CSE 545: Software Security (Group 3)

Secure Hospital Software - **User Guide**

Team Members

Saicharan Papani (Leader) - 1222323895
Debesh Mishra (Deputy Leader) - 1224330471
Sandeep Srivastav Bandikatla - 1221829687
Hanuman Reddy Solleti- 1222318448
Jitendra Prasanna Gottu - 1220802908
Tyler Chang - 1214898750
Akhila Sai Mandava - 1220311417
Glen Dsouza - 1222318617

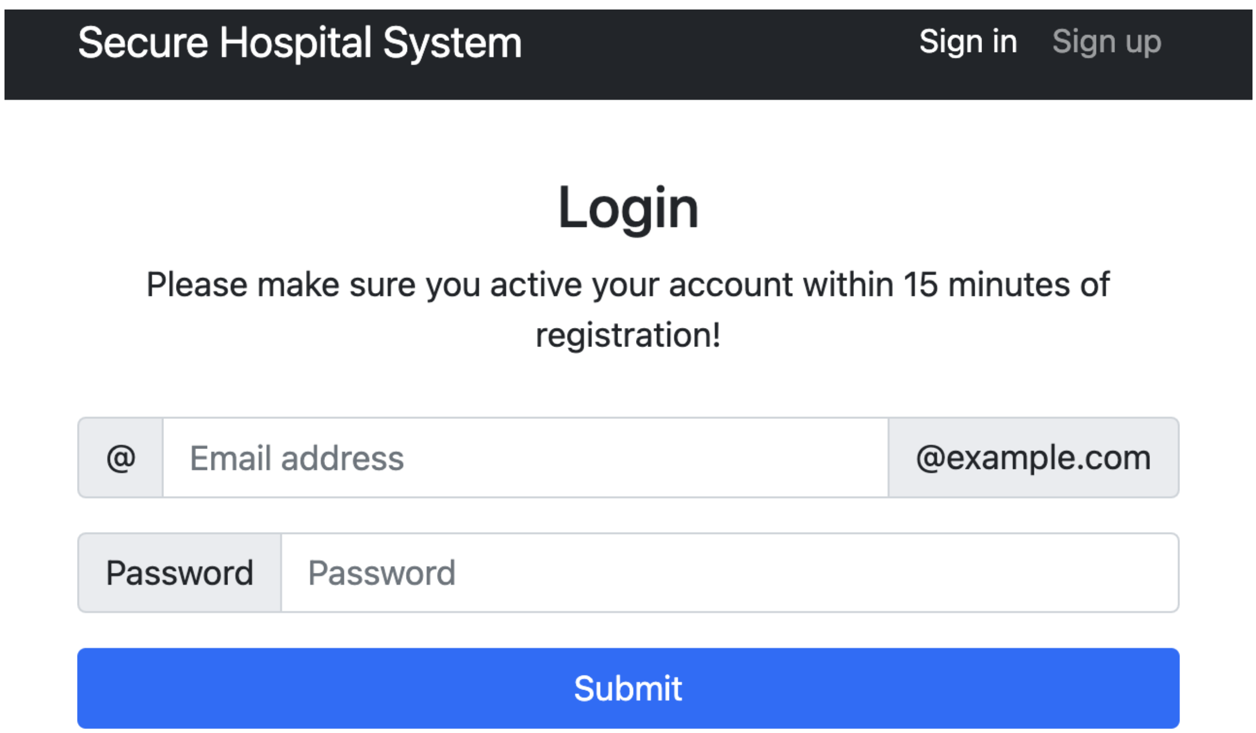
Technologies Used:

Programming language	Java, Javascript
Backend	Spring Boot
Server	AWS
Hosting platform	Heroku
Blockchain	Hyper ledger fabric
Operating System	Windows, Mac
Data Training platform	Dialog flow
Database	MySQL
Code Development Platform	Visual Studio Code, Eclipse IDE
Frontend	React

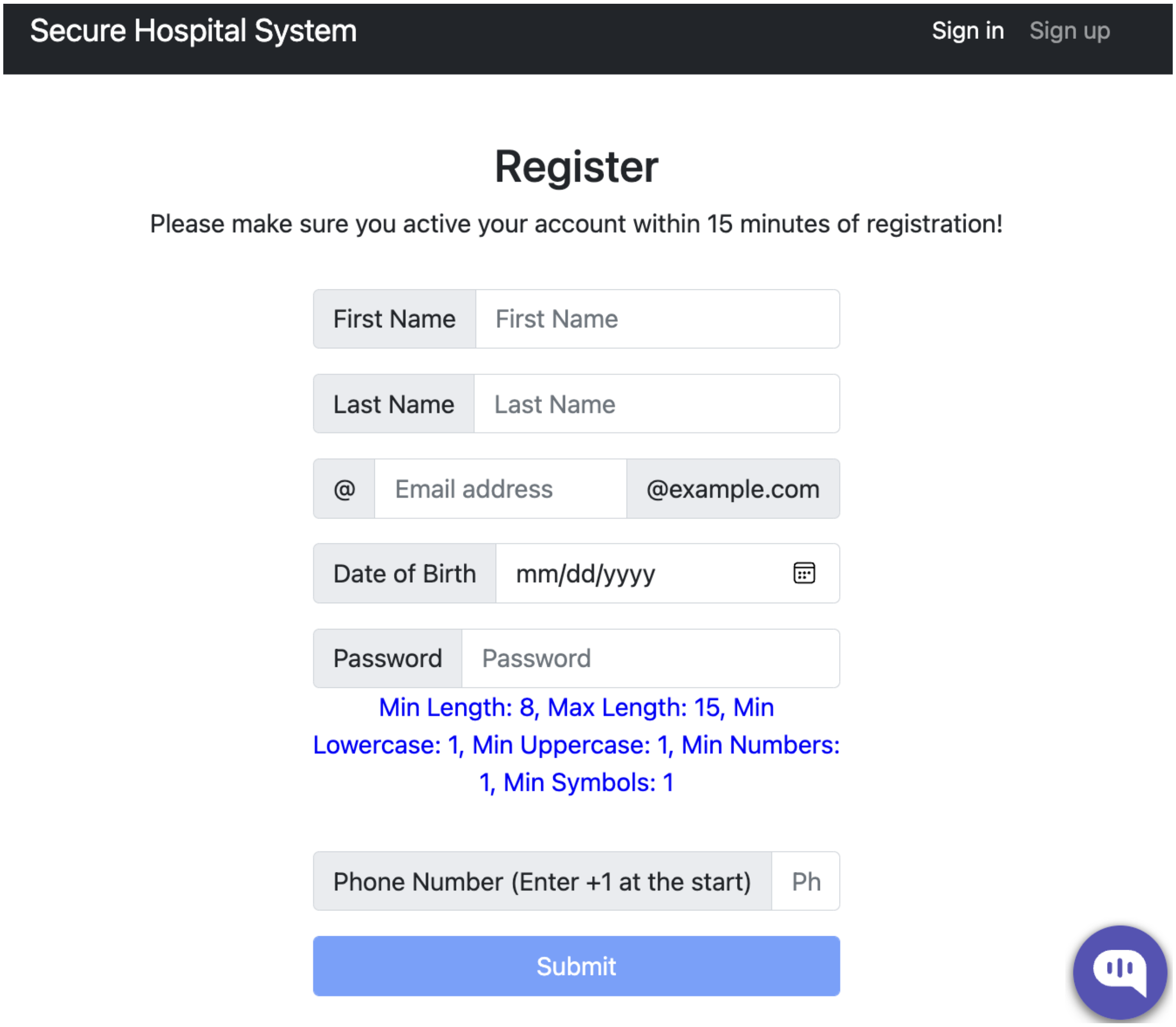
User Guide for Secure Hospital Staff

Login and Registration:

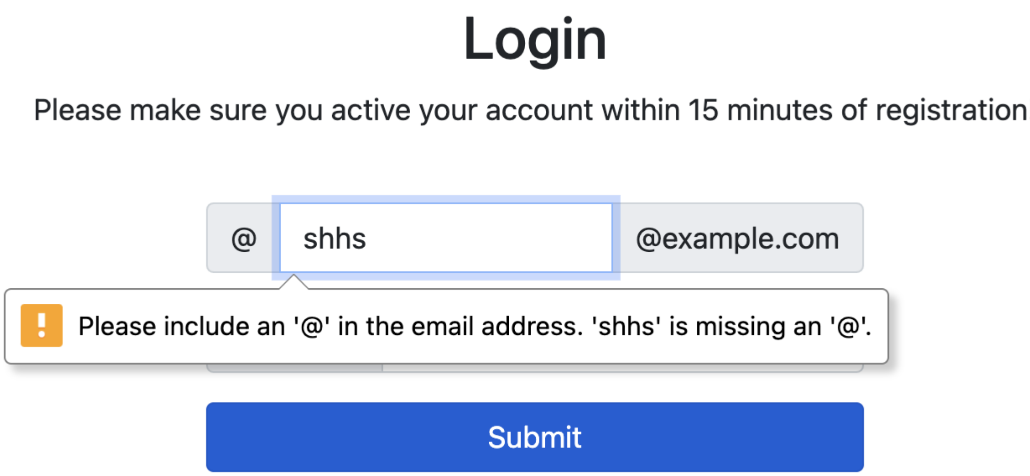
When the user opens the application for the first time, the user can see the sign in page on the home screen stating Login and Please make sure you activate your account within 15 minutes of registration! text on the screen. Users can enter details like email id and password for the sign in. Users can also have an option to reset the password in case he forgets the password. By clicking on the forgot password link the user can reset the password. After entering the mail and password for the sign in user can click the submit button through which he can login.



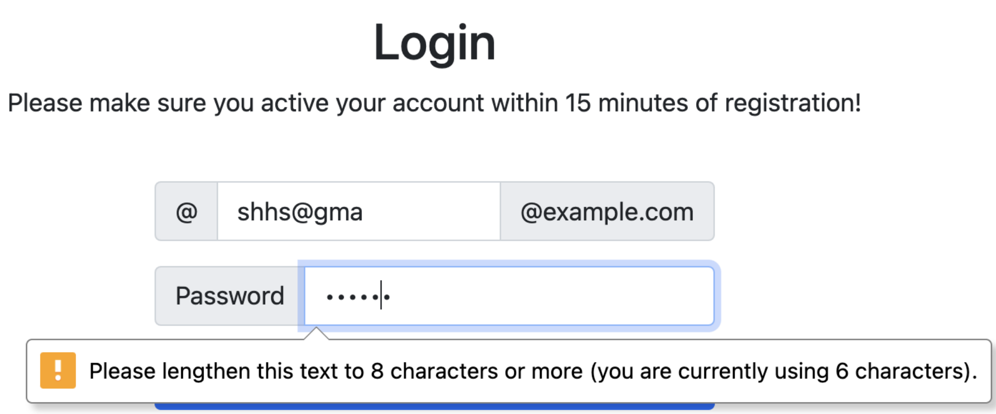
Users can also see a sign up button on the top right of the sign in button. If the user is using the application for the first time and he didn't have the sign in credentials, the user should click the sign up button. When the user clicks the signup button, he can see text saying Register and Please make sure you activate your account within 15 minutes of registration. Users can fill in information like first name, last name, email address, date of birth, password, phone number to sign up into the application.User should follow some conditions to generate a password. The password should have a min length of 8, max length of 15, there should be a minimum of one lower case letter and upper case letter, minimum one number and a symbol. To enter the phone number, the user should always enter the phone number starting with +1. After entering all the details the user should on the submit button to complete the sign up.



