

MEDIBOOK

REVIEW REPORT

Submitted by

Navaneeth Narayanan (20BCE0559)
Amrit Yash Srivastava (20BCE2259)
Krushn pathak (20BCE0580)
Rahul Kumar Ankola (20BCE0530)

Prepared For

SOFTWARE ENGINEERING (CSE3001) – PROJECT COMPONENT

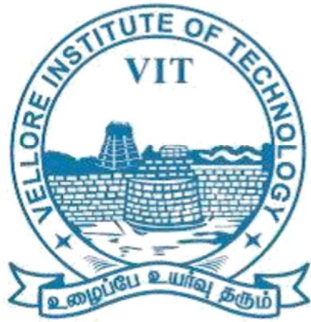
Submitted To

Dr. Anand Bihari
Assistant Professor (Sr)

School of Computer Science and Engineering



VIT[®]
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)



VIT[®]

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

**SCHOOL OF COMPUTER SCIENCE AND
ENGINEERING**

DECLARATION BY CANDIDATE

I/We hereby declare that the project report entitled “Medibook” submitted by me/us to VIT University, Vellore in partial fulfilment of the requirement for the award of the degree of B.Tech (CSE). This is a record of J component of project work carried out by me/us under the guidance of Prof. Anand Bihari for the course Software Engineering (CSE3001). I/We further declare that the work reported in this project has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma in this institution or any other institution or university.

Abstract

We propose to develop an android application to aid in dispensary patient data management and viewing. The system is aimed to help doctors to enter as well as view patient history as well as other patient details. Our system is a standalone system that can be installed on doctor android phone to be used for further login. On installation the application allows a doctor to open application and enter the details of any patient that undertakes his service. The application allows doctor to insert various data fields regarding a patient including patient name, disease, medication provided, date of arrival, cost etc. The system saves this patient related data in the android phone. The doctor may now view this data as and when needed. The doctor may check the details whenever needed. The application allows doctor to search patients by name as well as date.

Table of Contents

1.	4	5
2.	6	
3.	Error! Bookmark not defined.	6
4.	Process Model	7
5.	10	9
6.	Testing	20
	6.1 Testing Types	20
	6.2 Test Cases`	21
	6.3 Test Case Outputs	24
7.	Future work and conclusion	34
	7.1 Conclusion	34
	7.2 Future Work	34

1. INTRODUCTION

Patient tracking is a new technology in hospitals that hugely facilitate control over patient flow, treatment progress, as well as basic hospital processes such as patient acceptance and discharge. It improves the bed turnover rate at the hospital, allowing doctors to provide more people with treatment. This kind of system brings order to patient visits and gives the families of underage patients more confidence that their kids are safe. There are other benefits that hospital tracking system offers:

- Tracking visits. It is common for healthcare providers to use a patient tracking system with shared access. Now, whenever a patient is admitted to any healthcare facility, this data will be transferred to the primary physician. This way, it will be harder for caretakers to hide important clinical data from doctors and diagnosis precision will be improved.
- Helping locate patients who wander away from their room. Aside from other benefits of IoT in healthcare, connected technology for patient tracking will solve the issue of missing patients. Aside from tracking a person's location in real-time, patient tracking software can notify security as soon as a person wanders outside the permitted area.
- Higher patient satisfaction. Tracking systems are a good example of improving patient care through technology. Usually, healthcare facilities have a huge patient turnover, with thousands of people per month. Unfortunately, most of these visits are one-time — patients often ignore follow-up appointments and end up with chronic conditions. Having a bond that would help patients be more self-aware should be a hospital's priority. Tracking systems help physicians accomplish this goal as they provide hospitals with a database of patients scheduled for follow-up appointments. A patient, on the other hand, will get a phone notification, an email, and a social media reminder about the upcoming visit to a doctor.
- Better record keeping. Real-time tracking provides physicians with relevant updates on vitals and labs, gives insights on how to improve the efficiency of clinical trials and make a patient's hospital stay more productive. Other than that, patient tracking ensures interoperability between various hospital units — physicians, surgeons, nurses, and other links in the healthcare chain.
- Improved patient queuing. By tracking patients, hospital managers will be able to determine if there are any patterns in patient flow growth. Also, tracking systems will notify a caregiver that a patient showed up to an appointment — as a result, there's less of a need to rely on receptionists and not such a large margin for error.

Patient tracking provides more insight into treatment progress, if integrated into the hospital management system creates a transparent hospital management system, and improves patient safety.

2. AIMS AND SCOPE OF THE PROPOSED WORK

- i) Goals: To eliminate the burden of carrying medical files including reports and prescription. To save time of managing all the tasks for searching reports which are in paper format. To provide user friendly efficient service to all users.
- ii) Objectives: To develop an application which allows patient to view the medical history /records online. To reduce the time consumption required for visiting doctor at different times. To provide user friendly and time saving experience to the patient and doctor.

This application use in several Hospitals and Organization. In Future Patient can view his medical reports/history. All in one app. Scope of proposed system is justifiable because large amount of the population face the problem of managing the medical records in form of files and papers.

3. LITERATURE SURVEY

[1] S. Challa, G. Geethakumari and C. S. N. Prasad, "Patient Data Viewer: An Android application for healthcare," 2011 Annual IEEE India Conference, 2011, pp. 1-4, doi: 10.1109/INDCON.2011.6139641.

This paper presents the design and development of a Patient Data Viewer System using the Android mobile application development platform. This system allows the doctors to view the vital parameters of a patient remotely and respond accordingly.

[2] Ran Wei and Zhimin Yang, "Design and implementation of doctor-patient interaction system based on android," 2012 International Symposium on Information Technologies in Medicine and Education, 2012, pp. 580-583, doi: 10.1109/ITiME.2012.6291373.

The authors present a doctor-patient interaction system based on Android. Its excellent performance on mobile terminals makes it possible that patients are able to access the hospital server to obtain the necessary suggestion about the symptoms and interact with the doctors on their own mobile terminals, while doctors can track patients whenever and wherever possible or make a diagnosis of alert depends on the monitoring data from the hardware of mobile terminals.

[3] P. Szakacs-Simon, S. A. Moraru and L. Perniu, "Android application developed to extend health monitoring device range and real-time patient tracking," 2013 IEEE 9th International Conference on Computational Cybernetics (ICCC), 2013, pp. 171-175, doi: 10.1109/ICCCyb.2013.6617624.

This paper presents the Android mobile phone application developed in order to extended data communication range of our wireless health monitoring device. The main scope is to monitor people at risk in real time even if they are outside of their home and wireless home gateway is out of range.

[4] https://mail.easychair.org/publications/preprint_download/sLk1

Android patient tracker is actually nothing else then a tracking device which will be able to track patients who are in emergency, who are away from home, who cannot reach any hospitals in time, who no way or conveyance to reach hospitals in time so to ease them hospitals can reach such patients or we can say that the medical support can reach the patient that is the purpose of this application.

[5] M. H. Acharya, T. B. Gokani, K. N. Chauhan and B. P. Pandya, "Android application for Dementia patient," 2016 International Conference on Inventive Computation Technologies (ICICT), 2016, pp. 1-4, doi: 10.1109/INVENTIVE.2016.7823231.

This project focuses on the people who are suffering from dementia. They are generally admitted to mental hospital or imprisoned at home. This application reduces the gap between patient and caregivers. This application has several basic functionalities like "GPS Navigator", "Fall Detection System", "Mind Games", "Doctor-Finder" and "Emergency".

4. PROCESS MODEL

To identify and justify model, firstly we identified and made our modules, which are as follows:

1. User and Login Module:

This module tells everything about the doctor and their patients while accessing Patient-Tracker Portal. If any doctor wants to use the facilities which are provided in this portal, they must be registered in the portal by providing a username and a password, through which they can login and can use all the facilities and this module is used for all the operations required during login such as storing of username, password and other details that may be required to check authenticity if user requests a password reset.

2. Appointment Module:

This module handles all the appointments made by the patients for consultation to the doctor. This module also gives the next date of appointment for consultation.

3. Patients Information Module:

This module handles the patient's information added or updated by the doctor. The doctor can update the patient's information such as medication administered, disease history, date of arrival, treatment costs among other things. All this information can be used by the doctor when the patient comes for a follow-up routine.

