Fortifying Healthcare

By Tech Power

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Course code and title	**ITPG8.600 Advanced mobile and wireless technologies**
Lecturer name	Mr Akbar Hossain
Assessment title	Assignment 02_Sprint 4
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Abstract

In Sprint 3, we used personas, hypothetical interviewing and call interview to focus on settling on user groups, roles and their needs. This assisted us to get a better grasp of the needs of the Waikato District Health Board (DHB) physicians, nurses, paramedics, pharmacists and IT/security staff. With Sprint 4, the focus shifted to the prototyping of the solution according to the set of requirements obtained in the previous Sprint.

Sprint 4 was mostly focused on converting user requirements into products with some of the key objectives being set beforehand. We did 20 user stories and 10 wireframes of real-life tasks of various user roles in the system; especially the doctors, nurses, the medical records officers, billing and accounts, the receptionists, the paramedic teams, the pharmacists, the technical and information security staff. The main functions covered by the user stories included secure log-in, electronic record keeping, off-line data sync, appointment scheduling, insurance claims and payments, patient check-in and monitor activities. With the completion of Sprint 4 we were able to make the first visual prototype of the system, ensuring that no less than three user groups were considered in relation to usability, accessibility, and security.

***Key Words*:** Low fidelity wireframe, User stories, multi-factor authentication, OTP (One Time Password), User login

Contents

1. Introduction

In the previous sprint 3, we mentioned the user groups and user details gathered using hypothetical interviews, and a call interview with the users, and developed user personas to deliver a better understanding of the gathered information. According to the Software Development Life Cycle (SDLC), the first stage is requirement gathering, and it is mentioned in the sprint 3. After the requirement gathering, the next phase is designing. In this Sprint 4, we delivered the user stories and the low-fidelity wireframes according to the user groups, who were involved in the main problem of the project. The user stories belong to doctors, nurses, hospital administrative staff, IT support staff, emergency response staff, and pharmacists. Moreover, according to the user groups' main tasks, we designed low-fidelity wireframes.

2. User Stories

1. Common User Stories

The following user stories are common for all the user groups that are identified with the appointed roles.

I. New Users

1. As a new user, I want to change my temporary password and enable biometric authentication or a PIN code so that I can securely log in to the mobile application using my own credentials with multifactor authentication.

II. Old Users

2. As a user, I want the ability to reset my password if I forget it, so that I can regain access to my account without delay.
3. As a user, I want to log out of the mobile application on my own device, so that I can prevent third-party access to my account.
4. As a user, I want to receive an alert pop-up message when I enter incorrect login user name / password / PIN code distinctly, so that I know my login attempt was unsuccessful.

2. User Group 01 – Doctors or Specialist Doctors, and Nurses

III. Doctors User Stories

Doctors and Specialist Doctors at hospitals and remote locations can use the mobile application on authorized devices to securely access patient data. The following are some user stories from doctors:

5. As a doctor, I want to update a patient’s medication prescription so that the patient or nurse receives the updated medicine details on time.
6. As a doctor, I want to have instant access to a patient's medical record and history, so that I can make informed treatment decisions without delay, particularly in emergency situations.
7. As a specialist doctor, I want to easily review and analyse large diagnostic results such as lab files, MRIs, and X-rays, so that I can make faster treatment without waiting.

8. As a doctor, I want to send and receive real-time messages, alerts, and updates from other specialists and nurses, so that I can communicate instantly about treatment plans and patient requirements.

IV. Nurses User Stories

Nurses at hospitals can use the mobile application on authorized devices to securely access patient details. The following are some user stories from nurses:

9. As a nurse, I want to quickly record and update patient vitals at the patient's bedside, so that I can ensure that the records are accurate and instantly visible to doctors.
10. As a nurse, I want to report new critical incidents in emergency department so that I don’t miss informing management about them on time.

3. User Group 02 – Medical Records Officers, Billing & Accounts Team and Receptionists/Front Desk Staff

V. Medical Records Officers User Story

Medical Records Officers are responsible for managing and maintaining patient health information in a secure, accurate, and accessible manner. They play a key role in ensuring that medical records are complete, well-organized, and compliant with healthcare standards and legal requirements.

11. As a Medical Records Officer, I want to securely search, view, and update patient medical records through the mobile application, so that I can efficiently manage patient information, ensure accuracy, and support doctors and nurses with real-time access to records.
12. Medical Records Officer, I want to generate patient reports (e.g., admission history, discharge summary, billing information, or treatment record) and securely share them with authorized staff through the mobile application so that doctors and nurses can quickly access accurate information for patient care, audits, or hospital management.

VI. Billing & Accounts Team

The Billing & Accounts team ensures smooth financial operations within the hospital by managing invoices, processing insurance claims, and tracking payments.

13. As a billing staff member, I want to generate accurate invoices quickly through the system so that patient billing is clear and, timely and reduces errors in financial records.
14. As a billing staff member, I want to track outstanding payments and process insurance claims digitally so that I can follow up efficiently on pending balances, minimize delays, and keep hospital revenue flow consistent.

VII. Receptionists User Stories

Receptionists and Front Desk staff are the first point of contact for patients, managing appointments, registrations, and communication with healthcare providers. A mobile application helps them streamline check-ins, reduce waiting times, and deliver real-time updates to both patients and staff, ensuring smooth hospital operations.

15. As a receptionist, I want to register new patients and check in existing patients through the mobile application, so that patient details are captured accurately, and doctors can be notified of arrivals in real time.
16. As a receptionist, I want to schedule and cancel patient appointments via the mobile application so that the hospital can manage doctor availability efficiently and reduce scheduling conflicts.

4. User Group 03: Paramedic Offices and Pharmacists

VIII. Paramedic Officers User Stories

While offering prompt contact with hospital staff members, a paramedic officer’s responsibilities involve providing emergency treatment, protecting patients on the accident site, and cautiously transferring patients to the hospital.

17. As a paramedic officer, I need to upload emergency information so that the hospital gets the notification regarding the emergency.
18. As a paramedic officer, I need to communicate securely so that I can take action while en-route to the hospital.

IX. Pharmacists User Stories

Pharmacists are in control of carefully offering medications that are prescribed, delivering directions about when to properly use these medications, monitoring for possible associations or undesirable negative reactions, and regulating behalf of patients using medicinal products.

19. As a pharmacist, I need to view doctor's prescription, so that I can ready the medicine according to the prescription.
20. As a pharmacist, I need to report for management, so that I can inform management when the stocks are going to last.

5. User Group 04: IT Administrators and Technical & IT Security Staff

X. IT Administrators User Stories

IT administrators work within the ICT division of the hospital, who is responsible for managing all user accounts and access control of the system. They are also responsible for monitoring and performance of IT resources (Tracking the uptime of Electronic Health Records (EHR), ensuring system availability), maintaining operational efficiency along with effective resource utilisation so that it can prevent overload that can slow down or disturb critical functioning of hospitals. The user stories of the IT admin are as follows:

21. As an admin, I want to create and manage user accounts, assign roles, along with being able to grant and revoke permissions and access to the system, so that I can ensure only authorised staff can access the hospital system securely, ensuring the use of the system for their own respective roles only.

22. As an admin, the system should allow me delete the user account in case the user(employee) terminates due to retirement or other issues and to restrict or lock the user account in case of detection of an unauthorized access which helps in monitoring and maintaining compliance in the working of the hospital effectively, responsively as well as more securely.

XI. Technical and IT Security Staff User Stories

They focus on protecting IT infrastructure and data against threats or misuse. They are also responsible for system and network management (Installing, configuring and maintaining servers, operating systems and storage) as well as monitoring cybersecurity, managing vulnerabilities, maintaining security infrastructures, incident response, data protection and raising security awareness, focusing on defending systems from cyber threats, ensuring compliance. Following are the user stories of technical and IT security staff:

23. As a technical staff member, I want to request to add and configure new devices and get approval from the admin in real time, along with access to troubleshoot the devices in case of errors and malfunctioning of staff devices.
24. As an IT Security staff member, I want to continuously monitor the EHR dashboard to detect and alert admins to respond in critical cases of security incidents and malware. I am responsible for configuring and maintaining firewalls, antivirus and endpoint security tools, as well as performing risk management, penetration testing and patching vulnerabilities in order to manage vulnerabilities. I want to alert the user by raising a security awareness notification and notify them about the system availability and updates on their dashboard.

6. Low Fidelity Wireframes

1) Temporary Password Change & PIN Code / Biomatrix Enable

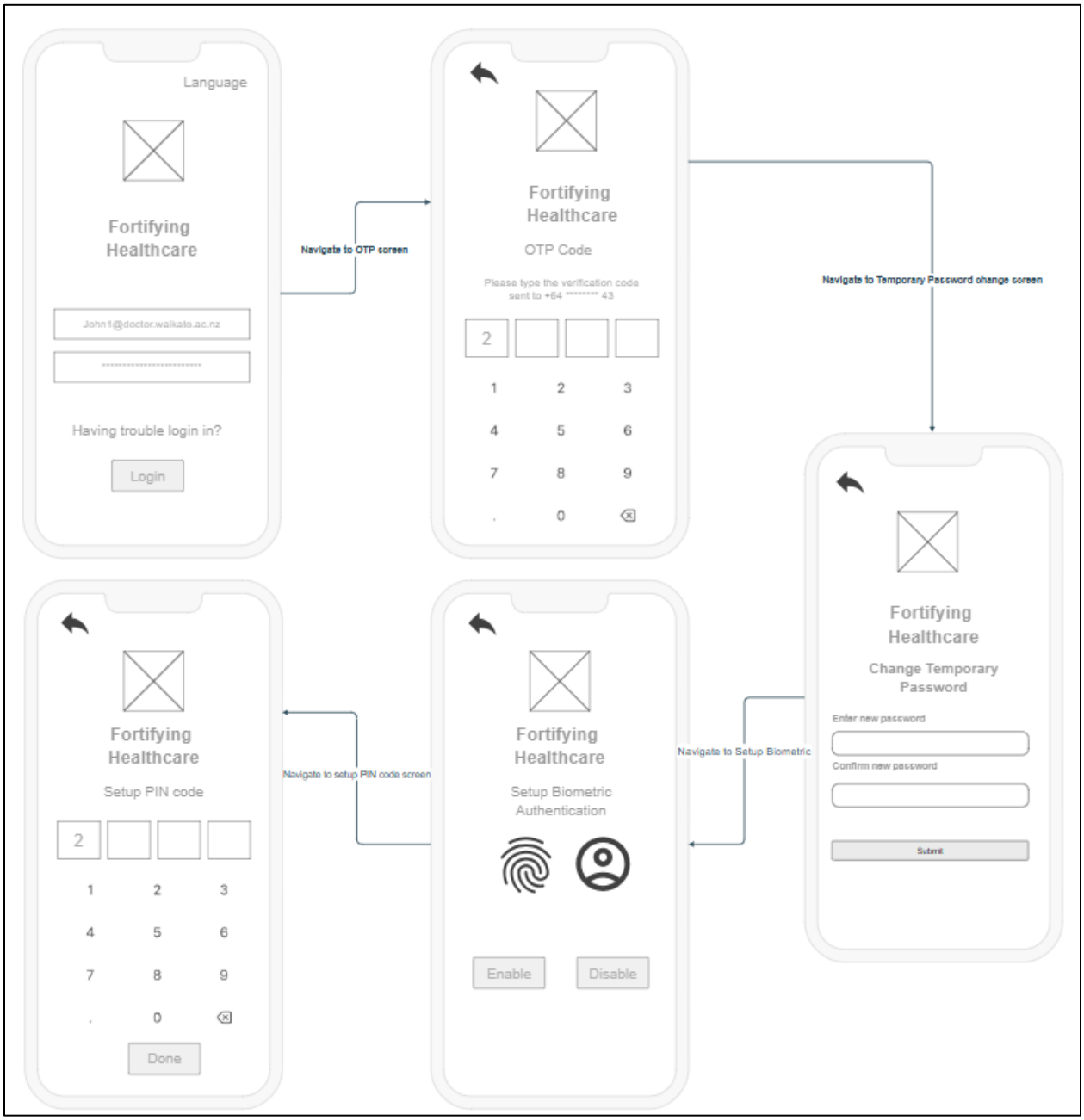


Figure 1 *Temporary Password Change (created using https://app.moqups.com)*

- User/staff enters email and password provided by administration to log in for the first time. After tapping log in button, the application navigates users to the next screen that requests an OTP (One Time Password) code sent to the registered mobile number of the staff.
- User/Staff can enter the OTP code in the boxes. Once the OTP is verified, the user is directed to the Temporary Password Change screen. Since the user log in with a temporary password initially, their need to set a new permanent password.
- The user should enter and confirms the new password, and after submitting it, the application navigates the user to the Setup Biometric Authentication screen. The user has authorization to enable or disable biometric authentication (fingerprint or face recognition).
- Next the user navigates to the Setup PIN Code Screen, where the user is asked to create a four-digit PIN code for accessing the application quickly or as an alternative to a password. The setup completes by clicking the Done button.
- Finally, the user is redirected back to the login page, where the user can log in to the system with a new password or an option of either biometric or pin (if enabled biometric setup).

2) Reset Password

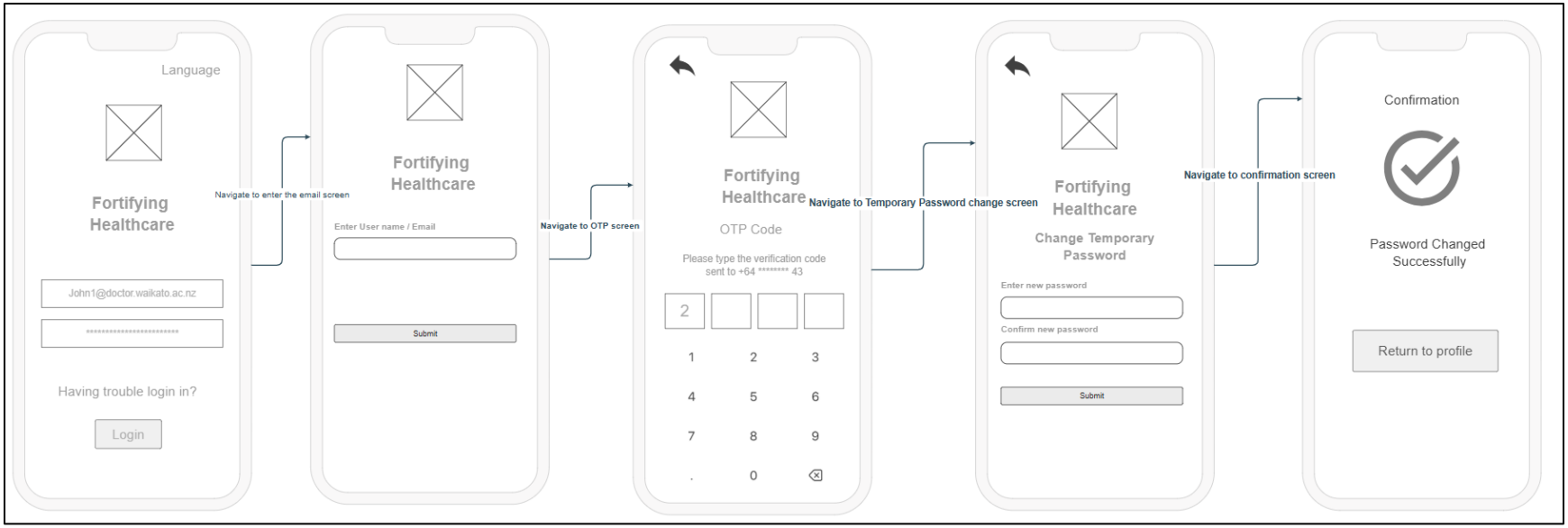


Figure 2 *Reset password (created using https://app.moqups.com)*

- User/staff enters email and password. In case of their login problems, they may opt to reset their password.
- Selecting Having trouble login in? navigates to the next screen having a field to write Username or Email. After submitting the email, the page redirects to OTP Verification.
- User receives One-Time Password (OTP) on their registered phone number. Once verified, the application navigates to the Change Temporary Password screen.
- User is then prompted to enter a new password and confirm a new password.
- After submitting it, the user is finally redirected to a page indicating confirmation of Password Changed Successfully.
- Moreover, users return to login page where they enter their new password and log in accordingly.

