health management ○ Develop a web-based health management system with the ff modules: (update modules listed) ○ Evaluate the system performance using black box testing based on the following: ○ Deploy the Health management system with data analytics in camarines sur polytechnic colleges 	
	7	Scope and Limitation <ul style="list-style-type: none"> • Include IT Field • Consider the SO of the project in writing the scope • Do not focus on the system development only 	Enhanced scope and limitations it includes the RSC of the panels.
	8	Project Dictionary <ul style="list-style-type: none"> • Improve operational definition, make it more specific to the study 	Improved operational definition, maked it more specific to the study.
2	16	<ul style="list-style-type: none"> • “Implementing Health Management System” 	Changed and created Implementing Health Management System
	19	“Roles of Data Analytics in Health Management” <ul style="list-style-type: none"> • Update (Focus on health management) 	Updated and focus on health management
		<ul style="list-style-type: none"> • Add RL's based on RFID & SMS 	Added RL's of RFID and SMS and it spell out the meaning
	22	<ul style="list-style-type: none"> • Include literature about tools/platform that can be used for: <ul style="list-style-type: none"> ○ Unit testing ○ Usability testing ○ Performance testing ○ Security testing 	Included the literatures about tools the 2.1.8 Testing Tools Literatures in page 30.
	28	Synthesis <ul style="list-style-type: none"> • Synthesize the literature for each topic after the synthesis for a topic, relate it to the current study, the similarities and differences 	Synthesized the literature for each topic and relates it to the current study, the similarities and differences.
	30	Gap <ul style="list-style-type: none"> • 1st par: relevant to the RL's, what is the gap? • 2nd par: how this project/study will fill the gap? 	Revised the Gap Bridged of the Study, put the gap and how this study filled the gap.
3	43-44	Flowchart <ul style="list-style-type: none"> • Introductory statement • Enhance image • Figure label 	Have introductory statement, revised the flowchart
	46	Architectural diagram <ul style="list-style-type: none"> • Introductory statement 	Have introductory statement, changed the background

SOFTWARE PROGRAM

MODULE NO. (DFD)	RECOMMENDATIONS, SUGGESTIONS, AND COMMENTS (RSC)	ACTION TAKEN
	REVISE MODULES AND FUNCTIONS OF USERS	
	<ul style="list-style-type: none"> • Use RFID for information / data access (also for doctor in/out to view availability • Medical certificate request 	All RSC in software program have created.



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Nabua, Camarines Sur
ISO 9001:2015 Certified
COLLEGE of COMPUTER STUDIES

- | | | |
|--|---|--|
| | <ul style="list-style-type: none">• Print forms• Have report generation• Users will be notified via SMS | |
|--|---|--|

NOTED BY:

ICHELLE F. BALUIS, MSIT
PANEL, CHAIRMAN

JOCELLE B. MONREAL, DIT
PANEL, MEMBER 1

JEREMY JIREH S. NEO
PANEL, MEMBER 2

APPENDIX L

CONSULTATION LOG FORM

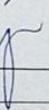
CONSULTATION LOGS FORM

Capstone Project Title:	Web Based Health Management System with Data Analytics and RFID for Camarines Sur Polytechnic Colleges Clinic						
Proponents:	Ma.Diah G. Cambronero Ike Renson S. Landong Ian Jay Kyle D. Tipanero						
Alias:	Branta Canadensis						
Total # of Modules:	8			as approved by the CAPSA /TSA:			
PROTOTYPE	Date of Consultation	# of Modules Fully Implemented	# of Modules Partially Implemented	Running Score	Percentage	Project Manager's Signature	CAPA/CAPSA/ Consultant/ Grammarians Signature
System	9/18/25	8	7	95%	95%		
	Remarks:						
	<ul style="list-style-type: none"> - No Schedule Appointment - VDO log out - Good to Go 						
Deadline: September 2, 2025							

CONSULTATION LOGS FORM

Capstone Project Title:	Development of Health Management System with Data Analytics for Camarines Sur Polytechnic Colleges Clinic						
Proponents:	Ma. Diah G. Cambonero Ike Renson S. Landong Ian Jay Kyle D. Tipanero						
Alias:	Branta Canadensis						
Total # of Modules:				as approved by the CAPSA /TSA:	<i>IAN P. BENITEZ, DIT</i>		
PROTOTYPE	Date of Consultation	# of Modules Fully Implemented	# of Modules Partially Implemented	Running Score	Percentage	Project Manager's Signature	CAPA/CAPSA/ Consultant/ Grammarians Signature
Chapter 1	<i>2-28-25</i>					<i>[Signature]</i>	<i>[Signature]</i>
	Remarks: <i>& revise Intro based on Adviser's suggestion & move some contents to methods & results later</i>						
Deadline: March 2, 2025							
Chapter 1							
	Remarks:						
Deadline: March 2, 2025							

