
Design Document

for

E-Vaidya

Version <1.0>

Prepared by

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Revisions

Version	Primary Author(s)	Description of Version	Date Completed
Initial Draft (v1.0)	Debuggers	Initiated the document. Added all the necessary details.	10/02/23

1 Context Design

1.1 Context Model

The system does not interact with any other pre-existing software systems neither is it supposed to be integrated with any further extensions. It is supposed to be a complete standalone software. Hence it is not expected to interact with other software systems in the environment. Thus, the context model/diagram is not applicable for the software system being developed.

1.2 Human Interface Design

The system will be accessed by all users through one website – users will log in with their accounts and be shown different pages depending on whether their account is marked as Patient, Doctor, Reception or Pharmacy.

- The Login Page

The log-in page will have a simple log-in dialog and a sign-up button. The sign-up button will replace the log-in dialog with a sign-up dialog with which Students can input their IITK emails and a password to register as patients. Doctor, Reception and Pharmacy users will have their accounts created for them by the development team.

E-Vaidya

you are a ...

- STUDENT
- DOCTOR
- NURSE
- RECEPTIONIST
- HC-PHARMACIST

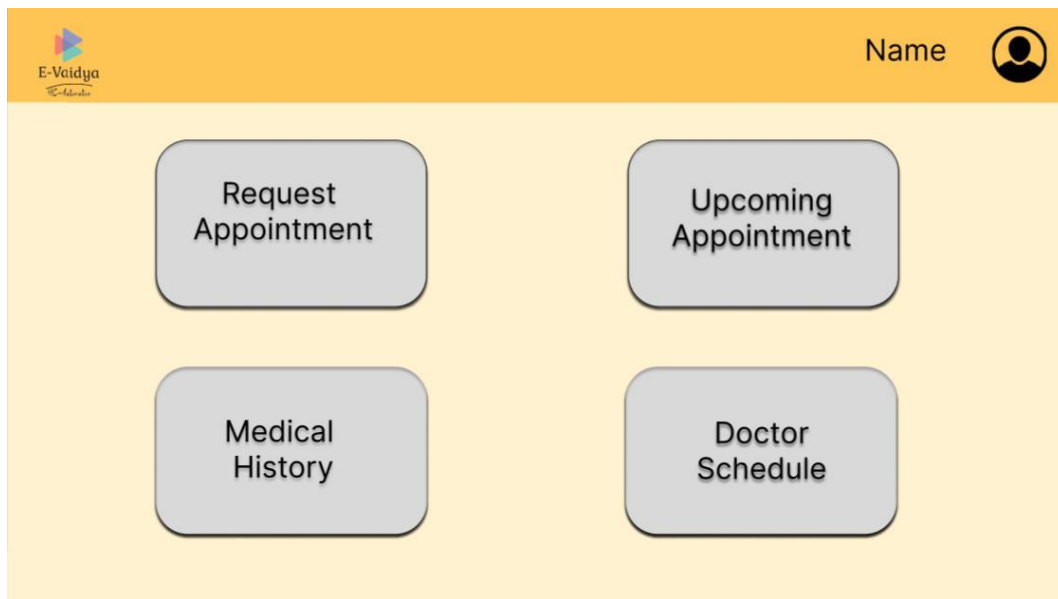
Enter User ID

Enter Password

LOGIN

doesn't have a account, sign up **HERE**



- The Patient's Page
 - Home Page



- Book Appointment Page

The image shows the "Request an Appointment" form in the E-Vaidya application. The form is set against a light yellow background. At the top left is the E-Vaidya logo, and at the top right is the word "HOME" and a user profile icon. The title "Request an Appointment" is on the left, and "Roll no. 123456" is on the right. The form contains several interactive elements: a "Preferred Slot" section with "OPD" (highlighted) and "Specialist" buttons; a "Preferred Doctor" section with "Morning" and "Evening" buttons; a list of doctor names: "Dr. AB", "Dr. ABCDEF", "Dr. ABVQOPEY", and "Auto-assign"; a "Symptoms" text input field; and a "Request" button at the bottom.

- View Doctor Schedule Page

HOME




Mr. ABCDRoll no. 123456

Table 1

Sr. No.	Doctor Name	Specialisation	Room No.
1	Dr. ABC	ABCD	A123
2	Dr. ABC	ABCD	A123
3	Dr. ABC	ABCD	A123

- Medical History

MEDICAL HISTORY

Date: 23/12/2022

Problem: fever

Doctor: Mr. Shyamalal Jedi

Date: 23/12/2022

Problem: fever

Doctor: Mr. Shyamalal Jedi

Date: 23/12/2022

Problem: fever

Doctor: Mr. Shyamalal Jedi

Date: 23/12/2022

Problem: fever

Doctor: Mr. Shyamalal Jedi

Medical History

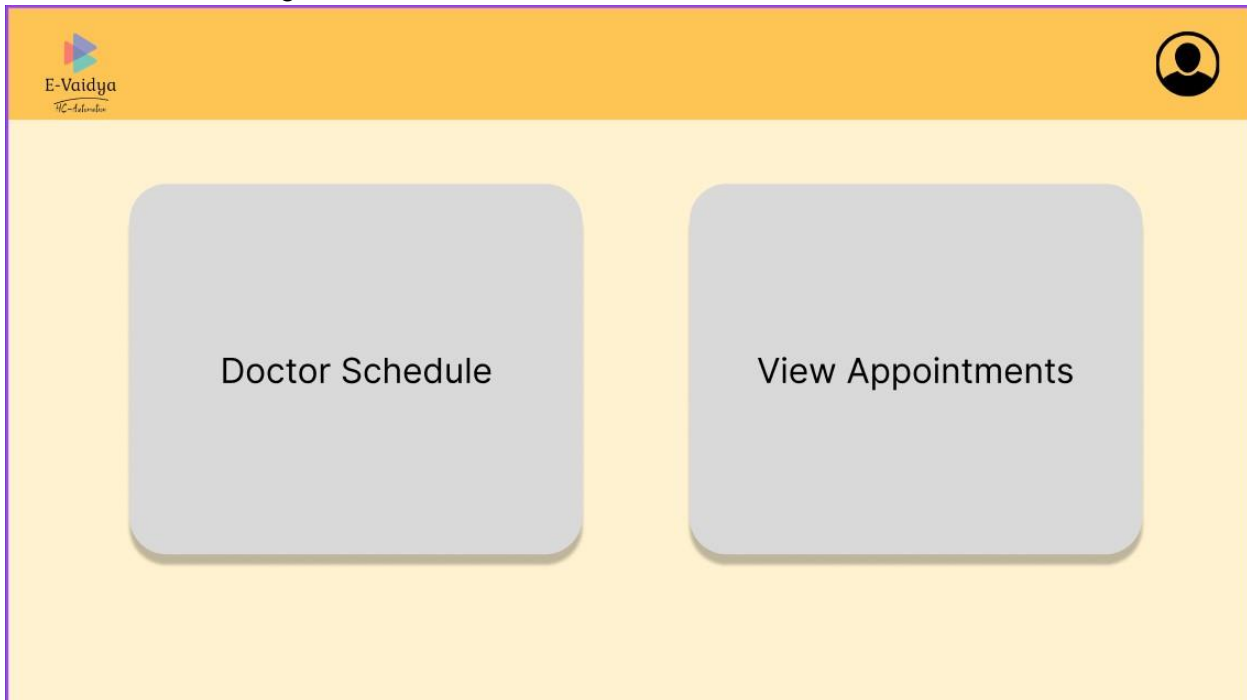
Medication:
5 days Crocin 1-0-1
5 days XYZ 1-0-0

Test Taken:
Dengue Test
PDF

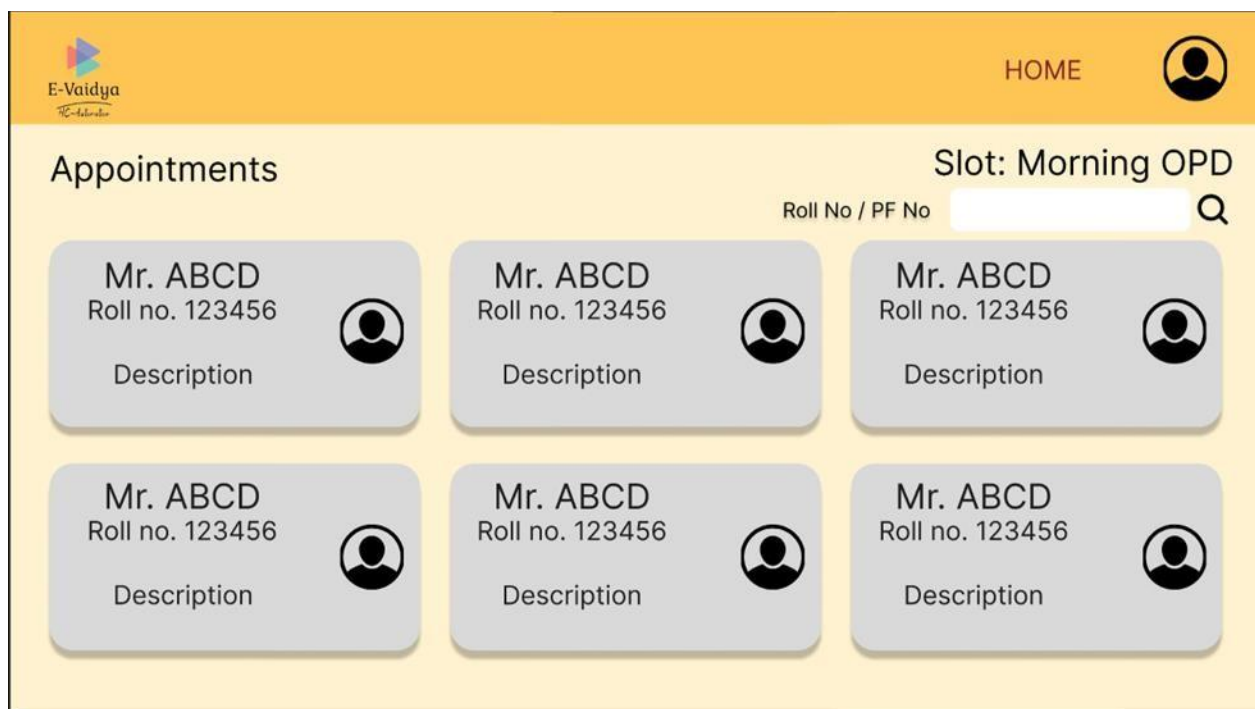
Vitals:
Temperature 102 deg F
BP 130/80 mmHg

Doctor: Mr. Shyamalal Jedi
22 Dec 22

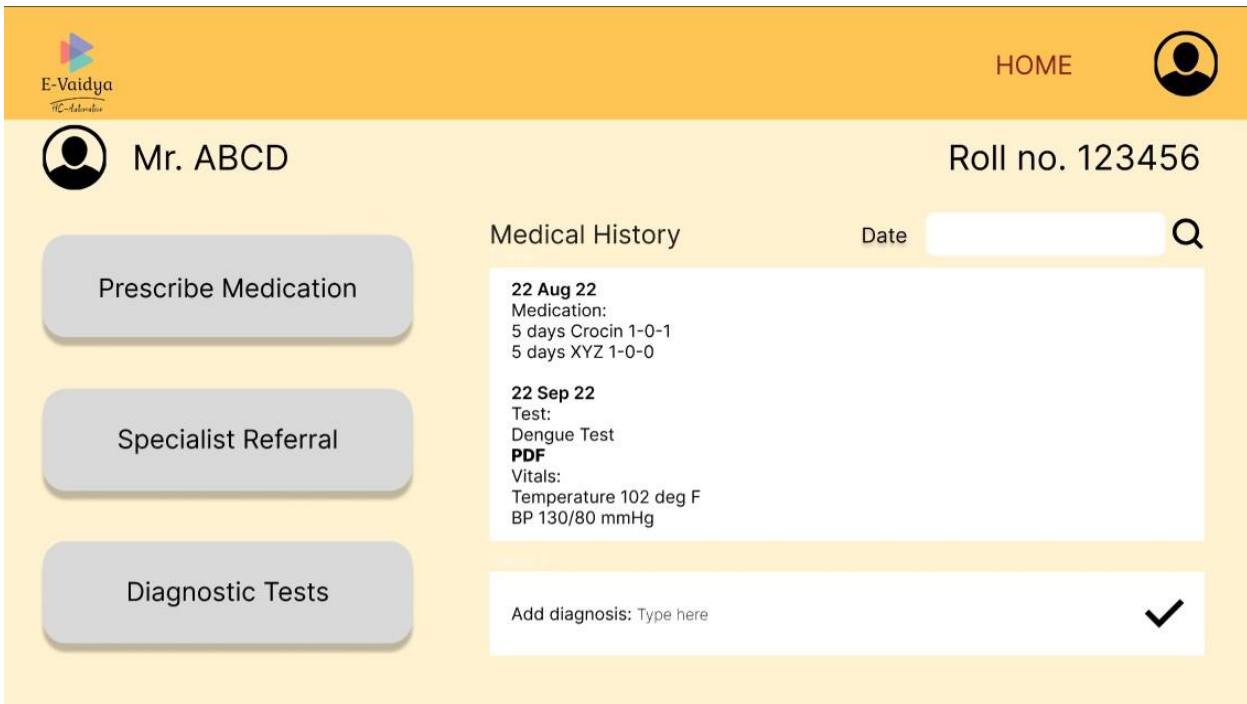
- The Doctor's Page
 - Home Page




- View Appointments Page




◦ Conduct Appointments Page



The 'Conduct Appointments Page' UI features a top orange header with the 'E-Vaidya' logo on the left, a 'HOME' link in the center, and a user profile icon on the right. Below the header, the user's name 'Mr. ABCD' and 'Roll no. 123456' are displayed. On the left side, there are three stacked buttons: 'Prescribe Medication', 'Specialist Referral', and 'Diagnostic Tests'. The main area is titled 'Medical History' and includes a 'Date' search bar with a magnifying glass icon. The history list contains two entries: one for '22 Aug 22' with medication details, and another for '22 Sep 22' with test and vital signs. At the bottom, there is an 'Add diagnosis' input field with a checkmark icon.