• Administrative Modules:

4. Reports Module:

By using this module administrator will get different types of reports regarding doctors like Number of doctors of the portal, number of consultations done through this portal etc. This module can be accessed and controlled by the administrator only.

5. Administrative Module:

This module must contain all the necessary functions and tools required by an administrator to perform the following:

- Retrieve all the doctors in the Database
- Add/Update/Delete patients' data
- Update/Delete any doctor's data
- Reset password
- View and print consultations for each patient

• From the above modules, we understood that as we progress in our project, we will have to introduce new technology and update the app. Therefore, the model that will be most suitable for our project is Incremental SDLC Model.

• This model will be useful and efficient as most of the requirements are known up-front but are expected to evolve over a period of time and we need to get basic functionality to the market early as the project would have tedious development schedules.

• Hence, Incremental SDLC model seems a great option for us as it satisfies all our conditions.

5. System Requirements Specification Document

MediBook

System Requirement specification (SRS)

Prepared By:

Krushn Pathak (20BCE0580)

Rahulkumar Ankola (20BCE0530)

Amrit Yash Srivastava (20BCE2259)

Submitted to:

Professor: Anand Bihari

Course Name: Software Engineering

Course Code: CSE3001

Table of contents

SL No	Name	Page No
5.1	Introduction	10
5.2	Requirement Analysis	10
5.3	DFD	11
5.4	Data Dictionary	13
5.5	Functional Requirements	14
5.6	Non Functional Requirements	14
5.7	System Requirements	14
5.8	WBS	15
5.9	Use Case Diagram	17
5.10	Class Diagram	18
5.11	Activity Diagram	19

PROPOSED SYSTEM REQUIREMENTS ANALYSIS AND DESIGN

5.1 Introduction

System architecture will simplify whole system in such a way that every user of the system gets benefits. As shown in figure there are 3 main users Admin (Development staff), Doctor and Patient. It's a tedious job to handle all the medical reports and the generated prescriptions through that. One finds it hard to maintain the prescription and reports while travelling or shifting to new place. Doctor needs to examine patient overall again to get the exact detail medical condition of the patient. Therefore, if the data is digitized and available to the doctor as well as Patient on the tap of their finger then it becomes easy to handle such digitized data. Here the main function is to provide digitized report and prescription to Doctor and Patient and to provide free and online access to the data. Doctor also registers and gets provided with Unique user ID and password, which he/she can use for login. Doctor can view patients profile, Disease Viral, etc.

5.2 Requirement Analysis

This document is meant for the developers and the users to explain what this project entails. This project involves the development of an Android application for viewing and managing patient data. The app is designed to help doctors to see the medical history of their patients, hence it is of a thus appropriate scope. Doctors can also continually upgrade the system by entering the latest medical data of their patients. This app can be installed on any Android device. Doctors can log in the app from their Android smartphones and enter relevant information about their patients, including patient name, disease history, medication administered, date of arrival, and consultation and treatment costs, among other things. Once the information is saved on the system, it will be stored for the perusal of doctors for their future cases. So, if a patient comes for a follow-up routine, doctors can immediately check up on their medical history and provide the necessary medical treatments.

Requirement analysis data and Table:

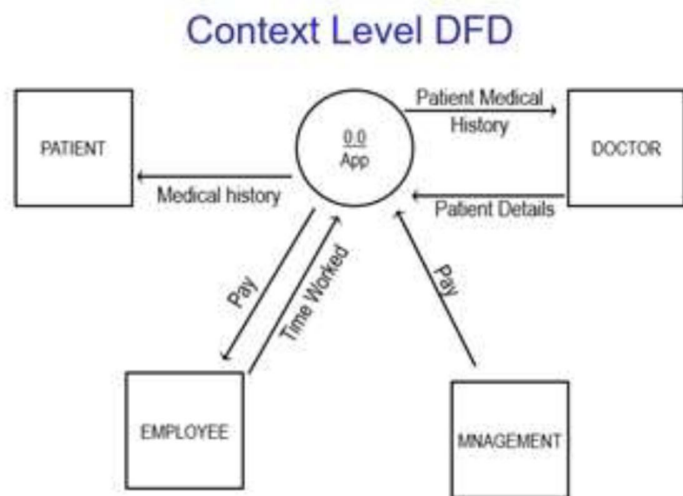
Name of the clinic	Contact Info	Requirements Discussed
Manan Clinic	0265 278 5062	Need of a streamlined software that can be used to track patient history and can be used to manage the records of the clinic by a single person
Mamta Clinic	065 248 2102	Cheap and cost-effective solution that has minimum overhead costs and that would not require investment in the form of additional Computers/Tools
Ashirwad Clinic	097252 87882	User Friendly Ui that is easy to understand and operate even for someone with no prior training as well as cheap and cost effective
Dev Clinic	095377 86478	The software should be cheap and should not require requirement for the installation of any new systems

Main points gathered from requirement analysis:

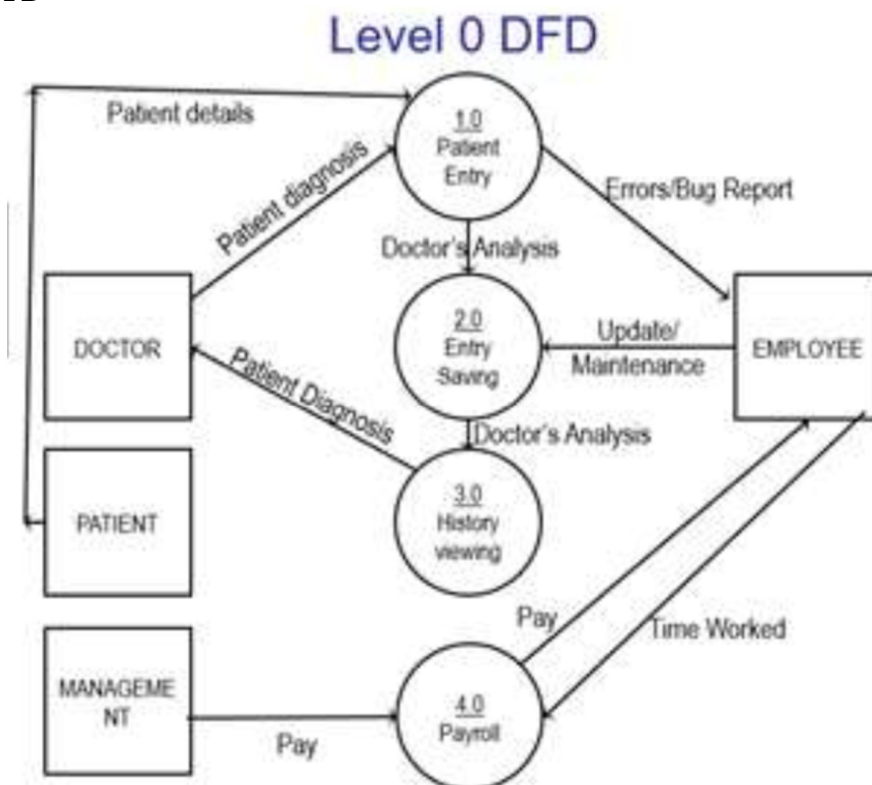
1. The software should be cheap
2. The software should run on low-end systems and preferably smart phones
3. The use for the software should be streamlined
4. The UI of the software should be easy and simple to understand and require no prior training
5. Should not require more than one single personal to handle and manage the database