3) System Logout

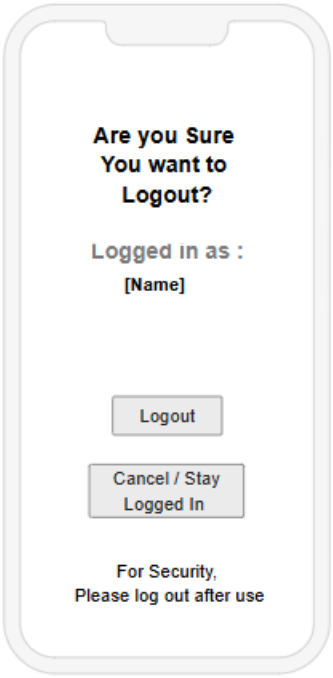


Figure 3 *System Logout Dashboard (created using https://app.moqups.com)*

The logout option is a common user wireframe, which allows all users to log out of the application.

In the top of the screen was a label, which questioned "Are you sure you want to log out?" and the logged user name is displayed to ensure the login.

After the label, there were two buttons displayed,

1. "Logout" button- When the user taps on the "Logout" button, the user is able to leave the application.
2. "Cancel/ Stay logged in" button – When the user taps on the "Cancel/ Stay logged In," the user is able to remain in the application, without logging, and the user navigates to the home screen.

4) Receiving error message

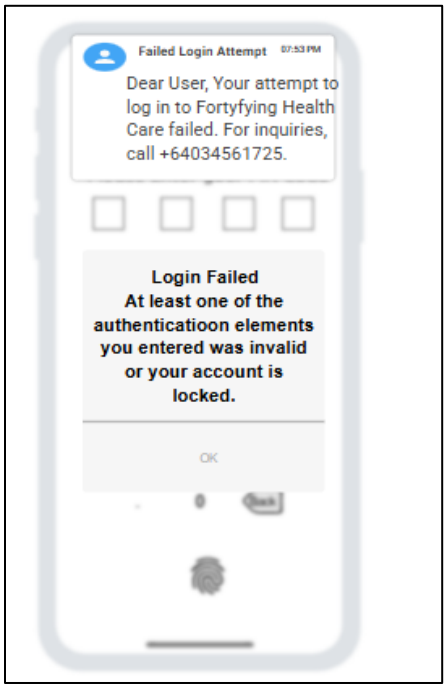


Figure 4 Receiving error message screen (created using https://app.moqups.com)

- This screen is a common wireframe for all users. Once the user enters an incorrect Password/username or PIN code, the user will receive an error popup message.
- "Dear User, your attempt to log in to Fortifying Health Care failed. For inquiries, call +xxxxxxxxxx"
- Also displaying a pop-up error message as well,
- "Login Failed. At least one of the authentication elements you entered was invalid, or your account is locked."

User Group 01 – User Profile 01 Doctors

Doctors Dashboard

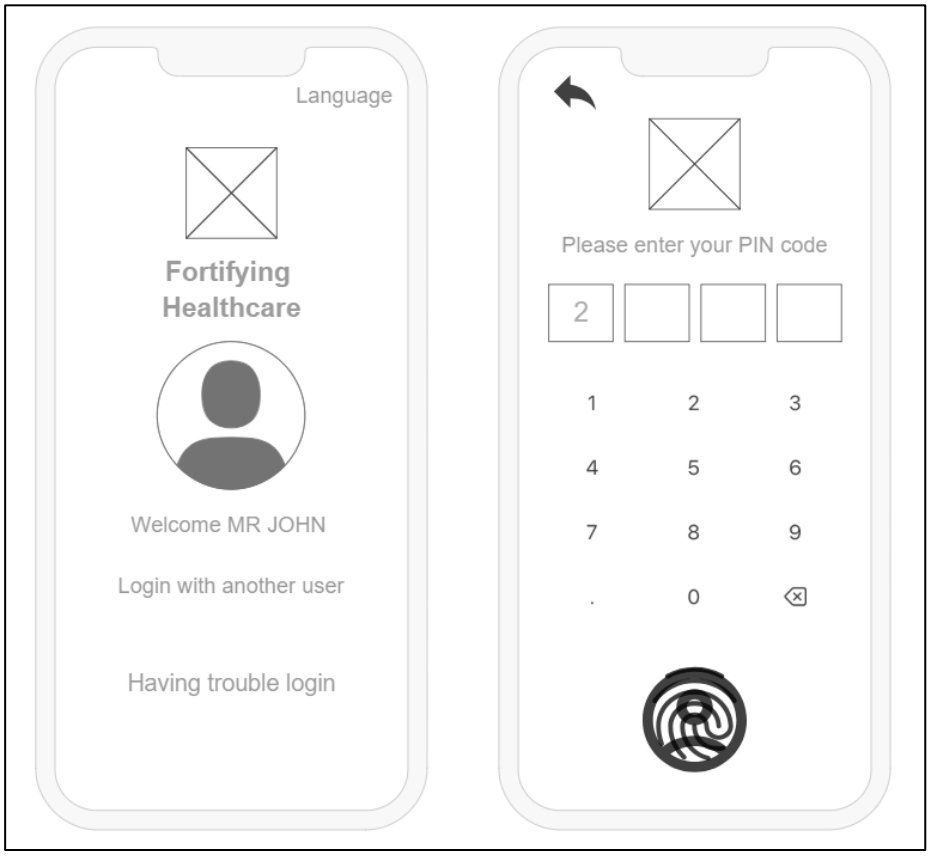


Figure 5 *Doctor's Dashboard Login Screen 01 & 02 (created using https://app.moqups.com)*

- The users (doctors) see a dashboard of logging.

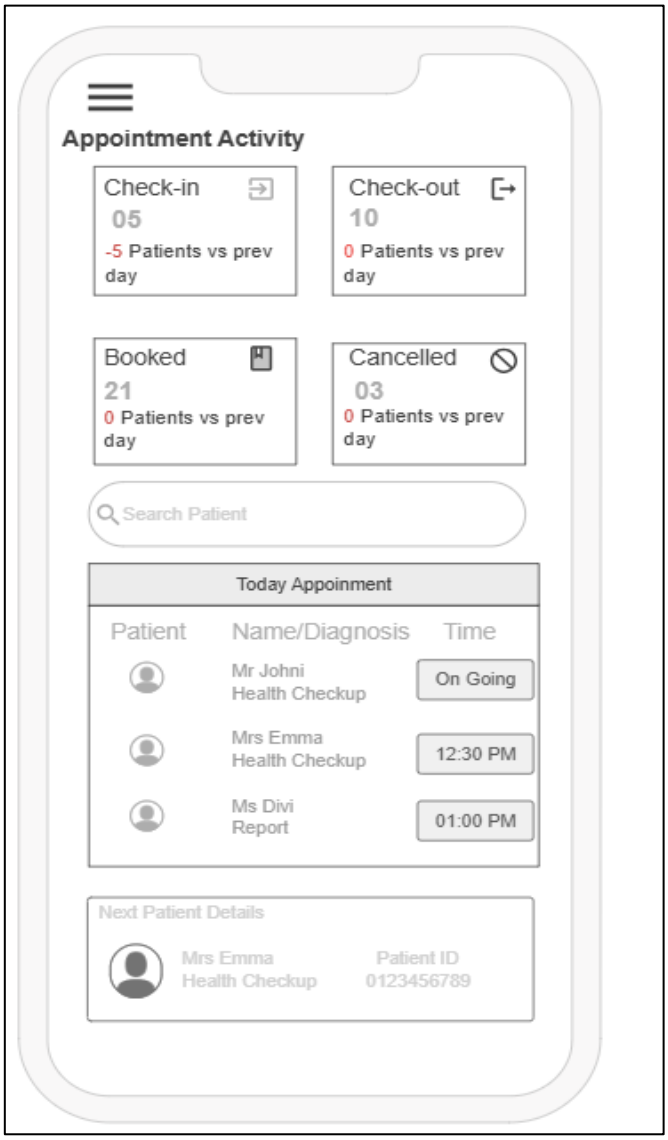


Figure 6 *Doctor's Dashboard (created using https://app.moqups.com)*

- After logging in, the user's dashboard appears, including appointment metrics and scheduled appointments.
- The user can access more secondary navigation choices using the hamburger menu.

Doctor's Navigation Pane

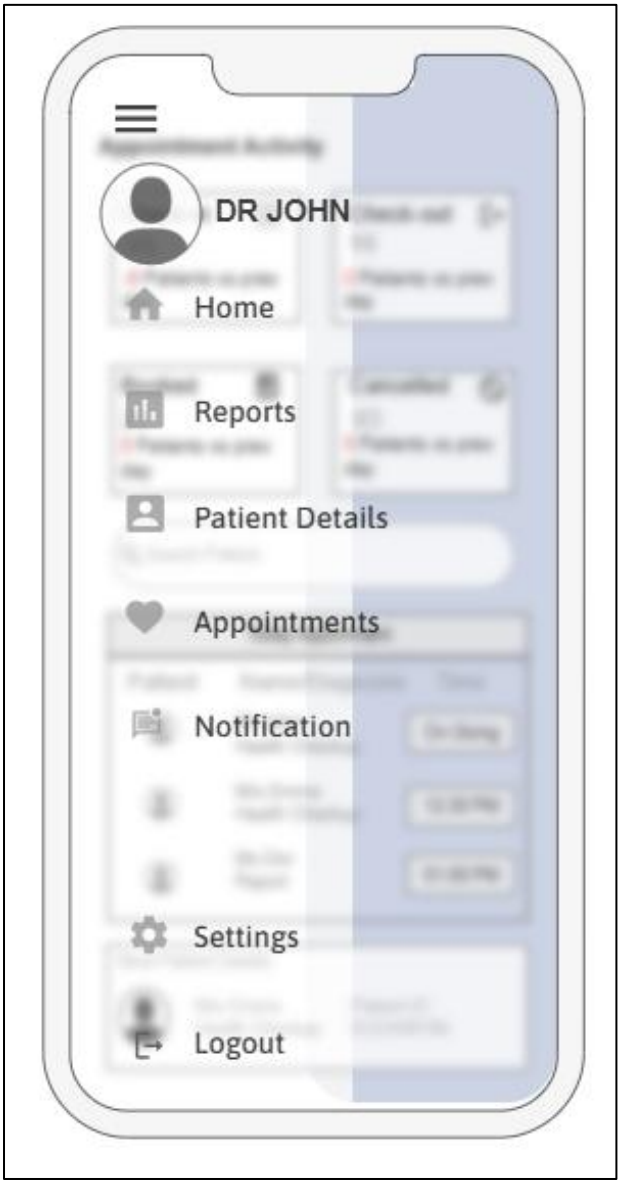


Figure 7 *Doctor's Navigation Pane (created using https://app.moqups.com)*

- The user's name and profile picture are shown at the top of the screen with quick access to following sections of the mobile application.
- **Home:** Takes you home to the main dashboard, **Reports:** Provides access to patient data and reports, **Patient Details:** Displays the dashboard for patient search and profile, **Appointments:** Organizes previous and future appointments, **Notifications:** Shows system updates and messages from other staff, **Settings:** Updating preferences and account settings, **Logout:** A secure way to leave the system.

5) Update a patient’s medication prescription

Patient Search Dashboard

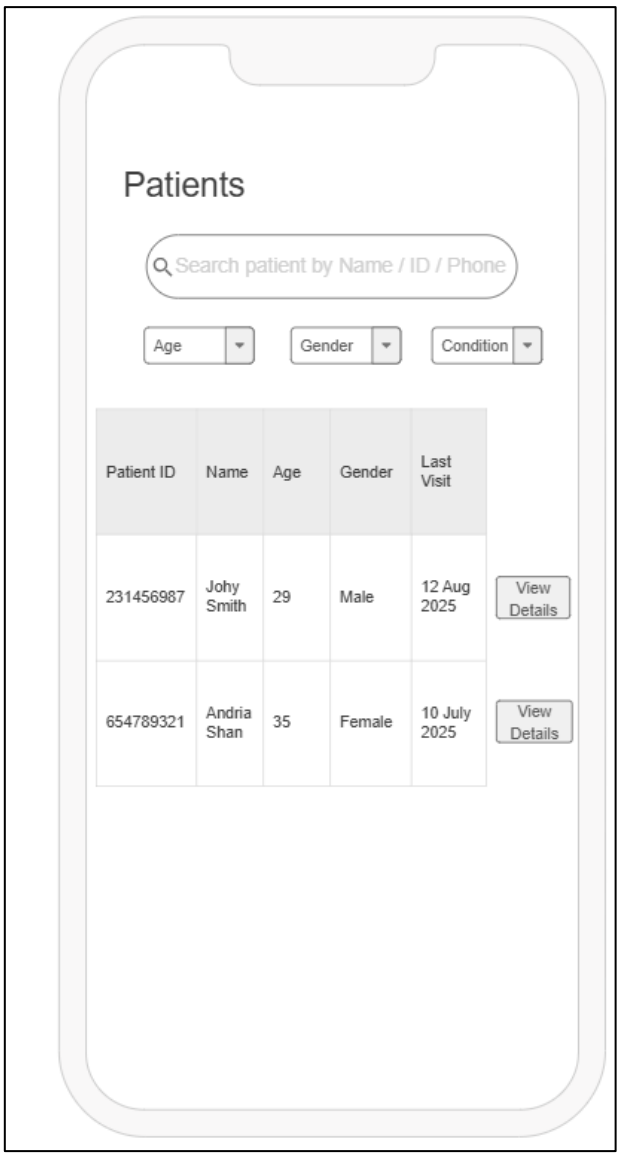


Figure 8 *Patient's Search Dashboard (created using https://app.moqups.com)*

- The user is instantly directed to the patient search interface when they click on "Patient Details" in the navigation pane.
- This dashboard features a patient detail chart, age, gender, and medical condition filters, as well as a search box.
- Every chart entry has a "View Details" button.
- Matching results show up below once a patient's name has been entered in the search box.
- The user has to click the "View Details" button in order to see a patient's complete profile.