CONSULTATION LOGS FORM

Capstone Project Title:	Development of Health Management System with Data Analytics for Camarines Sur Polytechnic Colleges Clinic.						
Proponents:	Ma.Diah G. Cambronero Ike Renson S. Landong Ian Jay Kyle D. Tipanero						
Alias:	Branta Canadensis						
Total # of Modules:				as approved by the CAPSA /TSA:		DR. JAN P. BENITEZ	
PROTOTYPE	Date of Consultation	# of Modules Fully Implemented	# of Modules Partially Implemented	Running Score	Percentage	Project Manager's Signature	CAPA/CAPSA/ Consultant/ Grammarian Signature
Chapter 2	03 - 10 - 2014						
	Remarks: <i>Revise synthesis</i>						
Deadline: March 10, 2025							
Chapter 2							
	Remarks:						
Deadline: March 10, 2025							

CONSULTATION LOGS FORM

Capstone Project Title:	Development of Health Management System with Data Analytics for Camarines Sur Polytechnic Colleges Clinic						
Proponents:	Ma.Diah G. Cambronero Ike Renson S. Landong Ian Jay Kyle D. Tipanero						
Alias:	Branta Canadensis						
Total # of Modules:				as approved by the CAPSA /TSA:			
PROTOTYPE	Date of Consultation	# of Modules Fully Implemented	# of Modules Partially Implemented	Running Score	Percentage	Project Manager's Signature	CAPA/CAPSA/ <u>Consultant/</u> Grammarians Signature
Chapter 3	9/21/28						
	Remarks:	<ul style="list-style-type: none"> - Functionality missing for Software Requirements - Functional requirements doesn't contain all processes at Cap C Clinic 					
Deadline: April 15, 2025							
Chapter 3							
	Remarks:						
Deadline: April 15, 2025							

CONSULTATION LOGS FORM

Capstone Project Title:	Web Based Health Management System with Data Analytics and RFID for Camarines Sur Polytechnic Colleges Clinic						
Proponents:	Ma.Diah G. Cambronero Ike Renson S. Landong Ian Jay Kyle D. Tipanero						
Alias:							
Total # of Modules:				as approved by the CAPSA /TSA:			
PROTOTYPE	Date of Consultation	# of Modules Fully Implemented	# of Modules Partially Implemented	Running Score	Percentage	Project Manager's Signature	CAPA/CAPSA/ Consultant/ Grammarian Signature
Chapter 4	8-29-2025						
Remarks: <i>* Rewrite your chap 4 -5 be Result-oriented, not method-oriented. Instead of showing how it was done, show the result. The method should be in chap 3</i>							
Deadline: August 29, 2025							



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CONSULTATION LOGS FORM

Capstone Project Title:	Web Based Health Management System with Data Analytics and RFID for Camarines Sur Polytechnic Colleges Clinic						
Proponents:	Ma.Diah G. Cambronero Ike Renson S. Landong Ian Jay Kyle D. Tipanero						
Alias:	Branta Canadensis						
Total # of Modules:				as approved by the CAPSA /TSA:			
<ul style="list-style-type: none"> • FOD Manuscript (Chapter 1 – 5 with preliminary pages, bibliograph, appendices, and curriculum vitae) • Certificate of Utilization • User Manual 	Date of Consultation	# of Modules Fully Implemented	# of Modules Partially Implemented	Running Score	Percentage	Project Manager's Signature	CAPA's Signature
	11/21/2023						
Remarks:							
FOD 100% completed and deployed system	Date of Consultation	# of Modules Fully Implemented	# of Modules Partially Implemented	Running Score	Percentage	Project Manager's Signature	Consultant's Signature
	4/26/23						
Remarks:							
<ul style="list-style-type: none"> - SMS Notification should not be after event creation. - Add /Edit Medicine - generic name, brand, huge, category, etc. Initial Stock - Add Stock in Medicine, should be separate - Add /Edit Inventory - hide /remove fields that are not relevant to the selected category. 							