E-Vaidya HOME 

 Mr. ABCD Roll no. 123456

Medical History Date


Prescribe Medication

Specialist Referral

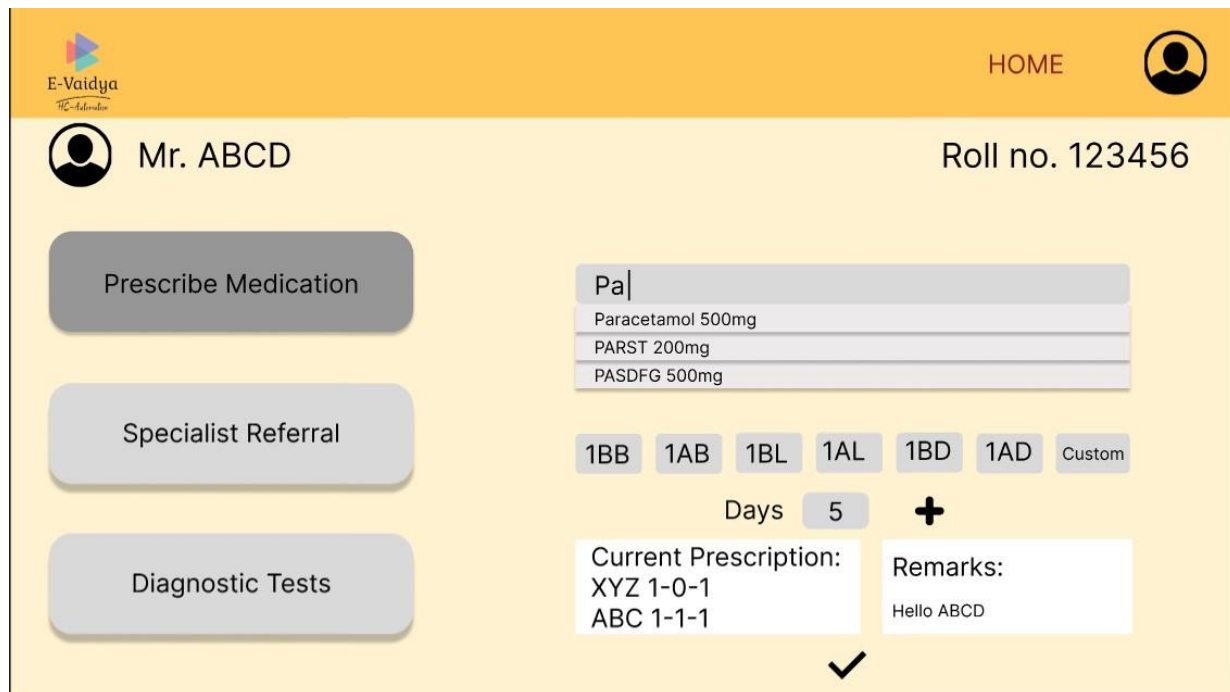
Diagnostic Tests

22 Aug 22
Medication:
5 days Crocin 1-0-1
5 days XYZ 1-0-0


22 Sep 22
Test:
Dengue Test
PDF
Vitals:
Temperature 102 deg F
BP 130/80 mmHg


Add diagnosis: Type here 

◦ Prescription Page



The 'Prescription Page' UI has a similar top orange header with the 'E-Vaidya' logo, 'HOME' link, and user profile icon. The user information 'Mr. ABCD' and 'Roll no. 123456' is shown. On the left, the same three buttons are present. The main area is for creating a prescription. It starts with a 'Pa' dropdown menu, followed by a list of medication options: 'Paracetamol 500mg', 'PARST 200mg', and 'PASDFG 500mg'. Below this is a row of frequency buttons: '1BB', '1AB', '1BL', '1AL', '1BD', '1AD', and 'Custom'. A 'Days' field is set to '5', followed by a '+' button. The 'Current Prescription' field shows 'XYZ 1-0-1' and 'ABC 1-1-1'. The 'Remarks' field contains 'Hello ABCD'. A checkmark icon is at the bottom right.

E-Vaidya HOME 

 Mr. ABCD Roll no. 123456

Prescribe Medication

Specialist Referral

Diagnostic Tests


Pa|
Paracetamol 500mg
PARST 200mg
PASDFG 500mg

1BB 1AB 1BL 1AL 1BD 1AD Custom

Days 5 +

Current Prescription:
XYZ 1-0-1
ABC 1-1-1

Remarks:
Hello ABCD

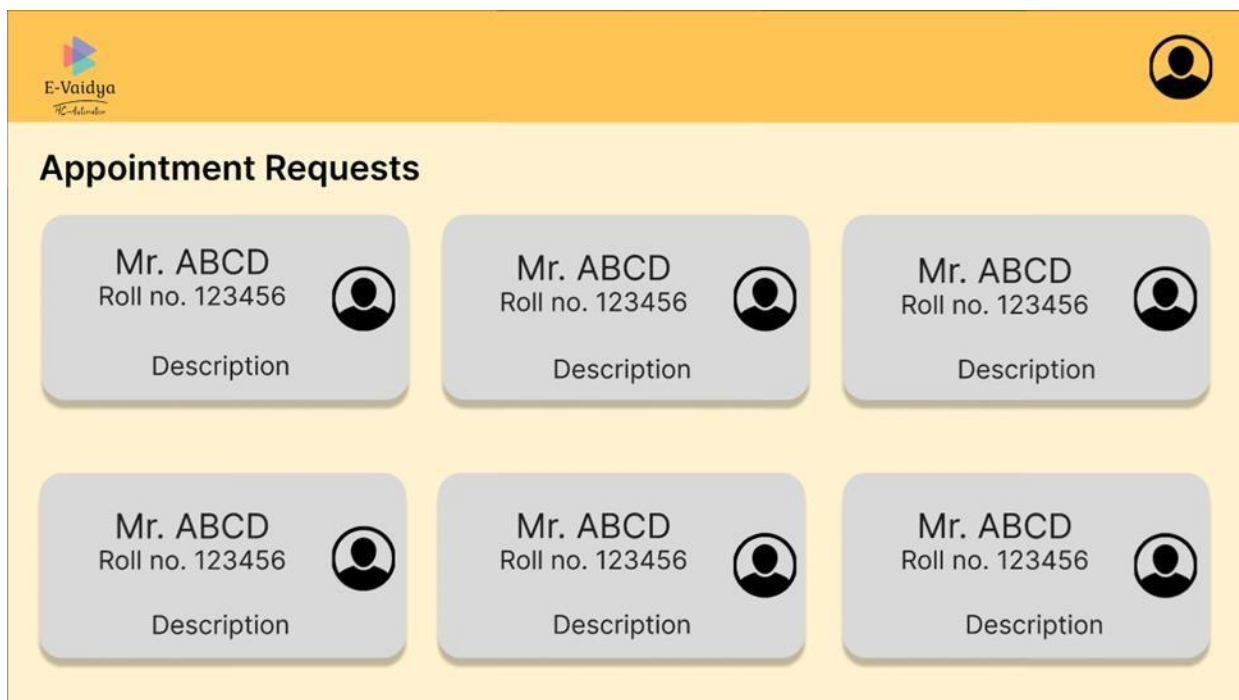


• The Reception Page

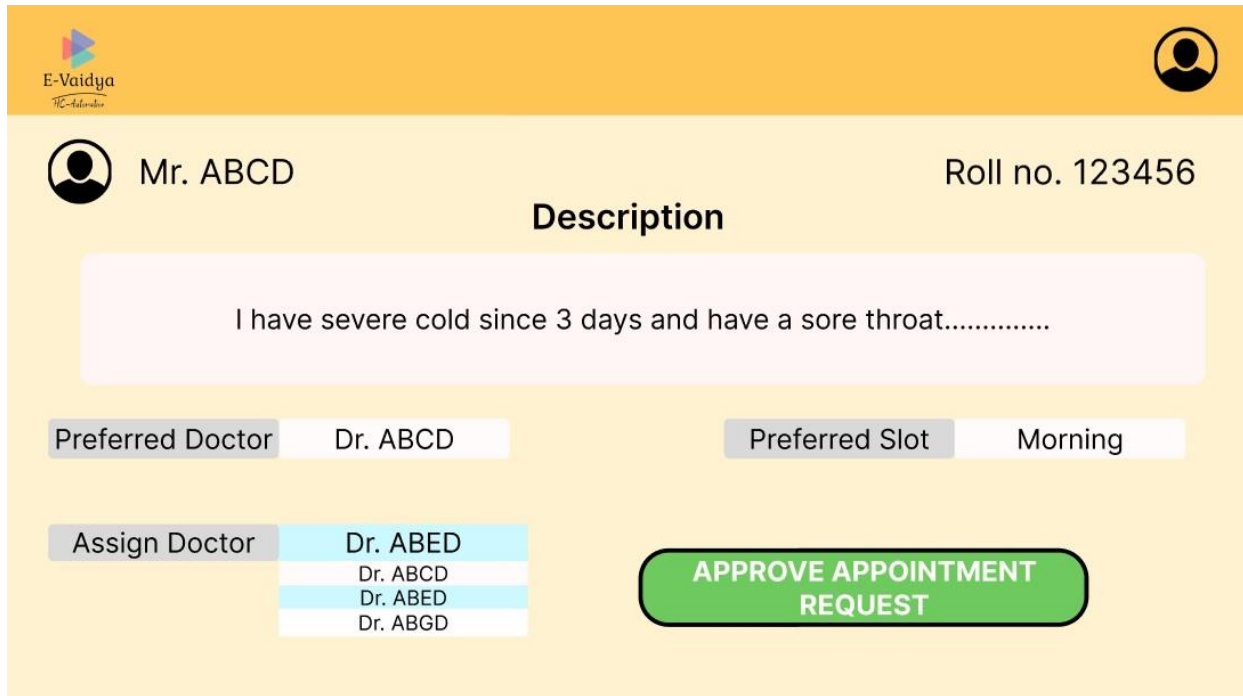
- Initial Page



- Appointment Requests Page



- Doctor Allotment Page



The Doctor Allotment Page features a yellow header with the E-Vaidya logo and a user profile icon. The main content area is divided into sections for patient information, description, and appointment options. The patient's name is Mr. ABCD and the roll number is 123456. The description field contains the text: "I have severe cold since 3 days and have a sore throat.....". The appointment section includes a "Preferred Doctor" dropdown set to "Dr. ABCD", a "Preferred Slot" dropdown set to "Morning", and an "Assign Doctor" dropdown with options "Dr. ABED", "Dr. ABCD", "Dr. ABED", and "Dr. ABGD". A prominent green button labeled "APPROVE APPOINTMENT REQUEST" is located to the right of the dropdowns.

