# Hospital Managemenet System

**Software Engineering Module**

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## ABSTRACT

The purpose of the project entitled as "**HOSPITAL MANAGEMENT SYSTEM**" is to computerize the Front Office Management of Hospital to develop software which is user friendly simple, fast, and cost – effective. It deals with the collection of patient's information, diagnosis details, etc. Traditionally, it was done manually. The main function of the system is register and store patient details and doctor details and retrieve these details as and when required, and also to manipulate these details meaningfully System input contains patient details, diagnosis details, while system output is to get these details on to the screen. The Hospital Management System can be entered using a username and password. It is accessible either by an administrator or receptionist. Only they can add data into the database. The data can be retrieved easily. The data are well protected for personal use and makes the data processing very fast.

## ACKNOWLEDGEMENT

After completing the final project of Hospital Management System, we would like to take this chance to express our sincere gratitude to our project supervisor **Mr. Dharshana Gamage** and **Dr.L.S.K.Udugama** who have guided us a lot throughout the project development.

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# Chapter 1: Introduction

The project Hospital Management system includes registration of patients, storing their details into the system, and also computerized prescription, and doctors details. The software has the facility to give a unique id for every patient and stores the details of every patient and the staff automatically

The Hospital Management System can be entered using a username and password. It is accessible either by an administrator or receptionist. Only they can add data into the database. The data can be retrieved easily. The interface is very user-friendly. The data are well protected for personal use and makes the data processing very fast.

Hospital Management System is powerful, flexible, and easy to use and is designed and developed to deliver real conceivable benefits to hospitals.

Hospital Management System is designed for multispeciality hospitals, to cover a wide range of hospital administration and management processes. It is an integrated end-to-end Hospital Management System that provides relevant information across the hospital to support effective decision making for patient care and hospital administration.

Hospital Management System is a software product suite designed to improve the quality and management of hospital management in the areas of clinical process analysis and activity-based costing. Hospital Management System enables you to develop your organization and improve its effectiveness and quality of work. Managing the key processes efficiently is critical to the success of the hospital helps you manage your processes

## 1.1. The practical problem

**Lack of immediate retrievals: -**

The information is very difficult to retrieve and to find particular information like- E.g. - To find out about the patient's history, the user has to go through various registers. This results in in convenienceand wastage of time.

**Lack of immediate information storage: -**

The information generated by various transactions takes time and efforts to be stored at right place.

**Lack of prompt updating: -**

Various changes to information like patient details or immunization details of child are difficult to make as paper work is involved.

**Error prone manual calculation: -**

Manual calculations are error prone and take a lot of time this may result in incorrect information.

**Preparation of accurate and prompt reports: -**

This becomes a difficult task as information is difficult to collect from various register.

## 1.2.Aims and objectives

1) Define hospital
2) Recording information about the Patients that come.
3) Recording information related to diagnosis given to Patients.
4) Keeping record of the Immunization provided to children/patients.
5) Keeping information about various diseases and medicines available to cure them.

These are the various jobs that need to be done in a Hospital by the operational staff and Doctors.

All these works are done on papers.

