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TEAM: CHICKEN NUGGETS

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INSTRUCTOR: Eray Tüzün

TEACHING ASSISTANTS: Muhammad Umair Ahmed, Elgun Jabrayilzade

TEAM MEMBERS:

Abdullah Riaz (22001296)

Ahmet Faruk Ulutaş (21803717)

Dilay Yiğit (21602059)

Mohammed Sohail (22001513)

Mostafa Khaled A. Mohamed Higazy (22001062)

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1. INTRODUCTION

Our project is to create a web application for Bilkent University's health center that aims to speed up the system and reduce the workload for both patients and health workers. While determining the basic features of this project, we focused on the issues that were causing slowdown or complexity in the current system of the health center, as a basis, such as not being able to access the patient's entire medical history, health-related announcements sent by email to Bilkenters causing a mass of emails and no online appointment or messaging methods.

By combining all these motivations with our project, we formulated a list of the basic features we want our website to have. Before examining the features of the website in more detail, the main motivations we considered while designing our project are as follows:

- Accessing a patient's medical history
- Writing and replying to messages
- Managing announcements/blood donation requests
- Appointment scheduling
- Online payment gateway

2. OVERVIEW

There are two types of users besides admin on our website. These are patients and staff, including receptionists, nurses, and doctors. The modules that these two users are allowed to access are different from each other.

2.1. STAFF (Doctors, Nurses, Receptionists):

2.1.1. Staff's access to manage patient's medical information

2.1.1.1. Patient summary for a doctor (Medical history form)

We think that the fact that doctors do not have direct access to the medical history of the patients they follow will mean that the doctor has to ask this question at every examination and that perhaps the correctness of the diagnosis will be tied to the patient's memory. In this case, we think that having access to the patients' past diagnoses, medications and operations will make the system more efficient.

2.1.1.2. Create/edit/view analysis and examination reports

The ability of healthcare professionals to create and organize up-to-date medical tests and reports via the website ensures that all patient data is collected in one place, making it easier for different doctors to follow up on the same patient.

2.1.2. Authority of doctors/nurses/receptionist

2.1.2.1. Create/edit/view announcements

Having all health-related information or announcements on this site will prevent information stack and confusion. In other words, the website we will create will generally contain all activities under the "health" label on the campus. Announcements on the health center's website will prevent this information density to a large extent, and health workers have access to create, edit and view announcements.

2.1.2.2. Writing and replying to messages

The fact that doctors have the authority to write and reply to messages about the creation or cancellation of appointments or about the urgent problems of patients not only leads to a closer doctor-patient relationship but also prevents the doctor from losing time in case of a possible appointment cancellation.

To ensure doctors are not a victim of spam, rate limits will be applied to patients so they can only have a maximum of 5 active tickets.

2.2. PATIENT:

2.2.1. Onboarding:

Newly signed up patients on the website will be prompted with a form to set up their health profile. This will be required for every new user since the information in the form is essential for the optimal experience of the website and its features.

2.2.2. Medical history of patients

2.2.2.1. Patient profile (Name, Age, Date of Birth, Nationality)

Each patient has a profile page with their own personal information. If necessary, the information on this page can be rearranged.

2.2.2.2. Patient's previous tests

The tests performed by each patient in the health institution before are recorded. Thus, information can be obtained quickly from the previous tests and test results of the patient.

2.2.2.3. Patient's previous diagnosis

The treatments that each patient has been in before in the health institution are recorded. Thus, information can be obtained quickly from the previous treatments and results of the patient.

2.2.2.4. Patient's previous reports

The previous reports of each patient are recorded. Thus, information can be obtained quickly from the previous reports of the patient.

2.2.2.5. Patient’s previous documents

Documents that the patient previously owned and uploaded to the system can be viewed. Thus, health information from external sources contributes to the acceleration of the treatment process.

2.2.2.6. Patient’s vaccines

The previous vaccinations of the patient can be viewed on the system. Thus, the treatment of the patient can be done accordingly.

2.2.2.7. Patient’s previous visits

The reasons for the previous examination of the patient's health institution are recorded in the system in order to obtain extensive information about the disease and treatment processes.

2.2.3. Authority of patients

2.2.3.1. Writing and replying to messages

When necessary, patients can reconnect with healthcare professionals who have communicated with them and provided treatment. They can receive messages from all healthcare professionals and respond to anyone who has sent a message to them.

2.2.3.2. View announcements/notifications

Patients receive a notification about the issue when there is progress in any process such as a report, treatment, vaccine, test in the health institution. In addition, they receive notifications if the information in their profile matches on issues such as blood donation or smoking cessation that concern volunteers. Thus, they both monitor their own progress and reach out to people who want to donate blood to those who need blood in the hospital or who want to quit smoking.

2.2.3.3. Create/view blood requests

Patients can create a blood request. Thus, a notification is sent to patients who match the blood type they need, and it is aimed to meet their blood needs in a short time.

2.2.3.4. View patient’s invoices/transactions

The patient's invoice and previous payment transactions and information are kept by the system. Thus, the patient can quickly and easily view the payment transactions and download them as documents.

2.2.3.5. View blood donation preference

Patients have a choice as to whether they want to donate blood. When this option is activated, the patient will be notified when there is a needy patient whose blood type matches.

2.2.3.6. Use online payment feature

With the online payment feature, patients can easily complete the cost of the health service they have received or will receive, without contacting anyone.

2.2.4. List of doctors/nurses

The information of all health workers will be available on the website. Thus, patients will be able to view the doctors they want to be examined and get their appointments accordingly.

3. REQUIREMENTS

3.1. Functional Requirements

3.1.1. Log in, sign up, initial registration form

Patients will be directed to the initial registration form to fill in on their first login to the site. This form consists of two parts, general and medical information. By filling out this form, patients create their own medical history to be viewed by doctors when necessary. On the other hand, health workers can log in to the site with the user IDs and passwords assigned to each staff member and perform patient procedures.

3.1.2. Appointment scheduling

Patients can create an examination appointment for the appropriate day and time from the list of doctors they can view. In this way, the possibility of a crowd of patients in the health center and the possibility of waiting for the doctor will be prevented. In addition to this, there are some department doctors, such as ophthalmologists, who come to the campus if there is an appointment. In the current system, this situation occurs by reaching the health center and making a request. However, thanks to the online appointment, which facilitates the patient's access to the doctor, it will be certain that these doctors come to which campus and at what time intervals, and appointments can be made at any time during these time intervals.

3.1.3. Patient’s medical history

Doctors will be able to view the initial registration form that patients are directed to fill out after logging in for the first time, while they are following their patients. This form filled by the patients will be counted as their medical history.

3.1.4. Messaging feature

There will be a message feature to keep the communication between the patient and the reception and between the reception and the doctor up-to-date in case of problems related to appointments, such as appointment cancellation. In addition, it will be possible to directly communicate with doctors about the issues that patients want to consult by using the tickets.

3.1.5. Announcements/notifications

If we consider that the mailboxes of Bilkent members are very active, we can say that blood donation announcements that come to our mailbox almost

every day can be lost among other incoming emails. The fact that the blood donation announcement, which is of such vital importance, is not sent to Bilkent members via email but in the form of an announcement on the health center's website will prevent this information density to a large extent.

Announcements do not only include blood donation requests. All announcements under the title of health within Bilkent University will be announced to the people of Bilkent on the website of the health center. Accordingly, it will be aimed to inform the users with notifications when necessary.

3.1.6. Online payment feature and transactions

Since Bilkent University health center is a private hospital, not all applications performed in the hospital are covered by the university. In cases where the payment is not met, the patient will be able to make the payment securely via the website with online payment methods.

3.2. Non-functional Requirements

3.2.1. Performance

Even if the user density is high, the system should not load longer than 3-4 seconds. The online appointment page should be updated every 2-3 seconds, if there is a change in the available appointment hours, the user should be able to see it within 2 seconds. Changes should display within seconds when users are using the messaging feature.

3.2.2. Usability

Announcements and blood donation requests should be under different labels to avoid confusion for users. Instead of a complex theme that is tiring on the eyes, a simple and white background should be created. Announcements or notifications with urgency should be colored red to make them stand out on a white background.

3.2.3. Reliability

All information of health workers displayed as a list must be correct. The confidentiality of the personal information and medical history of the patients in the initial registration form should be protected. Another patient should not be able to access the registration forms. Authorizations must be done correctly. Complete access should be accessible by only the admin. If the website goes down, there should not be a data leak.

3.2.4. Supportability

The website should be supported by all operating systems and all browsers. The website should be able to be viewed without any visual problems, both on desktop and mobile interface.

4. SYSTEM MODEL

4.1. Use Case Diagram

Use case diagram and explanations are as follows:

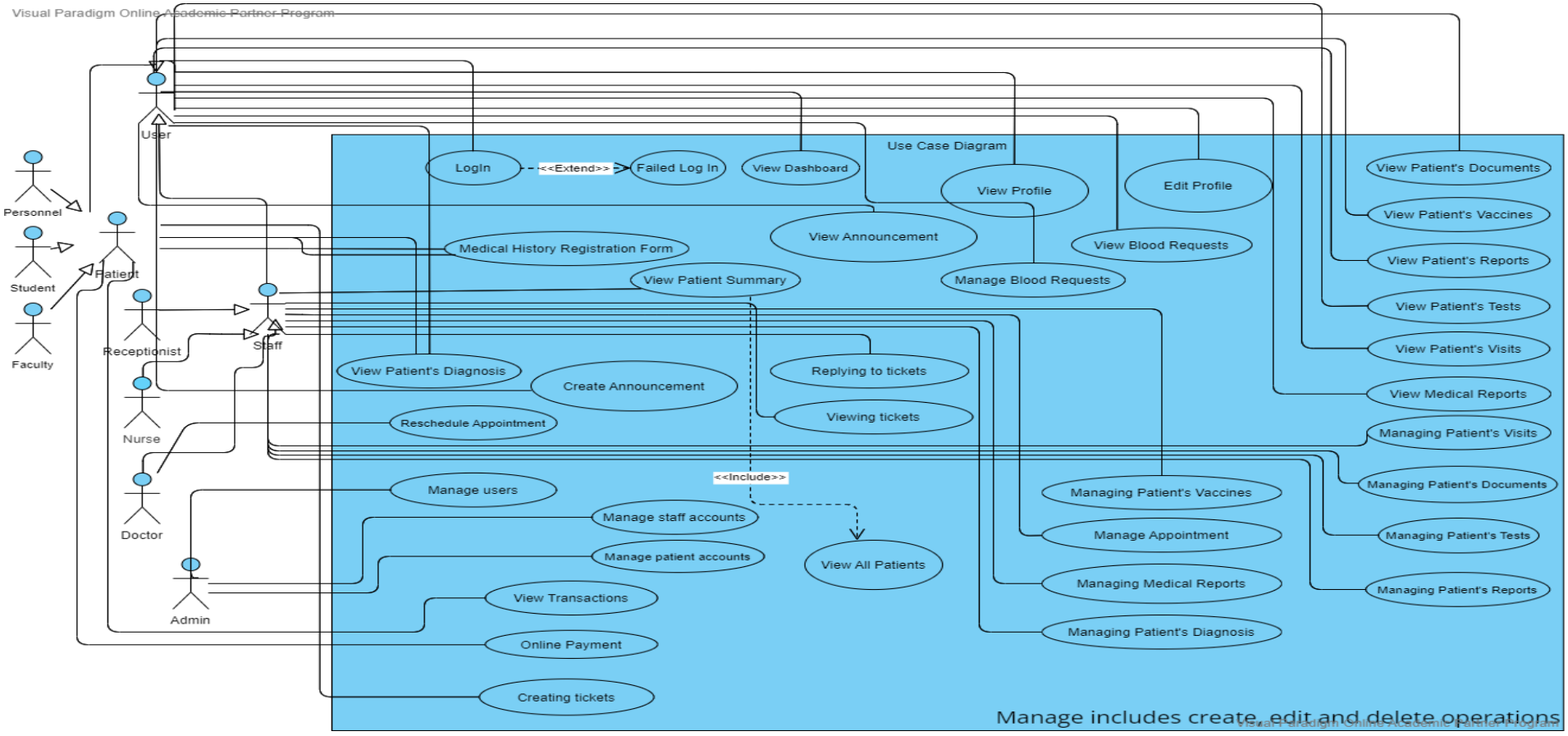


Figure 1: Use Case Diagram for Health Center Management System

Use Case: Login

Participating Actor(s):

User

Entry Conditions:

Actor is not logged in and already signed up.

