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# Design Document

for

## E-Vaidya

Version **1.1**

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
Final (v1.1)	Debuggers	Made necessary updates	23/04/23

# 1 Context Design

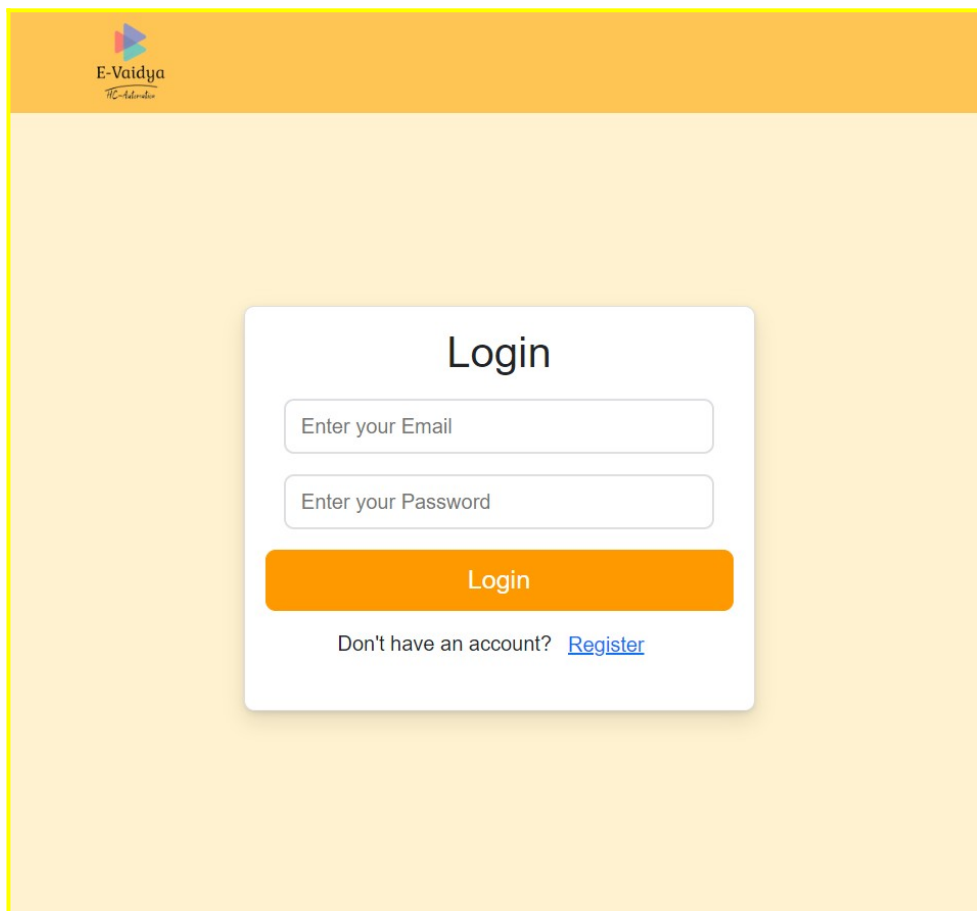
## 1.1 Context Model

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.

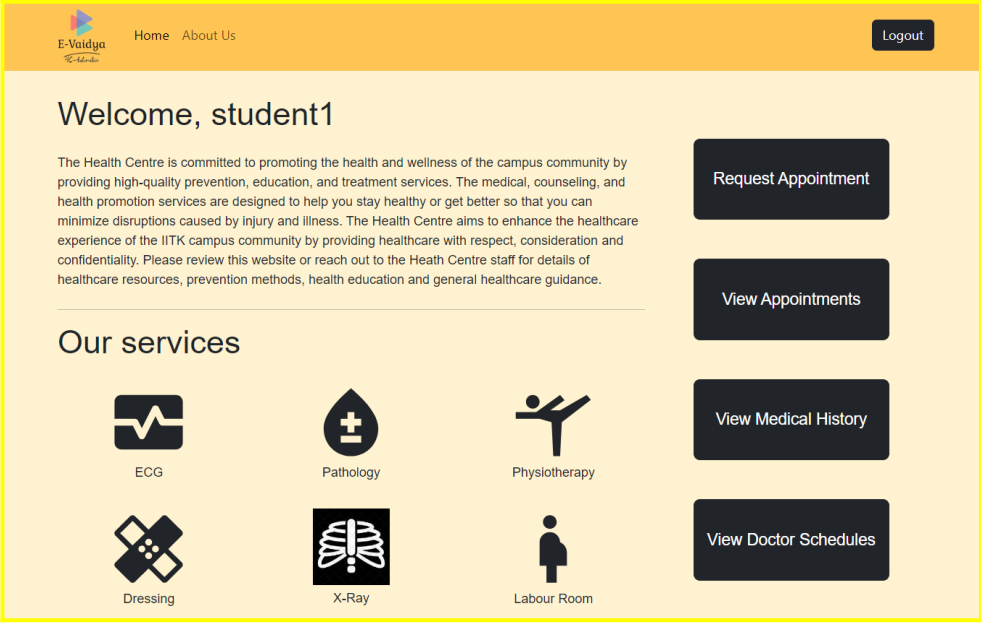
- The Login Page



The screenshot displays the login interface for E-Vaidya. At the top left, the logo features a stylized 'E' composed of three overlapping triangles in blue, green, and red, followed by the text 'E-Vaidya' and 'The Alternative' in a smaller font. The main content area has a light orange background. Centered on this background is a white login card with a subtle drop shadow. The card is titled 'Login' in a large, bold, black font. Below the title are two input fields: 'Enter your Email' and 'Enter your Password', both with rounded corners and light gray borders. Underneath these fields is a prominent orange button with the word 'Login' in white. At the bottom of the card, the text 'Don't have an account?' is followed by a blue, underlined link labeled 'Register'.

- The Patient's Page

- Home Page




The screenshot shows the 'Home' page of the E-Vaidya application. The header is orange and contains the E-Vaidya logo, navigation links for 'Home' and 'About Us', and a 'Logout' button. The main content area has a light orange background. It starts with a 'Welcome, student1' message, followed by a paragraph about the Health Centre's commitment to promoting health and wellness. Below this is a section titled 'Our services' which displays six icons representing different medical services: ECG, Pathology, Physiotherapy, Dressing, X-Ray, and Labour Room. To the right of these services are four dark blue buttons: 'Request Appointment', 'View Appointments', 'View Medical History', and 'View Doctor Schedules'.


E-Vaidya  
Home About Us Logout


## Welcome, student1


The Health Centre is committed to promoting the health and wellness of the campus community by providing high-quality prevention, education, and treatment services. The medical, counseling, and health promotion services are designed to help you stay healthy or get better so that you can minimize disruptions caused by injury and illness. The Health Centre aims to enhance the healthcare experience of the IITK campus community by providing healthcare with respect, consideration and confidentiality. Please review this website or reach out to the Health Centre staff for details of healthcare resources, prevention methods, health education and general healthcare guidance.


### Our services


  
ECG

  
Pathology

  
Physiotherapy

  
Dressing

  
X-Ray

  
Labour Room

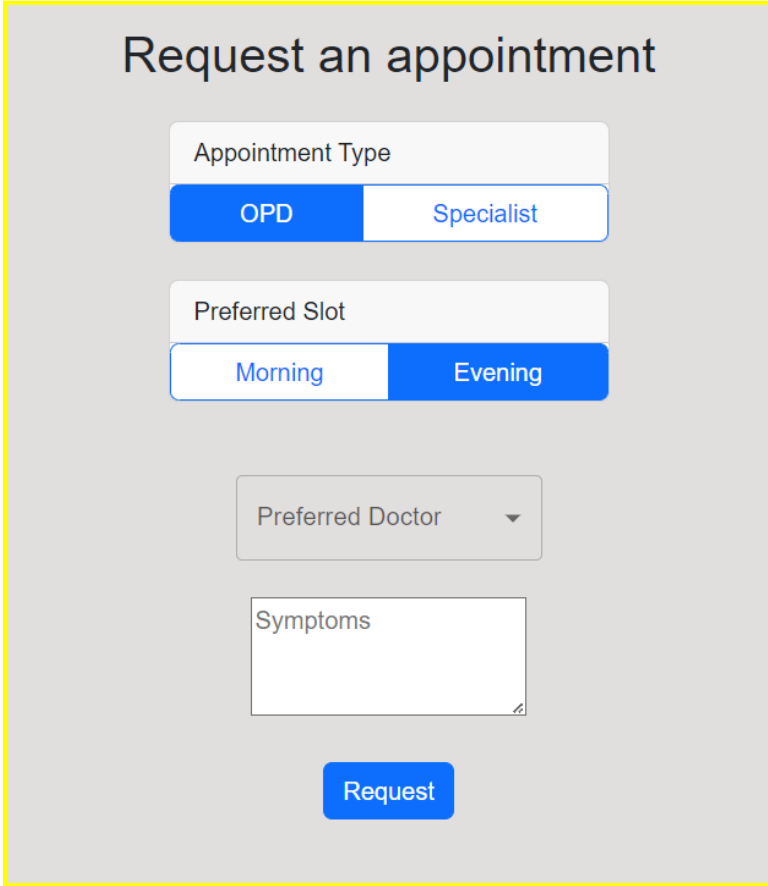
Request Appointment

View Appointments

View Medical History

View Doctor Schedules

- Book Appointment Page



The screenshot shows the 'Request an appointment' form. It has a light gray background. The title 'Request an appointment' is at the top. Below it are two groups of buttons for 'Appointment Type' (OPD and Specialist) and 'Preferred Slot' (Morning and Evening). Below these is a 'Preferred Doctor' dropdown menu and a 'Symptoms' text area. At the bottom is a blue 'Request' button.