## 1.3.Typical use case

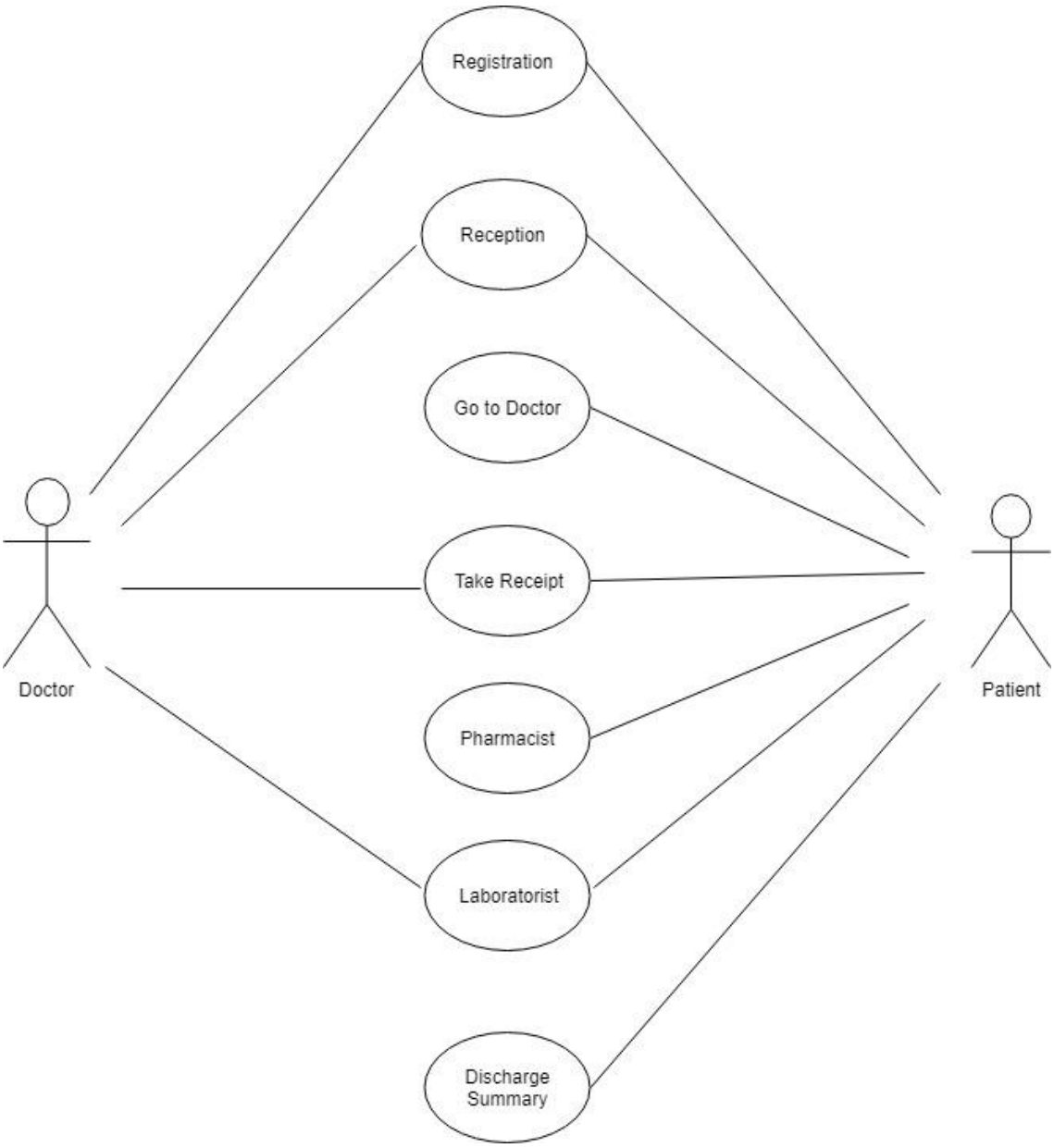


Figure 1: Typical use case diagram

## 1.4.Scop of the Project:-

1) Information about Patients is done by just writing the Patients name, age and gender. Whenever the Patient comes up his information is stored freshly.
2) Diagnosis information to patients is generally recorded on the document, which contains Patient information. It is destroyed after some time period to decrease the paper load in the office.
3) Immunization records of children are maintained in pre-formatted sheets, which are kept in a file.
4) Information about various diseases is not kept as any document. Doctors themselves do this job by remembering various medicines.

All this work is done manually by the receptionist and other operational staff and lot of papers are needed to be handled and taken care of. Doctors have to remember various medicines available for diagnosis and sometimes miss better alternatives as they can't remember them at that time.

## Chapter 2 : Background

Through manual system patients get lack much meeded information.They do not have another way to get information.Sometimes patients seek doctors,when they come to the hospital but they are not available at those times.In such situation people get irritated and waste their time.

In manual system we generally use the medical card for patients.If the medical book has been lost them we have to make a new medical card.Again which take time and till them patients have to wait and to look database again.For the patients information which is complied.

Manual system needed more workers then the online system it costs a lot.Also it is not much efficient.Through manual recoarding we cannot get each and every recoard about person.

## 2.1.Analysis:

First, we met the librarian and discussed what the basic requirements that the system should include are. Accordingly, the librarian does the following functions.

### 2.1.1.Functional requirements

1. Add Document to the system:

- New entries must be entered in database.

2. Update details to the system:

- Any changes in patients,doctors and prescriptions should be updated in case of update.

3. Delete details from the system:

- Wrong/Expiry/Un-usable entry must be removed from system.

4. Managing appionment:

- Managing all current appoinment to view their details.

### 2.1.2.Non-Functional Requirements

1. Availability Requirement:

• The system is available 100% for the user and is used 24hrs. a day. The system shall be operational 24 hours a day and 7 days a week

2. Efficiency Requirements:

• Mean Time to Repair (MTTR) - Even if the system fails, the system will be recovered backup within an hour or less.

3. Accuracy:

• The system should accurately provide real time information taking into consideration various concurrency issues. The system shall provide 100% access reliability

4. Performance requirements:

• The information is refreshed at regular intervals depending upon whether some update shave occurred or not. The system shall be allowed to take more time when doing large processing jobs. Responses to view information shall take no longer than 5 seconds to appear on the screen

5. Reliability Requirements:

• The system has to be 100% reliable due to the importance of data and the damages that can be caused by incorrect or incomplete data. The system will run 7 days a week, 24 hours a day.

### 2.1.3.Challenges

- As the system is fully computerized, the system can be hacked or affected by computer viruses so it was essential to be thorough with the safety & security of the system.

- Needed to have a good continuous internet access to get the SQL server connection to access the database.

# Chapter 3 : Design of solution

## 3.1 The design and architecture

### 3.1.1 User interfaces

This hospital management system is used by the hospital and patients. Thus it's simply designed with user colors and fonts. The interface is user friendly and easy to use buttons text is clear and easy to understand.

- **Welcome page**


Figure 2: Welcome page (interface)

This is designed for user and hospital. This simply designs with colorful images to be user friendly. It is used most suitable font and button sizes.