Patient Overview Dashboard

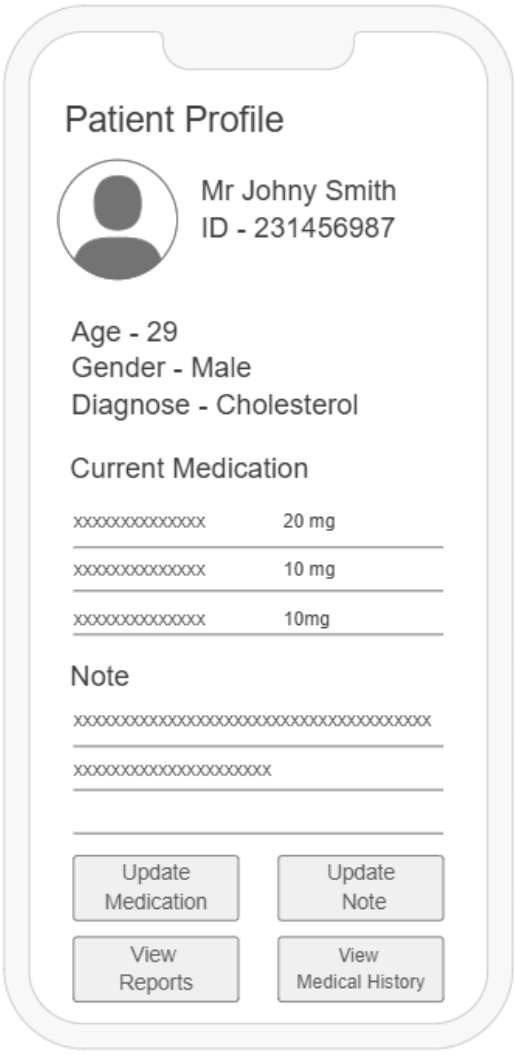


Figure 9 *Patient's Overview Dashboard (created using https://app.moqups.com)*

Full patient information is displayed on this dashboard, including:

The patient's name, ID, age, gender, diagnosis, present drugs, and remarks

There are four functional buttons at the bottom of the screen:

- **Update Medication:** Make changes to the patient's existing prescription information.
- **Update Note:** Modify or add clinical notes to the note.
- **View Medical History:** Examine the patient's past medical records.
- **View Record:** Access the whole patient record with the image of scan reports.

- After clicking the “Update Medication” button, it's goes to the below-mentioned screen

Medication Update Dashboard:

- The user is directed to the Medication Update Screen after selecting the "Update Medication" option, where they can change the following information:
    - Name of Medication
    - Dosage
    - The frequency of intake

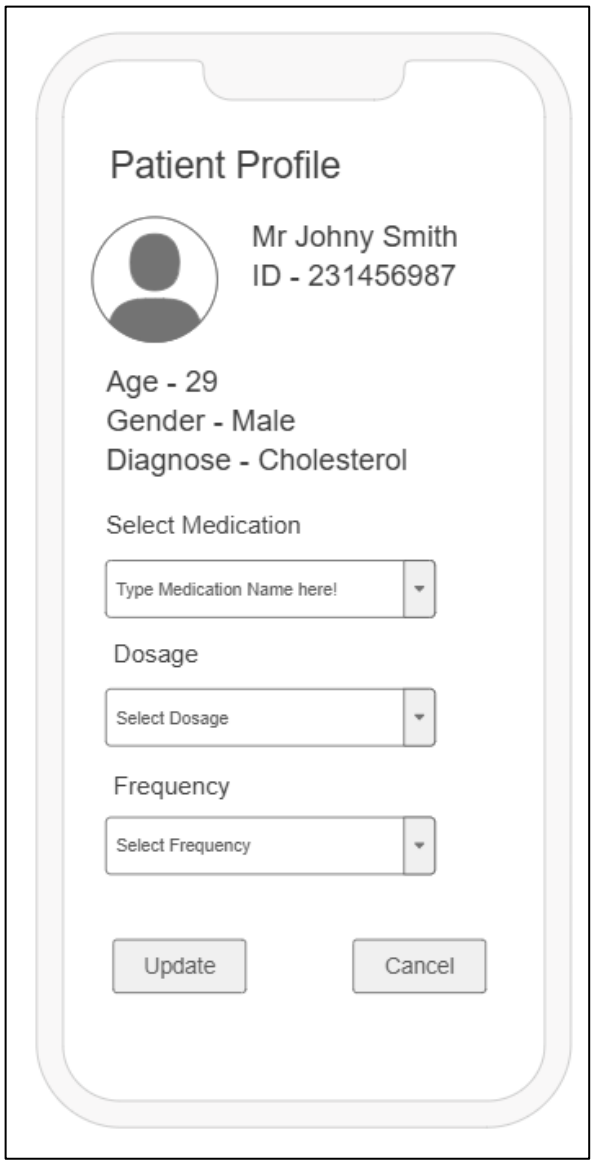
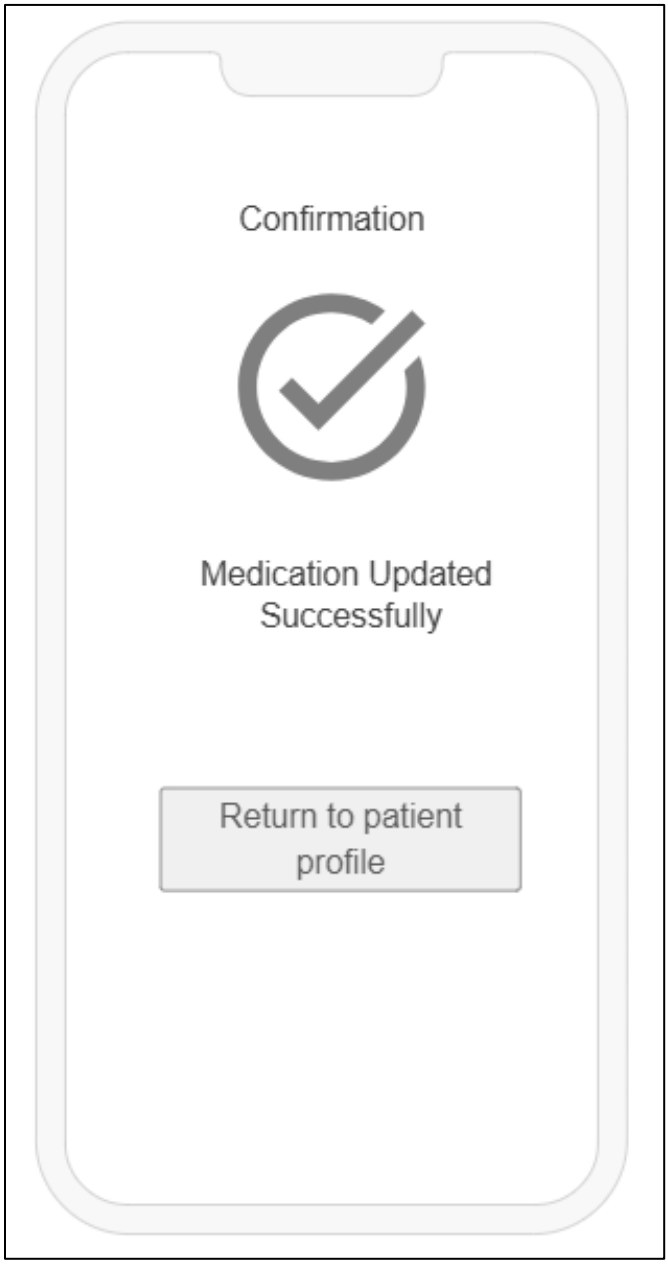


Figure 10 *Medication Update Dashboard (created using https://app.moqups.com)*

- There are two choices for action at the bottom of the dashboard:
    - Update: Saves the modifications made to the drug details.
    - Cancel: This option removes modifications and takes the user back to the home screen.

Update Confirmation Screen for Medication



- "Medication updated successfully" is the confirmation message that appears on this dashboard.
- One function button is shown at the bottom of the screen: Go back to the patient's profile page by selecting “Return to Patient Profile”.

Figure 11 *Update Confirmation Screen for Medication (created using https://app.moqups.com)*

6) Access to a patient's medical record and history

Medical History Access Dashboard

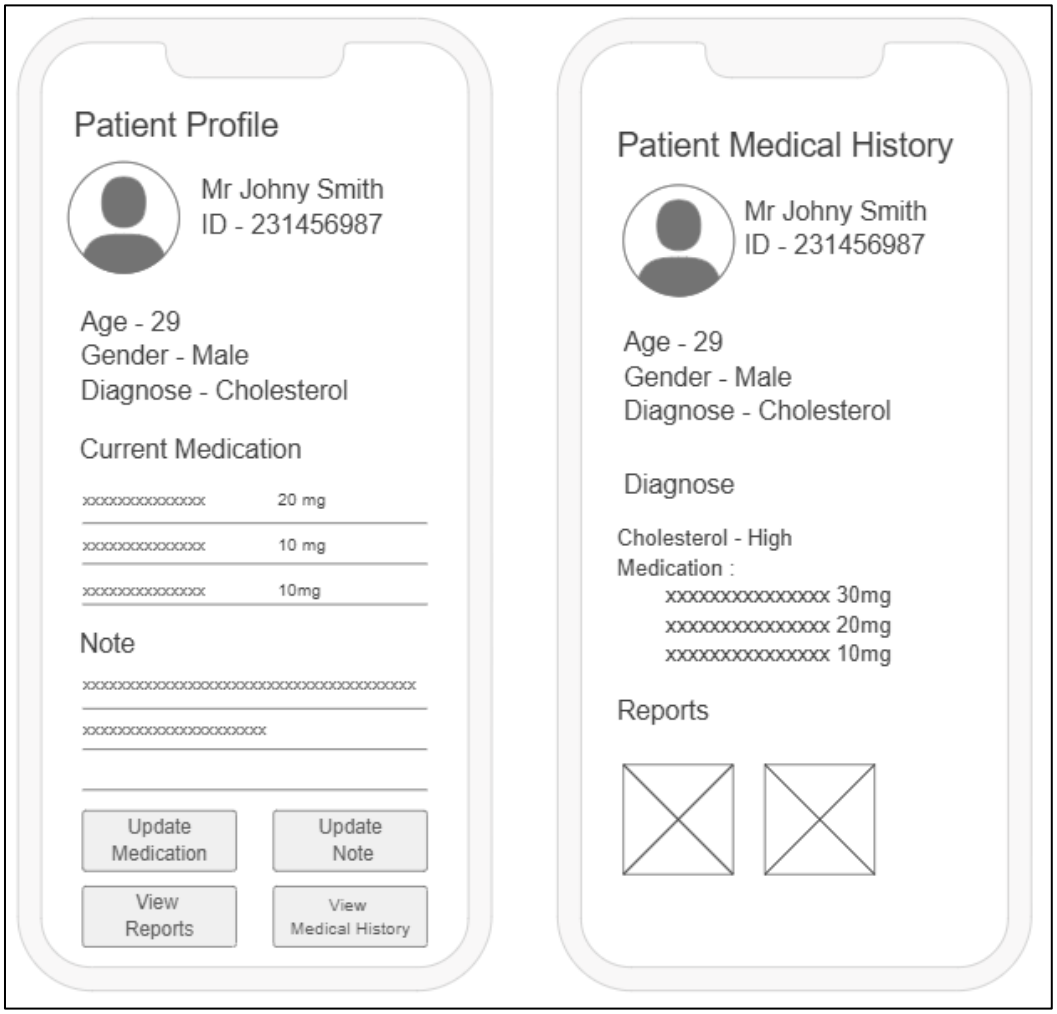


Figure 12 *Medical History Access Dashboard (created using https://app.moqups.com)*

The user is taken to a thorough overview screen that shows the patient's whole medical history when they click the "View Medical History" button.

This screen contains the following information such as patient full name, patient ID, age, gender, and diagnosis details with lab reports or scan reports.

7) Review and analyze large diagnostic results

Accessing the Report Dashboard

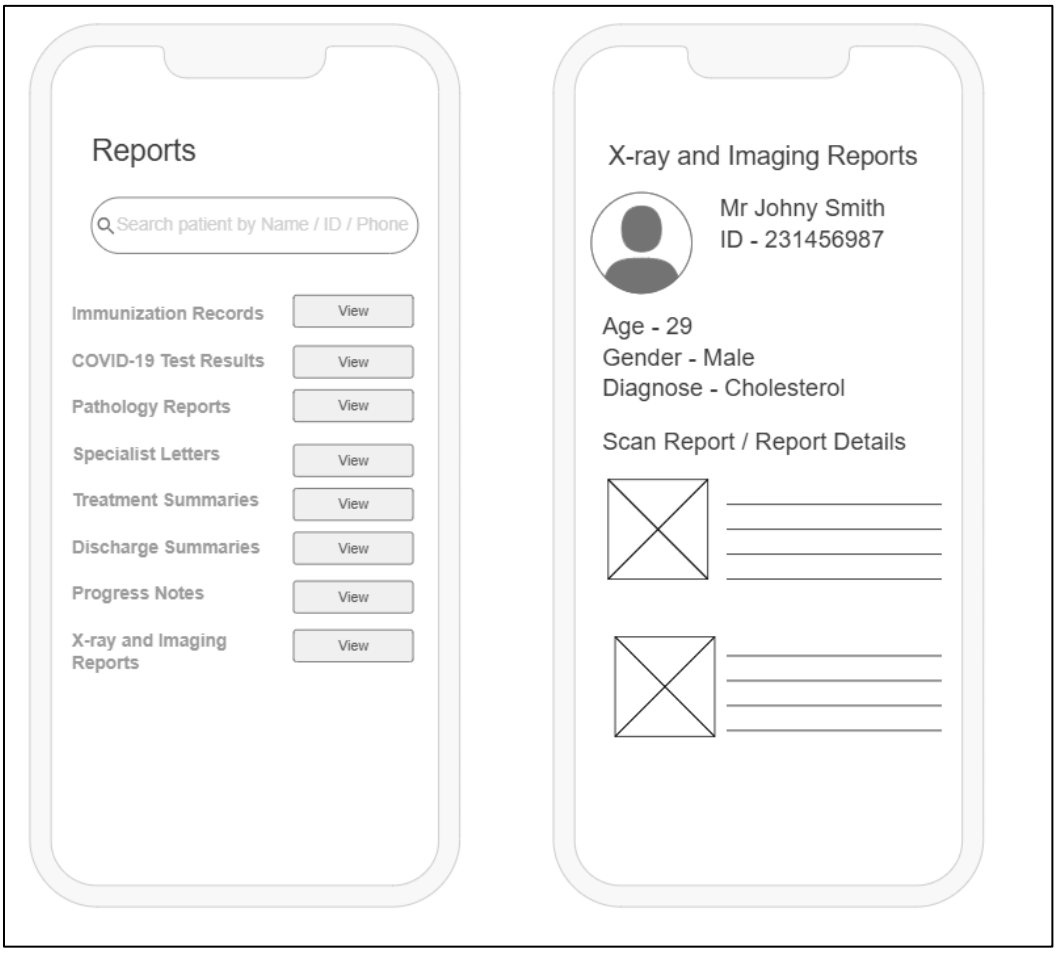


Figure 13 *Accessing the Report Dashboard Screen 01 & 02 (created using https://app.moqups.com)*

The Patient Dashboard and the Home Screen Navigation Bar are two simple ways for users to access the Report Dashboard.

There are two ways for users to find a patient's report on the Report Dashboard:

- **Search Function:** To obtain the patient's report immediately, enter their name, ID, or phone number.
- **Report List:** To see the X-ray and Imaging Reports Dashboard, browse the list and select the "View" option.