## Request an appointment

Appointment Type

OPD Specialist

Preferred Slot

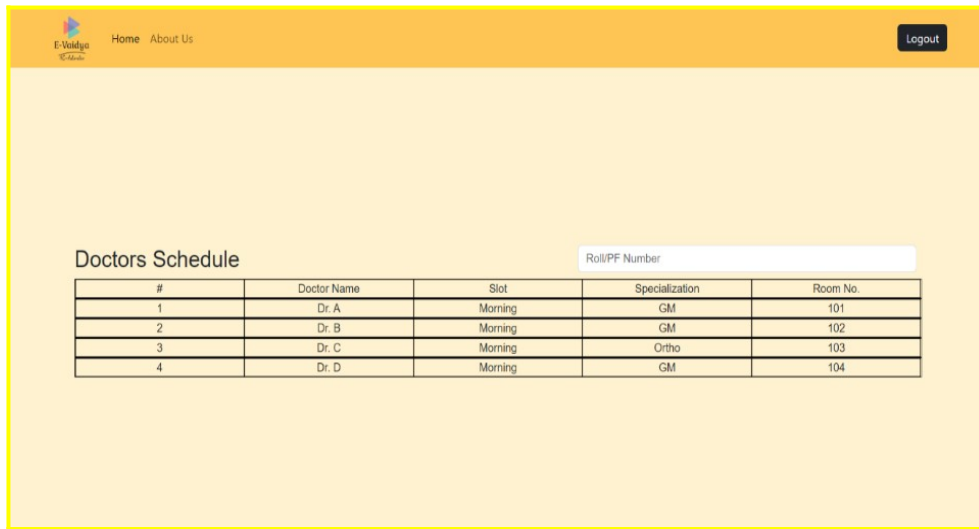
Morning Evening

Preferred Doctor ▼

Symptoms

Request

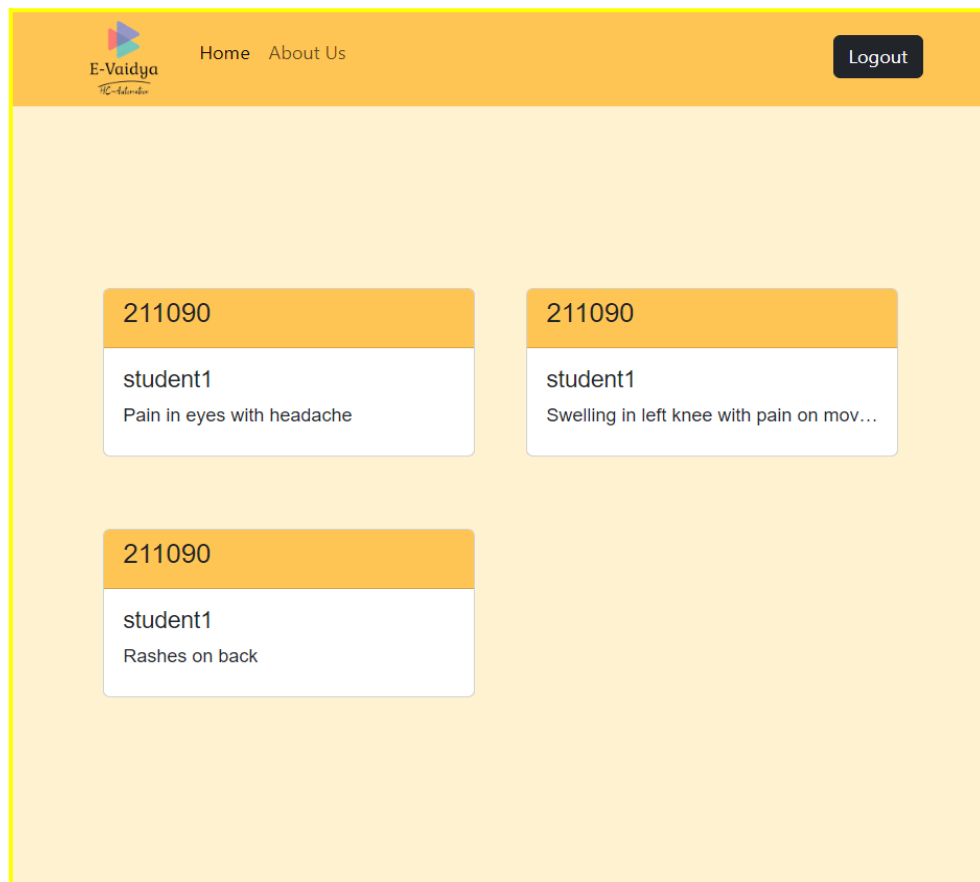
### ■ View Doctor Schedule Page



The screenshot shows the 'View Doctor Schedule Page' of the E-Vaidya system. The header includes the E-Vaidya logo, 'Home' and 'About Us' links, and a 'Logout' button. The main content area is titled 'Doctors Schedule' and features a search bar labeled 'Roll/PF Number'. Below the search bar is a table with the following data:

#	Doctor Name	Slot	Specialization	Room No.
1	Dr. A	Morning	GM	101
2	Dr. B	Morning	GM	102
3	Dr. C	Morning	Ortho	103
4	Dr. D	Morning	GM	104

### ■ View Upcoming Appointments



The screenshot shows the 'View Upcoming Appointments' page of the E-Vaidya system. The header includes the E-Vaidya logo, 'Home' and 'About Us' links, and a 'Logout' button. The main content area displays three appointment cards for 'student1' with Roll/PF Number 211090:

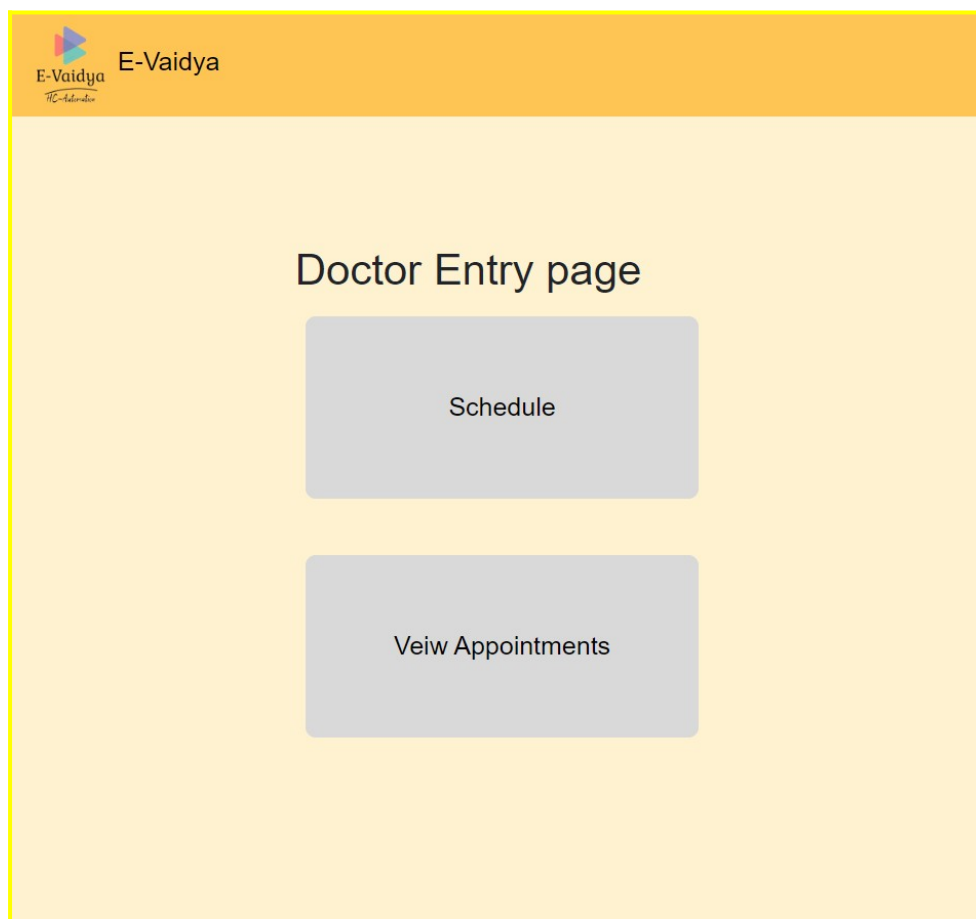
- Appointment 1:** Pain in eyes with headache
- Appointment 2:** Swelling in left knee with pain on mov...
- Appointment 3:** Rashes on back

- View Medical History



- The Doctor's Page

- Home Page



## ■ View Appointments Page

The screenshot shows the 'View Appointments Page' in the E-Vaidya system. The header includes the E-Vaidya logo and name. The main section is titled 'Appointment Requests' and features a search bar with the placeholder 'Roll/PF Number' and a 'Search' button. Below the search bar, there are six appointment cards arranged in a 2x3 grid. Each card has an orange header with a patient ID, a grey body with patient details, and an orange 'Conduct Appointment' button at the bottom.

007	s	student
<u>john doe</u> sad	<u>s</u> s	<u>student</u> dsdasc
Conduct Appointment	Conduct Appointment	Conduct Appointment

210496	st	abcd
<u>kartik</u> lack_of_sleep	<u>st</u> why	<u>abcd</u> trial run 1
Conduct Appointment	Conduct Appointment	Conduct Appointment

## ■ Conduct Appointments Page

The screenshot shows the 'Conduct Appointments Page' in the E-Vaidya system. The header includes the E-Vaidya logo, navigation links 'Home' and 'About Us', and a 'Logout' button. The main section is titled 'Medication' and contains several interactive elements:

- A 'Prescribe Medication' button on the left.
- A 'Medical History' button on the left.
- A 'Diagnostic Tests' button on the left.
- A 'Medicines' dropdown menu showing 'Morphine'.
- A row of frequency buttons: 'qD', 'BID', 'TID', 'BBF', and 'BD'.
- A 'Days' input field with a value of '0' and minus/plus buttons.
- An 'Add Medicine' button.
- A 'Prescribed Medicines' list with items: 'Tramadol TID-3', 'Asprin BID-3', 'Gabapentin BD-3', and 'Morphine BD-3', each with a delete 'X' icon.
- A 'Remarks' text area.
- A 'Prescribe' button.
- A 'Complete Appointment' button at the bottom.

