Automation System for Pediatric Doctor's Office

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Project Overview

Objective

The main objective of this application is to improve efficiency and reduce paperwork in a doctor's office setting. This is done through the storage of patient records, making visits easy, clear, and concise, which can allow for greater organization in future visits. There are three users of the interface: nurses, doctors, and patients. The nurses have the ability to update records, see previous records, and record necessary information for the doctor. The doctor has the ability to record information regarding the visit, see previous medications and health concerns, and prescribe medicine. The patient side of the portal allows the user to create an account, where they can update their personal information, view a summary of previous visits, and have the ability to contact the nurse or doctor via message regarding medications or other health concerns. In the system, phone calls can be made for important messages. This system allows for an efficient view for all three parties of a doctor's visit, allows for the removal of paperwork that has the potential to be lost, and the ability to keep records organized all in one place for every patient in the office.

Operation - Doctors and Nurses

Examination Stage:

Users will be presented with a welcome screen displaying two options, one for faculty login and one for the Patient Portal.

Doctors and Nurses will use an administration-provided username as well as a user-set password to access the faculty view.

After logging into faculty view, a home page will be displayed, showing active patients, an embedded inbox for patient requests, a patient search, and a logout option. Nurses will be able to add a new patient to the active patient queue. Doctors will have an option to send a prescription to the pharmacy.

If a Doctor or Nurse wishes to begin working with a patient, they must select one of the active patients

For both the Doctors and Nurses, while working with a patient, two pages will launch. One will display the patient info such as medical history, contact information, and previous prescriptions. The other will be an editable field with sections pertaining to the examination in progress.

As the Doctor or Nurse finishes their examination, they can click “Submit” to save the information at which point the information boxes will close.

When the nurse has gotten confirmation that the patient has received the needed care, they can remove the patient from the active queue.

Prescription Phase:

Doctors will have access to the prescription portal.

From the portal, Doctors will need to fill out the necessary information as a script.

To assist the Doctor, all following Arizona Law required fields will be implemented as field entries:

1. Date of issuance.
2. Name and Address of the patient for whom the drug or device is dispensed.
3. Drug name, strength, and dosage form or device name.
4. Prescribing medical practitioner's directions for use.
5. Quantity prescribed.
6. For a prescription order for a controlled substance, the medical practitioner's address and DEA number.
7. The medical practitioner's digital or electronic signature.

Messaging Stage:

Doctors and Nurses will both be able to see active messages from patients and guardians regarding their care by clicking the inbox icon.

In the messaging portal, faculty will see highlighted messages from patients awaiting replies.

After clicking a particular message, the faculty has the option of either messaging the patient back as well as calling the patient directly.

If a Doctor or Nurse needs more information about the patient, they can click the patient's name to open the patient search with the selected patient already selected.

Patient Search:

If a Doctor or Nurse needs to view a previous patient's history, they can select the patient search option on the home page.

After clicking a window will open with options to search for a patient by name.

To help identify the correct patient, information such as address and contact information will be displayed next to the patient's name.

Faculty can select a patient's name to view relevant information such as recent visit notes, active and previous prescriptions, as well as contact information and emergency contact.

Operation - Patients and Guardians

Users will be presented with a welcome screen displaying two options, one for faculty login and one for the Patient Portal.

After clicking the Patient Portal option, a login field will be displayed as well as a first-time user button.

If it is the patient or guardian's first time using the portal, they will use the first-time user setup. It will ask for the patient's name, address, email, and date of birth.

The system will then check the patient list for any matches, if there is one it will proceed, if not it will notify the patient, then ask Him/Her to try again.

If a match is found, the system will send an email to the patient/guardian with a generated username and temporary password to log in.

On the first login, the patient/guardian will be asked to change their password.

Once the patient/guardian successfully logs in they will be able to see three fields. The left side will show a list of previous visits along with visible notes from that visit. The right top will show active and previous prescriptions. The bottom right will show a messaging box where patients can ask Doctors and Nurses questions.

Technical Specifications

The implementation will be built around a backend that instantiates a login page.

The login page will authenticate users through the backend and have the ability to create new instances of the home page with properties based on the type of user.

Instances will be able to communicate with the backend in order to fetch and send data.

The backend will parse (encrypt/decrypt) this data as well as communicate with the database for storage.

In order to use the system, the office will require a host process running the backend as well as connected processes each with a distinct login page.

Code Reusability

The system will be designed with a similar structure as a networked system. This will increase future ability to port the system to mobile and web.

Schedule of Deliverables

<u>February 7, 2024</u> - Phase 1 - Team Formation, Document Project Requirements & User Guide

