Health Centre Application

PROJECT REPORT

Submitted by

Sheenam Waris (MXXXXXCA)

In partial fulfilment for the award of the Degree of
MASTER OF COMPUTER APPLICATIONS

Under the Guidance of

Dr. X

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
National Institute of Technology Calicut
Calicut, Kerala, India - 673 601

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I also take this opportunity to thank my friends who have cooperated with me and helped me throughout the project.

DECLARATION

I hereby declare that the project titled ***Health Centre Application*** *submitted by me for the partial fulfilment of the Master of Computer Applications degree is a record of the work carried out by me under the supervision and guidance of Dr. X.*
I further declare that this submission is, to the best of my knowledge and belief, contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or any other institute of higher learning, except where due acknowledgement and reference has been made in the text.

Place :

Date : 31-05-2023

Signature :

Name : Sheenam Waris

Roll. No. : MXXXXXXCA

CERTIFICATE

This is to certify that the project report entitled **Health Centre Application** submitted by Sheenam Waris to National Institute of Technology Calicut towards partial fulfillment of the requirements for the award of Degree of MASTER OF COMPUTER APPLICATIONS is a bonafide record of the work carried out by her during January 2023 - May 2023 under my supervision and guidance.

Dr. X.
Department of Computer Science and Engineering,

ABSTRACT

The project entitled “Health Centre Application” is an android application which designed and developed in Android Studio using Java programming language for it’s frontend and backend is written in Node.js. MySQL is used for the primary database management system. This project aims to develop an automated Health Management System for health centre of . The entire process of health centre done manually by providing each student a health card and these cards stored in drawers batch wise which is handled manually. The existing workflow can be automated through this application with an easy to understand and simple user interface. The Health Centre System provides an easy and efficient way for doctors, staff, and patients (NITC students) to manage their health records and prescriptions. It also allows for the admin to manage information about doctors and staffs, which helps in ensuring the smooth functioning of the system. Overall, the Health Centre Application helps to improve the efficiency of health management and provides an easy and convenient way for doctors, staff, and patients (NITC students) to manage their health-related information.

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Acronyms and Abbreviations

- **DB :** Database
- **ID :** Identity
- **MC :** Medical Certificate
- **UI :** User Interface
- **UX :** User Experience
- **NITC :** National Institute of Technology, Calicut
- **UML :** Unified Modelling Language
- **SQL :** Structured Query Language
- **XML :** Extensible Markup Language
- **API :** Application Programming Interface
- **VS Code :** Visual Studio Code

Chapter 1

Introduction

This project aims to develop an automated Health Management System for health centre of . The health center's entire procedure, which currently relies on manual distribution of health cards to individual students and their storage in batch-specific drawers, can be efficiently automated using this application. By incorporating a user-friendly and intuitive interface, this technology simplifies the process and streamlines it effectively. Current process is paper based and automating the process will improve the user experience.

1.1 Problem Definition

1.1.1 Problem Statement

To build and develop a platform for the streamline management and record keeping for health centre and enables students to access the facilities provided by the centre using mobile based application.

1.1.2 Goal

The plausible solution for the problem defined above is to develop an automated record management system for NITC health centre. This application will contain two modules, the admin module and the user module. This application will help the admin to manage and update information about doctors and staffs. The user module can be accessed by the doctors, the staffs and the patients(NITC students). The patients will be able to register by filling all required details and also update later. They can also book appointment and track their previous visits. They can download prescription and request medical certificate using this application. The doctors can see patient's records and issue medical certificate using our application. The staffs can also see patient's records, approve all requested appointments and upload prescription's image.

1.2 Product Scope

This software system will be an online health care portal for NITC wishing to manage their patient records and their appointment needs online. More specifically to design and develop a simple and intuitive system which shall cater the health centre needs of NITC. The system shall provide features to the patient to book appointment and request for medical certificate. Currently this application is for NITC community and they need NITC mail id to register.

Chapter 2

Overview

2.1 Product Overview

'NITC Health centre Application' is meant to serve as a common platform where management of everyday staff and patients' tasks can be carried out conveniently. Our goal is to develop a replacement to the manual health card used at health centre making it more users friendly and to provide hassle-free facility among the users. Following four actors are involved in the functioning of Health Centre Application :

- **Patient** person having an NITC email Id, signifying people of NITC.
- **Staff** health centre staff who is responsible in approving for booking appointment requests.
- **Doctor** health centre doctors who is responsible for patient visits and issue medical certificate.
- **Admin** person responsible for the add and remove the Doctor/Staff in the Health Centre Application.

In this, any patient who has a registered NITC email id can can login to the application. After registration they can request for appointment by submitting all required

details, then it will be approved by staff. Student can check their appointment history and also request for medical certificate, if needed.
This Application has two modules, one module has three users of the application Staff, Doctor and Patients (NITC students) and other has Admin module. First Admin will register Doctors and staff to the application also send their login credentials to them. Doctor is able to check its list of appointments and generate medical certificate. The Patient (NITC student) is able to request appointment and medical certificate. Staff is able to approve appointment and upload an image of prescription.

2.2 Product Functionality

This application will contain four actors

- **Student**
  - User Authentication and Login using Google OAuth API [4]
  - View and Edit Profile
  - New Appointment request
  - Previous Appointment history
  - Request Medical Certificate
  - Download Medical Certificate
- **Doctor**
  - User Authentication and Login
  - Medical history of patient
  - Generate Medical Certificate
  - View Today's Appointments
- **Staff**

  - User Authentication and Login
  - Upload Prescription's image
  - Approve Appointment Request
  - Create New Appointment
  - View Today's Appointments

- **Admin**
  - User Authentication and Login
  - Create, update and delete account of doctor
  - Create, update and delete account of staff
  - View all completed appointments

2.3 Assumptions and Dependencies

- In the interest of security, credentials of the health centre Admin will be manually added to the database. Doctors and staff will be added by admin.
- The intended user (Patient) of the application must be a part of NITC, that is they should have a NITC email-id.
- It requires proper internet connection for proper functioning of mobile application.

2.4 Requirements Specifications

2.4.1 Functional Requirements

- **F1:** The system shall allow the admin to securely access their account with proper authentication
- **F2:** The system shall allow the admin to manage the doctor's accounts by creating, updating, or deleting them as per the requirement.

- **F3:** The system shall allow the admin to manage the staff's accounts by creating, updating, or deleting them as per the requirement.
- **F4:** The system shall allow the admin with access to view all the previous appointments made by patients, doctors, and staff for record-keeping purposes.
- **F5:** The system shall allow the doctor to securely access their account with proper authentication.
- **F6:** The system shall allow the doctor to access the medical history of the patient for reference during treatment.
- **F7:** The system shall allow the doctor to generate a medical certificate for the patient to provide proof of illness and the need for medical leave.
- **F8:** The system shall allow the doctor with access to view the appointments scheduled for the current day for efficient time management.
- **F9:** The system shall allow the staff to securely access their account with proper authentication.
- **F10:** The system shall allow the staff to upload or edit the image of the prescription provided by the doctor for record-keeping and medication preparation purposes.
- **F11:** The system shall allow the staff to approve the appointment request made by the patient based on availability and scheduling requirements.
- **F12:** The system shall allow the staff to create a new appointment for the patient as per their request and availability.
- **F13:** The system shall allow the staff with access to view the appointments scheduled for the current day for efficient time management and scheduling.
- **F14:** The system shall allow the student to securely access their account with NITC email using google OAuth [4] authentication.
- **F15:** The system shall allow the students to upload the personal details as per the requirement.

- **F16:** The system shall allow the student to edit their profile details, such as contact information for accurate records.
- **F17:** The system shall allow the student to request a new appointment with the doctor or staff for treatment.
- **F18:** The system shall allow the student with access to view their previous appointment history for reference and follow-up.
- **F19:** The system shall allow the student to request a medical certificate from the doctor for illness and medical leave purposes.
- **F20:** The system shall allow the new student to authenticate using NITC email and register.

2.4.2 Non Functional Requirements

1. Correctness : The application should be correct in terms of adhering to the functional requirements and shall exhibit all the necessary functionalities.

2. Usability : The Application should be user-friendly. The software shall be easy to use and shall not require any complex operations from the user side.

3. Re-usability : The software should be designed in a way so that it could be debugged and modified in the future with the intent of adding new features and improving the existing ones.

4. Safety : Only Authenticated users should be able to access their section of Database.

Chapter 3

System Design

This chapter represents a comprehensive overview of the design aspects, providing a detailed description of the key diagrams and models that illustrate the structure and behavior of the system. This section serves as a bridge between the requirements analysis phase and the actual implementation of the project, showcasing how the system will interact.

3.1 Use Case Diagram

A use case diagram is used to represent the dynamic behavior of a system. The actor is shown as a stick person and the use case is shown as an ellipse. Lines indicate which actors perform which use cases. Figure 3.1 represents the use case diagram that depicts the use cases of the system and the roles that different actors play who are associated with the application.

3.2 Use Cases

3.2.1 Use Case 1 Login (Admin, Doctor, Staff)

Author : Sheenam Waris
Purpose : The purpose of this use case is to get access to the software. The user