Dashboard Report Features: The dashboard shows a wealth of patient data, such as Complete Name, Patient ID, Age, and Gender, Lab Reports with Remarks, Diagnosis Summary, and Examine Report Pictures.

8) Send and receive real-time messages

Secure Messaging & Notifications Dashboard

Figure 14 *Secure Messaging & Notifications Dashboard (step by step) (created using https://app.moqups.com)*

The Home Screen Navigation Menu allows users easy access to Secure Messages and System Notifications.

Users can do the following using the Secure Messaging dashboard:

- Send new, secure messages.
- Respond to messages from other employees.
- Messages should include report images for improved clinical understanding.

User Group 01 -User Profile 02 Nurses

Nurse Dashboard

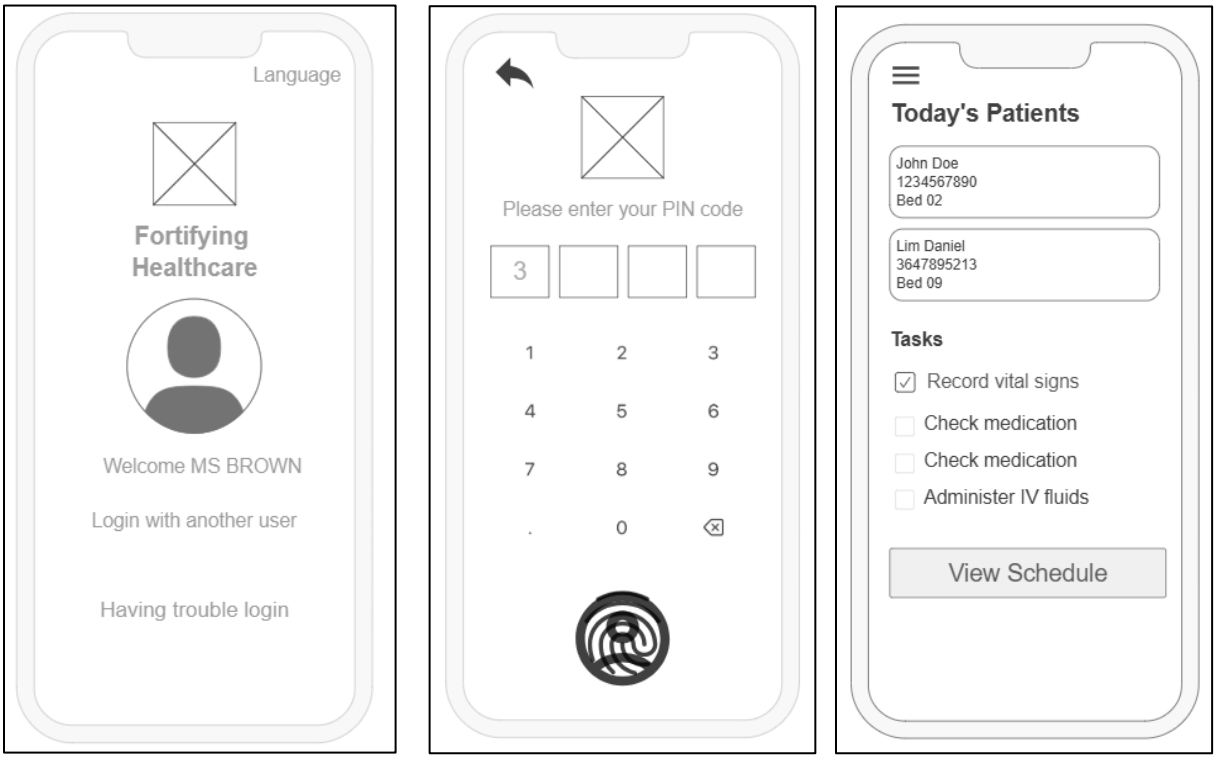


Figure 15 *Nurse's Dashboard (Screen 01, 02 & 03) (created using https://app.moqups.com)*

Step 01 **Step 02**

- The user (nurse) sees a dashboard after logging into the mobile application [step 01 & 02], which includes the following:
- Today's Patient Information, along with patient name, patient ID, bed number, daily task overview, and a list of the duties the nurse has been allocated for the day, which appears below the patient data.
- The nurse may view their whole shift schedule by clicking the "View Schedule" button at the bottom of the page.
- The user can access more secondary navigation choices using the hamburger menu.

Nurse's Navigation Pane

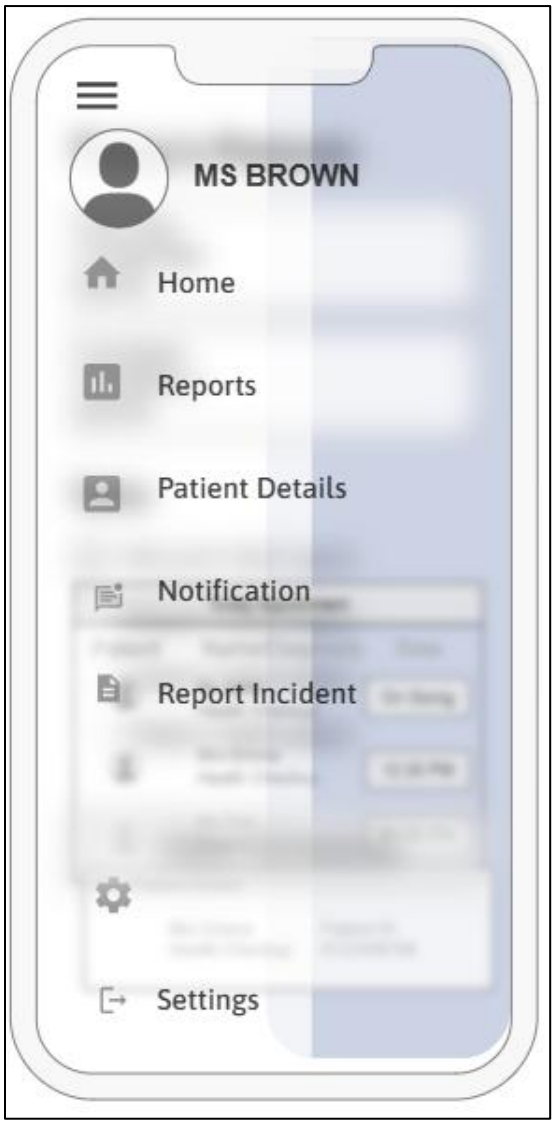


Figure 16 *Nurse's Navigation Pane (created using https://app.moqups.com)*

The user's name and profile picture are shown at the top of the screen with quick access to following sections of the mobile application.

Home: Takes you home to the main dashboard, **Reports:** Provides access to view the patient reports, **Patient Details:** Update the patient vitals and view the patient's vital history, **Notifications:** Shows system updates and messages from other staff, **Report Incident:** User can report a new incident to the doctors and management, **Settings:** Updating preferences and account settings, **Logout:** A secure way to leave the system.

9) Record and update patient vitals

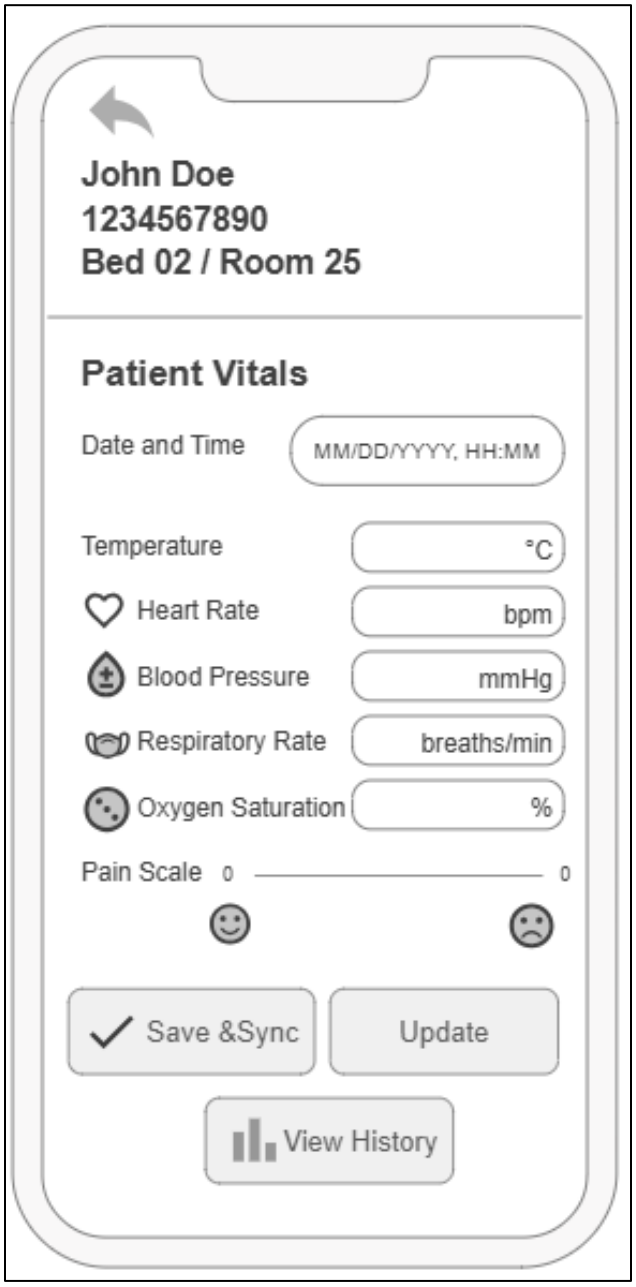


Figure 17 *Record and update patient vitals Dashboard (created using https://app.moqups.com)*

- The user is instantly directed to the patient search interface when they click on "Patient Details" in the navigation pane.
- In this dashboard, patient details are displayed along with their assigned bed and room numbers.
- It allows the nurse to update vitals with a few input steps.
- Having access to previous vital records is available, allowing for trend analysis and well-informed treatment choices.

10) Emergency Incident Report

Figure 18 *Emergency Incident Report Dashboard (created using https://app.moqups.com)*

- The user is instantly directed to the patient search interface when they click on "Report Incident" in the navigation pane.
- By entering the patient's name, choosing the incident category from a selected list, and providing important patient information such as age, gender, and diagnosis supported by multimedia.

User Group 02 – User Profile 03 Medical Records Officer Dashboard

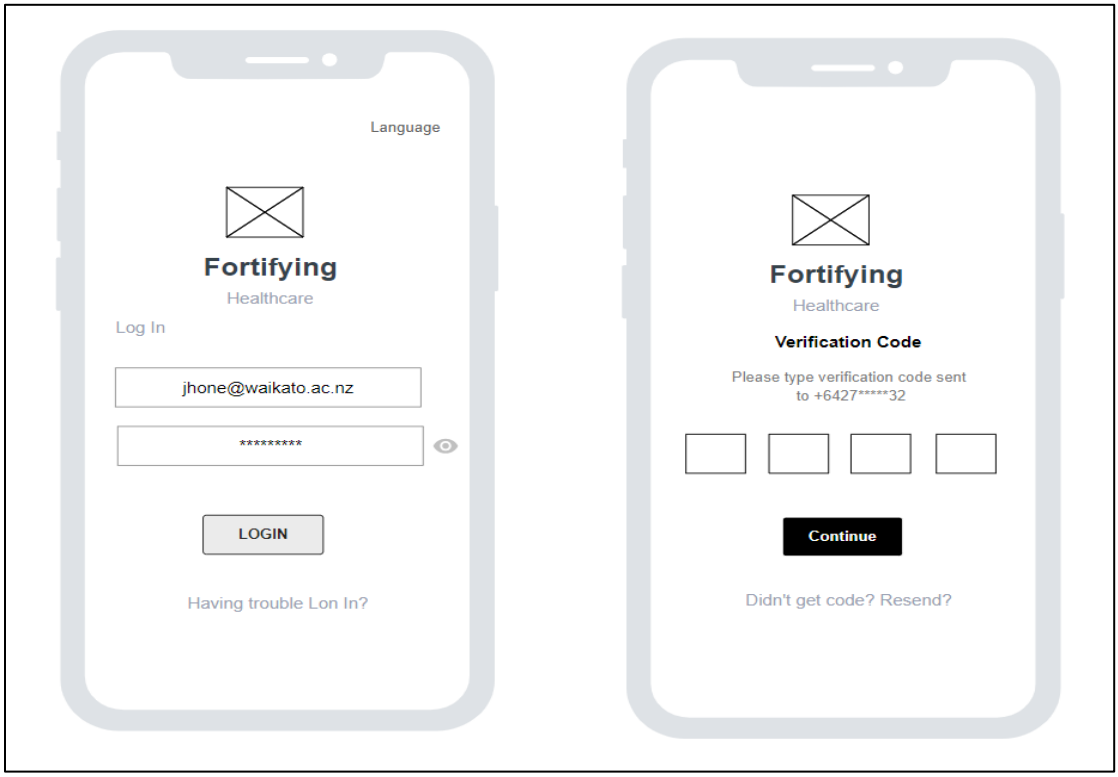


Figure 19 *Medical Records Officer's Dashboard (created using https://app.moqups.com)*

Medical Records Officer (MRO) can securely log in using their registered email and password. After successful authentication with a one-time password (OTP), the user is redirected to the MRO dashboard.

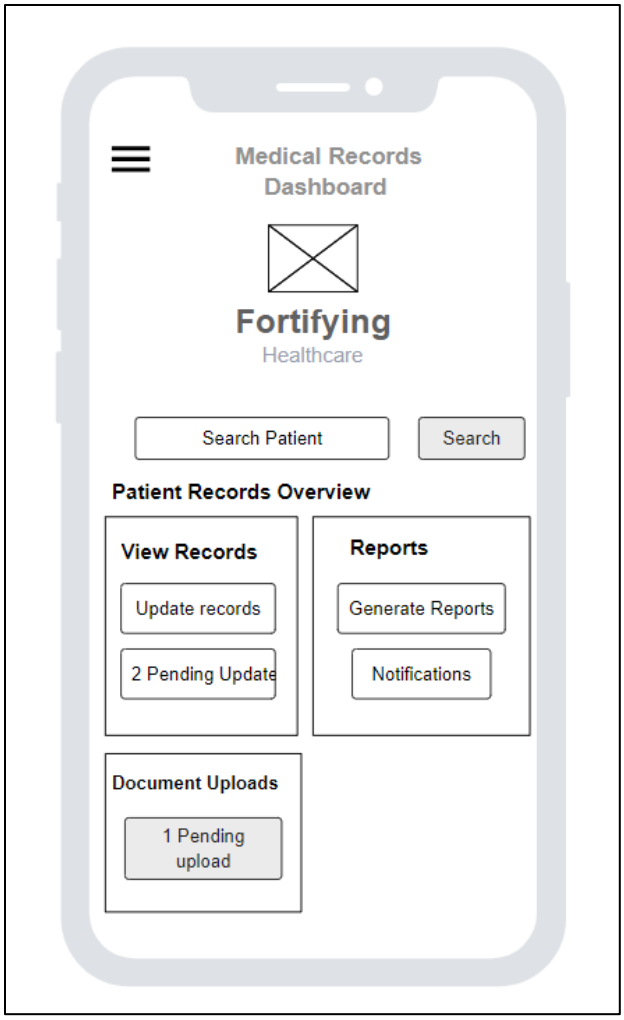


Figure 21 *Medical Records Officer's Dashboard (created using https://app.moqups.com)*

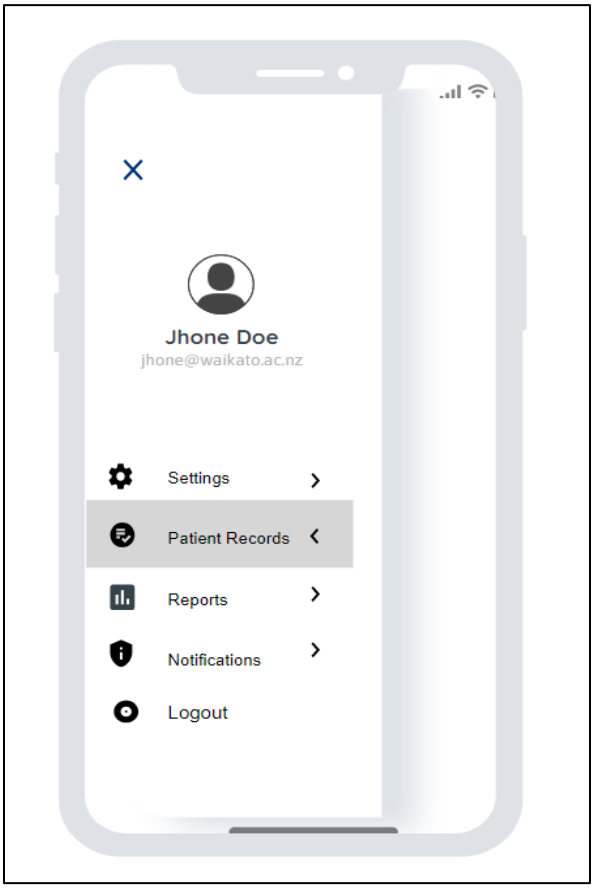


Figure 20 *Medical Records Officer's Navigation Pane (created using https://app.moqups.com)*

After logging in, the user is directed to the MRO dashboard, which provides access to patient search, patient records, reports, and a document upload overview section. The user can also easily navigate through the system using the navigation panel, which includes options for settings, patient reports, records, notifications, and logging out.