<u>March 20, 2024</u> - Phase 2 - Analysis, Initial design & Testing plan

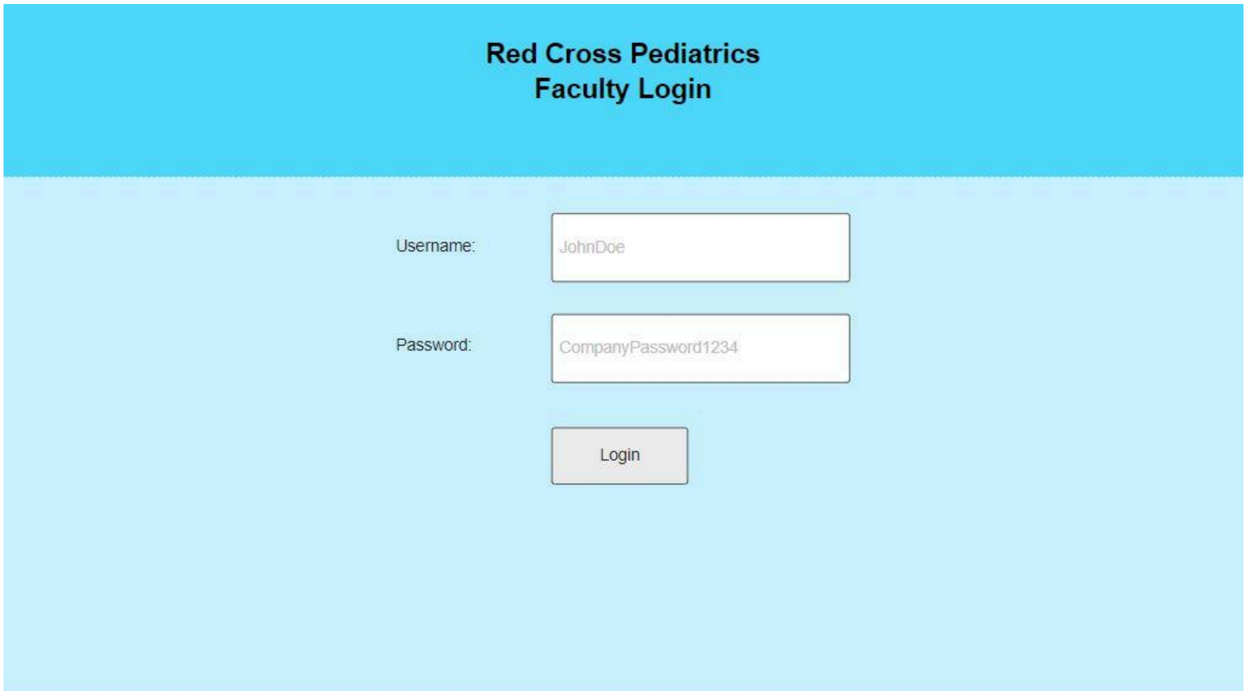
<u>April 3, 2024</u> - Phase 3 - Implementation

<u>April 17, 2024</u> - Phase 4 - Final Presentation and Report

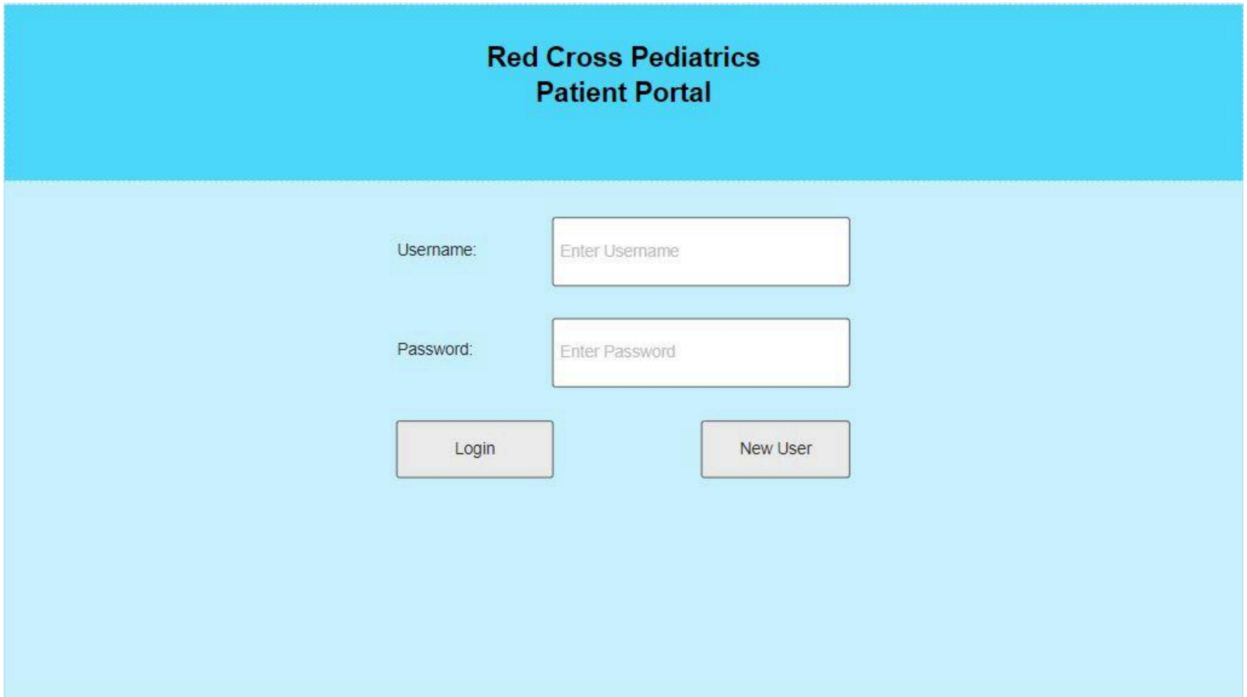
GUI Walkthrough
Human Interface Design:

The user interface design will consist of twelve pages. These are the welcome page, faculty login, patient login, patient first-time login, patient portal, nurse portal, doctor portal, doctor & nurse examination, waitlist, prescriptions, inbox messaging, and record search. Patients, doctors, and nurses will all use this system to input important information and make any changes needed for their profile. It starts at the welcome page, to determine which type of login the user will be choosing. If the user chooses patient, they will be sent to the patient portal and if it is their first time logging in, they will asked to input relevant information to create their account. If faculty is chosen, the user will be sent to the faculty portal. A nurse portal can access the waitlist, and the doctor portal can access the prescription portal and examination page. Any of the three portals can also access messaging between patient and doctor or nurse.