- **Login Page**

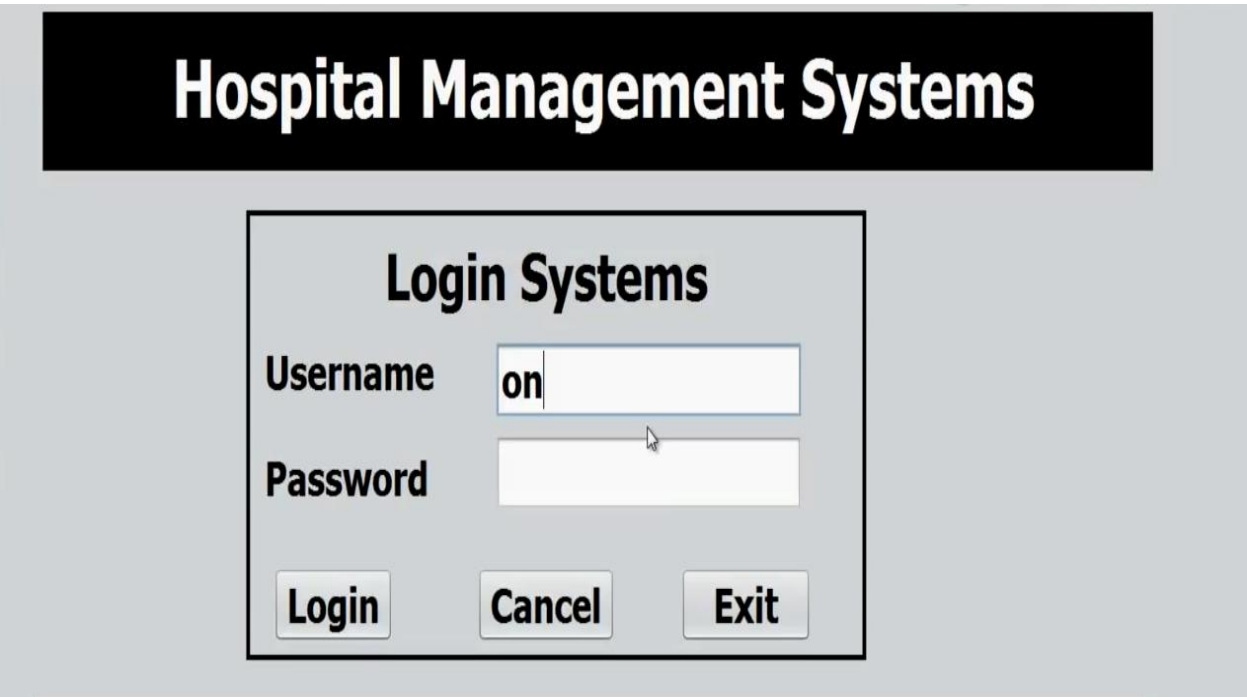


Figure 3: Login page (interface)

This is the login page for user. The login interface is simply designed with username and password text boxes. 'show password '  button will help if you forget the password.

- Patient page & Reception page

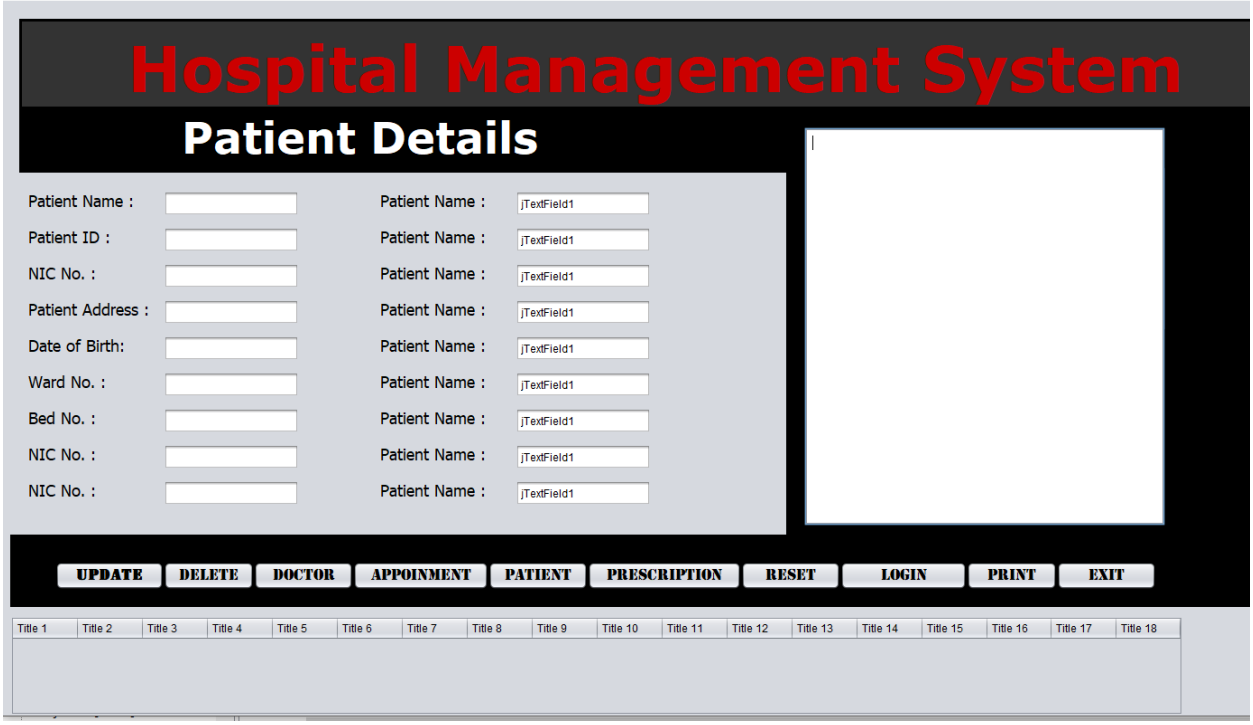


Figure 4 : patient & reception page (interface)

This is the patient page and it is designed for users. Accordingly it is designed with name bar, id no., email text boxes, search button. This is the main page of hospital management system.