Exit Conditions:

Actor enters the correct id and password.

The Flow of Events:

Actor clicks on username/password fields

Actor enters information

If information is valid actor logs into the health management system

Use Case: Failed login

Participating Actor(s):

User

Entry Conditions:

This use case extends the login use case. It initiates when the user enters the wrong login information.

Exit Conditions:

User enters valid login credentials

The Flow of Events:

Actor tries to login

Actor enters invalid login credentials

The system displays an error message and the actor has to re-enter their credentials.

Use Case: View Profile

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and viewing the profile.

Exit Conditions:

The actor left the profile viewing interface.

The Flow of Events:

The actor displays the user profile page.

Staff members can also view the patient's profile page.

Each page displayed contains information such as the user's name, surname, date of birth, and country.

The actor exits the user page.

Use Case: Edit Profile

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and editing the profile.

Exit Conditions:

The actor left the editing profile interface.

The Flow of Events:

The user enters the profile editing interface.

Each user can edit their own profile.

Staff can edit any user's profile.

The user exits the profile page editing interface.

Use Case: View Blood Requests

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and viewing the blood requests.

Exit Conditions:

The actor left the viewing blood requests interface.

The Flow of Events:

The user enters the blood requests display interface.

All users can view this page.

Staff can edit this page.

The user exits the viewing blood requests interface.

Use Case: View Patient’s Documents

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and viewing the patient's documents.

Exit Conditions:

The actor left the viewing of the patient's documents interface.

The Flow of Events:

The actor enters the interface where the recorded documents are displayed.

Examine the desired document.

Each user can review their own document page.

Staff can review all pages.

The actor exits the interface.

Use Case: View Patient’s Vaccines

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and viewing the patient's vaccines.

Exit Conditions:

The actor left the viewing of the patient's vaccines interface.

The Flow of Events:

The actor enters the interface where the recorded vaccines are displayed.

Examine the desired vaccine information.

Each user can review their own vaccine information page.

Staff can review all pages.

The actor exits the interface.

Use Case: View Patient's Reports

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and viewing the patient's reports.

Exit Conditions:

The actor left the viewing of the patient's reports interface.

The Flow of Events:

The actor enters the interface where the recorded reports are displayed.

Examine the desired report.

Each user can review their own report page.

Staff can review all pages.

The actor exits the interface.

Use Case: View Patient's Tests

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and viewing the patient's tests.

Exit Conditions:

The actor left the viewing of the patient's tests interface.

The Flow of Events:

The actor enters the interface where the recorded tests are displayed.

Examine the desired test.

Each user can review their own test page.

Staff can review all pages.

The actor exits the interface.

Use Case: View Patient's Visits

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and viewing the patient's old visits.

Exit Conditions:

The actor left the viewing patient visits interface.

The Flow of Events:

The actor enters the interface where the recorded old visits are displayed.

Examine the desired old visit.

Each user can review their own visits page.

Staff can review all pages.

The actor exits the interface.

Use Case: View Medical Reports

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and viewing the patient's medical reports.

Exit Conditions:

The actor left the viewing of the patient's medical reports interface.

The Flow of Events:

The actor enters the interface where the recorded medical reports are displayed.

Examine the desired medical report.

Each user can review their own medical reports page.

Staff can review all pages.

The actor exits the interface.

Use Case: Managing Patient's Visits

Participating Actor(s):

Staff

Entry Conditions:

The actor is logged in and manages the patient's visits page.

Exit Conditions:

The actor left the managing patient's visits interface.

The Flow of Events:

The actor enters the interface where the management of patient's visits are displayed.

Examine and manage the desired old visit.

Staff can review all pages.

The actor exits the interface.

Use Case: Managing Patient's Documents

Participating Actor(s):

Staff

Entry Conditions:

The actor is logged in and manages the patient's documents page.

Exit Conditions:

The actor left the managing patient's documents interface.

The Flow of Events:

The actor enters the interface where the management of the patient’s documents is displayed.

Examine and manage the desired document.

Staff can review all document pages.

The actor exits the interface.

Use Case: Managing Patient’s Tests

Participating Actor(s):

Staff

Entry Conditions:

The actor is logged in and manages the patient's tests page.

Exit Conditions:

The actor left the managing patient's tests interface.

The Flow of Events:

The actor enters the interface where the management of patient tests is displayed.

Examine and manage the desired old tests.

Staff can review all pages.

The actor exits the interface.

Use Case: Managing Patient’s Reports

Participating Actor(s):

Staff

Entry Conditions:

The actor is logged in and manages the patient's reports page.

Exit Conditions:

The actor left the managing patient's reports interface.

The Flow of Events:

The actor enters the interface where the management of patient’s reports are displayed.

Examine and manage the desired old reports.

Staff can review all pages.

The actor exits the interface.

Use Case: View Announcements

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and viewing the announcements page.

Exit Conditions:

The actor left the viewing announcements interface.

The Flow of Events:

The actor enters the interface where the announcements are viewed.

Examine and manage the desired old announcements.

Staff can review all announcements pages.

The actor exits the interface.

Use Case: Medical History Registration Form

Participating Actor(s):

Patient

Entry Conditions:

The actor is logged in and viewing the medical history registration page.

Exit Conditions:

The actor left the medical history registration interface.

The Flow of Events:

The actor enters the interface where the medical history registration forms are viewed.

Examine and manage the desired old forms.

The actor exits the interface.

Use Case: View Patient Summary

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and viewing the patient summary page.

Exit Conditions:

The actor left the patient summary interface.

The Flow of Events:

The actor enters the interface where the patient summary is viewed.

Examine and the desired summaries.

The actor exits the interface.

Use Case: Manage Blood Requests

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and managing the blood requests.

Exit Conditions:

The actor left the managing the blood requests interface.

The Flow of Events:

The actor enters the interface where the blood requests are managed.

Patients can view and manage only their own requests.

Staff can view and manage all requests.

The actor exits the interface.

Use Case: View Patient's Diagnosis

Participating Actor(s):

Patient

Entry Conditions:

The actor is logged in and viewing the old diagnosis.

Exit Conditions:

The actor left the viewing the old diagnosis interface.

The Flow of Events:

The actor enters the interface where the patient's diagnoses are viewed.

Patients can view only their own diagnosis.

The actor exits the interface.

Use Case: Create Announcements

Participating Actor(s):

Staff

Entry Conditions:

Actor is logged in and creates announcements.

Exit Conditions:

The actor creates an announcement.

The Flow of Events:

The actor enters the interface where the announcements are created.

Only staff can create announcements.

Announcements can be sent to all users or specified users.

The actor exits the interface.

Use Case: Replying to Tickets

Participating Actor(s):

Staff

Entry Conditions:

Actor is logged in and replying to tickets.

Exit Conditions:

The actor replies to a ticket.

The Flow of Events:

The actor enters the interface where the tickets are replied to.

Only staff can reply to a ticket.

The actor exits the interface.

Use Case: Viewing Tickets

Participating Actor(s):

User

Entry Conditions:

Actor is logged in and viewing tickets.

Exit Conditions:

The actor left the viewing tickets interface.

The Flow of Events:

The actor enters the interface where the tickets are viewed.

Patients can only view their own tickets.

Only staff can view all of the tickets.

The actor exits the interface.

Use Case: Manage Users

Participating Actor(s):

Staff

Entry Conditions:

Actor is logged in and manages users.

Exit Conditions:

The actor left the manage users interface.

The Flow of Events:

The actor enters the interface where the users are managed.

Only staff can manage users.

The actor exits the interface.

Use Case: Manage Staff Accounts

Participating Actor(s):

Admin

Entry Conditions:

Actor is logged in and manages the staff accounts.

Exit Conditions:

The actor left the manage staff accounts page.

The Flow of Events:

The actor enters the interface where the staff are managed.

Only the admin can manage staff..

The actor exits the interface.

Use Case: Manage Patient Accounts

Participating Actor(s):

Admin

Entry Conditions:

Actor is logged in and manages the patient accounts.

Exit Conditions:

The actor left the manage patient accounts page.

The Flow of Events:

The actor enters the interface where the patients are managed.

Only the admin can manage patients.

The actor exits the interface.

Use Case: View Transactions

Participating Actor(s):

Patient

Entry Conditions:

Actor is logged in and views transactions.

Exit Conditions:

The actor left the view accounts interface.

The Flow of Events:

The actor enters the interface where the patient's transactions are viewed.

The actor exits the interface.

Use Case: Online Payment

Participating Actor(s):

Patient

Entry Conditions:

Actor is logged in and making an online payment.

Exit Conditions:

The actor completes an online payment of an invoice.

The Flow of Events:

The actor enters the interface where the patient's payments are made online.

Patients pay their own payments online.

The actor exits the interface.

Use Case: Creating Tickets

Participating Actor(s):

Patient

Entry Conditions:

Actor is logged in and creates tickets.

Exit Conditions:

The actor creates a ticket.

The Flow of Events:

The actor enters the interface where the patient’s tickets are created.

Patients create their own special ticket.

The actor exits the interface.

Use Case: View All Patients

Participating Actor(s):

User

Entry Conditions:

Actor is logged in and viewing all patients. Viewing all patients includes the use case of view patient summary.

Exit Conditions:

The actor left the view of all patients' interface.

The Flow of Events:

The actor enters the interface where the patient’s viewed.

Users can view all patients.

The actor exits the interface.

Use Case: Managing Patient’s Vaccines

Participating Actor(s):

Staff

Entry Conditions:

Actor is logged in and manages the patient's vaccines.

Exit Conditions:

The actor left the managing patient’s vaccines interface.

The Flow of Events:

The actor enters the interface where the patient's vaccines are viewed.

Actors can view or manage patient's vaccines.

The actor exits the interface.

Use Case: Manage Appointments

Participating Actor(s):

Staff

Entry Conditions:

Actor is logged in and manages appointments.

Exit Conditions:

The actor left the managing appointments interface.

The Flow of Events:

The actor enters the interface where the management of appointments are made.

Actors can view or manage patients' appointments.

The actor exits the interface.

Use Case: Managing Medical Reports

Participating Actor(s):

Staff

Entry Conditions:

The actor is logged in and manages the patient's medical reports.

Exit Conditions:

The actor left the managing patient's medical reports interface.

The Flow of Events:

The actor enters the interface where the patient's medical reports are managed.

Actors can view or manage patients' medical reports.

The actor exits the interface.

Use Case: Managing Patient's Diagnosis

Participating Actor(s):

Staff

Entry Conditions:

The actor is logged in and manages the patient's diagnosis.

Exit Conditions:

The actor manages a patient's diagnosis by modifying the diagnosis.

The Flow of Events:

The actor enters the interface where the patient's old diagnosis is viewed.

Actors can view or manage a patient's diagnosis.

Use Case: Reschedule Appointment

Participating Actor(s):

Doctor

Entry Conditions:

The actor is logged in and navigates to the rescheduling page of the appointment.

Exit Conditions:

The actor reschedules a patient's existing appointment to a different time.

The Flow of Events:

The actor enters the interface where the patient's appointments are listed.

The actor selects the appointment that they want to reschedule.

The actor selects a different time for the appointment and reschedules it.

Actors can reschedule a patient's appointment.

Use Case: View Dashboard

Participating Actor(s):

User

Entry Conditions:

The actor is logged in and views their dashboard.

Exit Conditions:

The actor navigates to another page through their dashboard navigation.

The Flow of Events:

The actor is redirected to their dashboard once they login.

Actor can navigate to other pages of the application and see summary of their account.