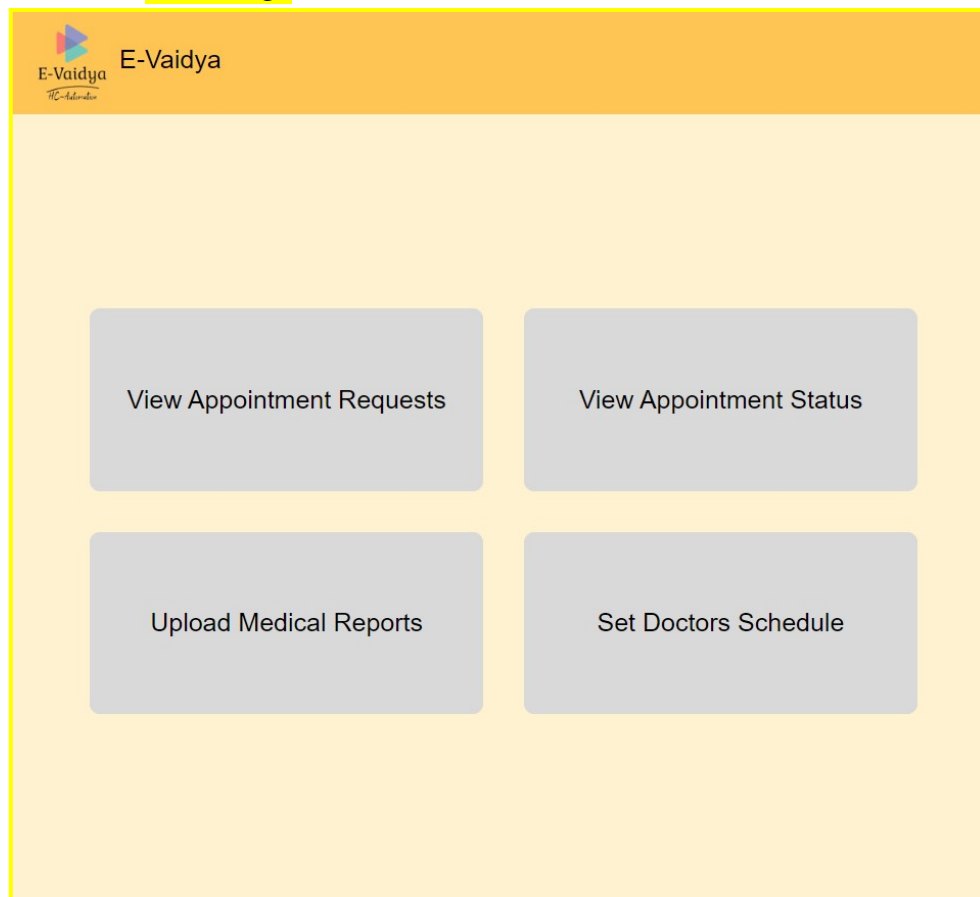


## ■ Diagnosing Tests Page

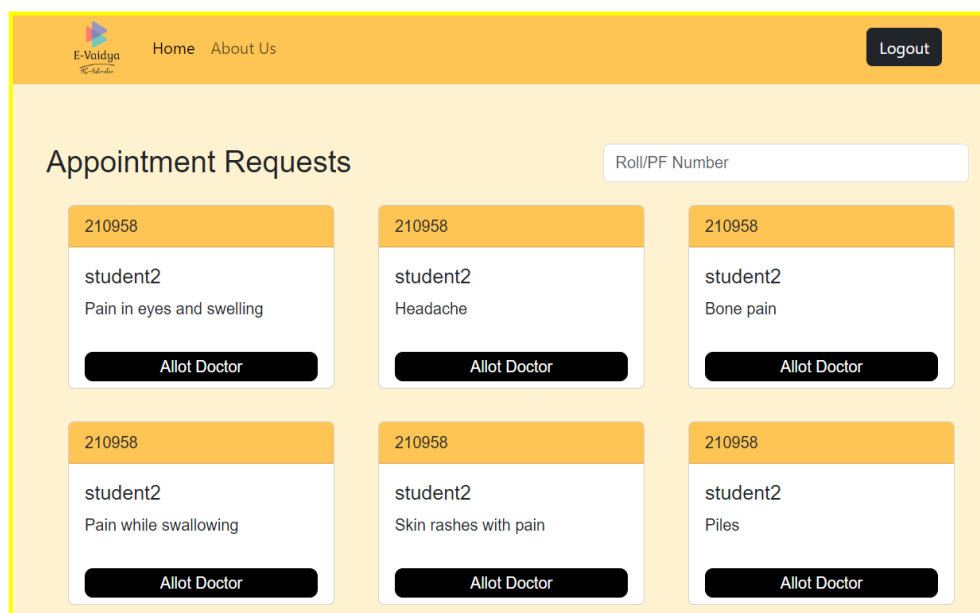
The screenshot displays the 'Diagnosing Tests' page within the E-Visit application. The page has a light orange background and a dark orange header bar. In the top left corner of the header, there is a logo for 'E-Visit' and navigation links for 'Home' and 'About Us'. In the top right corner, there is a 'Logout' button. The main content area features a vertical sidebar on the left with three dark blue buttons: 'Prescribe Medication', 'Medical History', and 'Diagnostic Tests'. The central part of the page is titled 'Medical Tests' and contains a dropdown menu labeled 'Tests'. Below this menu is an 'Add Test' button. Underneath, there are two columns: 'Prescribed Tests' and 'Remarks'. The 'Prescribed Tests' column contains a large white text area, and the 'Remarks' column contains a smaller white text area with a small icon in the bottom right corner. Below these columns is a 'Prescribe' button. At the bottom center of the page is a 'Complete Appointment' button.

- The Reception Page

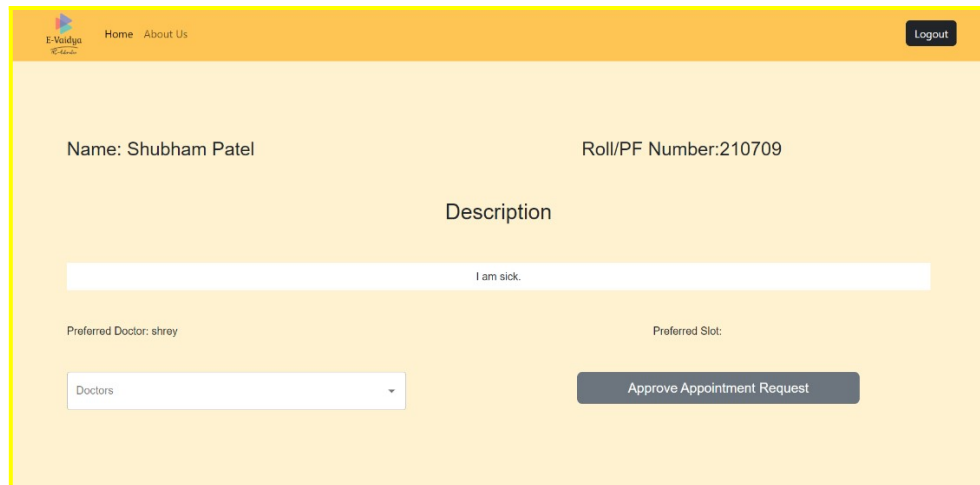
- Initial Page



- Appointment Requests Page

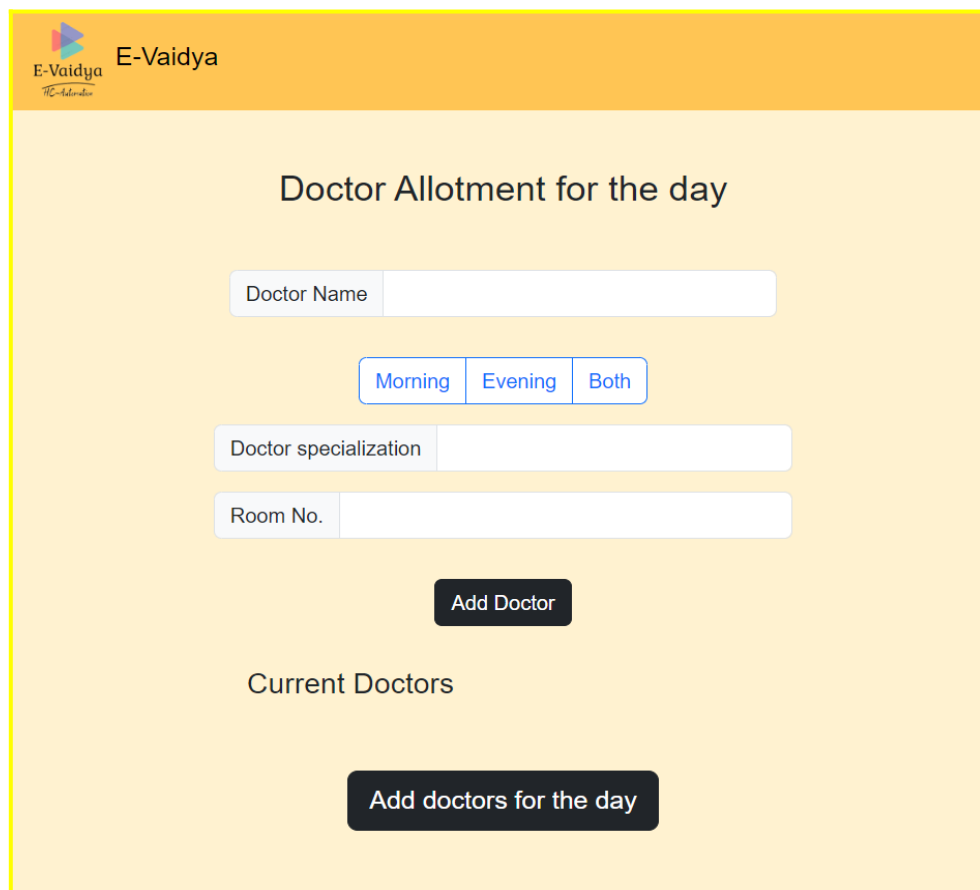


## ■ Approve Appointment Page




The screenshot shows the 'Approve Appointment Page' of the E-Vaidya system. The header is orange with the E-Vaidya logo, 'Home', 'About Us', and a 'Logout' button. The main content area is light orange. It displays the user's name 'Shubham Patel' and 'Roll/PF Number:210709'. Below this is a 'Description' section with a text input field containing 'I am sick.'. Further down, there are two sections: 'Preferred Doctor: shrey' with a dropdown menu labeled 'Doctors', and 'Preferred Slot:'. A dark grey button labeled 'Approve Appointment Request' is positioned to the right of the dropdown menu.

## ■ Doctor Schedule Page



The screenshot shows the 'Doctor Schedule Page' of the E-Vaidya system. The header is orange with the E-Vaidya logo and the text 'E-Vaidya'. The main content area is light orange. It features a title 'Doctor Allotment for the day'. Below the title are four input fields: 'Doctor Name', 'Doctor specialization', and 'Room No.', each with a corresponding label. Between the 'Doctor Name' and 'Doctor specialization' fields are three buttons: 'Morning', 'Evening', and 'Both'. At the bottom of the form is a dark grey button labeled 'Add Doctor'. Below the form fields, the text 'Current Doctors' is displayed, followed by another dark grey button labeled 'Add doctors for the day'.

■ Lab Reports Upload Page

 E-Vaidya  
TC-Innovations

## Upload Medical Reports

Name:

Roll/PF Number:

- The Pharmacy Page

- Prescriptions Pending Page

The screenshot shows the 'Pending Prescriptions' page. At the top, there is a navigation bar with the E-Vaidya logo, 'Home', 'About Us', and a 'Logout' button. Below the navigation bar, the page title 'Pending Prescriptions' is displayed. To the right of the title is a search bar labeled 'Roll/PF Number'. The main content area contains a grid of prescription cards. Each card displays a Roll/PF Number, a student name, and a 'View Prescription' button. The cards are arranged in three rows: the first row has three cards for Student 1 (Roll/PF Number 2102001); the second row has three cards for Student 2 (Roll/PF Number 2102002); and the third row has two cards, one for Student 2 (Roll/PF Number 2102002) and one for Student 3 (Roll/PF Number 2102003).

- Prescription Page

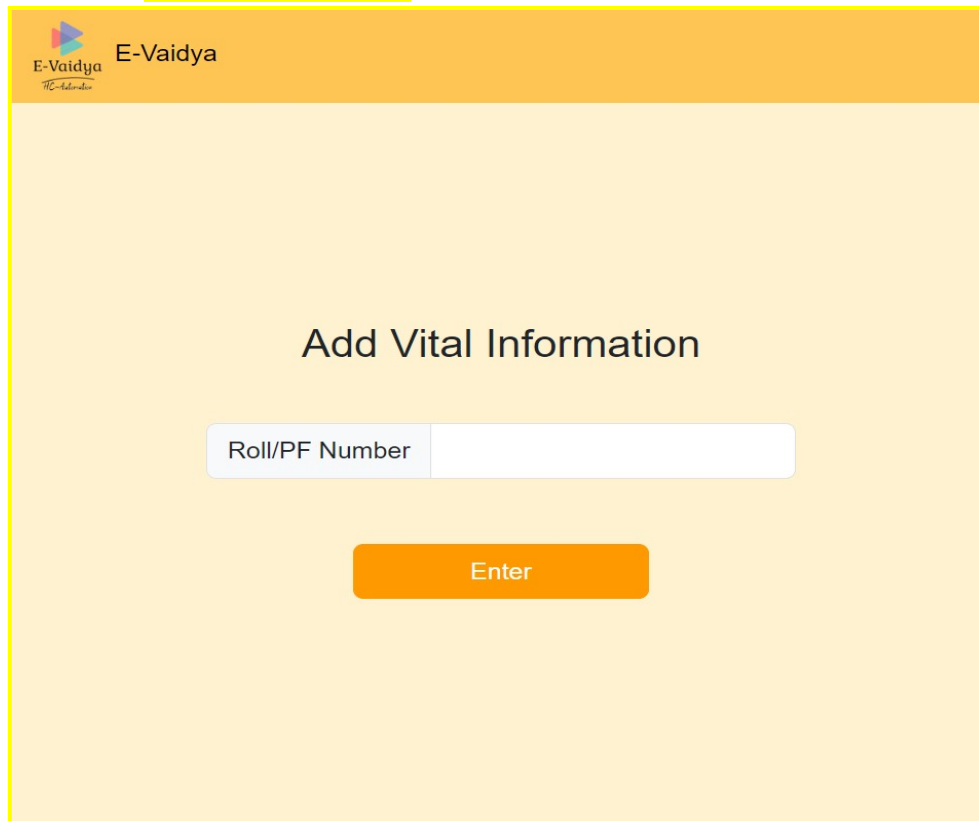
The screenshot shows the 'Prescription' page. At the top, there is a navigation bar with the E-Vaidya logo, 'Home', 'About Us', and a 'Logout' button. Below the navigation bar, the page title 'Prescription' is displayed. Below the title, the patient's name 'Name: student2' and the Roll/PF Number 'Roll/PF Number: 210958' are shown. The main content area contains a table with the following data:

#	Medicine ID	Medicine Name	Dosage	Status
1	6426ec1e33db447ec49851f1	Tramadol	TID	<input checked="" type="checkbox"/>
2	6426ec1e33db447ec49851f2	Asprin	BID	<input checked="" type="checkbox"/>
3	6426ec1e33db447ec49851f3	Gabapentin	BD	<input type="checkbox"/>
4	6426ec1e33db447ec49851f4	Morphine	BD	<input type="checkbox"/>

Below the table, there are two buttons: 'Dispense' and 'Print Receipt'.

