1. **Project Title :** Health Information system

2. **Project Summary :**

   A major challenge in the healthcare industry is timely treatment of students and other patients. Moreover, during the testing times of pandemic, receiving relevant observation and reservation of equipment becomes altogether laborious. Thus, giving rise to the utmost requirement of a system connecting patients to hospitals, doctors and blood banks, thereby shortening the time taken between identification and treatment which would otherwise have been the difference between life and death.

   Effective health care requires that students have timely access to it. In conflict settings, such access may be delayed, limited, or even impossible, which could result in unforeseen scenarios. Thus, giving rise to the utmost requirement of a system connecting patients to hospitals, doctors and blood banks which would eventually assist in providing timely guidance and arrangements. This forms the basis as well as the prime motive for creating this project, i.e. to minimize the time of delayed treatment of patients and improve functional performance, quality of life and survival.

   The core functionality consists of providing the users a platform to connect with doctors, book, schedule and analyze their appointments, search for nearby hospitals, book beds and donate blood which would be highly valuable for the students urgently requiring it. Also students will have an option to opt for external insurance.

   The aim of this project is to minimize the time of delayed treatment of patients and improve functional performance, quality of life and survival.

3. **Description:**

   Demanding and unsparing times caused by non-chronic and chronic diseases have resulted in the needy not being able to access appropriate medical services. Thus, giving rise to the need of creating a Health Care System, catering to the medical needs and emergencies of students which can result in timely treatment thus saving multiple lives. The students must be able to find the hospitals and doctors according to their needs and be able to donate blood as well as request for it during requirements. The prime objective should be to

enable students to avail medical needs in time and enable patient information access to universities and officials, thus saving multiple lives.

4. **Usefulness**: The website attempts to aid users/ students get required medical attention as soon as possible. It allows the users to find the nearest hospital and also book a bed at the hospital using the portal. It also helps them get access to blood from different blood banks. Moreover, universities can get access to student records. This makes tracking immunization records, appointments, blood groups and health insurance easier. Lastly, doctors can take appointments with patients and approve/dismiss their immunization records. In the future, a feature can be added where doctors can prescribe drugs to patients directly via the portal and send those prescriptions to different medical stores near the user.

5. **Realness**:

   Datasets will be needed for entities such as Students, Hospital, University, Doctors, Blood banks.
   Student data required is name, address, contact number, emergency contact details and university.
   University data required is name, address, contact details, student data.
   Blood Bank data required is name, address, contact details, blood_availaibility.
   Doctor data would be the same as student data, the only difference being, an additional field describing the type of doctor.
   Hospital data would comprise the hospital name, contact details, address, number of beds available.

   The current plan would be to find a random dataset on the internet available, which is similar to the schema required, from sites like Kaggle, Data.gov, Datahub.io, HealthData.gov or other healthcare datasets provided by hospitals.

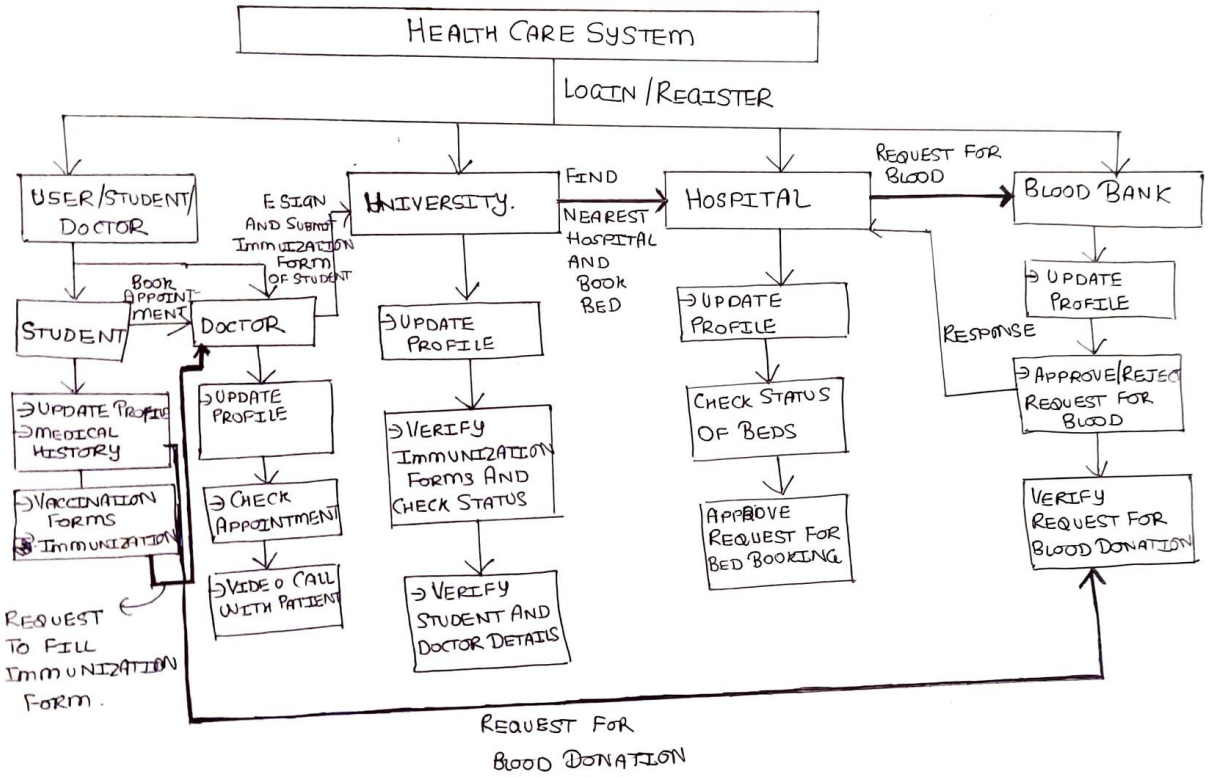
   Second possible option is to generate data ourselves with the right schema and comparable to real world data. This option is considered in cases where we have not found the dataset online, does not contain the right schema or limited data available.