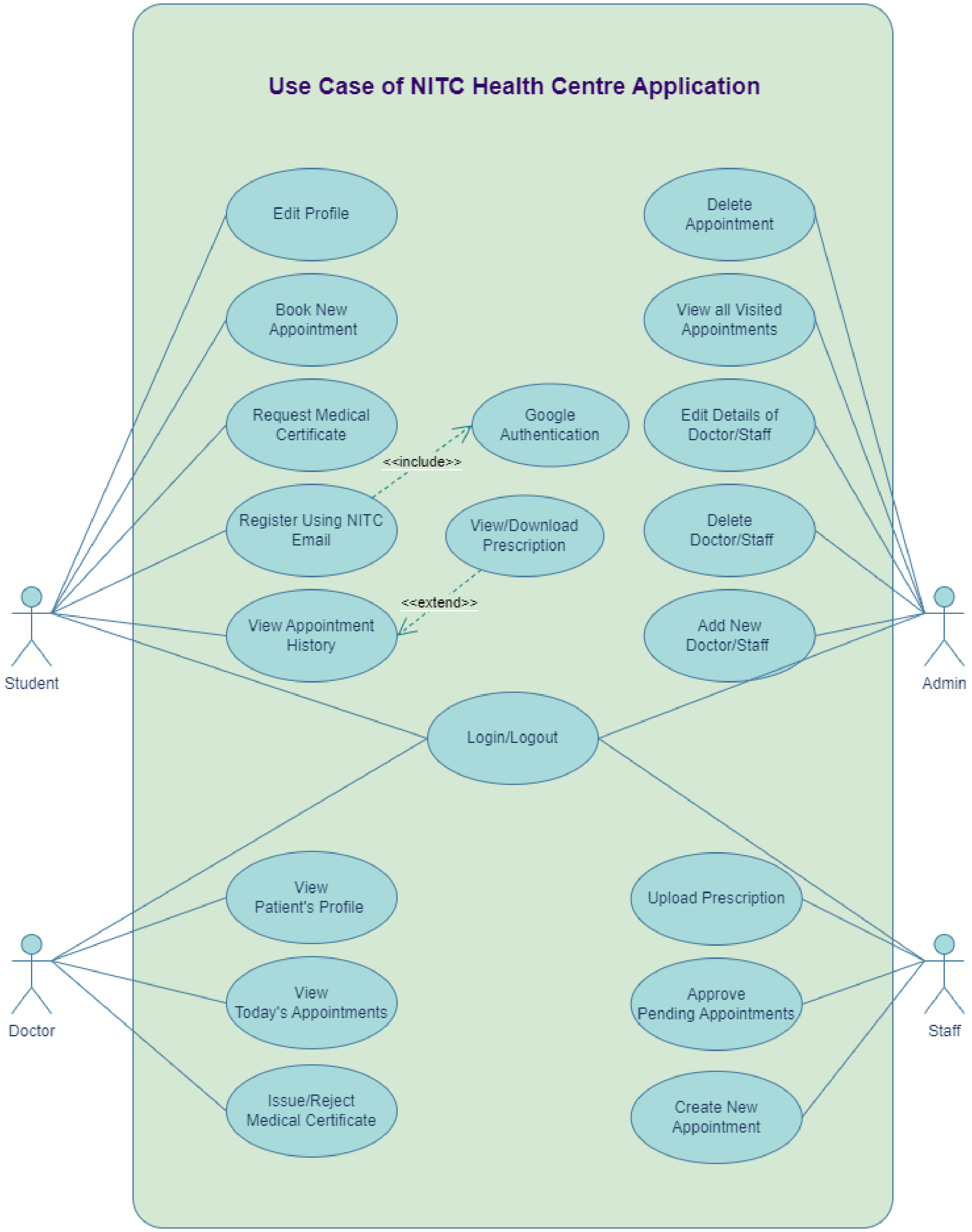

Use Case of NITC Health Centre Application
Edit Profile
Book New Appointment
Request Medical Certificate
Register Using NITC Email
View Appointment History
Google Authentication
<<include>>
View/Download Prescription
<<extend>>
Delete Appointment
View all Visited Appointments
Edit Details of Doctor/Staff
Delete Doctor/Staff
Add New Doctor/Staff
Login/Logout
View Patient's Profile
View Today's Appointments
Issue/Reject Medical Certificate
Upload Prescription
Approve Pending Appointments
Create New Appointment
Student
Admin
Doctor
Staff

Figure 3.1: Use case diagram of Health Centre Application

will provide its credentials to get access.
Requirements Traceability : F1, F5, F9
Priority : High
Precondition : The user has to enter the credentials to get logged to the account.
Post condition : This will give the user access to the software.
Actors : Human (Admin, Doctor, Staff)
Extends : Verification of user's entered credentials
Flow of Events :

- **Basic Flow -** The user(Admin, doctor, Staff) will enter his/her email id, password to the system. If the credentials are correct the user will be logged in to his account.
- **Alternate Flow -** If the credentials are invalid then an error message is displayed.
- **Exceptions -** Server is not responding.

Includes : Registered user (already registered by the admin).

3.2.2 Use Case 2 Login Patient (NITC Student)

Author : Sheenam Waris
Purpose : The purpose of this use case is to get access to the software. The student will be able to login using NITC email.
Requirements Traceability : F14
Priority : High
Precondition : The user has to be logged in their NITC email to get logged to the account.
Post condition : This will give the user access to the software.
Actors : Human (Student)
Extends : Verification of user's entered credentials
Flow of Events :

- **Basic Flow -** The patient (NITC student) will click on google authentication using NITC email to login the system. If the credentials are correct the user will be logged in to his account.
- **Alternate Flow -** If it's not NITC email then an error message is displayed.
- **Exceptions -** Server is not responding.

Includes : Registered user (already registered if not the first time).

3.2.3 Use Case 3 Add Doctor/Staff

Author : Sheenam Waris
Purpose : The purpose of this use case is to allow admin to register a doctor/Staff that is an employee of NITC health centre.
Requirements Traceability : F2,F3
Priority : High
Precondition : Admin should be logged in to the application, to register any new Doctor/Staff that is employed in NITC health centre.
Post condition : Admin will see a successfully registered message, after doctor/Staff data is saved in the database.
Actors : Human (Admin)
Extends : None.
Flow of Events :

- **Basic Flow -** Admin needs to enter Name, email Id, password, phone number,gender and click on submit button. If the doctor/Staff data is not present in the system, then it gets successfully saved and gives a message " Doctor/Staff added successfully".
- **Alternate Flow -** If the doctor/Staff data already existed into the database then it will give an error message "Doctor/Staff Exists".
- **Exceptions -** Database server is not responding.

Includes : None.

3.2.4 Use Case 4 Register New Student (Patient)

Author : Sheenam Waris
Purpose : The purpose of this use case is to allow student to upload details. So that students can access the application.
Requirements Traceability : F20
Priority : High
Precondition : : student should be a new user of application.
Post condition : NITC student will be added to the system
Actors : Human (Student)
Extends : None.
Flow of Events :

- **Basic Flow -** Student needs to upload personal info data through and current student's details will be added to database.
- **Alternate Flow -** If the student roll number is already exist into the database, then it will give an error message "Invalid User".
- **Exceptions -** Database server is not responding.

Includes : Google authentication of NITC email.

3.2.5 Use Case 5 Remove Doctor/Staff

Author : Sheenam Waris
Purpose : The purpose of this use case is to allow admin to remove any doctor/staff from the application. This is the case when a doctor/Staff leaves NITC.
Requirements Traceability : F2,F3
Priority : Low
Precondition : The doctors/ staff's data should be present in the application and admin should be logged in.
Post condition : The doctor/ staff's data is successfully deleted from the application.

Actors : Human (Admin)
Extends : None.
Flow of Events :

- **Basic Flow -** The admin will verify the doctor/staff selected is correct. then it will click on the "Remove" button to delete data.
- **Alternate Flow -** None.
- **Exceptions -** Database server is not responding.

Includes : None.

3.2.6 Use Case 6 All Completed Appointment History

Author : Sheenam Waris
Purpose : The purpose of this functionality is to show all appointment history to Admin.
Requirements Traceability : F4
Priority : Medium
Precondition : The Admin should be logged in to the application.
Post condition : The Admin will see all completed appointment history visited by patient
Actors : Human (Admin)
Extends : None.
Flow of Events :

- **Basic Flow -** The Admin will login to the application and then move to medical history to check all the details of appointments which has been completed previously
- **Alternate Flow -** Admin can delete any appointment.
- **Exceptions -** Database server is not responding.

Includes : None.

3.2.7 Use Case 7 Appointment History of Patient

Author : Sheenam Waris
Purpose : The purpose of this functionality is to show medical history to doctor and patient.
Requirements Traceability : F6,F18
Priority : Medium
Precondition : The student and doctor should be registered to the application.
Post condition : The student will see his own medical history and doctor will see medical history of the patients.
Actors : Human (Student,Doctor)
Extends : None.
Flow of Events :

- **Basic Flow -** The doctor will login to the application and then move to medical history to check all the details of his appointments he has previously taken and his upcoming appointments. Student is also able to check his appointment date, time and download prescription.
- **Alternate Flow -** If no appointments is done yet, the page will be blank for that person.
- **Exceptions -** Database server is not responding.

Includes : None.

3.2.8 Use Case 8 Issue Medical Certificate

Author : Sheenam Waris
Purpose : The purpose of this functionality is to allow the doctor to issue medical certificate for the student who requested for medical certificate and is not able to attend classes/ examination because of suffering from severe problem and need to be admitted to hospital. After successful recovery the student will need doctor and admin permission to re-join campus.

Requirements Traceability : F7
Priority : Medium
Precondition : The doctor's data should be present in the application, student should have a medical history to proof of his request of medical certificate.
Post condition : After Successful verification of student submitted document, the students can re-join campus.
Actors : Human (Doctor)
Extends : None.
Flow of Events :

- **Basic Flow -** The student will request for medical certificate online. Doctor will verify and generate medical certificate. After successfully verified, the doctor will issue a medical certificate for the student.
- **Alternate Flow -** If the doctor finds that any of the provided documents by the student is faulty then his request is cancelled and he again needs to apply for it with correct details.
- **Exceptions -** Database server is not responding.

Includes : Medical Certificate Request.

3.2.9 Use Case 9 Upload/Remove Prescription

Author : Sheenam Waris
Purpose : The purpose of this functionality is to allow the staff to upload or edit a prescription's image that will be visible in the patient's profile.
Requirements Traceability : F10
Priority : Medium
Precondition : The staff should be logged in to the application and open today's appointment.
Post condition : Message will pop up " Successfully Uploaded" and then redirected to dashboard page.
Actors : Human (Staff)

Extends : None.
Flow of Events :

- **Basic Flow -** The staff will log in to the application then click on the view patient's appointment then upload prescription's image, then click on the upload button.
- **Alternate Flow -** Staff can edit the prescription if they found out any mistakes while uploading.
- **Exceptions -** Database server is not responding.

Includes : Requested and approved by staff.

3.2.10 Use Case 10 Approve Appointment Request

Author : Sheenam Waris
Purpose : The purpose of this functionality is to allow staff to approve appointment requested by student.
Requirements Traceability : F11
Priority : High
Precondition : The staff should be logged in to application and he/she should have scheduled requested appointments on that date or any empty slot.
Post condition : The appointment will be moved to upcoming appointments in patient dashboard when their request has been approved.
Actors : Human (Staff)
Extends : None.
Flow of Events :

- **Basic Flow -** The staff logged in to the application and moved to the ”pending appointment” page. Here, then give approval. After successful approval the patient can consult the doctor.
- **Alternate Flow -** If the approval is not possible for some reason, then staff can also create appointment by their end

- **Exceptions -** Database server is not responding.

Includes : Request Appointment by Student.

3.2.11 Use Case 11 New Appointment Request

Author : Sheenam Waris
Purpose : The purpose of this functionality is to allow users (Student, Staff) of this application to book an appointment.
Requirements Traceability : F12,F17
Priority : High
Precondition : The user should be registered to the application and logged in to it.
Post condition : The appointment will be booked successfully.
Actors : Human (Staff,Student)
Extends : None.
Flow of Events :

- **Basic Flow -** The user first login to the application and then move to the book appointment page then according to his illness problem will select the option and then describe his problem in the textbox and visit date after click on the ”Request appointment” button. Users can visit when appointment booking is approved by staff.
- **Alternate Flow -** If the student was not able to book then staff can book new appointment whenever student visits.
- **Exceptions -** Database server is not responding.

Includes : None.

3.2.12 Use Case 12 View Current Day's Scheduled Appointment

Author : Sheenam Waris

Purpose : The purpose of this functionality is to show doctor/staff current day's appointment of patient.

Requirements Traceability : F8,F13

Priority : Medium

Precondition : The doctor/staff should be logged in to application and he/she should have scheduled requested appointments on that date and time.

Post condition : The doctor/staff will plan accordingly based on appointments.

Actors : Human (Staff,Doctor)

Extends : View Patient Profile and Upload Prescription.

Flow of Events :

- **Basic Flow -** The Doctor/staff logged in to the application and moved to the "new appointment" page. Here, views all current scheduled appointment.
- **Alternate Flow -** None.
- **Exceptions -** Database server is not responding.

Includes : None.

3.2.13 Use Case 13 Request Medical Certificate

Author : Sheenam Waris

Purpose : The purpose of this functionality is to allow user to request for medical certificate.

Requirements Traceability : F19

Priority : Medium

Precondition : The user should be logged in to the application. User should have a completed appointment history.

Post condition : Request will be approve or reject by doctor and available to

download the medical certificate.
Actors : Human (Student)
Extends : None.
Flow of Events :

- **Basic Flow -** The user will login to the application then move to the " Completed Appointment history" page. Then they can request medical for respective appointment.
- **Alternate Flow -** If in the verification some faults occur in his documents then he again needs to submit the request with correct purpose or duration. .
- **Exceptions -** Database server is not responding.

Includes : Download Medical Certificate.