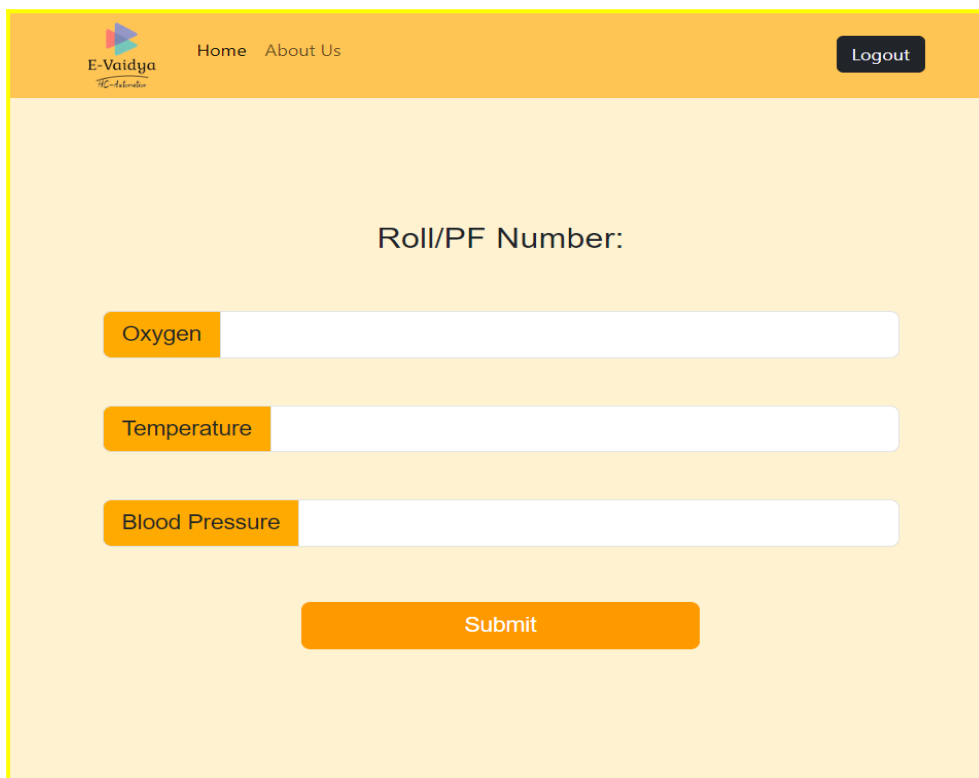
- The Nurse Page

- Student Details Page



The screenshot shows the 'Add Vital Information' page. At the top, there is a header with the E-Vaidya logo and the text 'E-Vaidya'. The main content area has a light orange background. In the center, the text 'Add Vital Information' is displayed. Below this, there is a text input field with the placeholder 'Roll/PF Number'. Underneath the input field is an orange button labeled 'Enter'.

- Vitals Page



The screenshot shows the 'Vitals Page'. At the top, there is a header with the E-Vaidya logo, the text 'E-Vaidya', and navigation links 'Home' and 'About Us'. A 'Logout' button is located in the top right corner. The main content area has a light orange background. In the center, the text 'Roll/PF Number:' is displayed. Below this, there are three text input fields, each with a label on the left: 'Oxygen', 'Temperature', and 'Blood Pressure'. At the bottom, there is an orange button labeled 'Submit'.

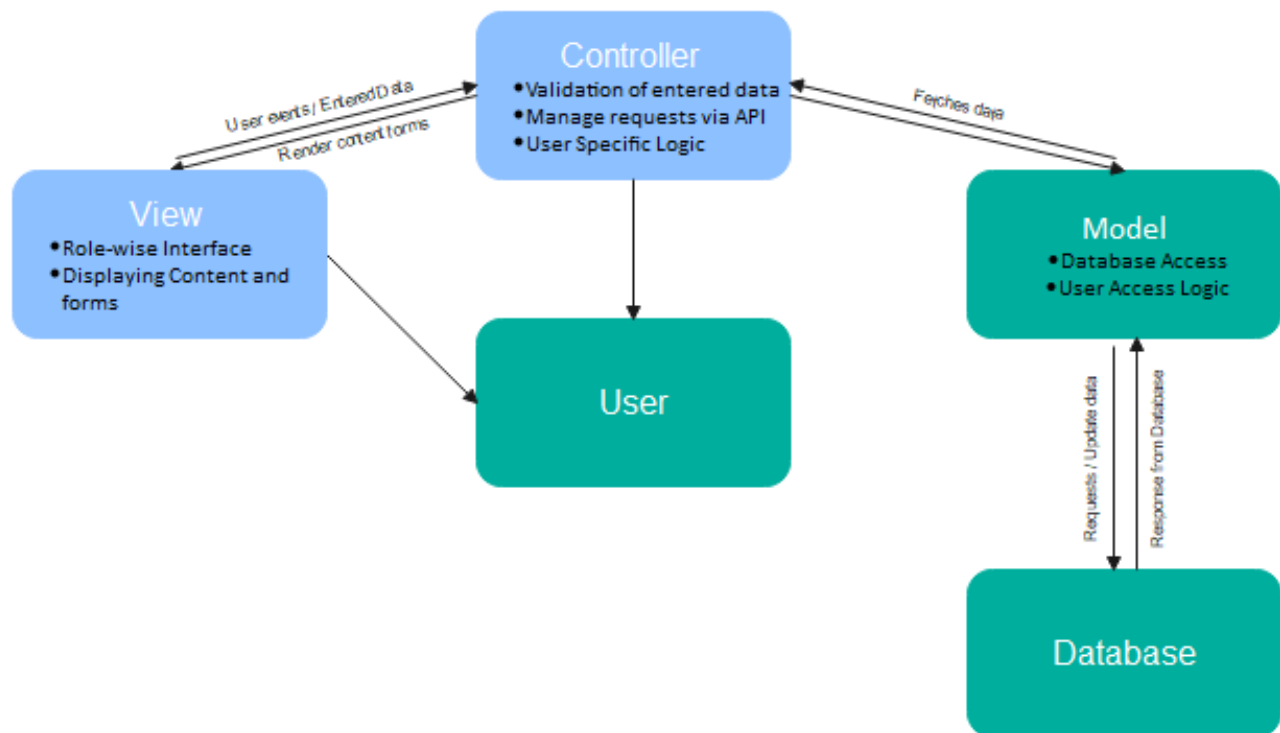
## 2 Architecture Design

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

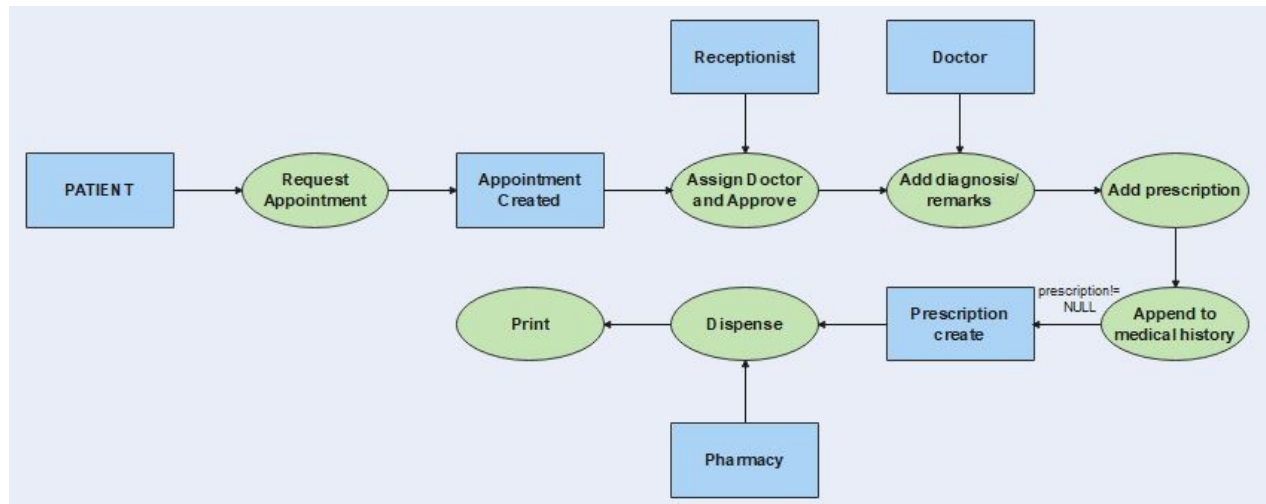
Model View Controller Architecture allows the system to display different the underlying data in different views depending on the user/role which is trying to access the system. The interaction between the users and the system is streamlined and the controller ensures that the data entered by the user 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



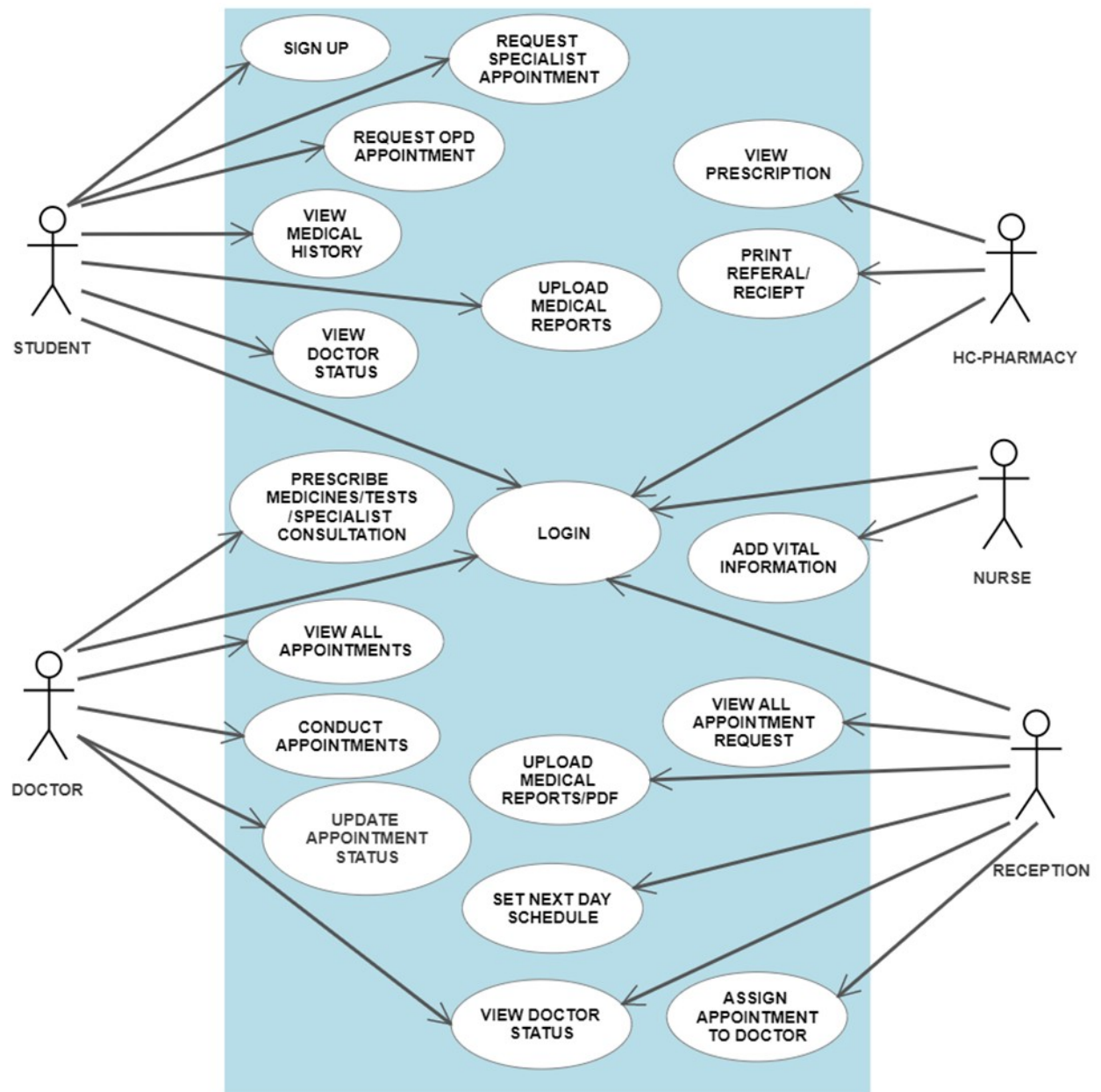
Pipe and Filter Architecture for Appointment and Prescription processing:





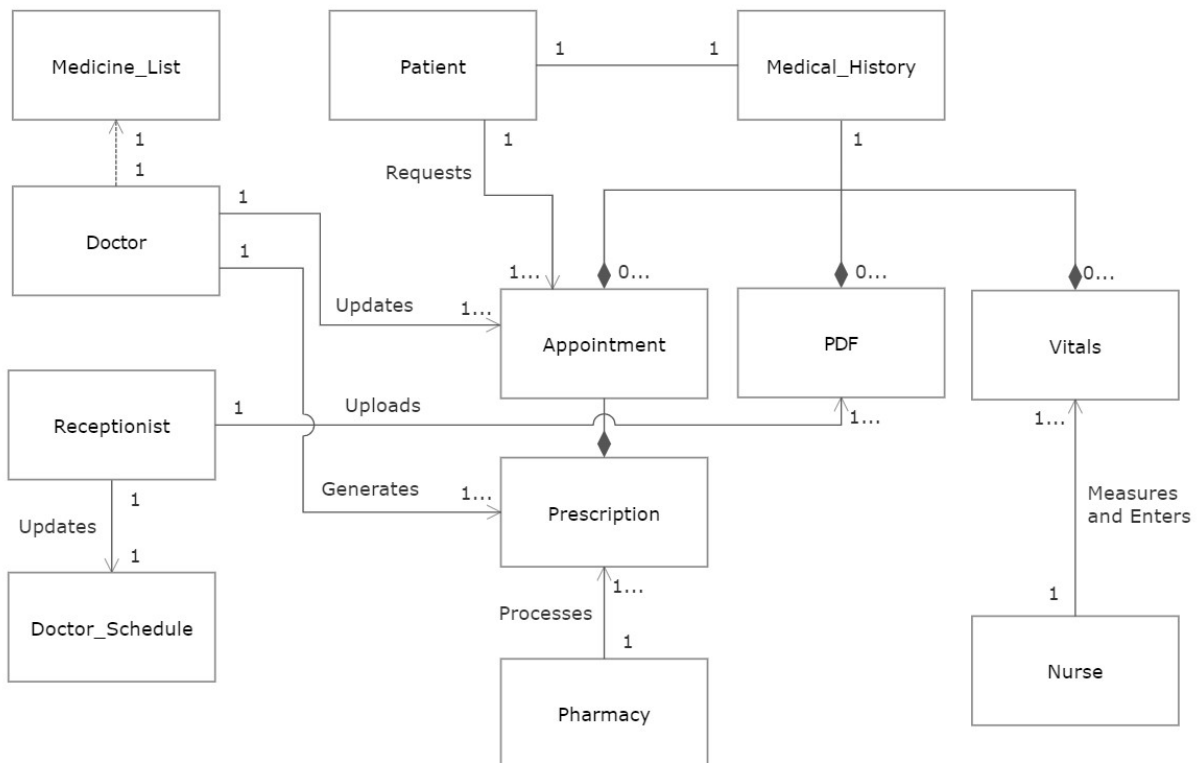
### 3 Object Oriented Design

### 3.1 Use Case Diagrams



## 3.2 Class Diagrams

The classes to be used in the software system along with their various associations is as follows:



Detailed description of each class with its attributes and functions is as follows:

Receptionist
login_ID : string password : string
view_appmnt_request()

Appointment
status : string doctor_name : string slot : string token : number
request_appntmnt() post_appntmnt()

Doctor_Schedule
doctor_list : array of strings slot_list : array of strings
update_doc_schedule() view_doc_schedule()

Nurse
login_ID : string password : string
add_vitals()

type_of_report : string
upload_PDF()
create_prescription()

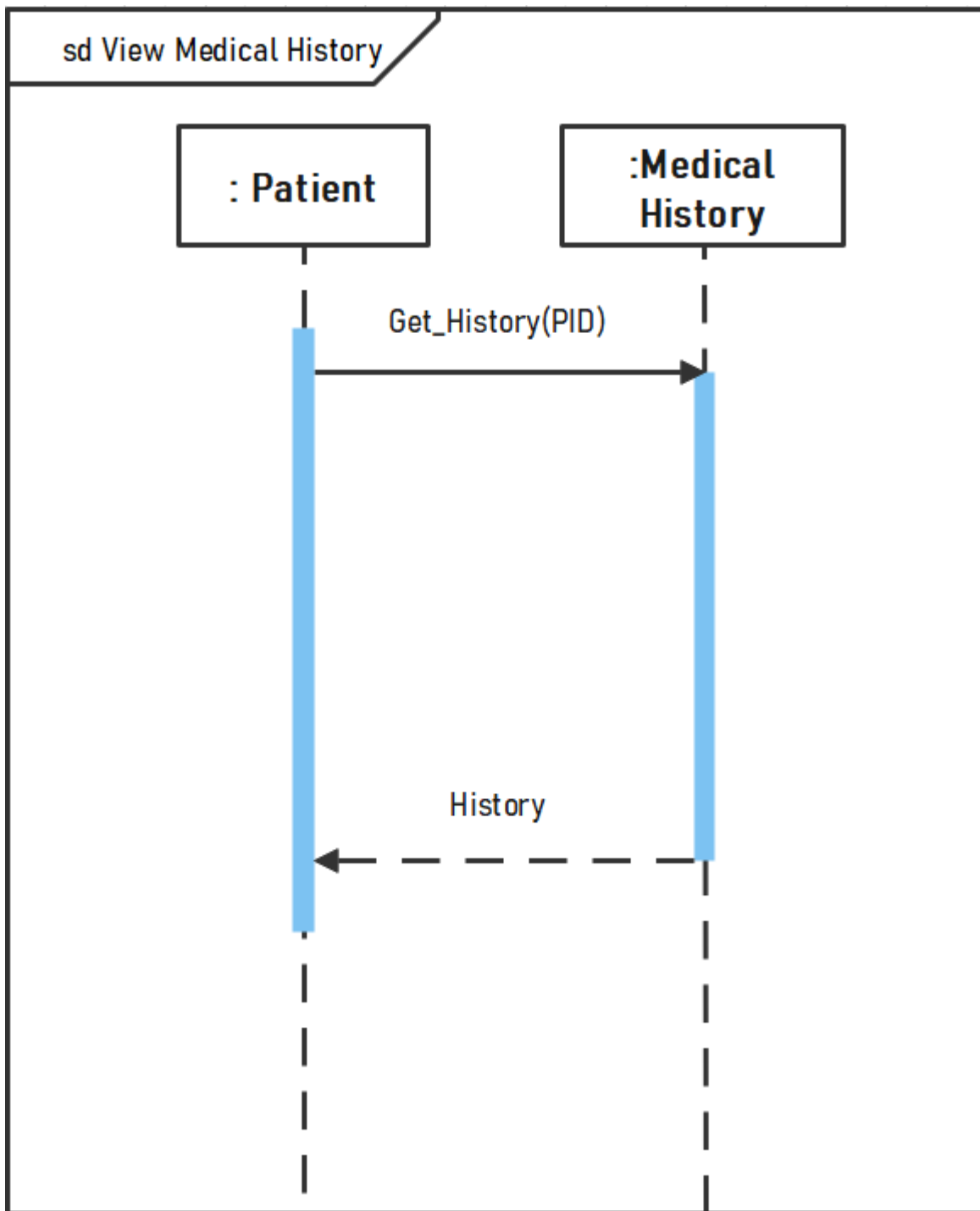
Patient
name : string roll_no : number password : string email : string phone_no : number blood_group : string health_details : string past_conditions : string
view_history() view_upcoming_apmnt()

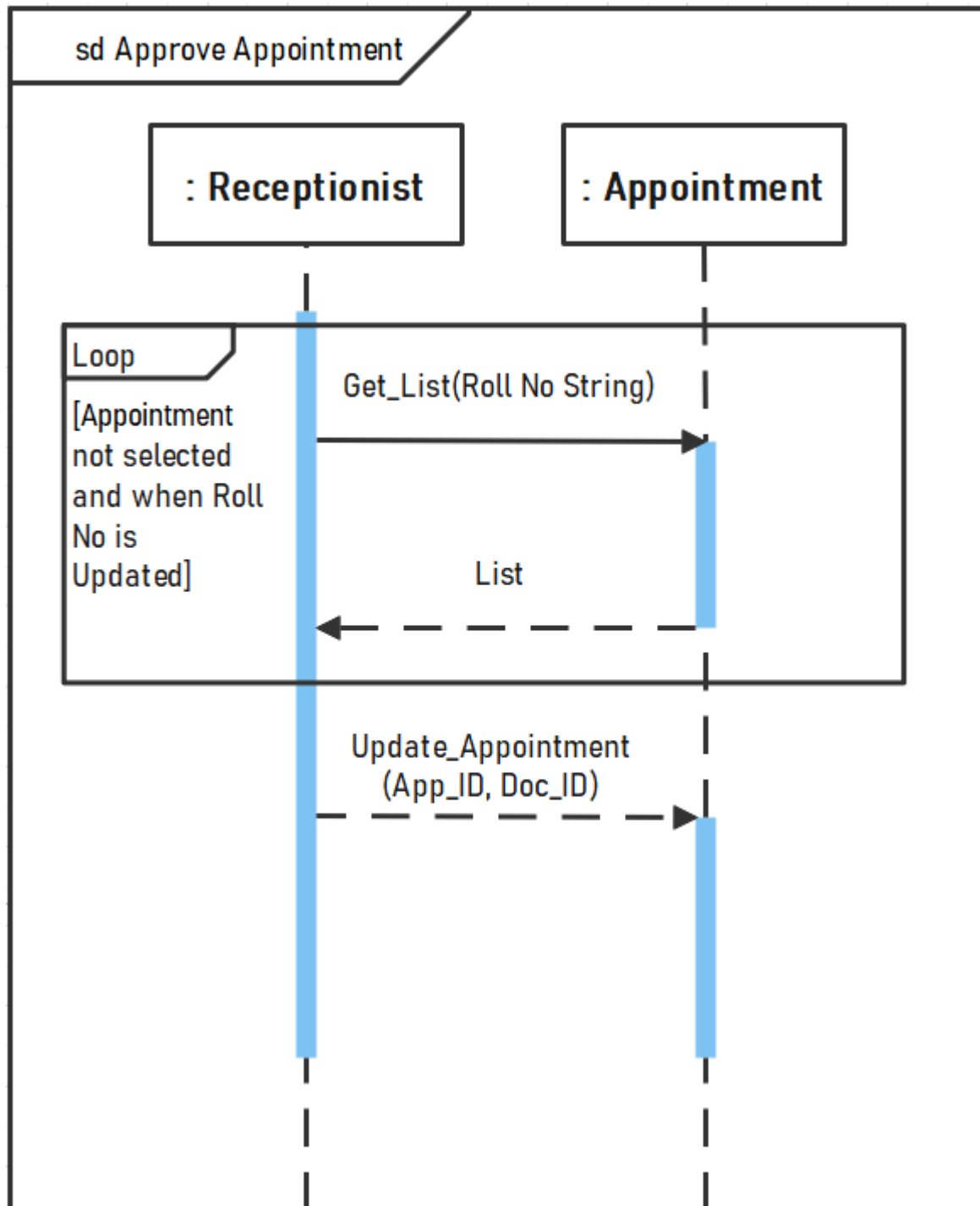
Medical_History
roll_no : number date : number time : number