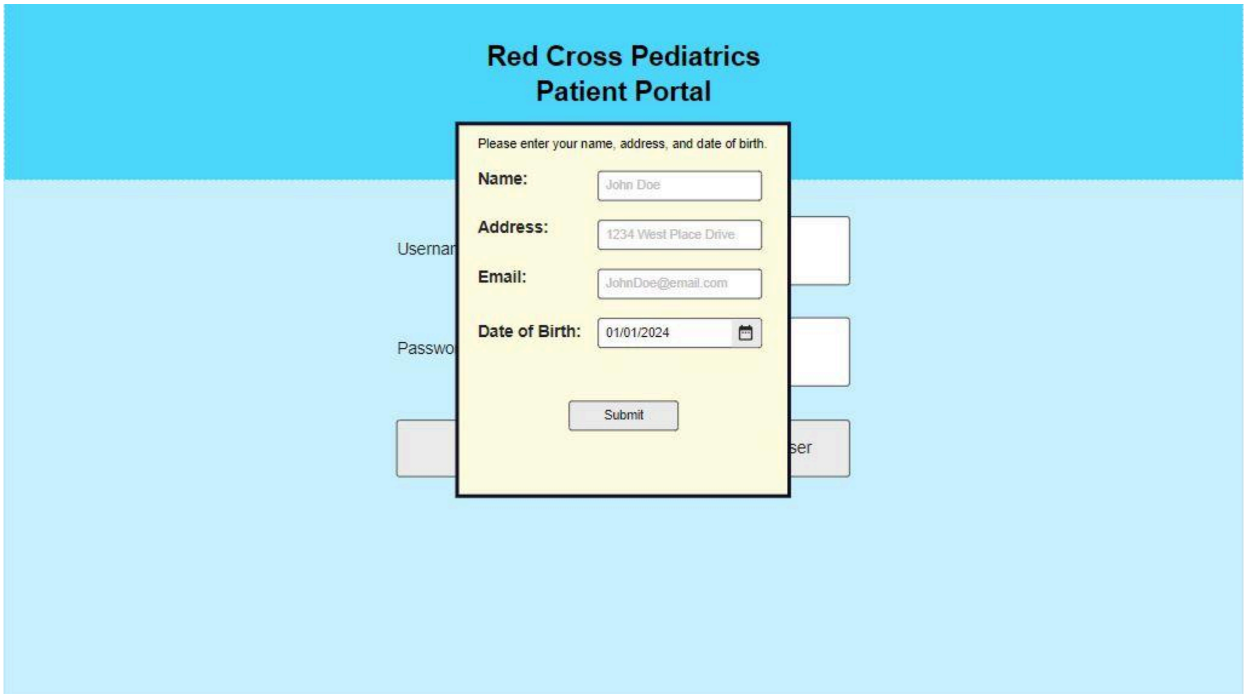
This is the welcome screen for the Red Cross Pediatrics doctor's office, the first image displayed when opening the app. There are only two options on the screen, directing a login for faculty or patients.