4.2. Class Diagram

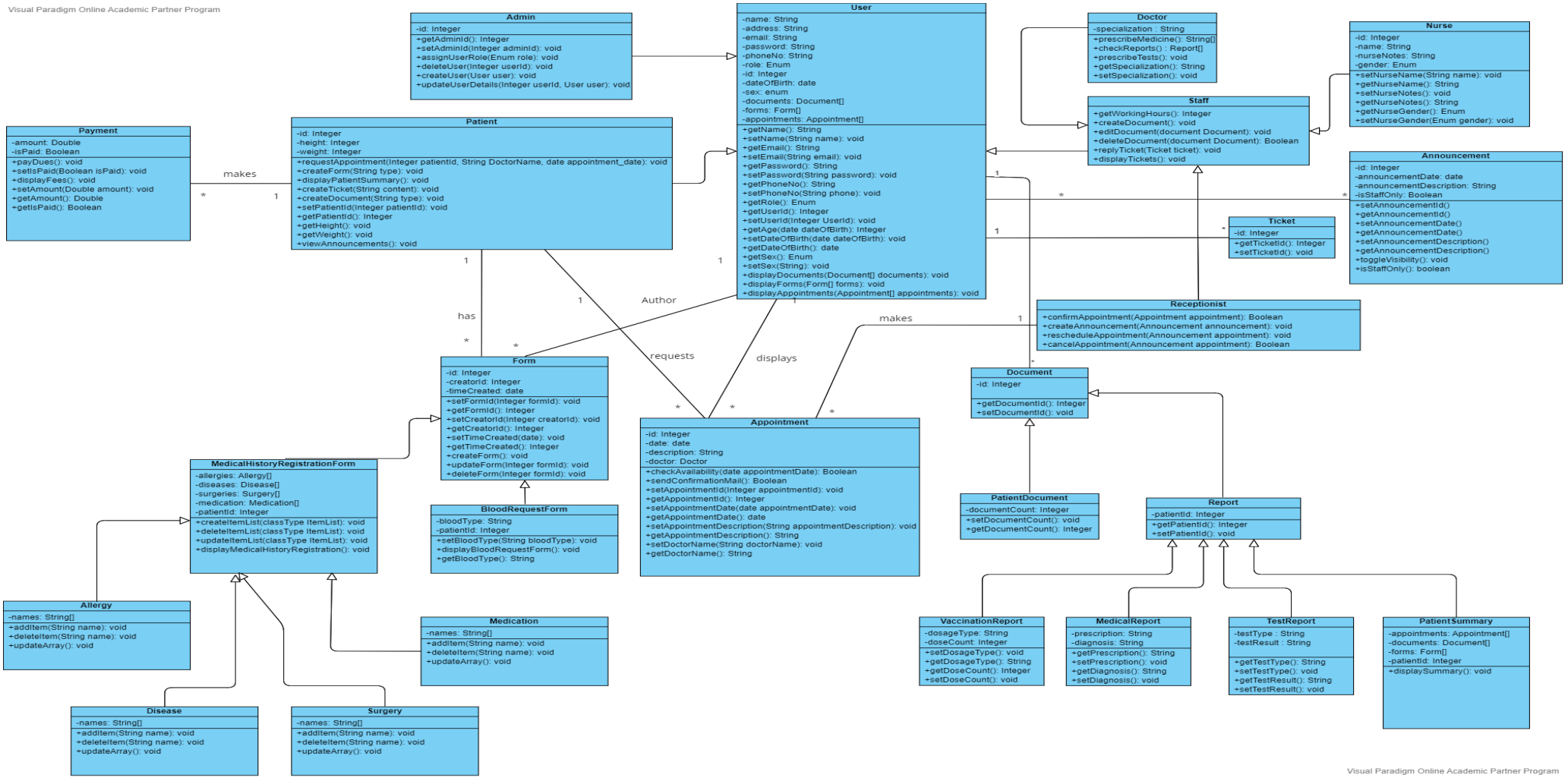


Figure 2: Class Diagram for Health Center Management System

The class diagram contains 25 classes. The diagram presents the infrastructure and fundamental objects that we will be using during this project. The explanations of the class diagram with the image above are as follows:

User class: The User class is a super class of Admin, Patient and Staff classes. This class contains functions, definitions and variables that are common to all 3 roles such as name, user id, gender, phone number etc.

Patient class: The Patient class is a child class of User class. It includes functions, definitions and variables that users in only the patient role will use in common such as patient id, getter functions for height and weight variables.

Admin class: This class is the only one with full access to privileges. Creates patient and staff accounts. It has all creation, editing and viewing permissions.

Staff class: The Staff class is a child class of User class. It contains functions and definitions that staff users commonly use such as creating and editing documents. This class is also a super class of Doctor, Nurse and Receptionist classes.

Doctor class: The Doctor class is a child class of Staff class. It includes functions like prescribing medicine and reports that can only be accessed by doctors except admin.

Nurse class: The Nurse class is a child class of Staff class. Since nurses should not access patient's all information, they can only access patient's general information such as weight and height.

Receptionist class: The Receptionist class is a child class of Staff class. The functions that this class uses differently from other classes are appointment and announcement creation. So that it includes functions for these features.

Announcement class: The Announcement class is for creating, editing and viewing announcements by users. For that reason this class is directly connected with the User class. It includes getter, setter, add and delete functions.

Payment class: Payment class contains the variables and functions that will be used for extra payments to be made by the patient such as creating and viewing fees, a variable to hold an amount of money.

Ticket class: The ticket class is to provide a support structure where users can talk to authorized people for their problems. The ticket class has only the ticketId variable. It has two methods. One fetches the ticketId. The other one changes the ticketId.

Documents class: The Documents class is designed for the patient to upload their documents in their own profile. The documents class has only the documentsId variable. It has two methods. One fetches the documentsId. The other one changes the documentsId.

Reports class: The Reports class is an interface used to obtain the reports and general summary that the patient needs during the treatment process. The reports class has only the patientId variable. It has two methods. One fetches the patientId. The other one changes the patientId.

Vaccination Report class: The Vaccination Report class is a class created for tracking vaccinations. It has two variables: dose type and dose number. Also, these variables have to get and set methods.

Medical Report class: The Medical Report class is the class that allows the patient to receive a health report. It includes the definition of the disease and its treatment. Also, these variables have a get and set method.

Test Report class: The test report class is the class that holds the given test results, such as the covid test. There are two variables under this class, the test type, and the result. These variables have to get and set methods.

Patient Summary class: The patient summary class is the class that keeps appointments, documents, and forms in the form of a patient-specific list. There is one method that displays the patient summary.

Appointment class: The appointment Class is the class that allows the patient to make an appointment. It enables the patient to make an appointment with the doctor he/she wants with the explanation he/she wants on the appropriate date. It has methods such as eligibility, history, doctor control.

Form class: The form class is the interface that allows the user to create various forms such as form blood request or medical history registration. This class has variables such as formid, creatorId, and generation time. There are methods for editing variables.

Blood Request Form class: The Blood Request Class is the class that keeps the type and which patient blood is requested. It has methods that use these variables.

Medical History Registration Form class: The health history registration form is the class that includes various past problems that the patient has and has had, such as allergies, illness, surgery, medication. Easy to reveal the patient's health status.

Medication class: Medication class is the class where the patient's drugs can be created as an array and drug addition and subtraction can be done. It is a subclass of the Health Historical Record.

Allergies class: Allergies class is the class where the patient's allergies can be created as an array and allergy addition and subtraction can be done. It is a subclass of the Health Historical Record.

Diseases class: Diseases class is the class where the patient's diseases can be created as an array and disease addition and subtraction can be done. It is a subclass of the Health Historical Record.

Surgeries class: Surgeries class is the class where the patient's surgeries can be created as an array and surgery addition and subtraction can be done. It is a subclass of the Health Historical Record.

4.3. Dynamic Models

4.3.1. Activity Diagrams

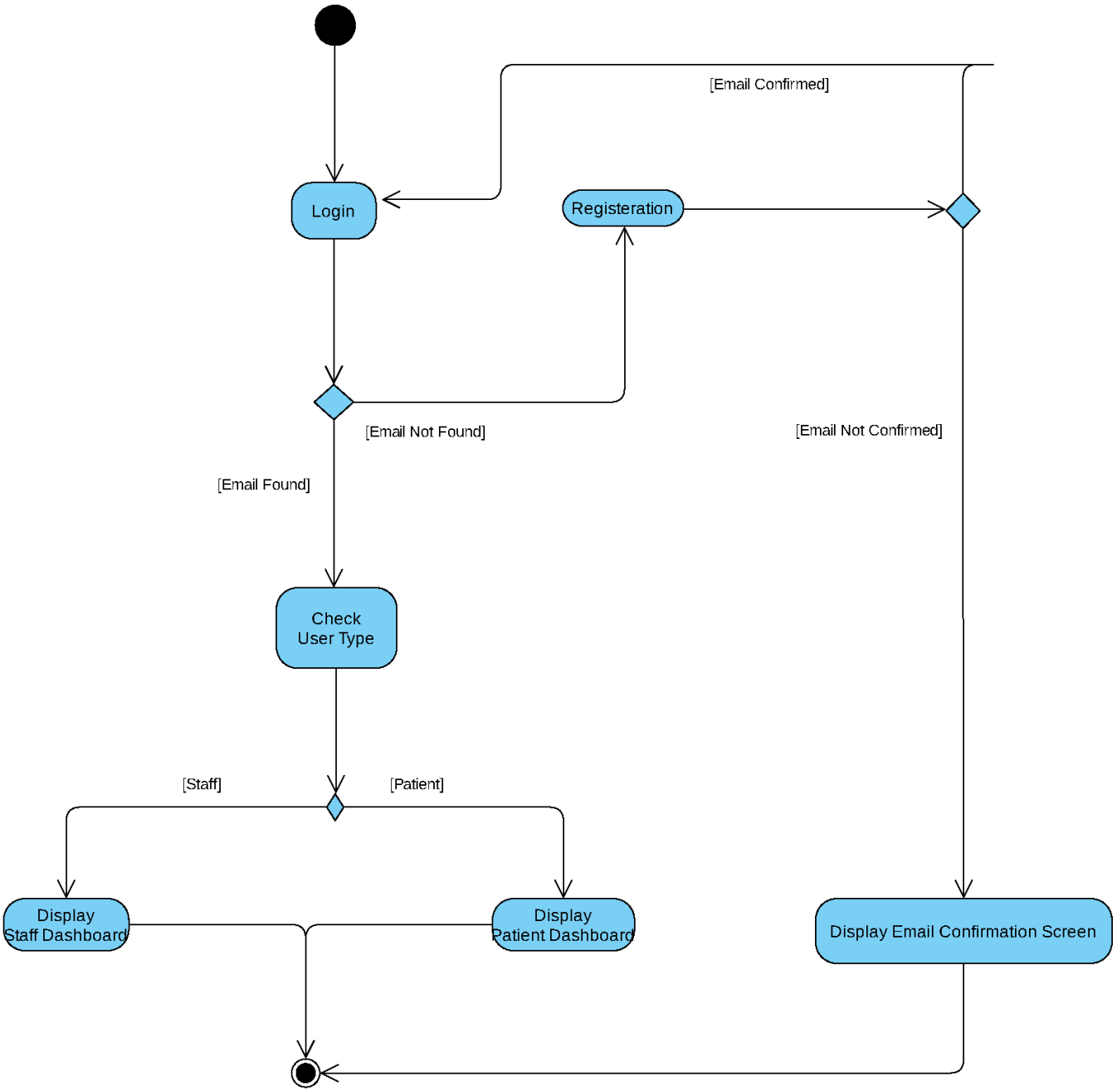


Figure 3: Activity Diagram for logging into the website

Scenario: A user(staff or patient) tries to log in to the website, the system checks if the email entered exists in the system. If it does not find a matching email, it sends the user to the registration webpage. Following registration, it checks if the user has confirmed their email. If not, it takes them to a page asking them to confirm their email. If the email does exist, it gets the role associated with the account and takes them to the patient or staff dashboard accordingly.

