

Anesthesia Monitoring and Analysis System

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Abstract: *Anesthesia monitoring and Analysis System when a patient goes under anesthesia monitoring their vitals is one very critical factor to follow which in the traditional ways for many hospital still involves monitoring on paper by hand while tending to other things at once. Though the existence of a methodology, it's not an efficient one, as errors in record-keeping there and more possibility of being lost or scrambling for patient histories when need. To automate such processes this project Anesthesia monitoring Analysis system aims to provide online access. The system includes logging in, having user roles of admin, staff, and patient, having a dedicated user interface for each. staff manages vital statistics, administered values, and patient health condition. From their own profiles, the patients can view the anesthesia information for their surgeries, monitor charts of their vitals, and download the reports from the system. It is written in PHP with the Code Igniter 4 framework for the server side. The client side technologies are HTML, CSS and Bootstrap and MySQL for database.*

Keywords: *Anesthesia*

1. INTRODUCTION

Anaesthesia monitoring involves many different forms of information at various points in time. The relevant data about patients history, operative description, drug administered, physiological monitoring and follow up reports may be looked after by different staff members but all they all pertain to the same operating procedures of the patient. The proposed system integrates all these scattered information and keeps all of it in web access-based application, there by enabling patients and personnel of all grades with access of relevant integrated information rather than relying on separate individual files and databases. the medical team and even patients will be able to access an integrated set of data and eliminate multiple documents that need to be brought together to follow an anaesthetic. A user application is a request generated from web browser to send for processing into CodeIgniter Controller. Input data are processed through validation and then sent through Query Builder in order to use either to query the database to show to the user in HTML view or save. Every module which will manage Admin, Staff and Patient has specific Controller and View with regards to the M.V.C framework architecture project application so that it's simpler to work.

Application can also be found in terms of data Entry and restricting access based on user role that data in a labels to correspond for whatever is type of data that being entered in to it.

II. METHODOLOGY

In my project initial work involved identifying who the system's users would be, and what each user really needed that involved some thinking to identify the roles (admin, staff, patient) of the system, as well as the underlying core records that it must maintain (patients, doctors, operations, vitals, anaesthesia entries). This thinking was done first, and the table schema and screen designs flowed naturally from it.

From there, the build was sectioned off into modules - login, doctor management, patient management, staff management, surgery management, recording vitals, anaesthetic logging, live monitoring, chat-bot, alerts, and reports- and all developed and testing in-more or-less isolation. Because of this, a fault in one could be discovered rather



sooner, as it wouldn't cascade through everything. On the backend, PHP running on the CodeIgniter 4 framework handles validation and talks to the MySQL database, which stores everything from doctor records to individual vitals readings. HTML, CSS and Bootstrap handle appearance; JavaScript and AJAX polling is where real-time ECGs come in, real-time vitals appear, and alerts pop up. PDF reports are created on the server-side with pdf. In the future this system could use proper WebSocket streams, or have it directly integrated with real medical hardware rather than manually inputted values.