If the user enters wrong information in username or password, the user will get a pop up saying bad credentials. Also if the username doesn't follow the requirements like including '@' in the username, the user will get a pop up saying "Please include a '@' in the email address.



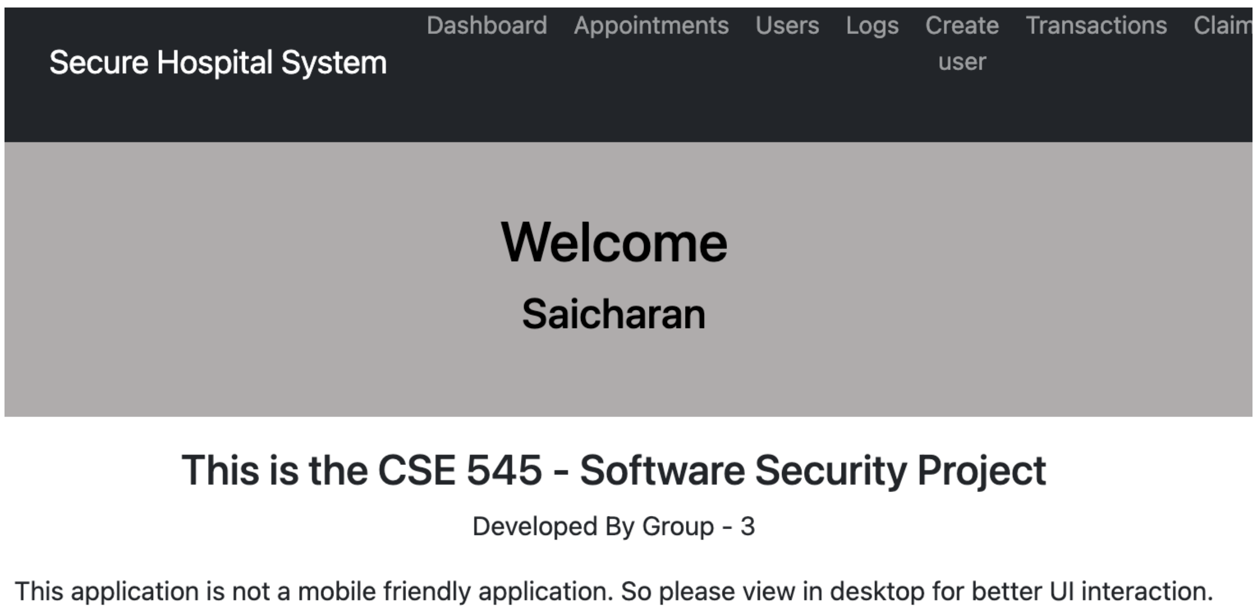
User also should follow a requirements for the password like password length should be minimum of 8 characters, if it is less than that user will get a pop up saying “please lengthen this text to 8 characters or more and current length of the password will also be displayed.



If the user follows the above requirements for the username and password, he can sign in to the application without any problem.

Admin portal

If the user logs in as admin, Dashboard, appointments, users, logs, create user, transactions, claims, policies, coverages, and lab test reports tabs are displayed. When a user clicks on the dashboard button he can see the Welcome message.



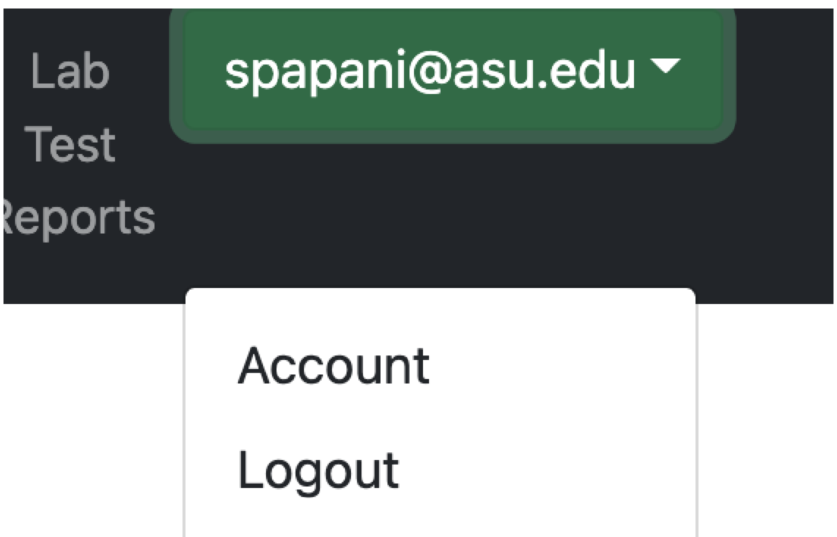
ADMIN

If the user logs in as admin, he can see the following features on the home screen. They are:

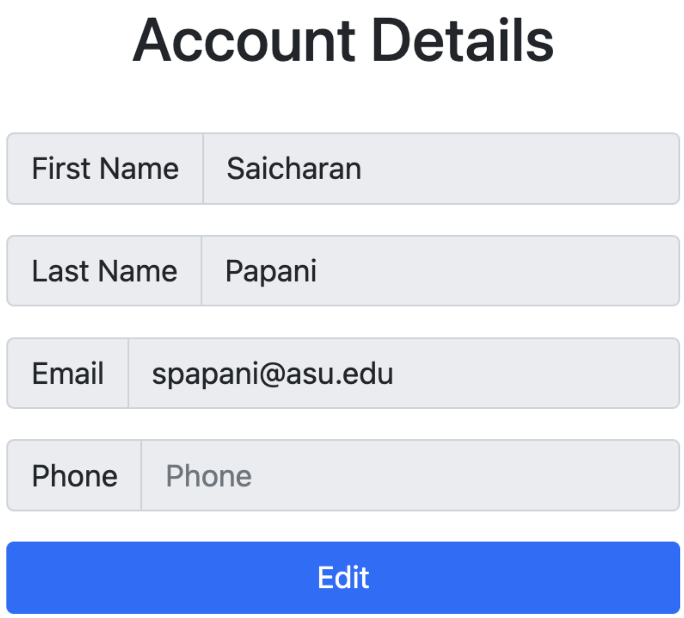
1. Dashboard
2. Appointments
3. Users
4. Logs
5. Create User
6. Transactions
7. Claims
8. Policies
9. Coverages
10. Lab Test Reports
11. Button with Email id

When a user clicks on the Button with mail id he can see two options

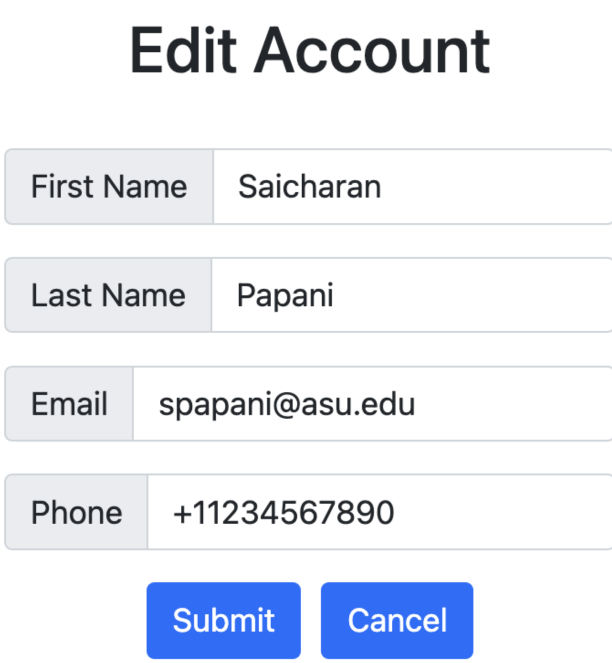
1. Account
2. Logout

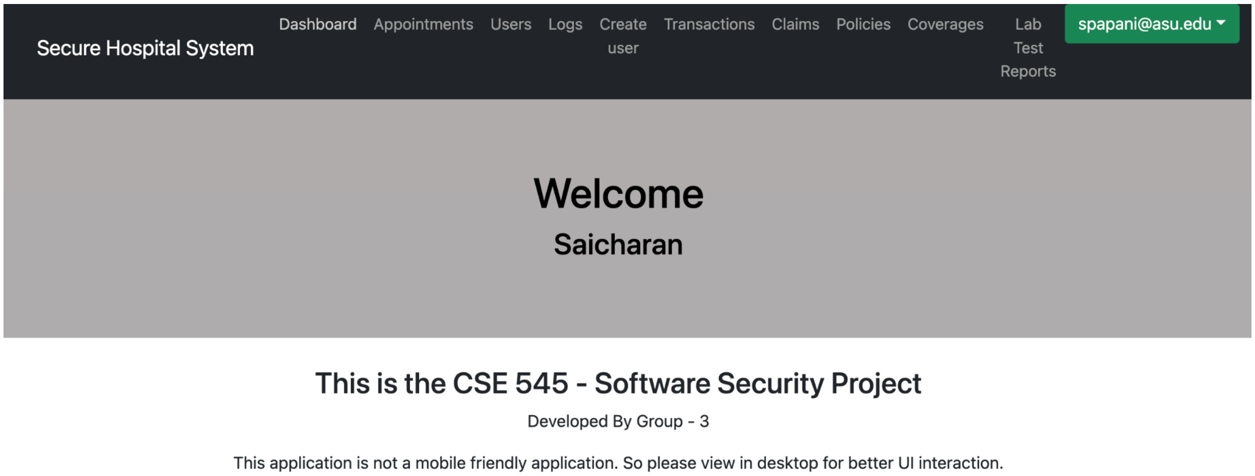


If he wants to see his account information, he should click the account button, the details of the account like first name, last name, email, phone number will be displayed.