E-Vaidya

Mr. ABCD Roll no. 123456

Description

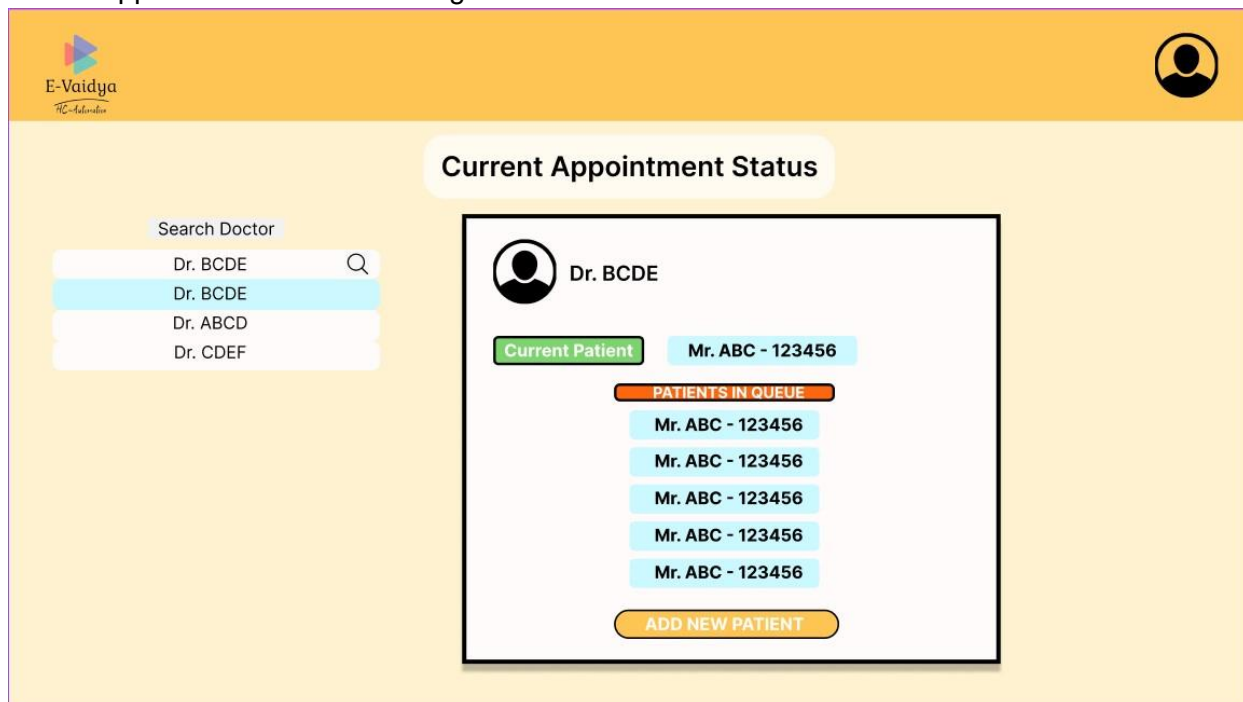
I have severe cold since 3 days and have a sore throat.....

Preferred Doctor Dr. ABCD Preferred Slot Morning

Assign Doctor Dr. ABED
Dr. ABCD
Dr. ABED
Dr. ABGD

APPROVE APPOINTMENT REQUEST

- Appointments of Doctor Page



The Appointments of Doctor Page features a yellow header with the E-Vaidya logo and a user profile icon. The main content area is titled "Current Appointment Status". On the left, there is a "Search Doctor" dropdown menu with options "Dr. BCDE", "Dr. BCDE", "Dr. ABCD", and "Dr. CDEF". The central panel displays the appointment details for Dr. BCDE, including the "Current Patient" (Mr. ABC - 123456) and a list of "PATIENTS IN QUEUE" (Mr. ABC - 123456, Mr. ABC - 123456, Mr. ABC - 123456, Mr. ABC - 123456, Mr. ABC - 123456). An "ADD NEW PATIENT" button is located at the bottom of the queue list.

E-Vaidya

Current Appointment Status

Search Doctor Dr. BCDE Dr. BCDE Dr. ABCD Dr. CDEF

Dr. BCDE

Current Patient Mr. ABC - 123456

PATIENTS IN QUEUE

Mr. ABC - 123456
Mr. ABC - 123456
Mr. ABC - 123456
Mr. ABC - 123456
Mr. ABC - 123456


ADD NEW PATIENT

- Lab Reports Upload Page


The screenshot shows the 'Upload Medical Documents' interface. At the top, there is a header with the E-Vaidya logo and a user profile icon. The main heading is 'Upload Medical Documents'. Below this, there is a text input field labeled 'Enter Roll No.' with an 'ENTER' button. A light blue box contains a user profile for 'Mr. ABCD' with 'Roll No. - 123456'. To the right of the profile is an 'Add Documents' button, followed by a file upload area showing 'Blood Sample1.pdf' with a PDF icon. Below the file area is an 'UPLOAD' button. At the bottom of the light blue box is a green 'UPDATE PROFILE' button.

- The Pharmacy Page
 - Initial Page


The screenshot shows the 'Completed Prescriptions' interface. The header includes the E-Vaidya logo and the text 'Completed Prescriptions' next to a user profile icon. Below the header, there is a section titled 'Pending Prescriptions' with a search bar labeled 'Roll No / PF No' and a magnifying glass icon. The main content area displays a grid of six prescription cards. Each card contains the text 'Mr. ABCD', 'Roll no. 123456', and 'Description', along with a user profile icon.

- 
E-Vaidya
The Holistic Approach

HOME



Dispense Medicines


Mr. ABCD

Prescription ID. 123456

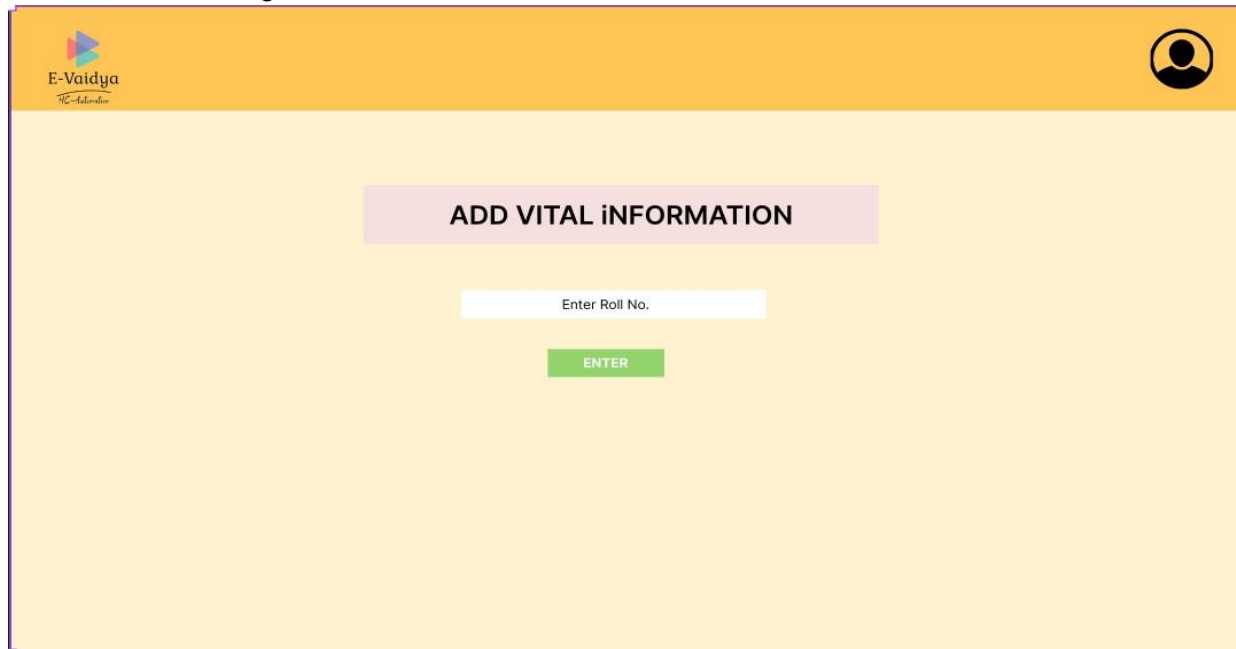
Roll no. 123456

Sr No	Medicine ID	Medicine Name	Quantity	Given
				<input type="checkbox"/>
				<input checked="" type="checkbox"/>
				<input checked="" type="checkbox"/>

Dispense

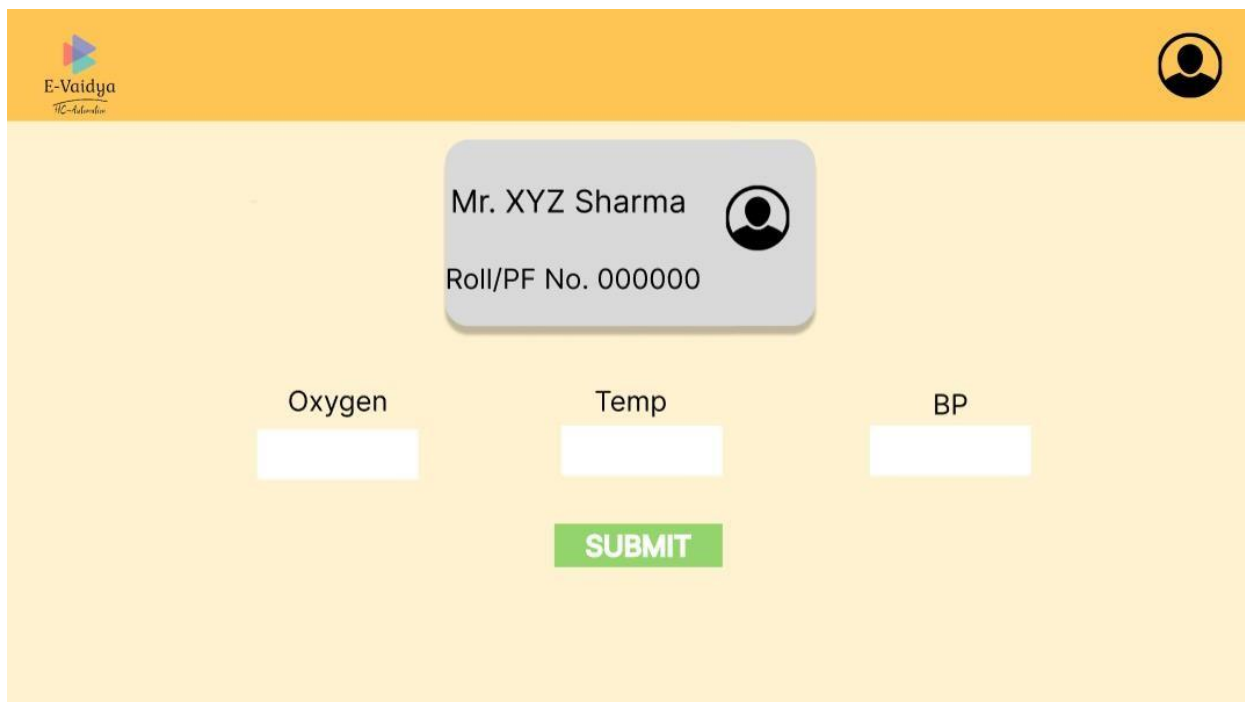
- [illegible]

- The Nurse Page
 - Initial Page



The Initial Page of the Nurse Page features a yellow header bar. On the left is the E-Vaidya logo, and on the right is a user profile icon. The main content area is light yellow and contains a pink rectangular button labeled "ADD VITAL INFORMATION". Below this button is a white input field with the placeholder text "Enter Roll No.". At the bottom of the input field is a green button labeled "ENTER".

- Vitals Page



The Vitals Page of the Nurse Page features a yellow header bar with the E-Vaidya logo on the left and a user profile icon on the right. The main content area is light yellow. In the center, there is a grey rounded rectangle containing the text "Mr. XYZ Sharma" and "Roll/PF No. 000000", accompanied by a user profile icon. Below this, there are three white input fields labeled "Oxygen", "Temp", and "BP". At the bottom center is a green button labeled "SUBMIT".

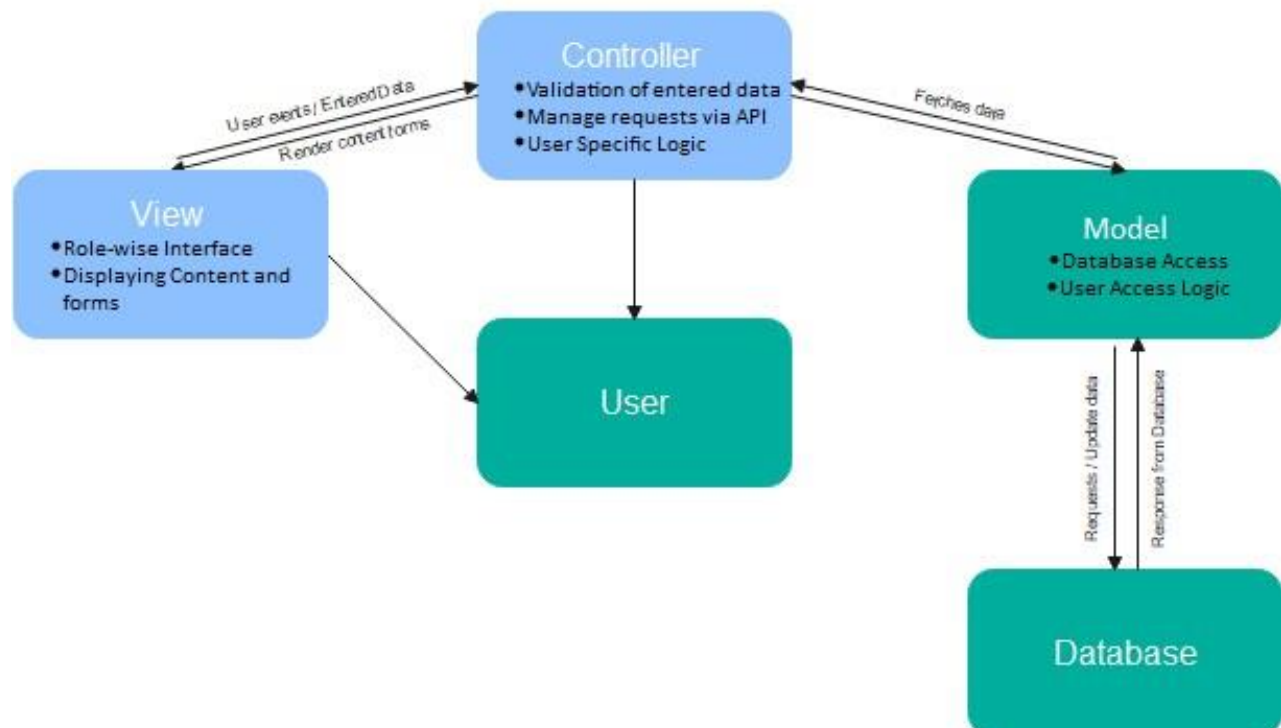
2 Architecture Design

We plan to use a hybrid of Model View Controller Architecture along with Pipe and Filter architecture.