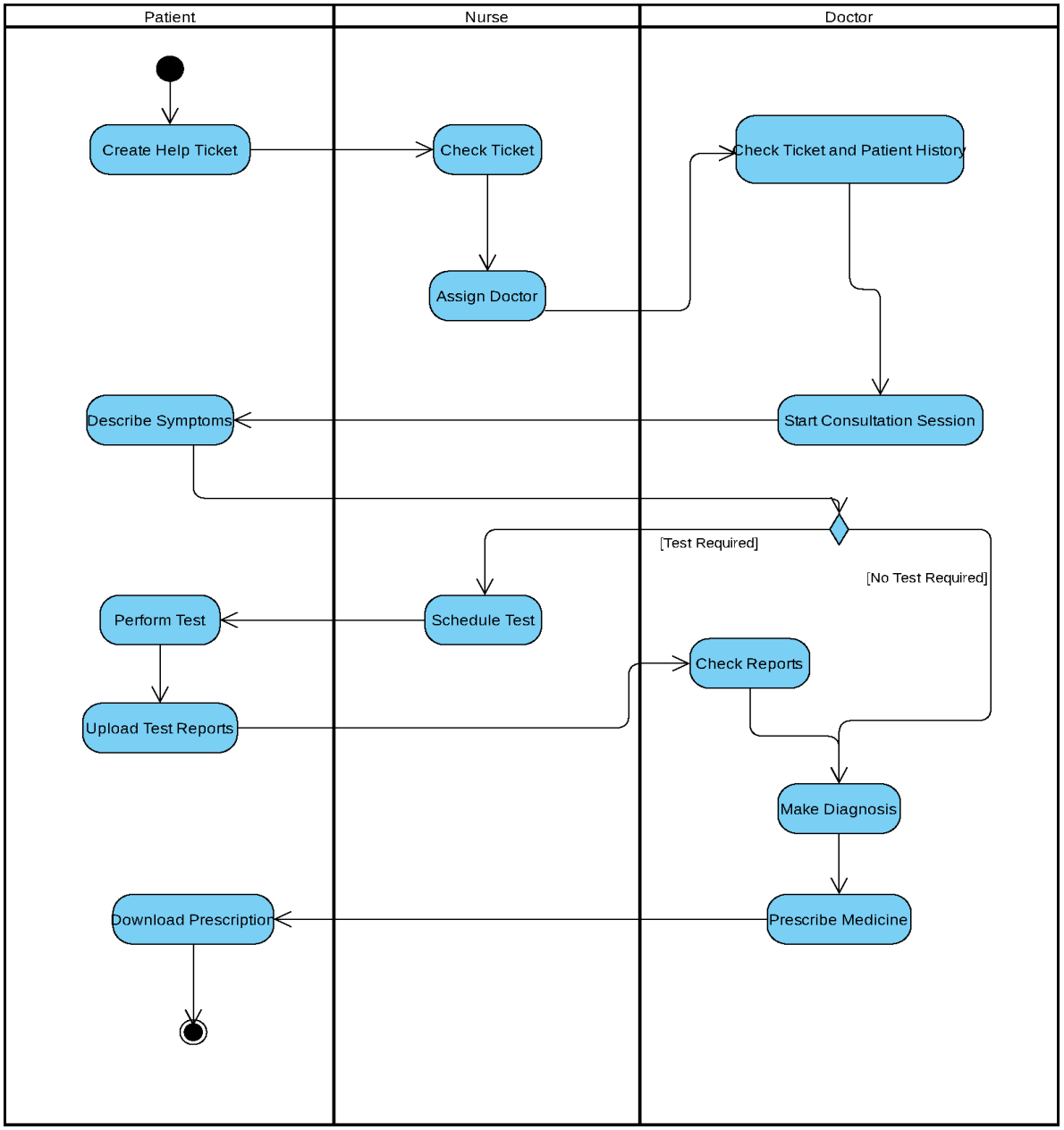


Figure 4: Activity Diagram for Telemedicine

Scenario: The activity diagram above illustrates a scenario where a patient uses the ticket-based help system to communicate with a doctor. When a ticket is opened, it is checked by a nurse, who accordingly assigns a doctor to the ticket based on the patient's needs. The doctor then checks the ticket along with the patient's pre-recorded visit history or/and medical reports. He can initiate consultation in the form of a video call or back and forth messaging. The patient describes his symptoms or issues in more detail, and based on that, the doctor can either ask for additional tests that the nurse would schedule, and the patient will upload his results, or the doctor can give an immediate diagnosis if he feels satisfied with the available information. The patient can then download the prescription.

4.3.2. Sequence Diagrams

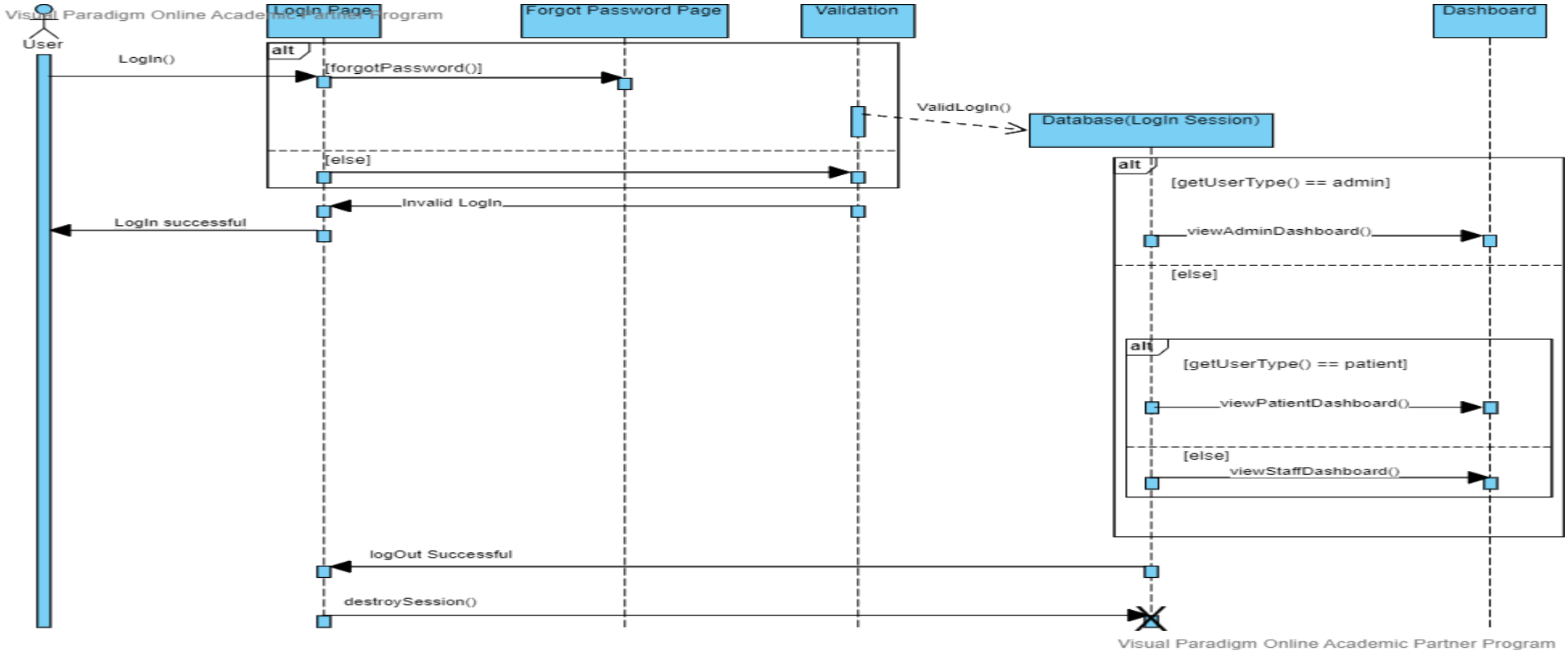


Figure 5: Sequence Diagram for logging into the website

Scenario: The user navigates to the login page, and clicks the log-in button. The LogIn details are then checked. If the LogIn is invalid the user is returned to the login page again. If the user clicks forgot password the user is directed to the forgot password page. If the LogIn is valid the user type is checked with the database, and the user is allowed to access only the dashboard specific to his user type. On logging out the user is returned to the login page again, and the login session is destroyed.

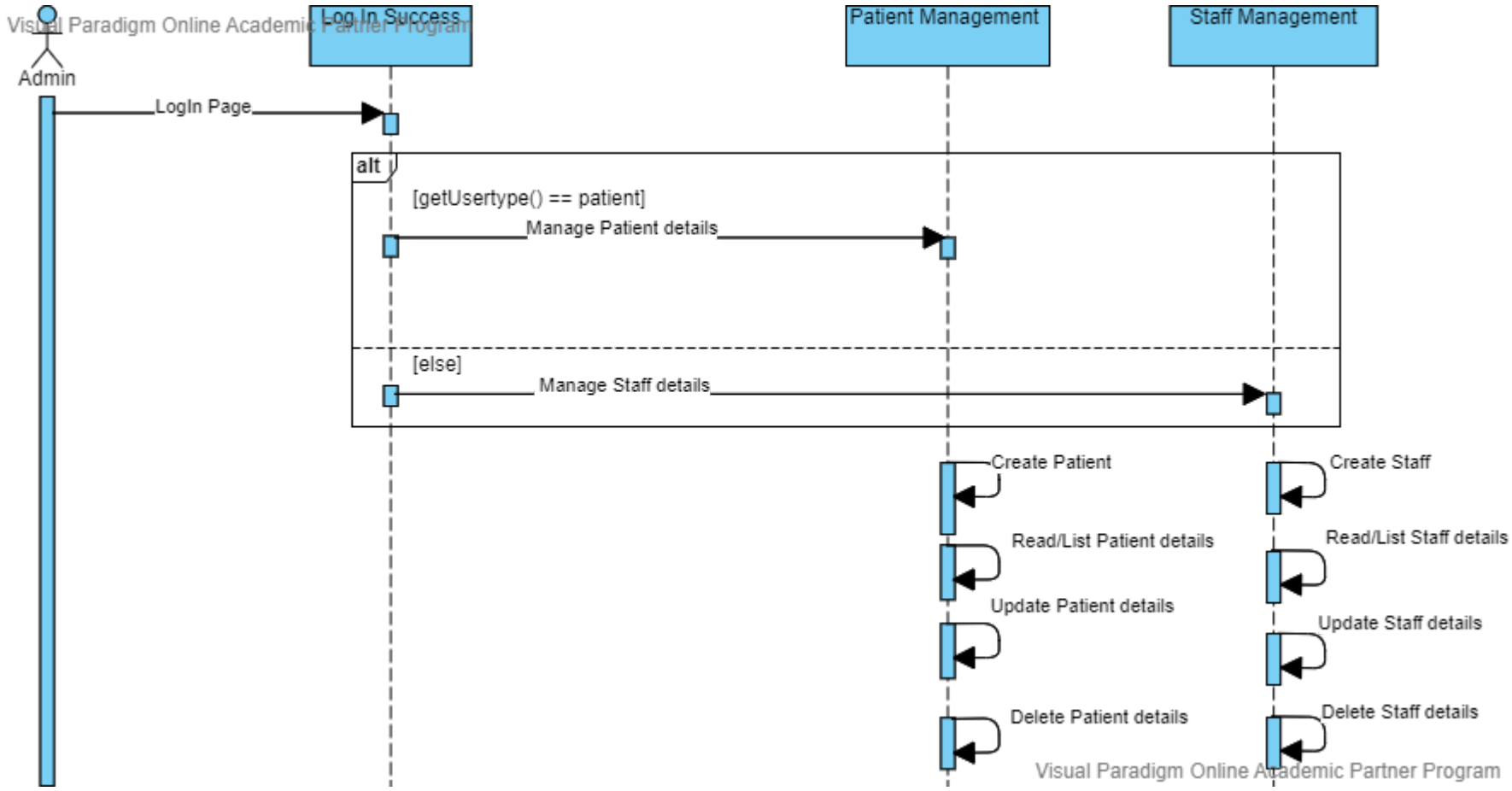


Figure 6: Sequence Diagram for managing staff accounts and manage patient accounts use cases

Scenario: An admin navigates to the login page, and clicks the log-in button. The admin then navigates to the patient management and Staff management buttons on the admin dashboard, and is able to perform CRUD(Create, Read, Update, Delete) operations on the Patient, and Staff accounts.