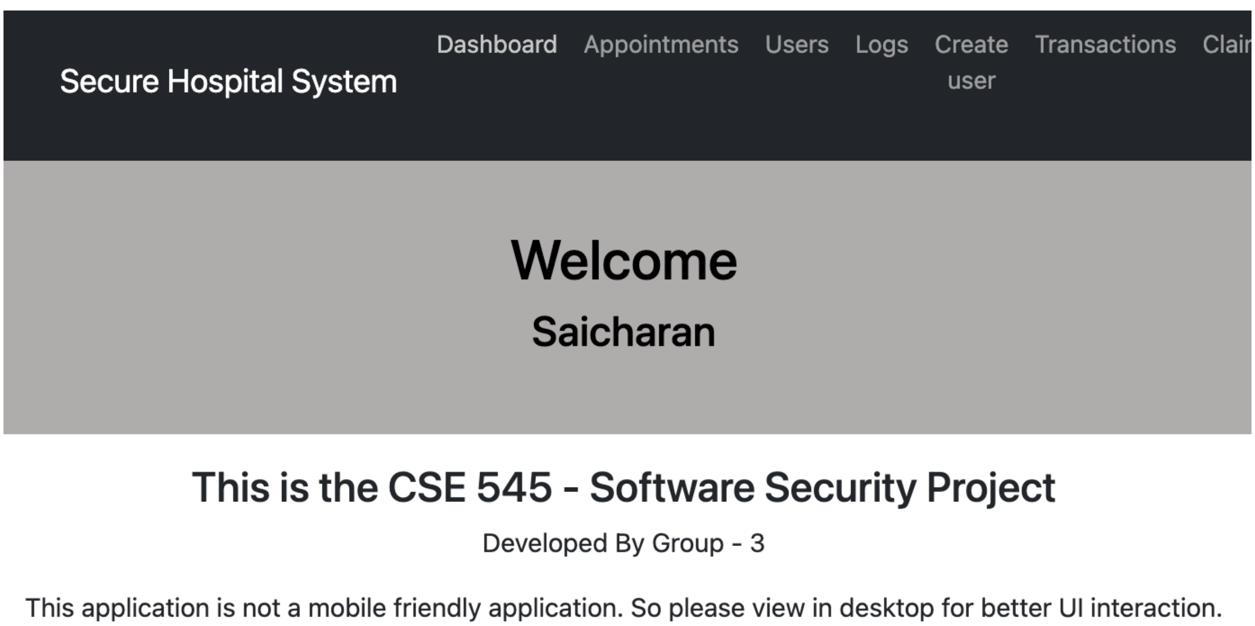


If the user wants to edit his account information, he should click the edit button then he can be able to edit the information and submit the information or he can cancel the edit. If the user clicks the edit button, the user will be redirected to the account details page.

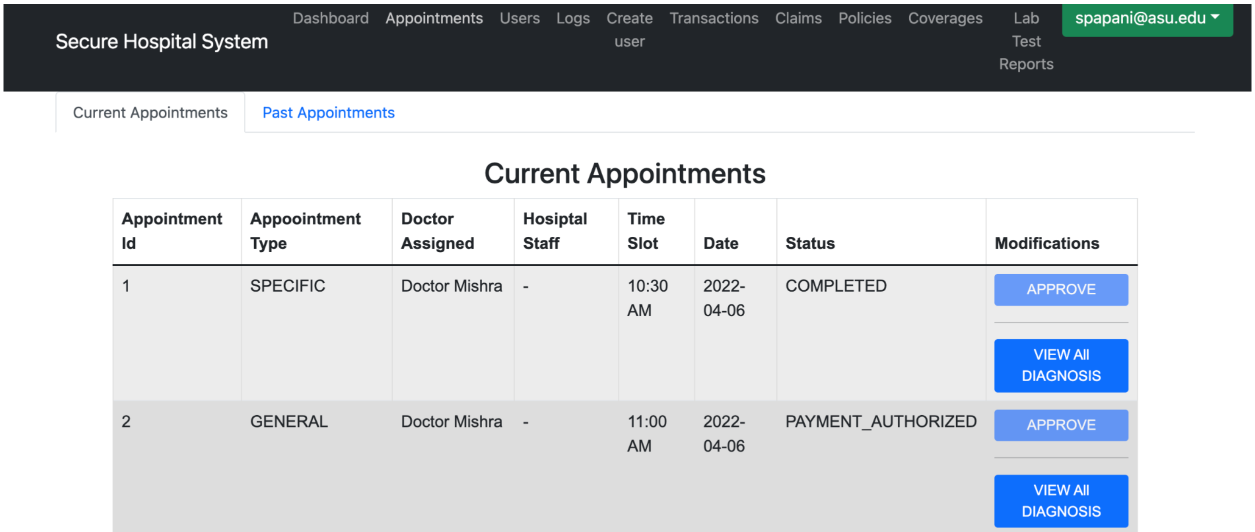




When a user clicks on the Dashboard button he can see the welcome message.

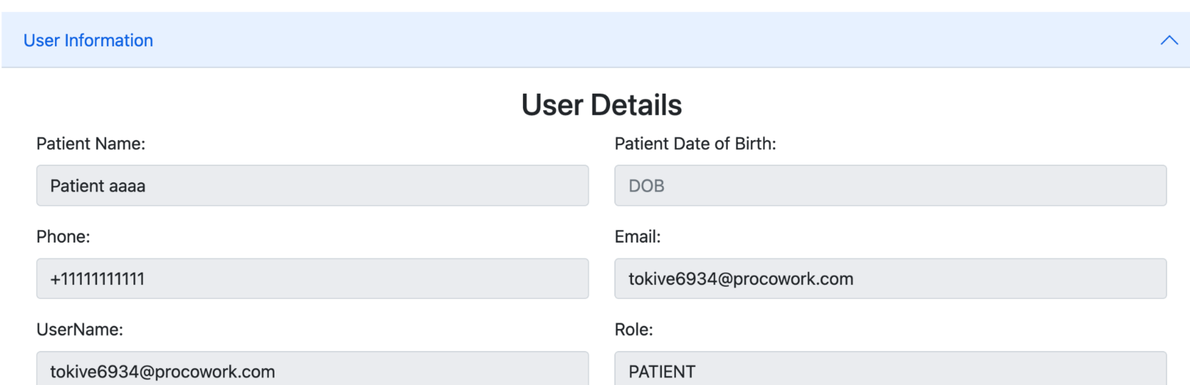


If the admin wants to see the appointments, he should click the appointments button on the top. After clicking if he wants to view the current appointment, he should click the current appointments tab. The admin can see the appointment details like appointment id, appointment type, Doctor assigned, Hospital staff, time slot, date, status,modifications as columns in a table.



If the admin wants to approve the appointment, he should click on the approve button. If admin wants to see the diagnosis information of the patient he should click on the view all diagnosis button. After clicking on the view all diagnosis button, the user can see the patient records like User information, appointments, Lab reports, claims, policies, bills , transactions under separate tabs.

If the user wants to see the User information of the patient, the user should click on the User information button. It will display the following information.



If the user wants to see the Appointments information of the patient, the user should click on the Appointments button. It will display the following information.

Appointments

Appointment Id: 1 - Date : 2022-04-06

Appointment Id: 2 - Date : 2022-04-06

If the user wants to see the Lab reports information of the patient, the user should click on the Lab reports button. It will display the following information.

Lab Reports

Lab Test Results

Lab Test Name:	Blood Test	**Lab Test Cost:**	10	**Lab Test Status:**	PENDING
Result:	-	**Lab Staff Note:**	-		
Doctor:	Doctor Mishra	**Patient:**	Patient aaaa	**LabStaff:**	-
Lab Test Name:	Blood Test	**Lab Test Cost:**	10	**Lab Test Status:**	PENDING
Result:	-	**Lab Staff Note:**	-		
Doctor:	Doctor Mishra	**Patient:**	Patient aaaa	**LabStaff:**	-

If the user wants to see the claims information of the patient, the user should click on the claims button. It will display the following information.

Claims

Claims

Claim ID	Policy ID	Appointment ID	Claim Amount	Status
1	1	2	110	APPROVED

If the user wants to see the policies information of the patient, the user should click on the policies button. It will display the following information.

Policies

Policies

Policy ID	PolicyName	InsuranceProviderName	Maximum Claim amount	PolicyType	Coverages
1	Test	ABCDE	100	BASIC	Heart (Heart)

If the user wants to see the bills information of the patient, the user should click on the bills button. It will display the following information.

Bills

Bills

Bill ID	Generated time	Appointment ID	Amount	Status
1	2022/04/05 15:30:33	1	100	SETTLED
2	2022/04/05 15:36:58	2	100	PENDING

If the user wants to see the transaction information of the patient, the user should click on the transactions button. It will display the following information.

Transactions

Transactions

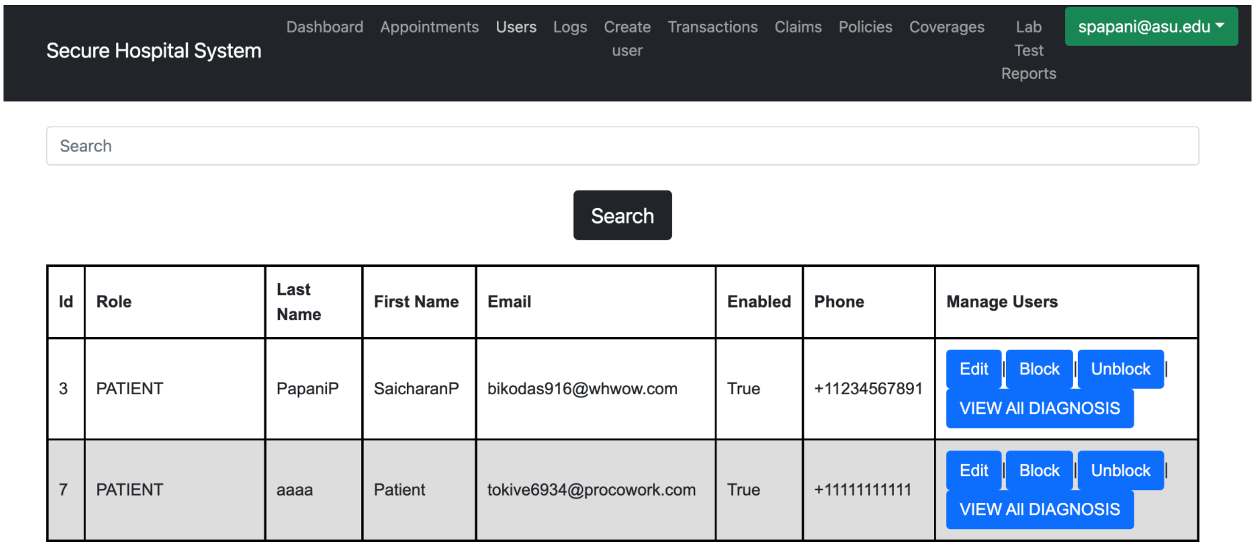
Transaction ID	time	Appointment ID	Bill ID	Amount	Approved By	Status
1	2022/04/05 15:31:21	1	1	100	Saicharan Papani	APPROVED
2	2022/04/05 15:37:44	2	2	100		PENDING

If the user wants to see the patient's past appointments, user should click on past appointments

Current Appointments | Past Appointments

No Appointments!