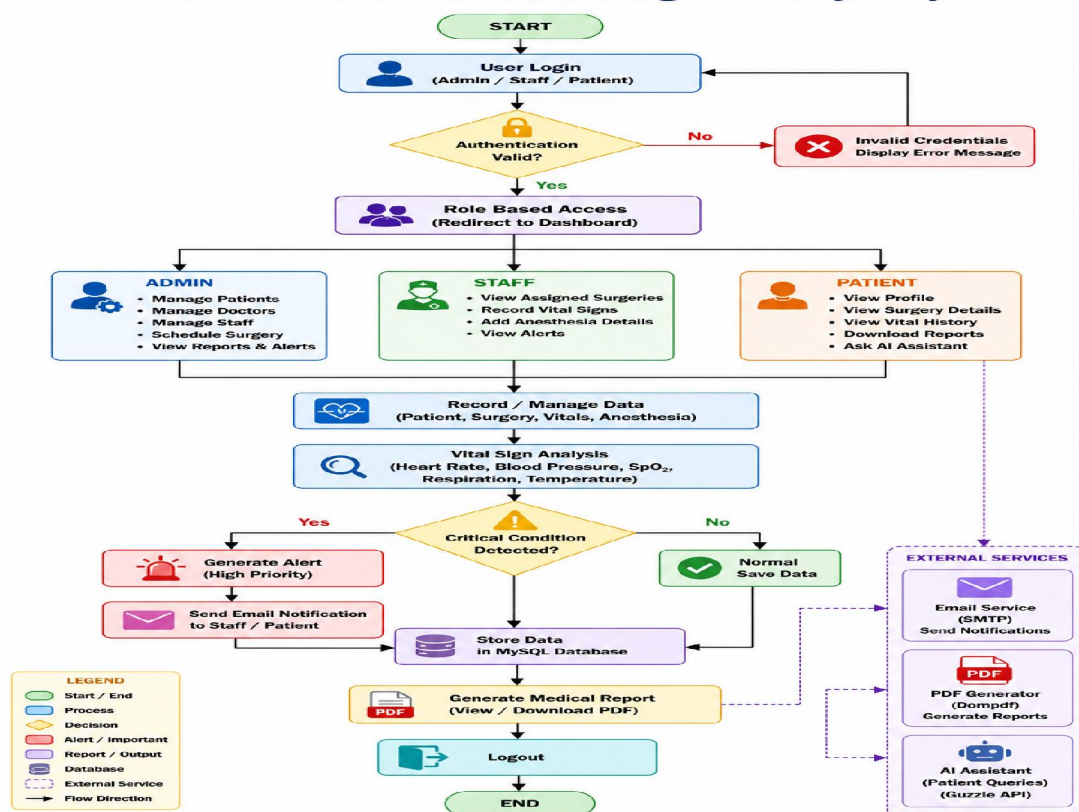
III. MODELING AND ANALYSIS

Table 1. Tools and usage

Tool / Technology	Purpose
PHP (CodeIgniter 4)	Backend MVC framework — routing, controllers, business logic
MySQL	Stores patient, doctor, staff, surgery, vitals and anesthesia records
HTML, CSS, Bootstrap	Front-end design for the Admin, Staff and Patient dashboards
JavaScript / AJAX	Live ECG and vitals display, alerts, chatbot interaction
Dompdf	Generates PDF reports on the server side
Composer	Manages PHP dependencies