6. **Description of functionality that the website offers:**

   The basic functionality of the project involves creating a health care portal which is linked to universities, hospitals, and blood banks. The basic workflow of the website is as shown in the flowchart below. Upon visiting the website, the login

page has four different types of login namely, User Login, University Login, Hospital Login, Blood Bank Login.

Website Flowchart Diagram:



User: Whenever a new user visits the website, the user would need to register as either a student or a doctor. If the user registers as a student, the student's profile would be linked to the respective university that the student is associated with. The student's roll number would be verified using the University's student

database and if a match is found, the registration would be approved. After registering, the student can login using the assigned credentials and subsequently the student/ user can update the profile, update the medical history, upload vaccination certificates on the respective university portal linked to the website. The user/student can also book appointments with doctors depending on their needs. A user can book an appointment with any doctor, however a student would be able to book an appointment only with doctors associated with the university. A student can also request a doctor to fill the immunization form on the portal and electronically sign it, which would get automatically submitted to the university once signed.

A doctor can also get himself registered to the portal using the user registration wherein there will be a boolean specifying whether the user is a doctor or not. A doctor can also associate himself to a particular university or a particular hospital or work independently as a private doctor. These options would be available during the time of registration. If the doctor decides to associate himself to a particular hospital or a university, the credentials will first be verified using the hospital and the university databases and then the registration would be approved. The doctor can check his schedule on the portal, and also if comfortable, can conduct video calls with the patient using the portal itself.

Both, a student and a doctor would be able to donate blood to a particular blood bank, by sending a request to the blood bank through the portal. The blood bank would then check the medical history of the user/doctor through the portal and would then respond regarding the approval of the request.

University: A particular university can login to the portal and check the medical status of the students associated with it, the student history of doctor appointments and also verify the online immunization forms. If the University finds a discrepancy, it can send a message to the student regarding the same.

In the case of an emergency, where a student needs to be admitted to a hospital immediately, the portal aids with that by finding the nearest hospital and allowing the university to contact the hospital and book a bed depending on the availability. Moreover, the university can also lookup the blood group of the student and order required units of blood from the blood bank.