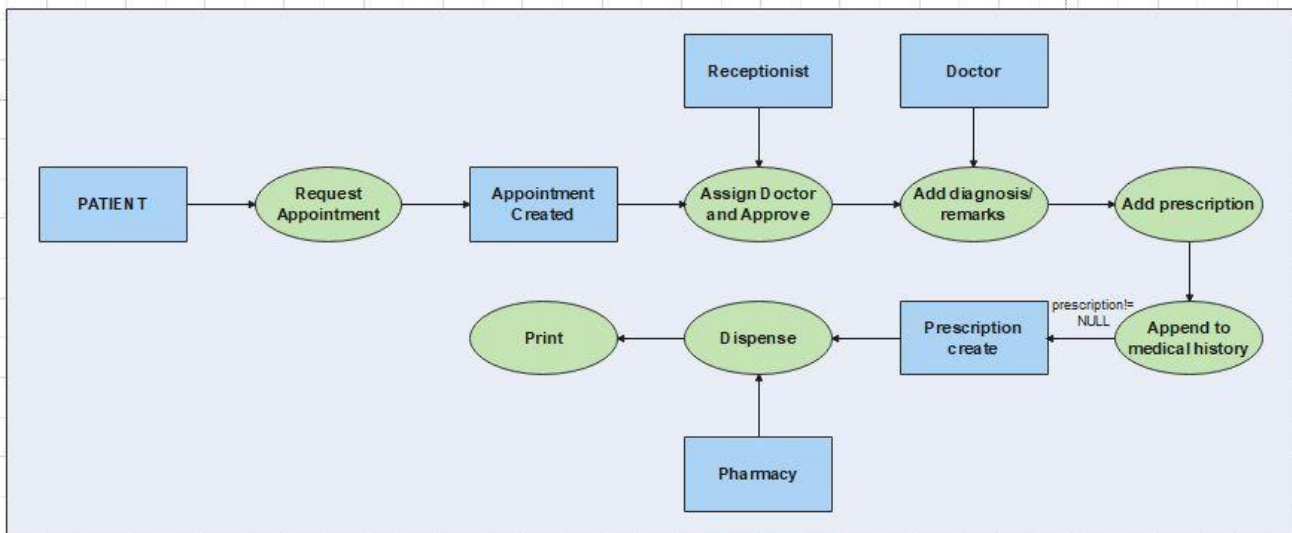
Model View Controller Architecture allows the system to display different the underlying data in different views depending on the user/role which is trying to access the system. The interaction between the users and the system is streamlined and the controller ensures that the data entered by the user is correct. The controller also implements the user specific logic. The model is responsible for implementing the user access control and communication with the database. Thus this architecture allows implementation of various functional requirements such as role-dependent views and functions. It also ensures that the system's privacy/security related non-functional requirements are fulfilled.

The processes of requesting, scheduling and conduction of an appointment, and the processing of a prescription necessitate the use of a pipe and filter architecture, because the appointment/prescription object created are acted upon by a number of functions by various users. The result is finally appended to the medical history of the patient. For the implementation of this flow of data from a source to sink, the pipe and filter architecture is well suited.

ARCHITECTURAL DESIGN

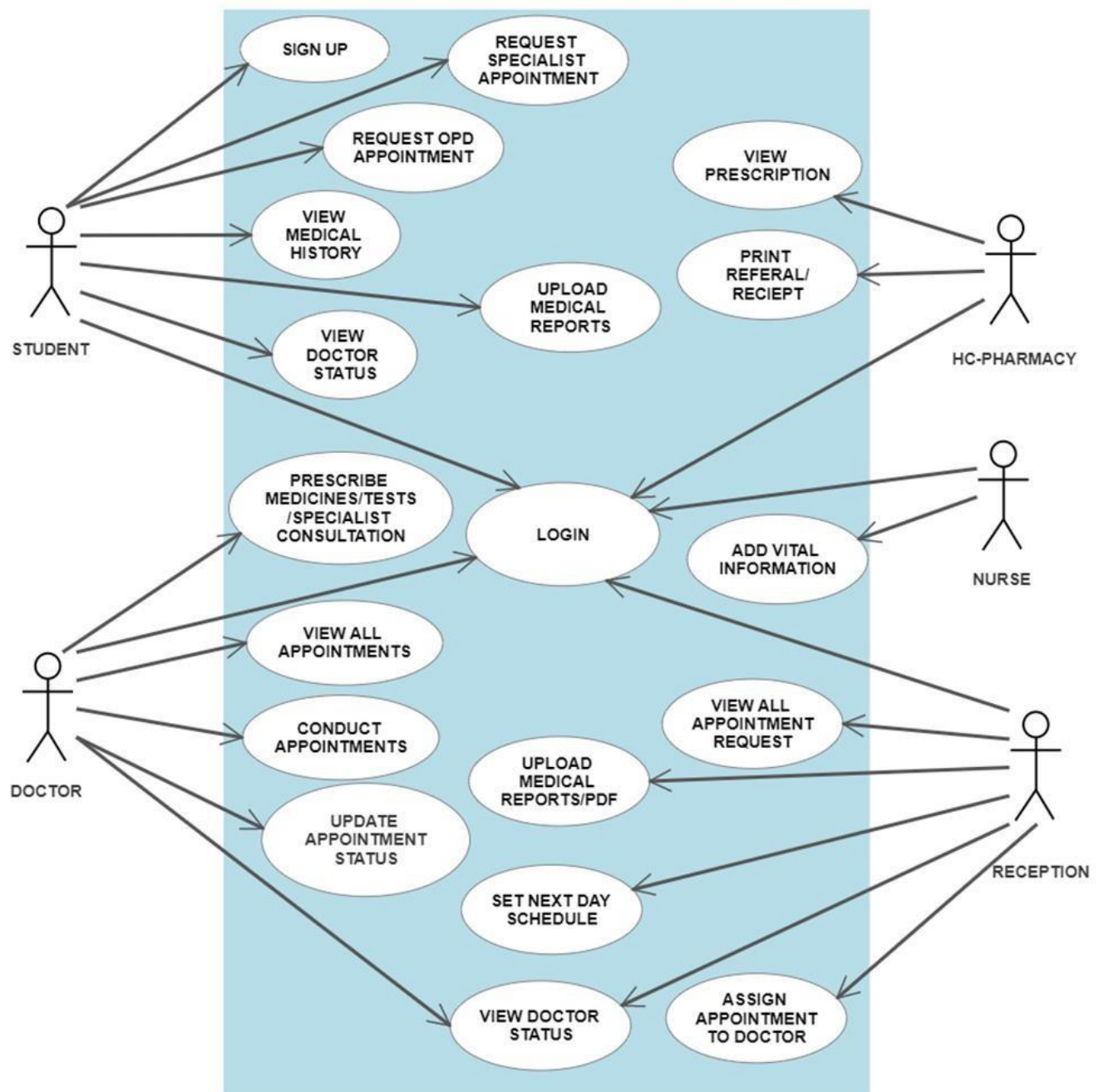


Pipe and Filter Architecture for Appointment and Prescription processing:

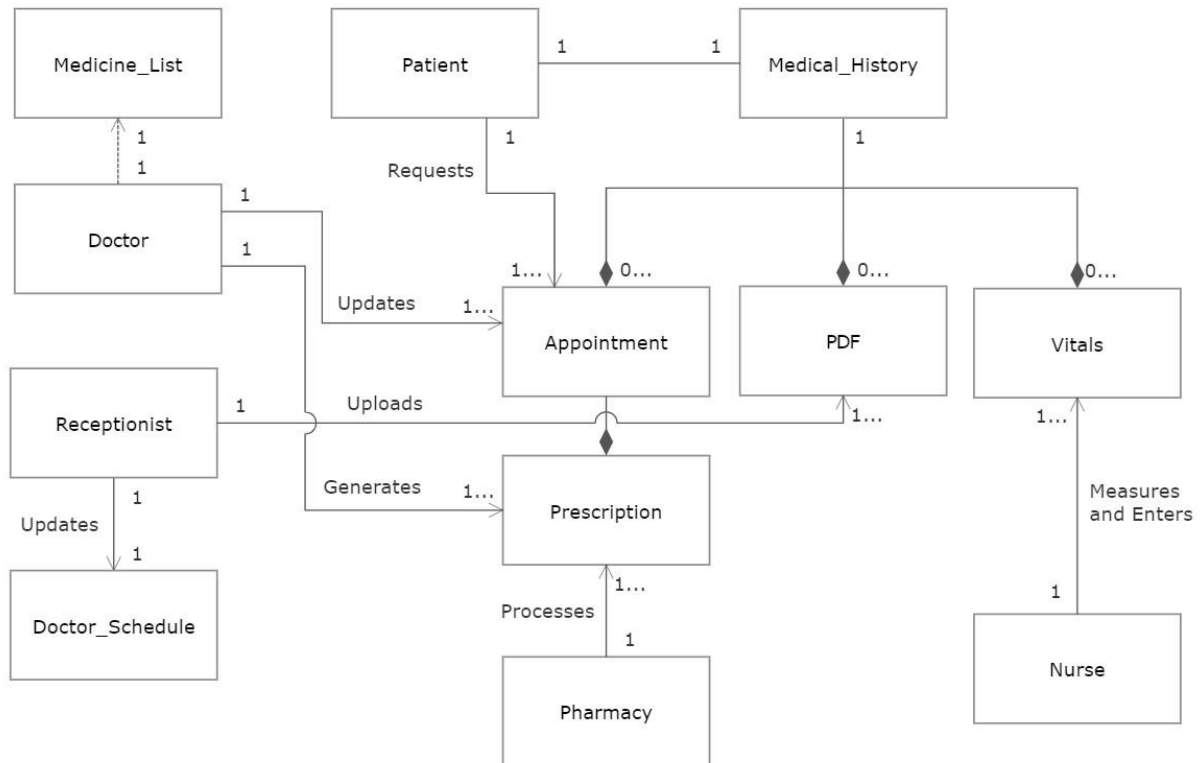


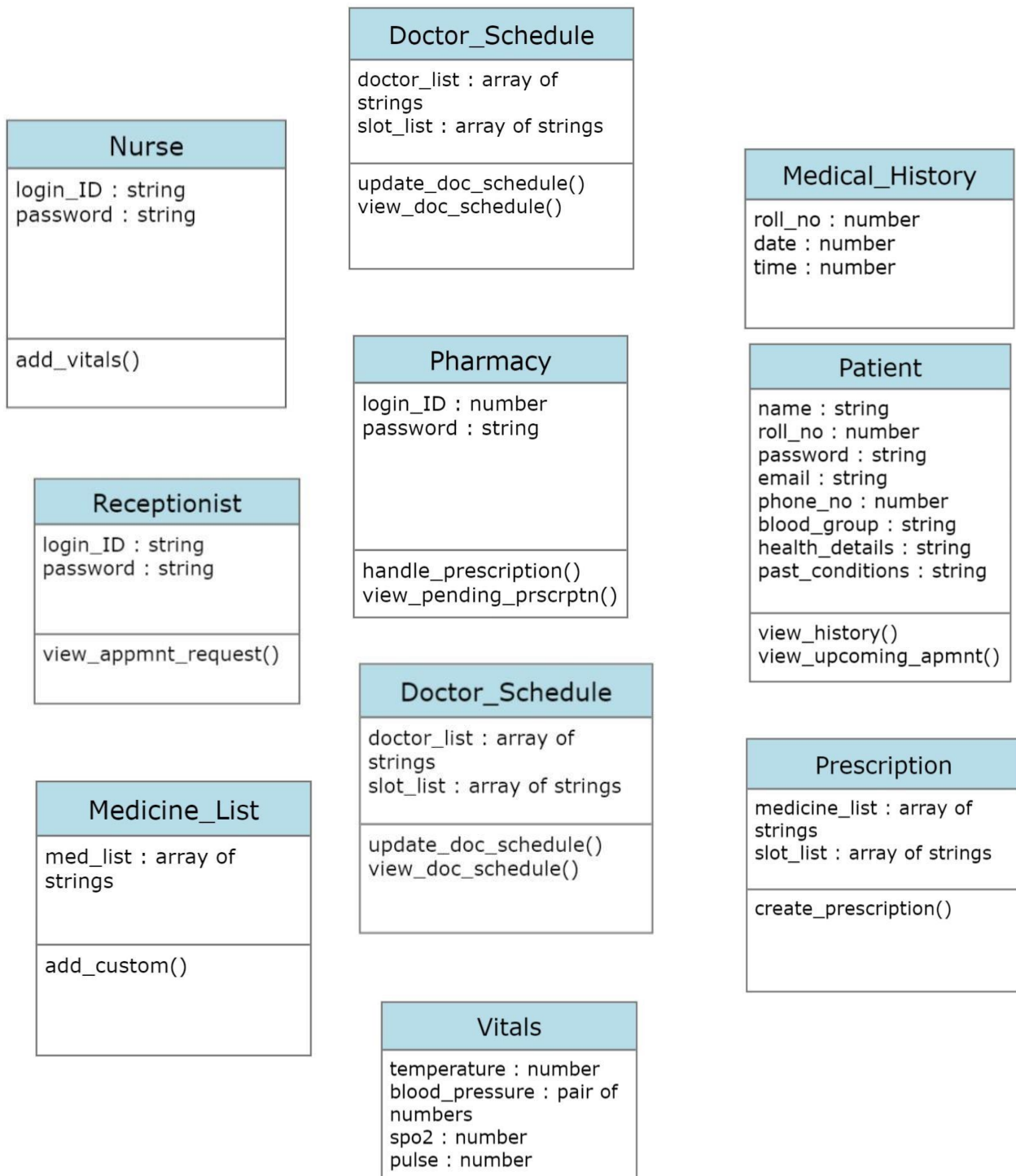
3. Object Oriented Design

3.1 Use Case Diagrams

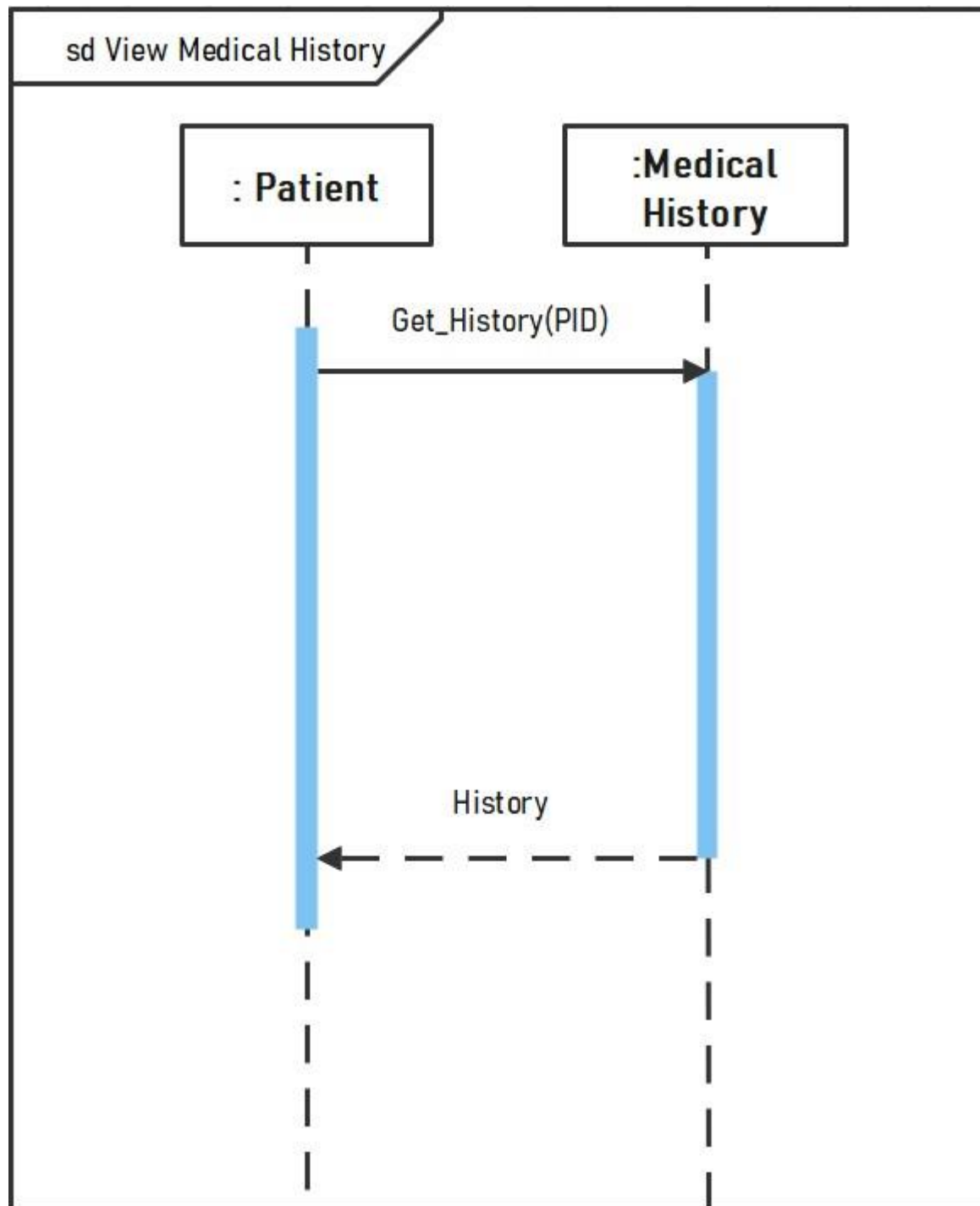


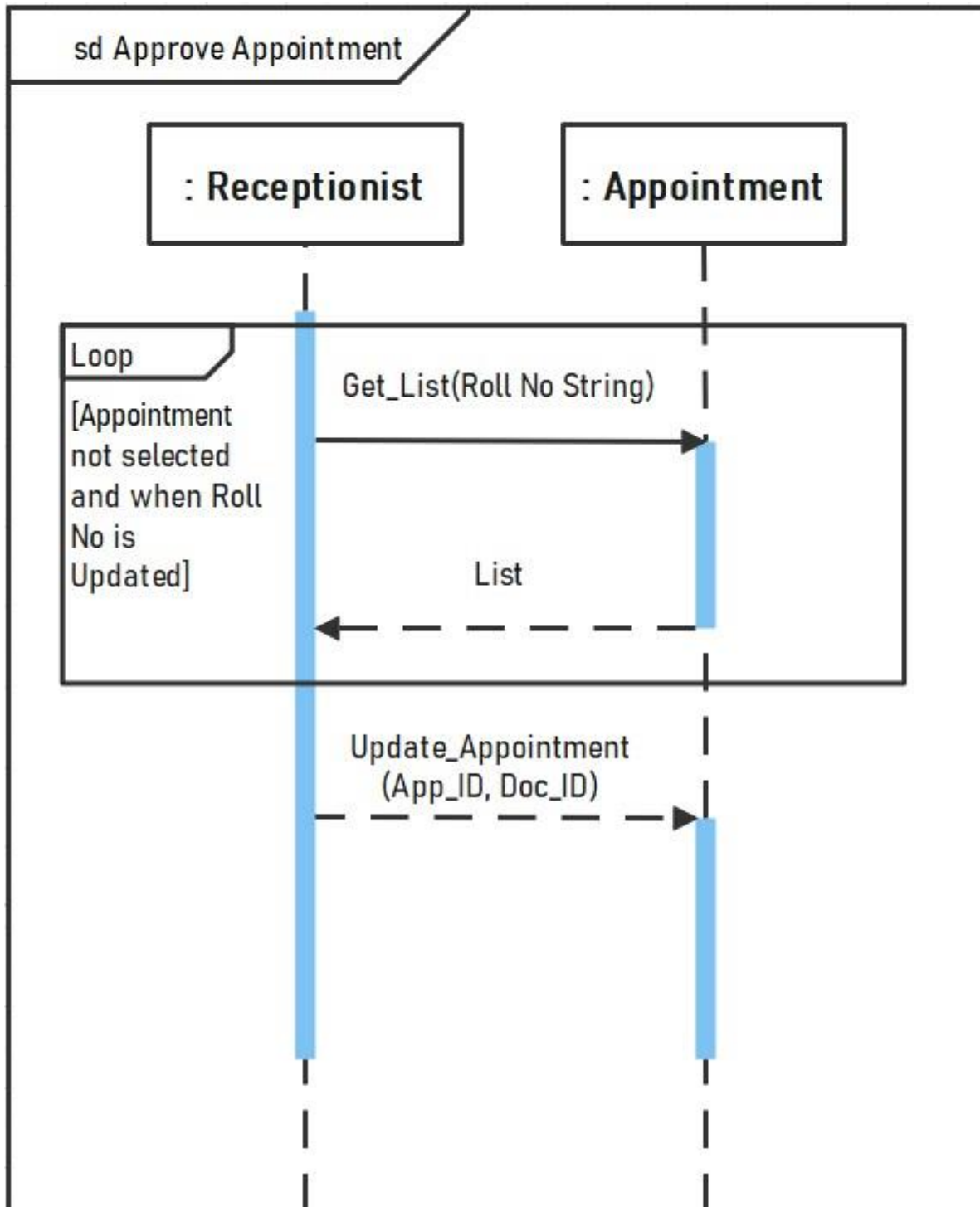
3.2 Class Diagrams

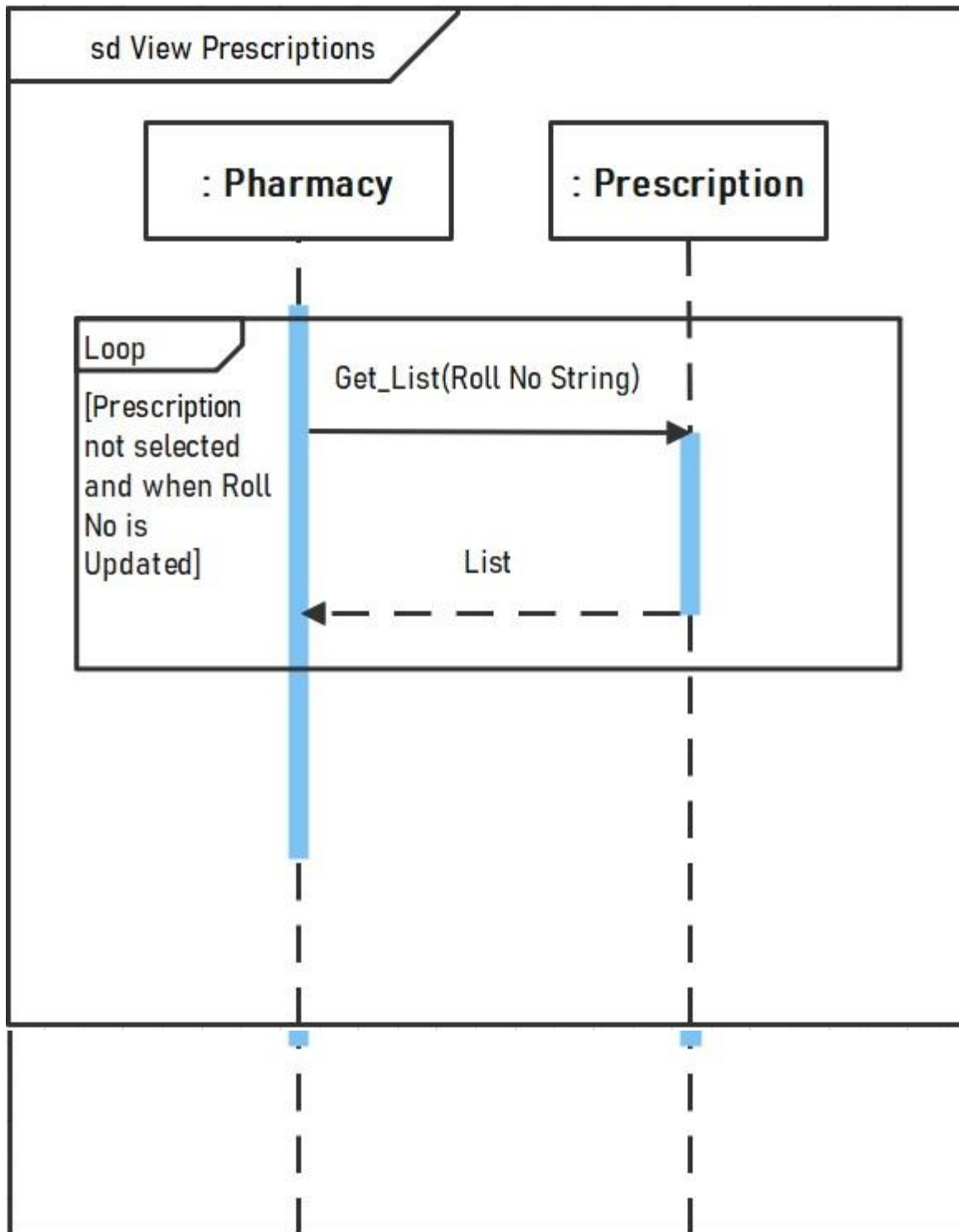


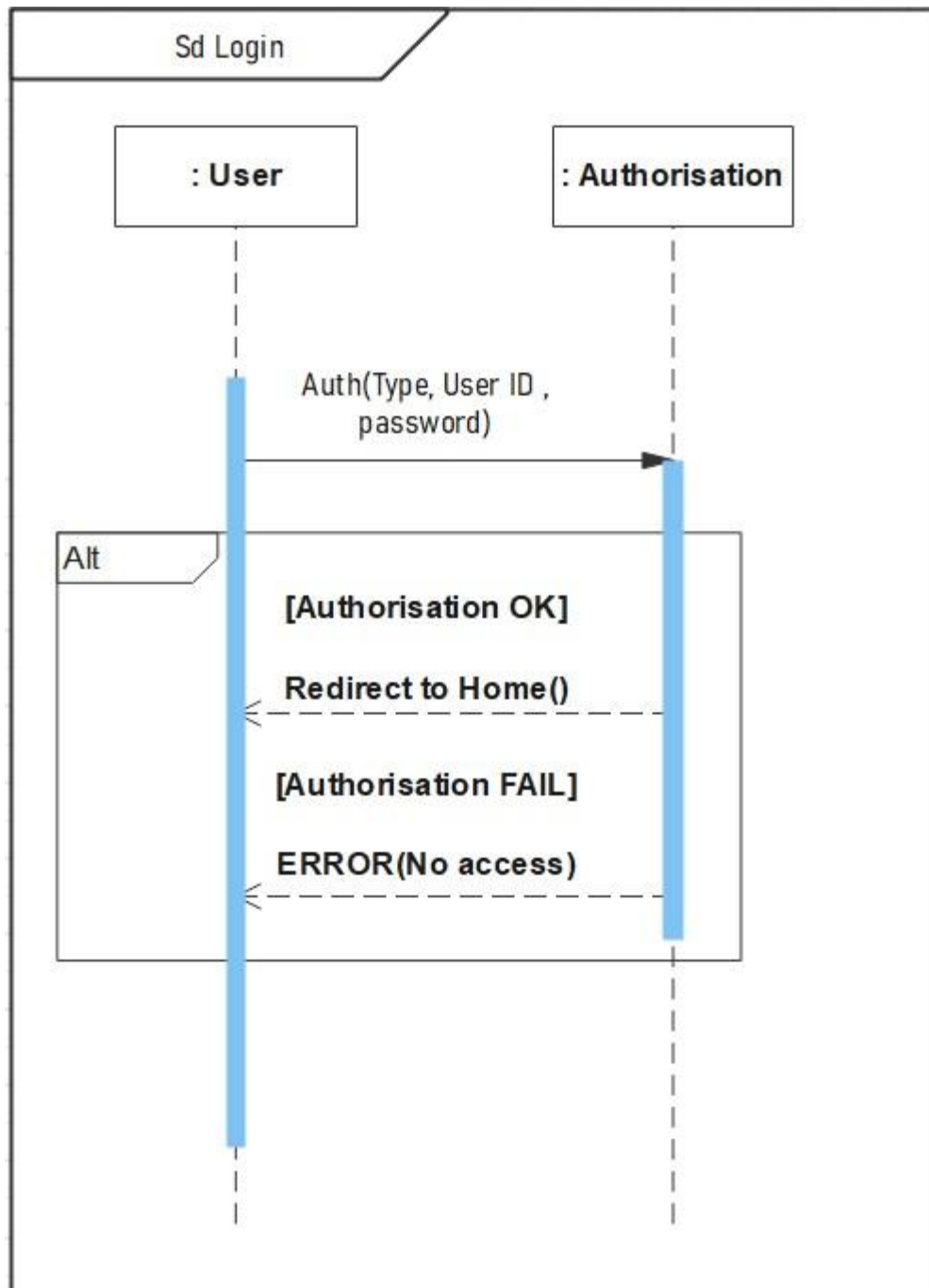


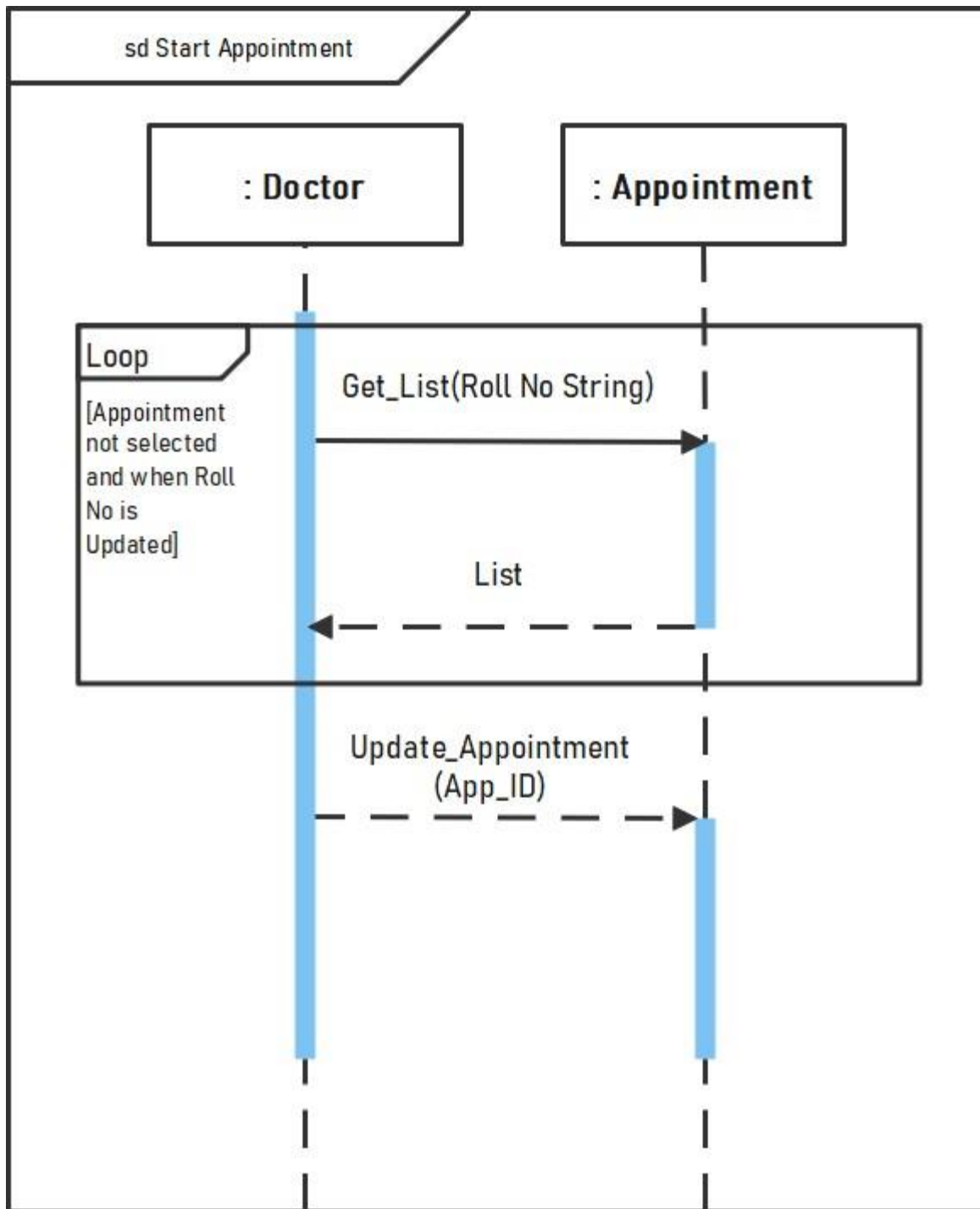
3.3 Sequence Diagrams

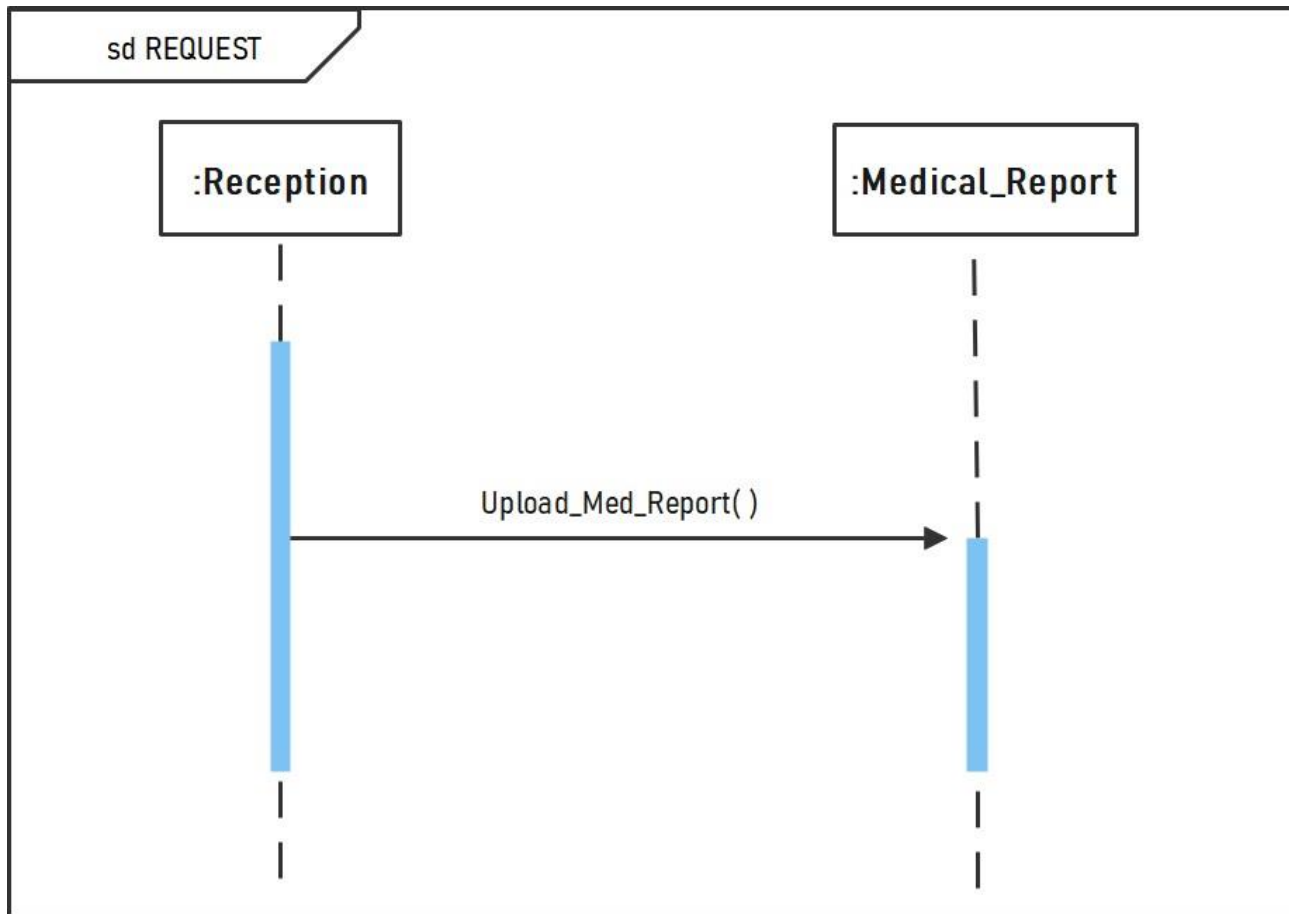


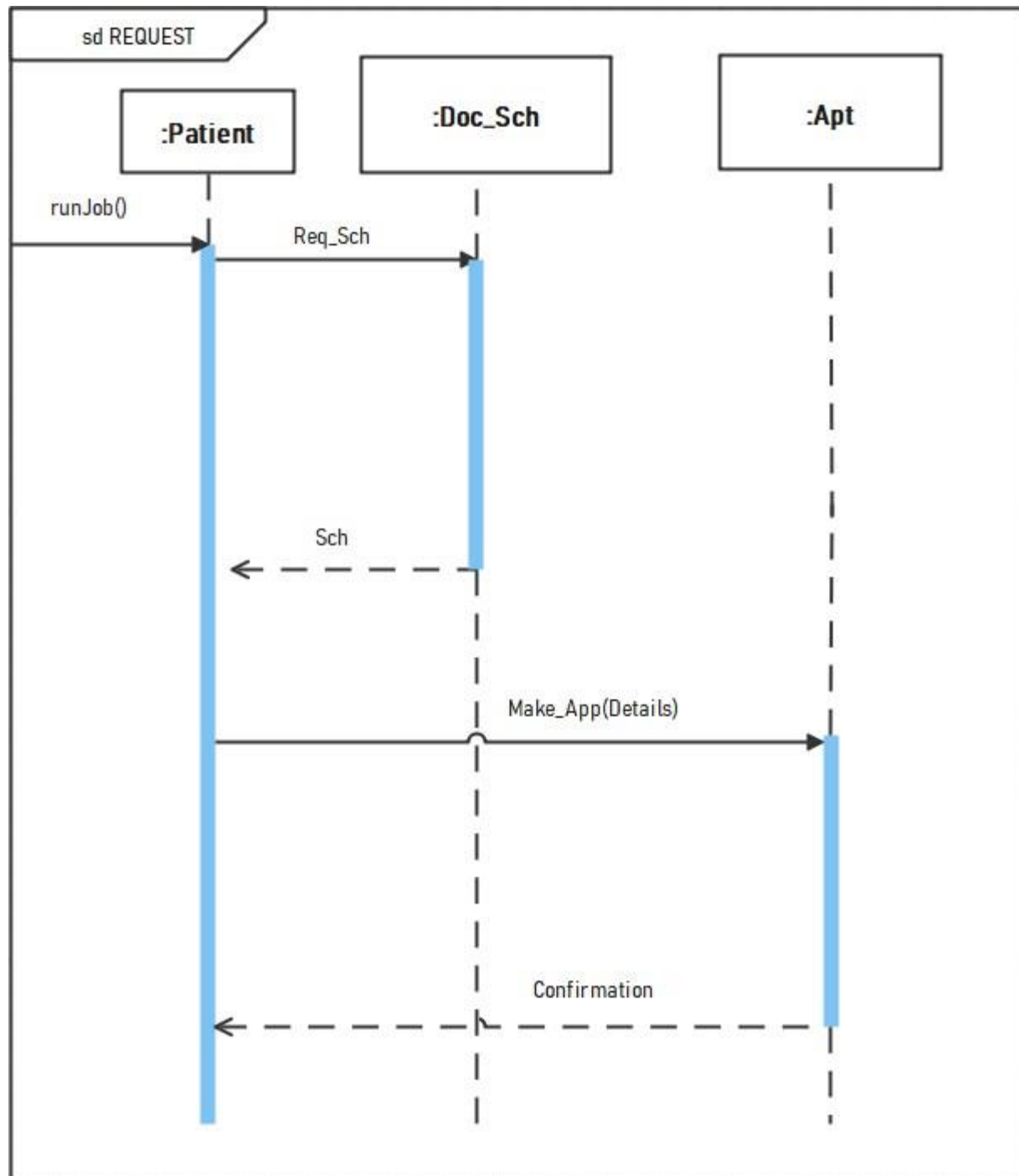


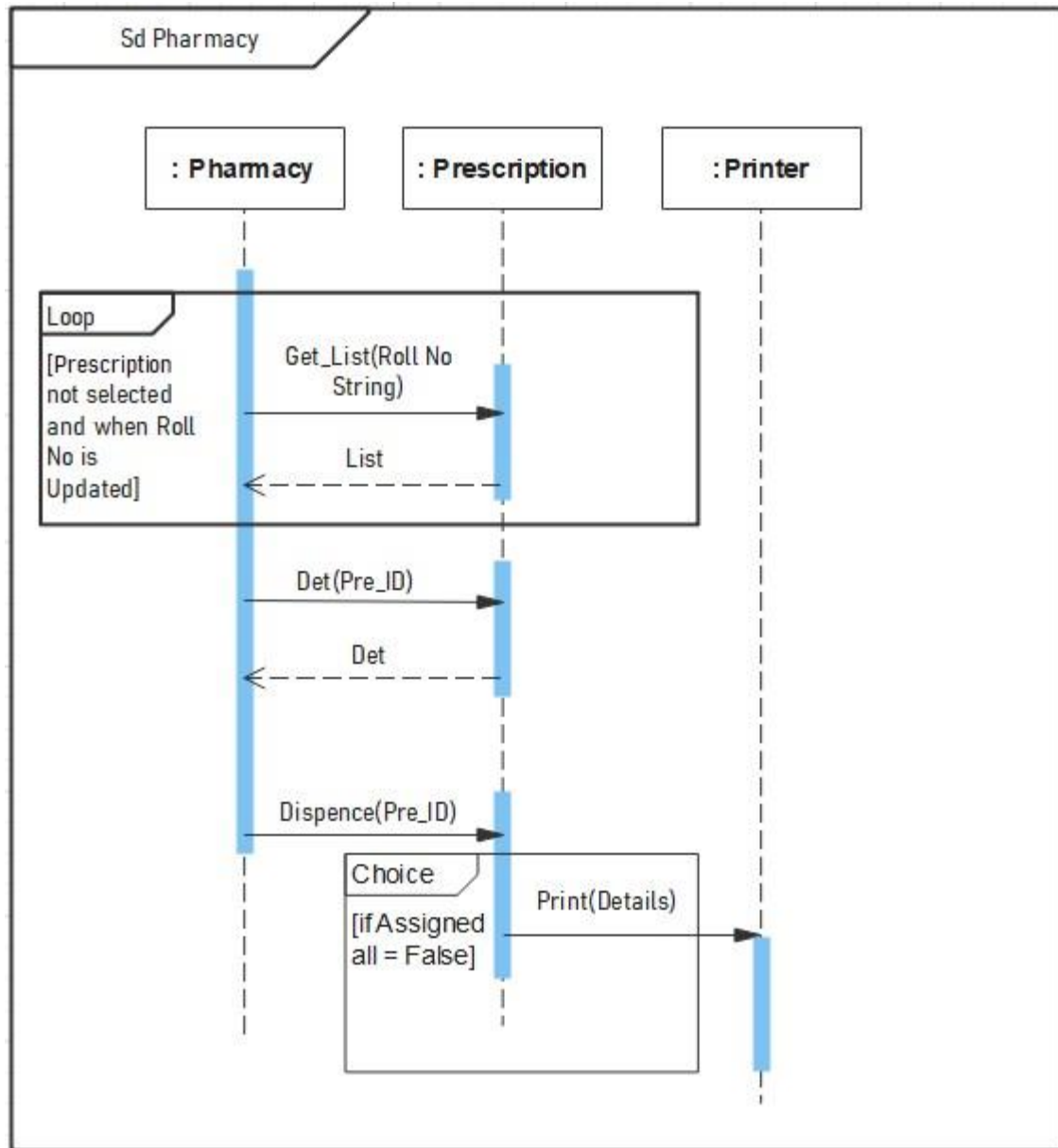


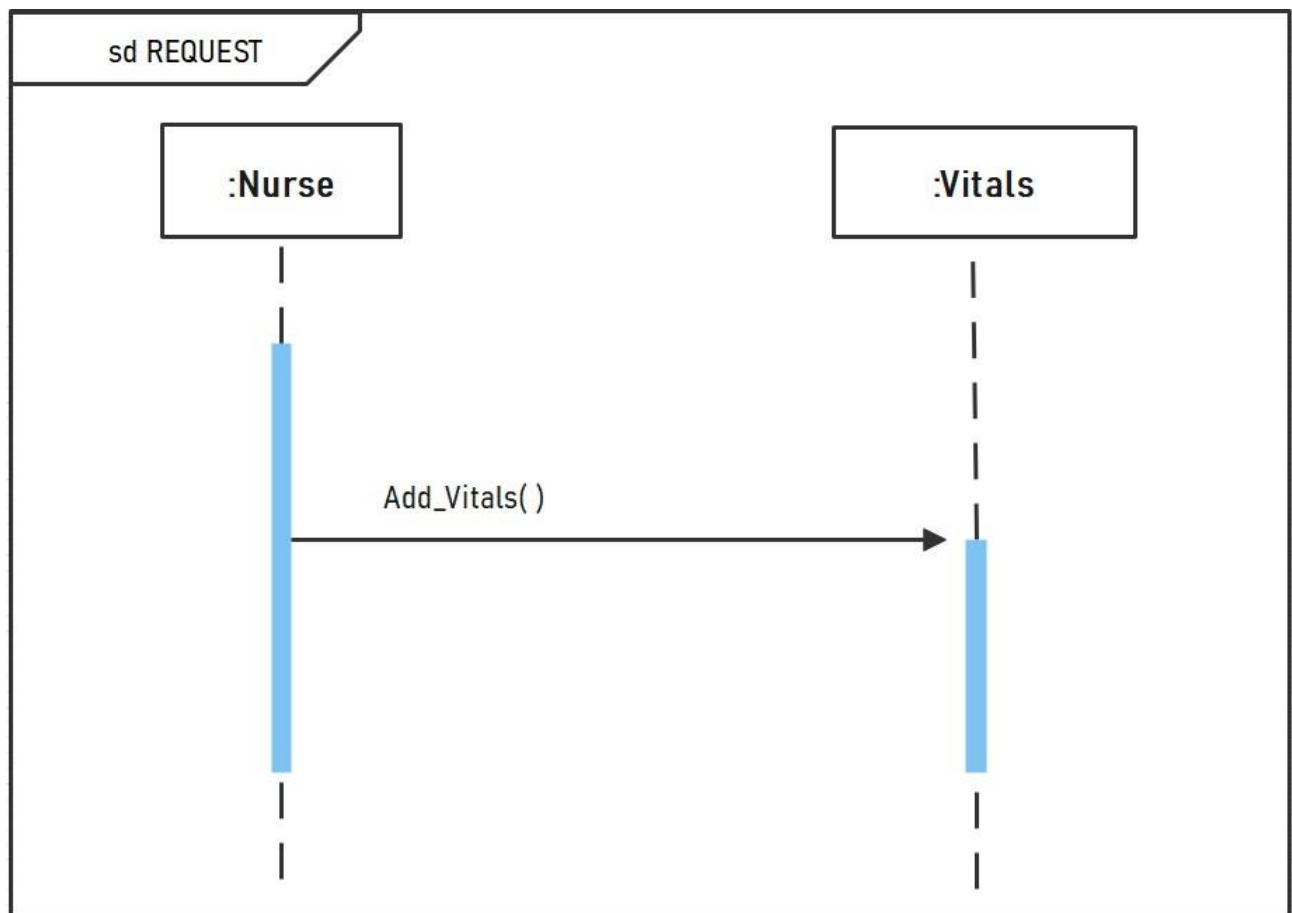


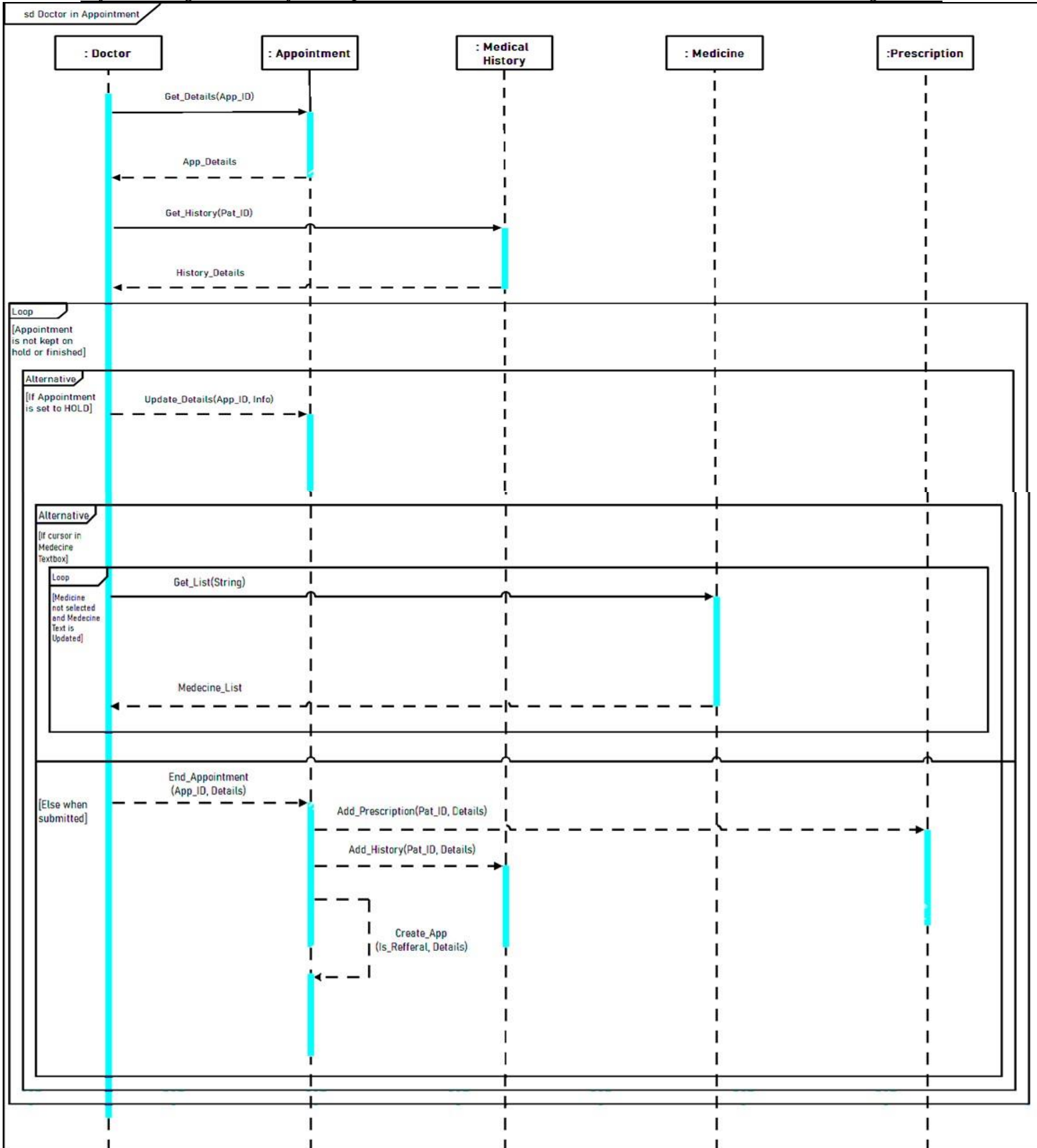






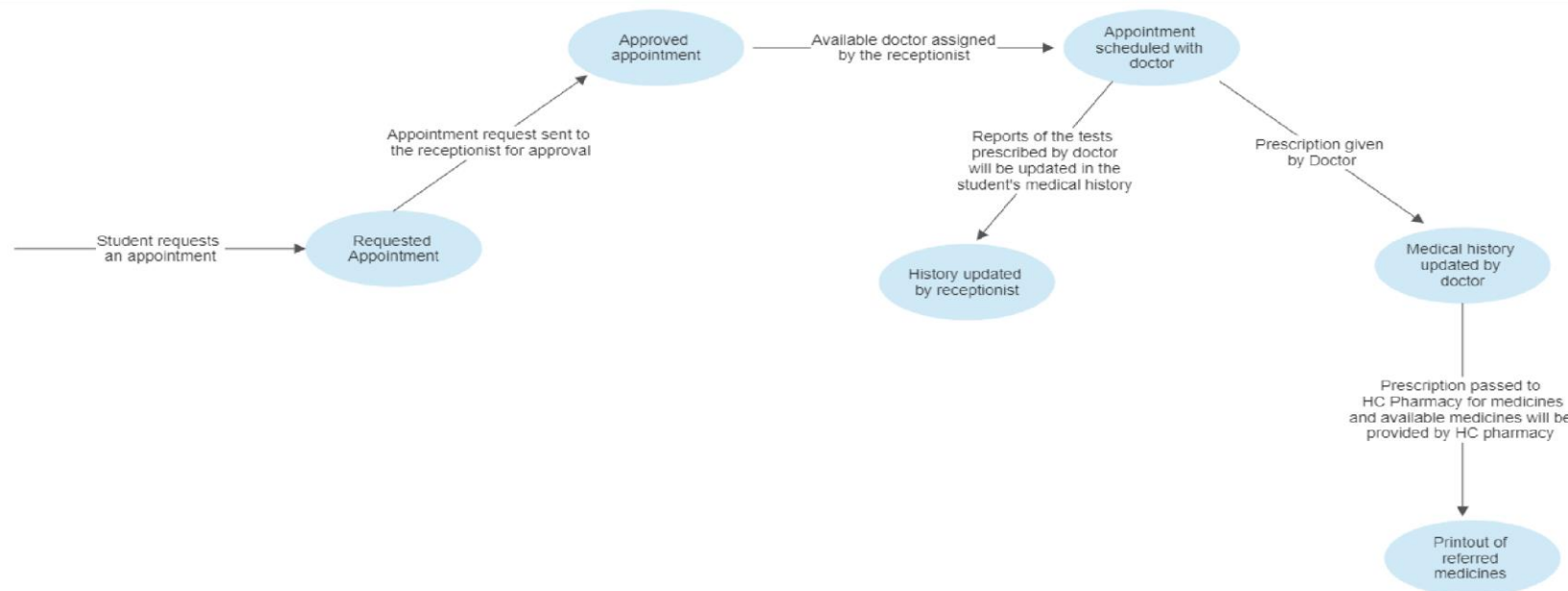






3.4 State Diagrams

The handling of each appointment by the software can be described using a state diagram. The system has multiple states which are attained depending on the inputs and actions of various users, as described below:



4 Project Plan

4.1 Login-Page

This page will be the entry page of the website for all the users. This page will first ask user to select their role and then there would be user login page where they would be authenticated based on uid and password which they will set along with many fields upon sign-up

4.2 UI for Different Role

→ Home Page

- Request-an-Appointment- There will be a card for requesting an appointment that will redirect user to a new page where student can select appointment details and book appointment for HC.
- View-All-Appointment - There will be a card for requesting an appointment that will redirect user to a new page where student can see the forthcoming appointments and their details.
- View Medical History - It will also be present as card that will redirect user to a page which in a tabular form contain all previous appointment details.