11) Search, View, And Update Patient Medical Records

Medical Records Dashboard

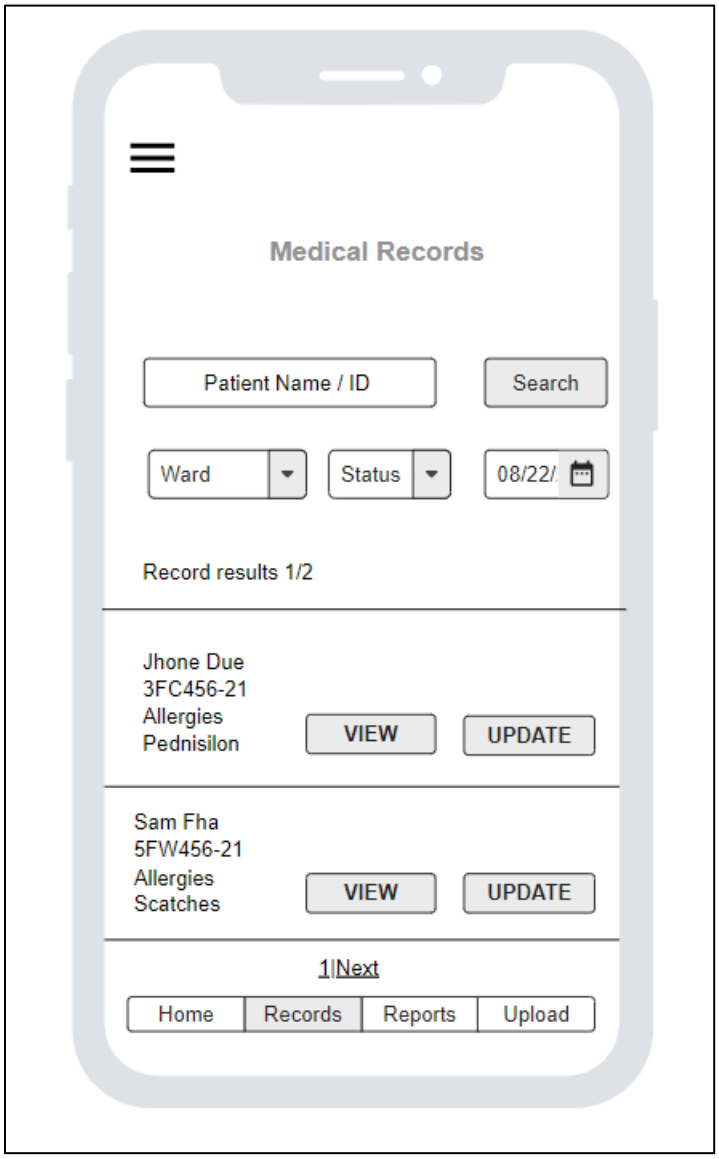


Figure 22 *Medical Records Dashboard (created using https://app.moqups.com)*

User can search medical records by using patient name and ID; after clicking the “Search” button, it populates medical record cards relevant to the patient ID. Each card consists of view and update buttons. If user need to view more details, user can click “View” button, and it will populate complete record details as below screen.

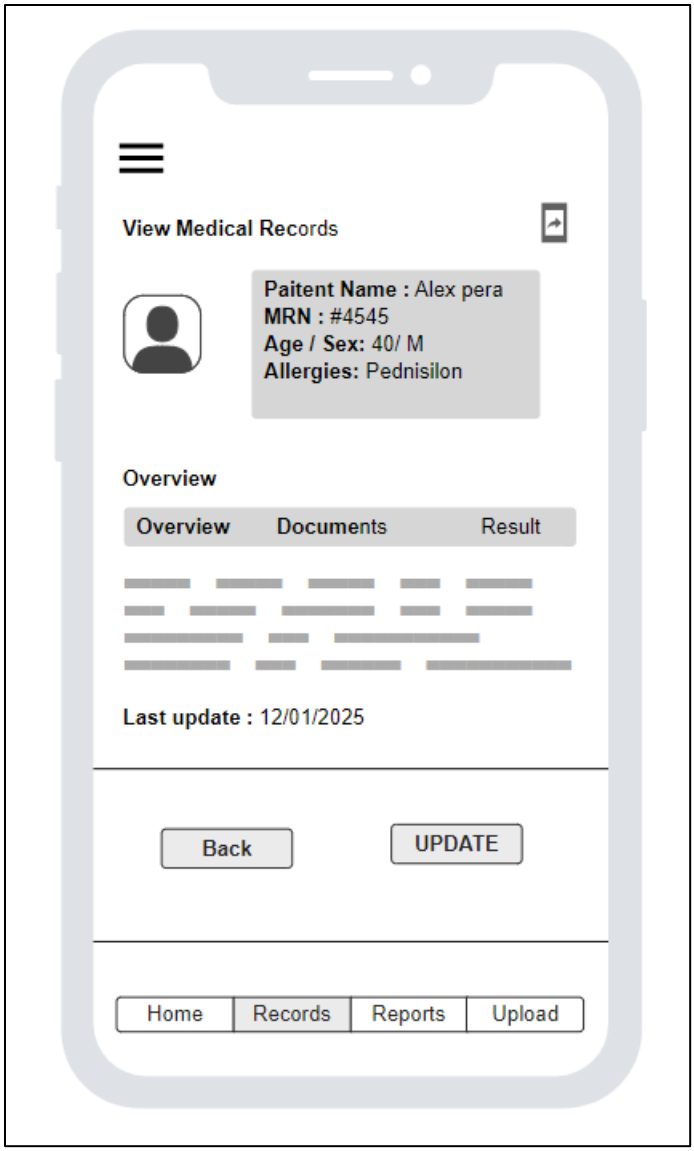


Figure 23 *View Medical Records Dashboard (created using https://app.moqups.com)*

The **View Medical Records** screen allows authorized users to access a patient's complete medical history in one place. After searching for and selecting a patient, this screen displays key patient information, such as name, medical record number (MRN), date of birth, age, gender, and known allergies.

At the bottom, there is a "Update" button that allows Medical Records Officers to edit or update patient details when necessary. Additional options, such as Share, let staff securely send reports or summaries to doctors, nurses, or administrators.

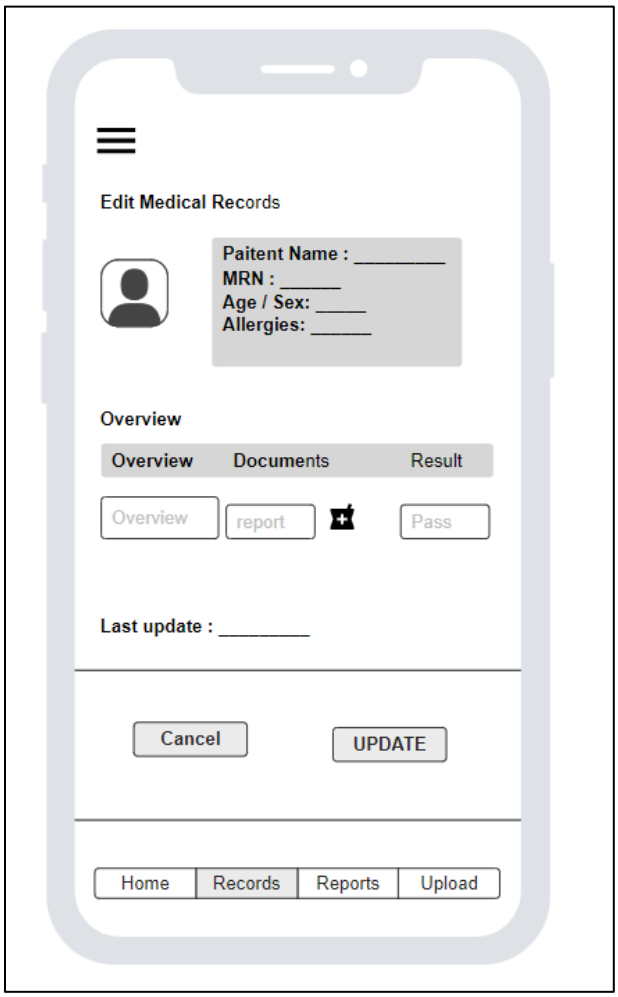


Figure 25 *Edit Medical Records Dashboard (created using https://app.moqups.com)*

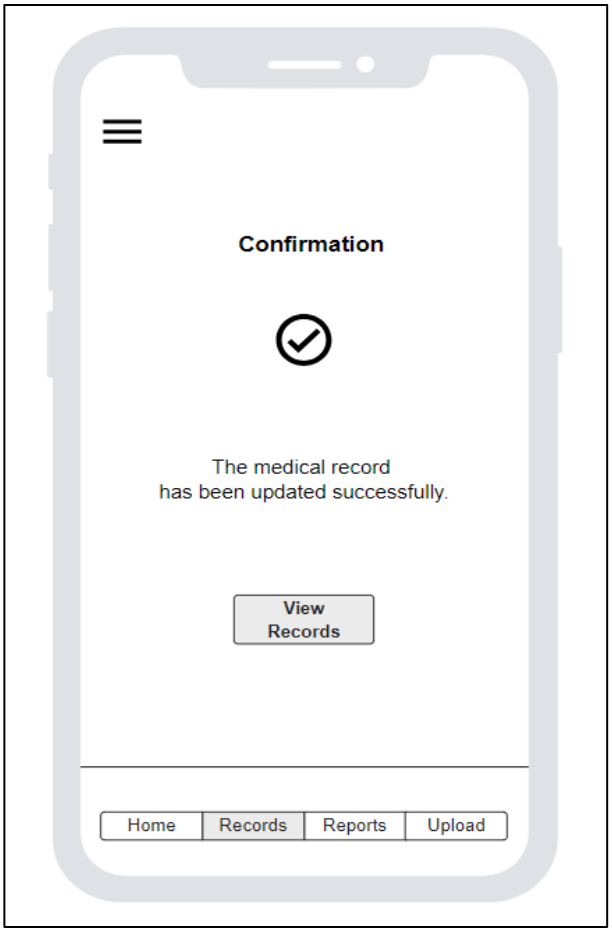


Figure 24 *Confirmation Dashboard (created using https://app.moqups.com)*

After saving changes, the system shows a simple confirmation message, and the user can then continue navigating through the application.

Generate patient reports

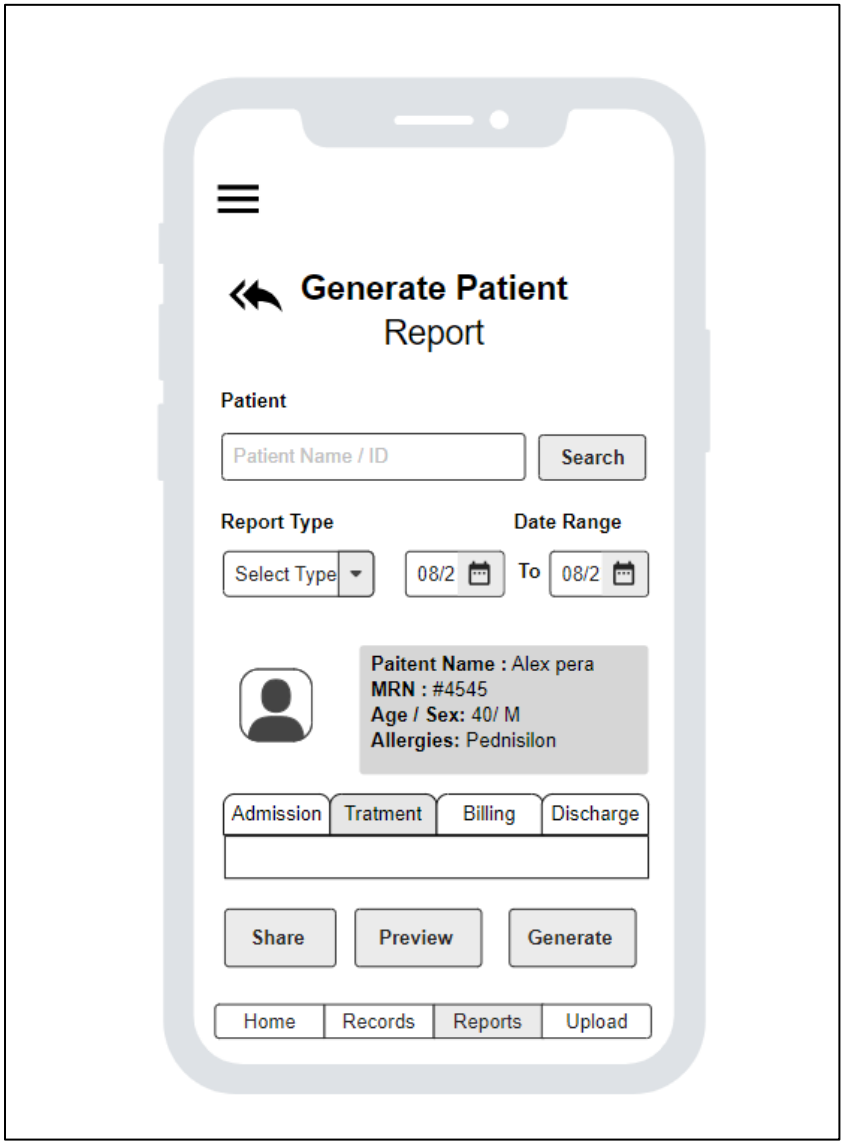


Figure 26 *Generate Patient Report Dashboard (created using https://app.moqups.com)*

The Generate Patient Report screen allows medical records officers to create reports such as admission history, discharge summaries, billing details, or treatment records. After selecting a patient and report type, the report can be generated, previewed, and securely shared with authorized staff for quick access to accurate information.