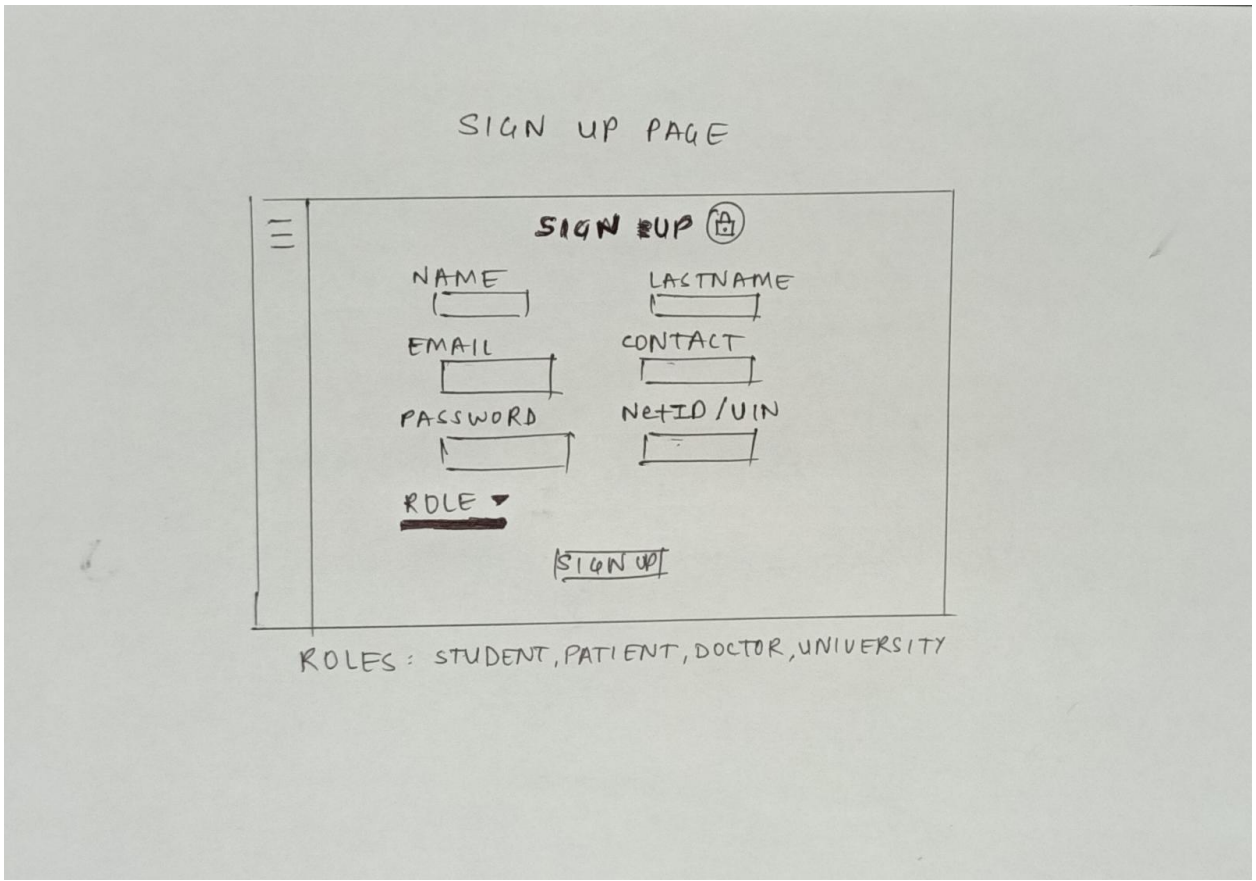
Hospital: On the hospital side of the portal, the hospital can update the current status of the beds and emergency rooms and update the details on its profile. The hospital can request a blood bank for blood using the portal wherein the

hospital would be needed to upload the medical history and current status of the patient on the portal.

Blood Bank Using the portal, the blood bank would be able to view the requests for blood donation and approve or reject