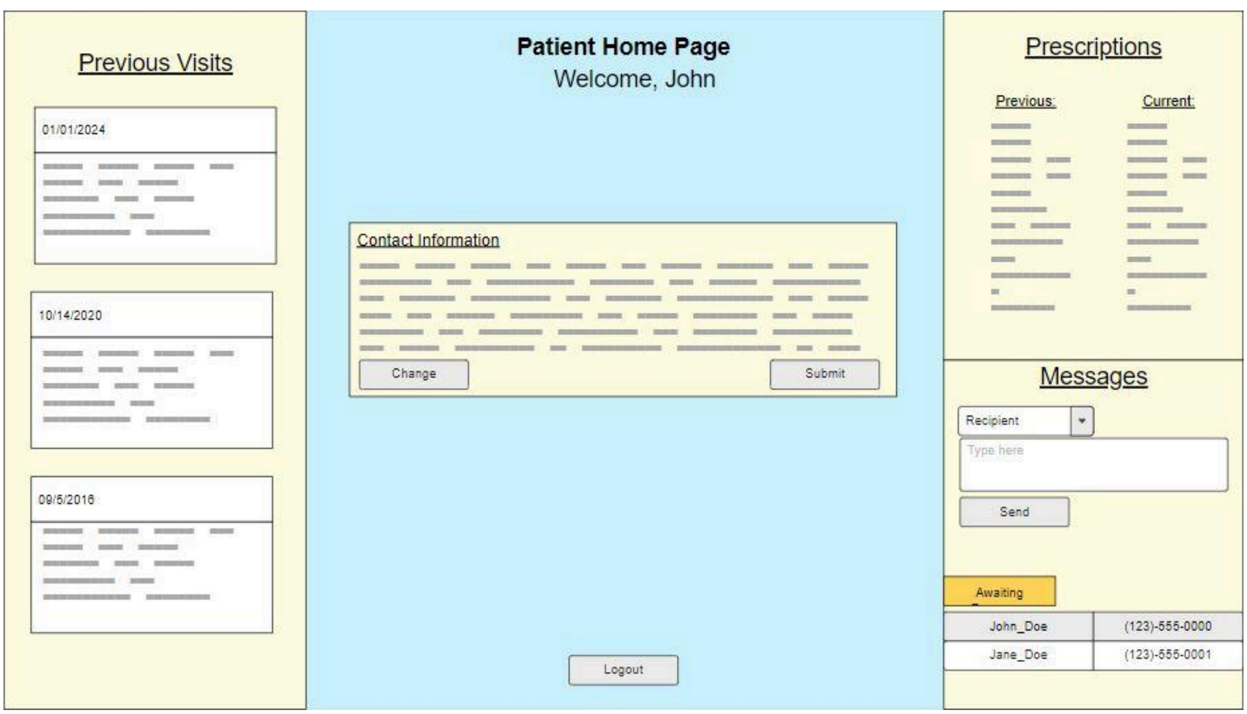
This is the Faculty login window, accessed by selecting the “Faculty Login” checkbox from the welcome screen, only for either the doctors or nurses. There are two main sections of this screen: the username and password text boxes. Faculty will type their unique username and password into the field, where they can proceed with the login button. Incorrect entries will prompt the user with an “Incorrect username/password, try again” error message below the login button, where either the case-sensitive usernames or passwords typed were not found in the company database for faculty. Upon an incorrect entry, the user can retype their correct credentials.



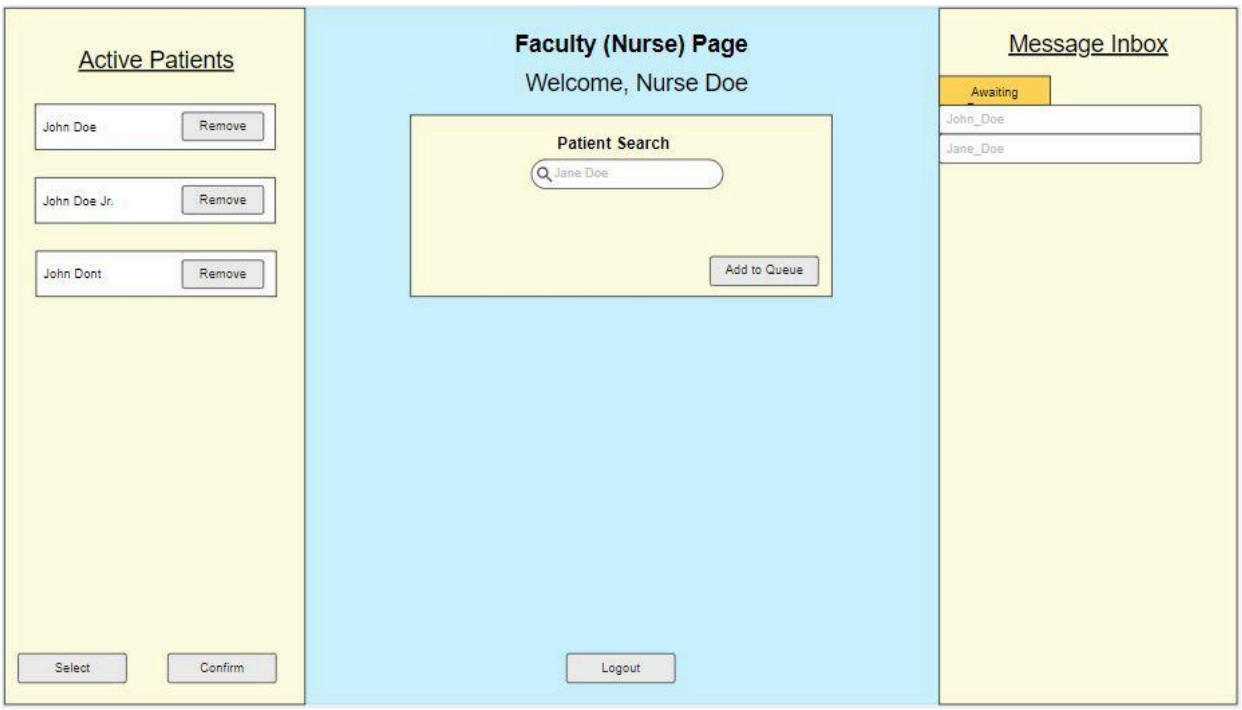
This is the Patient Portal window, accessed by selecting the “Patient Portal” checkbox from the welcome screen. If the patient is new, they can select the “New User” checkbox to create a new account. Otherwise, the previous patient can enter their case-sensitive username and password to log in. If an incorrect login occurs, an “Incorrect username/password, try again” error message below the login button will be displayed. Otherwise, the login button will take the patient to the portal.