5.3 Stakeholder Identification

Context level DFD

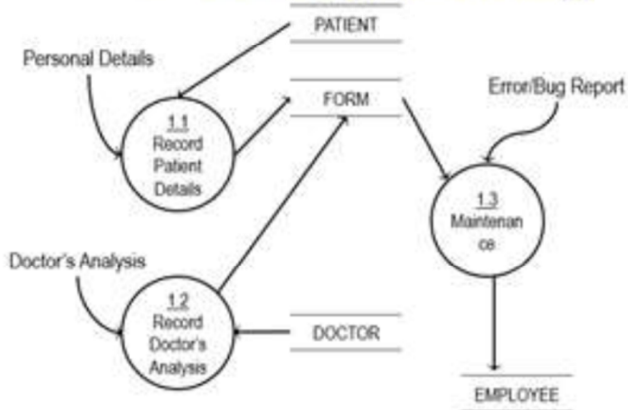


Level 0 DFD

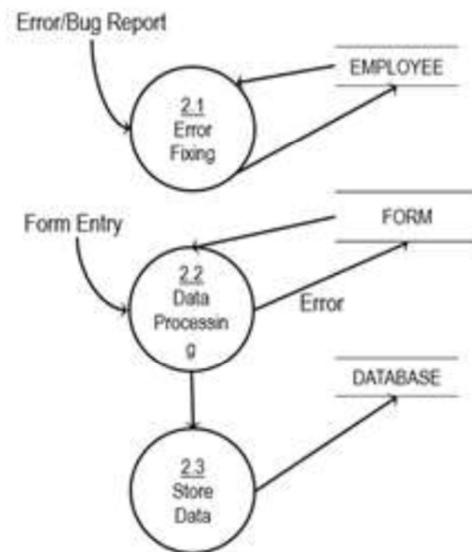


Level 1 DFD

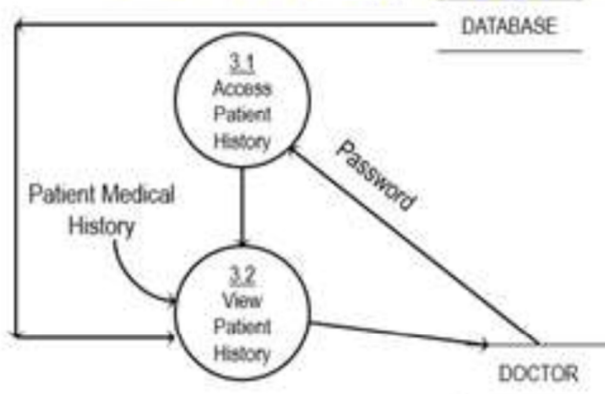
Level 1 DFD (Patient Entry)



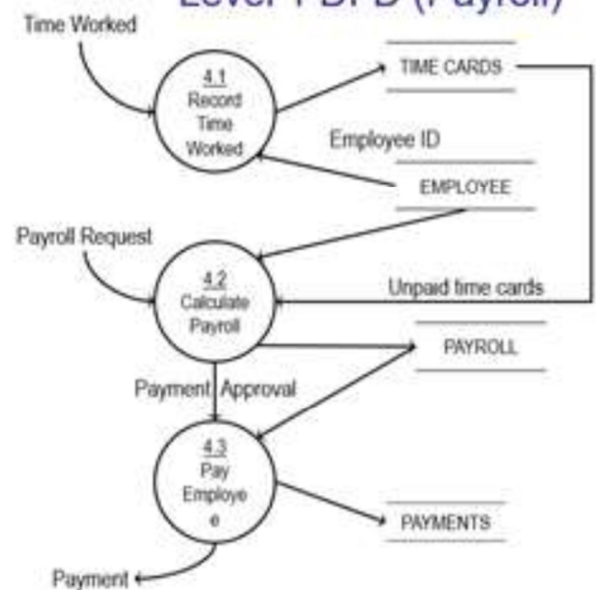
Level 1 DFD (Entry Saving)



Level 1 DFD (History Viewing)



Level 1 DFD (Payroll)



5.4 Data Dictionary

Data Dictionary for Login

Column	Type	Description	Example
USER_CRED	varchar(20)	Username	admin
PASS_CRED	varchar(20)	Password	vitadmin1234

Data Dictionary for Doctors

Column	Type	Description	Example
D_ID	varchar(4)	Id of doctor	D104
D_NAME	varchar(30)	Name	Krushn Pathak
D_DATE	date	Date of joining	21/03/2000

Data Dictionary for Patient

Column	Type	Description	Example
P_ID	varchar(5)	Id of patient	P304
P_NAME	varchar(30)	Name	Rahul Ankola
P_MOBILE	number(10)	Contact Number	7069936070
P_ADDRESS	varchar(30)	Address	Mumbai
P_AGE	number(3)	Age of patient	32
P_BLOODGROUP	varchar(4)	Bloog group	O+
P_SEX	varchar(1)	Gender	M

Data Dictionary for Patient History

Column	Type	Description	Example
P_ID	varchar(5)	Id of patient	P505
P_DATE	date	Date of appointment	12/03/2022
P_REMARKS	varchar(80)	Remarks by doctor	Pain in stomach
P_MEDICATION	varchar(80)	Medication given	Paracetamol

5.5 Functional Requirements

The features of this system include:

Adding Patients: The PTS (Patient tracker system) patient details are added to the database via a form.
Assigning an ID to the patient: The DBMS assigns an alphanumerical ID for the patient that can be used to identify and search for the patient details.

Info of the Patient: The PTS generates a record on every patient concerning various details like individuals name, Phone number, Dates of visit, the medical professional's name whom it appoints, as well as the patient's medical history segregated based on which specialization it falls under.

Compulsory Individual Information: Every patient has some required data like phone number, their first and last name, individual wellness number, postcode, country, address, city, person's ID number, and so on which will be added to the records.

Searching for Patients: The doctor may now view this data as and when needed. The doctor may check the details whenever needed. The application allows doctor to search patients by name as well as date.

Updating details of the Patient: The PTS enables the user to update the info of the individual by modifying it via an entry. Search for the patient, an entry appears with the patient's personal details, and update in the required section.

5.6 Non Functional Requirements

5.6.1 Performance Requirements

- **Response Time:** The system provides acknowledgment in just one second once the 'patient's information is checked.
- **Capacity:** The system needs to support at least 10000 patients at once.
- **User-Interface:** The user interface acknowledges within five seconds.

5.6.2 Safety Requirements

- **Availability:** The system is available all the time.
- **Back-Up:** The system offers the efficiency for data back-up.
- **Errors:** The system will track every mistake as well as keep a log of it.

5.6.3 Security Requirements

- **Doctor Identification:** The system needs the doctor to recognize herself or himself using the phone.
- **Login ID:** Any user who make use of the system need to hold a Login ID and password.
- **Modifications:** Any modifications like insert, delete, update, etc. for the database can be synchronized quickly and executed only by the user himself/herself.
- **User Rights:** The staff in the front desk can view any data in the Patient Tracker System add new patients record to the HMS but they don't have any rights alter any data in it.