CONSULTATION LOGS FORM

Capstone Project Title:	Web Based Health Management System with Data Analytics and RFID for Camarines Sur Polytechnic Colleges Clinic						
Proponents:	Ma.Diah G. Cambonero Ike Renson S. Landong Ian Jay Kyle D. Tipanero						
Alias:	Branta Canadensis						
Total # of Modules:				as approved by the CAPSA /TSA:			
<ul style="list-style-type: none"> • FOD Manuscript (Chapter 1 – 5 with preliminary pages, bibliograph, appendices, and curriculum vitae) • Certificate of Utilization • User Manual 	Date of Consultation	# of Modules Fully Implemented	# of Modules Partially Implemented	Running Score	Percentage	Project Manager's Signature	CAPA's Signature
Remarks:							
FOD 100% completed and deployed system	Date of Consultation	# of Modules Fully Implemented	# of Modules Partially Implemented	Running Score	Percentage	Project Manager's Signature	Consultant's Signature
	b6hrs						
Remarks:							
<p>- permanent dan </p>							



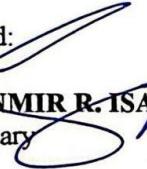
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APPENDIX M
SECRETARY CERTIFICATE

SECRETARY'S CERTIFICATION

This is to certify that the undersigned has provided true and correct recommendations, suggestions, and comments unanimously agreed and approved by the panel of examiners during the oral examination of the capstone project entitled "**WEB BASED HEALTH MANAGEMENT SYSTEM WITH DATA ANALYTICS AND RFID FOR CAMARINES SUR POLYTECHNIC COLLEGES CLINIC**" prepared and submitted by Ma.Diah G. Cambronero, Ike Renson S. Landong, and Ian Jay Kyle D. Tipanero and that the same have not been amended, modified or obliterated.

Signed:


JOHNMIR R. ISAAC
Secretary

Date signed: 1/14/20

GRAMMARIAN'S CERTIFICATION

This is to certify that the undersigned has reviewed and went through all the pages of the capstone project entitled "**WEB BASED HEALTH MANAGEMENT SYSTEM WITH DATA ANALYTICS AND RFID FOR CAMARINES SUR POLYTECHNIC COLLEGES CLINIC**" as against the set of structural rules that govern research writing in accord with the composition of *sentences, phrases, and words* in the English language.

Signed:

NEL FRANCIS B. BUENA, MLL
Grammariam

Date signed: _____

APPENDIX O
CERTIFICATE OF UTILIZATION



APPENDIX P

ACM FORMAT

WEB BASED HEALTH MANAGEMENT SYSTEM WITH DATA ANALYTICS AND RFID FOR CAMARINES SUR POLYTECHNIC COLLEGES CLINIC

Ma.Diah G. Cambronero

Camarines Sur Polytechnic Colleges, macambronero@my.cspc.edu.ph

Ike Renson S. Landong

Camarines Sur Polytechnic Colleges, iklandong@my.cspc.edu.ph

Ian Jay Kyle D. Tipanero

Camarines Sur Polytechnic Colleges, iatipnaero@my.cspc.edu.ph

ABSTRACT

The Web-Based Health Management System with Data Analytics and RFID for Camarines Sur Polytechnic Colleges Clinic is an essential digital solution for institutional setting that restricts services provision based on manual processes. This platform changes the way the CSPC clinic functions by transferring manual processes with significant labor needs like record processing, appointment booking, and health report creation are being transferred to a safe, digital system. The system aims to enhance daily clinic efficiency for students, employees and staff by eliminating manual inefficiencies, service delays, and inaccurate data. The system uses an Agile Scrum model of flexibility, which has an eight-module structure. The RFID module, Medical/Dental Record Management, Appointment with SMS Notification, and Data Analytics and Reporting modules are the essential elements. These elements make operations digital, increase the accessibility of the records, and offer clinic administrators with the necessary data-driven health insights. System testing was done through rigorous procedures that ensured the system was operational and secure. Unit Testing had a high rating of 0.97, and Usability Testing gave the highest score of 1.0. OWASP scored 0.98 on Security Testing and Performance Testing demonstrated that the system could support many simultaneous users with a small amount of delay. Deployed in a cloud environment, the system provides CSPC digitized services, improved data accuracy, and easier healthcare access. This health management system is a digital hub of institutional healthcare that has shown the use of technology in enhancing the quality of services, health outcomes, and overall institutional effectiveness.

CCS CONCEPTS • Health Information System • Web-Based Application • RFID • Data Analytics • Agile Software Development

Additional Keywords and Phrases: Web-Based System, Health Management, Data Analytics, RFID Technology, Medical Records, Appointment Scheduling, SMS Notification, Event and Calendar Management, Black Box Testing.