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- **Doctor's page**

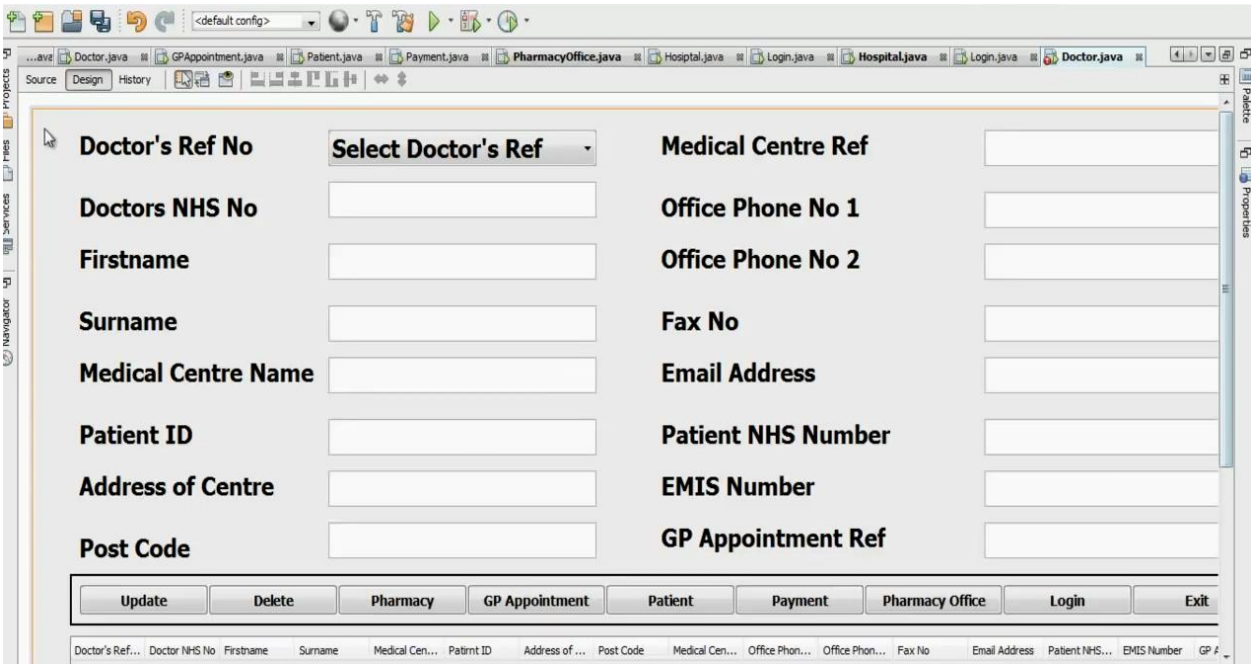


Figure 5: Doctor's page (interface)