them. It would also be able to fulfill a hospital's demand for blood by verifying the patient and the hospital details.

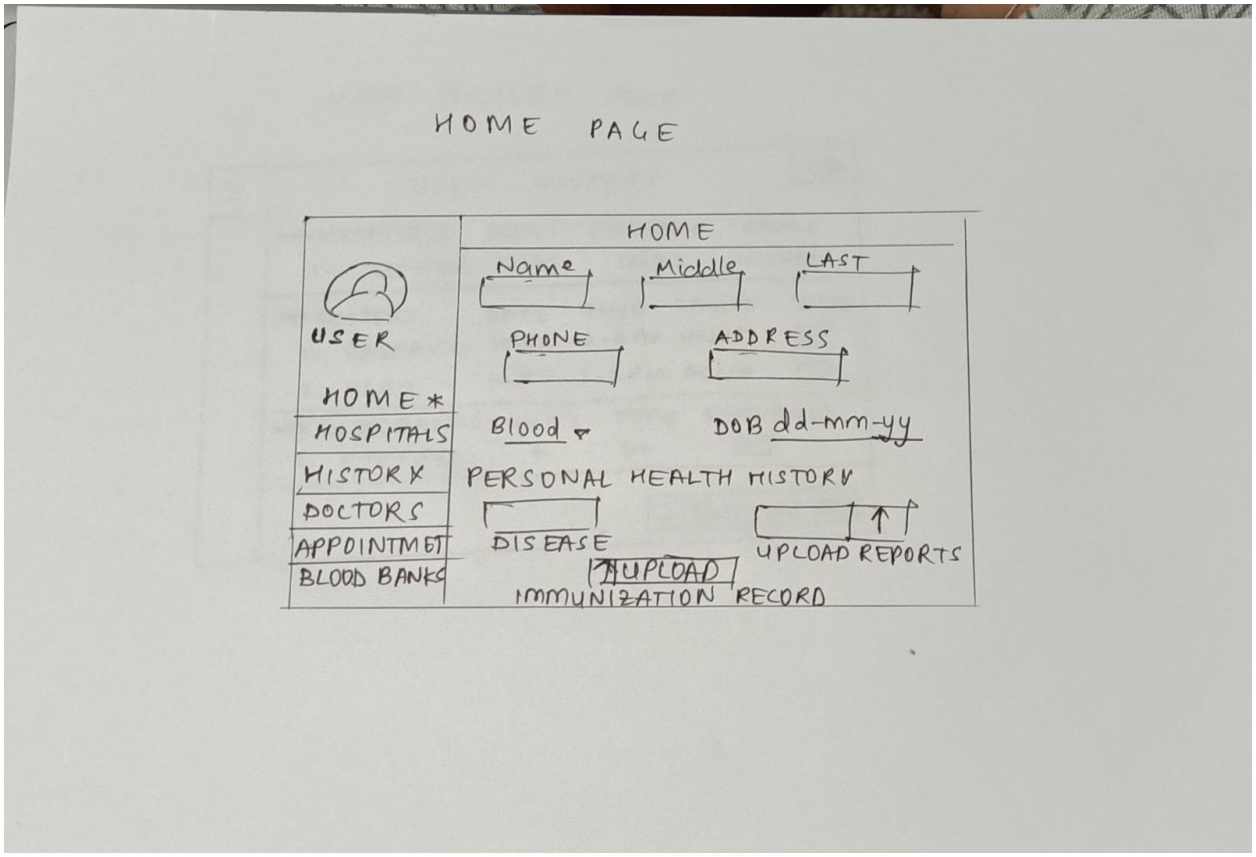
An additional creative feature which could be included in the portal, would be to allow universities or users to book an ambulance, in the case of an emergency and subsequently be assigned the nearest available ambulance. The status of the ambulance could also be tracked using the portal, basically trying to create an Uber for ambulances.