1 INTRODUCTION

The digital transformation has dramatically changed the face of the healthcare system in most parts of the world, and healthcare facilities have transitioned to electronic health records, telemedicine, and analytics-oriented models to enhance service delivery and efficiency in their administration. Although these changes have been made, the CSPC clinic still uses manual and paper-based operations that make the process of retrieving medical and dental records slow, hence inefficient in the scheduling of appointments, tracking doctor availability efficiently, and mismanagement of records. Such operating issues consequently impact on the quality and timeliness of healthcare services offered to the students and workforce negatively. Past studies in CSPC have already admitted such problems, but the scale of the solutions is still rather limited, as they do not include data analytics, RFID-based identity verification, doctor availability tracking, and automated SMS alerts, which are currently required to streamline the clinical workflow.

Besides these problems identified, present clinic operations have intrinsic flaws, such as the lack of centralized electronic data, the lack of access to real-time data, appointment system relying on physical presence, and the impossibility to study historic health tendencies to make informed decisions. Such constraints impose a massive technological and functional difference between old ways of doing things at the clinic and updated expectations of digital healthcare systems within the academic community. With the development of descriptive analytics, RFID technology, responsive web-interfaces, and automated scheduling systems to overcome these shortcomings, the study will fill this gap by offering a holistic, modernized, and data-driven health management solution to CSPC. In this project, the proposed system will not only

digitize the current processes but also increase efficiency in the operation, make the processes more accessible, and make healthcare services overall higher in the institution.

2 BACKGROUND

The suggested Web-Based Health Management System was created to solve the inefficiencies witnessed in CSPC clinic especially in medical and dental records, appointment handling and availability monitoring of the doctors. The system combines the major features of RFID-based digital logging, electronic medical and dental records, an appointment module with SMS notifications, a doctor availability tracker, and descriptive data analytics that help in making health-related decisions. Previous studies on web-based SMS appointment systems have shown that the use of SMS messages promotes a high level of efficiency in the scheduling process and less administrative workload [3]. In the meantime, local implementation research on eHealth in the Philippines also mentions the potential of implementing eHealth systems in low-resource environments and the obstacles present such as training, infrastructure, and readiness to use systems, among others [2][1]. The role of data analytics is becoming more central to the Philippine health sector: the talk at health-sector datathons and accounts by analytics vendors demonstrate how AI and predictive analytics can be used to shape both the policy and operational choices of the populace in the sphere of health [7]. System features, interoperability and sustainability are also a challenge of health information systems in the country as was examined in research of local HIS landscapes [4]. Moreover, the analyses of the EHR efficiency in the health facilities in the Philippines indicate not only positive care results but also the existing obstacles including data quality and privacy [5]. Systematic review evidence of the patient reminder systems demonstrate that reminders (such as SMS) may considerably decrease the missed appointments and enhance attendance [6]. Thus, the proposed system builds on the proven technologies, SMS reminders, EHR, web-based access, and analytics that would directly respond to the needs of the CSPC clinic in a contextually relevant manner.

3 METHODOLOGY

3.1 Software Development Methodology

The development of Web Based Health Management System with Data Analytics and RFID for CSPC Clinic used the Agile Scrum approach. It is an iterative and incremental approach and is therefore useful in meeting user needs and dealing with the changing system requirements. The process was split into short development cycles called sprints. Feedback was obtained regularly through sprint review and conversation with the clients. This enabled the team to optimize functionalities, address technical problems early and progressively enhance the system performance and usability. Such flexibility assisted in blending all the key elements and creating a stable and user-friendly platform which was developed to meet the requirements of CSPC Clinic.

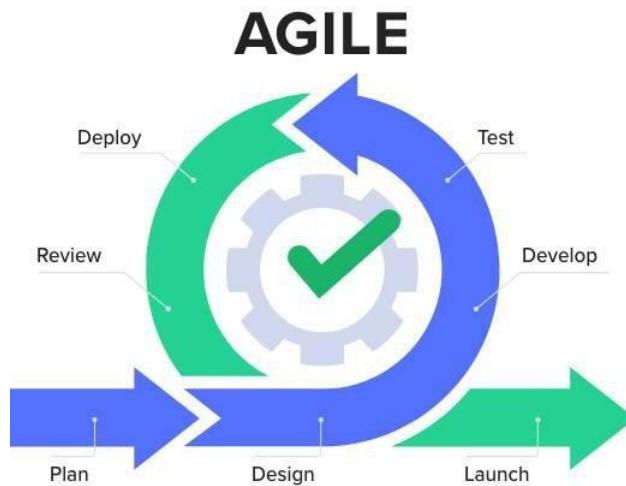


FIGURE 1: Scrum Agile Methodology Framework

3.1.1 Planning

During the Planning Phases, the researcher starts with planning stages in Scrum process. The first step in Scrum process is planning. It has a timed sprint planning meeting before each sprint. All members of the Scrum Team; the Product Owner plus the Scrum Master and the Development Team are in attendance. Sprint planning will involve deciding what items in the Product Backlog to tackle and how the work in the next sprint will be done. The researchers aimed at making