4.3.3. State Diagram

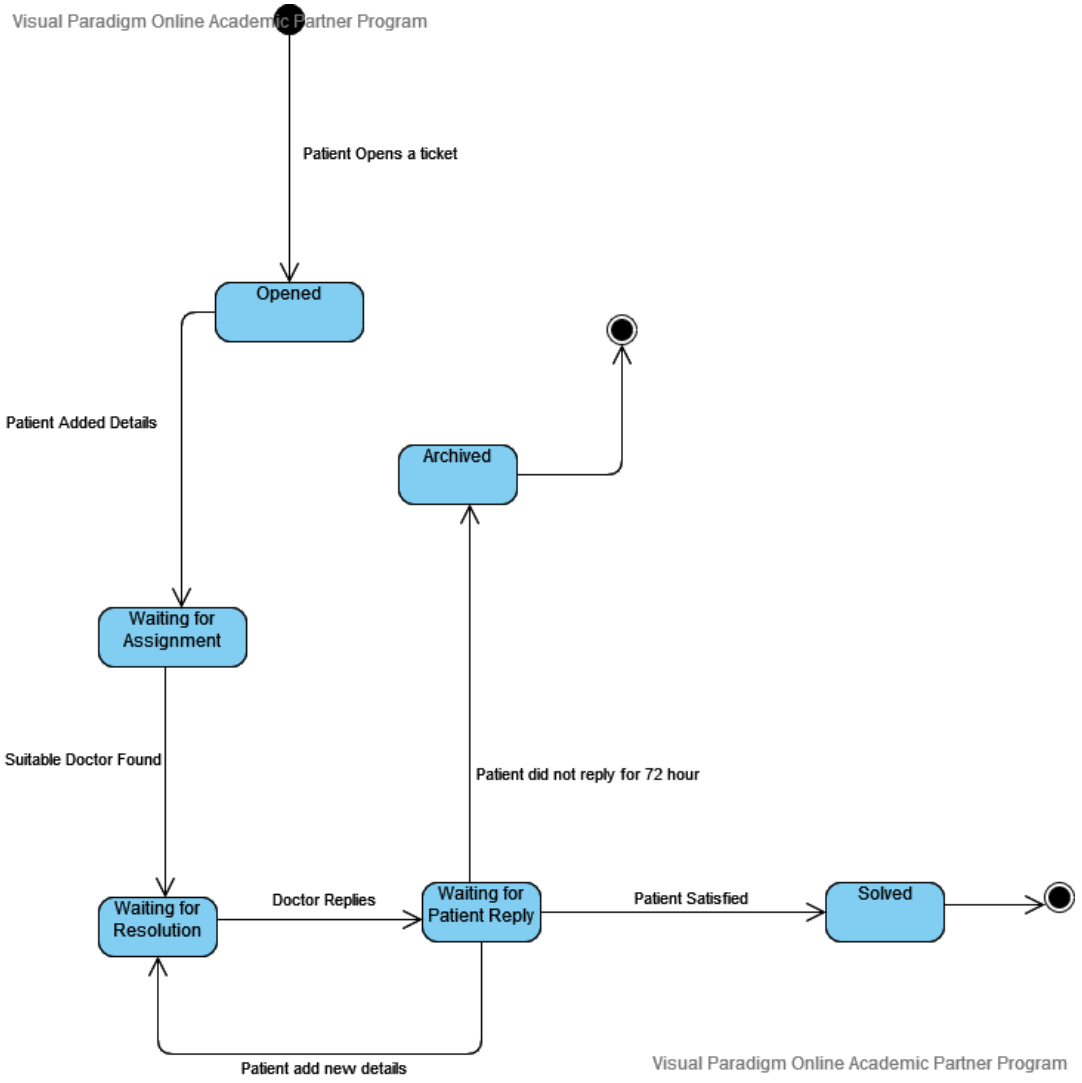


Figure 7: State Diagram for Ticket Status

Scenario: A Patient creates a new ticket and the status for the ticket is changed to open. When the patient adds the details of his issue, the ticket status changes to 'awaiting assignment of doctor'. A doctor is assigned and a to and fro ticket replies are sent to patient to doctor and vice versa. When the patient is satisfied, the ticket is closed or if the patient doesn't reply for more than 72 hours its status is changed to archived

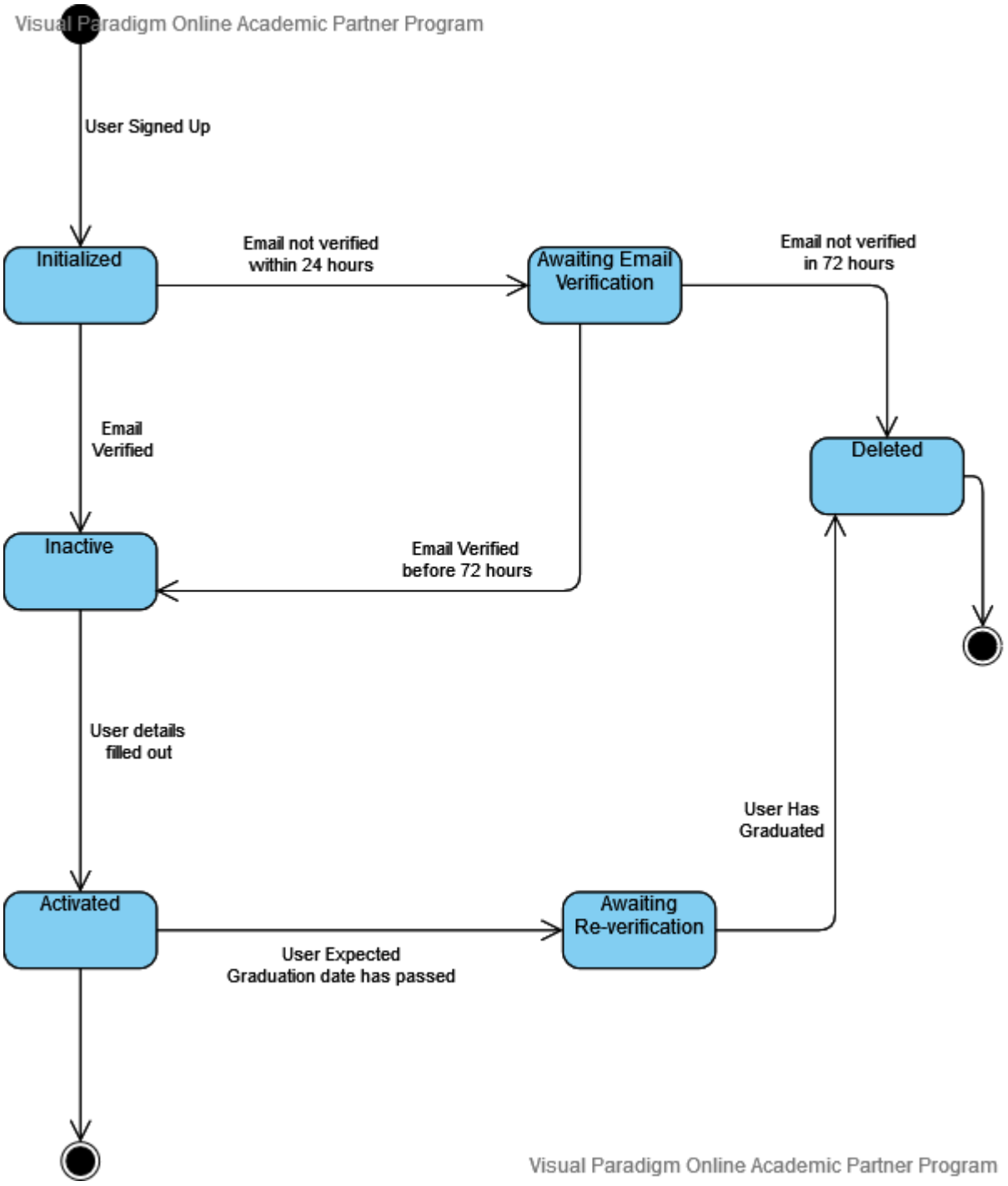
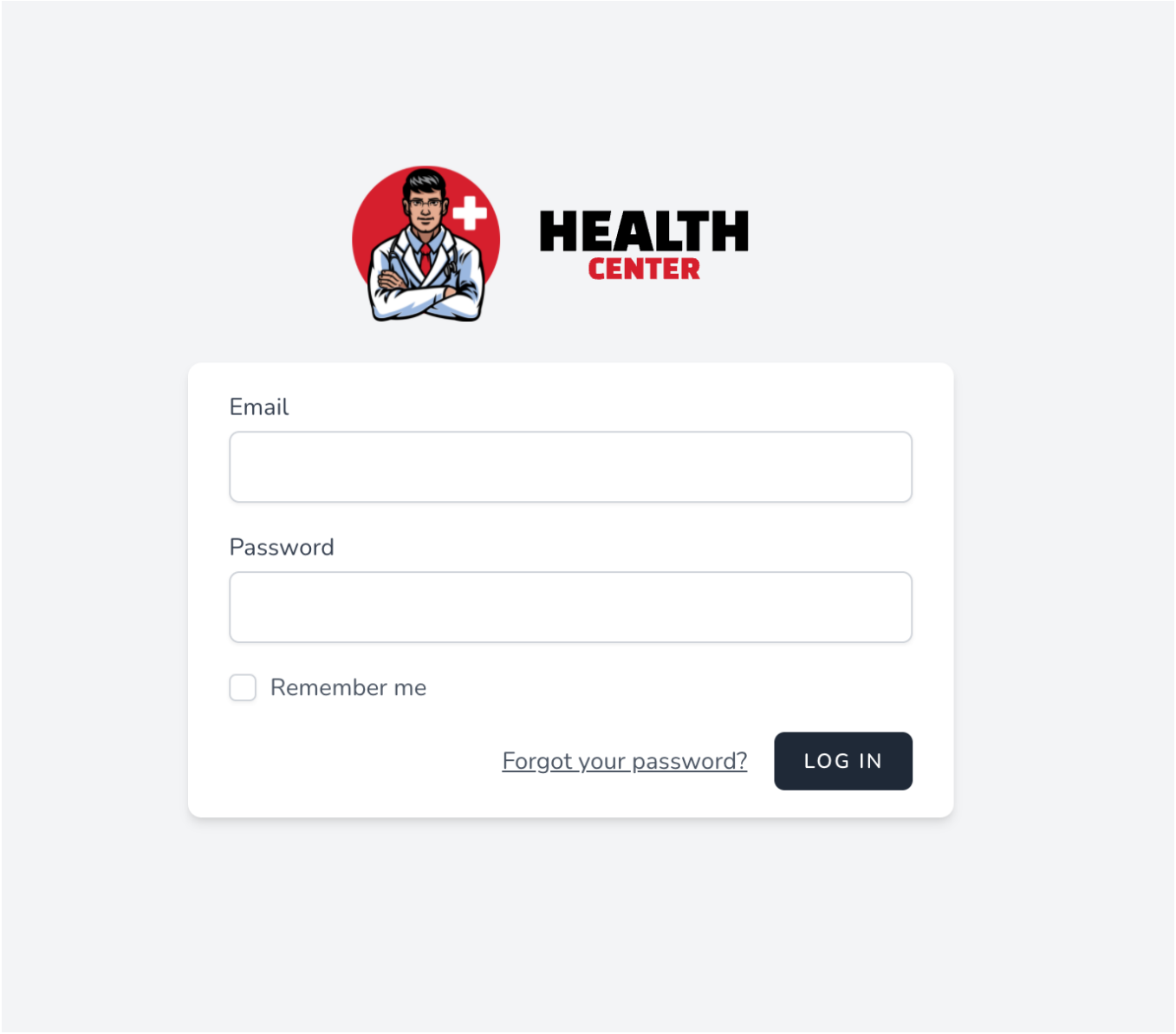


Figure 8: State Diagram for User Lifecycle

Scenario: This scenario shows the state of a user account. When a user signs up, the user is in a state of un-verification until he verifies his email. If he doesn't in 72 hours, the account is deleted from the system. If the email is verified m the account state remains inactive until he completes onboarding and fills his details. After that, the account finally moves into an active state.