3.2.14 Use Case 14 Update Student Profile

Author : Sheenam Waris
Purpose : The purpose of this functionality is when a user enabled to update his/her details and the changes should reflect in database.
Requirements Traceability : F16
Priority : Low
Precondition : The user should be logged in to the application. The student must be a registered patient.
Post condition : The record of patient is updated in database.
Actors : Human (Student)
Extends : None.
Flow of Events :

- **Basic Flow -** The user will login to the system. He/she view his record then selects update details. Now user may change the necessary fields. Popup of update details.
- **Alternate Flow -** None.

- **Exceptions -** Database server is not responding.

Includes : None.

3.3 Class Diagram

Figure 3.2 represents the system model using class diagram. Class diagram is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operation (or methods) and the relationship among classes[1].

3.4 ER Diagram

Figure 3.3 represents the Entity Relationship Diagram illustrates how 'entities' such as people, concepts or objects relate to each other in the system. It graphically represents the data model that defines the information structure which should be implemented in the database. The rectangles are entities and relations are shown with joining line between entities.

3.5 System Interaction through Sequence Diagram

Sequence diagram is a Unified Modeling Language (UML) diagram that illustrates the sequence of messages between objects in an interaction. A sequence diagram consists of a group of objects that are represented by lifelines, and the messages that they exchange over time during the interaction[1].

3.5.1 Login Sequence

Figure 3.4 represents Patient's(NITC Student) Login Sequence Diagram

- Student will start the application and they will use google authentication using NITC email-id to the login page.

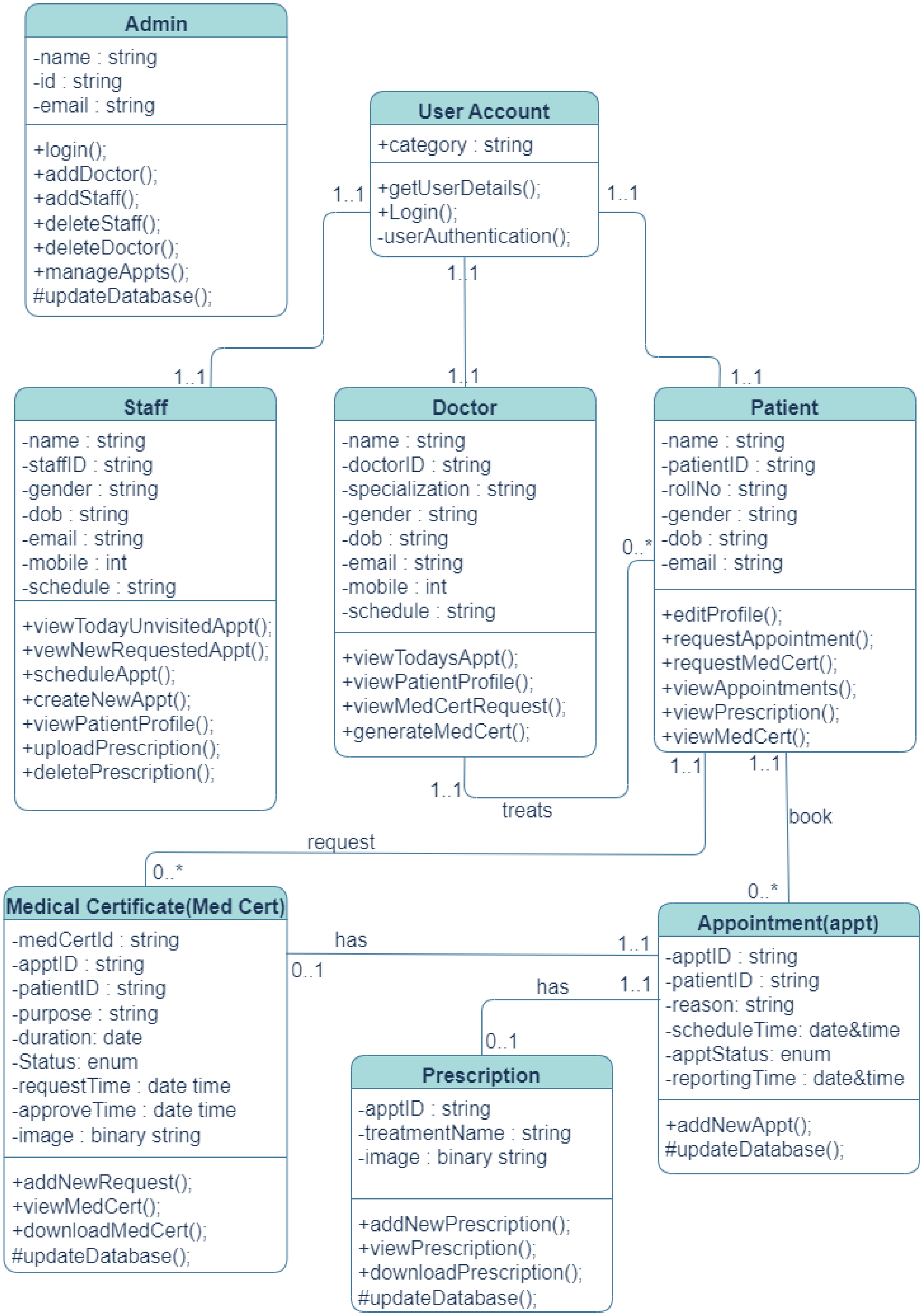


Figure 3.2: Class diagram of Health Centre Application

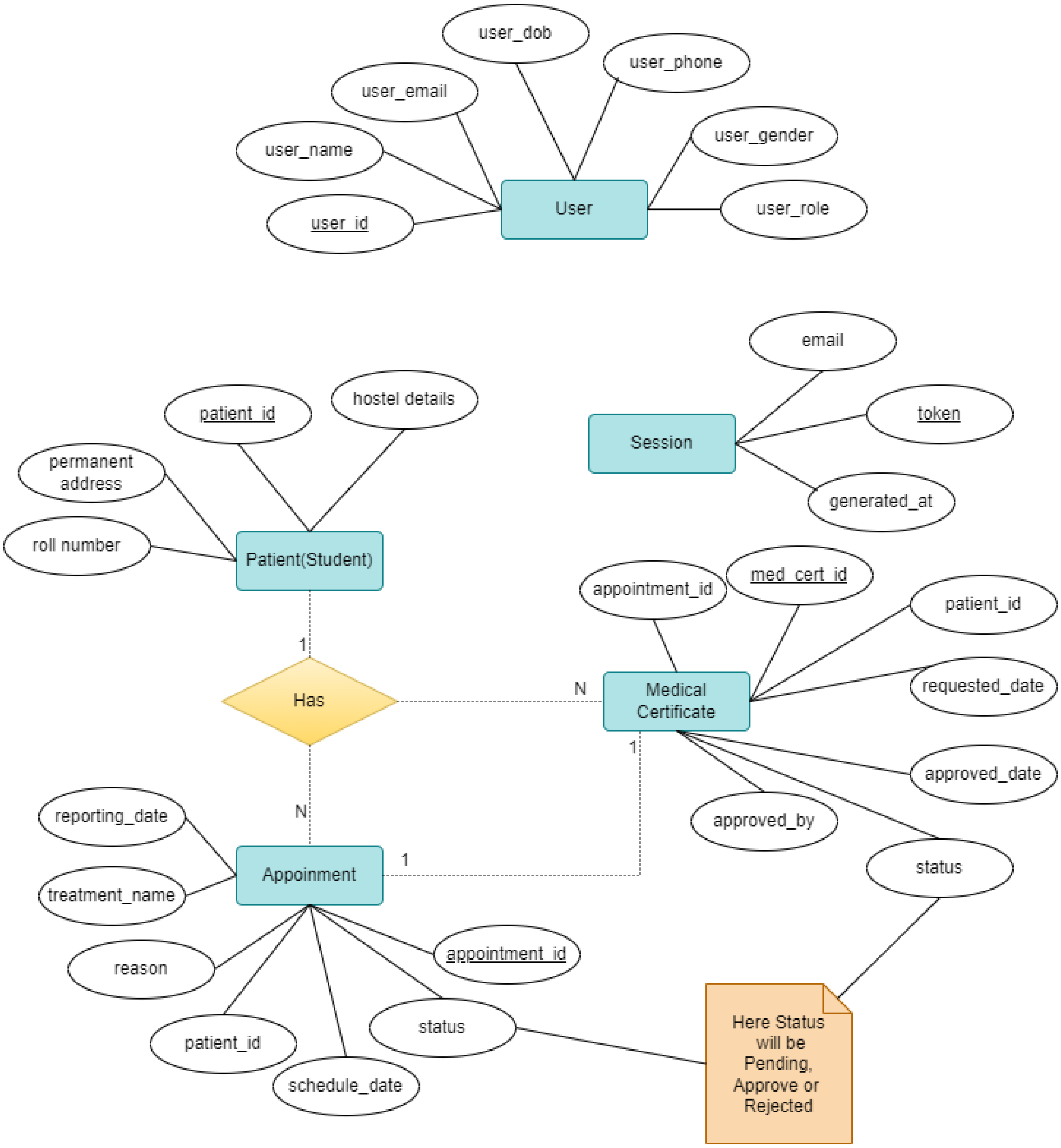


Figure 3.3: ER diagram of Health Centre Application

- If Student's email-id presents in database then they will directly direct to their dashboard of the application.
- For the first time, student will direct to register page and fill details to continue and successfully register to system.
- If they user try to login using other than NITC email, it will generate an error message "Please Login Using NITC Email".

3.5.2 Appointment Sequence

Figure 3.5 represents request of new appointment, approve and upload prescription through Sequence Diagram

- The student will write the reason of his problem and select Date then select the slot available according to his convenience.
- From the list of pending appointments staff will give reporting time to visit health centre and schedule appointment.
- From the list of appointments staff will upload prescription image after student consult with doctor.

3.5.3 Medical Certificate Sequence

Figure 3.6 represents request of new medical certificate and issued by doctor through Sequence Diagram

- The student will request for medical certificate available only after appointment is completed.They will write purpose for requesting certificate and the duration.
- Doctor will check, then approve or reject it.
- Then the user will be able to download medical certificate.
- If doctor rejected the request then student can re-apply for medical certificate with correct details.