transactions in the school clinic easier among students, employees and clinic staff and they have approached it by making up of this research that we are addressing and writing about.

3.1.2 Design

During this phase, the developers produced a mock-up design for the Web Based Health Management System with Data Analytics and RFID for Camarines Sur Polytechnic Colleges Clinic. The design process which the mock-ups satisfied the client expectations and system requirements, the design process was accomplished, and the development team held meetings to finalize the system structure with the emphasis on the centralized administration and the operations at the branch level. Other key components of the design were forms, diagrams and reports. This step established the foundation towards the development of a system that could handle medical and dental records and downloadable forms, inventory, feedback and reports, events of calendar, data analytics, appointment with SMS and RFID logbook.

3.1.3 Development

The development phase involved iterative refinement as developers implemented the system according to the planned design, integrating key modules such as the RFID Logbook, Medical and Dental Records, Certificates and Forms, Appointments with SMS, Calendar Events, Inventory Management, and Data Analytics. The back end was built using PHP with the CodeIgniter framework for efficient, secure, and scalable operation, supported by a MySQL database to manage sensitive medical data. RFID technology and SMS gateway APIs were also incorporated to ensure seamless logging, notifications, and smooth communication across system components.

3.1.4 Sprint Review and Retrospective

The Sprint Review and Retrospective stage was aimed at assessing the deliverables of the system, enhanced the development process, and the system addressed the needs of CSPC Clinic. The Web-Based Health Management System with Data Analytics and RFID underwent thorough Blackbox testing, including unit, usability, performance, and security tests. Problems found were fixed to enhance the quality of the system and the ongoing consultation with the client offered sufficient feedback on functionality and performance. The iterative process of reviewing the system made it stay in touch with the requirements of the clinic and also fall to high levels of reliability and efficiency.

3.1.5 Deployment

The CSPC Clinic Web-Based Health Management System Data Analytics RFID was successfully implemented on Hostinger which offers a stable cloud platform that can be accessed by students, employees, and the clinic staff via any modern web browser without any local installation. Hostinger also took care of hosting, domain control, configuration of the SSL, and the provision of HTTPS, which provides secure data flow and stable network availability. The implementation enabled the system to be used through laptops, desktops, and smart phones to ensure that clinic services could be efficient and available to a wide range of people. The system link was officially distributed with the coordination of the Healthcare Services Unit Head, Mr. Mark Adrian J. Manzano. Though the RFID feature worked well, it was not fully implemented because the clinic did not have a dedicated workstation. Overall, its deployment proved that the system is now ready to be used in real-world practice, enhanced accessibility, and enhanced digital health management in the CSPC Clinic, albeit with some limitations in the usage of RFID.

3.2 Materials and Statistical Tools

3.2.1 Research Design

The current research is based on a mixed-method research design, and it is a combination of quantitative and qualitative methods to address the research goals in a comprehensive way. Quantitative methods which include semi-structured interviews that the researcher employed as a guideline that assisted in organizing the interviews and to have ensured that all the essential information was encompassed. Survey questionnaire was a qualitative method applied to collect specific data on the performance of the system such as functionality and usability of the system in the view of the end users.

3.2.2 Research Method

The data collection process was done in a sequence of steps. Firstly, the researcher obtained the permission of College Dean to undertake the study. After this, they designed and disseminated validated research materials such as interview guide and assessment questionnaire to the selected respondent, which comprised of CSPC Clinic and system user. The respondent tested and assessed the CSPC Clinic platform of Web Based Health Management System with Data Analytics and RFID. The feedback, with gathered data, was collected, counted and analyzed so as to determine the effectiveness of the system.