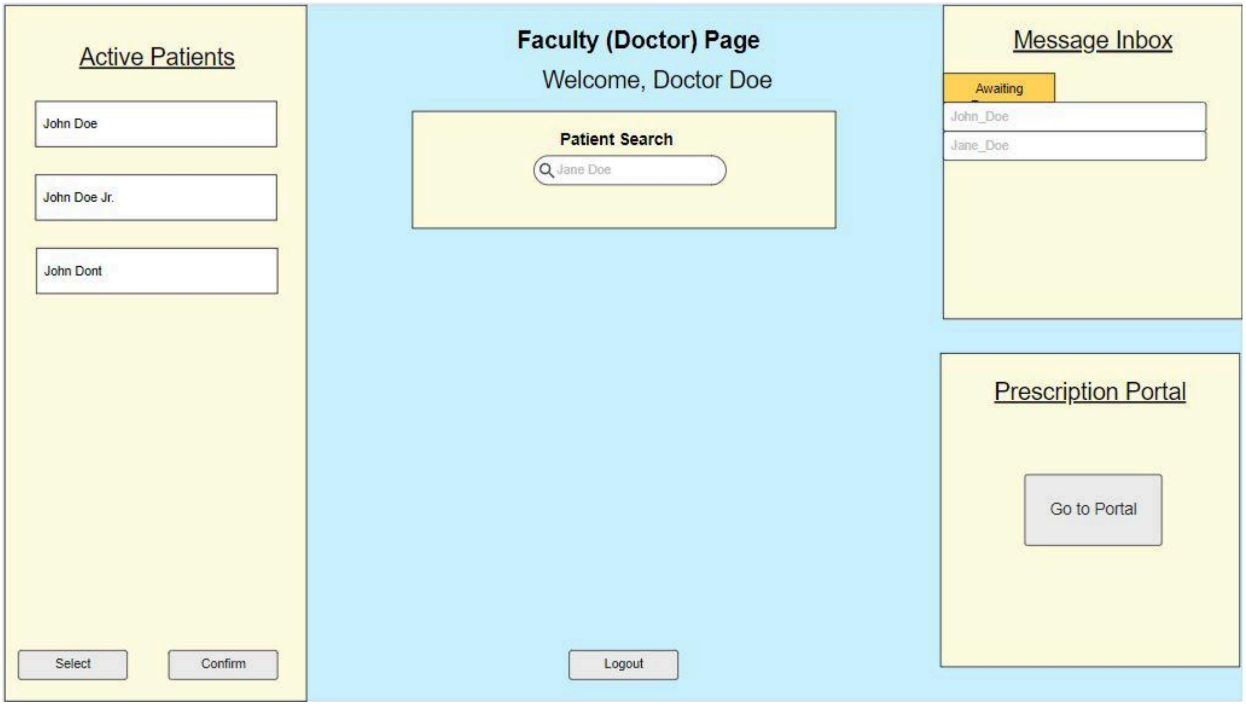
This is the “New User” window, where first-time patients can input their relevant information to improve user confidentiality, as well as relevant information for creating an account. Each patient is uniquely identified in the system as a combination of their first name, last name, and birthday.



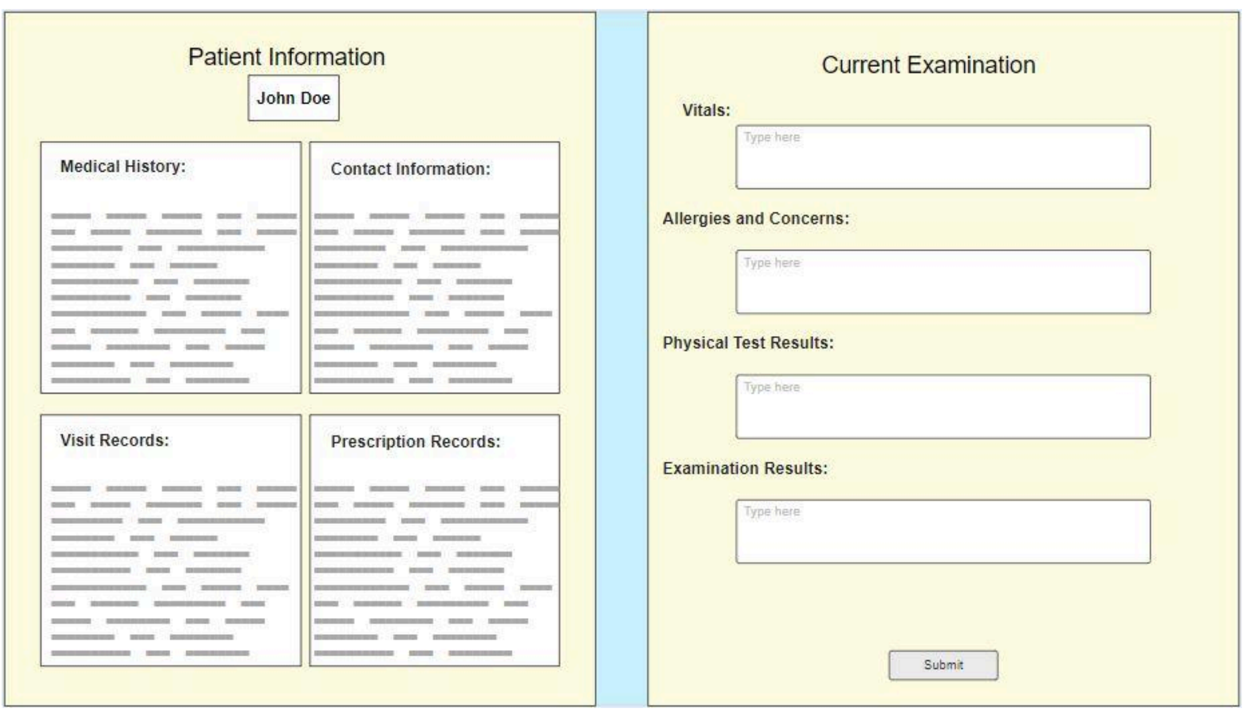
This is the main patient portal hub, which is accessible upon a correct username and password input. Here the user has access to multiple settings: the ability to see and change their contact information, see a summary of each visit, a view of prescribed medications and directions, and the ability to send messages to their doctor/nurse about specific health or medication concerns. Non-urgent replies or messages from the doctor/nurse to the patient will also be shown in this view, as urgent messages will be communicated via telephone. Finally, the user has the logout button at the bottom which saves changes and returns to the welcome screen.