- Doctor Schedule - It will also be present as a card that will open a dialog box containing a table about doctors available for a particular slot on a particular date and the current token number of the patient they are seeing.

→ Doctor's Homepage

- The homepage would be very neat with cards available for functionalities for simplicity.
- Doctor-Schedule - It will land to a page from which doctor can view his/her schedule.
- View-Appointment - This will open a new page having all the appointments of the students as clickable cards, upon choosing a card a new page will open where a doctor can view patients' medical history as well as he can prescribe the patient medical tests and medicines.

→ Pharmacy-Page

- This will contain the medication details of appointments that the doctor prescribed having a detail of the prescription as clickable cards which upon clicking will open a tabular dialog box containing the info of medicine and amount to be given as well as a checkbox for viability of medicine.
- Completed Prescription Page-It will show the list of medicines given to all the patients.

→ Receptionist-Page

- The page will separate clickable cards for all the function ability for the following-
- View Appointment request - It will open a new page - The page will have the request patient made online with patients' credentials and description as clickable cards which upon clicking will open doctor allotment page
- Doctor Allotment Page - It will contain credentials of patient of student, details of preferred doctor as well as their description and preferred slot for prescription in which the receptionist will be able to add a doctor's appointment.
- Upload Medical records- It will open a new page in which a receptionist can add a medical report in a pdf form to a particular patient profile.

4.3 Backend

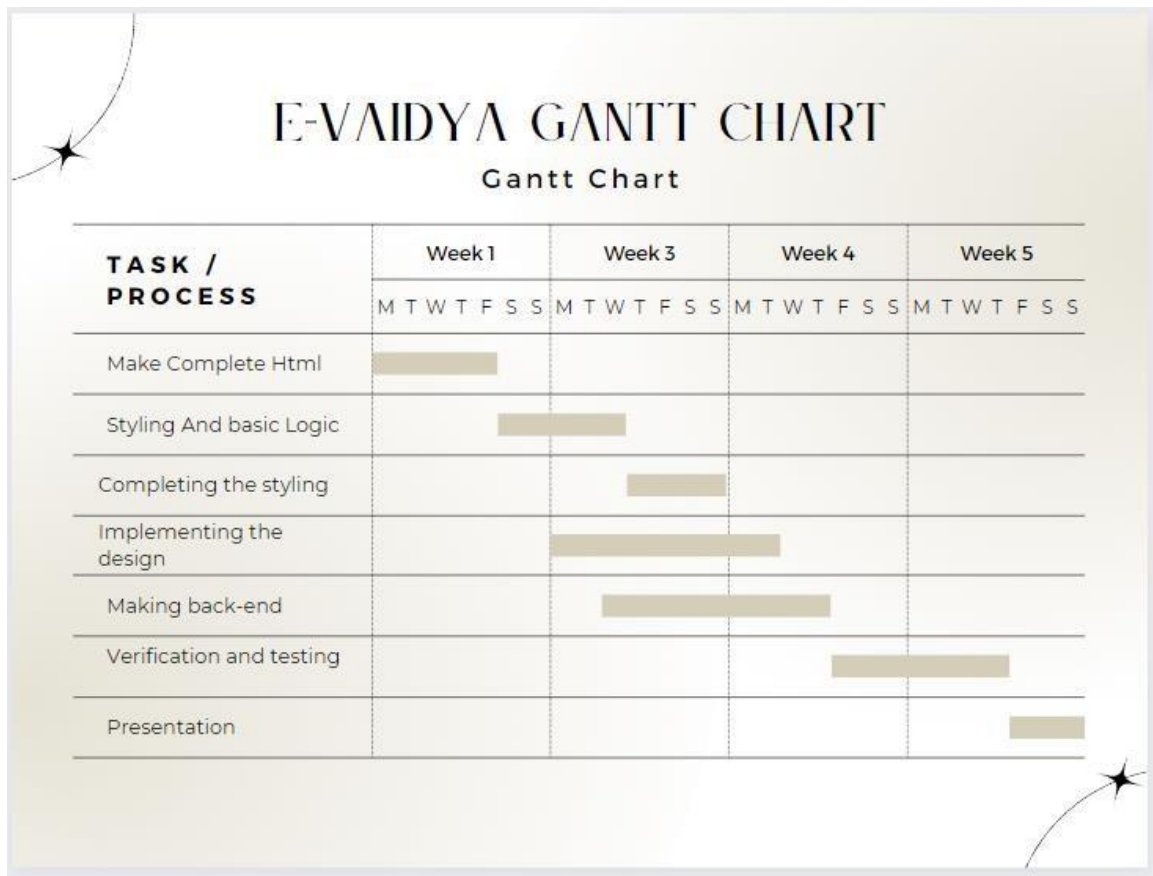
→ Database designing

- We would broadly use 3 mongo databases all 3 will be having roll no. as well as name as data-entry of all the registered students
- Global - This db. will be private, and it will be having password which we will use for patient authentication, it will contain detail of student but for security issue we will only allow patient to access this db.
- Medical History - This will be a connected db. between student and the health center server it will contain details of previous appointments Exact Structure- Roll no. as uid, name, Date of visit to Doctor, Name of Doctor, Prescription by the Doctor.
- Doctor-Schedule - This will be a dynamic shared dB in which receptionist will be having the editor access, it will contain details of doctors that are examining patient for that day and their current token id_no.
- Upcoming Appointment - It contains details of all the upcoming appointment

→ Logic Design

- Register ()- Register a user based on the details provided as input and add the details to the database
- verify Login ()- Returns login access of the user to the site, based on the login id and password given by the user.
- Logout ()- Access to users already logged into the site, to terminate the session and logout.
- Request-appointment ()- Take in details entered by user and add to the requested appointment database.
- View_all_appointment() - Searches the upcoming appointment db. by roll no as key as outputs all upcoming appointments.
- Upload document () - Add the medical document from student's page to Medical History db.
