

# Knight Foundation School of Computing and Information Sciences

## Fall 2023 Senior Design Project

# Secure HealthPath: HIPAA Edition



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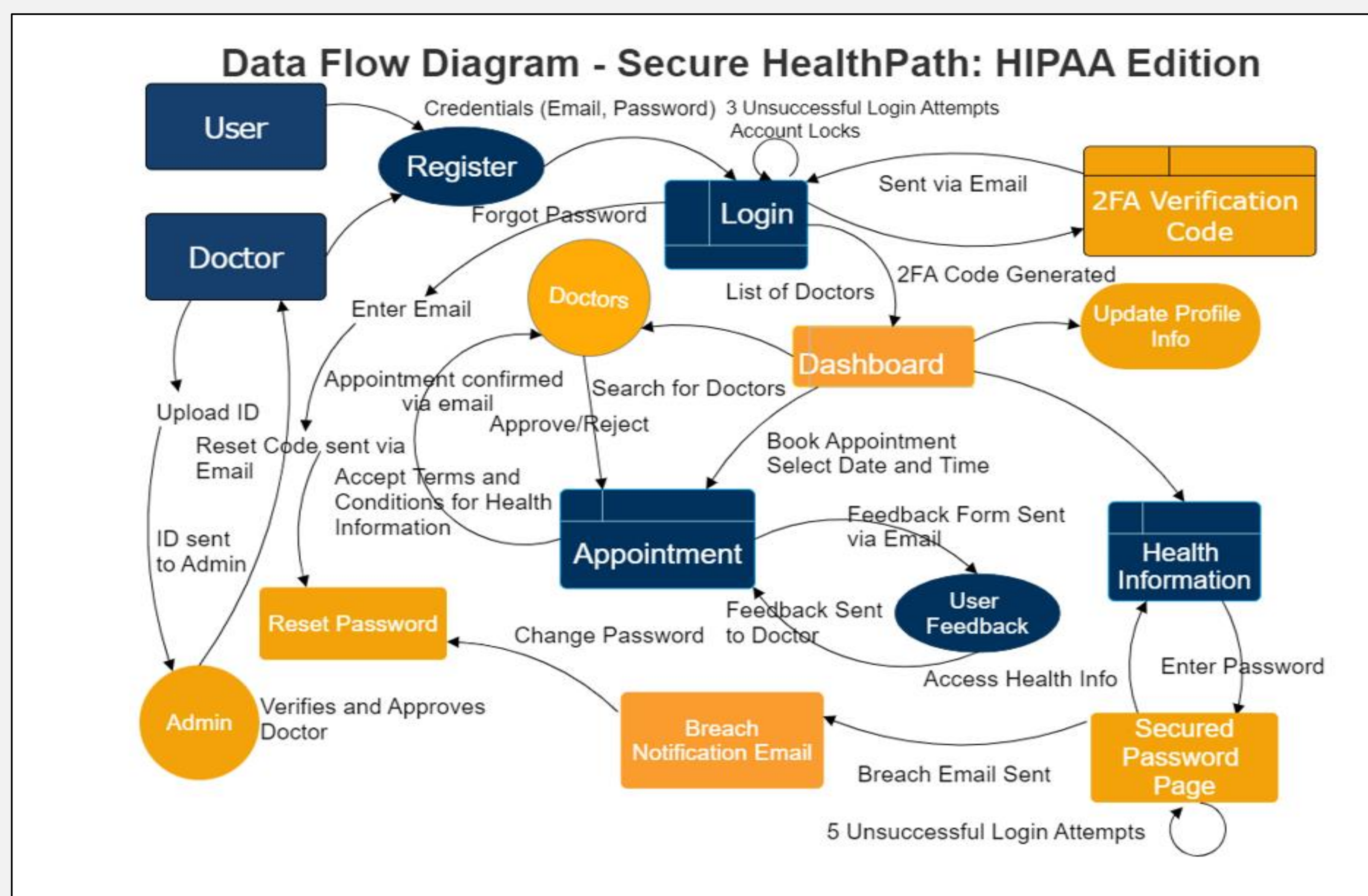
**Instructor/Faculty:** Masoud Sadjadi, Florida International University