5. USER INTERFACE - WEBSITE MOCKUP

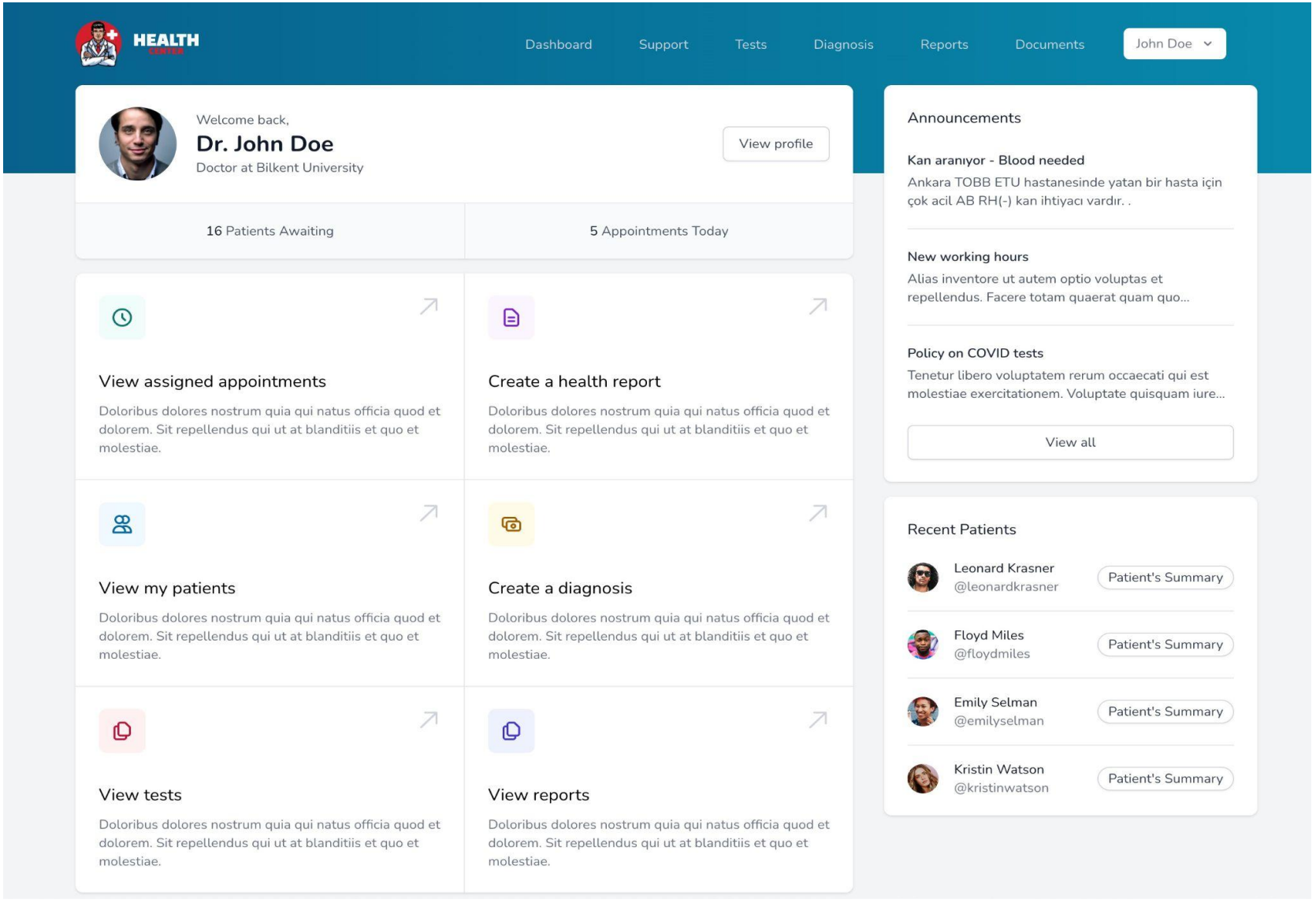
5.1. Authentication View



5.2. Dashboard

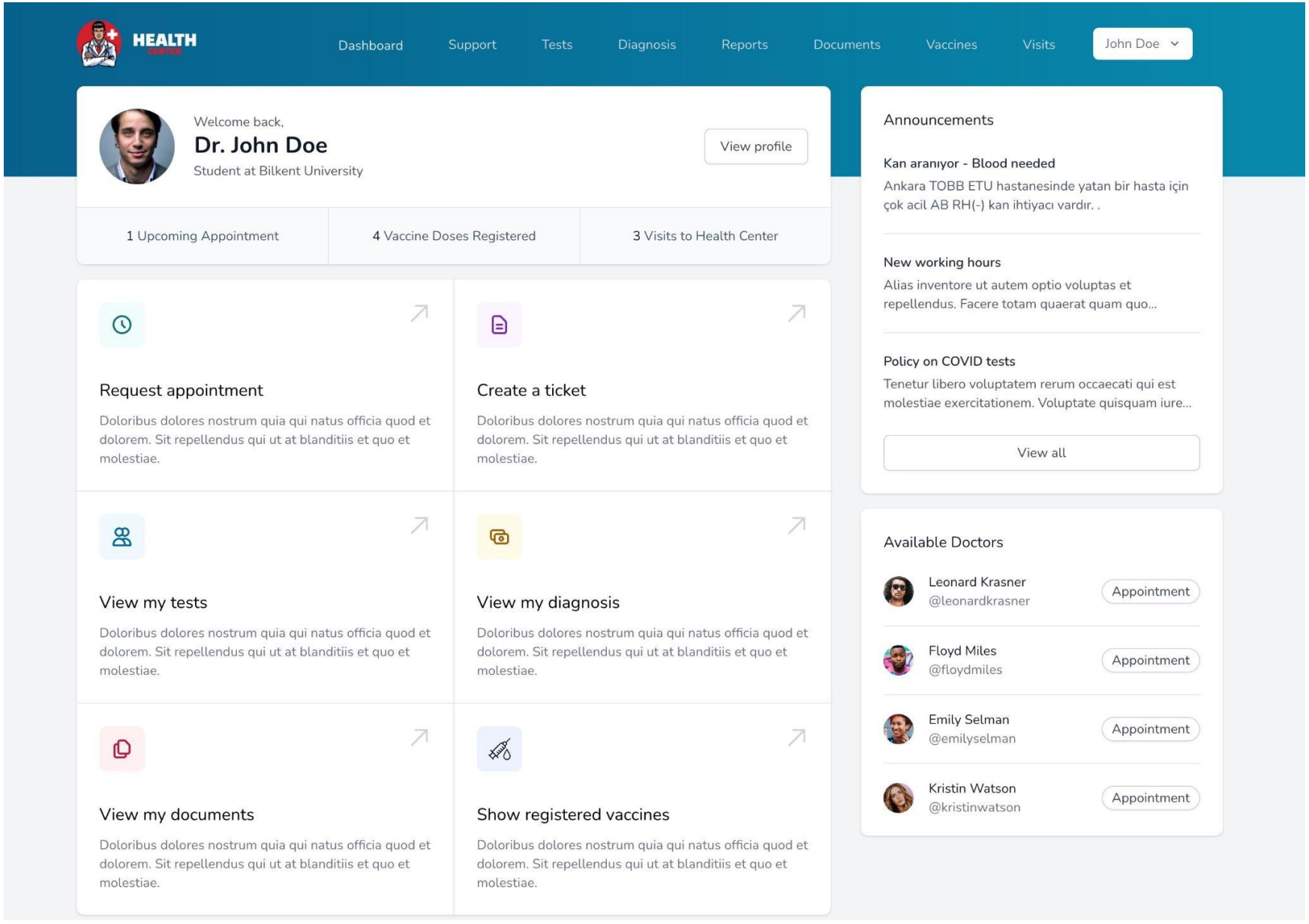
5.2.1. **Staff's Dashboard**

The staff's dashboard will allow staff members to manage appointments, appointment requests, health reports, patients, diagnosis and documents.



5.2.2. **Patient's Dashboard**

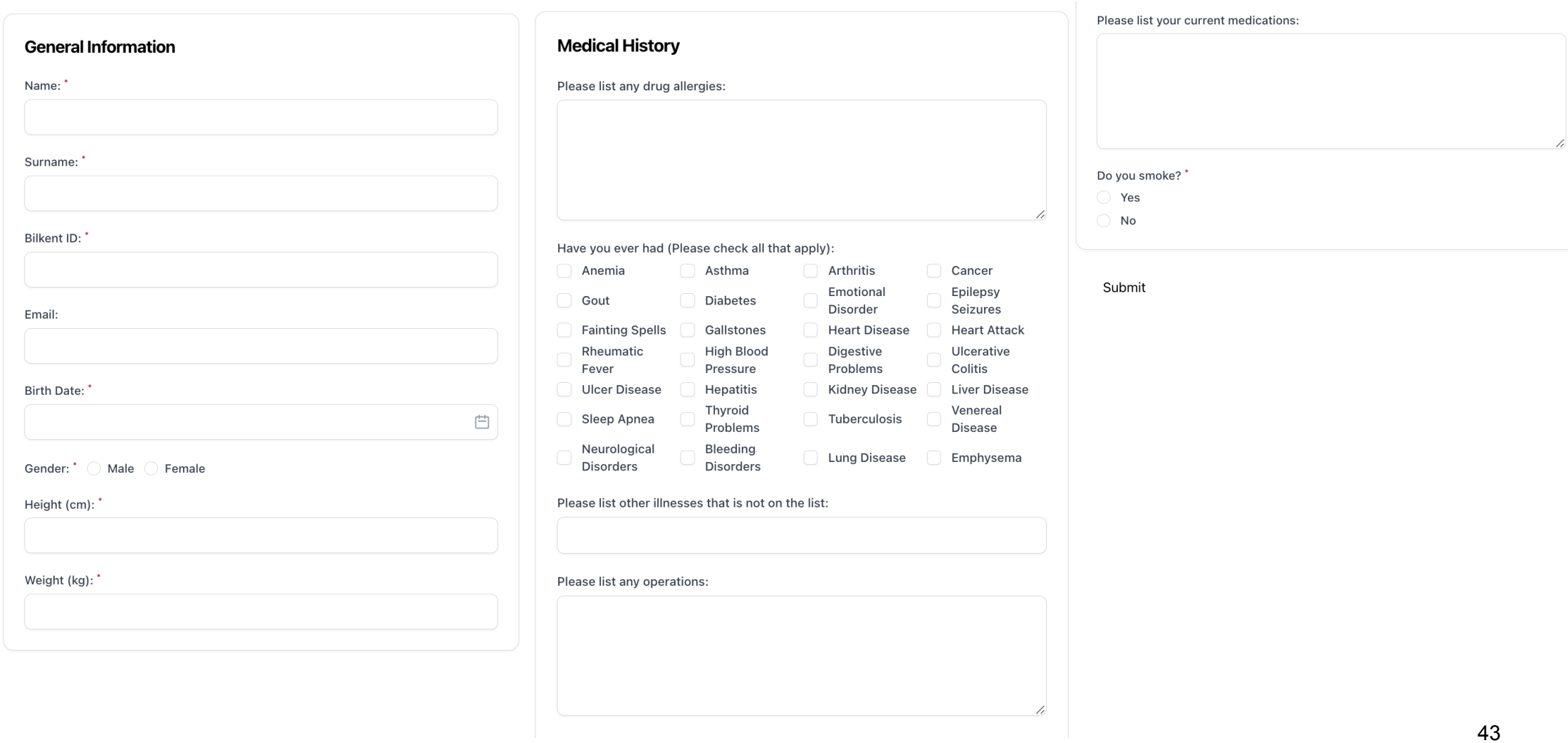
The patient's dashboard will allow them to request appointments, create support queries, and see their data registered with the health center.



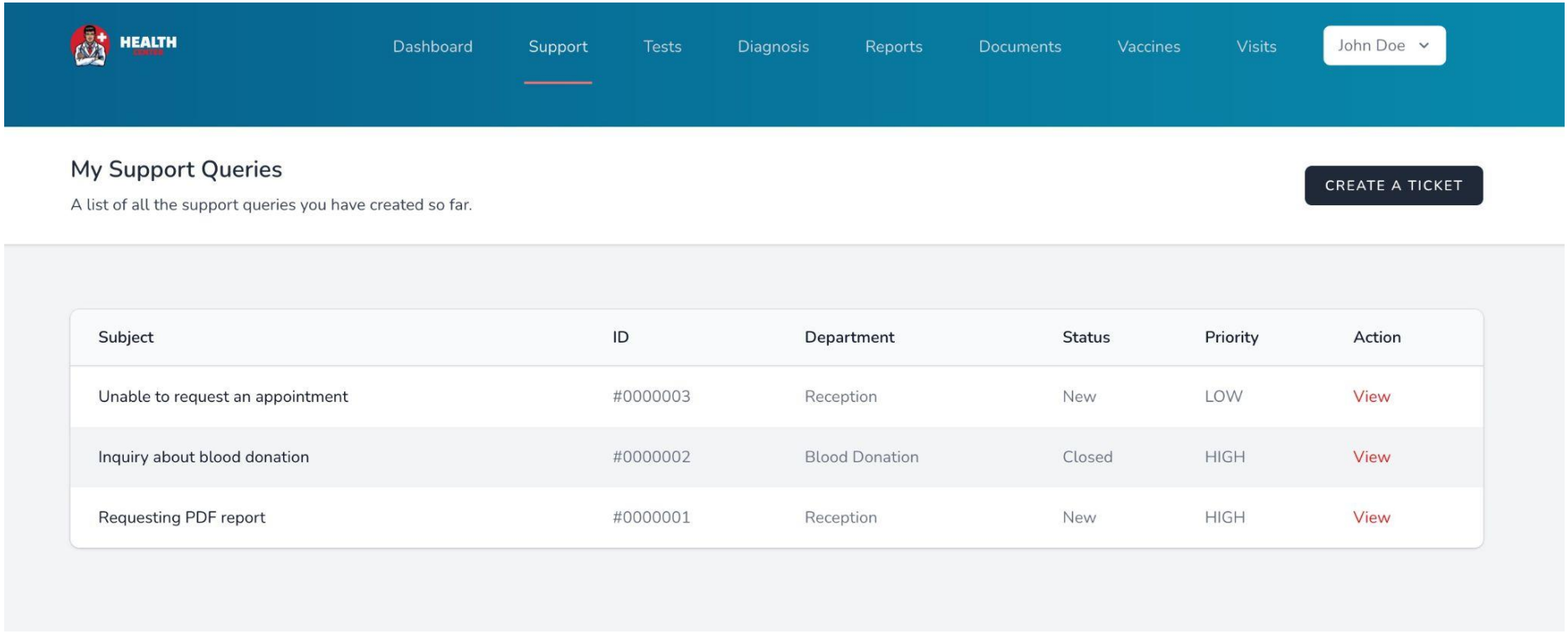
5.3. Patient's Views

The patient's views are dedicated to the patients using the web application. These will help them perform the activities on the website in a user-friendly way.