5.7 System Requirements

5.7.1 H/W Requirements to develop application(details about Application-Specific Hardware)

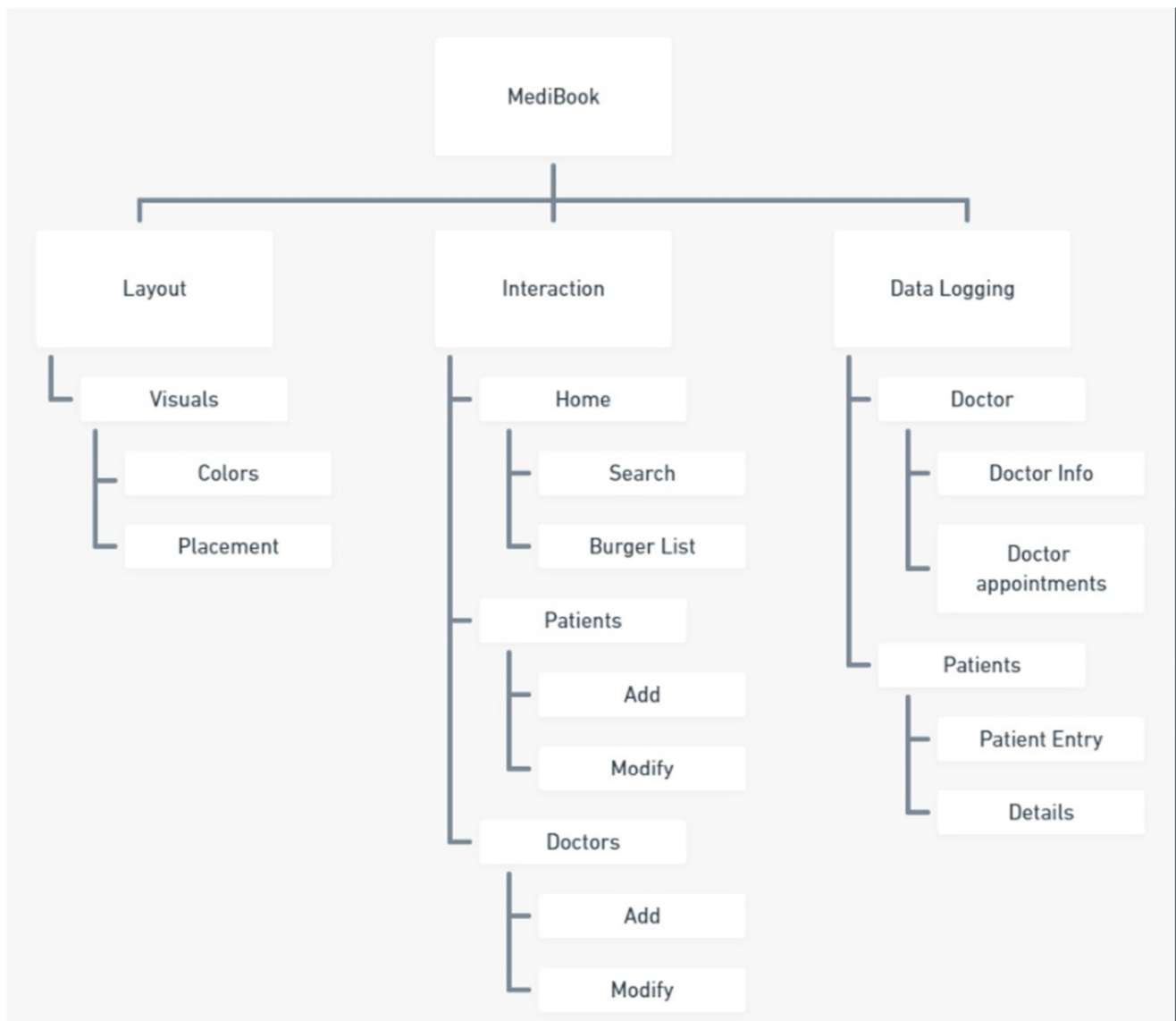
- Processor – i3
- Hard Disk – 5 GB
- Memory – 1GB RAM

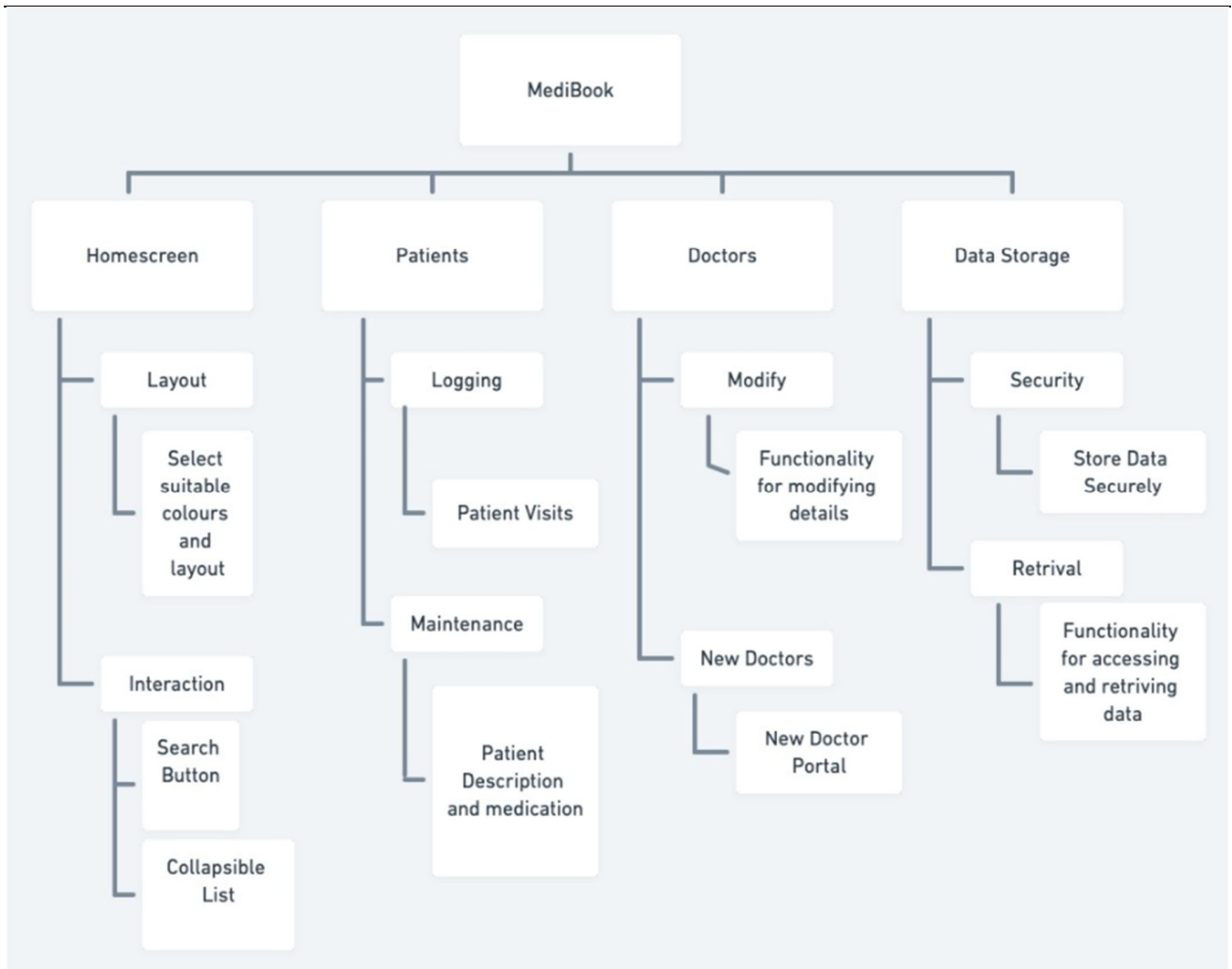
5.7.2 S/W Requirements to develop application (details about Application-Specific Software)