## PROBLEM

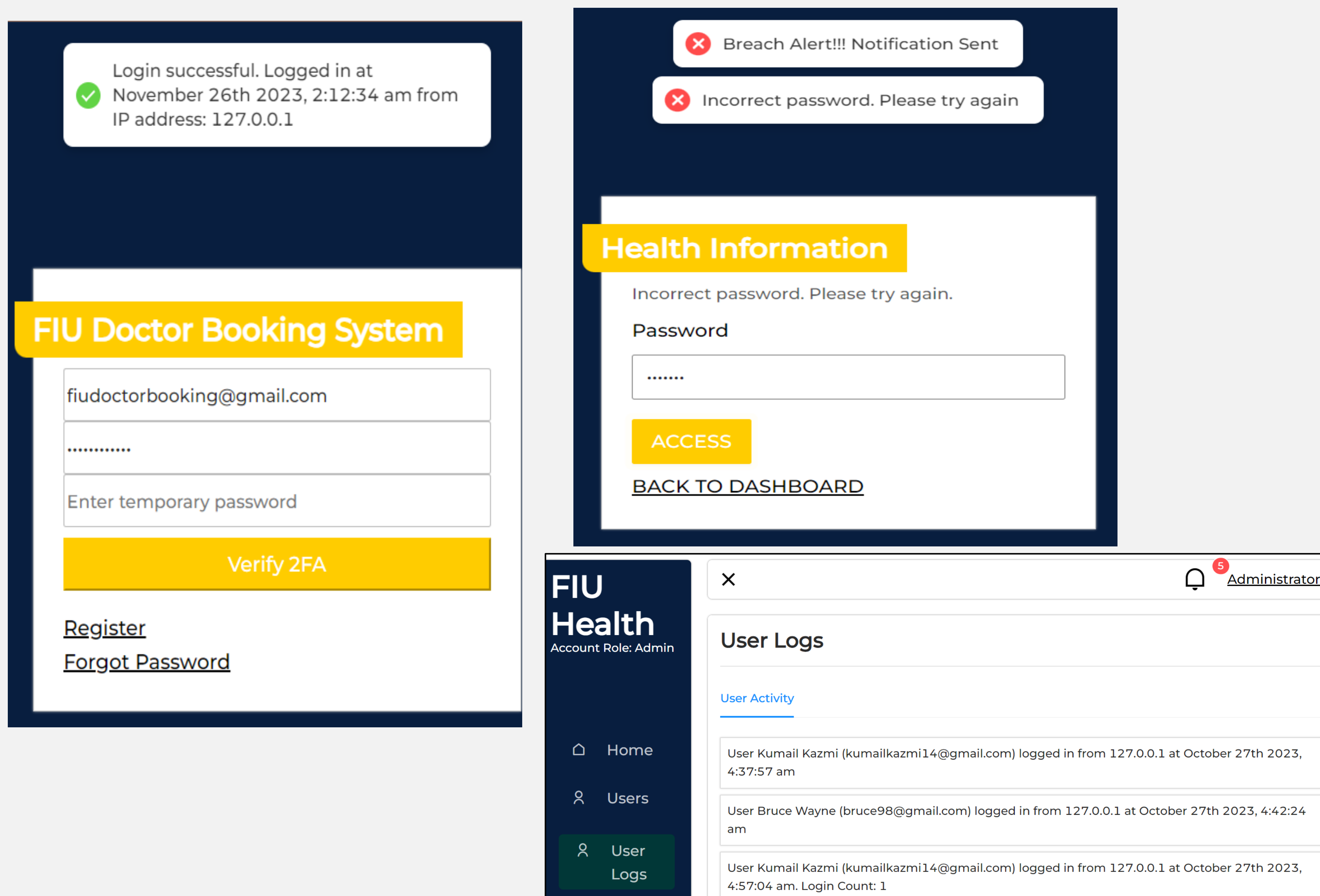
- Unsecure Patient Health Information and User Account Information is at risk of being exposed to vulnerabilities and malicious threats.
- Failure to comply with HIPAA guidelines exposed the web application to various risks. Weak user account security and recovery mechanisms and lack of alert systems posed a risk to the application's integrity.
- To solve this problem, security features and functionalities were implemented in the app specifically aligned with HIPAA guidelines ensuring a secure and robust framework.

## SYSTEM DESIGN

A complete data flow and system design of the Secure HealthPath Application showing the security features and interactions of the users and doctors with the app.



## USER INTERFACE



## CURRENT SYSTEM

Front-end structure on React, Express and NodeJS was already completed by our mentor, including the back-end MongoDB database with all the dependencies to store users, doctors, and appointments data. React components such as models, routes, middleware, server and client-side code were already pre-configured.

HIPAA security features implemented including but not limited to:

- User must be able to change their password and have limited unsuccessful log-in attempts (Security Rule – 164.308(a)(5)(ii)(iii)(C))
- Doctor must provide digital verification proof after they register an account and access PHI (Privacy Rule – 164.514(h)).

## REQUIREMENTS

The goal of the Secure HealthPath App is to provide user and doctors a seamless, secure, convenient and authentic experience for booking and handling appointments and personal health information. Security features compliant to HIPAA guidelines were implemented such as:

- Delete Doctor and User data when no longer required.
- Confirmation Email for Appointment Booking
- Update User and Doctor Profile
- Change Account Password by using Email to Reset Password
- Limiting Unsuccessful Log-in Attempts – Account Locks for 2 minutes
- Terms and Conditions for Users and Doctors
- Monitoring Log-In Attempts and Information
- Digital ID Verification of Doctor and File Scanning for Viruses
- Password protected Personal Health Information Page
- Breach Notification Email incase of breach on health information.

## IMPLEMENTATION

The web application was designed and implemented on the MERN (MongoDB, Express, React, NodeJS) Stack and the language of implementation was JavaScript. The MongoDB database was pre-configured and existent. Secure HealthPath Application was developed to be compliant to HIPAA rules and guidelines. Security features and functionalities aligned with the rules provided by HIPAA.



## SUMMARY

The Secure HealthPath Application has undergone substantial enhancements, addressing and rectifying numerous issues associated with patient health information, appointment booking, notification systems, and user and doctor communication. These improvements contribute to a more streamlined and efficient user experience. Notably, extensive efforts have been devoted to fortifying the application's security posture in accordance with HIPAA guidelines, thereby mitigating potential vulnerabilities to malicious threats. In my capacity as a team lead, my responsibilities included the meticulous maintenance of project documentation and fostering collaboration within the team to ensure the alignment of our efforts with the overarching goal of adhering to HIPAA guidelines. While significant progress has been made, acknowledging that further enhancements are possible, particularly in terms of structural robustness and resilience against cyber threats, underscores the ongoing commitment to advancing the Secure HealthPath Application's security framework.

## ACKNOWLEDGEMENT

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