### 3.1.2.Use case diagram

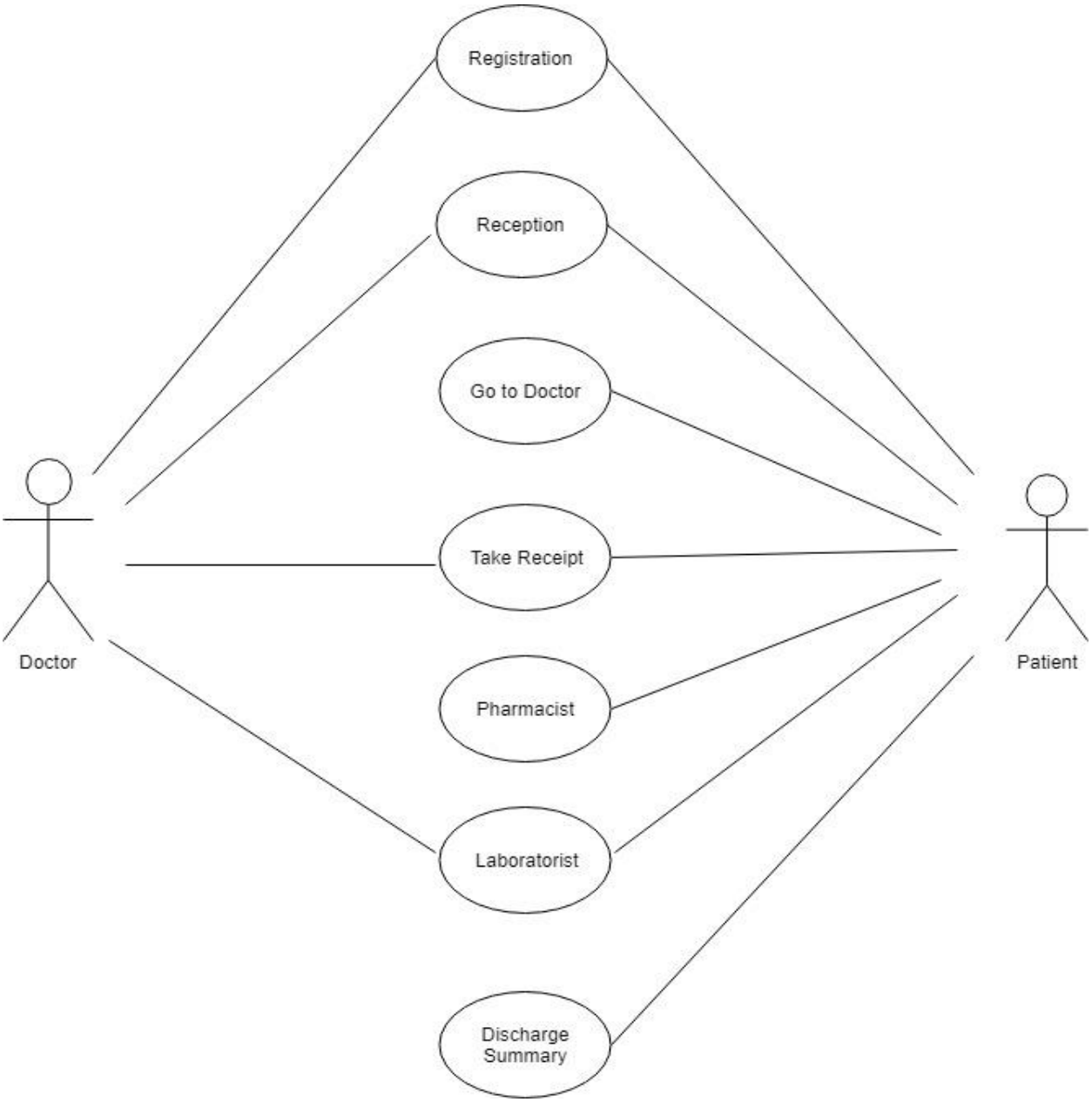


Figure 6:Use case diagram