7. **UI Mockups**
    - **Sign Up Page :**
      Here the user can choose their role as Student, University or Doctor.

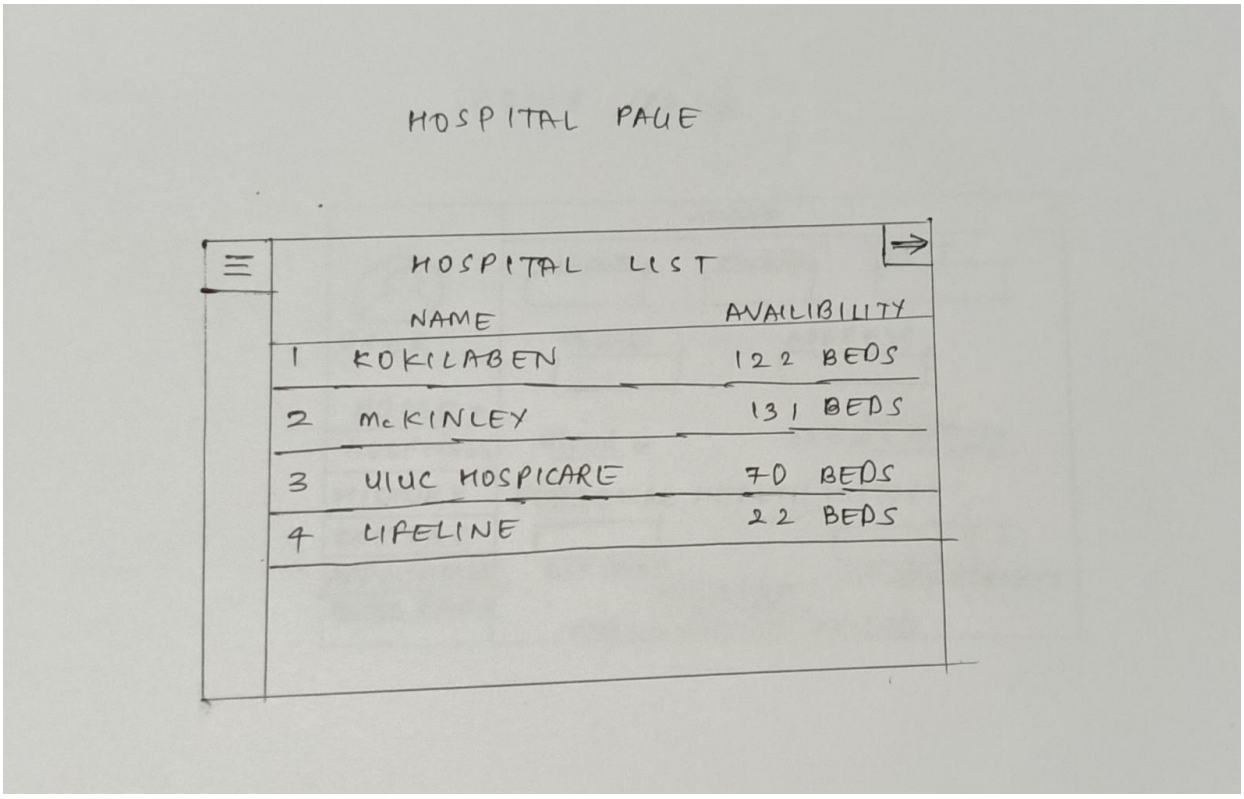


    - **Student/Patient Landing Page :**

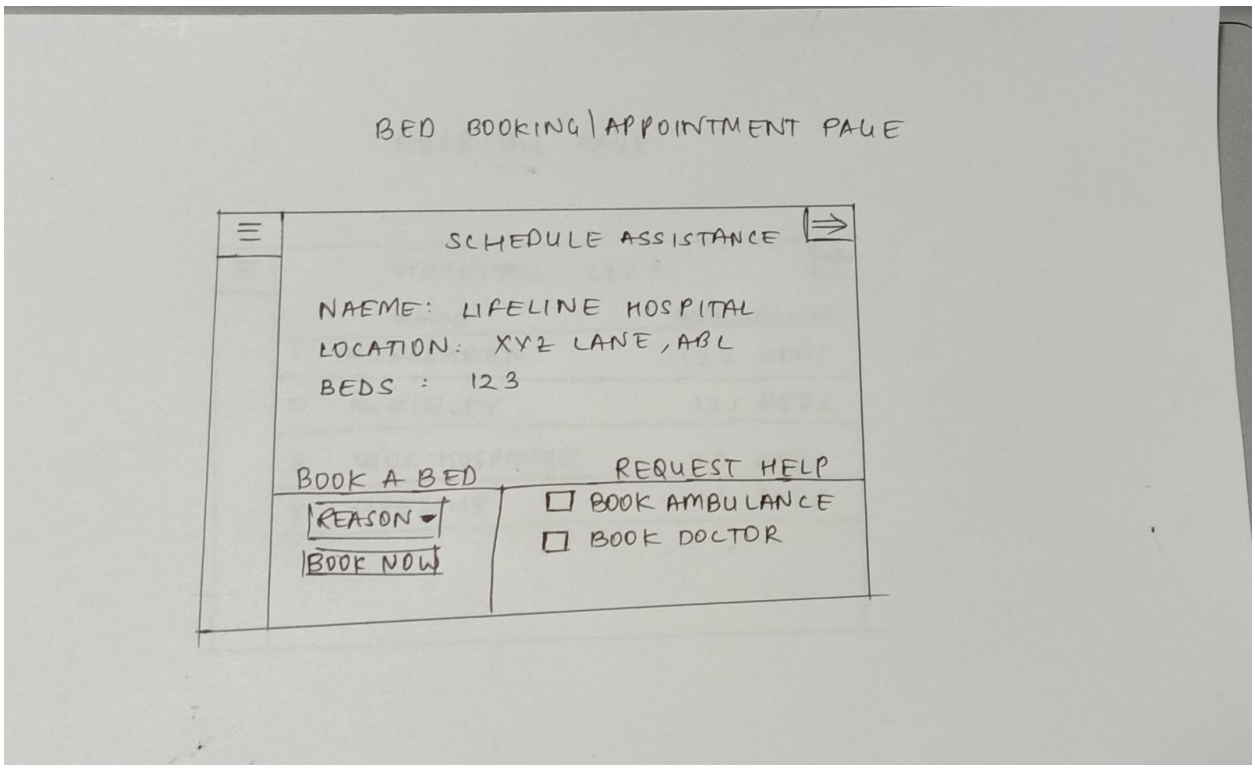
Here, the user can edit/update their personal information and health records.