- Windows
- Android SDK

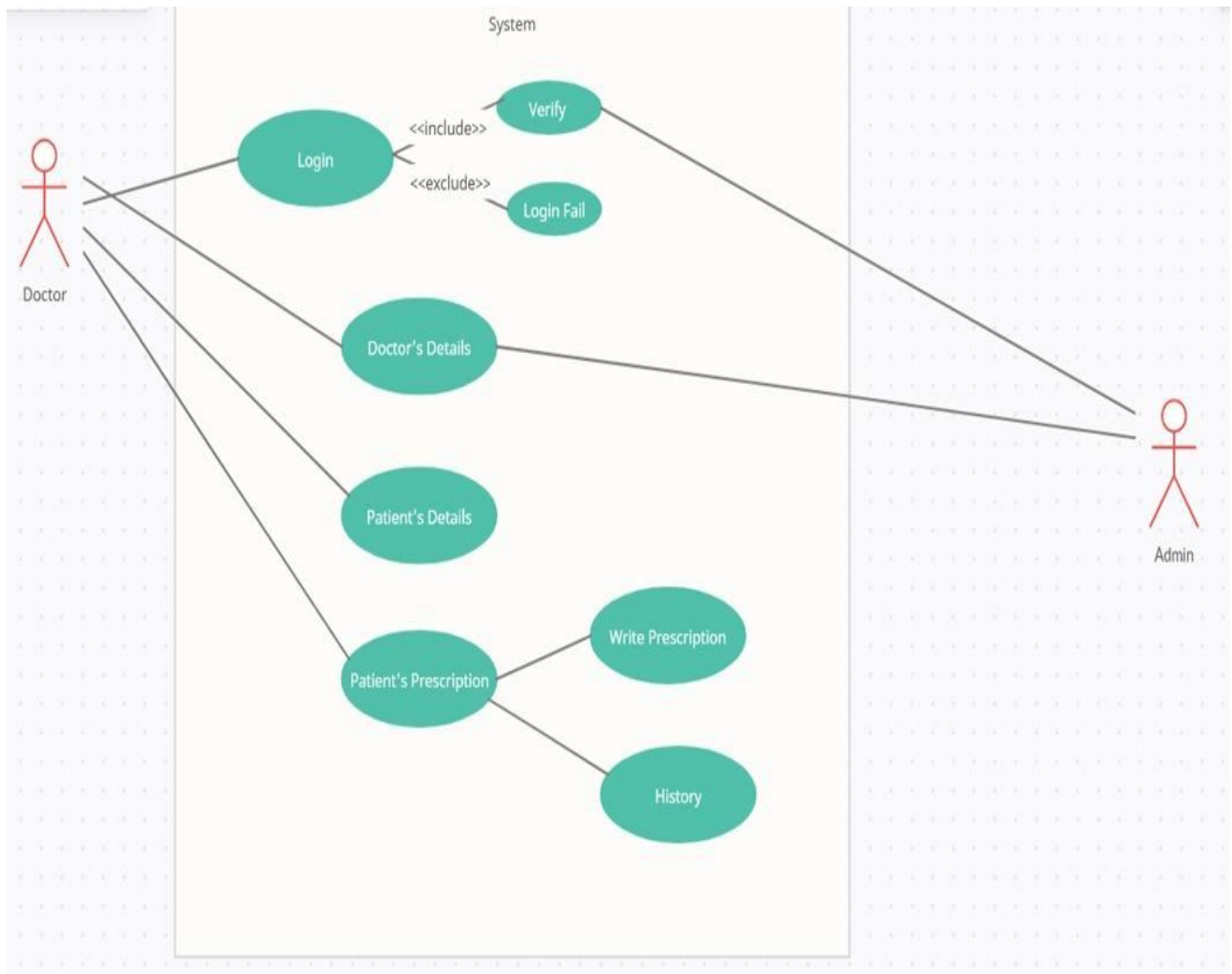
5.7.3 S/W Requirements for application

- Android operating system

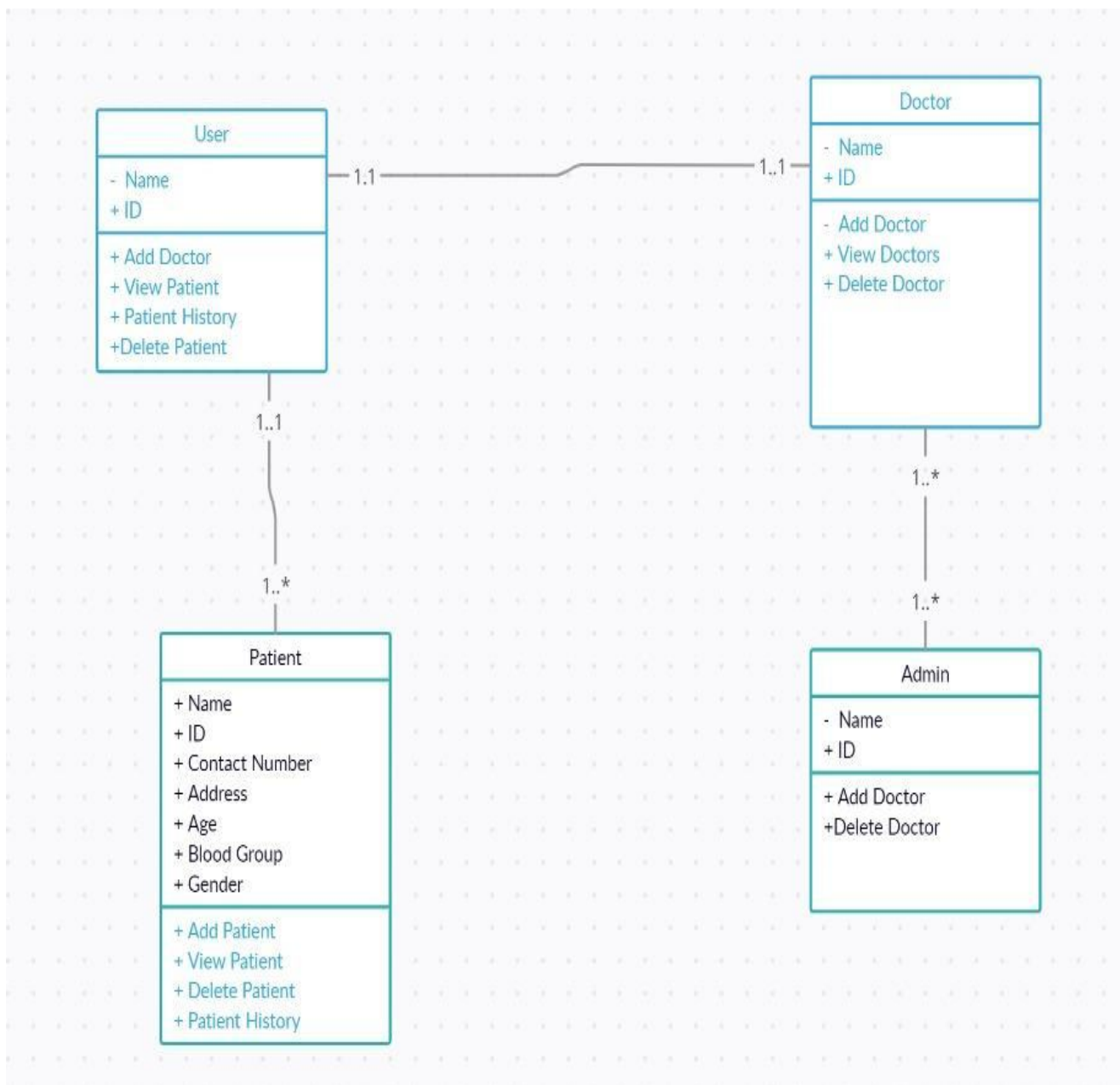
5.8 Work breakdown structure



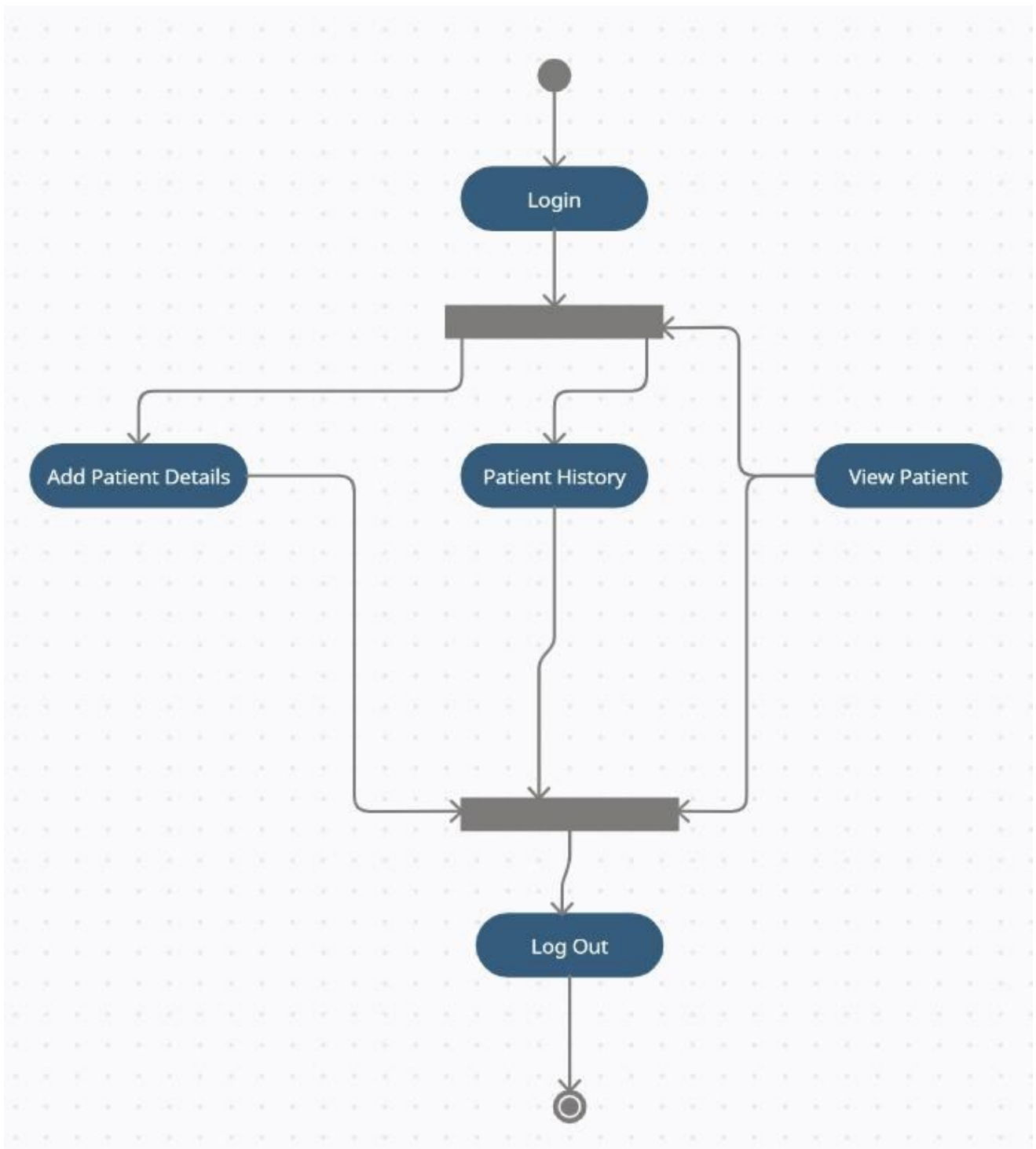
5.9 Use case diagram



5.10 Class diagram



5.11 Activity Diagram



6. Testing

6.1 Types of Testing:

We were aware of the various types of Software Testing such as Functional Testing, Non-Functional Testing, Automation Testing, Agile Testing, and their sub-types, etc. Each type of testing has its own features, advantages, and disadvantages as well. However, in this project, we have covered all those testing which are suitable for our project.

- o **Install/Uninstall Testing** - testing is done on full, partial, or upgrade install/uninstall processes on different operating systems under different hardware or software environment. We checked our webapp on different browsers like safari, chrome, firefox etc. Also on different operating systems like windows, ubuntu, MacOS etc.

- o **Graphical User Interface Testing** - The objective of this GUI Testing is to validate the GUI as per the business requirement. We

38

tested the size of the buttons and input field present on the screen, alignment of all text, tables, and content in the tables. We also validated the menu of the application, after selecting different menu and menu items, it validates that the page does not fluctuate and the alignment remains same after hovering the mouse on the menu or sub-menu.

- o **Load Testing** - It is a type of Non-Functional Testing and the objective of Load Testing is to check how much load or maximum workload a system can handle without any performance degradation. For this we tried our app with many users simultaneously to check if our app can handle heavy traffic.

- o **Boundary Value Testing** - is performed for checking if defects exist at boundary values. Boundary Value Testing is used for testing a different range of numbers. There is an upper and lower boundary for each range and testing is performed on these boundary values. We in our app tested the location input with extreme values to find the boundary values for locations.