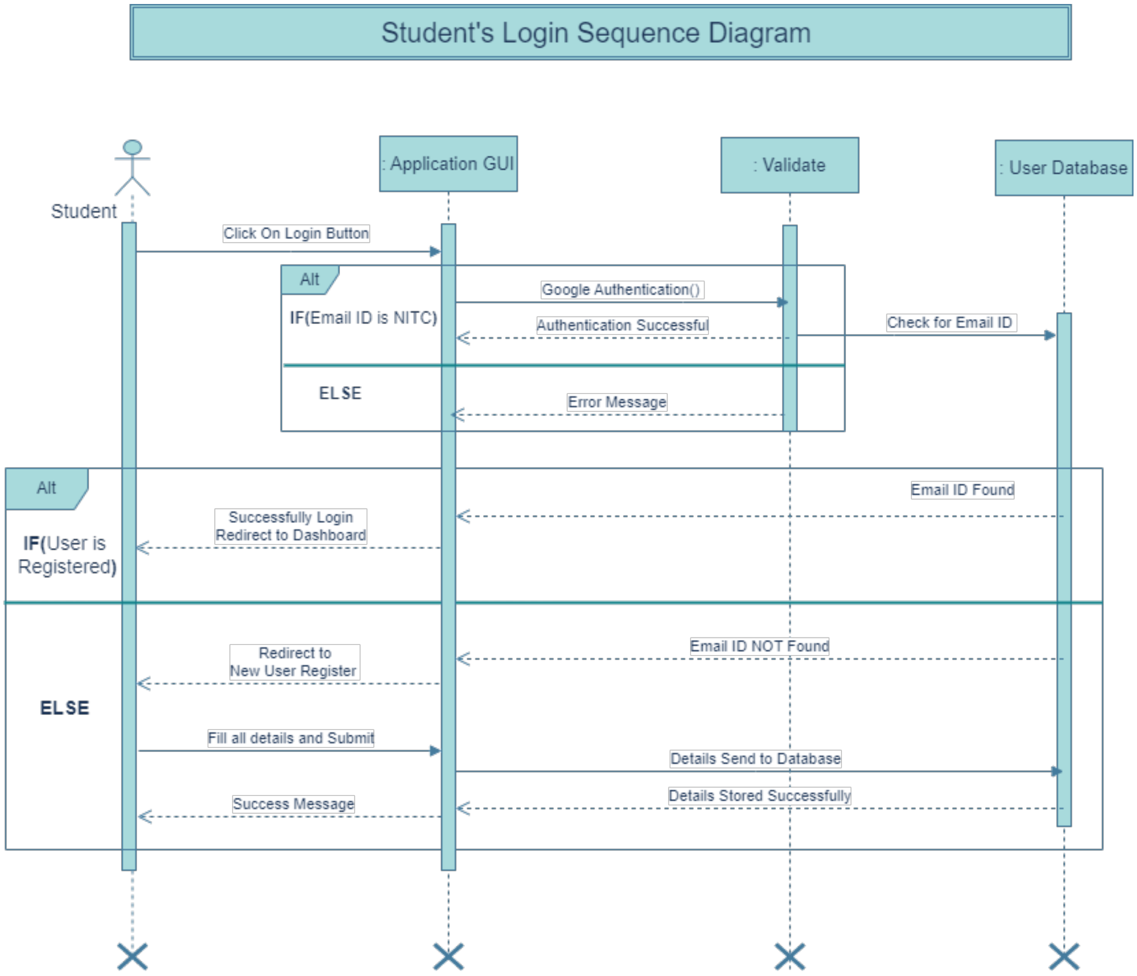


Figure 3.4: Sequence Diagram of Student's Login

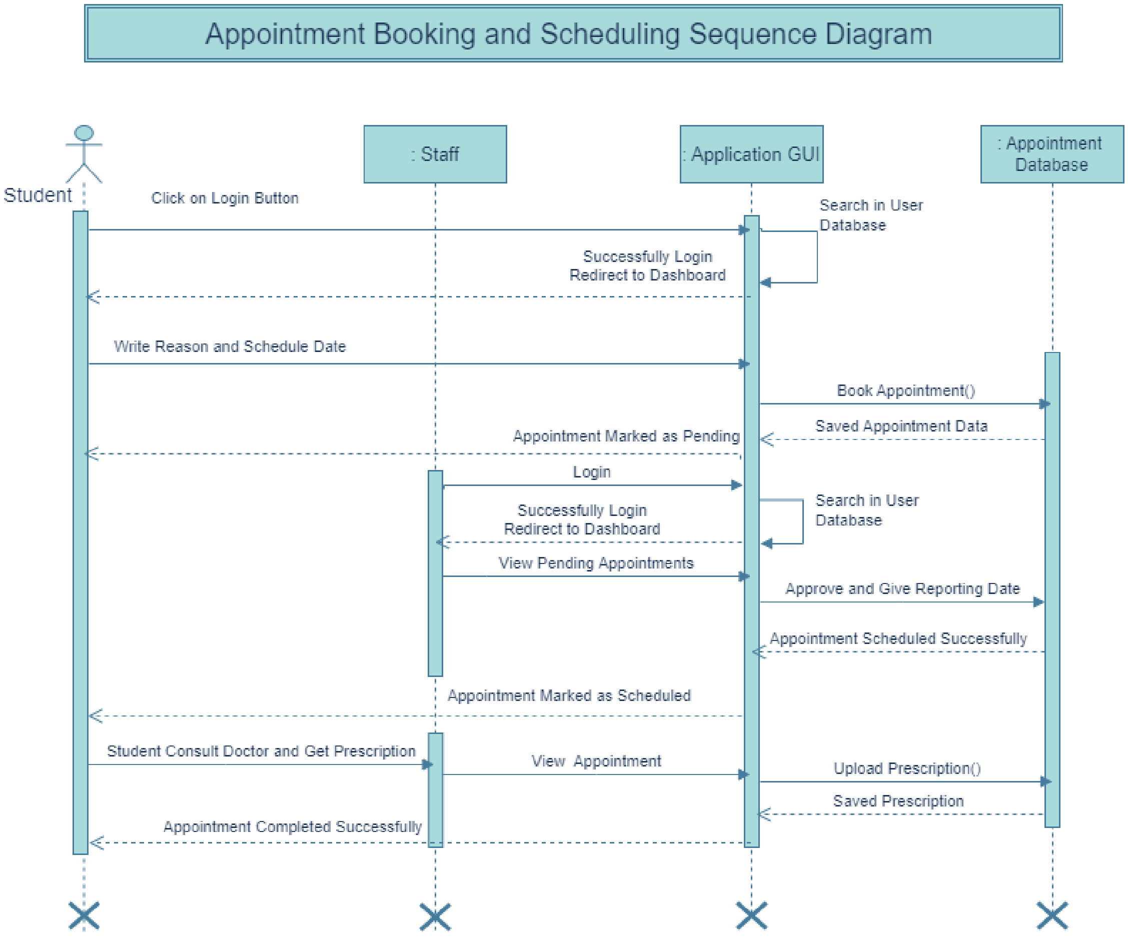

Appointment Booking and Scheduling Sequence Diagram
Student
: Staff
: Application GUI
: Appointment Database
Click on Login Button
Search in User Database
Successfully Login
Redirect to Dashboard
Write Reason and Schedule Date
Book Appointment()
Saved Appointment Data
Appointment Marked as Pending
Login
Search in User Database
Successfully Login
Redirect to Dashboard
View Pending Appointments
Approve and Give Reporting Date
Appointment Scheduled Successfully
Appointment Marked as Scheduled
Student Consult Doctor and Get Prescription
View Appointment
Upload Prescription()
Saved Prescription
Appointment Completed Successfully

Figure 3.5: Sequence Diagram of Appointment

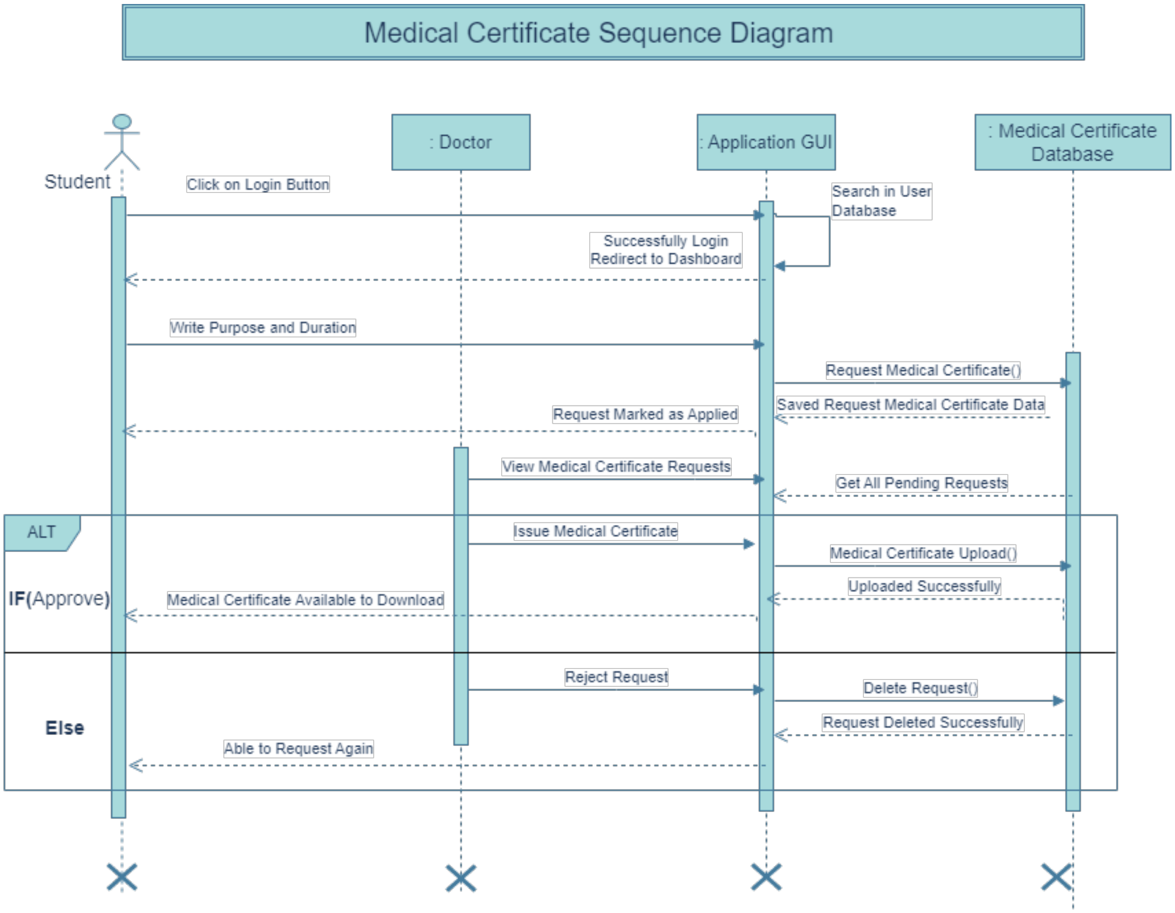

Medical Certificate Sequence Diagram
Student
: Doctor
: Application GUI
: Medical Certificate Database
Click on Login Button
Search in User Database
Successfully Login Redirect to Dashboard
Write Purpose and Duration
Request Medical Certificate()
Saved Request Medical Certificate Data
Request Marked as Applied
View Medical Certificate Requests
Get All Pending Requests
ALT
IF(Approve)
Issue Medical Certificate
Medical Certificate Upload()
Uploaded Successfully
Medical Certificate Available to Download
Else
Reject Request
Delete Request()
Request Deleted Successfully
Able to Request Again

Figure 3.6: Sequence Diagram of Medical Certificate

3.6 Activity Diagrams

This UML diagram [1] focuses on the execution and flow of the behaviour of a system instead of implementation. Activity diagrams consist activity of appointment booking and medical certificate.

3.6.1 Appointment Activity

Figure 3.7 represents appointment booking activity, upload prescription and approve by staff.