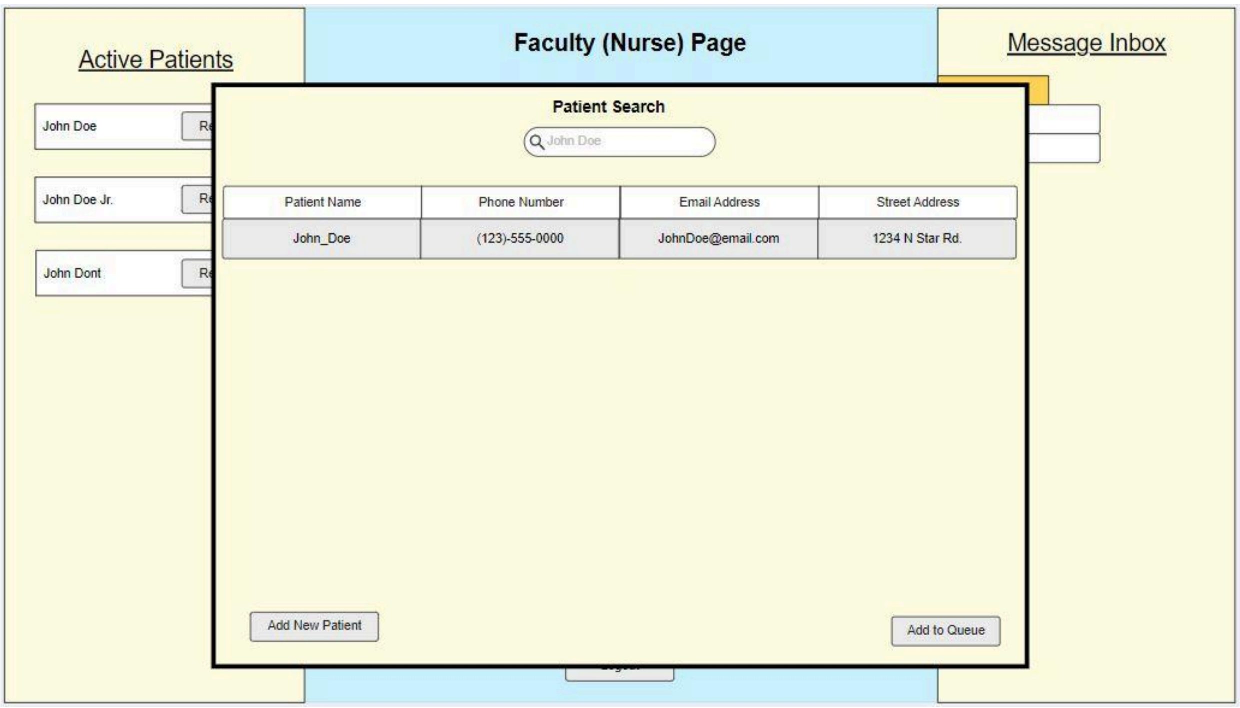
This is the main faculty hub for the nurses. The nurse has the ability to message patients as seen on the right-hand side of the GUI. If the nurse needs access to the information of a previous patient, they can search for the patient's name in the center. The relevant patients (patients who are scheduled for a visit for the day) are seen on the left for quick and convenient access. When the patient is seen and does not need to be contacted again, the nurse can remove their name to clear up space.