- o **Backend Testing** - Whenever an input or data is entered on front- end application, it stores in the database and the testing of such database is known as Database Testing or Backend Testing.

6.2 Test Cases:

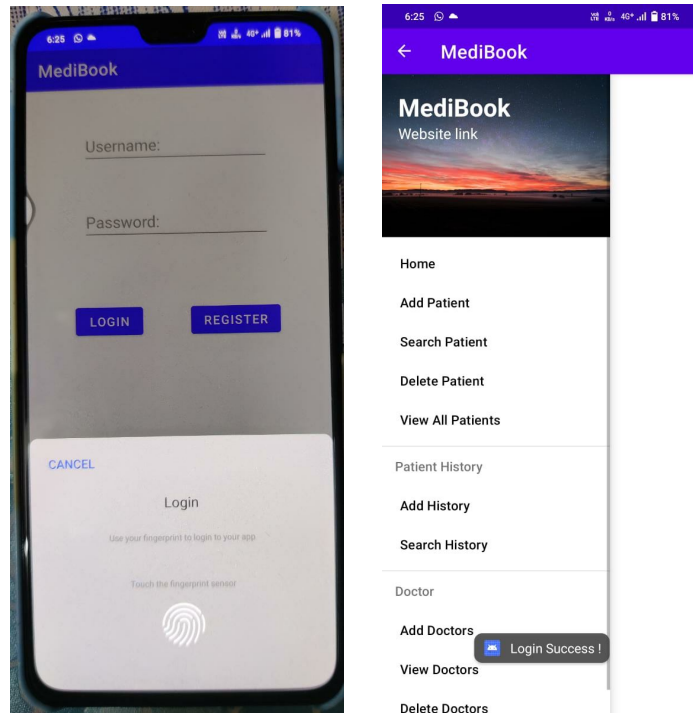
Test Id	Input	Expected result	Actual result	PASS/FAIL
T1	FingerPrint sensor(registered)	Valid Login	Logged in	PASS
T2	Fingerprint sensor(non-registered)	Invalid Login attempt try-again	Retry	PASS
T3	Login with correct username	Accepts login	Logged in	PASS
T4	Login with incorrect username	Login rejected	retry login	PASS
T5	Login with correct username and incorrect password	login rejected	retry login	PASS
T6	Register new user	Open register window	Registration Portal	PASS
T7	Register new user with incorrect confirm password	Decline new Registration	Re-Enter password does not match with the original password	PASS
T8	Add new patient	Enter details properly	Patient details accepted	PASS
T9	Search Patient	Enter registered patients id	Gives patient info	PASS

T9	Search Patient with incorrect id	No patient found	Patient (username)does not exist	PASS
T10	Delete Patient with correct ID	Patient Deleted	Patient Deleted	PASS
T11	Delete Patient with incorrect id	Patient does not exist	Patient does not exist	PASS
T12	Add Patient History	History Added	Patient History Added	PASS
T13	Search Patient History	Search by Patient Id	App Crash	FAIL
T14	Add Doctors	Add doctor details	Doctor added	PASS
T15	View Doctors	Show list of doctors with info	Shows list of doctors with information	PASS
T16	Delete Doctors	Input Registered doctor id	Delete the doctor from the database	PASS
T17	Delete Doctors	Input unregistered doctor id	Doctor does not exist	PASS
T18	Doctor information empty	Should decline registration of the new doctor	Accepts empty fields as inputs	FAIL
T19	Patient information empty	SHould decline registration of the new patient	Accepts empty fields as inputs	FAIL

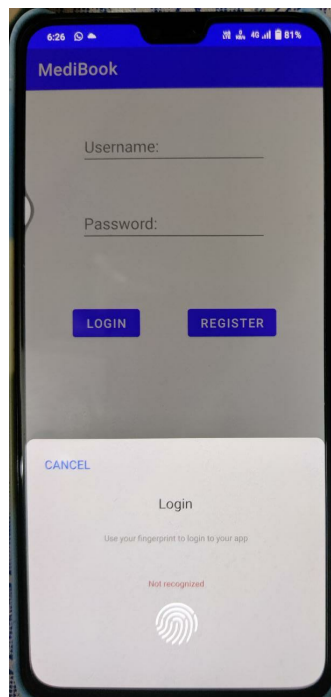
T20	Show error for empty username for new user	Should show error	Does not show error but also does not accept the new user	PASS/FAIL
-----	--	-------------------	---	-----------

6.3 Testing Outputs

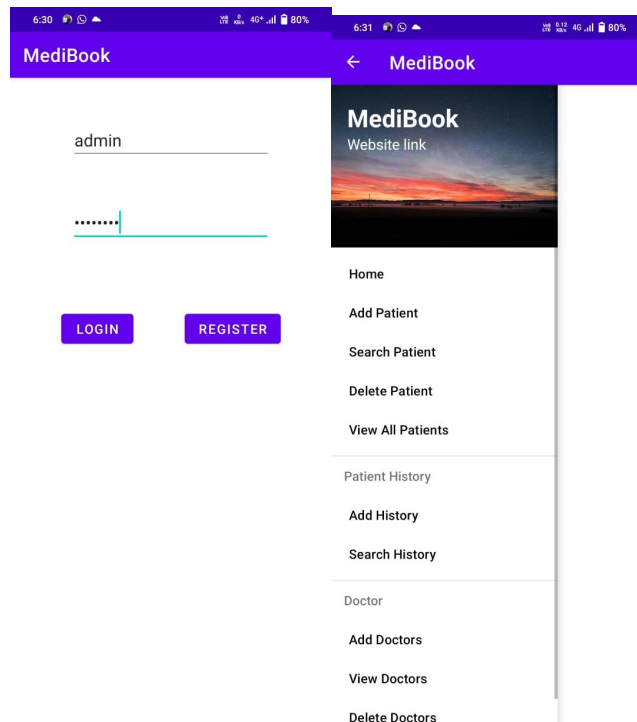
T1:



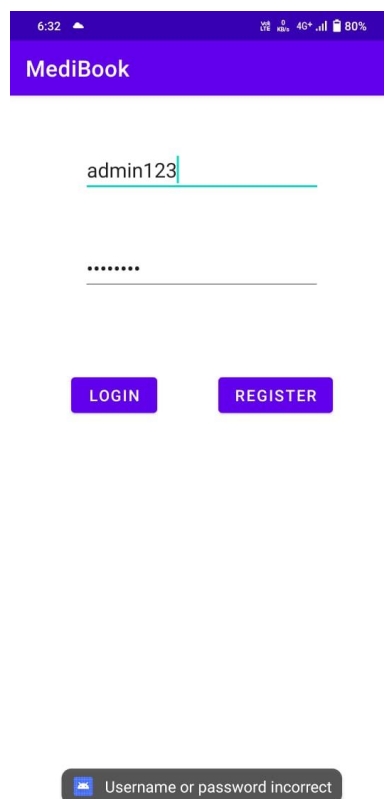
T2:



T3:



T4:



T5:

The image shows a mobile application interface for 'MediBook'. At the top, there is a status bar with the time 6:38, signal strength, 4G LTE, and 79% battery. Below the status bar is a purple header with the text 'MediBook'. The main content area has a light blue background. It contains two input fields: the first is labeled 'username' and contains the text 'admin'; the second is labeled 'password' and contains seven dots. Below these fields are two buttons: 'LOGIN' and 'REGISTER'. At the bottom, there is a dark blue error message box that says 'Username or password incorrect'.

6:38 4G LTE 79%

MediBook

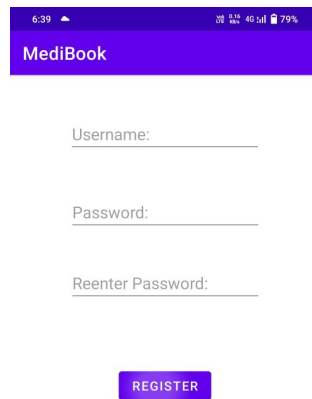
username admin

password

LOGIN REGISTER

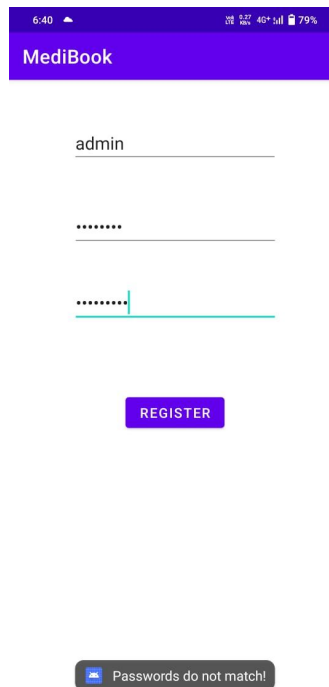
Username or password incorrect

T6:



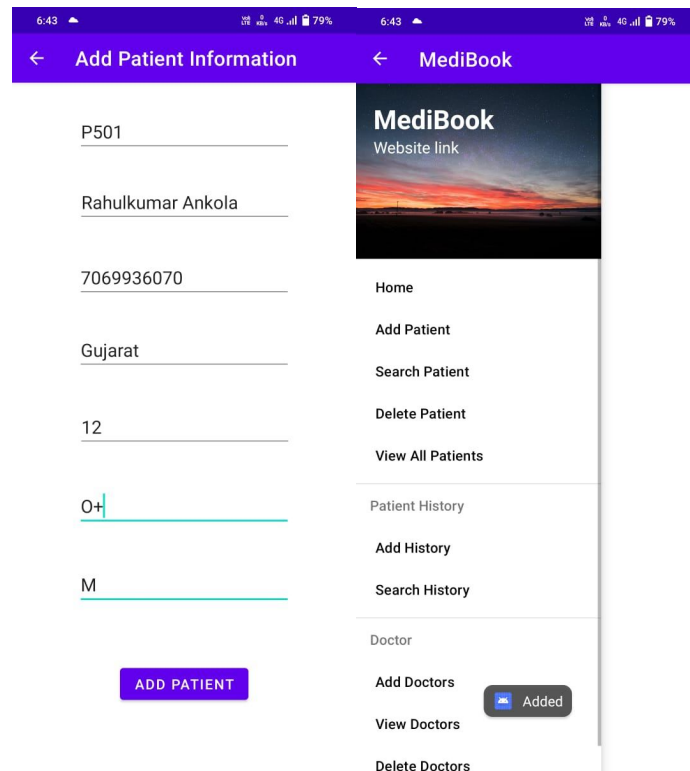
A screenshot of a mobile application interface for 'MediBook'. The status bar at the top shows the time as 6:39, signal strength, 4G+ network, and 79% battery. The app title 'MediBook' is displayed in a blue header. Below the header, there are three input fields labeled 'Username:', 'Password:', and 'Reenter Password:'. At the bottom, there is a blue button labeled 'REGISTER'.

T7:



A screenshot of the same 'MediBook' registration form. The status bar shows the time as 6:40, signal strength, 4G+ network, and 79% battery. The app title 'MediBook' is in the blue header. The 'Username:' field contains the text 'admin'. The 'Password:' field contains seven dots. The 'Reenter Password:' field contains seven dots and a vertical red line, indicating a mismatch. At the bottom, there is a blue button labeled 'REGISTER'. Below the button, there is a red error message box that says 'Passwords do not match!'.

T8:



T9:



Enter Patient ID to search

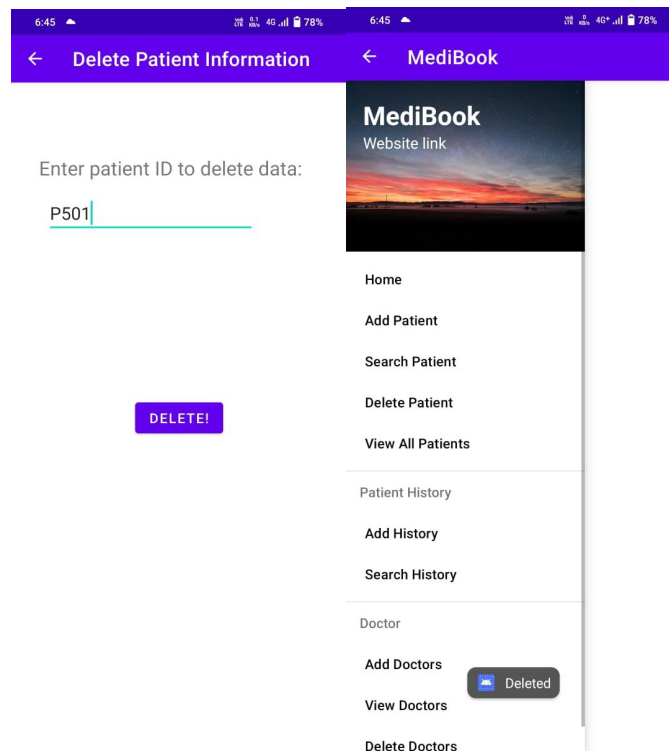
P501

SEARCH

PATIENT DETAILS:

ID: P501
Name: Rahulkumar
Ankola
Mobile: 7069936070
Address: Gujarat
Age: 12
Bloodgroup: O+
Sex: M