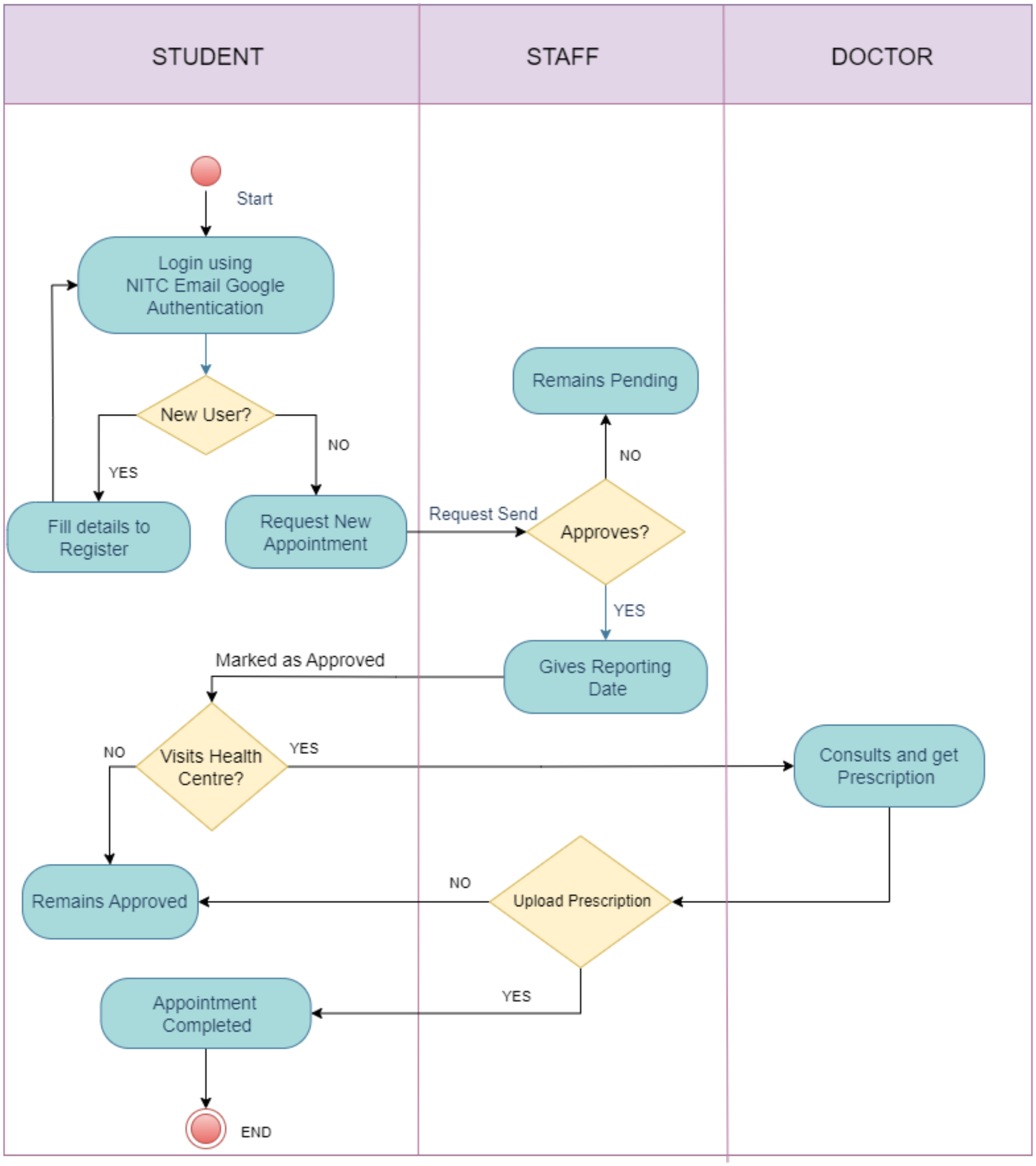


Figure 3.7: Activity Diagram of Appointment

3.6.2 Medical Certificate Activity

Figure 3.8 represents medical certificate request activity and approval of doctor.

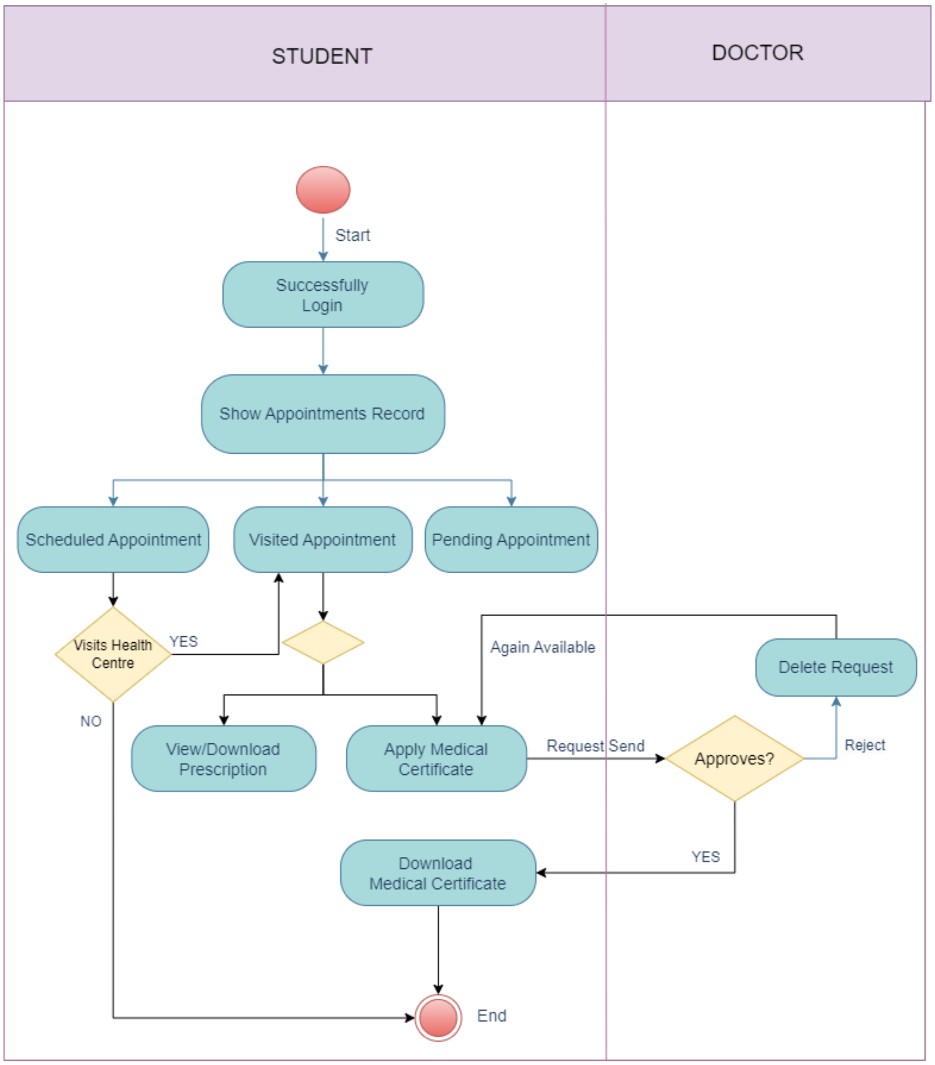


Figure 3.8: Activity Diagram of Medical Certificate

Chapter 4

Implementation and Results

4.1 Technology Stack

FrontEnd :
Android UI Design : XML
Programming Language: Java

Backend :
Framework: Express.js
Runtime Environment: Node.js [2]

Database : Relational Database - MySQL
Development Environment : Android Studio [3], VS Code
Other Tools : MySQL Workbench(to view Database), Postman (for testing APIs)

Implementation details:

The authentication of the users is done using Google OAuth API [4]. The user details returned by the API is also stored in database. For the admin,doctor and staff the authentication is done using valid credentials through database.

The login sessions are managed by generating a token and giving a copy of that token to the user. Tokens are set to expire after 7 days. Till then the user can login using the token until and unless the user hits '/logout', thereby invalidating the token in the server.
Prisma Client [5], powerful database access library is used for database operations. It simplifies database operations by providing a type-safe, auto-generated API for interacting with your database. It enhances productivity, improves code quality, and allows you to focus on building your application logic rather than dealing with low-level database operations.
The backend consists of various API endpoints to allow the frontend application to allow the users of the application to access their data through the internet and perform different operations on it.

4.2 Results

The outcome of this project is an android based Health Centre Application with all the necessary functionalities as mentioned in the requirements specifications.

4.2.1 Testing Phase

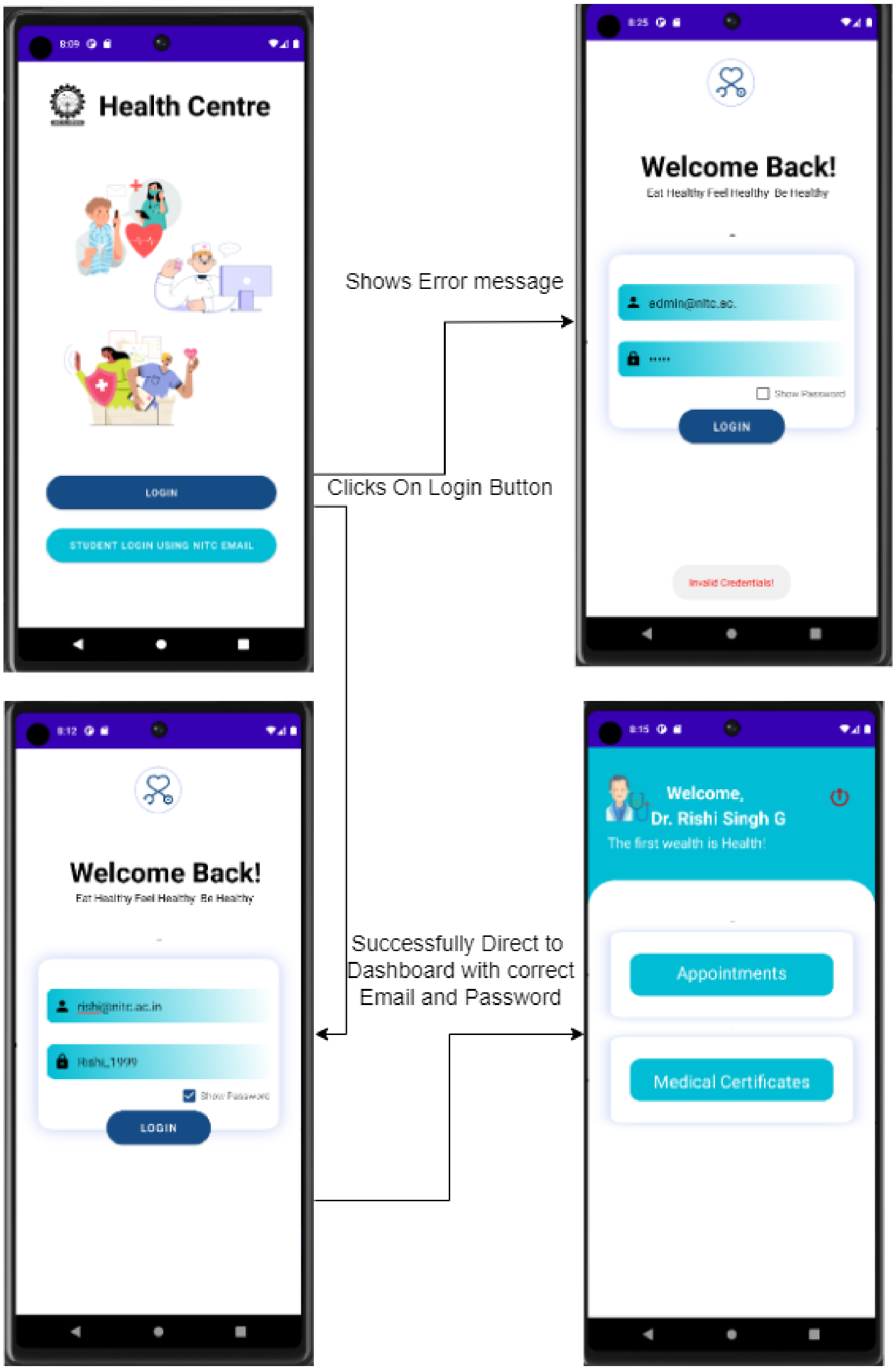
Test Case 1 Login (Admin, Doctor, Staff)

Flow of Events : Figure 4.1

- **Basic Flow -** The user(Admin, doctor, Staff) will enter his/her email id, password to the system. If the credentials are correct the user will be logged in to his account.
- **Alternate Flow -** If the credentials are invalid then an error message is displayed.