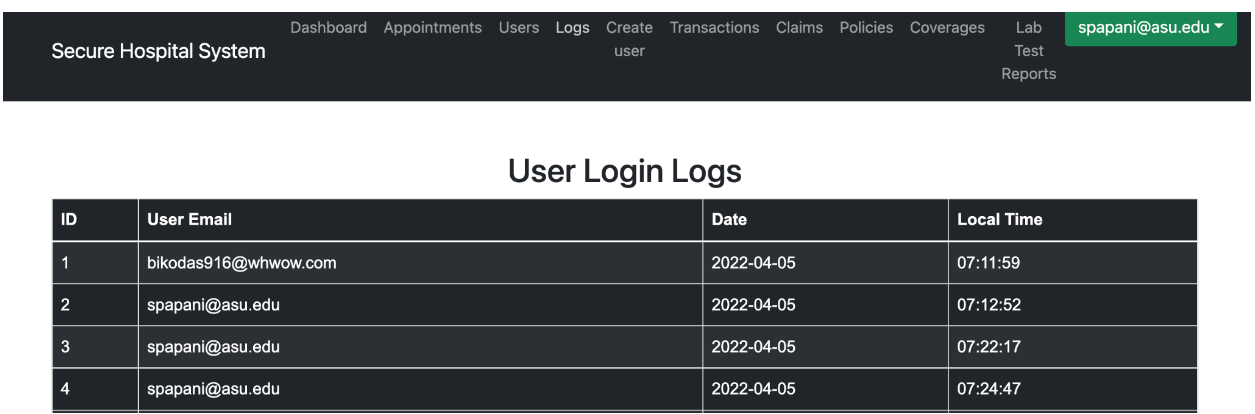
If the admin wants to see the information of the patients, he should click on the users tab. Admin should be able to see all the patient information with the following fields. Admin will also have a search bar on the top to search a particular patient by name or any of the given fields in the table displayed.



Id	Role	Last Name	First Name	Email	Enabled	Phone	Manage Users
3	PATIENT	PapaniP	SaicharanP	bikodas916@whwow.com	True	+11234567891	Edit | Block | Unblock | VIEW All DIAGNOSIS
7	PATIENT	aaaa	Patient	tokive6934@procowork.com	True	+11111111111	Edit | Block | Unblock | VIEW All DIAGNOSIS

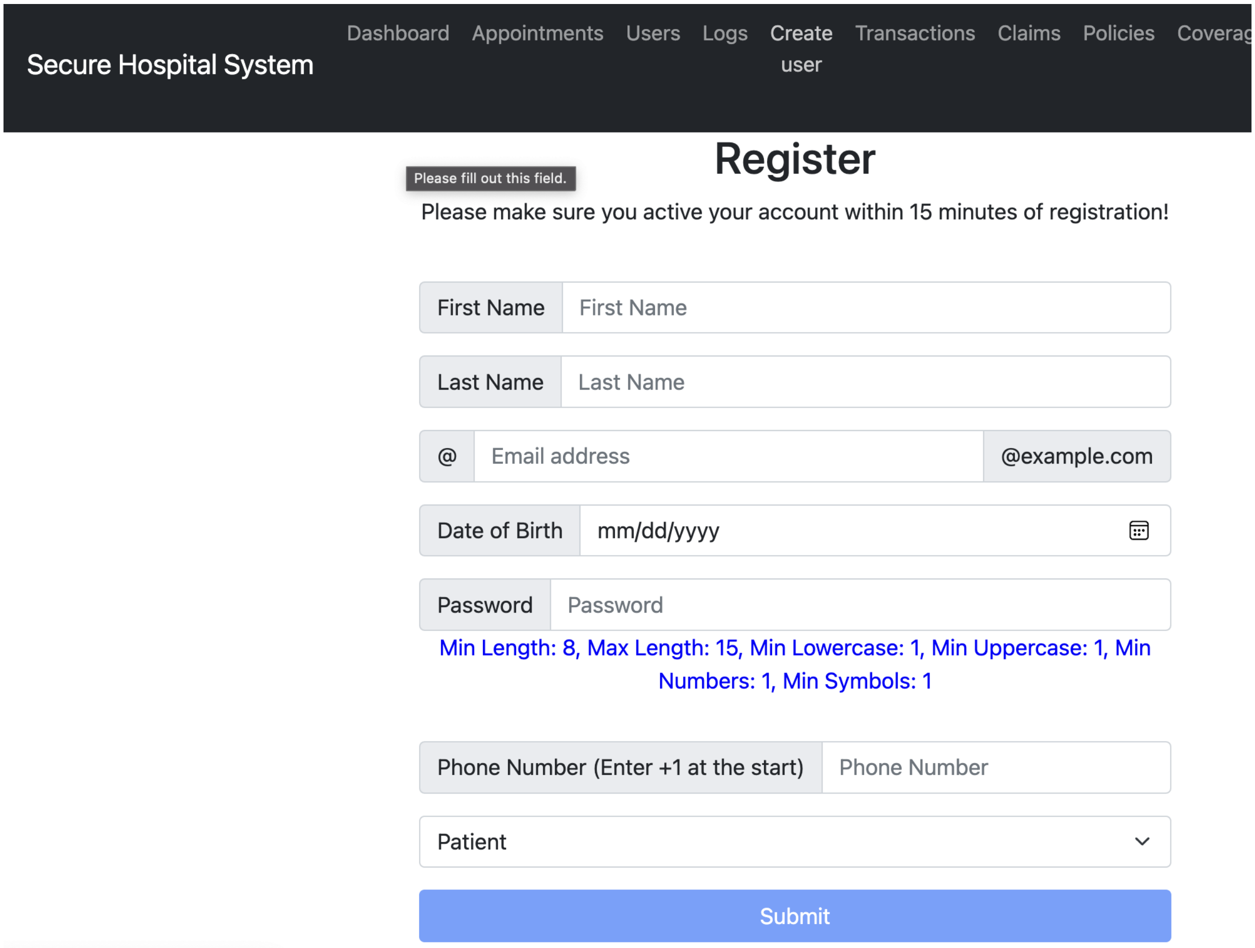
Under the manage users column, admin can edit the information of the patient by clicking on the edit button. If the admin wants to stop a patient from logging in for some time he should block the button. If we want to unblock the blocked patient in the past, he should click on the unblock button. Admin can view diagnosis information of the patient in this tab also by clicking the view all diagnosis button.

Admin can see the patient login and logout under the logs tab. When admin clicks on the logs tab, the application will display the patient login and logout date and times as follows.



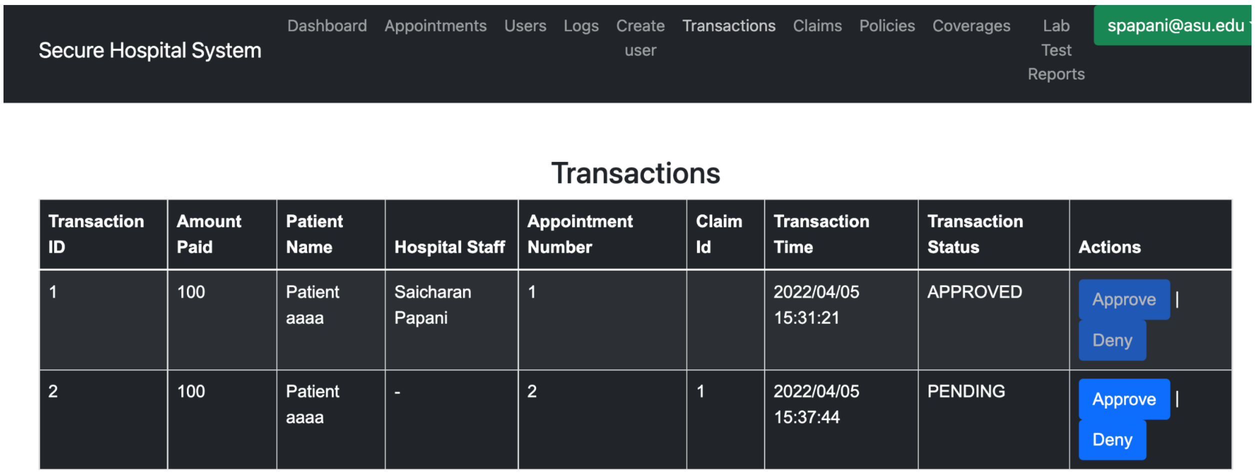
ID	User Email	Date	Local Time
1	bikodas916@whwow.com	2022-04-05	07:11:59
2	spapani@asu.edu	2022-04-05	07:12:52
3	spapani@asu.edu	2022-04-05	07:22:17
4	spapani@asu.edu	2022-04-05	07:24:47

Admin can create a new user also by clicking the create user tab above. He will be displayed with the same signup on the home screen.


Secure Hospital System
Dashboard
Appointments
Users
Logs
Create user
Transactions
Claims
Policies
Coverag
Please fill out this field.
Register
Please make sure you active your account within 15 minutes of registration!
First Name
First Name
Last Name
Last Name
@
Email address
@example.com
Date of Birth
mm/dd/yyyy
Password
Password
Min Length: 8, Max Length: 15, Min Lowercase: 1, Min Uppercase: 1, Min Numbers: 1, Min Symbols: 1
Phone Number (Enter +1 at the start)
Phone Number
Patient
Submit

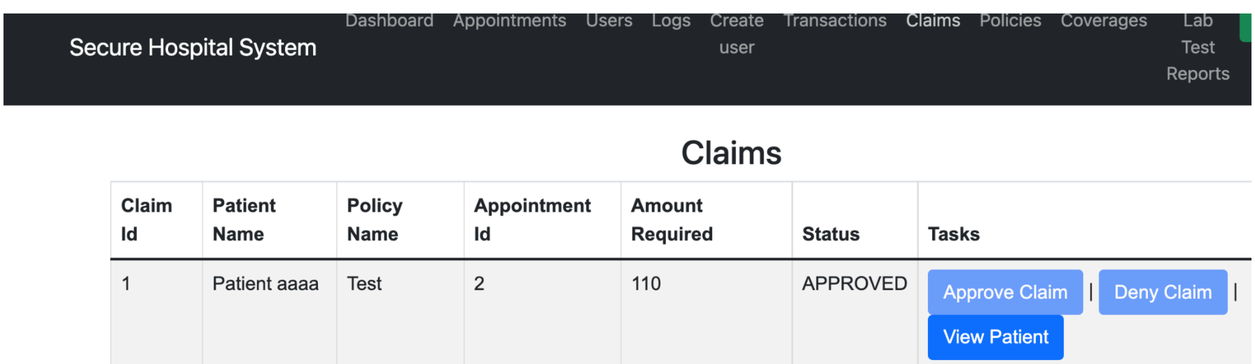
If the admin wants to see the patient transactions, he should click on the transactions button above. The transaction can be approved or denied by the approve and deny button as shown below.

If the transaction is approved, the application will give a pop saying transaction approved and transaction status will also be updated to approved from pending.



Transaction ID	Amount Paid	Patient Name	Hospital Staff	Appointment Number	Claim Id	Transaction Time	Transaction Status	Actions
1	100	Patient aaaa	Saicharan Papani	1		2022/04/05 15:31:21	APPROVED	Approve | Deny
2	100	Patient aaaa	-	2	1	2022/04/05 15:37:44	PENDING	Approve | Deny

If the admin wants to see the clams of the patient, he should click on the claims button above. Under tasks column, admin can approve,deny claims by clicking the respective approve and deny button and also he can view the patient information by clicking the view patient button. If the admin clicks on the view patient he will be redirected to patient information page.