3.2.3 Instrument

The primary instrument used for data collection was a researcher developed instrument consisting of a semi structured interview guide and survey via questionnaire. These instruments were designed based on the objectives of the study to gather both qualitative and quantitative data that relevant to the development of Web Based Health Management System with Data Analytics and RFID for CSPC Clinic platform. The semi structured interview guide was utilized to gather information from CSPC Clinic regarding to their current challenges they encountered in managing their records, appointment, analytics, forms, event, feedback and reports.

The survey via questionnaire, on the other hand, was developed to obtain the quantitative data from system's users, including Admin/staff, students, and employee. It was designed to gauge their response concerning the usability, functionality and the overall user experience of the system.

3.2.4 Sampling Technique

The researcher used convenience sampling, where this approach involves the researcher select participants who are readily available and easy to reach, such as students and employees in the school. This available sample is used to gather data up until the required sample is reached, one of the important features being that it is not random in selection, thereby all members of the target population would not have one equal opportunity of being used as a member of this sample. By using of these methods, it guarantees that the findings of the study will be valid and reliable.

3.2.5 Respondents

Respondents play an essential role in providing a study with important insights and data. In Web Based Health Management System with Data Analytics and RFID for CSPC Clinic, admin/staff, students, employee, and IT expert each contribute essential feedback: admin/staff assess backend operation and workflow and also evaluate the system features, student and employee evaluates the features of the system from their functionality, usability, and IT expert evaluate the security of the system. Their combined views guarantee an abhorrent assessment of the systems functionality, usability, security and effectiveness.

3.2.6 Statistical Test

To analyze and interpret the data gathered from the study, the researchers employed descriptive statistics, specifically the arithmetic mean and frequency and percentage. The arithmetic mean was used to compute the average responses of the respondent regarding the system's functionality, usability, security, and overall performance. Frequency and percentage were applied to describe the demographic distribution of respondents. These statistical tools provide a structured and measurable way to interpret the data and validate the effectiveness of Web Based Health Management System with Data Analytics and RFID for CSPC Clinic.

4 RESULTS AND DISCUSSION

This chapter presents the data gathered from the testing phases, which evaluated the system's usability and security based on the criteria in the testing plan. The system usability was rigorously evaluated by one hundred and sixty-one (161) respondents composed of students, employees and clinic staff. The system security also rigorously evaluated by three (3) IT Expert.

Table 9 shows the respondents details needed in the proposed study. It indicates the distribution of the respondents. The participants in the study are classified into the table, and the details of data collection and system are contained.

Table 9: Frequency Distribution of the Respondents

Respondents	Frequency	Percentage
Students	151	92%
Employee	7	4%
Staff	3	2%
IT Experts	3	2%
TOTAL	164	100%

A total of 164 respondents were used in the study and were chosen using the convenience sampling approach and therefore assured of accessibility and reliable data collection among the CSPC community. The most significant contributor in terms of its feedback was the students who had 151 participants (92%), who were the primary users of the system. The rest of the respondents consisted of 7 employees (4%), 3 staff members (2%), and 3 IT specialists (2%), whose opinions were significant to the administration and technical details. This distribution guaranteed that the evaluation of the system was inclusive of the user experience as well as the operational feasibility and as such the results were holistic and representative of all the major stakeholders.

Table 2 shows the summary result of unit testing with PHPUnit framework conducted on the system. The table includes testing results along with its interpretation.

Table 10: System's Unit Testing Result

Blackbox Testing	Result	Interpretation
Unit Testing	97%	Highly Functional
Overall Result	.97	Highly Functional

Table 10 CSPC Clinic Health Management System was fully tested in PHPUnit following the major modules including event scheduling, RFID-based medicine dispensing, feedback, medical forms and inventory management. The system was found to be very reliable, had rapid performance and operation in key activities such as appointment booking, tracking of medicines, generating certificates and monitoring supplies. There were some improvements that were found such as the improvement of data export, validation enhancement, optimization of bulk administrative processes, and analytics and reporting. In general, the system is clinically deployable with additional improvements to be made in the future to increase its efficiency.

Table 11: System's Usability Testing Result

Blackbox Testing	Result	Interpretation
RFID Module	1.0	Very Highly Usable
Medical and Dental Record Management	1.0	Very Highly Usable
Medical and Dental Certificates and Forms Management	1.0	Very Highly Usable
Appointment Module with SMS	1.0	Very Highly Usable
Events of Calendar Management Module	1.0	Very Highly Usable
Inventory Management Module	1.0	Very Highly Usable
Data Analytics	1.0	Very Highly Usable
Feedback and Reports Module	1.0	Very Highly Usable
Overall Result	1.0	Very Highly Usable

Table 11 shows the usability testing of the Web-Based Health Management System with Data Analytics and RFID, 161 respondents, 151 students, 7 employees, and 3 clinic employees: giving a total of 2,439 responses to all the key modules. The results show a 100% success rate in every module, including RFID logbook, medical and dental records, certificates and forms, appointments with SMS, calendar, inventory, data analytics, and feedback and reports. All user groups found the system easy to use, intuitive, and effective in completing tasks. The high level of usability is an assurance that the system can effectively substitute the manual processes of the clinic so that the clinic can enjoy faster processes, a

smoother working process and a better user experience can be enjoyed which is a reason why it is ready to be fully deployed.