Test Case 2 Login Patient (NITC Student)

Flow of Events : Figure 4.2


Health Centre
LOGIN
STUDENT LOGIN USING NITC EMAIL
Shows Error message
Clicks On Login Button
Welcome Back!
Eat Healthy Feel Healthy Be Healthy
Show Password
LOGIN
Successfully Direct to Dashboard with correct Email and Password
Welcome,
Dr. Rishi Singh G
The first wealth is Health!
Appointments
Medical Certificates

admin@nitc.ac.

•••••

Invalid Credentials!

rishi@nitc.ac.in

Rishi_1999

Figure 4.1: Admin,Doctor and Staff Login UI

- **Basic Flow -** The patient (NITC student) will click on google authentication using NITC email to login the system. If the credentials are correct the user will be logged in to his account.
- **Alternate Flow -** If it's not NITC email then an error message is displayed.

Test Case 3 Add Doctor/Staff

Flow of Events : Figure 4.3

- **Basic Flow -** Admin needs to enter Name, email Id, password, phone number,gender and click on submit button. If the doctor/Staff data is not present in the system, then it gets successfully saved and gives a message " Doctor/Staff added successfully".
- **Alternate Flow -** If the doctor/Staff data already existed into the database then it will give an error message "Doctor/Staff Exists".

Test Case 4 Register New Student (Patient)

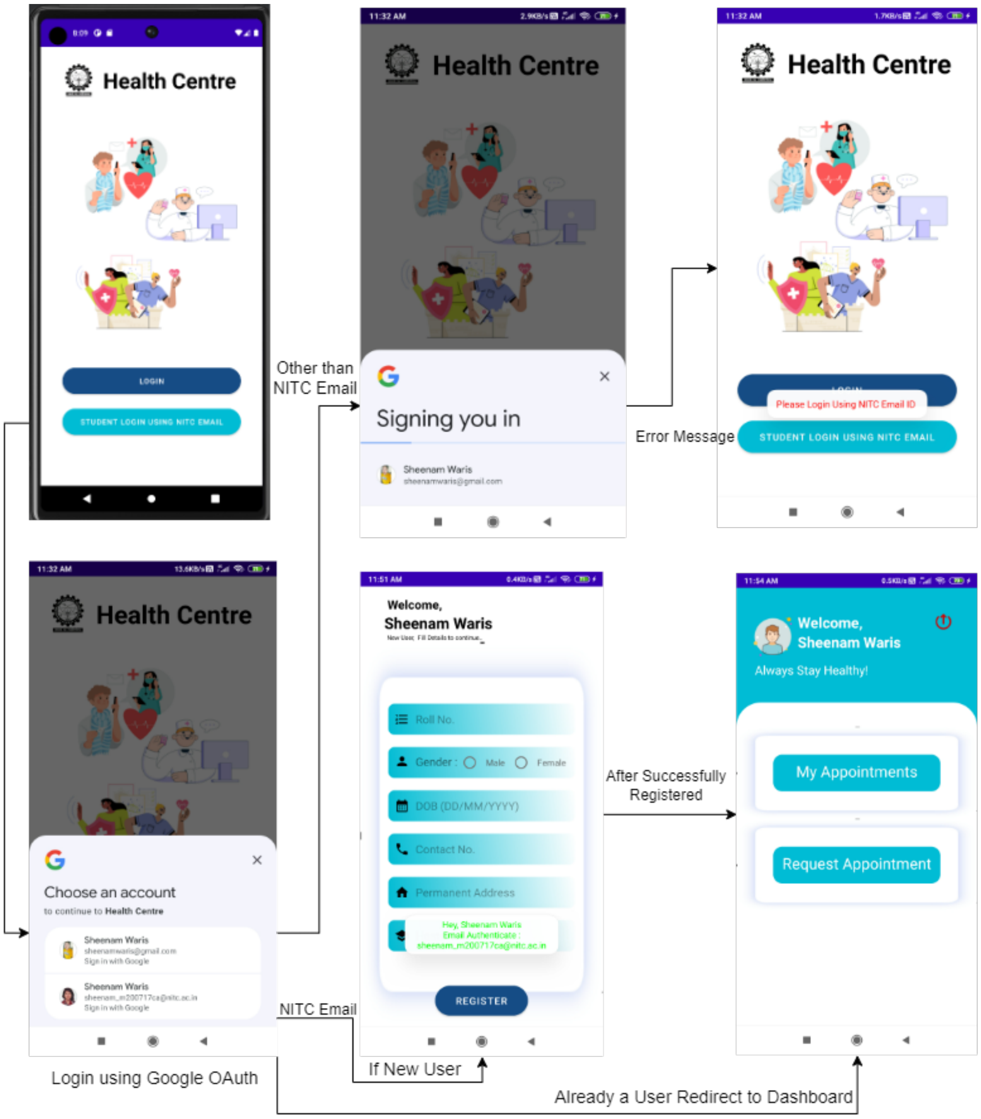
Flow of Events : Figure 4.2

- **Basic Flow -** Student needs to upload personal info data through and current student's details will be added to database.
- **Alternate Flow -** If the student roll number is already exist into the database, then it will give an error message "Invalid User".

Test Case 5 Remove Doctor/Staff

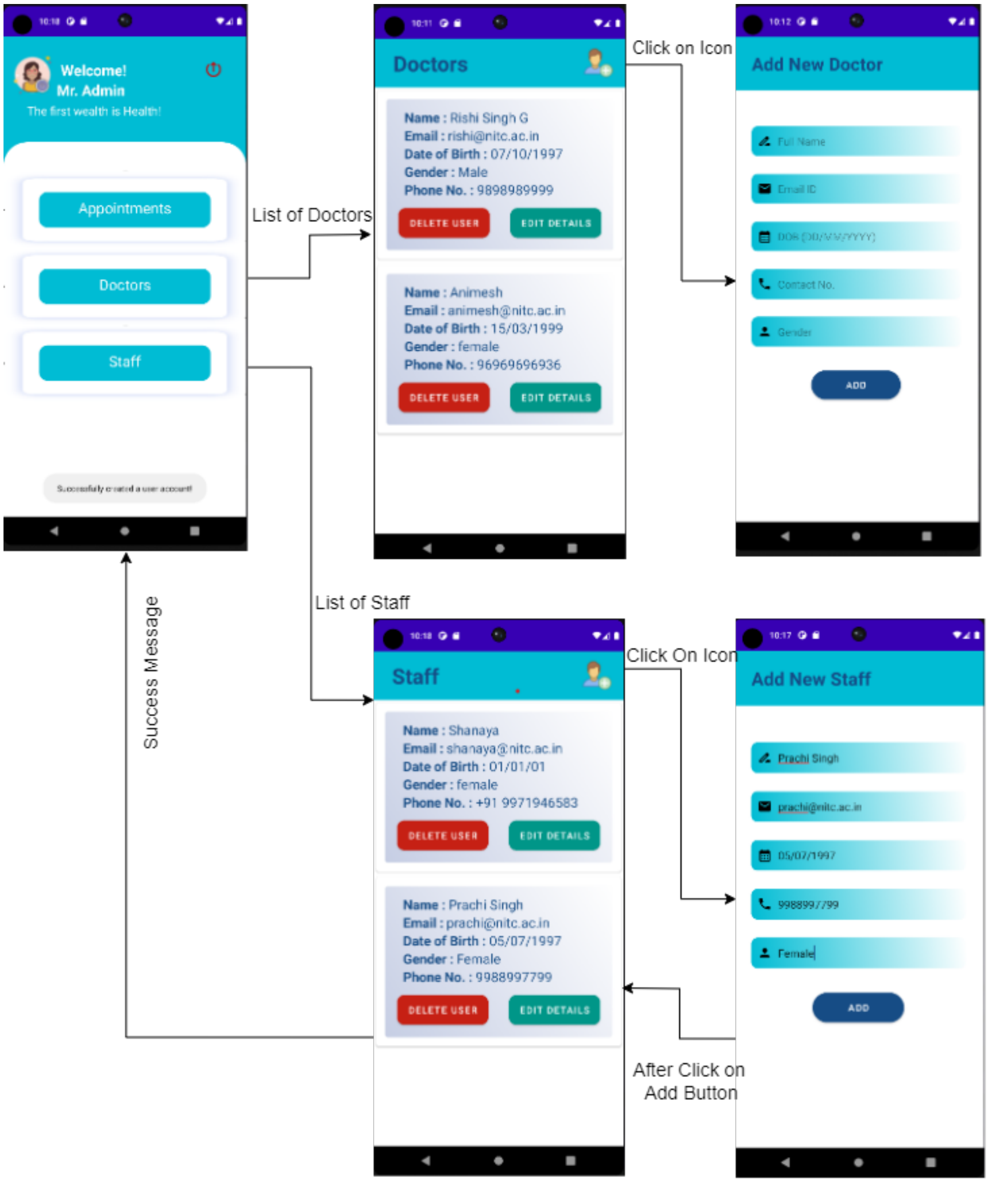
Flow of Events : Figure 4.4

- **Basic Flow -** The admin will verify the doctor/staff selected is correct. then it will click on the "Remove" button to delete data.
- **Alternate Flow -** None.



Hey, Sheenam Waris Email Authenticate : sheenam_m200717ca@nitc.ac.in

Figure 4.2: Student's Login UI



Name : Rishi Singh G
Email : rishi@nitc.ac.in
Date of Birth : 07/10/1997
Gender : Male
Phone No. : 9898989999

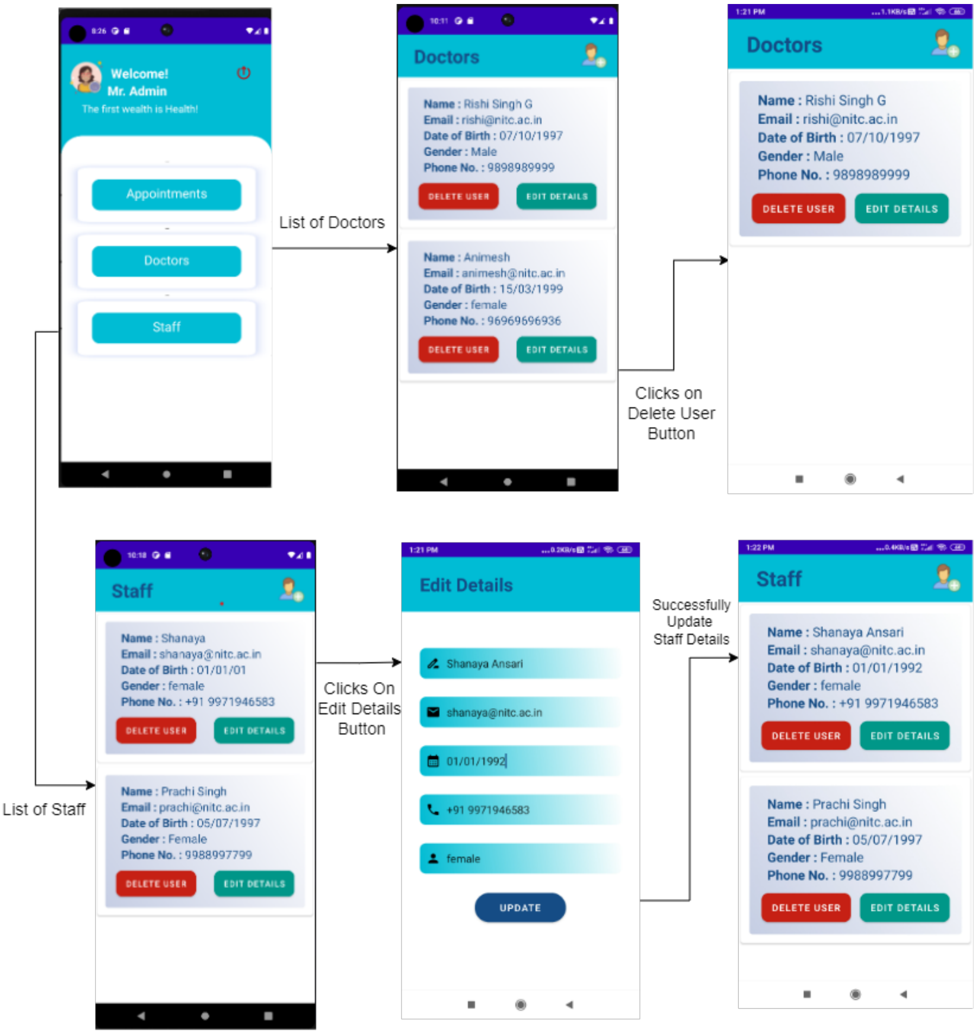
Name : Animesh
Email : animesh@nitc.ac.in
Date of Birth : 15/03/1999
Gender : female
Phone No. : 96969696936