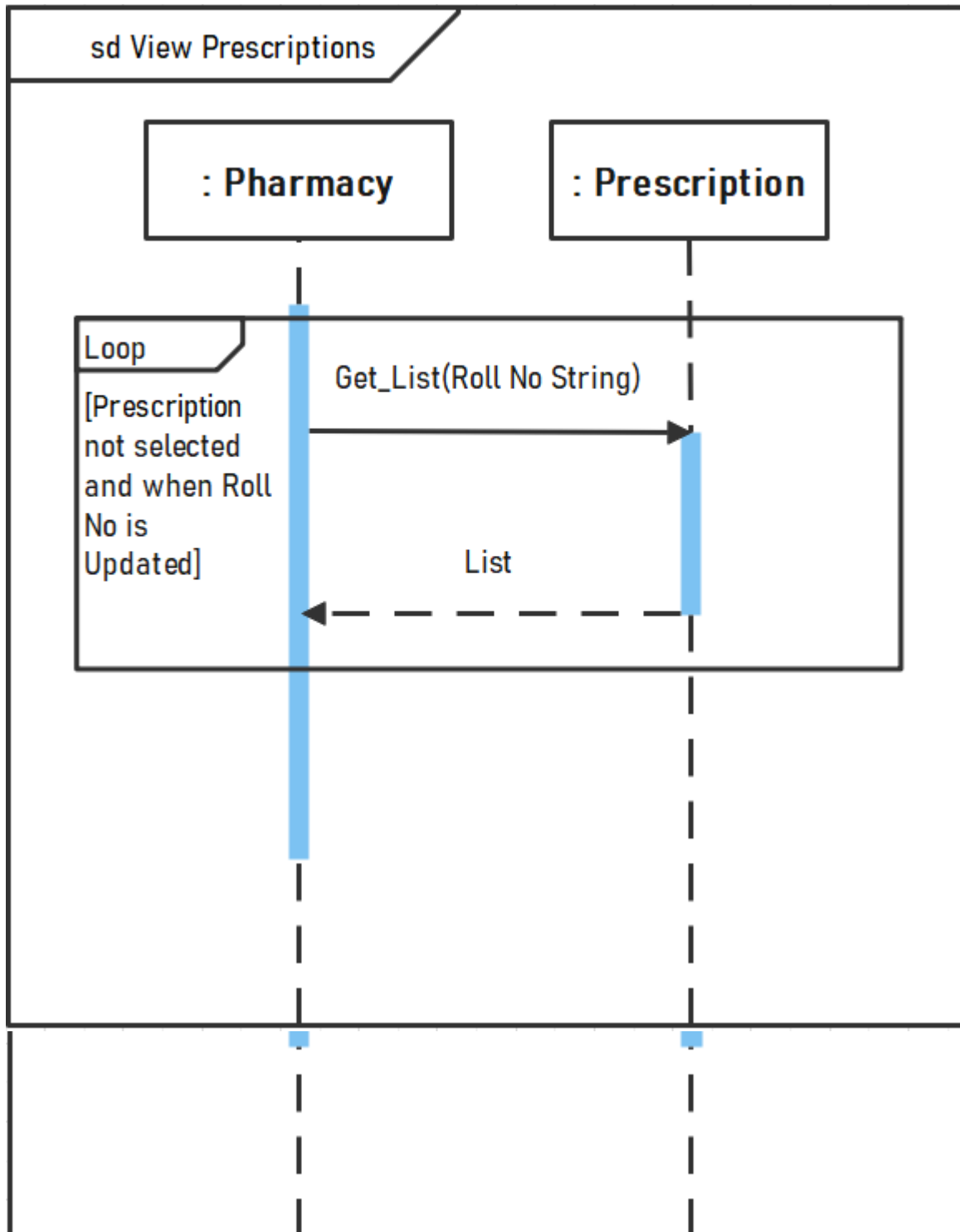
Pharmacy
login_ID : number password : string
handle_prescription() view_pending_prscrptn()

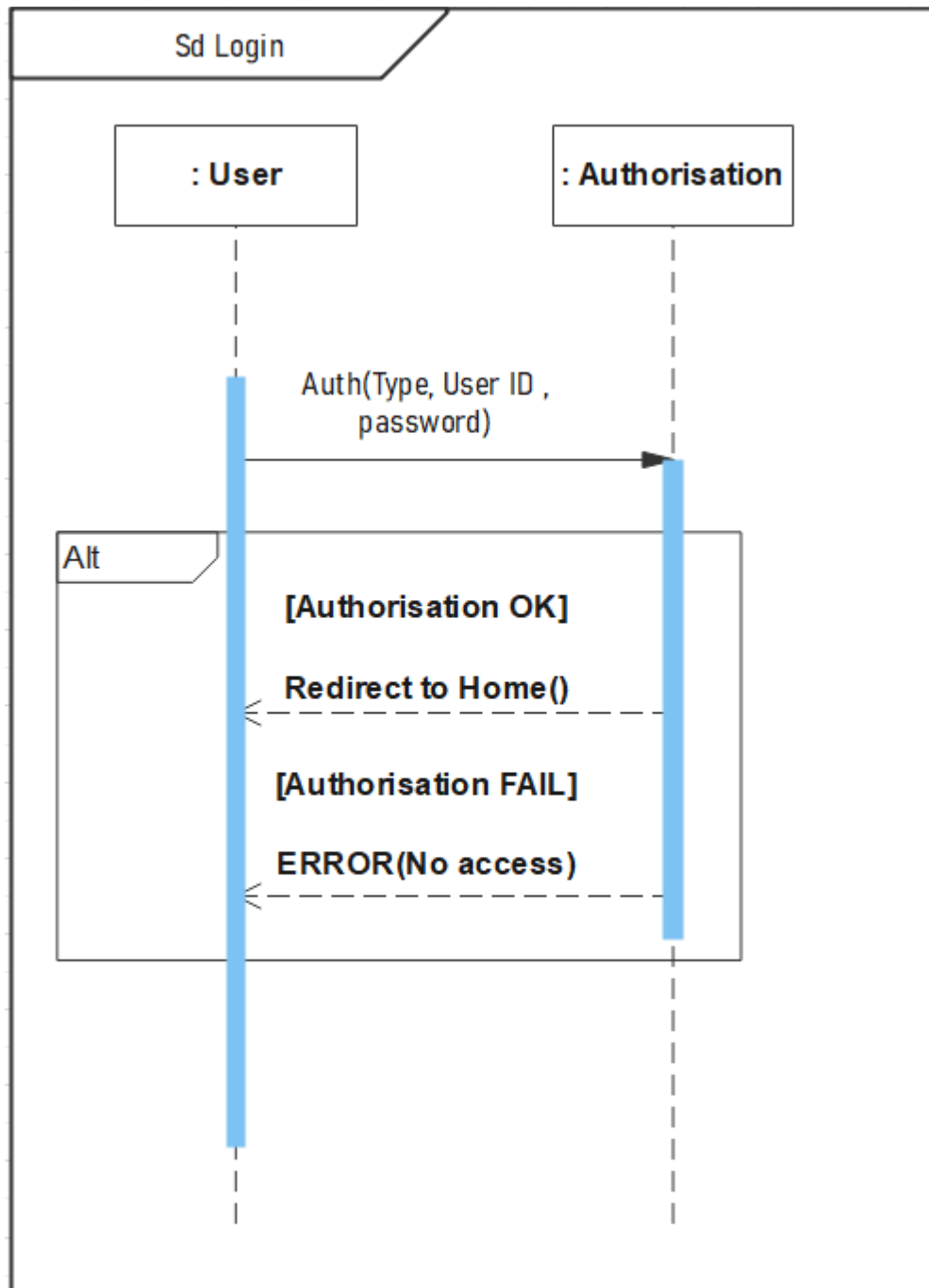
Medicine_List
med_list : array of strings
add_custom()