User Group 03 – User Profile 04 Ambulance / Paramedic teams

Paramedic Officer Login

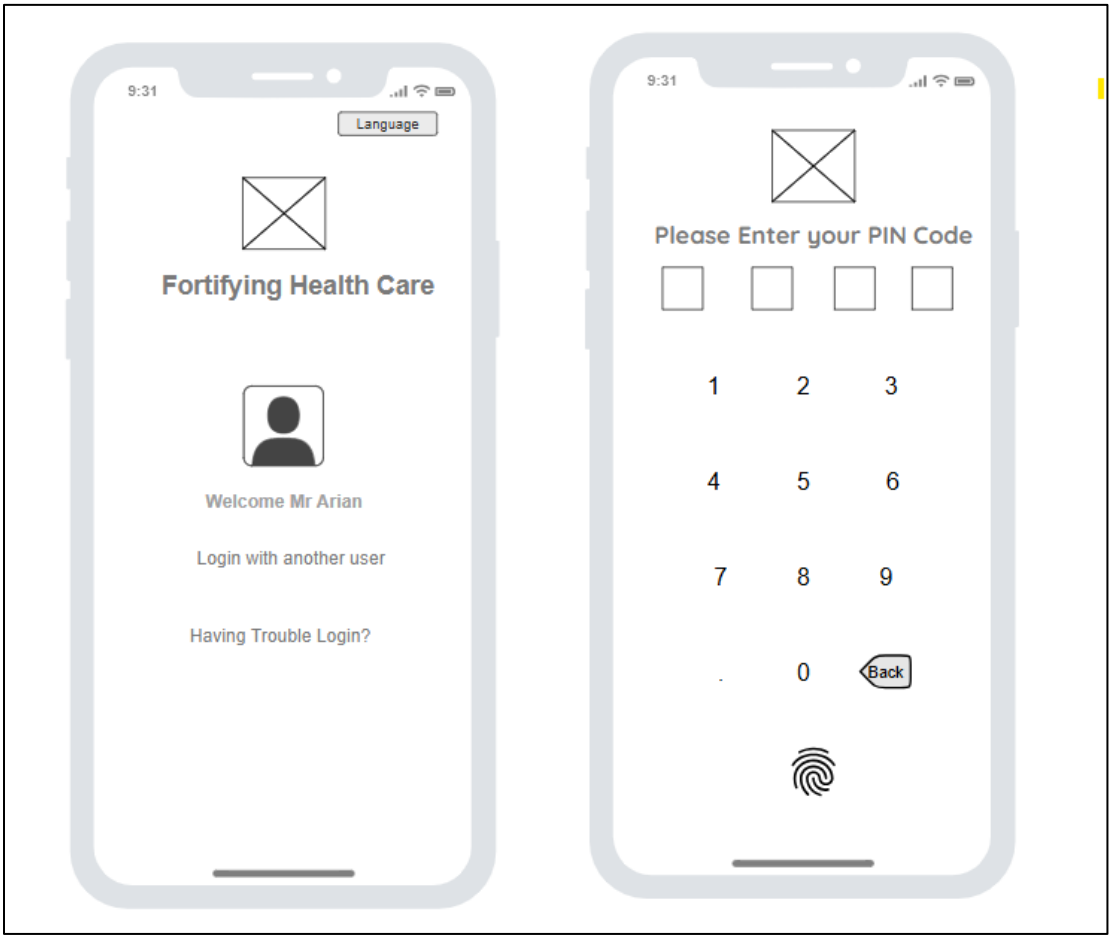


Figure 27 *Paramedic Officer Login Dashboard (created using https://app.moqups.com)*

Login Page 1:

The logo of the hospital is displayed at the top of the screen along with the logged users' profile picture and name, and the "Language" button is also displayed to change the language as per the user's preference.

From using the "Having Trouble Login?" button, users are able to reset their password.

"Login with another user" option is enabled for other users who have authorization to access the mobile application by using their own user ID and password.

Login Page 2:

After entering the password, the user is able to log in using biometric login and PIN code. No longer need to enter a password, the user is able to log in through biometrics.

Paramedic Officer Navigation Dashboard

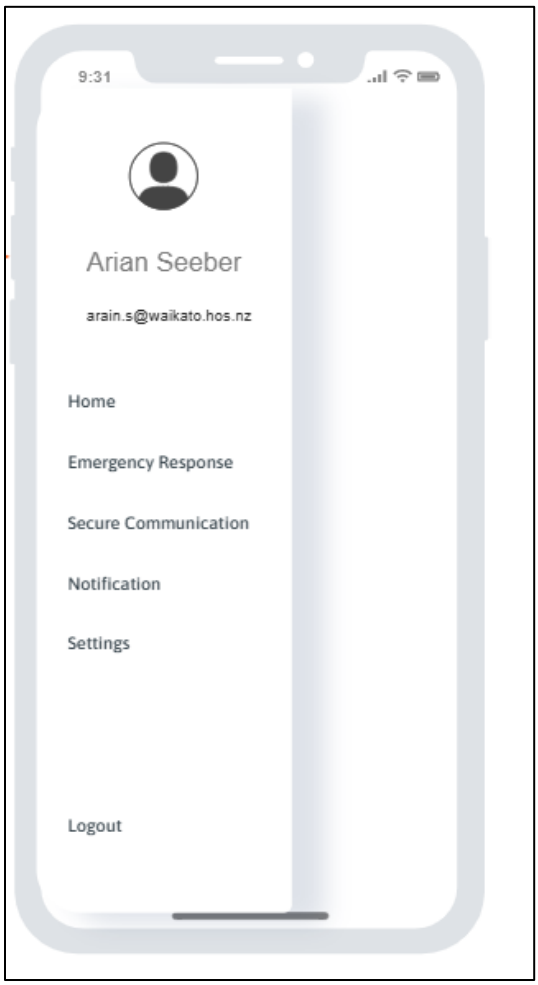


Figure 28 *Paramedic Officer Navigation Pane (created using https://app.moqups.com)*

When a user login to the application, the user's profile picture, user name, and user e-mail address are displayed at the top of the navigation dashboard.

Home: It will navigate the user to the main screen. "**Emergency Response**" option will navigate to the emergency response screen. "**Secure Communication**" option will navigate to the secure communication screen. "**Notification**" option will navigate to the notification screen. The "**Settings**" option will navigate to the settings screen, and the user is able to change the user preferences and account settings using that. "Logout" option is enabled to log out of the application.

Paramedic Officer Emergency Response Portal.

Figure 29 *Paramedic Officer Emergency Response Portal (created using https://app.moqups.com)*

The Paramedic officers have access to this portal screen, and basically, it is used to enter the mandatory data of patients that are necessary for the hospital while the patient is arriving.

Let's discuss the features of the "Upload Emergency Information" screen.

- "Emergency Title" dropdown: From this dropdown, the Officer is able to select the emergency type. Such as; COVID-19, road accident, Chest pain etc..
- "Category" dropdown: From this dropdown, the Officer is able to select the category type under the emergency title. Such as if user selects COVID-19 as the emergency title, then it will show the categories like pneumonia, outbreak etc.
- "Description" text field: In this text field user is able to input special notes regarding the patient's situation.
- "Urgency Level" radio buttons: This feature communicates the urgency level of the patient, whether it is low, medium, or high.

- “Upload document” text area: The user is able to upload photos of documents such as patient reports, scans.
- “Upload Video” text area: The user is able to upload a video of documents such as patient reports, scans, or the patient’s current situation.
- “Send” button: After entering all the details, the user is able to send the details by tapping on the “Send” button.

After sending all the details via the “Emergency Portal” screen, the user will get either a “Success” or “Error” message. There are also two buttons included.

1. “View Report” button. – The user is able to view the entered details as a report.
2. “Go back to response portal” button – The user is able to go back to edit details and resend it by using the “Go back to response portal” button.

Paramedic Officer Secure Communication.

Figure 30 *Paramedic Officer Secure Communication (created using https://app.moqups.com)*

The Paramedic officers have access to the "Secure Communication" screen, and basically, it is used to secure messaging, secure voice or calling and share live location to the hospital.

Let's discuss the features of the "Secure Communication" screen.

- "Send Emergency Alert" button: From this button user is able to access the "Send Emergency Alert" screen.
- "Share Live Location" button: From this button user is able to share the live location with the hospital.
- "Type Here" Text field: This text field is used to securely message with the Doctor or Nurse.
- "Record Audio" field: This text field is used to record audio and share with the Doctor or Nurse.
- "Voice" button: When the user taps on the "Voice" button, he/she can send "Voice".
- "Text" button: When the user taps on the "Text" button, he/she can send "Text".

After sending all the voice/call via the "Secure Communication" screen, the user will get either a "Success" or "Error" message. There is also a button to "Go back"– The user is able to go back to edit details and resend it from using the "Go back to response portal" button.

Notification

This screen displays the notifications that the user received. At the top of the screen, it displayed the “Search” bar, and users were able to search notifications by using the search field. Also, they are categorized as “Recent” and “Earlier” messages. When the user clicks on one of the notifications, the pop-up is displayed and shows the date and time with the user sent.

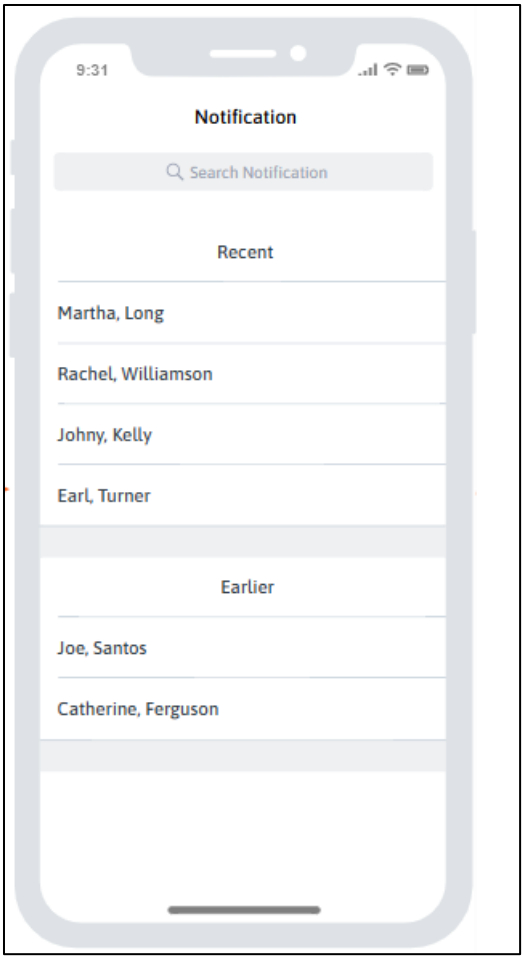


Figure 31 *Notification Dashboard (created using https://app.moqups.com)*

User Group 03 – User Profile 05 Pharmacists

Pharmacist Login

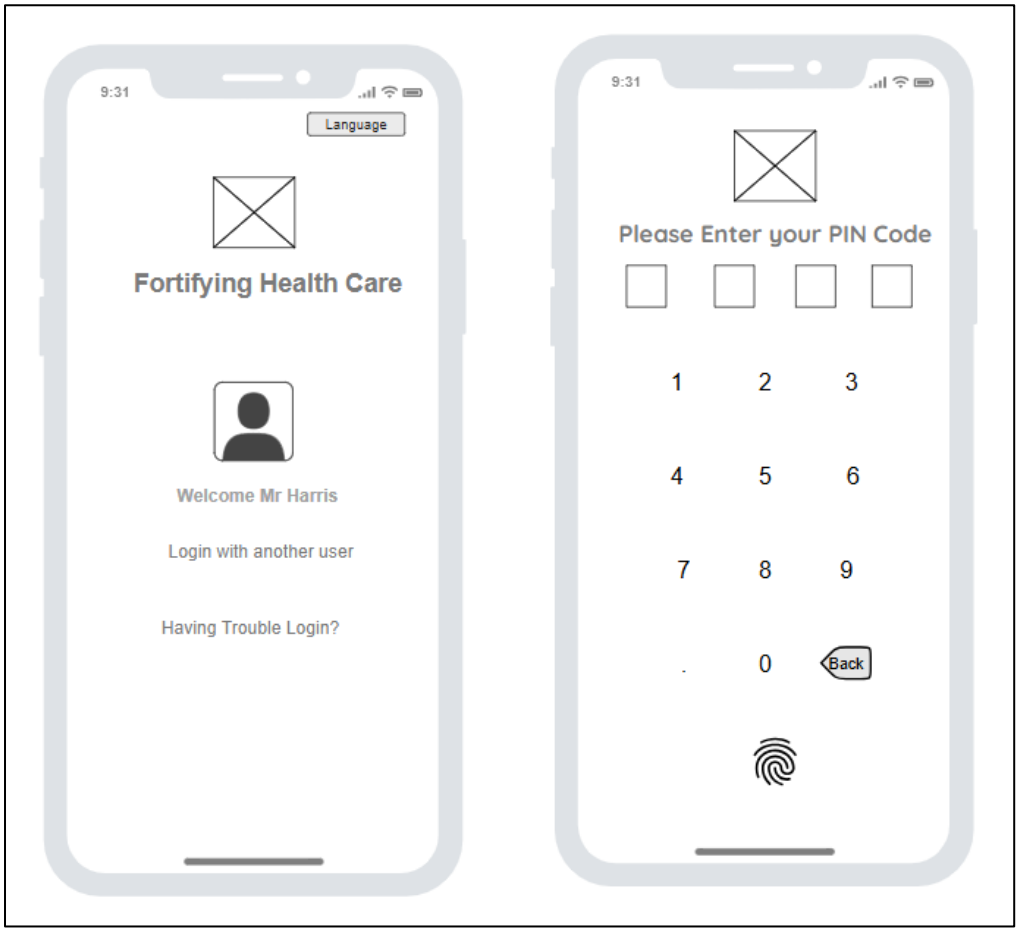


Figure 32 *Pharmacist Login Dashboard (created using https://app.moqups.com)*

Login Page 1:

As per the Paramedic Officer login, the logo of the hospital is displayed at the top of the screen along with the logged users' profile picture and name, and the "Language" button is also displayed to change the language as per the user's preference.

From using the "Having Trouble Login?" button, users are able to reset their password.

"Login with another user" option is enabled for other users who have authorization to access the mobile application by using their own user ID and password.

Login Page 2:

As per the Paramedic Officer login, after entering the password, the user is able to log in using biometric login and PIN code. No longer need to enter a password, the user is able to log in through biometrics.