Name : Shanaya
Email : shanaya@nitc.ac.in
Date of Birth : 01/01/01
Gender : female
Phone No. : +91 9971946583

Name : Prachi Singh
Email : prachi@nitc.ac.in
Date of Birth : 05/07/1997
Gender : Female
Phone No. : 9988997799

Prachi Singh
prachi@nitc.ac.in
05/07/1997
9988997799
Female

Figure 4.3: Add Doctor/Staff UI



Name : Rishi Singh G
Email : rishi@nitc.ac.in
Date of Birth : 07/10/1997
Gender : Male
Phone No. : 9898989999

Name : Animesh
Email : animesh@nitc.ac.in
Date of Birth : 15/03/1999
Gender : female
Phone No. : 96969696936

Name : Rishi Singh G
Email : rishi@nitc.ac.in
Date of Birth : 07/10/1997
Gender : Male
Phone No. : 9898989999

Name : Shanaya
Email : shanaya@nitc.ac.in
Date of Birth : 01/01/01
Gender : female
Phone No. : +91 9971946583

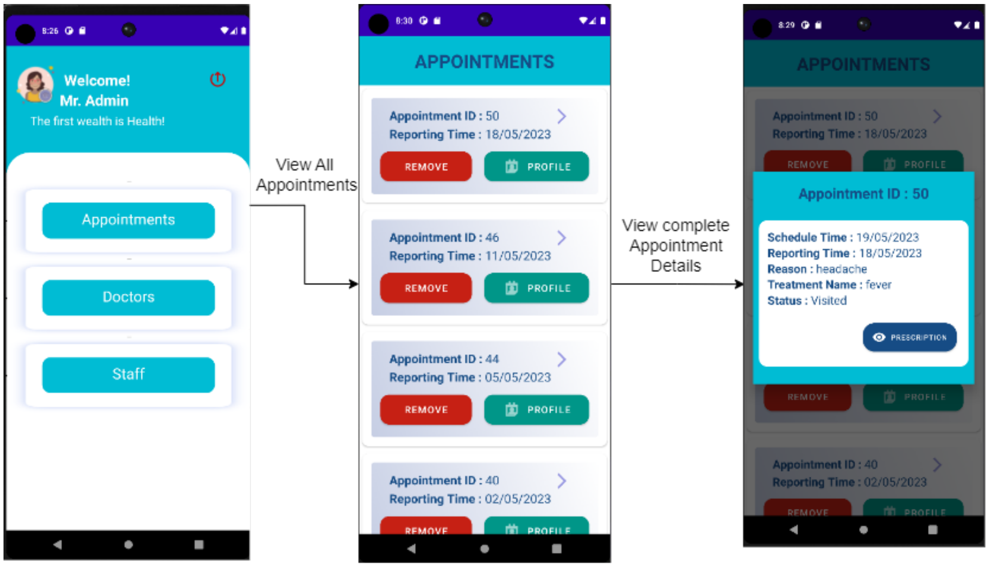
Name : Prachi Singh
Email : prachi@nitc.ac.in
Date of Birth : 05/07/1997
Gender : Female
Phone No. : 9988997799

Shanaya Ansari
shanaya@nitc.ac.in
01/01/1992
+91 9971946583
female

Name : Shanaya Ansari
Email : shanaya@nitc.ac.in
Date of Birth : 01/01/1992
Gender : female
Phone No. : +91 9971946583

Name : Prachi Singh
Email : prachi@nitc.ac.in
Date of Birth : 05/07/1997
Gender : Female
Phone No. : 9988997799

Figure 4.4: Remove and Edit Details of Doctor/Staff UI



Appointment ID : 50
Reporting Time : 18/05/2023

Appointment ID : 46
Reporting Time : 11/05/2023

Appointment ID : 44
Reporting Time : 05/05/2023

Appointment ID : 40
Reporting Time : 02/05/2023

Appointment ID : 50
Schedule Time : 19/05/2023
Reporting Time : 18/05/2023
Reason : headache
Treatment Name : fever
Status : Visited

Figure 4.5: Admin View and Remove Appointments UI

Tesr Case 6 All Completed Appointment History

Flow of Events : Figure 4.5

- **Basic Flow -** The Admin will login to the application and then move to medical history to check all the details of appointments which has been completed previously
- **Alternate Flow -** Admin can delete any appointment.

Test Case 7 Appointment History of Patient

Flow of Events : Figure 4.6

- **Basic Flow -** The doctor will login to the application and then move to medical history to check all the details of his appointments he has previously taken and his upcoming appointments. Student is also able to check his appointment date, time and download prescription.

- **Alternate Flow -** If no appointments is done yet, the page will be blank for that person.

Test Case 8 Issue Medical Certificate

Flow of Events : Figure 4.7

- **Basic Flow -** The student will request for medical certificate online. Doctor will verify and generate medical certificate. After successfully verified, the doctor will issue a medical certificate for the student.
- **Alternate Flow -** If the doctor finds that any of the provided documents by the student is faulty then his request is cancelled and he again needs to apply for it with correct details.

Test Case 9 Upload/Remove Prescription

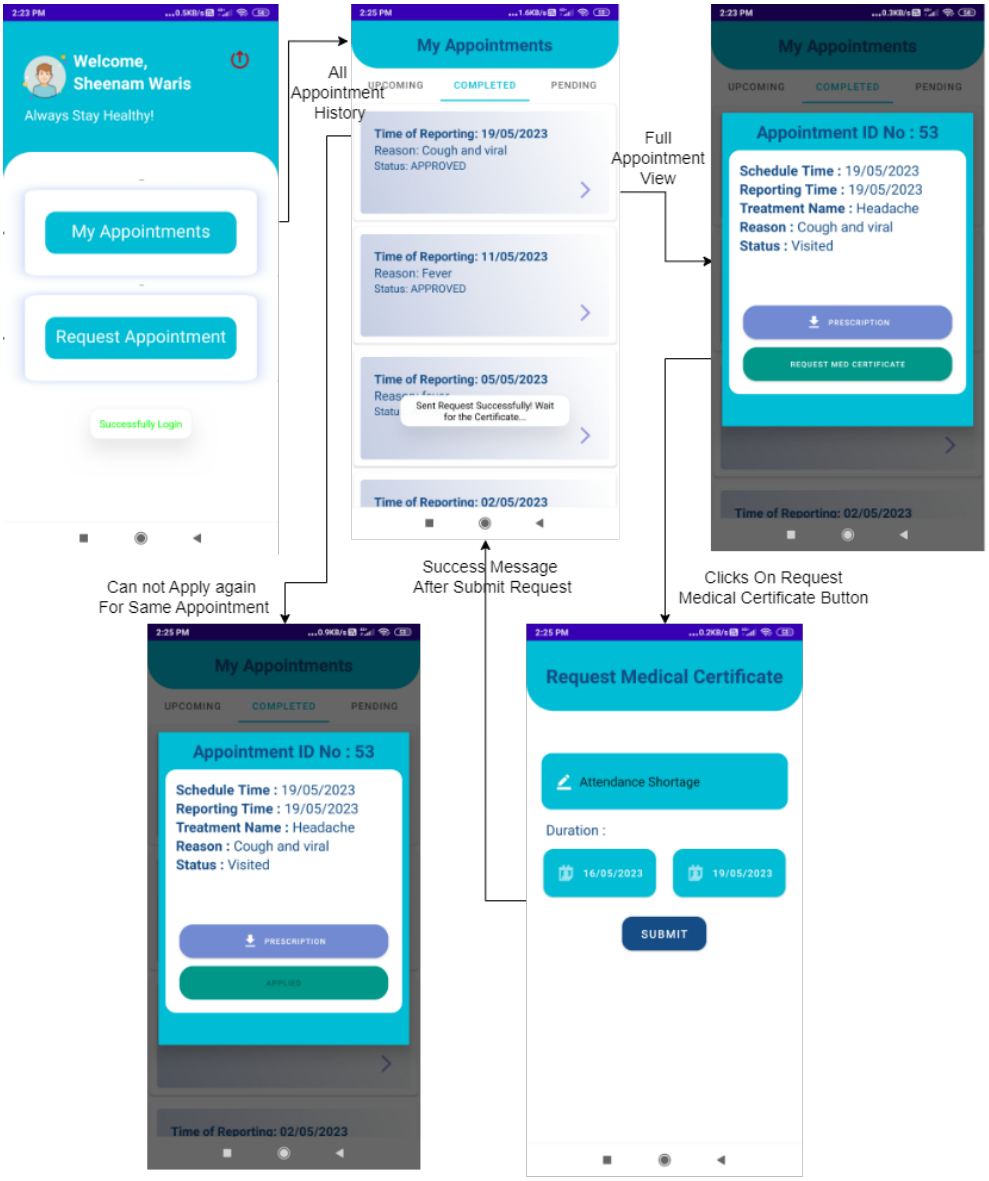
Flow of Events : Figure 4.9

- **Basic Flow -** The staff will log in to the application then click on the view patient's appointment then upload prescription's image, then click on the upload button.
- **Alternate Flow -** Staff can edit the prescription if they found out any mistakes while uploading.
- **Exceptions -** Database server is not responding.

Test Case 10 Approve Appointment Request

Flow of Events : Figure 4.8

- **Basic Flow -** The staff logged in to the application and moved to the "pending appointment" page. Here, then give approval. After successful approval the patient can consult the doctor.
- **Alternate Flow -** If the approval is not possible for some reason, then staff can also create appointment by their end



Time of Reporting: 19/05/2023
Reason: Cough and viral
Status: APPROVED

Time of Reporting: 11/05/2023
Reason: Fever
Status: APPROVED

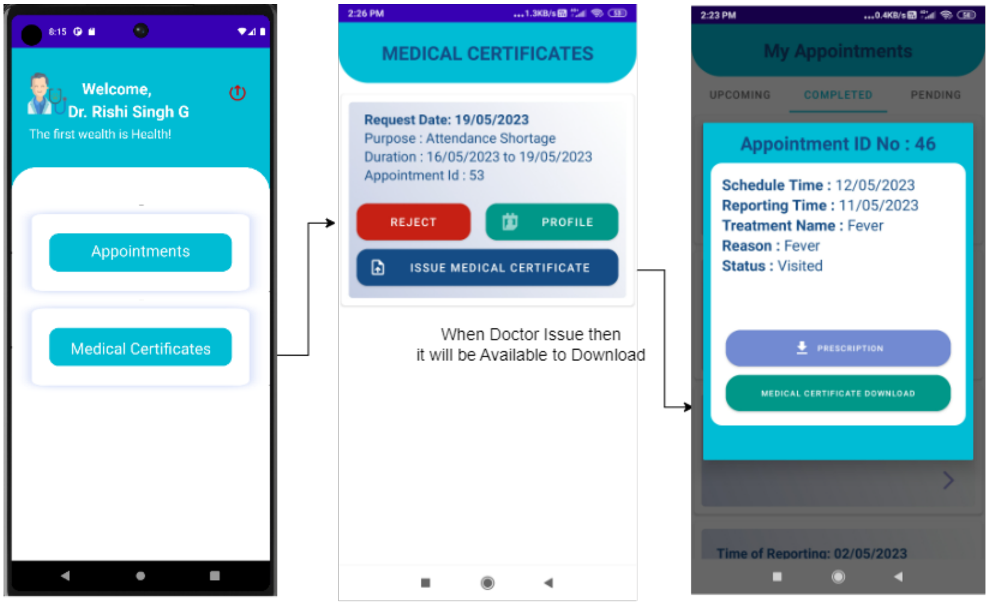
Time of Reporting: 05/05/2023

Time of Reporting: 02/05/2023

Appointment ID No : 53

Schedule Time : 19/05/2023
Reporting Time : 19/05/2023
Treatment Name : Headache
Reason : Cough and viral
Status : Visited

Figure 4.6: Student's Previous Appointment History UI



Welcome,
Dr. Rishi Singh G
The first wealth is Health!