IV. FLOW DIAGRAM

Flowchart – Anesthesia Monitoring and Analysis System



V. SNAP SHOTS

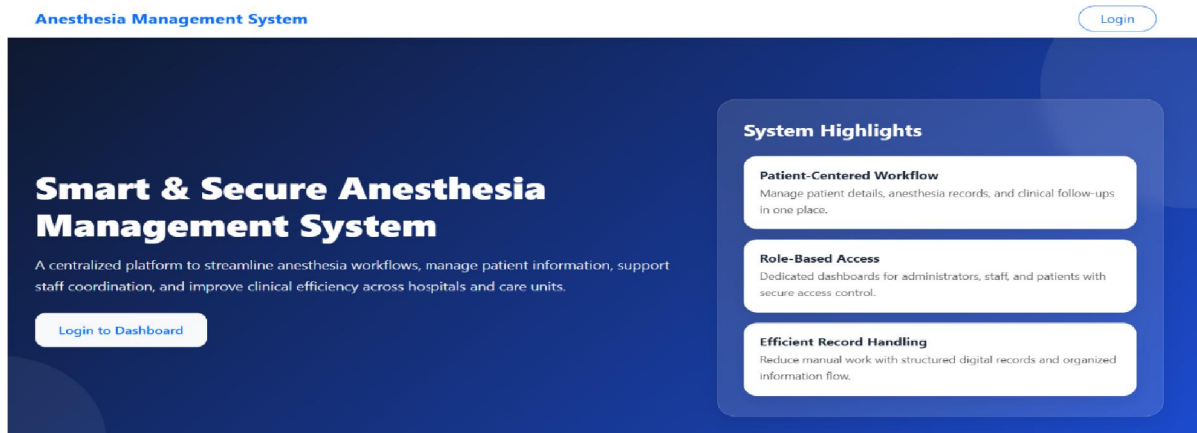


Figure 1: Home Page

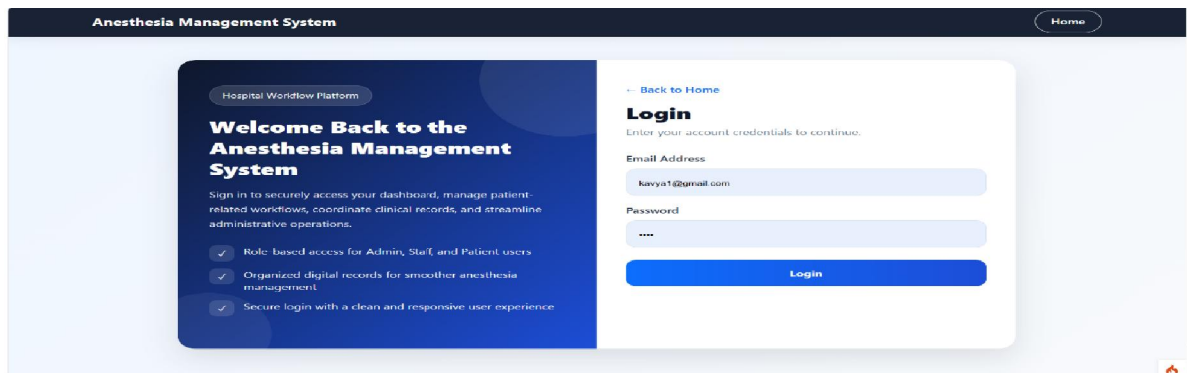


Figure 2: Login Page

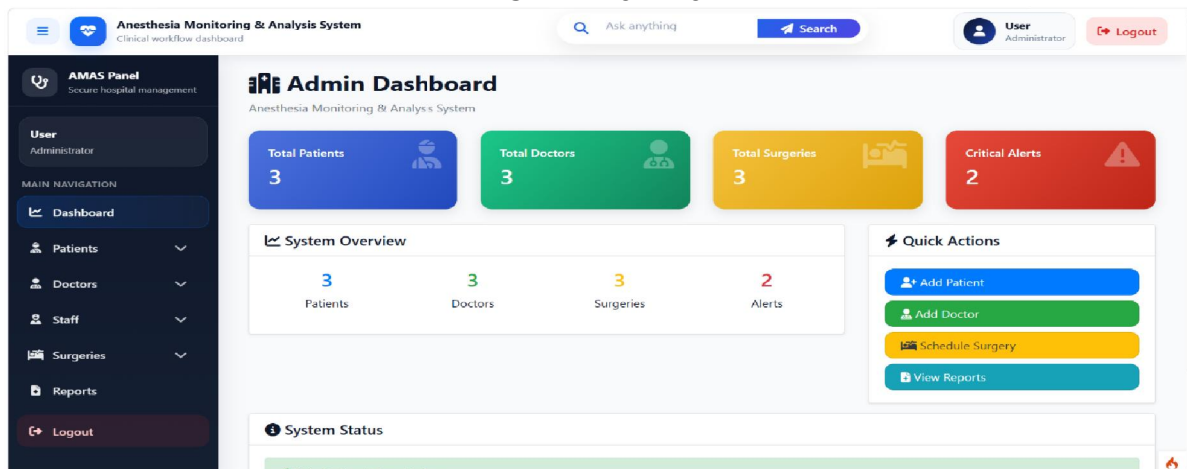


Figure 3: Admin dashboard



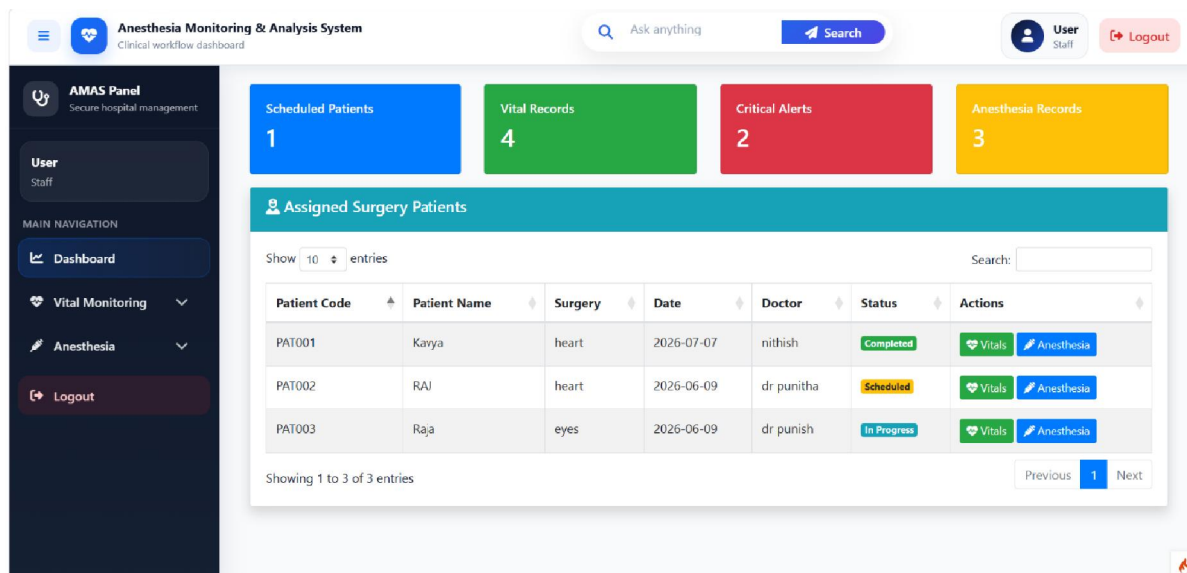


Figure 4: Staff Dashboard

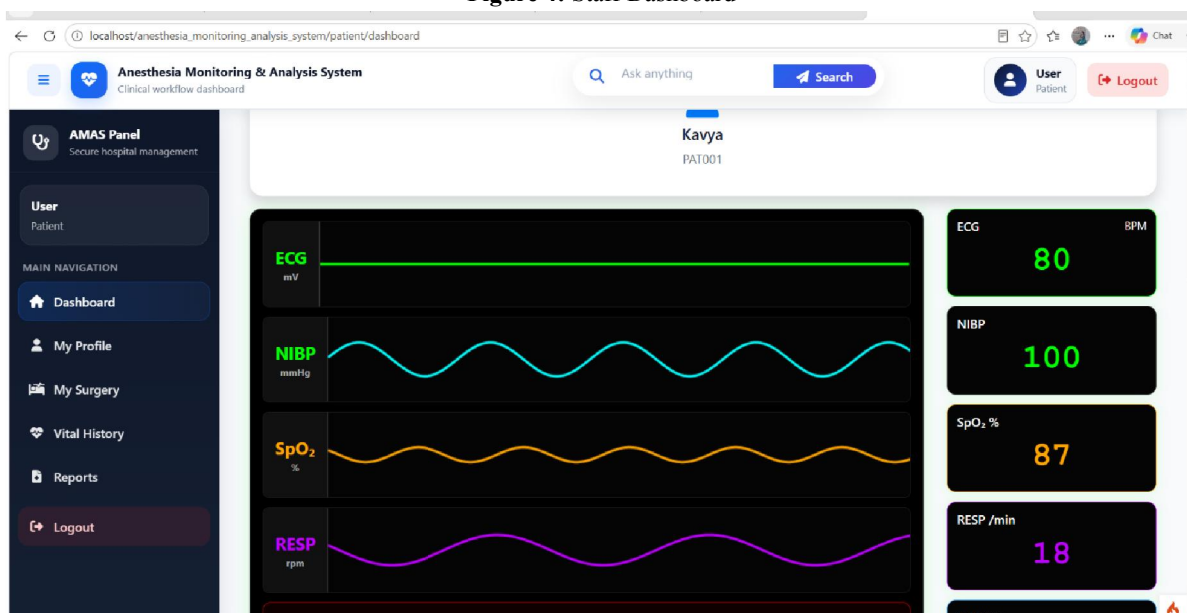


Figure 5: Patient Dashboard

VI. RESULTS AND DISCUSSION

In my project what has come out is a successfully working application that addresses the end to end anesthesia process. Now staff can input and anesthesia records in real time and the patient can view their own monitoring history, print report. The admin module was where they could store all users (doctors, patients, staff) and upcoming surgeries. In terms of the validated modules by saving data and updating it throughout the test process and came out of the database.



It's a small thing but role-based logins helped keep the users isolated to the views that made sense. Live monitoring views and the Chatbot helped make the system not just clinical but feel user-friendly from the perspective of a patient and providing a print report option in pdf reduces the need for manual work involved to gather all the required records and compiles everything.

VII. CONCLUSION

In the Anesthesia Monitoring system implement a healthcare workflow through PHP, CodeIgniter 4, MySQL and responsive web technologies. Connecting between the patient and work records to the scheduling module, vitals monitoring module, anesthesia record module, alert and notification module, patient's dashboards and reporting tool. It provides user-specific interfaces, reducing the complexity.

It ensures the continuity across the various module of the workflow by using the same database.

The added vitality rule can visualize the stored measurements in action as the measurements being continuously analysed instead of simply stored as past values, similar manner the reporting tool demonstrates how past measurements can be reused to update to patient's communication.

The MVC-oriented organization, reusable dashboard template, query-builder operations and Composer libraries provide a practical base for continued development.

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