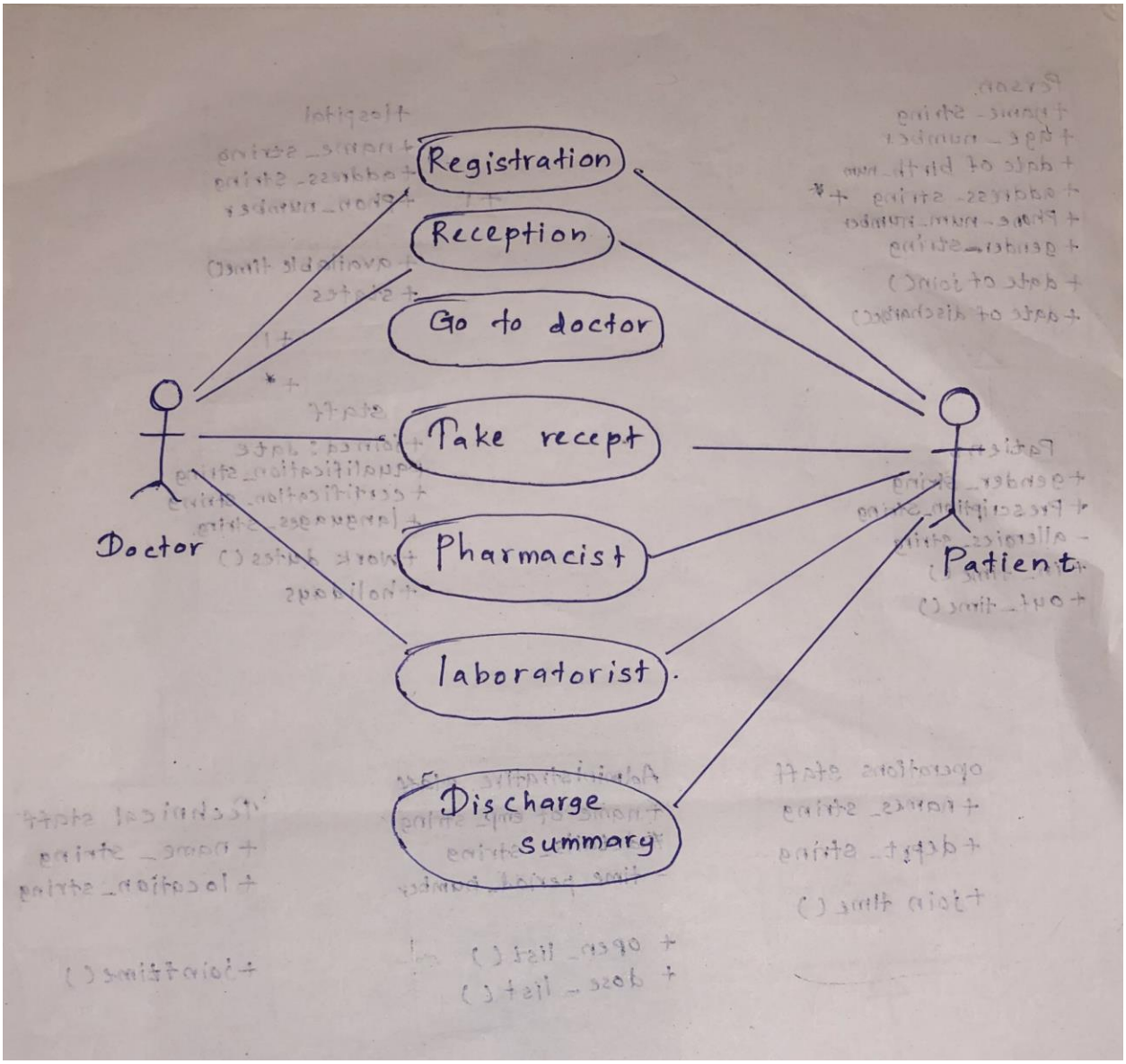


Figure 7: Use case diagram(sketch)