Request Date: 19/05/2023
Purpose : Attendance Shortage
Duration : 16/05/2023 to 19/05/2023
Appointment Id : 53

When Doctor Issue then
it will be Available to Download

Appointment ID No : 46
Schedule Time : 12/05/2023
Reporting Time : 11/05/2023
Treatment Name : Fever
Reason : Fever
Status : Visited

Time of Reporting: 02/05/2023

Figure 4.7: Doctor Issue Medical Certificate UI

Test Case 11 New Appointment Request

Flow of Events : Figure 4.8

- **Basic Flow -** The user first login to the application and then move to the book appointment page then according to his illness problem will select the option and then describe his problem in the textbox and visit date after click on the ”Request appointment” button. Users can visit when appointment booking is approved by staff.
- **Alternate Flow -** If the student was not able to book then staff can book new appointment whenever student visits.

Test Case 12 View Current Day’s Scheduled Appointment

Flow of Events : Figure 4.9

- **Basic Flow -** The Doctor/staff logged in to the application and moved to the ”new appointment” page. Here, views all current scheduled appointment.

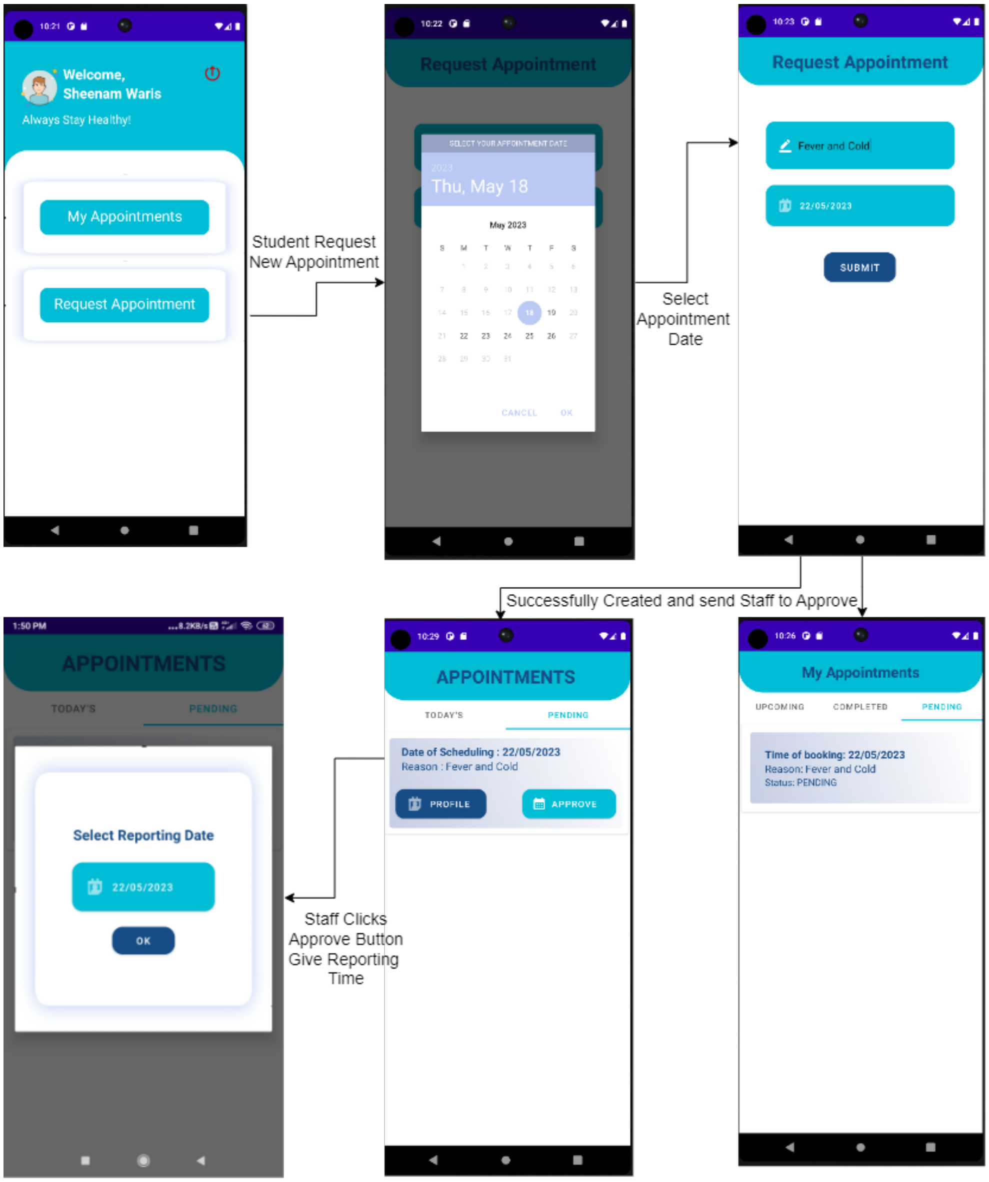


Figure 4.8: Request and Approve Appointment UI

- **Alternate Flow -** None.

Test Case 13 Request Medical Certificate

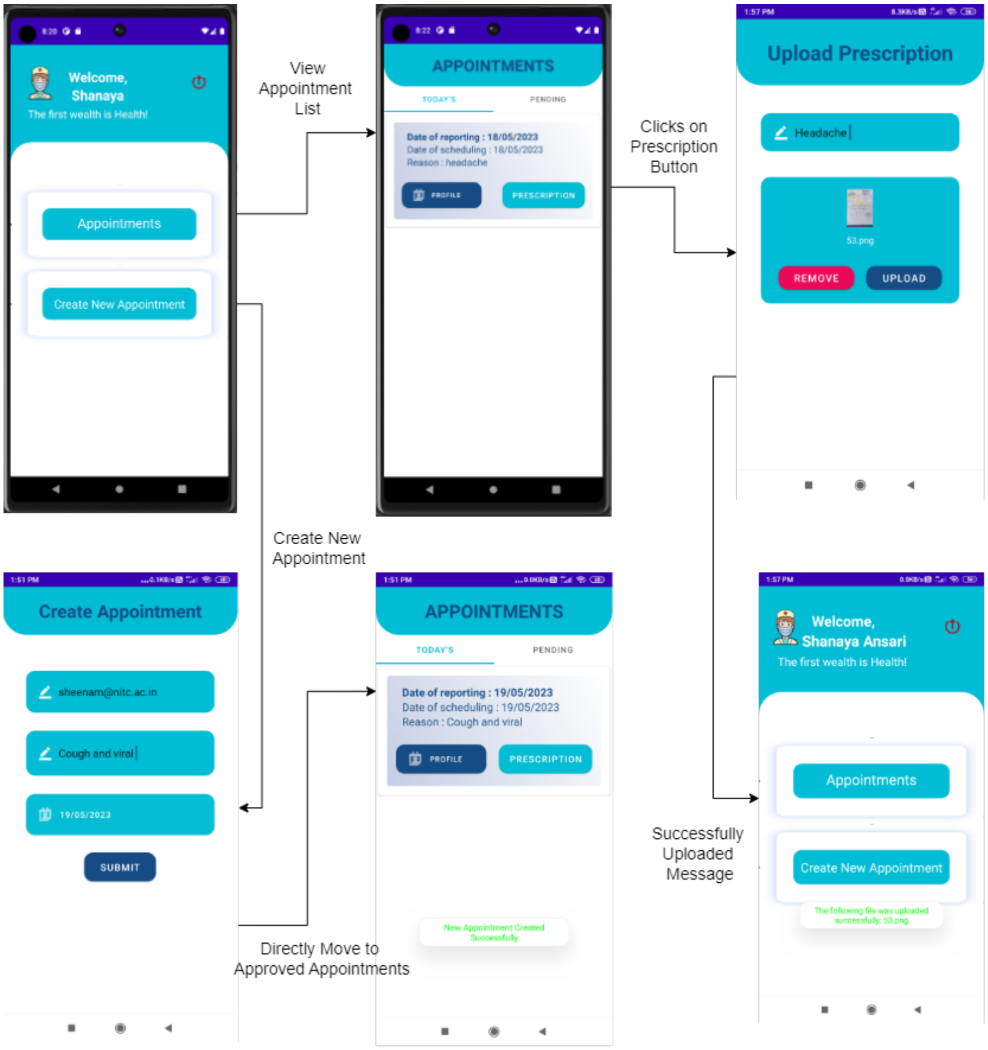
Flow of Events : Figure 4.6

- **Basic Flow -** The user will login to the application then move to the " Completed Appointment history" page. Then they can request medical for respective appointment.
- **Alternate Flow -** If in the verification some faults occur in his documents then he again needs to submit the request with correct purpose or duration. .

Test Case 14 Update Student Profile

Flow of Events :

- **Basic Flow -** The user will login to the system. He/she view his record then selects update details. Now user may change the necessary fields. Popup of update details.
- **Alternate Flow -** None.



Date of reporting : 18/05/2023
Date of scheduling : 18/05/2023
Reason : headache

Headache

sheenam@nitc.ac.in

Cough and viral

19/05/2023

Date of reporting : 19/05/2023
Date of scheduling : 19/05/2023
Reason : Cough and viral

New Appointment Created Successfully

The following file was uploaded successfully: 53.png

Figure 4.9: Upload Prescription in Appointment UI

Chapter 5

CONCLUSION

In conclusion, the development of the Health Centre application with the admin and user modules has successfully addressed the needs of the healthcare system. The application provides a comprehensive set of functionalities for both admin and users, including doctors, staff members, and patient (NITC students). The necessity of the institute is to provide a transparent system which can create a safe and healthy environment that promotes the well-being and productivity of their employees and students.

5.1 Future Work

Although the Android application provides a solid foundation for efficient healthcare management. Some suggestions for future work include:

- **Integration of additional modules :** This would further streamline the overall healthcare workflow and enhance the user experience.
- **Integration of notifications :** Implement a notification system within the application to alert users about upcoming appointments, prescription updates, and important announcements. This feature would improve communication and help users stay informed.

References

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[4] Google Authorization API *https://developers.google.com/identity/protocols/oauth2*. (Accessed 19 May 2023)

[5] Prisma Client : Database Client for Node.js *https://www.prisma.io/client*. (Accessed 23 May 2023)