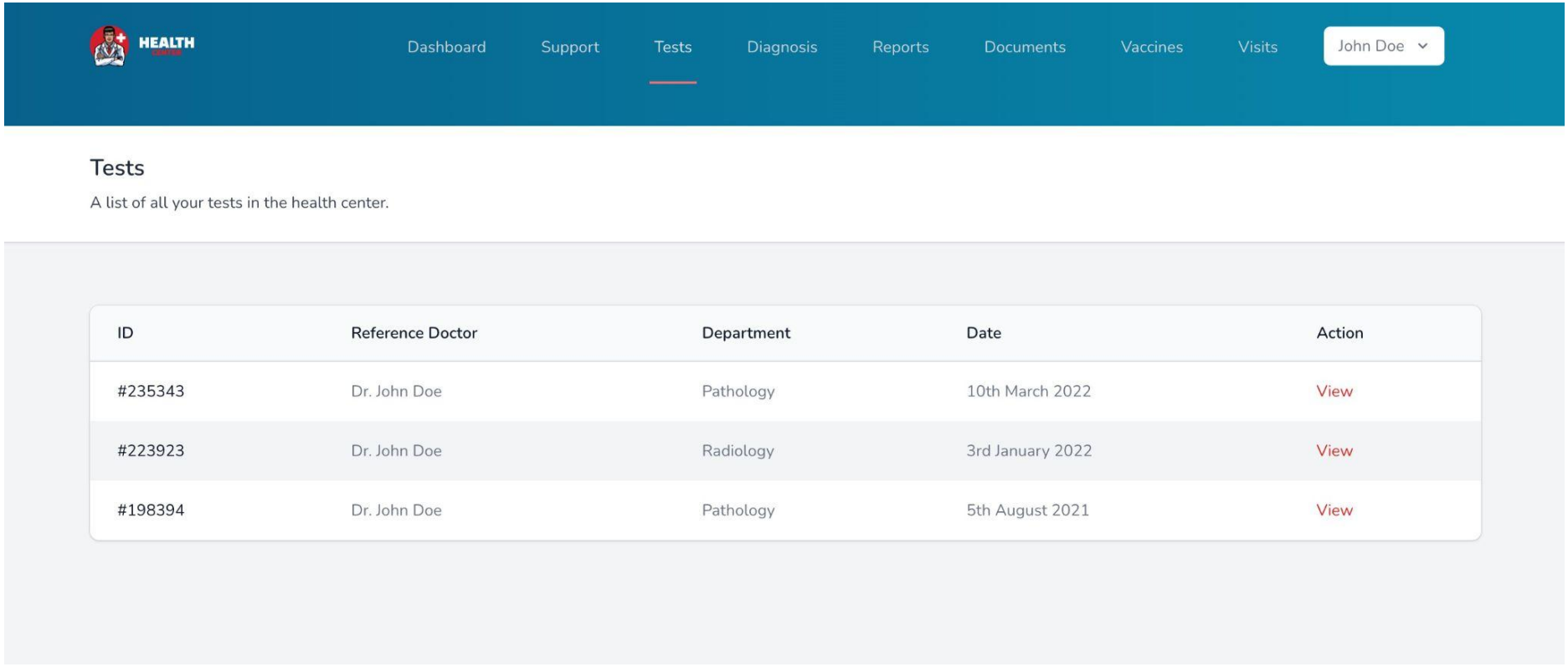
5.3.1. Initial Registration Form View

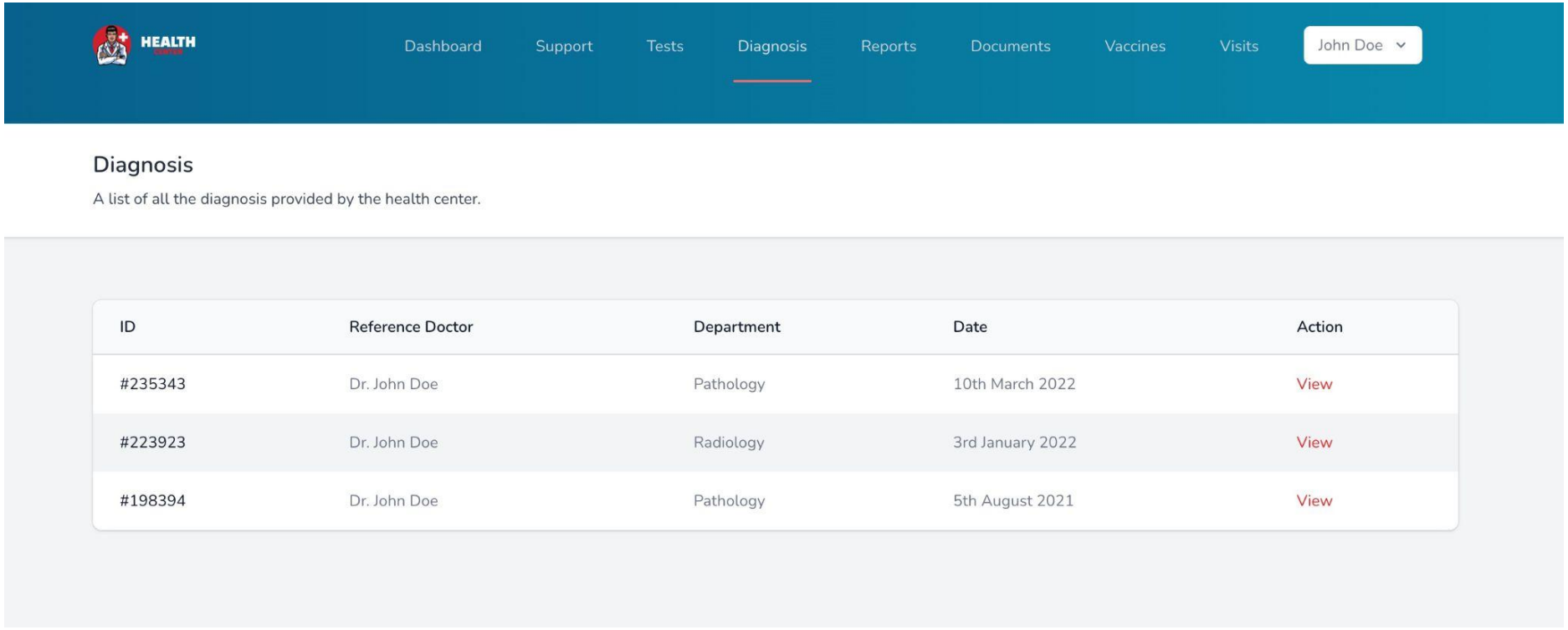


5.3.2. **Support / Messaging View**



5.3.3. **Patient's Tests, Diagnosis & Reports**



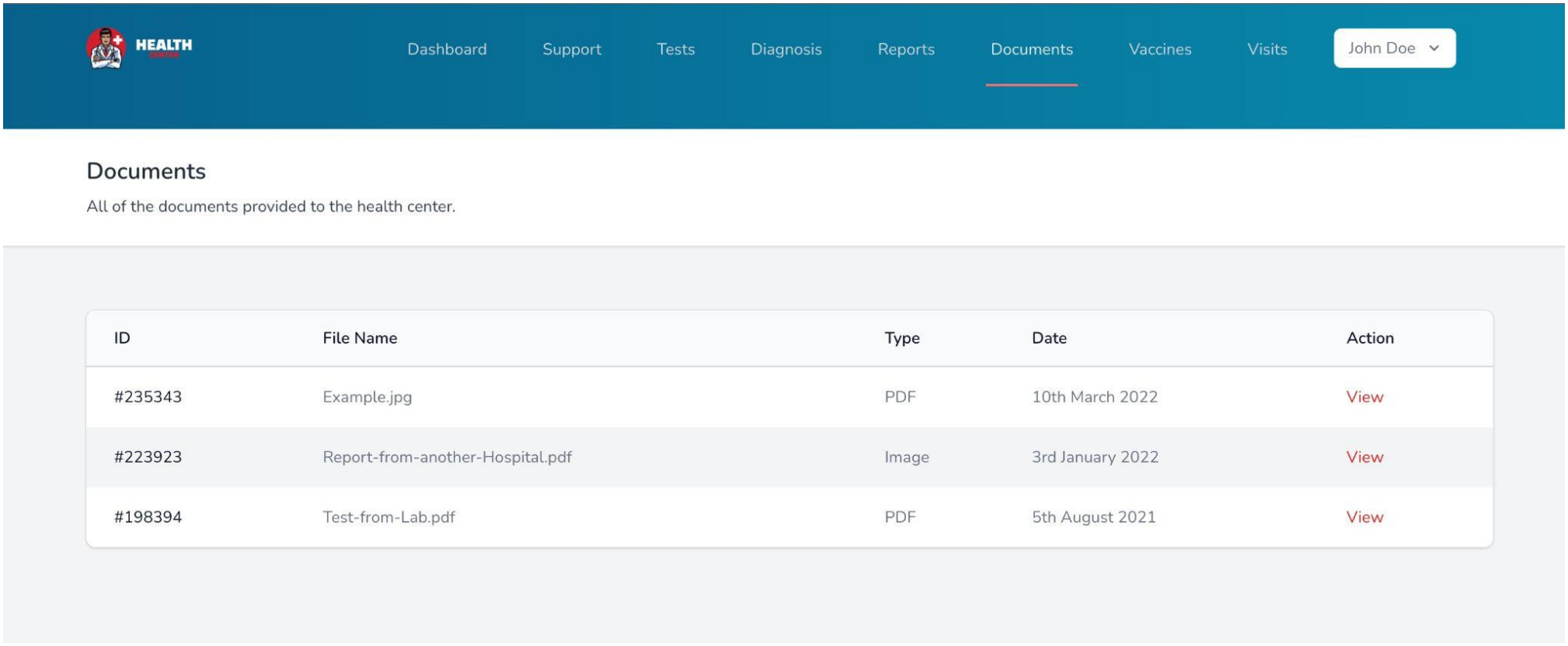

HEALTH
Dashboard
Support
Tests
Diagnosis
Reports
Documents
Vaccines
Visits
John Doe
Diagnosis
A list of all the diagnosis provided by the health center.
ID
Reference Doctor
Department
Date
Action
#235343
Dr. John Doe
Pathology
10th March 2022
View
#223923
Dr. John Doe
Radiology
3rd January 2022
View
#198394
Dr. John Doe
Pathology
5th August 2021
View