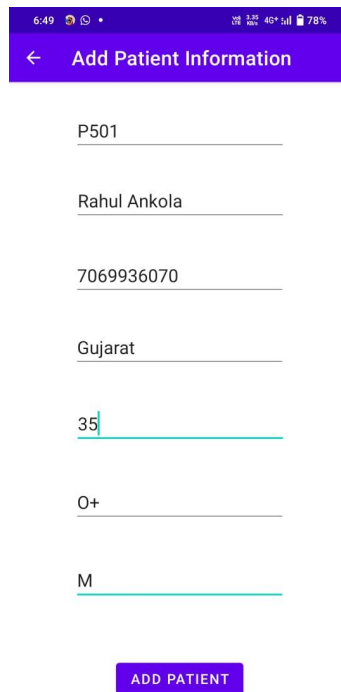
T10:



T11:



T12:



6:49 5:14 46% 78%

← Add Patient Information

P501

Rahul Ankola

7069936070

Gujarat

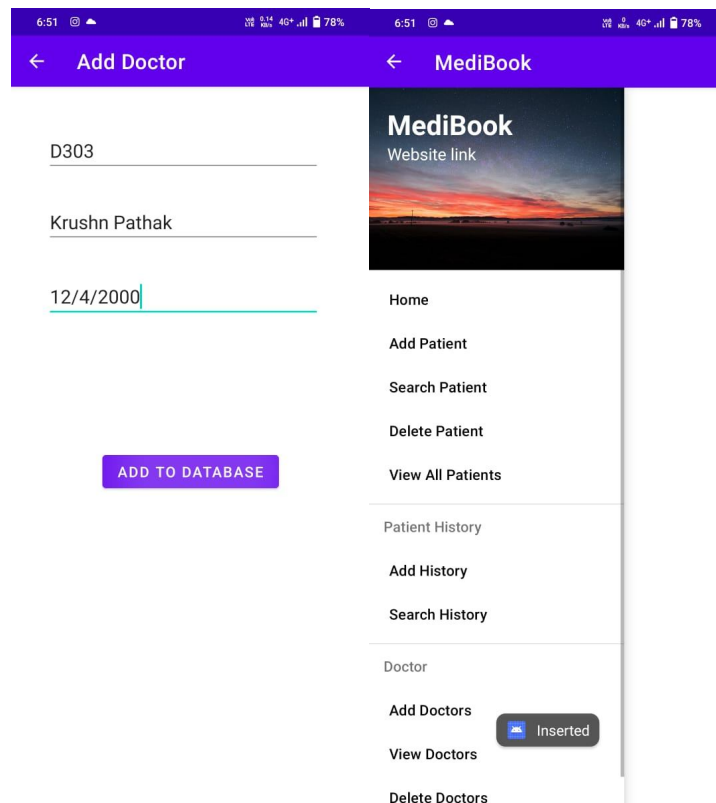
35

O+

M

ADD PATIENT

T14:



6:51 5:14 46% 78%

← Add Doctor

D303

Krushn Pathak

12/4/2000

ADD TO DATABASE

MediBook

Website link

Home

Add Patient

Search Patient

Delete Patient

View All Patients

Patient History

Add History

Search History

Doctor

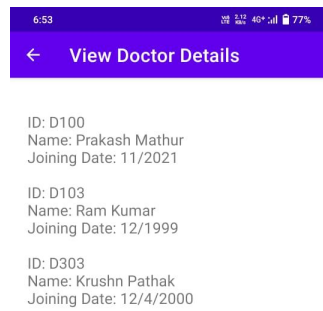
Add Doctors

Inserted

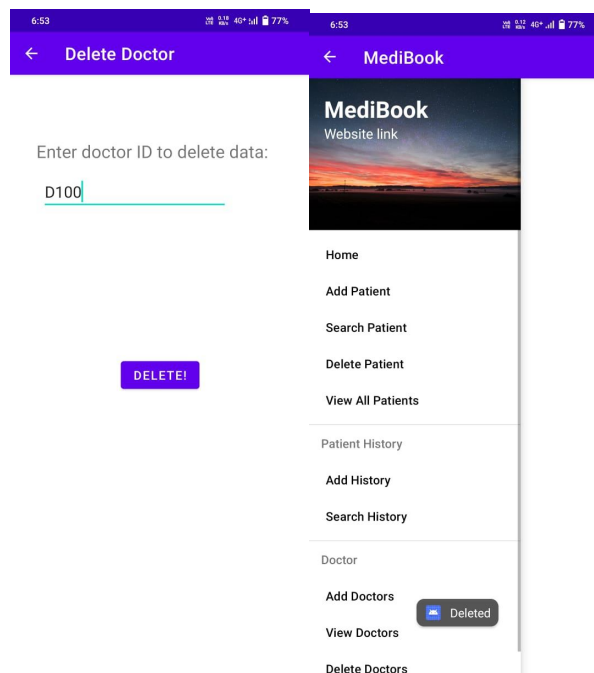
View Doctors

Delete Doctors

T15:



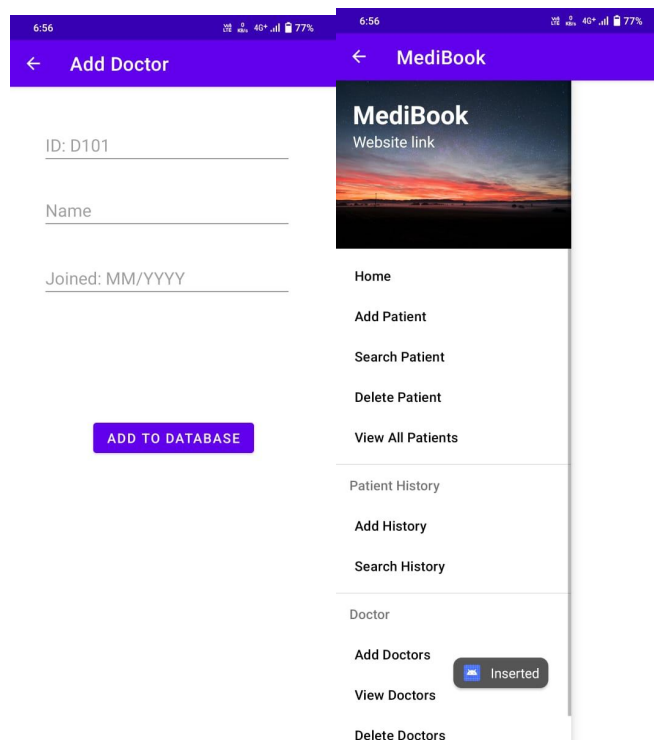
T16:



T17:



T18:



T19:

7:01 76%

MediBook

Website link

Home

Add Patient

Search Patient

Delete Patient

View All Patients

Patient History

Add History

Search History

Doctor

Add Doctors

View Doctors

Delete Doctors

Added

ADD PATIENT

ID: P101

Name

Mobile Number

Address

Age

Bloodgroup

Sex: M/F/O

T20:

7:02 76%

MediBook

Username:

Password:

LOGIN

REGISTER

Username or password incorrect

7 Conclusion and Future Work

7.1 Conclusion

In this work we have made a java based app that can be used for record keeping of small scale clinics and hospitals which integrates all the aspects of record keeping from data entry to data maintenance. This app allows the burden of record keeping to be transferred from special personals specially appointed for record keeping to the doctor or the nurse or the receptionist.

7.2 Future Work

Currently the software is limited to smaller clinics but it could be integrated into a system which can be used on a much larger scale as the basic functionalities have been implemented and the project only needs some refinement and robustness so that it can be used for much larger clinics or medical hospitals.

WORK BREAK DOWN

Team Member Registration Number	Name	Work Assigned
20BCE0559	Navaneeth Narayanan	Made DFD
20BCE0580	Krushn Pathak	History Viewing Search By name Gather Requirement analysis
20BCE2259	Amrit Yash Srivastava	History Viewing Search by date
20BCE0530	Rahul Kumar Ankola	Entry Saving Search by name Add Encryption to login Database creation

REVIEW EVALUATION

COMPONENT	MARKS	MEMBER 1	MEMBER 2	MEMBER 3	MEMBER 4	MEMBER 5
Project Objective	2.5					
Process model chose with justification	3.5					
Stakeholders, Project and Product Scope	2.5					
WBS	3.5					
Project Report	3					
Project Presentation	5					
Total	20 Marks					