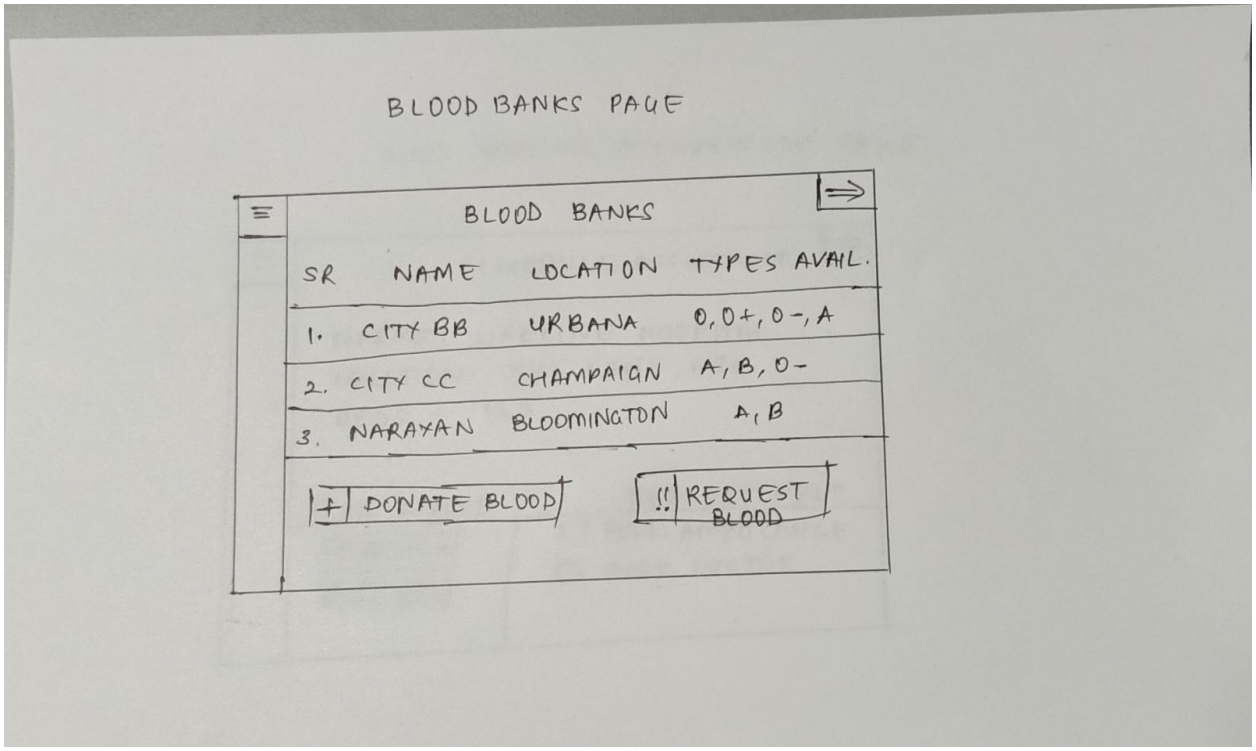
- **Hospital List Page :**
  Here the user can browse all the hospitals that have beds available.



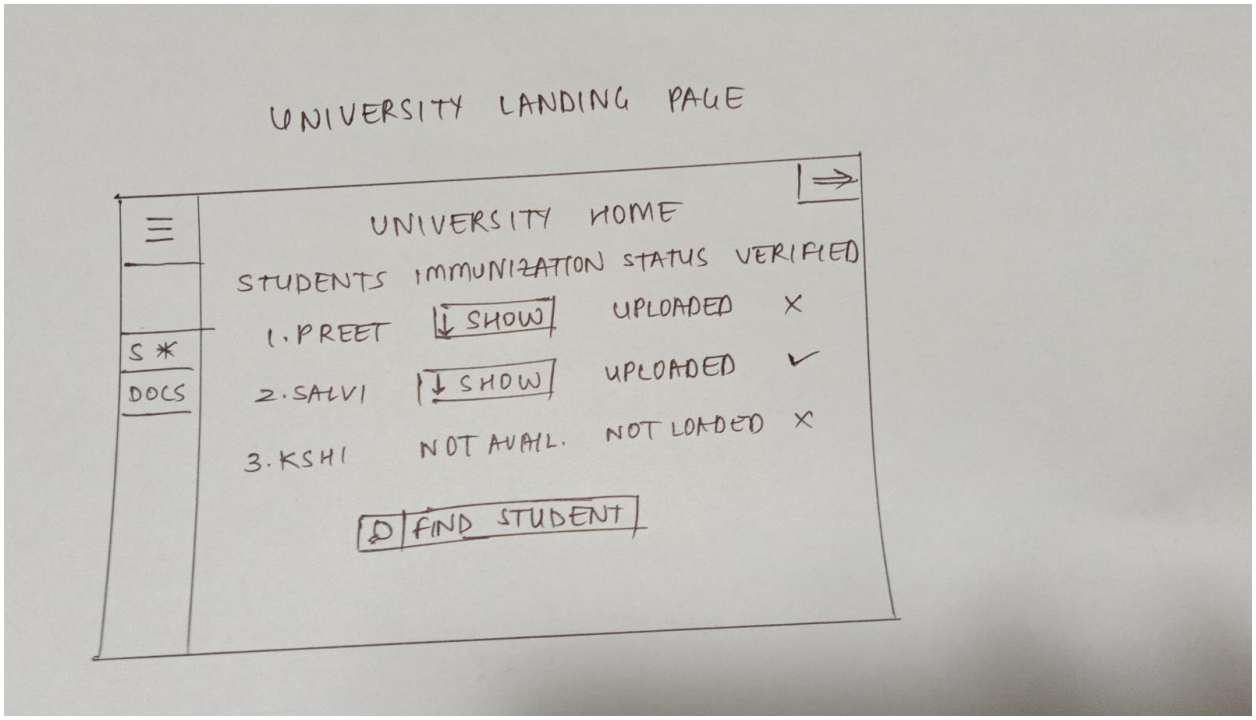
- **Bed Booking / Appointment Booking Page :**
  Here, the user can book a bed or request an ambulance.