### 3.1.3.Sequence diagram

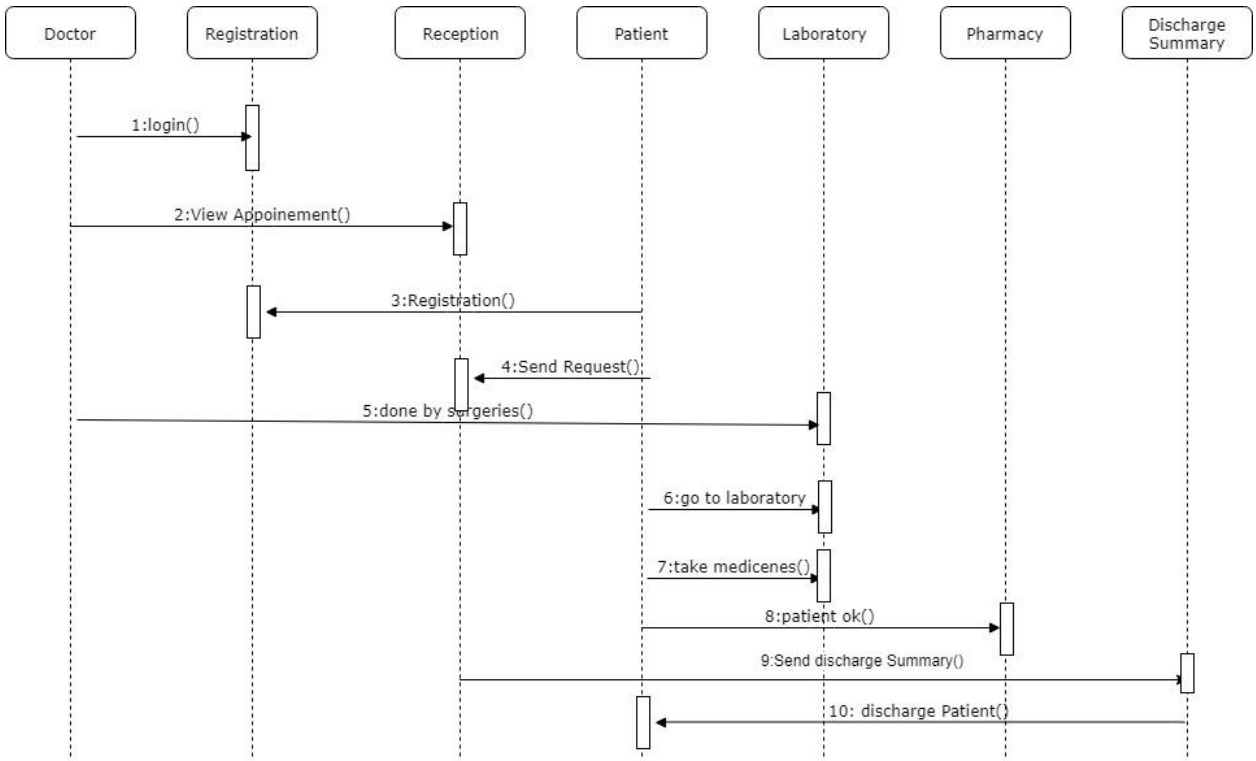


Figure 8: Sequence Diagram

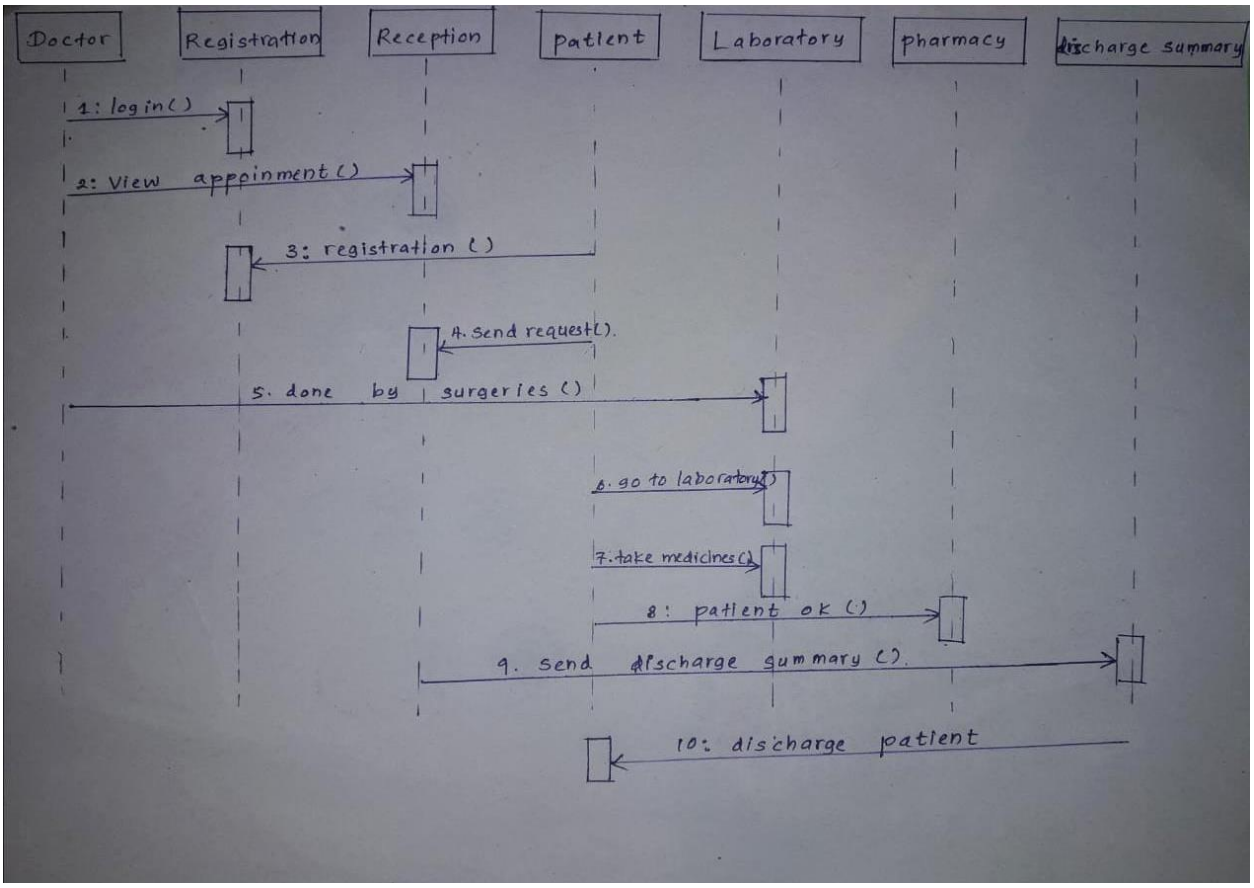


Figure 9 : Sequence diagram (sketch)