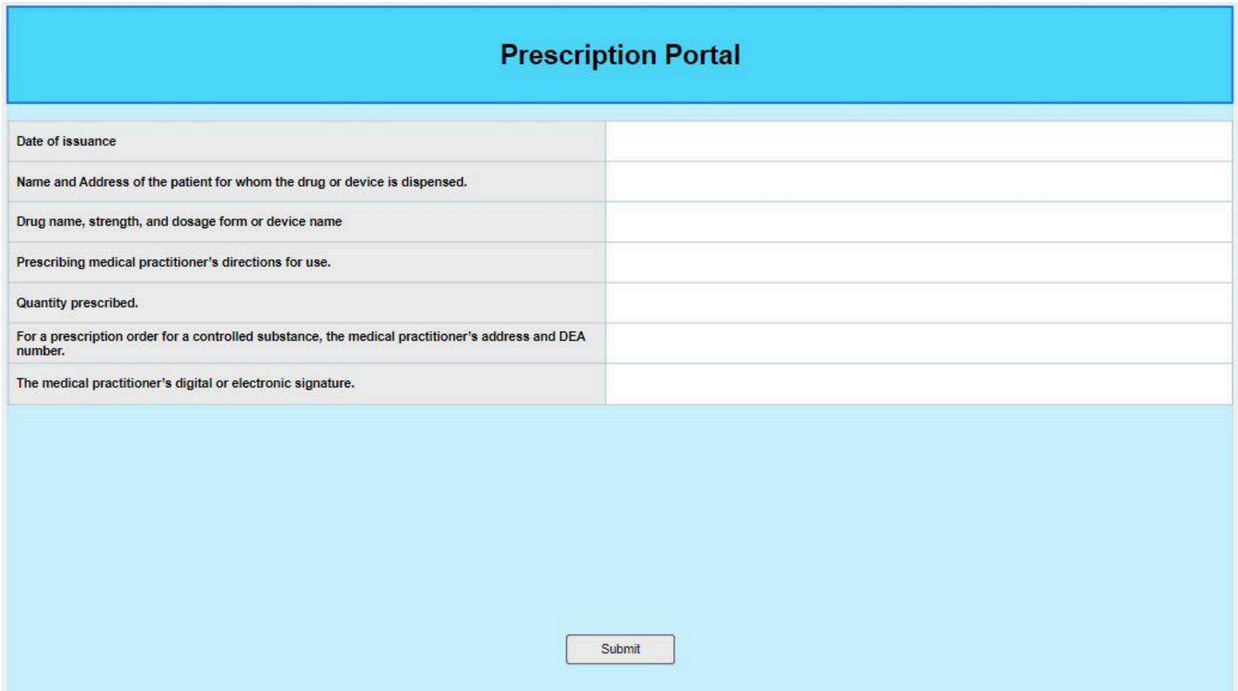
This is the main faculty hub for the doctor. The doctor has all of the same functions as the nurse, except for the inability to add and remove patients to the active queue and the unique ability to access the prescription portal.



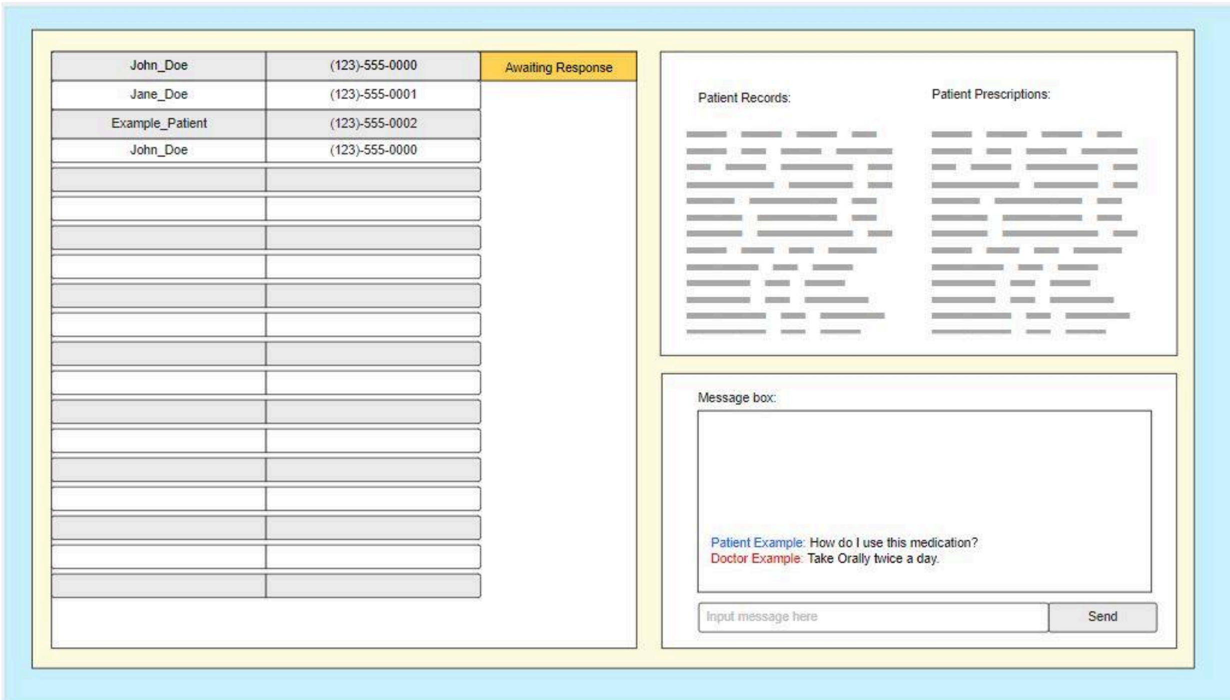
This is the window where the doctor or nurse can access and update patient information. The right half of the section is reserved for the current visit and new information, while the other half is past information. This is where the nurse inputs the vitals measured from the visit, allergies, concerns, and other necessary information the staff needs to be aware of. The doctor can include the results of physical tests and examination results in the same area, and also be able to update any of the information the nurse provided before being screened by the doctor. Medical histories, contact information, previous visits, and records of prescriptions are all displayed, so the doctor or nurse has all of the relevant information about the patient before speaking with them, so the staff can input updates and comments from the previous visits. Upon submission of the new information, the records are now updated and the current visit is now stored with the past visits.