Claim Id	Patient Name	Policy Name	Appointment Id	Amount Required	Status	Tasks
1	Patient aaaa	Test	2	110	APPROVED	Approve Claim | Deny Claim | View Patient

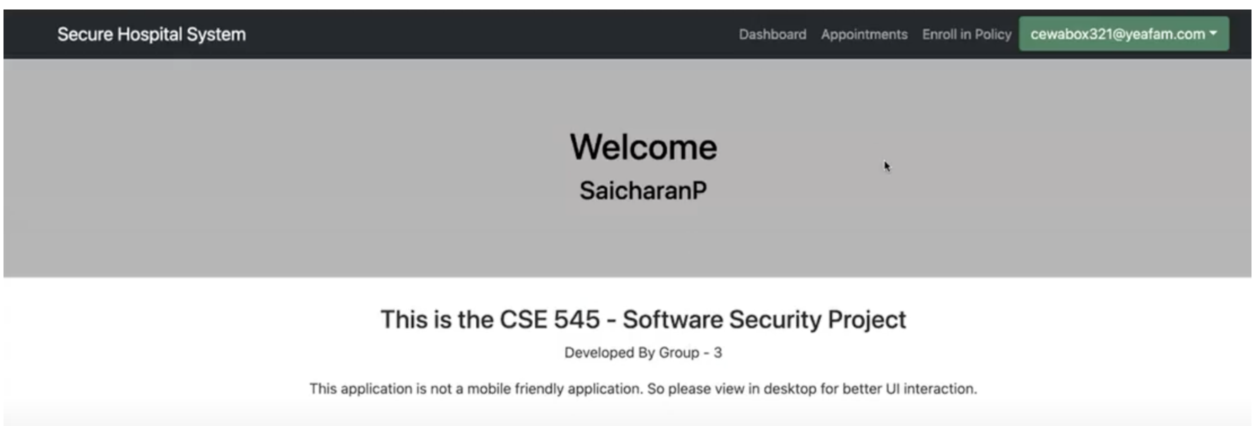
Patient portal

If a user logs in as a patient in our application, user can see features like

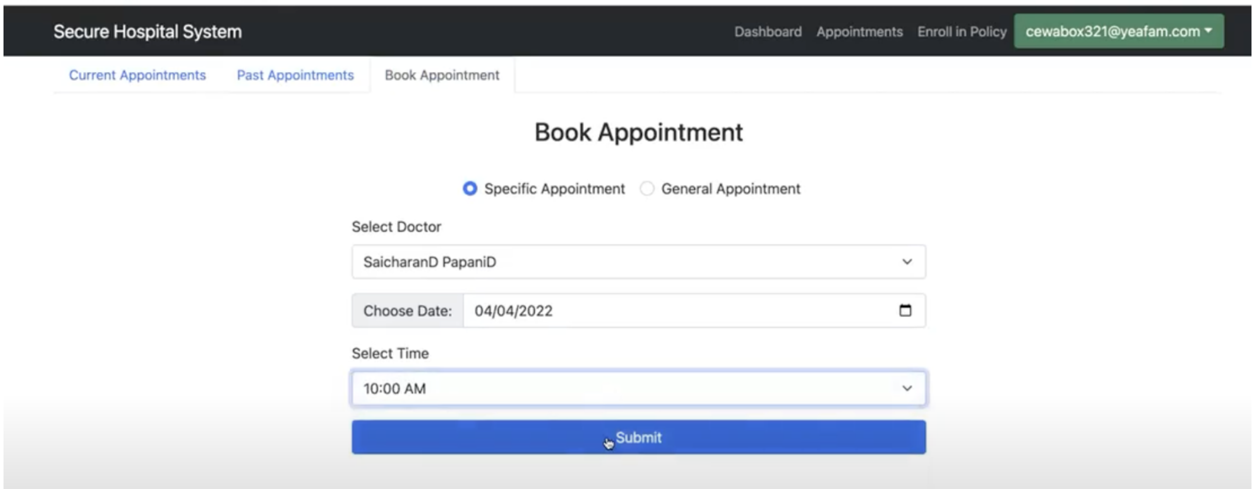
1. Dashboard
2. Appointments
3. Enroll in policy

under separate tabs.

For a patient to book an appointment, the user should click the Appointments tab first. When the user clicks the Appointments tab, the user can see Current Appointments, Past Appointments, and Book Appointment tabs under it. To book an appointment, the user should click the Book Appointment tab. Users can see Specific Appointment, General Appointment as two appointment types when the Book Appointment tab is clicked. Users can select only one type at a time. Users can also select the doctor to whom they want to book an appointment with. To select a doctor to book the appointment, the user can see a drop down of doctors available at that time. Users can select a doctor from the drop down.



Users also can choose a date for the appointment. After selecting the date of the appointment, the user can select the time for the particular appointment from the dropdown of available times that are displayed. And finally, the user should click the submit button to book the appointment. After clicking the submit button, the user can see an alert message saying “Success” which indicates the appointment is booked successfully without any problem. Users can see the current booked appointment by again clicking the Appointments tab and then the Current appointments tab under it. Current booked appointments will have details like Appointment ID, Appointment Type, Doctor Assigned, Hospital Staff, Time Slot, Date, Status, Modifications, Payment.

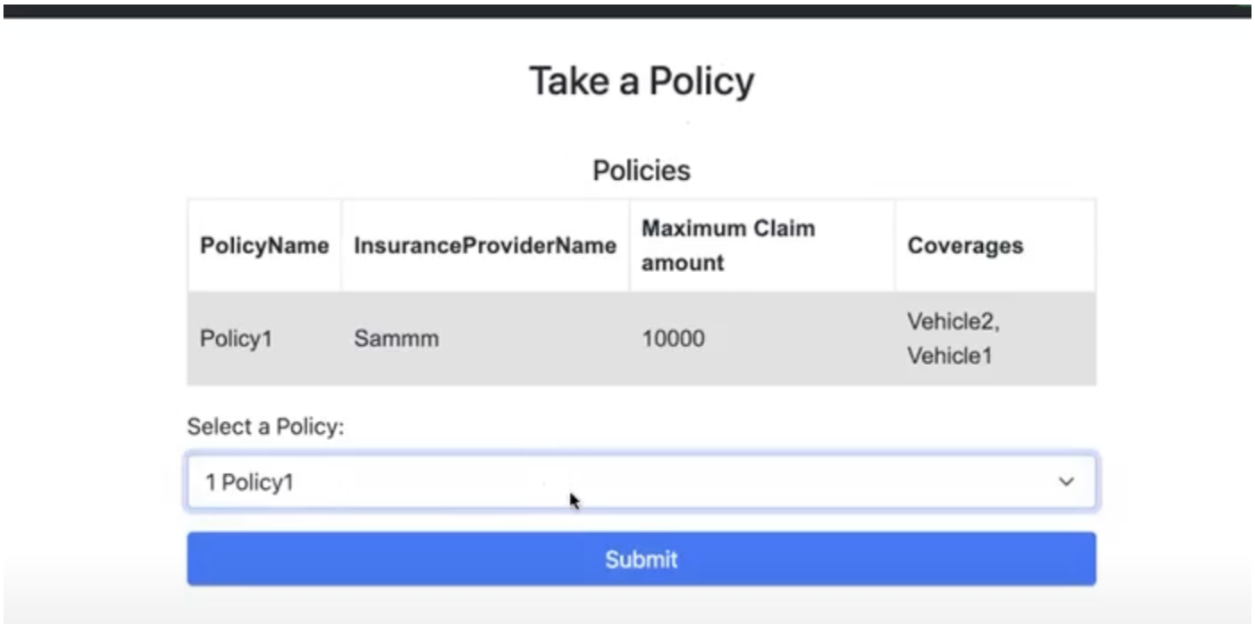


If the appointment type is “Specific Appointment” the Status of the appointment will be “approved”. Under the Modifications column, users will have two features like CANCEL and VIEW ALL DIAGNOSIS. For the Specific Appointment type, the user will not have an option to cancel the appointment, can click only the VIEW ALL DIAGNOSIS button to see the diagnosis information of the patient. The cancel button will be not clickable by default.

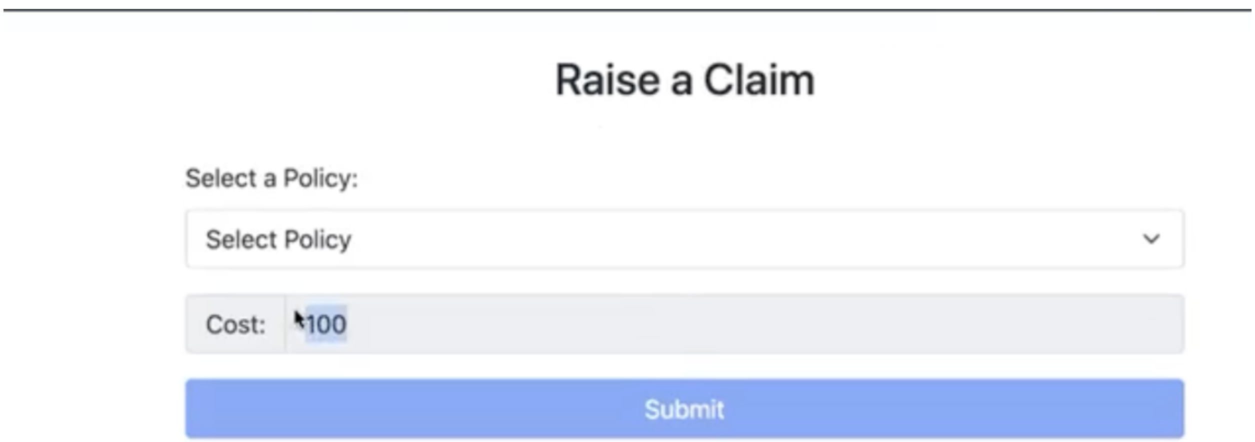
If the user wants to select a doctor with the same time as the previous appointment, the time of the previous appointment will not be displayed automatically under the drop down for selecting time slots. Users can only select unique time slots for a specific doctor. If the appointment type is “General Appointment, " the user cannot have an option to select a doctor, but only has an option to select the date and time slot for the appointment. Users should click the submit button after entering the date and time slot for the General Appointment to book. User can see an alert message “Success” if the appointment is booked successfully. Users can see the current booked appointment by again clicking the Appointments tab and then the Current appointments tab under it. If the appointment type is General, under modifications the column user will have two features: CANCEL and VIEW ALL DIAGNOSIS and status will be REQUESTED. To cancel an appointment, users have to click the CANCEL button. When the user clicks the CANCEL button, the application will send an alert message to the screen saying “Success” which indicates the appointment is canceled successfully and the status will also be set to “Canceled”.

If the status column in the current appointments tab is “diagnosed”, the payment column will have “Make a payment” and “raise a claim”.