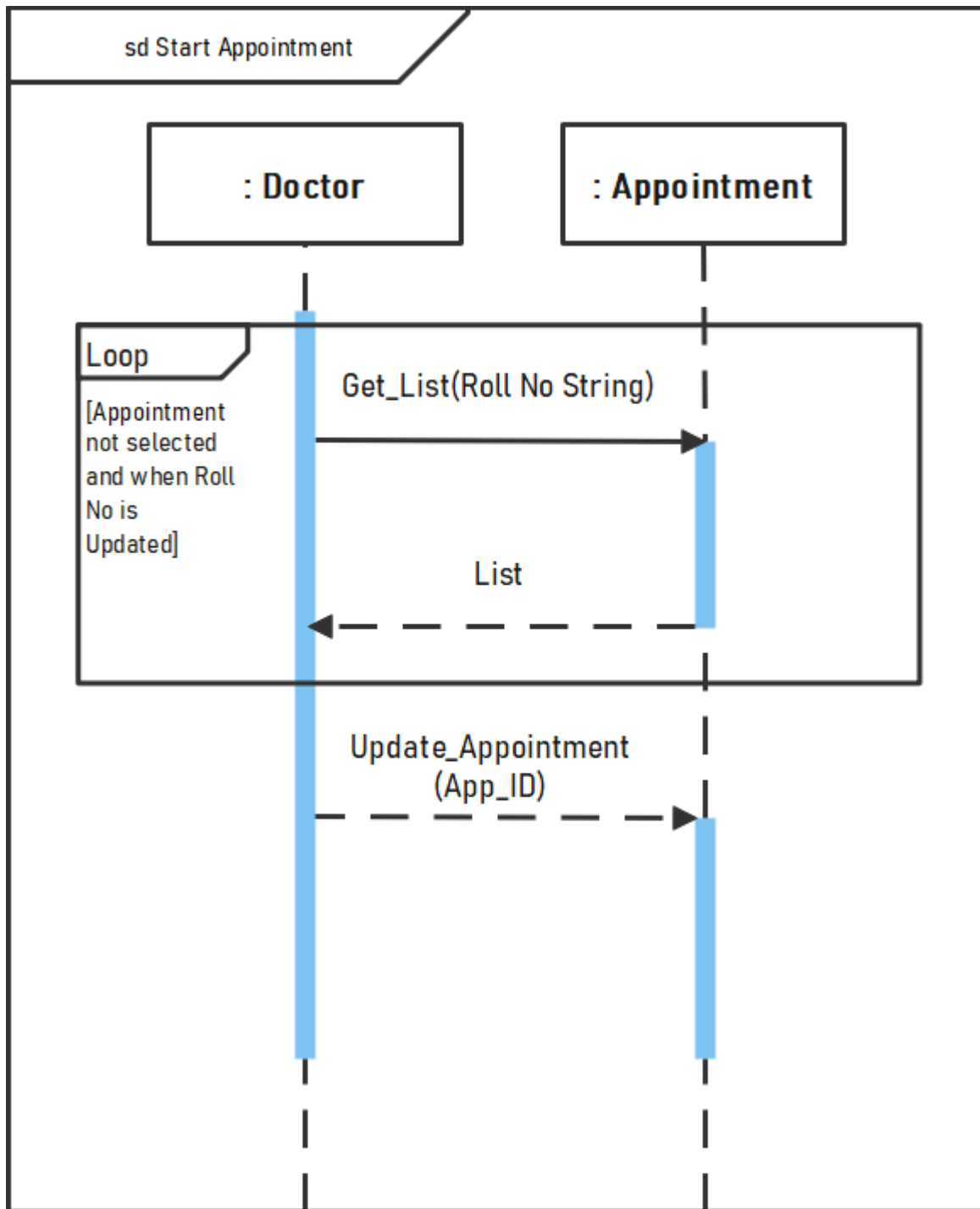
### 3.3 Sequence Diagrams



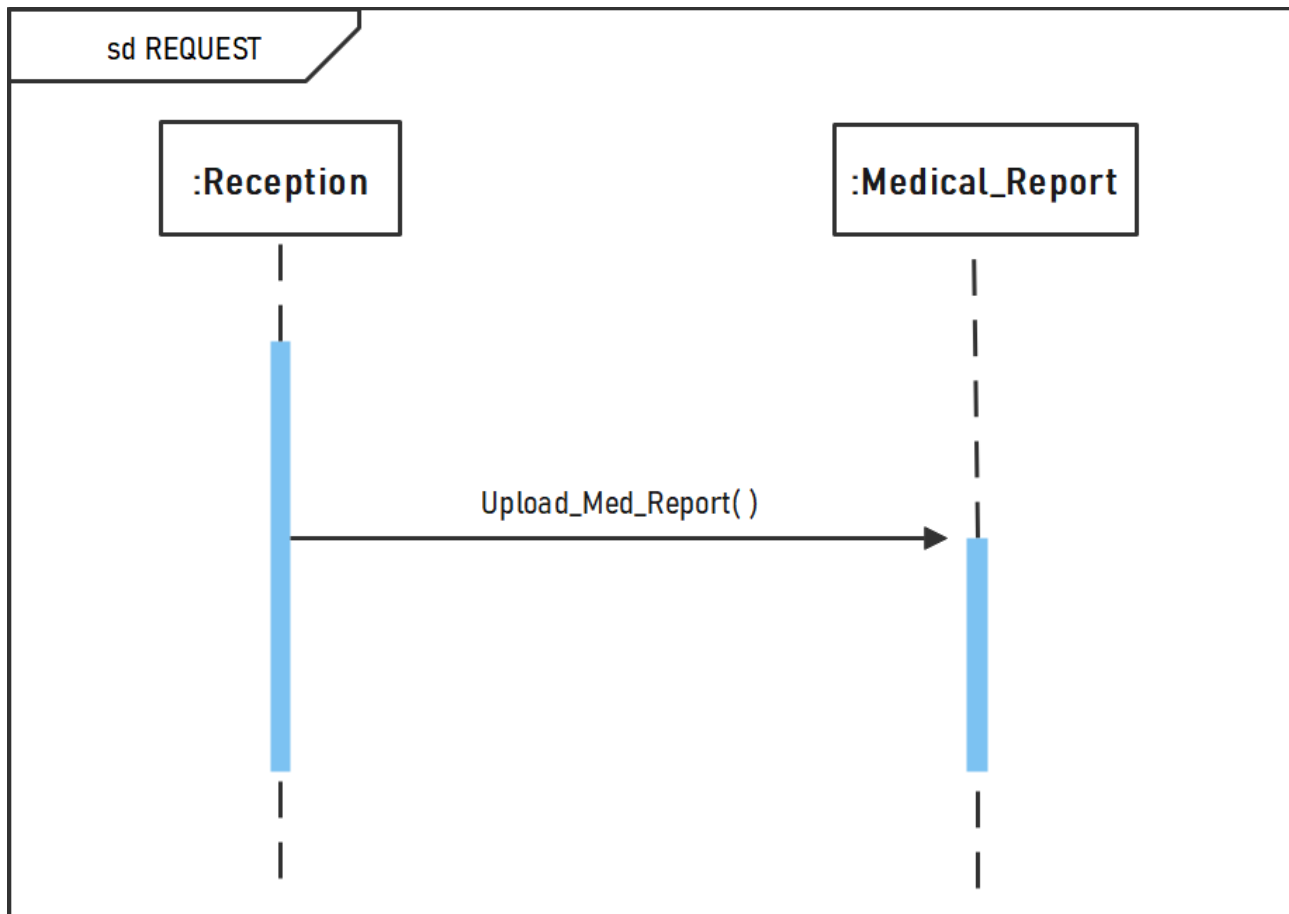


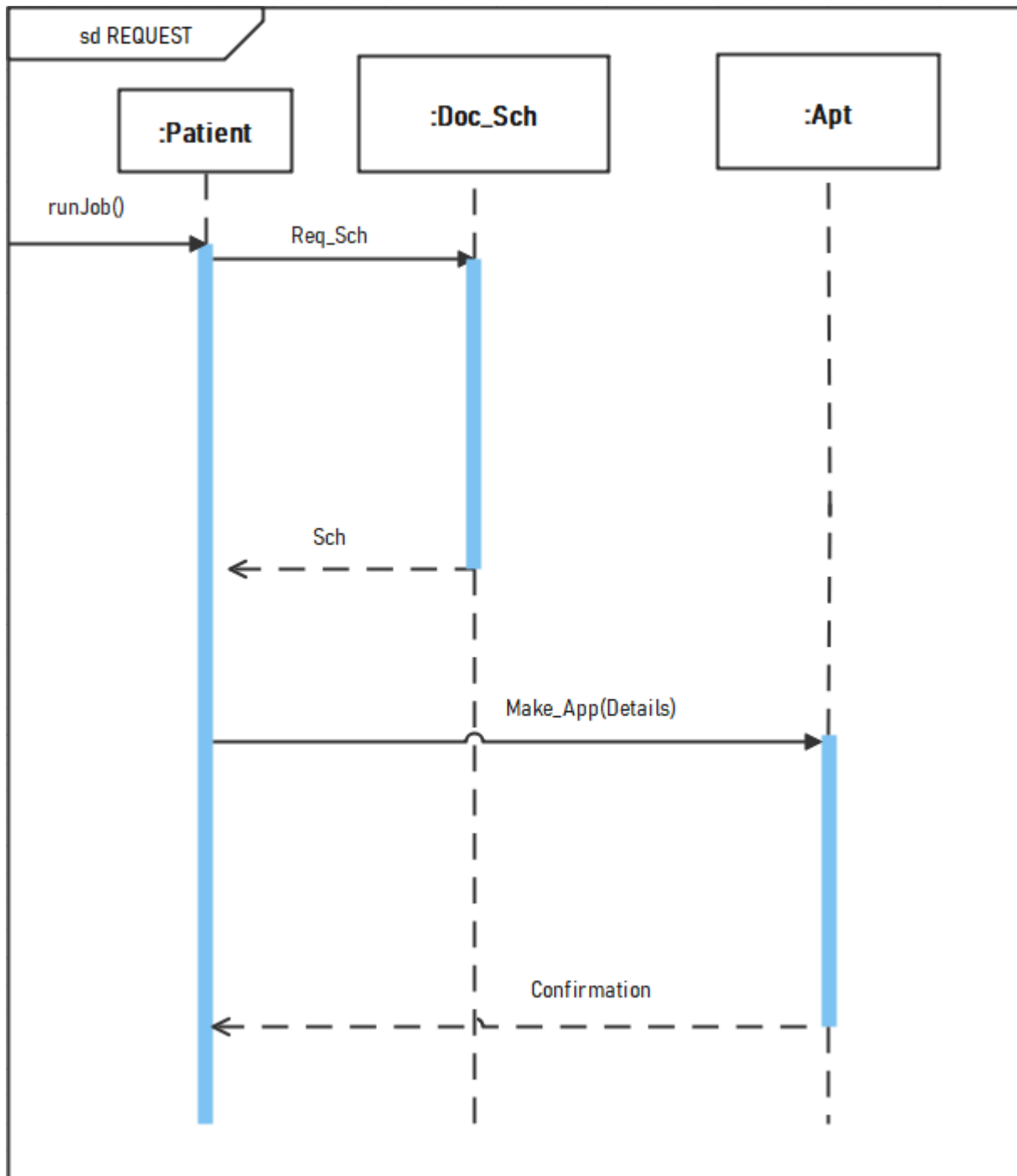


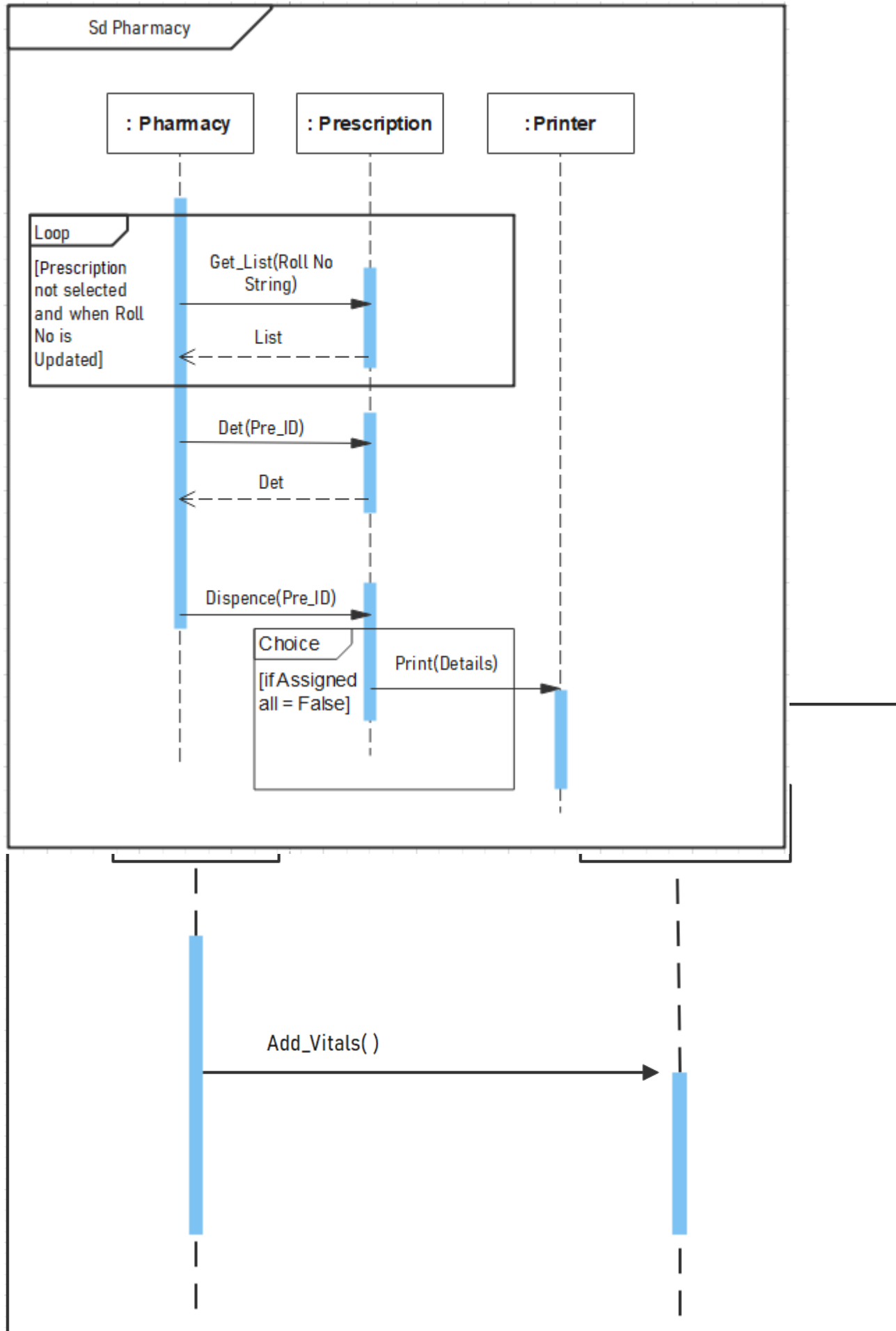




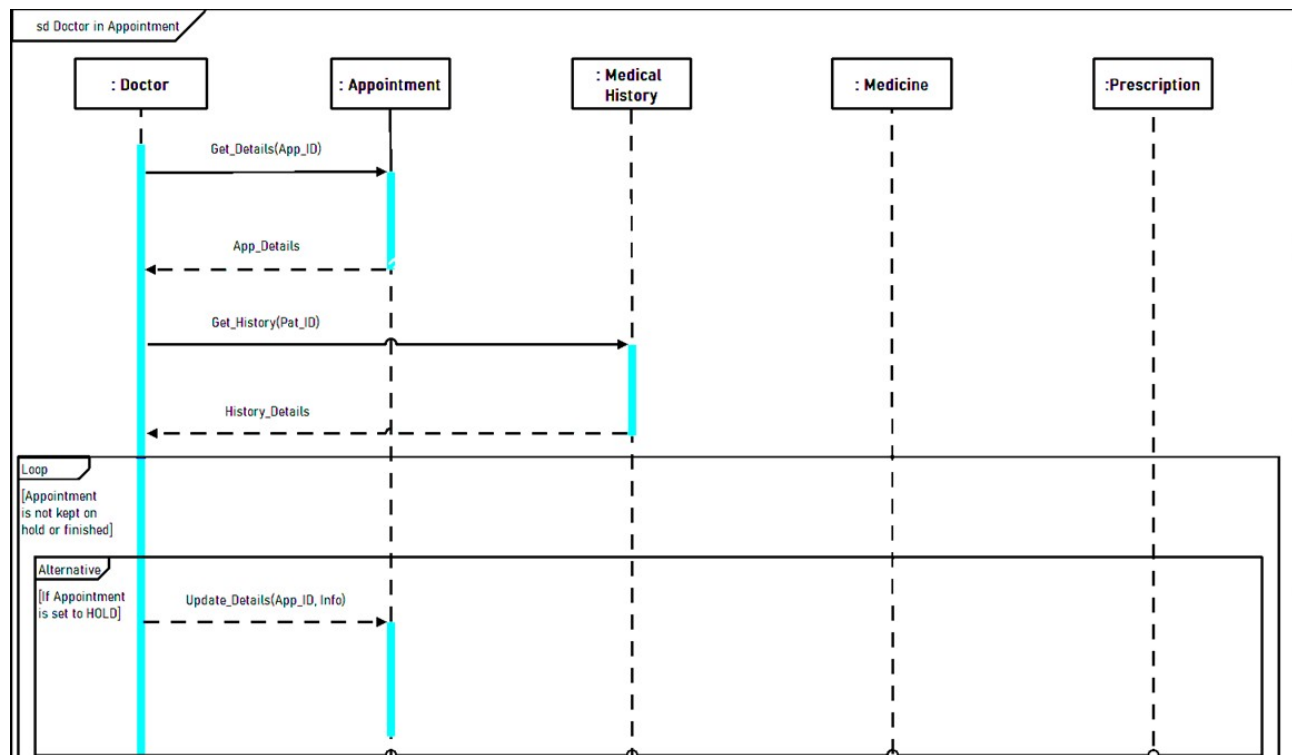




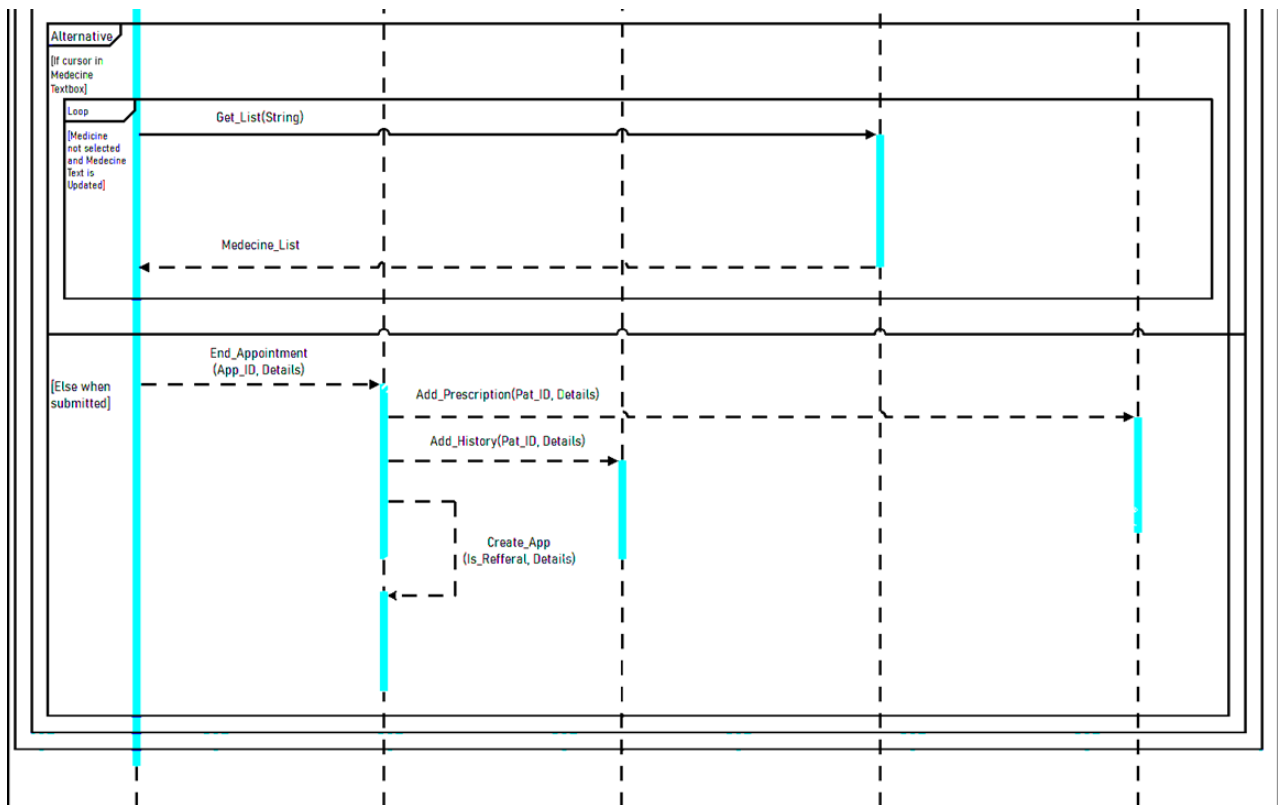






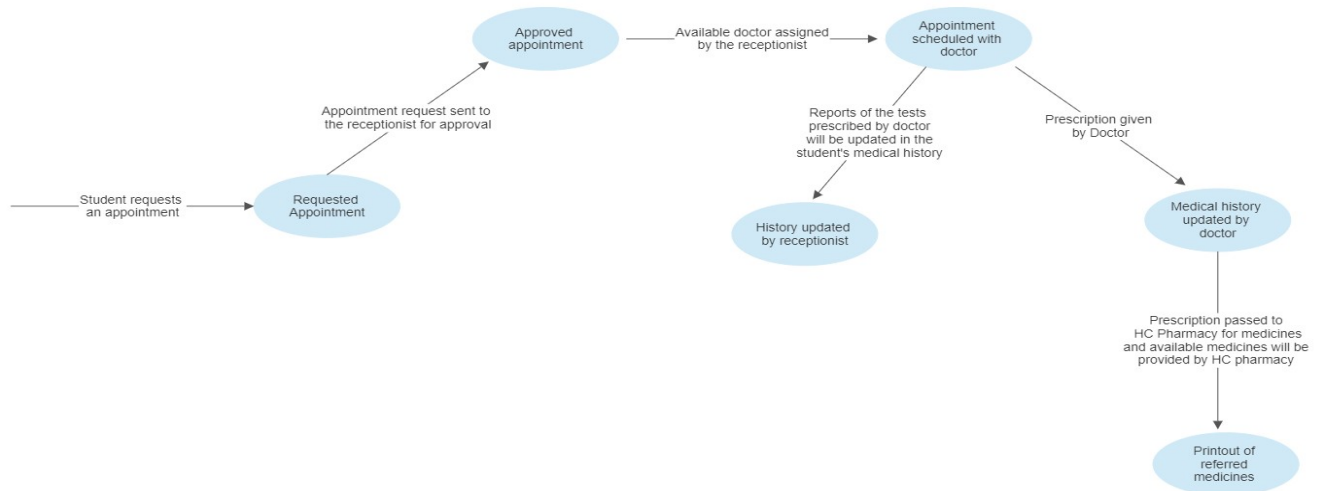