Reports

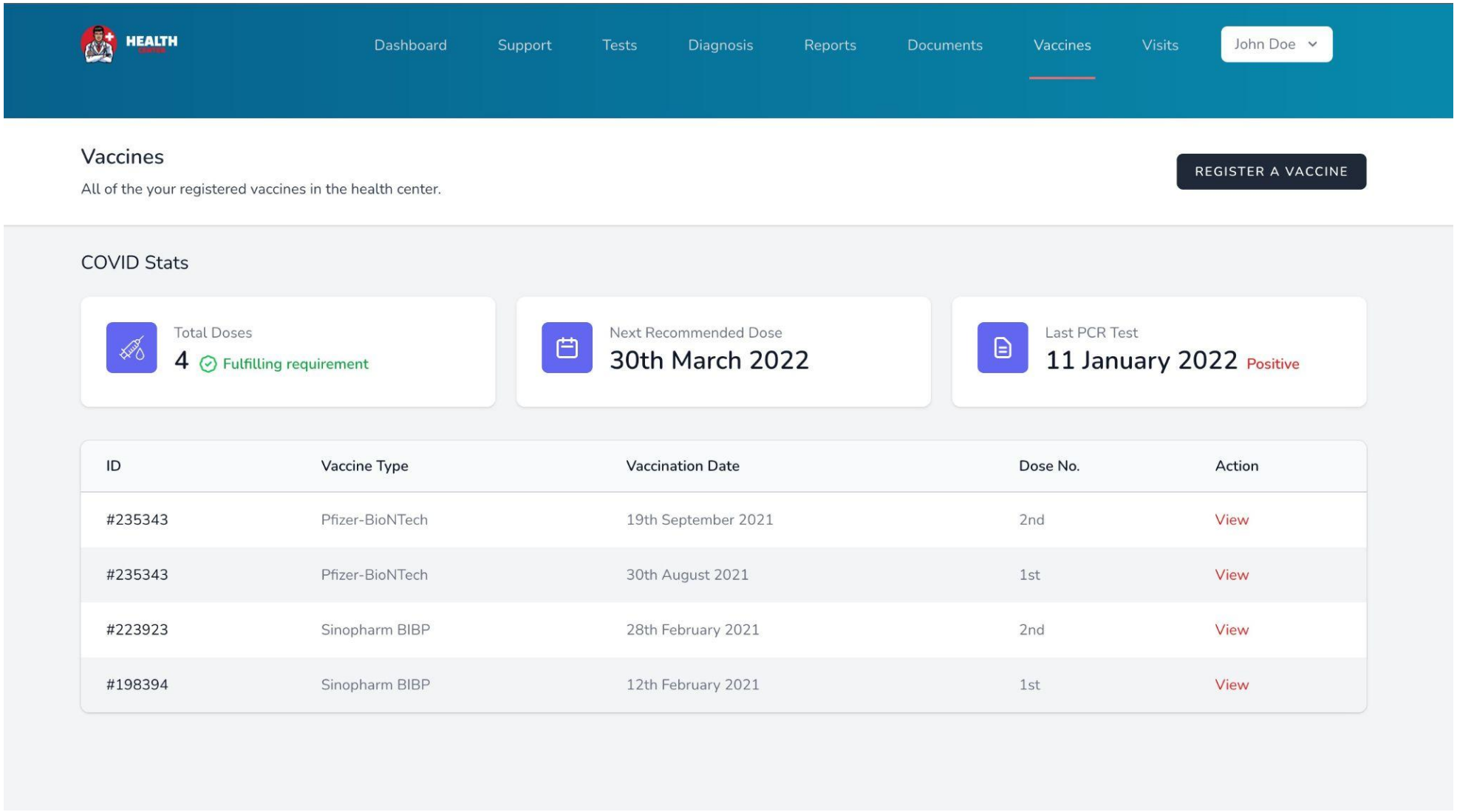
A list of all the medical reports provided by the health center.

ID	Subject	Days	Reference Doctor	Date	Action
#235343	Health Report for Injury	7 days	Dr. John Doe	10th March 2022	View
#223923	Health Report for Fever	1 day	Dr. John Doe	3rd January 2022	View
#198394	Health Report for COVID	14 days	Dr. John Doe	5th August 2021	View

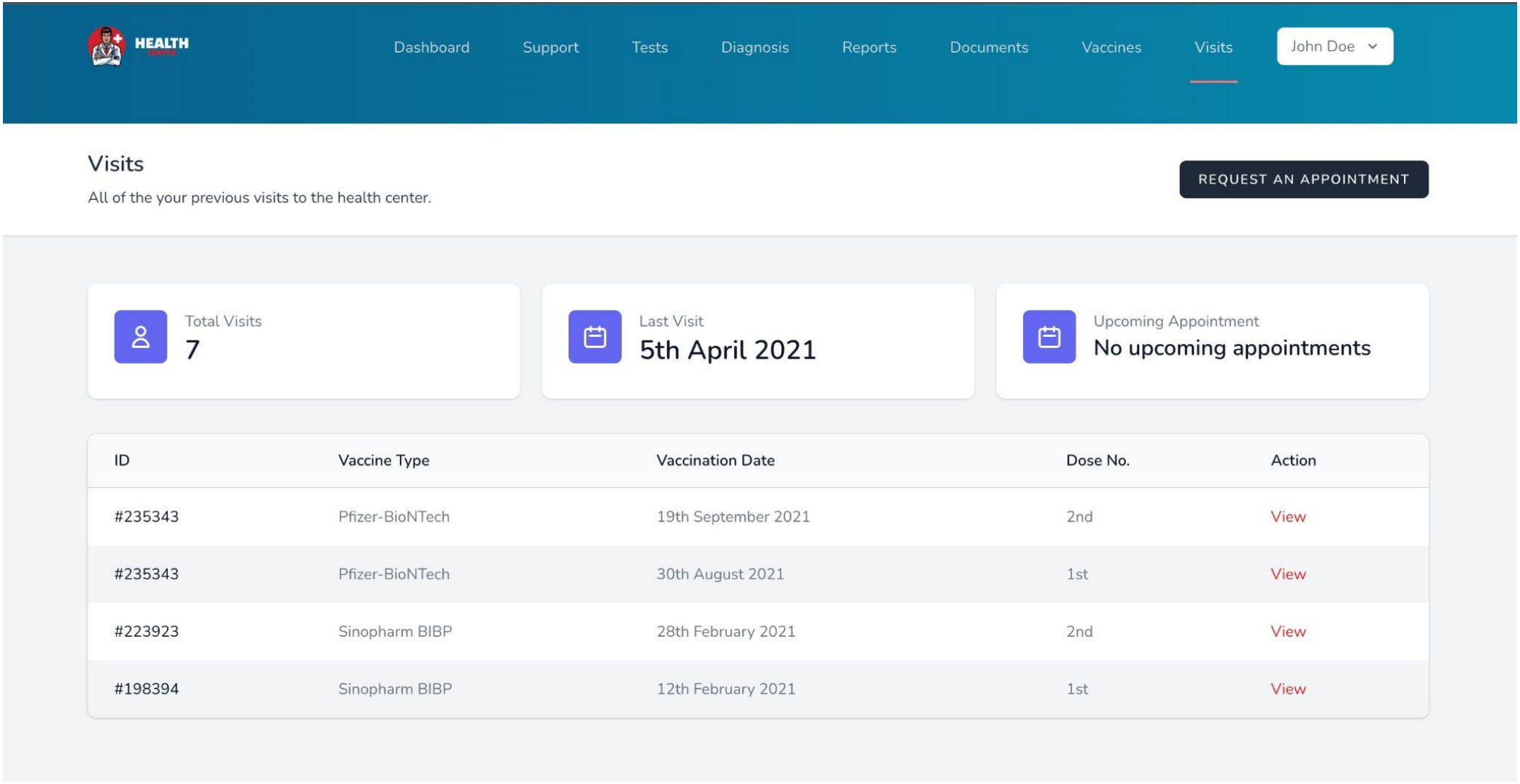
5.3.4. **Patient's Documents**



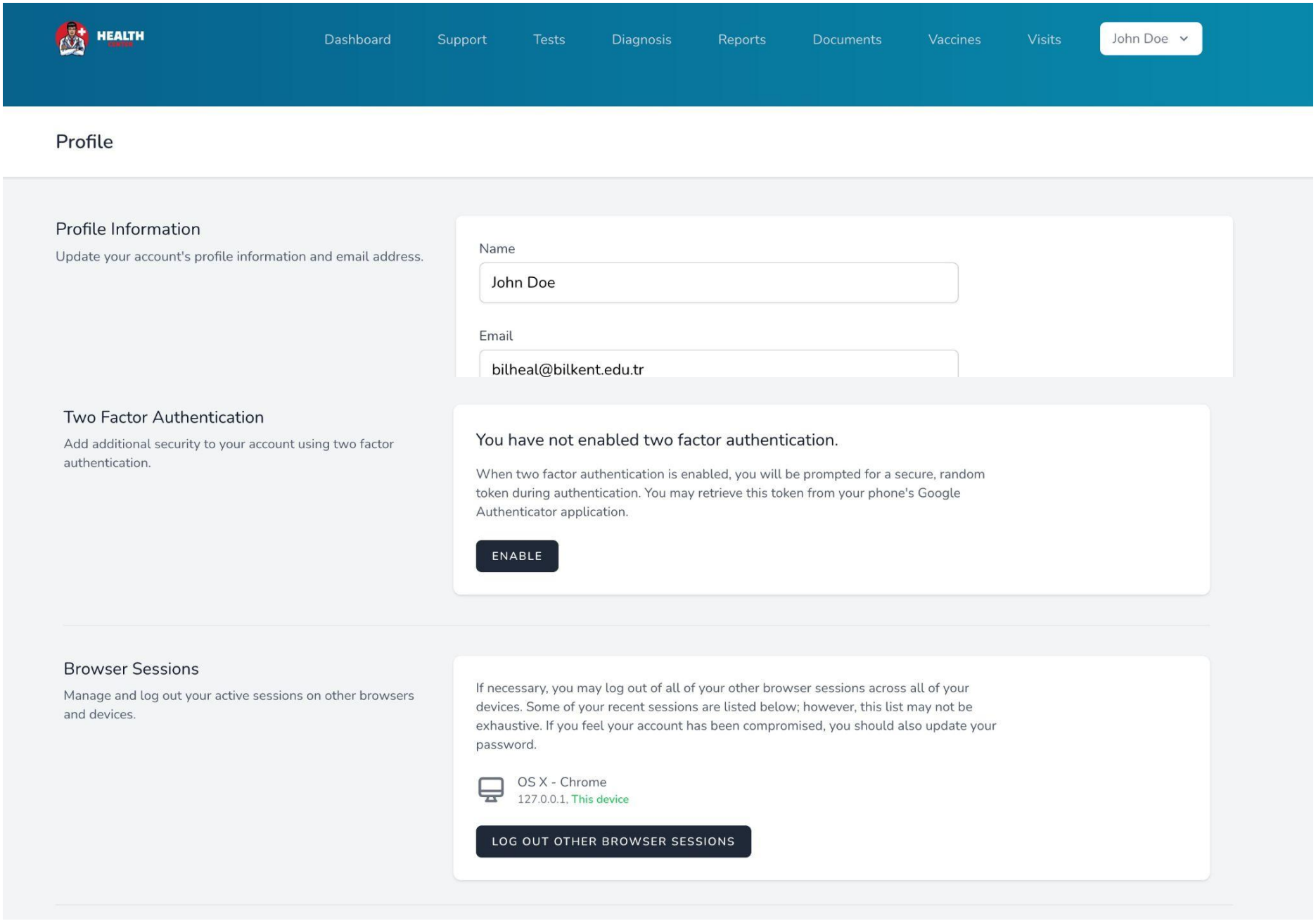
5.3.5. **Patient's Vaccines**



5.3.6. **Previous Visits**



5.3.7. **Manage Profile View**



6. CONCLUSION

Overall, the website application we are aiming to build will include access for three main roles: patient, staff (nurse, doctor, receptionist), and administrator. As it is a user-facing website, our aim is to create the website accessible, user-friendly, and completely functional.

7. IMPROVEMENT SUMMARY

Both the use case and the class diagram were revised according to the feedback from the Professor, TA and our peer review sibling group. These changes led to modification throughout the report. Next, the state and sequence diagrams were completely remade as they were not according to the instructor's and TA's expectations. While remaking these diagrams, we referred to the Professor's slides and past exams. Each and every note left by the instructor and the TA was taken into account in our second iteration. Next, the sibling group's notes were discussed among the team. Lastly, the report was reviewed again to see if further changes need to be done. Since our understanding of diagrams improved at this point in the semester, changes were done accordingly

8. REFERENCES

[1] https://hms.infyom.com/
[2] https://enabiz.gov.tr/Account/Login
[3] https://w3.bilkent.edu.tr/bilkent/health-center/