- Doctor-Schedule ()-Opens the doctor schedule for the day also its constructor is private to the class receptionist.

- Prescribe()-Doctor will see student and upon calling the prescription will be added to medical history and will be added to pharmacy.
- Pharmacy_Prescribe_medicine()-It will add the medication given by pharmacy to its database.
- Assign_doctor()-Add the appointments from fresh or from requested appointment database to upcoming appointment after completing all the details of the appointment.



Link for project plan - [Project-Plan](#)

Appendix A - Group Log

Date	Members Present	Summary of the Meeting
01 Feb	Aman, Aniket, Goutam, Narendra, Prashant, Goutam, Shrey, Shubham, Swastik	Discussion on the architecture to be used for implementation of the project
04 Feb	Aniket, Narendra, Goutam, Shrey, Shubham, Swastik	Finalised the architecture to be used. Discussion on class diagram and on the overall object-oriented design of the system
05 Feb	Aman, Aniket, Deven, Kartik, Narendra, Prashant, Goutam, Shrey, Shubham, Swastik	Official meeting with TA, discussed doubts with TA regarding context model
06 Feb	Aman, Aniket, Kartik, Narendra, Prashant, Goutam, Shrey, Shubham, Swastik	Finalised the classes to be created as a part of the object-oriented design. Discussed sequence diagrams
08 Feb	Aman, Aniket, Kartik, Narendra, Prashant, Goutam, Shrey, Shubham, Swastik	Finalised the sequence diagrams and created the state diagram
09 Feb	Aman, Aniket, Deven, Kartik, Narendra, Prashant, Goutam, Shrey, Shubham, Swastik	Discussed the project plan and made minor changes in class associations
10 Feb	Shrey, Shubham, Kartik, Aniket, Goutam, Narendra	Finalised the entire document, made minor changes after thorough proofreading and ensured proper formatting