- **Blood Banks Page :**
  Here the user can view all the blood banks and blood groups available.

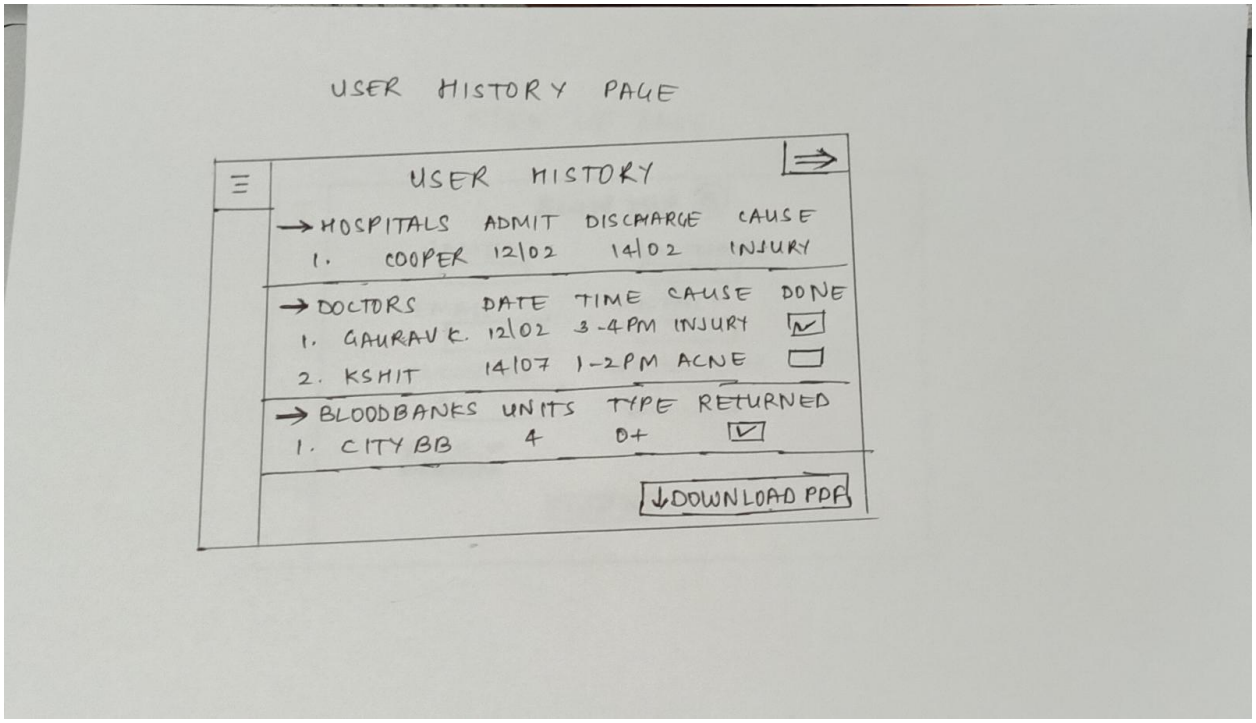


- **Patient Appointment Page :**
  Here, the user can view and update all their appointments with doctors and hospitals.