Table 12: System's Performance Testing using K6

CATEGORY	Max Throughput (req/s)	Avg HTTP Response time (ms)	Average Response Time	p(95) Latency (ms)	Performance	Interpretation
USER SIDE	6.38	1230ms	2460 ms	5200 ms	92.8	Good
ADMIN SIDE	7.67	1230ms	1930 ms	5470 ms	99.4	Good

The K6 load-testing tool was used to collect the overall summary of the system performance testing results in order to determine the performance and stability of the Health Management System and its responsiveness in terms of its speed, stability, and responsiveness when performing the load-testing experiment with a high interaction rate of users. Both User Side and Admin Side were tested to make the testing conditions true to reality. User Side has a performance rating at 92.8% which is categorized as Good and has stable throughput and no HTTP failure indicating that it can handle more than 1 concurrent request. Its larger response and latency times, however, point to the possibility of additional optimization, such as caching or improvements in database queries. Conversely, the Admin Side was much better with a 99.4% score, no mistakes, and a very stable running with a significant load, which proves the optimization of the backend. In general, the two modules worked well, confirming that the system is ready to be deployed, with the need to expand on responsiveness and scalability when it is heavily utilized.

Table 13: System's Performance Testing using Apache JMeter

Blackbox Testing	Result	Interpretation
Performance Testing	96%	Good

Table 13 summarizes the performance testing of the system with apache JMeter in which the virtual users were 50 and the test was conducted to determine the efficiency, responsiveness and stability of the application under the load. The performance was good with an average response time of 903 ms which is in the optimal sub-second range and a throughput rate of 2.6 requests per second, meaning that the system will not slow down even when several simultaneous actions were undertaken. The minimal error rate of 0.37 percent also confirms the stability when there is concurrent usage. The system had a total performance rating of 96 with an error rate of 40, throughput rate of 40 and a response time rated 20 based on a weighted scoring model (40, 40, and 20 respectively). These results show that the system is reliable in real load scenarios and industry requirements of web-based applications.

Table 14: System's Security Testing Result

Blackbox Testing	Result	Interpretation
Security Testing	98%	Highly Secured
Overall Result	0.98	Highly Secured

Table 14 presents the findings of the security testing of the system based on the OWASP ZAP and black box testing conducted by three IT professionals through seven tests. The scan showed that there are 9 medium-risk, 11 low-risk and 15 informational findings which means that the system is mostly stable with few vulnerabilities. The security score 0.98 was computed by considering the percentage of non-critical issues in comparison to overall findings and correcting it according to full test cases coverage and verified by an expert. Such medium-risk items included typical web weaknesses like XSS, cookie settings, and the lack of security headers, which do not represent a direct risk for using them but need

to be improved with the help of fixes. Minor issues such as version disclosure and missing headers were low-risk and informational results gave details on system configuration. In general, the evaluation indicates that the Health Management System is stable and secure and should be monitored continuously and regularly; otherwise, security will remain high.

5 CONCLUSION AND RECOMMENDATIONS

The research finds that the manual operations in the CSPC Clinic were very ineffective and caused delays and lengthy queues, slowed appointment processes, trouble in accessing medical and dental records, ineffective inventory management, and inability to create necessary reports or apply data analytics to proactive healthcare. The Web-Based Health Management System with Data Analytics and RFID developed could address these concerns since it incorporated eight functional modules, RFID logbook, medical and dental records, certificates and forms, appointment scheduling with SMS notifications, events and calendar management, inventory tracking, data analytics, and feedback with reporting. These modules computerized the clinic processes, enhanced the delivery service and simplified the health record management. Extensive black box testing was used to establish the reliability and readiness of the system to be deployed, unit testing scored 0.97 (“Highly Functional”) functionality, usability testing took a perfect score of 1.00 (“Very High Usable”) satisfaction rating, performance testing reported stable operation even at heavy load, and security testing scored 0.98 (“Secured”) security assurance. Based on these conclusions, the system can be considered a secure, efficient and scalable solution that has the ability to support the day-to-day activities of CSPC Clinic. Future improvement suggestions can be to book fewer appointments in a day and trigger the approvals with RFID, integrate predictive analytics, build a mobile application, add an emergency alert option, integrate the system with current institutional systems, provide offline RFID logging, build automatic backup and recovery systems, and use modern penetration testing tools like Burp Suite or Nessus to ensure better security validation.