Pharmacist Navigation Dashboard

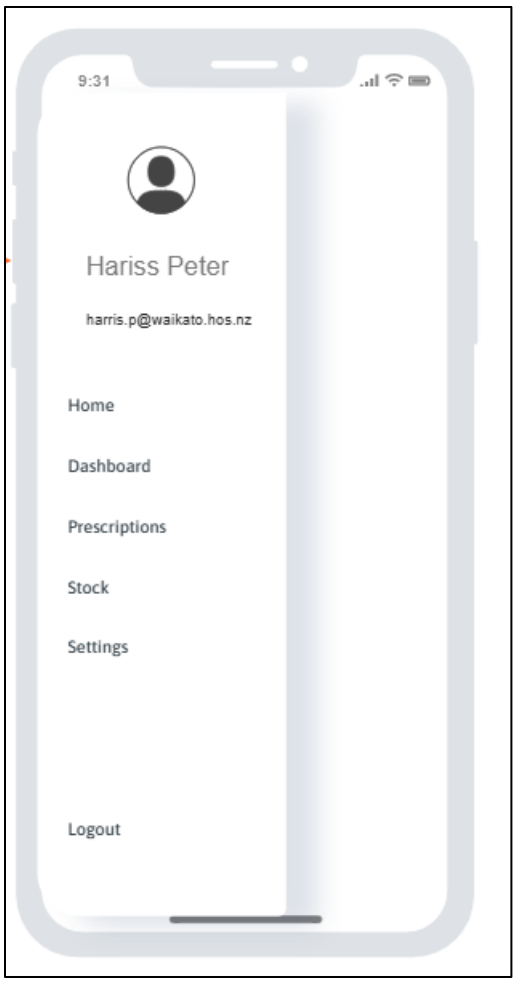


Figure 33 *Pharmacist Navigation Pane (created using https://app.moqups.com)*

When a user logged in to the application, the user's profile picture, user name, and user e-mail address are displayed at the top of the navigation dashboard.

Home: It will navigate the user to the "Dashboard" screen. The "**Prescriptions**" option will navigate to the "**Prescription**" screen to verify the prescriptions that were received from the doctor. "**Stock**" option will navigate to the "Stock" screen, and it will display the overview of the stock. The "**Settings**" option will navigate to the "Settings" screen, and the user is able to change the user preferences and account settings using the "Settings" screen. "Logout" option is enabled to log out of the application.

Pharmacist Dashboard

Figure 34 *Pharmacist Dashboard (created using https://app.moqups.com)*

This dashboard displays the main responsibilities of the pharmacist, which are prescription handling and medicine stock management. Both tasks are displayed as "Prescriptions" and "Stocks" tabs, and the user is able to switch between both categories.

In this screen displayed about the view, when switching to the "Prescriptions" tab. In the dashboard interface, it simply displays basic details of the prescription, and the user needs to tap on the tile to view the detailed prescription. When tapping on a basic tile, the user will navigate to the "Prescriptions" screen.

Prescription screen.

Figure 35 *Prescription screen Dashboard (created using https://app.moqups.com)*

This screen displayed the detailed view of the prescription; the patients' details (patient name, ID, date, age, and gender) and the prescription details (drug name, dosage, and instructions)

On the bottom of the screen there were two buttons.

1. "Mark As Prepared" – When medicine is ready, the user communicates it by tapping on this button.
2. "Contact Doctor" – If the user has and clarification or verification, he/she need to communicate it with the doctor. This button is used to communicate with the doctor, and after tapping on the "Contact Doctor" button, navigate to the "Secure Message" screen.

Stock Status

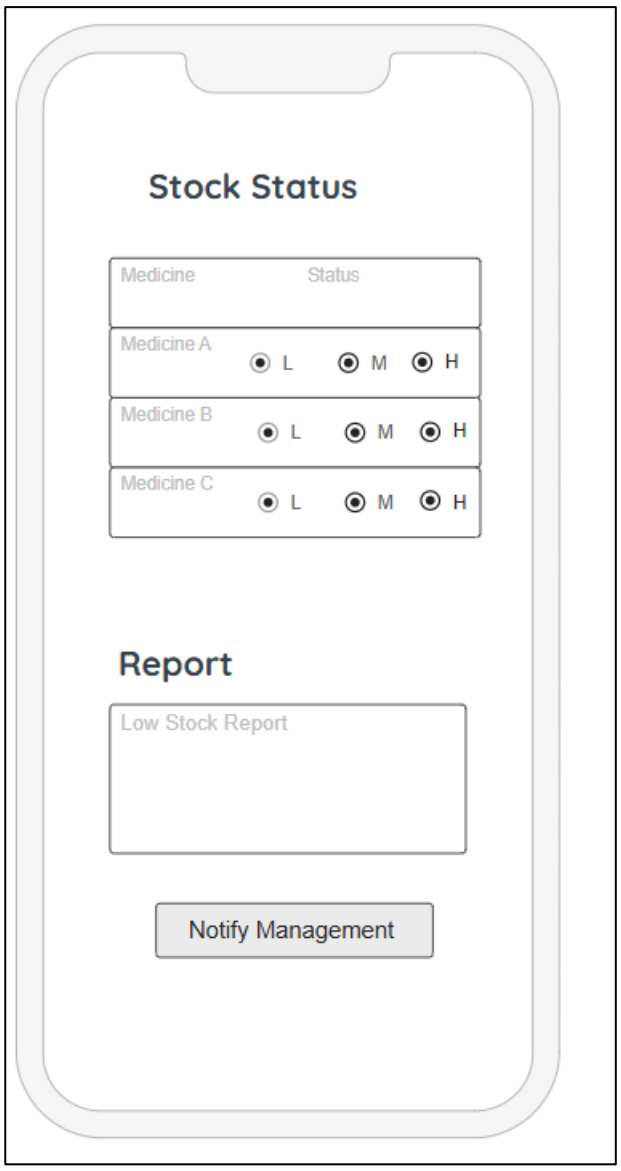


Figure 36 *Stock Status Dashboard (created using https://app.moqups.com)*

This screen is displayed about the hospital's medicine availability.

In the upper tile of the "Stock" screen, the "Stock Status" is displayed, and it gives an idea to the pharmacist about the status of stocks using the indication radio buttons.

At the bottom of the screen displayed the "Report" of the medicine was displayed. When the user taps on the "Medicine", the report section is updated automatically.

The "Notify Management" button is used to share the stock status with the management. When the user taps on the "Notify Management" Button, the report is shared with them.

User Group 04 – User Profile 06 System Administrators

Admin Dashboard

- The admin starts with a login page, followed by a verification code.

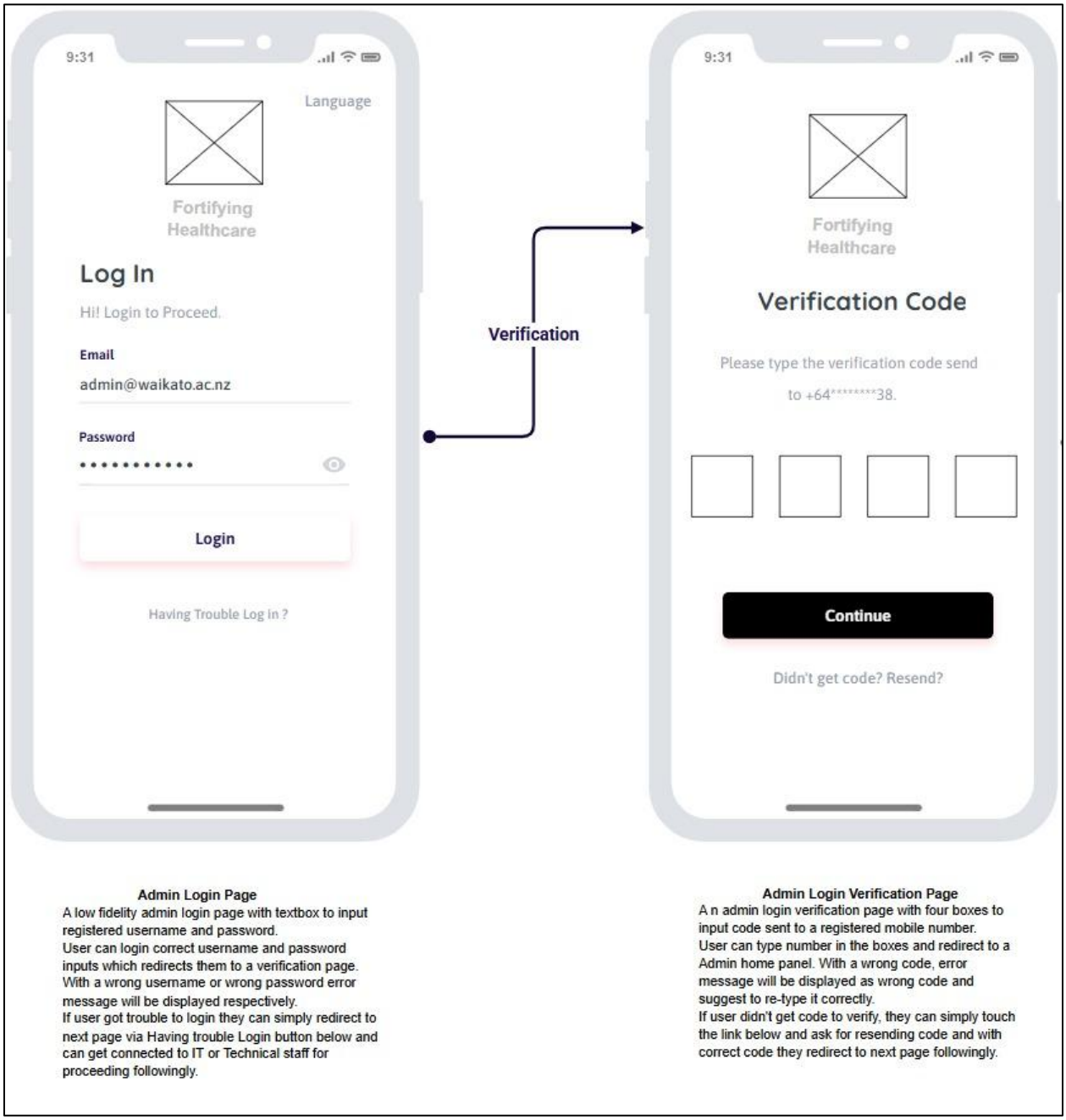


Figure 37 *Admin Login Dashboard (Screen 01 & 02 (created using https://app.moqups.com))*

- After verification, the admin is redirected to a home dashboard.

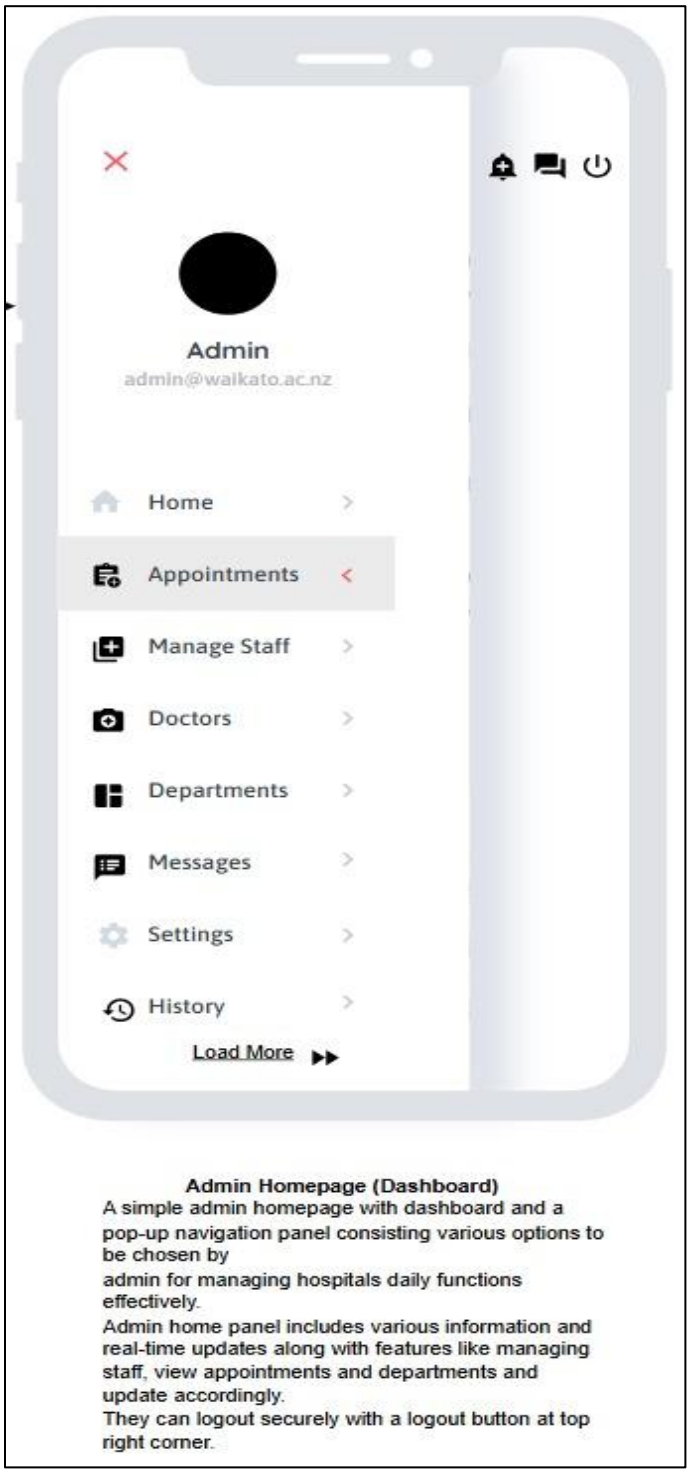


Figure 38 *Admin Navigation Pane (created using https://app.moqups.com)*

- Verified admin is redirected to a home dashboard. As soon as the dashboard appears, we can see the hamburger menu that expands (navigation pane) with a number of functionalities for admins such as appointments, managing staffs, departments, and so on.

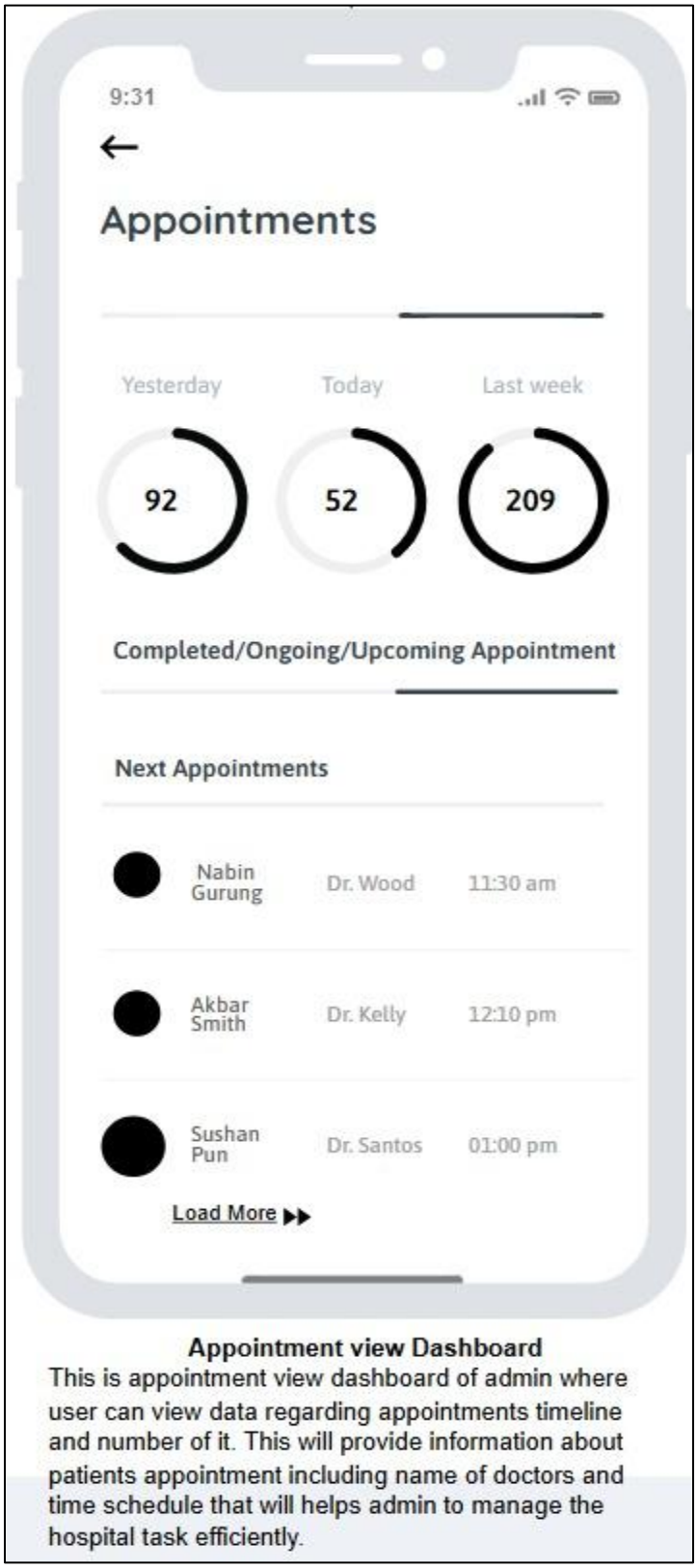


Figure 39 *Appointments View Dashboard (created using https://app.moqups.com)*

- On the appointment navigation pane choice, the admin can view appointments and manage them.