Continued on next page...



### 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

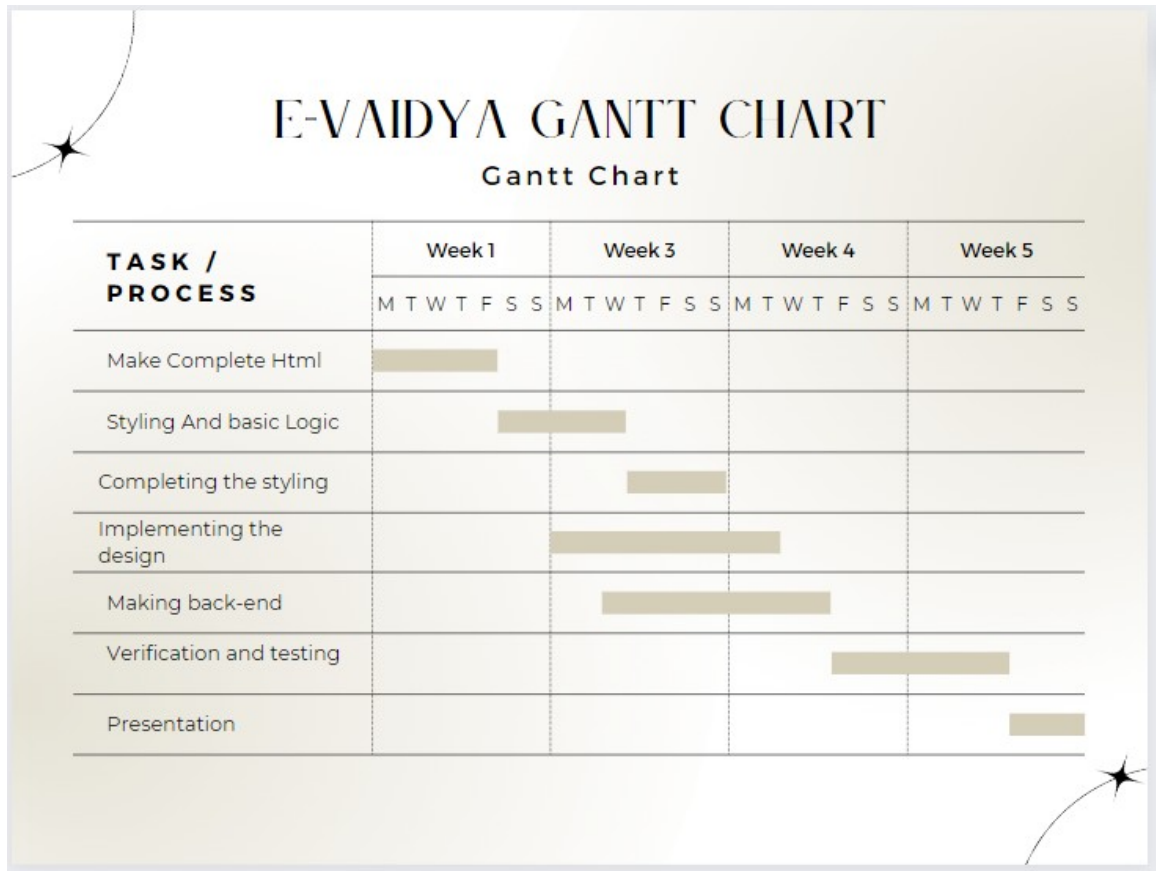
#### → Database designing

- 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](#)



## 5 Other Details

## 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