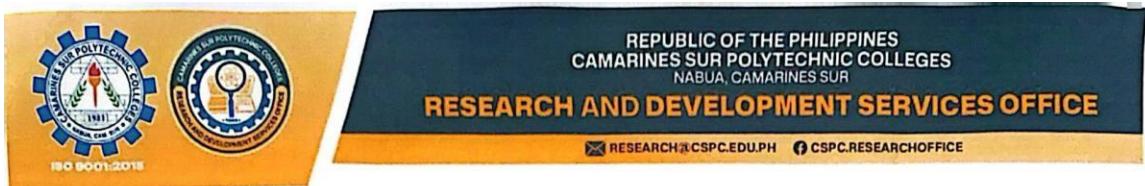
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7 REFERENCES

- [1] Arturo M. Ongkoko Jr., MSc, RN. 2024. Promises and realities of electronic health information system in the Philippines. *Acta Medica Philippina* 58, 22 (December 2024). DOI:<http://dx.doi.org/10.47895/amp.v58i22.12364>
- [2] Bettina D. Evio, MAN, RN and Sheila R. Bonito, DrPH, RN. 2024. Formative evaluation of the implementation of eHealth in the Philippines: A qualitative study. *Acta Medica Philippina* 58, 12 (July 2024). DOI:<http://dx.doi.org/10.47895/amp.v58i12.9289>
- [3] Cristine Rebullo, Pamela Rogelio, Jennifer Venus, and Jennifer Reynaldo. 2025. Web-based SMS Notification Appointment and Records Management System. *Information Technology cross-platform application and development* (October 2025). DOI:<http://dx.doi.org/10.53378/10.25.009>
- [4] Mia Amor C. Tinam-isan and January F. Naga. 2024. Exploring the landscape of Health Information Systems in the Philippines: A methodical analysis of features and challenges. *International Journal of Computing and Digital Systems* 15, 1 (July 2024), 225–237. DOI:<http://dx.doi.org/10.12785/ijcds/160118>
- [5] Myra Cusi Britiller, Aimee M. Amponin, and Cecilia C. Pring. 2023. Effectiveness and challenges: The current situation of Electronic Health Records (ehrs) to improve health care outcomes. *South East Asia Nursing Research* 5, 1 (March 2023), 1. DOI:<http://dx.doi.org/10.26714/seanr.5.1.2023.1-18>
- [6] Shadrack Ochieng Opon, Wanja Mwaura Tenambergen, and Kezia Muthoni Njoroge. 2021. The effect of patient reminders in reducing missed appointment in medical settings: A systematic review. *PAMJ - One Health* 2 (2021). DOI:<http://dx.doi.org/10.11604/pamj-oh.2020.2.9.21839>
- [7] Venus Oliva Cloma-Rosales. 2025. Health data, Social Impact: AI and analytics for universal health care in the Philippines. (June 2025). Retrieved November 24, 2025 from https://101healthresearch.com/health-data-social-impact-ai-and-analytics-for-universal-health-care-in-the-philippines/?utm_source=chatgpt.com

APPENDIX Q
CERTIFICATE OF PLAGIARISM CHECK



CERTIFICATION

Date of Release: January 13, 2026
Submission ID: 23367:126089970
Output Title: WEB BASED HEALTH MANAGEMENT SYSTEM WITH DATA ANALYTICS AND RFID FOR CAMARINES SUR POLYTECHNIC COLLEGES CLINIC
Author(s): Ma. Diah G. Cambronero
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Program: Bachelor of Science in Information Technology

Authenticity Report:

Similarity Index Report: 10%

Internet Sources: 1%

Publications: 0%

Student Papers: 11%

- **Interpretation:** The similarity index report means that 10% of the output is similar to the sources in Turnitin's (authenticity software) online repository and databases.

AI-Generated Report: -

AI-generated only: -

AI-generated text that was AI-paraphrased: -

- **Interpretation:** The AI generated report means that the entire output is less than 20% and includes the possibility of false positives, although some text is *likely* AI-generated.


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