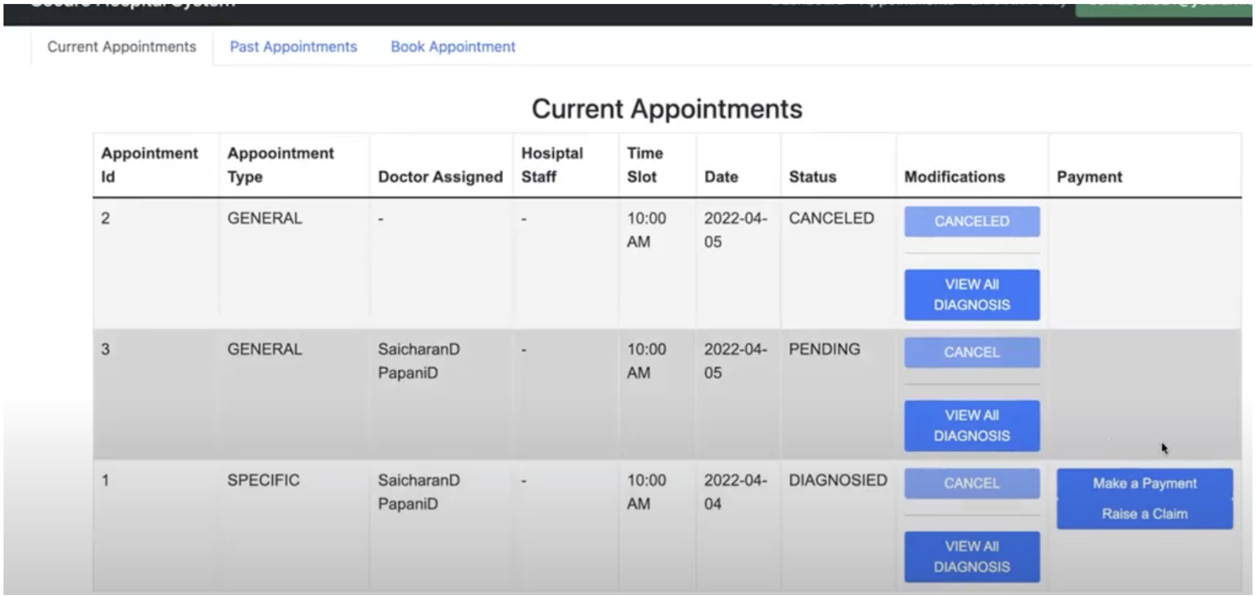
If the patient wants to enroll in a policy, patient has to click Enroll in a policy tab. Patient has to select a policy from the drop down of available policies and then click submit.



After the patient clicks the submit button, the application will alert a message saying "Congratulation Policy is taken" which indicates the patient is enrolled in a policy successfully.
If the patient wants to raise a claim, the patient has to click the raise a claim button in the payment column present in the current appointments tab.



After clicking on the raise a claim button, the patient can select a policy from the drop down of available policies and enter the cost of the claim and then should click the submit button to raise a claim.



Appointment Id	Appoointment Type	Doctor Assigned	Hosiptal Staff	Time Slot	Date	Status	Modifications	Payment
2	GENERAL	-	-	10:00 AM	2022-04-05	CANCELED	CANCELED VIEW All DIAGNOSIS	
3	GENERAL	SaicharanD PapaniD	-	10:00 AM	2022-04-05	PENDING	CANCEL VIEW All DIAGNOSIS	
1	SPECIFIC	SaicharanD PapaniD	-	10:00 AM	2022-04-04	DIAGNOSIED	CANCEL VIEW All DIAGNOSIS	Make a Payment Raise a Claim

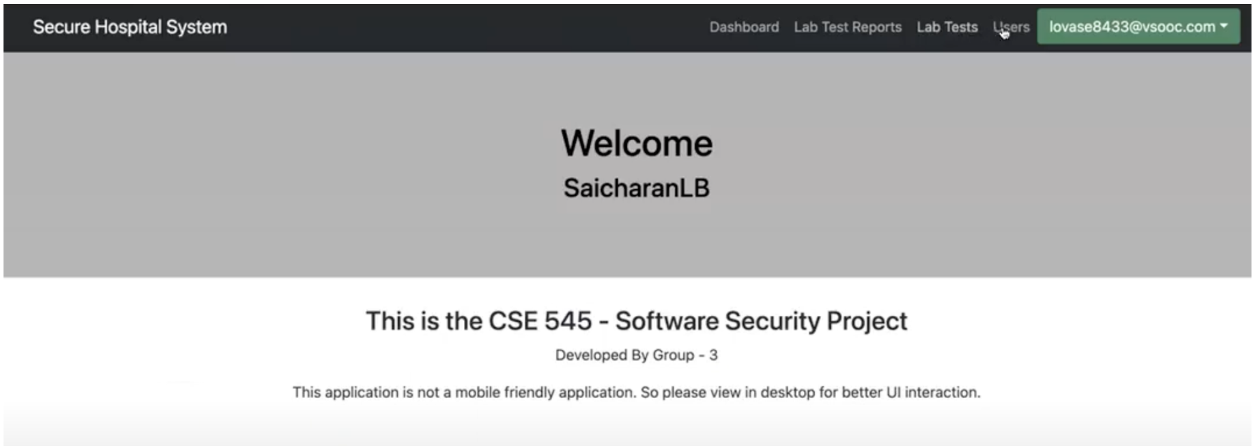
If the patient wants to make a payment, patient has to click the make a payment button under the payment column in the current appointments tab. After clicking on the make a payment button, to pay the bill the patient has to click on the pay bill button. The application will return an alert message saying “successfully initiated a transaction”. Since the patient paid the bill, the status column under the current appointments tab will be now changed to “PAYMENT_AUTHORIZED”.

Lab staff portal

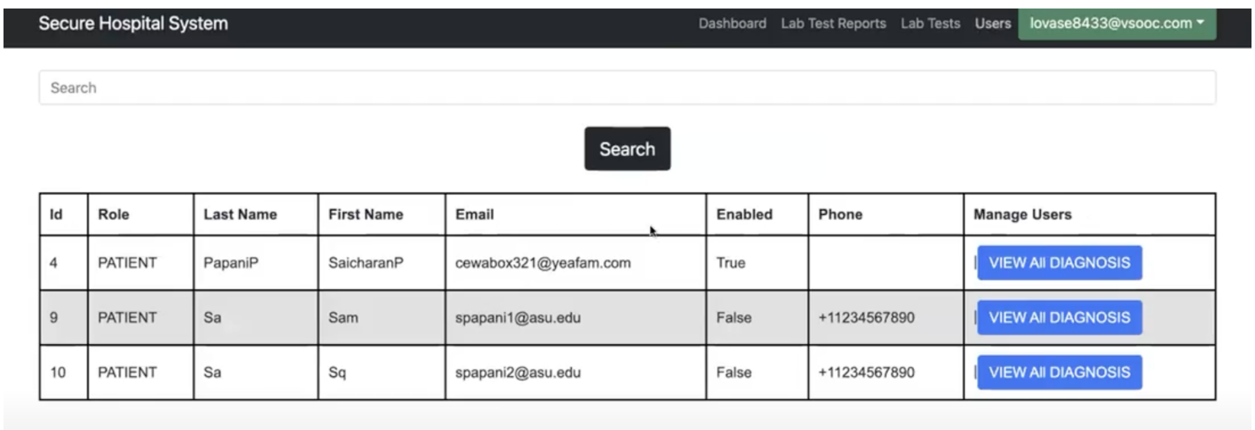
When users login as lab staff in our application, users can see features like

1. dashboard
2. lab test reports
3. lab tests
4. users

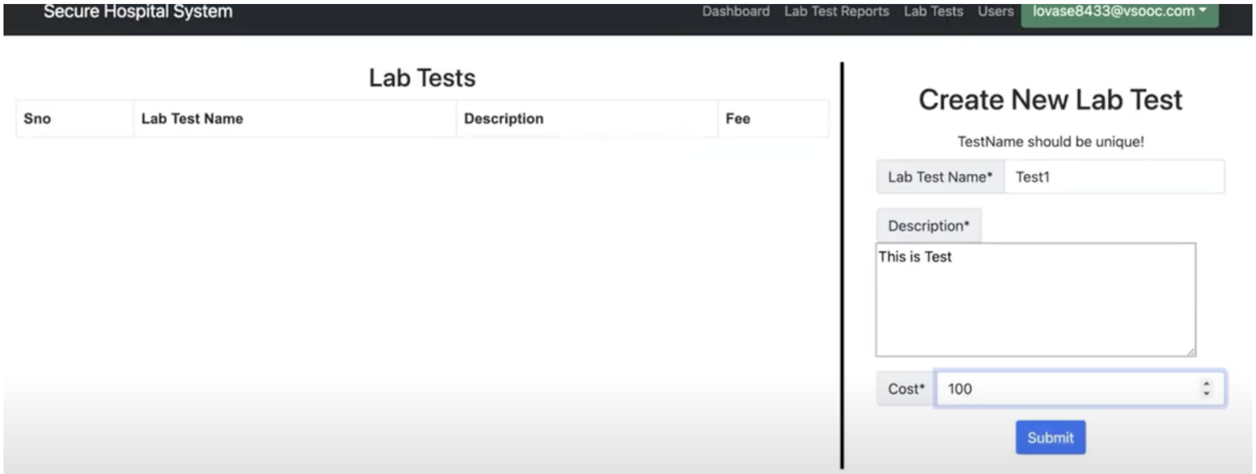
under separate tabs and search functionality to find patients by their details.



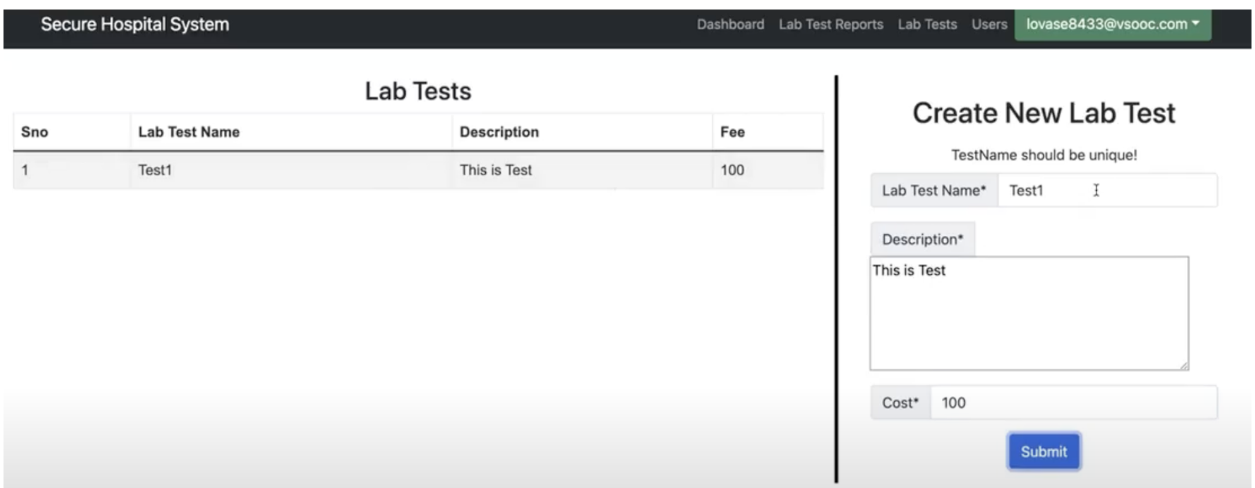
If the user clicks the Users tab, the user can see all the patients and their details like ID, Role, Last name, first name, Email, Enabled, Phone number, and Manage Users in a table.
Manage Users will have to view all diagnosis buttons; if the user clicks that, it will display patient diagnosis information.