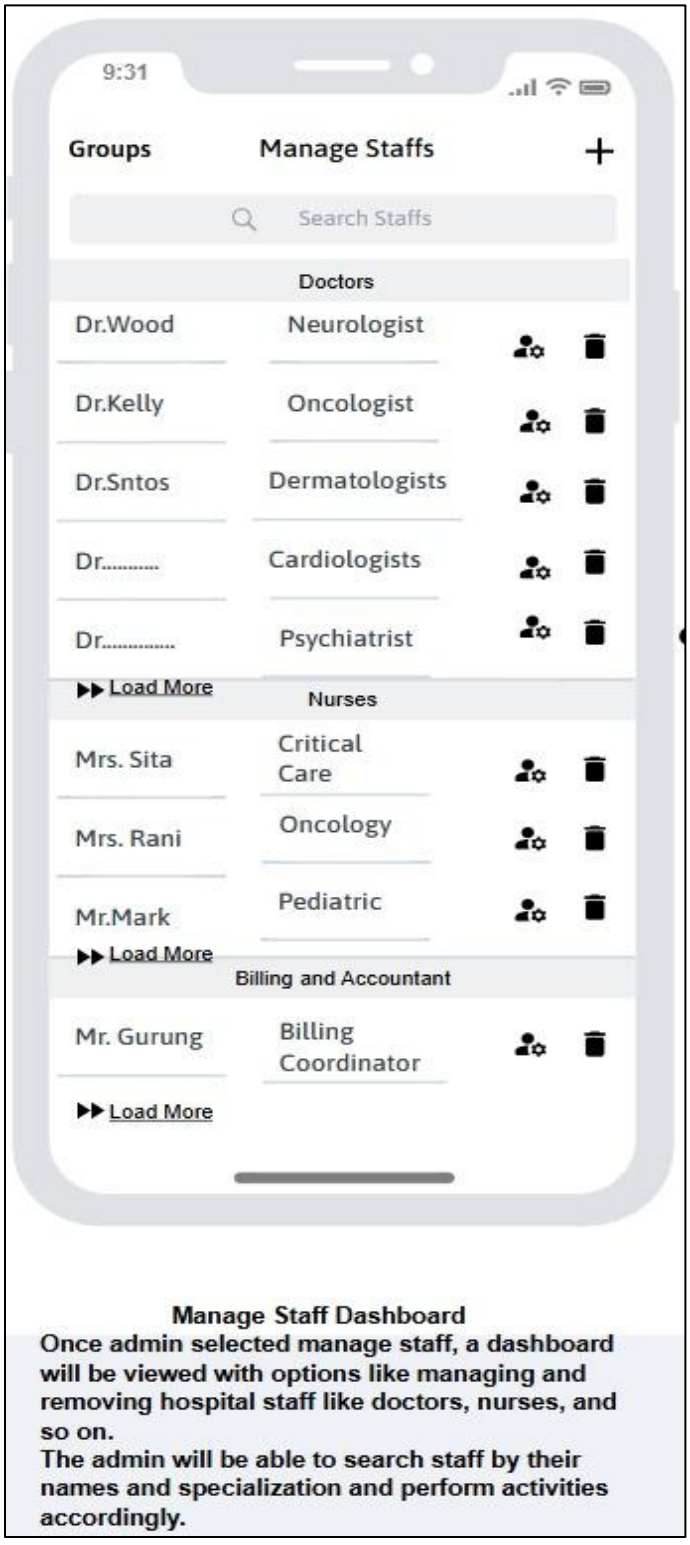


Figure 40 *Manage Staff Dashboard (created using https://app.moqups.com)*

- With the staff management option, the admin is redirected to a screen where they can manage, add, and remove staff members in a hospital.
- With the search tab, the admin can search staff by name and manage them.

- Moreover, the admin can manage departments with department option which includes various information about multiple departments in hospitals.

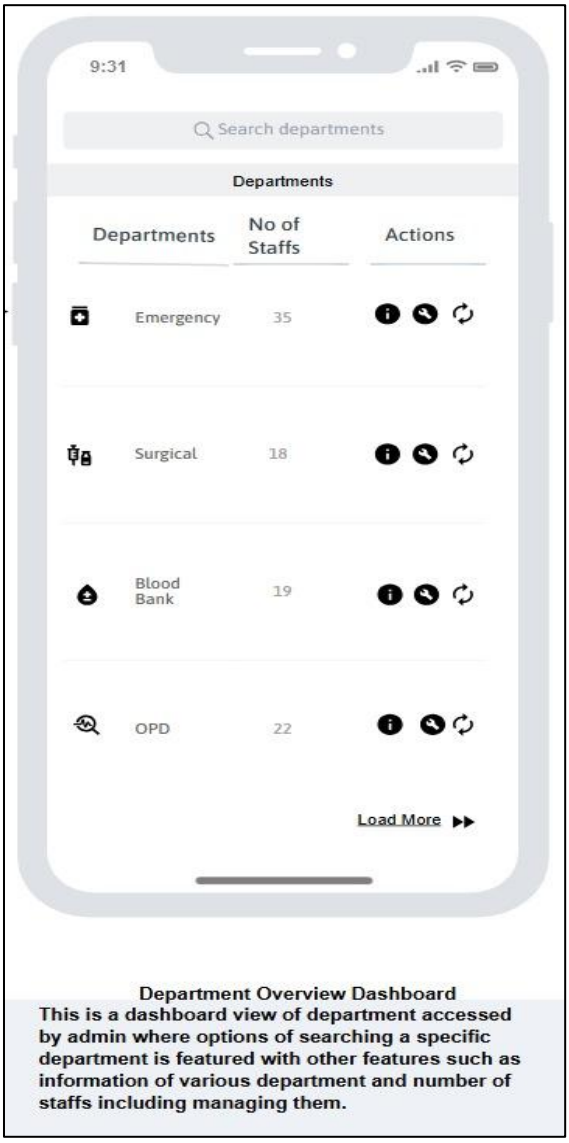


Figure 41 *Department Overview Dashboard (created using https://app.moqups.com)*

- On each wireframe Load More presents the remaining functionality of the admin in a dashboard.
- Finally, the admin will be able to logout of the system with the help of the log-out icon present in the top right corner of the application in the home dashboard.

User Group 04 – User Profile 07 Technical and IT Security Staff

As common to other user stories, technical and IT security staff have got the same login and verification page. Upon successful verification, IT security staff are directed to their designated dashboard as follows:

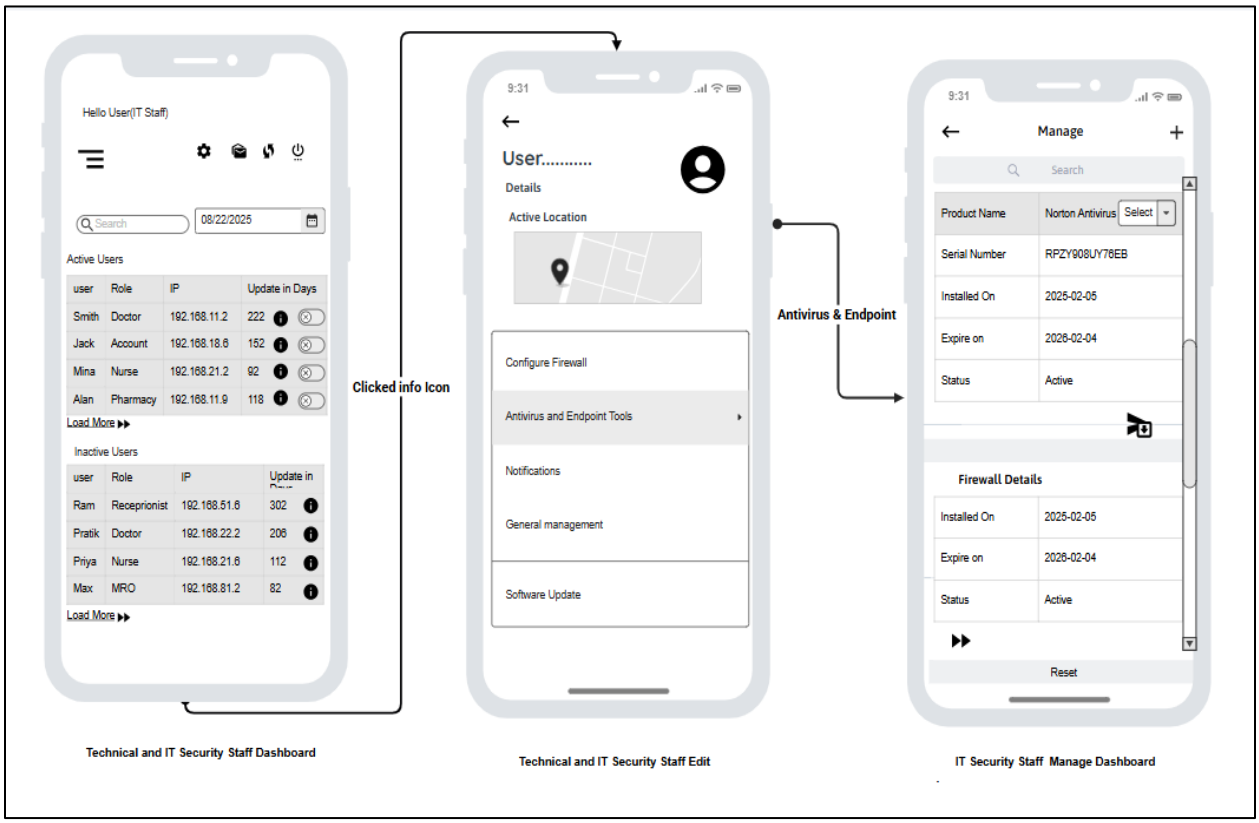


Figure 42 *Technical IT User Dashboard (created using https://app.moqups.com)*

- After validation, IT security staff can access a dashboard to continuously monitor active, along with inactive users, including other details such as user IP, firewall, antivirus and endpoint security update deadline. Each toggle button on the right-hand side of each active user is clickable and once clicked, it sends an alert to an admin to respond and block the user in case of detection of vulnerabilities with that device.
- On clicking on the icon tab of the user, IT security staff will shift to the next dashboard containing the last device active location of that particular user, along with a vertical menu consisting of configuration of firewall, antivirus/Endpoint tools, notifications, general management and software update.

- Antivirus and Endpoints tools provide IT users access to manage dashboard to manage firewall, antivirus updates and reset options.

7. Conclusion

Within Sprint 3, we have been dedicated to determining the primary performance enhancement opportunities and the selection of security mechanisms necessary to secure the activity of the proposed mobile application. This involved analysis of data processing performance and user authentication procedures in an attempt to maintain performance and security in the end-product.

On the basis of these outcomes, the current sprint (Sprint 4) will be devoted to the detailed description of the user journey. The given report provides the low fidelity wireframes of each user type, which identifies the way these users use one screen to go to another in a chronological and logical order. This will ensure the structure of the app will facilitate easy and smooth communications in all the use cases.

Sprint 5 will be chiefly centered on creating high fidelity wireframes of the mobile application. We will start working on streamlining the real UI screens, and will also start incorporating more complicated navigation code, which would also reveal more clearly the user paths of each type of user.

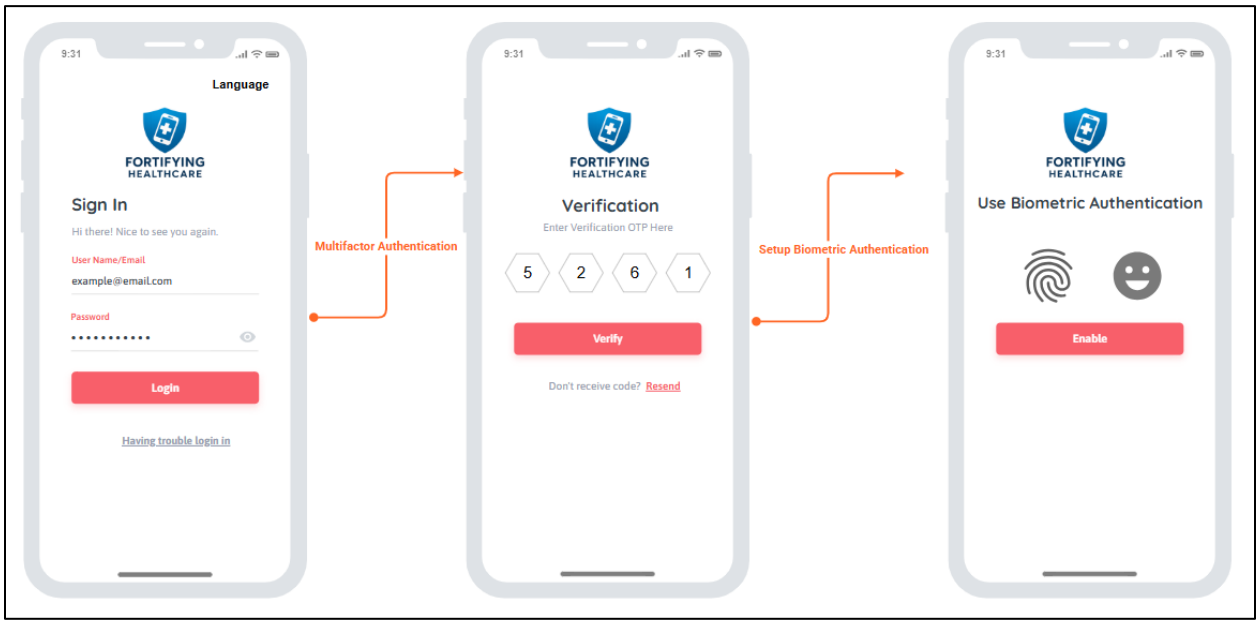


Figure 43 *High Fidelity Wireframe (created using https://app.moqups.com)*