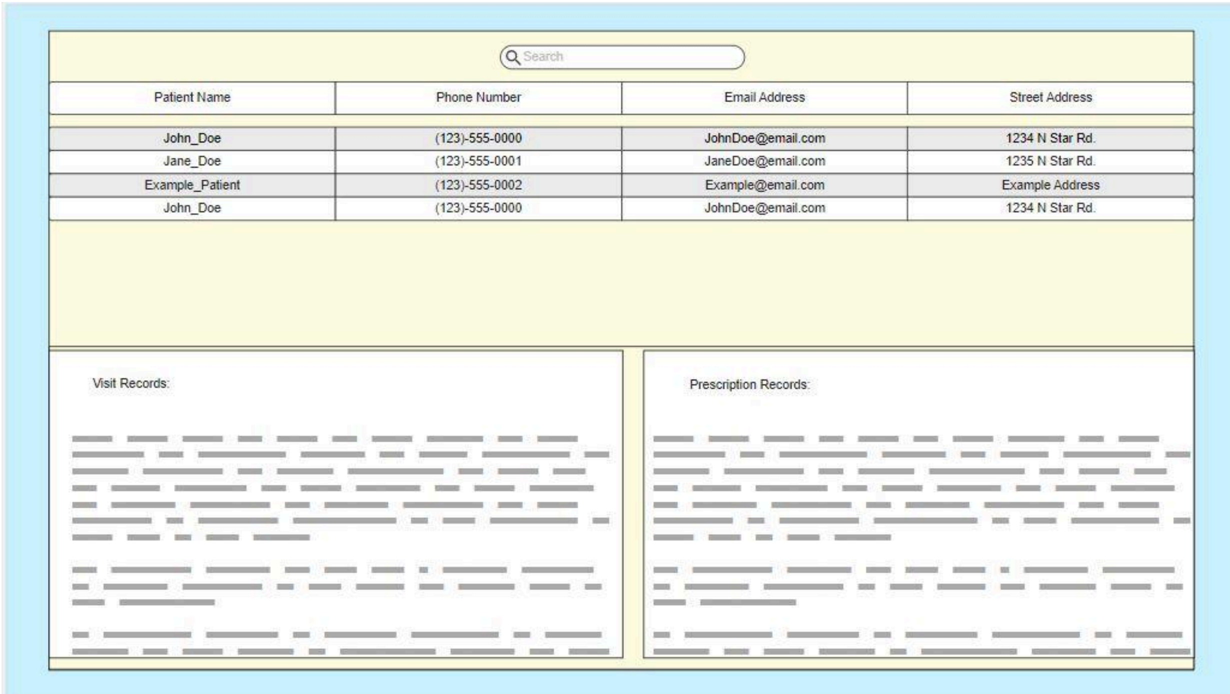
This is the “Patient Search” window, where the doctors and nurses have the ability to access all necessary information of any patient in the database. The staff can search the patient by their name, and their phone number, email address, and street address appear. If the patient is new, the staff can add the new patient to the database, by selecting the “Add New Patient” button in the bottom left of the window. Otherwise, if a patient is scheduled for the day, the staff has the ability to add the patient to the queue by selecting the “Add to Queue” checkbox on the bottom right of the screen, where the patient will now be listed under the “Active Patients” tab, ready for access during the appointment.



This is the "Prescription Portal" window that is only accessible by the doctor. The functionality of this window is the ability to send prescriptions to pharmacies for the patient to pick up. For the prescription to be received, all necessary information is to be inputted into the system. This information includes the date of issuance, name and address of the patient for the medicine to be prescribed, the medication name, strength, and dosage, the directions for the drugs usage, the quantity, security information for controlled substances such as medical practitioners address and DEA number, and finally the practitioners electronic signature. Once the required fields are satisfied and the doctor is ready to send the medication to the pharmacy, the submit checkbox is to be pressed to finalize the information.



Here is the listed message view from the side of the doctor or nurse. This page is accessed through the “Messages” button. The staff has a list of all the patients, and next to their phone numbers shows new or outgoing messages. The staff can click on the name of a patient, and the message box which shows previous messages will be displayed. This is the main communication window for the staff and patients. Important information about the patient is displayed above the message box, which shows previous patient records as well as prescription histories so the staff has relevant information about the patient, to which they can respond to all questions and concerns



This is the window of the master search of all patients in the database. This is where the doctor or nurse can find all the necessary information about any patient in their system. The staff can search for a patient's name and select the patient when they come up. All patients' names, phone numbers, email addresses, and street addresses will be displayed regardless. When a patient's name is selected, their visit and prescription records will be displayed on the bottom left and bottom right-hand corners of the screen, respectively.

Credit Sheet - Group Tu2

Team Member Name	Contributions
Trevor Long	Cover Page: 20% Project Overview: 20% User Guide: 20%
Andrew Calderon	Cover Page: 20% Project Overview: 20% User Guide: 20%
Tyler Fujikawa	Cover Page: 20% Project Overview: 20% User Guide: 20%
Zachary Stewart	Cover Page: 20% Project Overview: 20% User Guide: 20%
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