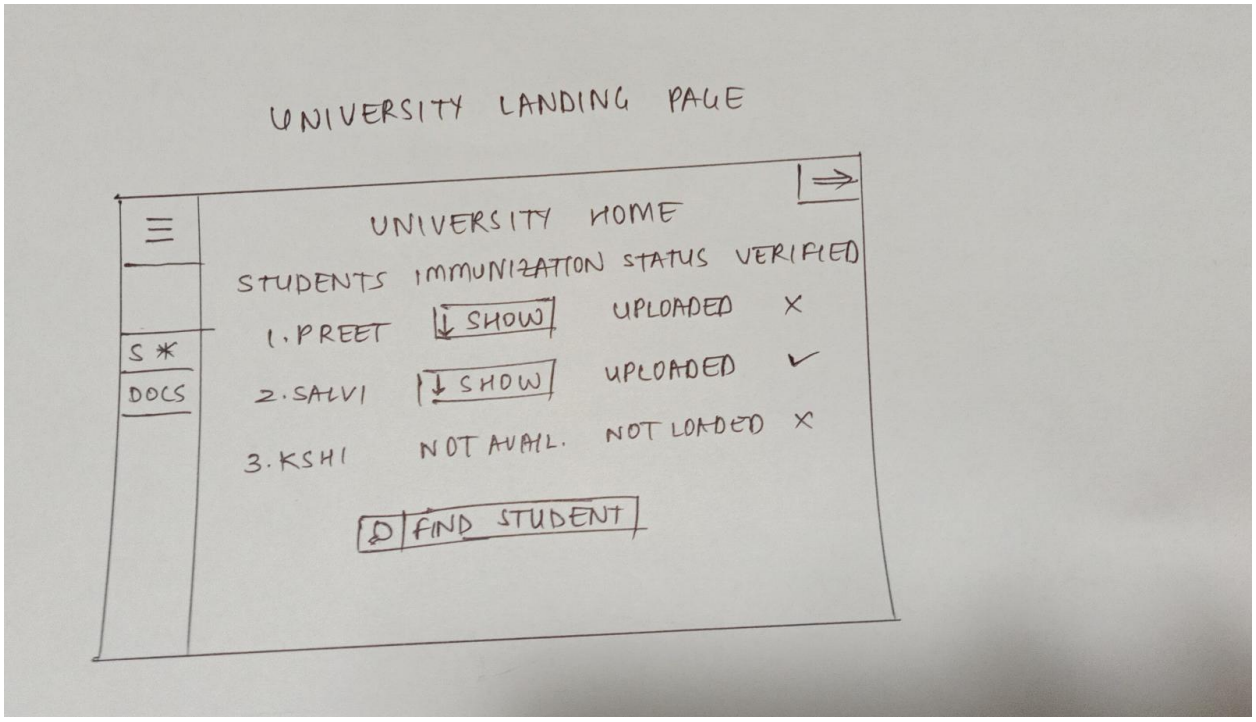
- **User History Page :**

Here, the user can view all the past records and activity associated with doctors, blood banks and hospitals.



- **University Landing Page :**

Here, officials from the university can view student and doctor records. They can browse immunization records and health insurance related information.



8. **Project work distribution**:

Preet Sanghavi (NetId: ps72):
His main role in the project consists of 2 major tasks -

a. **Dataset collection/generation and Cleaning** -
    i. Searching for available datasets which are particularly relevant to this project.
    ii. Cleaning dataset by fixing/removing unwanted, corrupted or irrelevant data.
    iii. Data generation or preparation in case there are no available datasets or lack of data.
b. **Conceptual and Logical database design -**
    i. Deciding all the minor and major functionalities of the system.
    ii. Creating the conceptual database design using ER/UML diagrams.
    iii. Providing all necessary assumptions for the ER/UML diagrams.
    iv. Converting this conceptual database design to its equivalent logical database design (Relation Schema).

v. Providing appropriate format and necessary indications for the Relational Schema

Siddharth Salvi (NetId: ss184) :
His main role in the project consists of 2 major tasks -

a. **Database implementation and Indexing -**
    i. Responsible for creating Database Tables and Columns.
    ii. Querying using DDL, DML, DCL and TCL commands necessary for project implementation.
    iii. Creating complex or advanced queries necessary.
    iv. Creating stored procedures or triggers if necessary.
    v. Finally, responsible for Database Indexing.
b. **Functional Improvements and Frontend development -**
    i. Responsible for providing improvements or feedback for the system.
    ii. Responsible for creating the User Interface of the Project.
    iii. Optimizing user-interaction for Database Admin and End users.
    iv. Testing and maintaining each component of the frontend.

Sristi Ingleshwar (NetId: sristii2) :
Her main role in this project consists of 2 major tasks -

a. **Database implementation and Indexing -**
    i. Responsible for creating Database Tables and Columns.
    ii. Querying using DDL, DML, DCL and TCL commands necessary for project implementation.
    iii. Creating complex or advanced queries necessary.
    iv. Creating stored procedures or triggers if necessary.
    v. Finally, responsible for Database Indexing.
b. **Database structural integrity testing -**
    i. Verifying all components of the database, schema validation, testing tables and columns, manual testing of complex queries, stored procedures and triggers.
    ii. Functional testing using white box/ black box testing.
    iii. Load testing of the database by providing by measuring response time of the database.

Kevin Dsouza (NetId: kevind8):
His main role in the project consists of 2 major tasks -

a. **Conceptual and Logical database design** -

i. Deciding all the minor and major functionalities of the system.
ii. Creating the conceptual database design using ER/UML diagrams.
iii. Providing all necessary assumptions for the ER/UML diagrams.
iv. Converting this conceptual database design to its equivalent logical database design (Relation Schema).
v. Providing appropriate format and necessary indications for the Relational Schema

b. Database integration with frontend and Quality testing -

i. Integration of the database with the frontend.
ii. Testing each integrated component, ensuring efficient performance, response time and data persistence.
iii. Debugging the entire system for bugs or potential flaws.
iv. Also, repeat testing the Database Structural Integrity.

Along with these specific responsibilities, each member in general, is also responsible for assisting other members in case of issues or problems they face with their tasks mentioned. Also, each member is equally responsible for contributing to the demo and additional improvements to the system.