Under the Lab Tests tab, users can create new lab tests. To create a new lab test, users can enter information like Lab Test Name, description and cost of the test and should click the submit button.

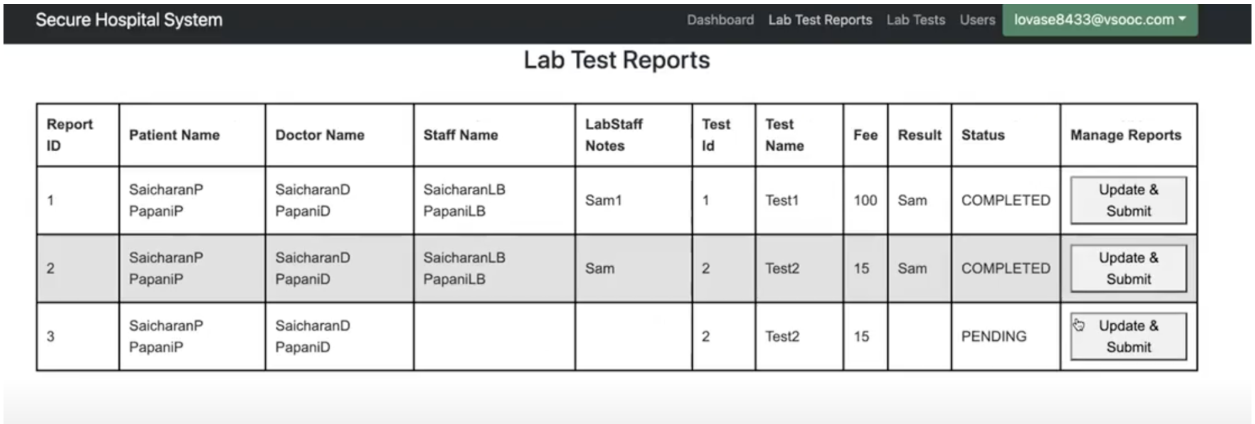


When the user clicks the submit button, our application will alert a message “Lab Test successfully received”. The information entered for creating a lab test will be displayed on the left..



If we want to go to another role like appointments in our application from the lab staff, we have designed the application in such a way that it will not allow us to go to the other role.

If lab staff has to send reports of the patient, they have to click the lab test reports tab, there they can see an update and submit button under the manage reports column with which they can update the lab reports of the patient. Also, the status column will be shown “pending”. When lab staff click on the update and submit button, they can write “Lab staff note” and “result” and click the submit button to get the data updated.



Report ID	Patient Name	Doctor Name	Staff Name	LabStaff Notes	Test Id	Test Name	Fee	Result	Status	Manage Reports
1	SaicharanP PapaniP	SaicharanD PapaniD	SaicharanLB PapaniLB	Sam1	1	Test1	100	Sam	COMPLETED	Update & Submit
2	SaicharanP PapaniP	SaicharanD PapaniD	SaicharanLB PapaniLB	Sam	2	Test2	15	Sam	COMPLETED	Update & Submit
3	SaicharanP PapaniP	SaicharanD PapaniD			2	Test2	15		PENDING	Update & Submit

The application says “success” when the lab staff clicks the submit button and the data is updated successfully. Now under the Status column in the Lab test reports tab will be changed from pending to completed.

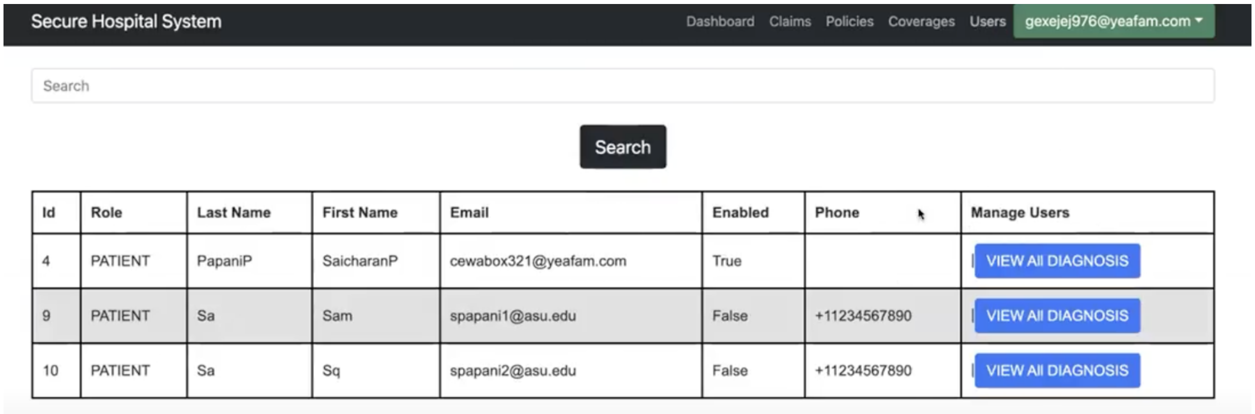
Insurance user portal

When a user logs in as an insurance user in our application, the user can see features like

1. Dashboard
2. Claims
3. Policies
4. Coverages
5. Users

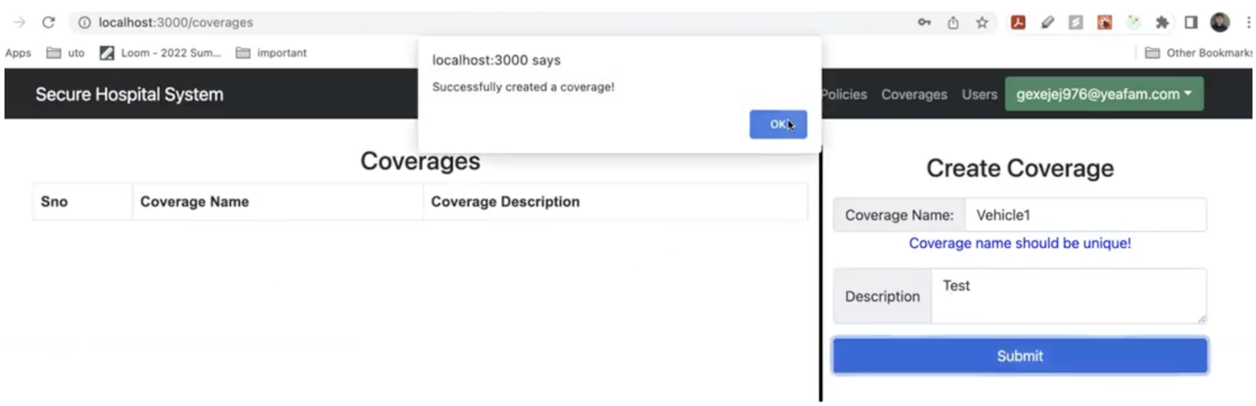
under separate tabs.

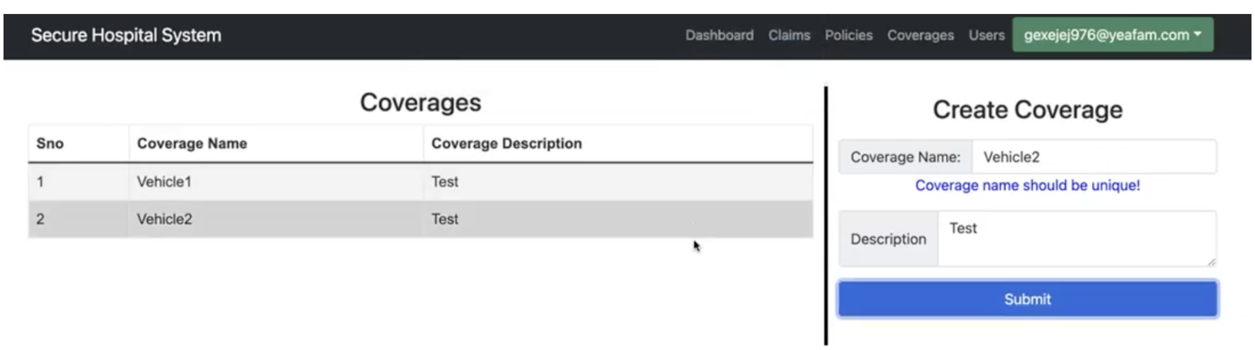
If the insurance user wants to see the patient's information, he should click on the users tab on the top. Then the user can see the following information. If the insurance user wants to see the patient diagnosis information, he should click on the view all diagnosis button.



To create a coverage, the user should click the Coverages tab and enter information like Coverage name, description of the coverage and click the submit button. Our application will alert a message “Successfully created a coverage” after clicking the submit button and the Coverage name entered for the first time.

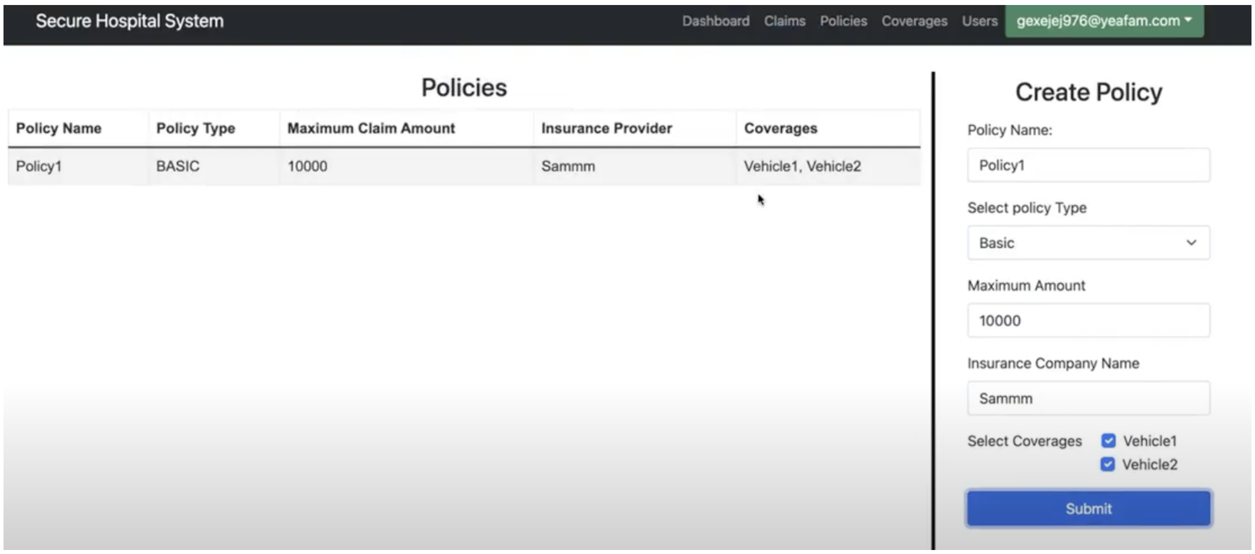
Coverage names should be unique, if the user enters the same Coverage names, our application will alert a message “Error in creating a record”.





To create a policy, the user should click Policies tab and create information like Policy Name, Policy type, Maximum amount, Insurance company name. Users also have an option to select from the coverages that are already present.

Policy type has options like Basic and Premium for the user. Users can select only one at a time.



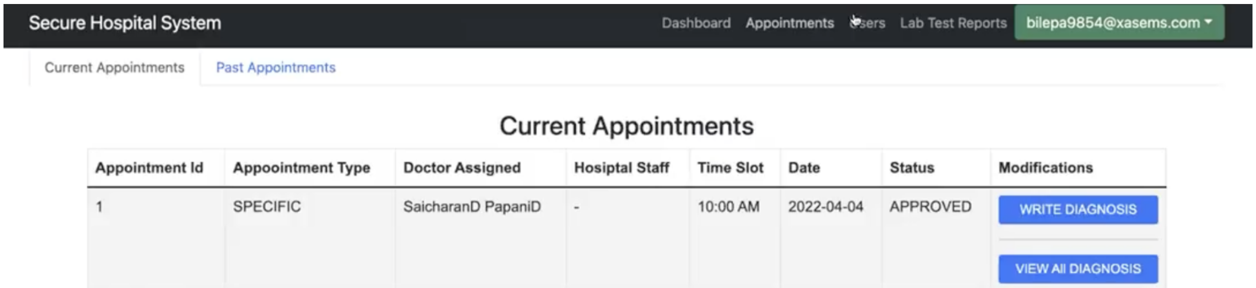
Maximum amount, Insurance company name are the mandatory fields, users cannot submit until these fields are filled. If the user didn't fill these fields, the user will get a pop up called "Please fill out this field".

Maximum amount has not only the option to enter the amount but also can be increased or decreased after entering the amount using upward and downward arrows.

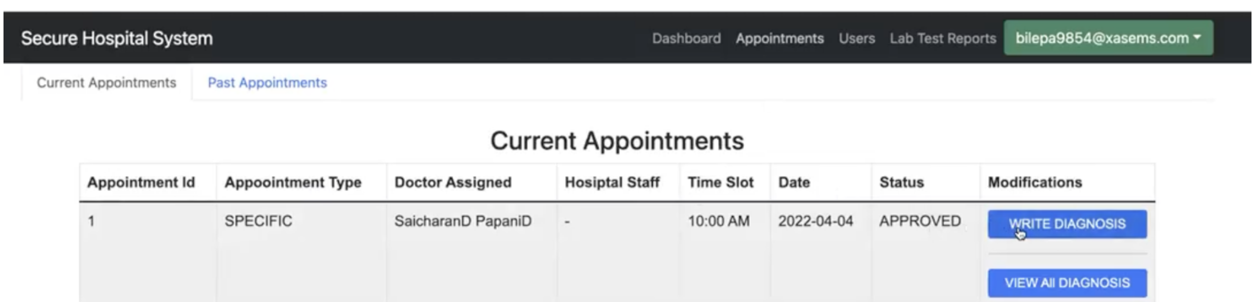
If the insurance staff wants to approve a claim raised by the patient, the user has to click on the claims tab and there they can see three buttons Approve claim, deny claim and view patient. User has to click the approve claim button to approve the claim. After the approve claim button is clicked, the application will alert a message saying "Approved".

Doctor portal

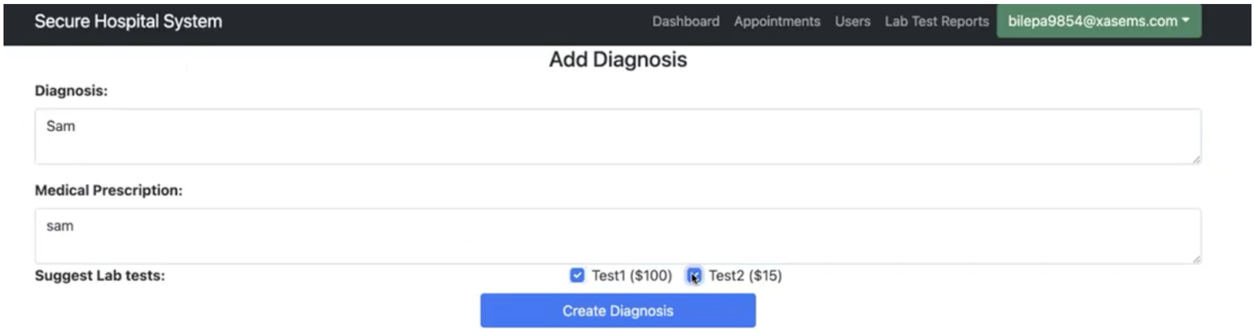
If a user logs in as a doctor in our application, the user can see features like Dashboard, Appointments, Users, Lab Test Reports under separate tabs.



If the user wants to see the appointments of a particular doctor, the user has to click the appointments tab. Under the current appointments tab, users can see the latest appointments with fields like Appointment ID, Appointment type, Doctor Assigned, Hospital Staff, Time slot, Date, Status, Modifications. Under the Modifications column, the user can see WRITE DIAGNOSIS, VIEW ALL DIAGNOSIS as options to select. If the doctor wants to write a diagnosis for a particular patient, the doctor should click WRITE DIAGNOSIS. After clicking WRITE DIAGNOSIS, the doctor can see the Diagnosis, Medical Prescription, and Suggest Lab test features. For the Suggest Lab tests feature, doctors can suggest two test options: Test 1(100$) and Test 2(15$). After selecting tests, the user has to click the “create diagnosis” button and the application will alert a message saying “success” if the creating diagnosis is successful. If the doctor writes a diagnosis, the status in the current appointments will be changed to “pending”. Pending status suggests that the Doctor is waiting for the lab tests based on the diagnosis written to be done.



Doctors can also see the previous records of the patient by clicking the “View all diagnosis” button. Previous records contain previous appointments, lab reports, claims, policies, bills, transactions.



If the doctor wants to see the details of the patients with whom the doctor has an appointment with, the user has to click the Users tab. If the user clicks the Users tab, the user can see the patient details like ID, Role, Last name, first name, Email, Enabled, Phone, Manage Users.

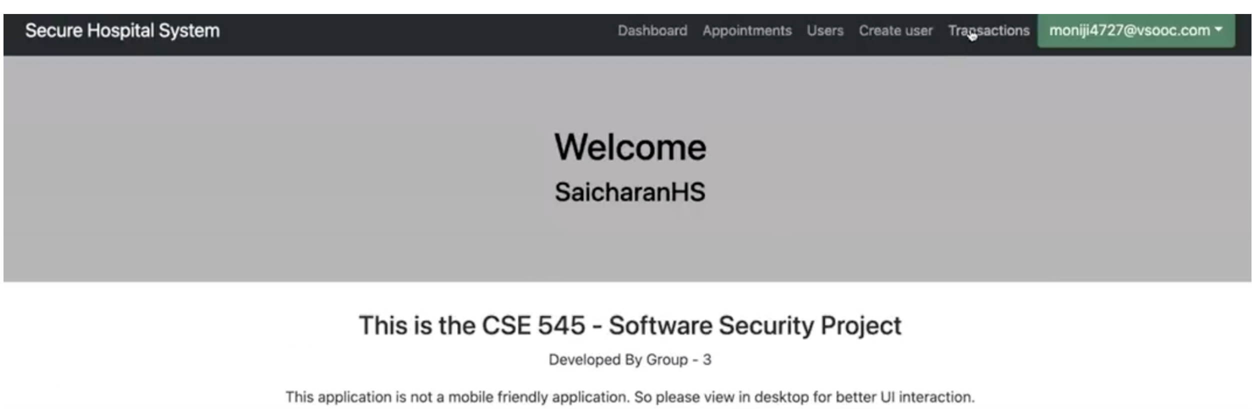
If the status column in the current appointments tab is pending, under modifications the column doctor can see the complete appointment and view all diagnosis buttons. If the doctor clicks “complete appointment”, the status column in the current appointments tab will be changed to “diagnosed”.

Hospital staff portal

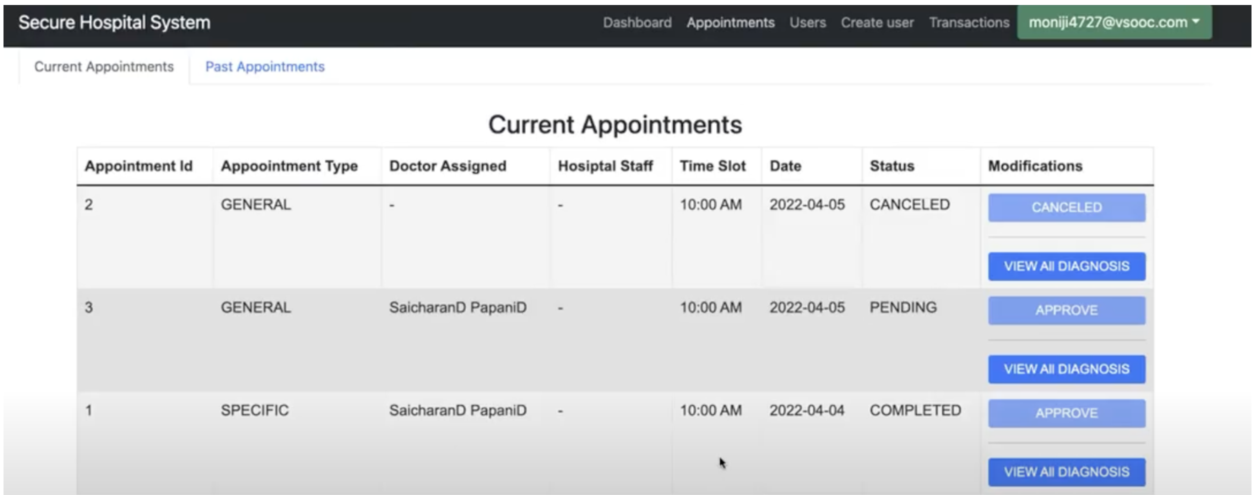
When user’s login as hospital staff, they can see

1. Dashboard
2. Appointments
3. Users Create User
4. Transactions

under separate tabs. If the hospital staff has to approve/reject any appointments, they should click on the



appointments tab and then the current appointments tab should be clicked. After they click the current appointments tab, under the modification column they can see Approve and view all diagnosis buttons to select. If hospital staff has to approve or reject the appointment, they should click on the Approve button. Hospital staff can approve/ reject appointments for only the appointments whose status is requested; they can't do anything if the status is canceled or pending.



After the Approve button is clicked, hospital staff can select a doctor if available and approve the appointment by clicking the Approve appointment button below. If the Hospital staff want to reject the appointment, they can directly click the Reject appointment button below. If the Hospital staff approved an appointment, status and doctor assigned columns in the current appointments tab will be changed to approved and the name of the doctor assigned.

If the hospital staff has to approve a transaction done by the patient, they have to click the transactions tab first. After clicking the transactions tab, under the actions column the user can either Approve or deny. If the staff has to approve it, they will click on the approve button and the application will alert a message stating "Transaction is complete". After this, the status column in the current appointments tab will be changed to COMPLETED.