### 3.1.4.Class diagram

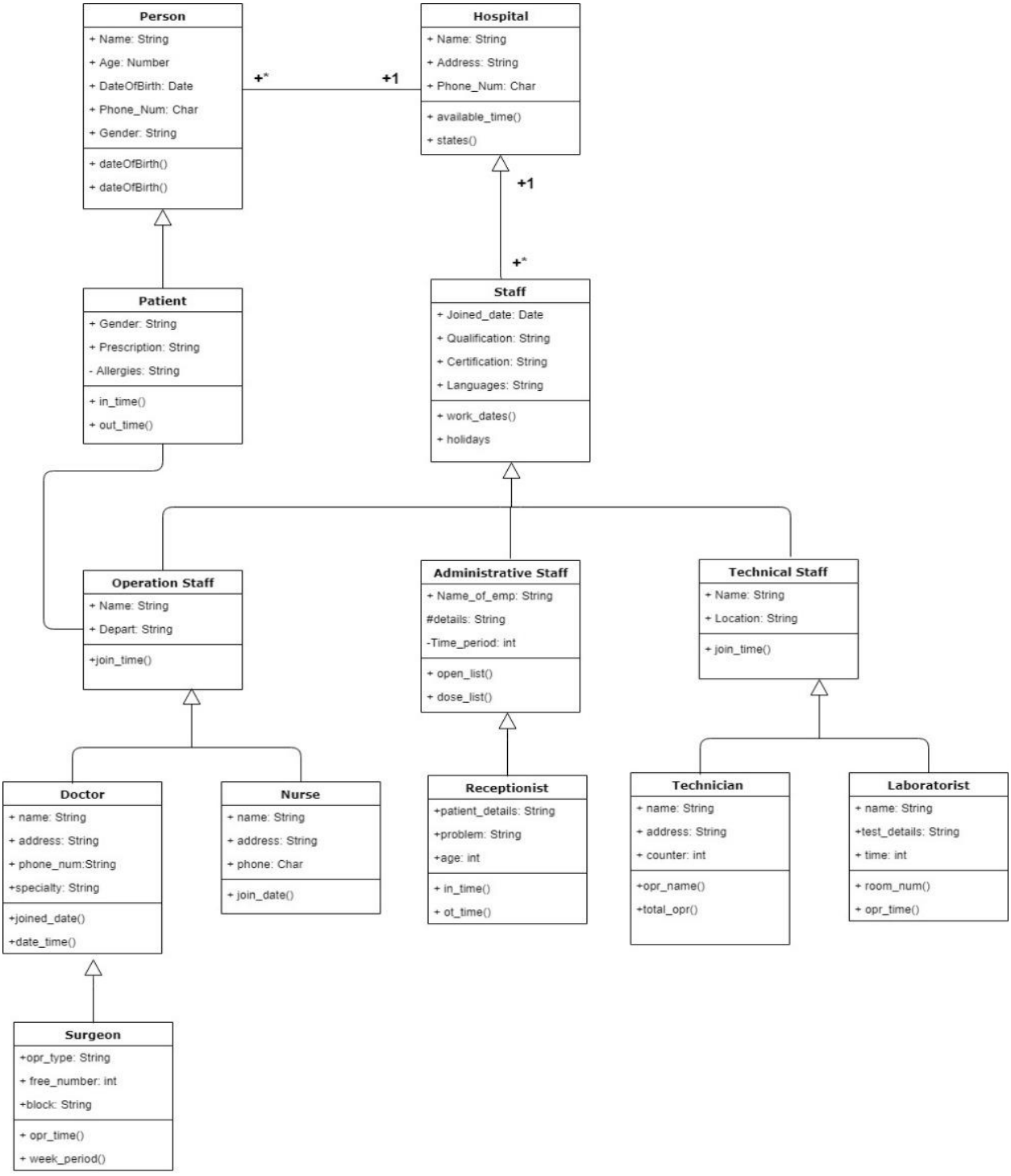


Figure 10: Class diagram

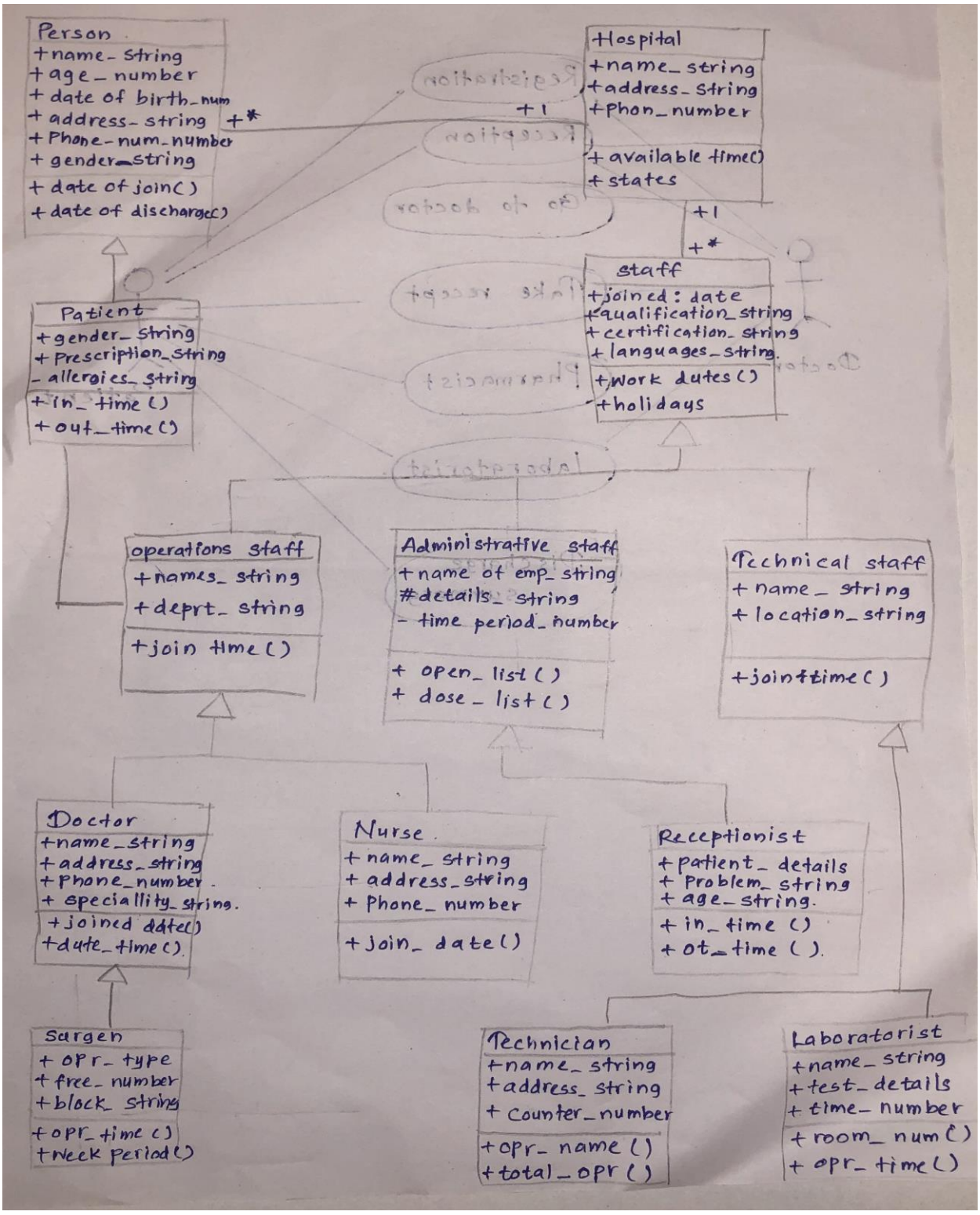


Figure 11: Class diagram (sketch)

### 3.1.5.Activity diagram

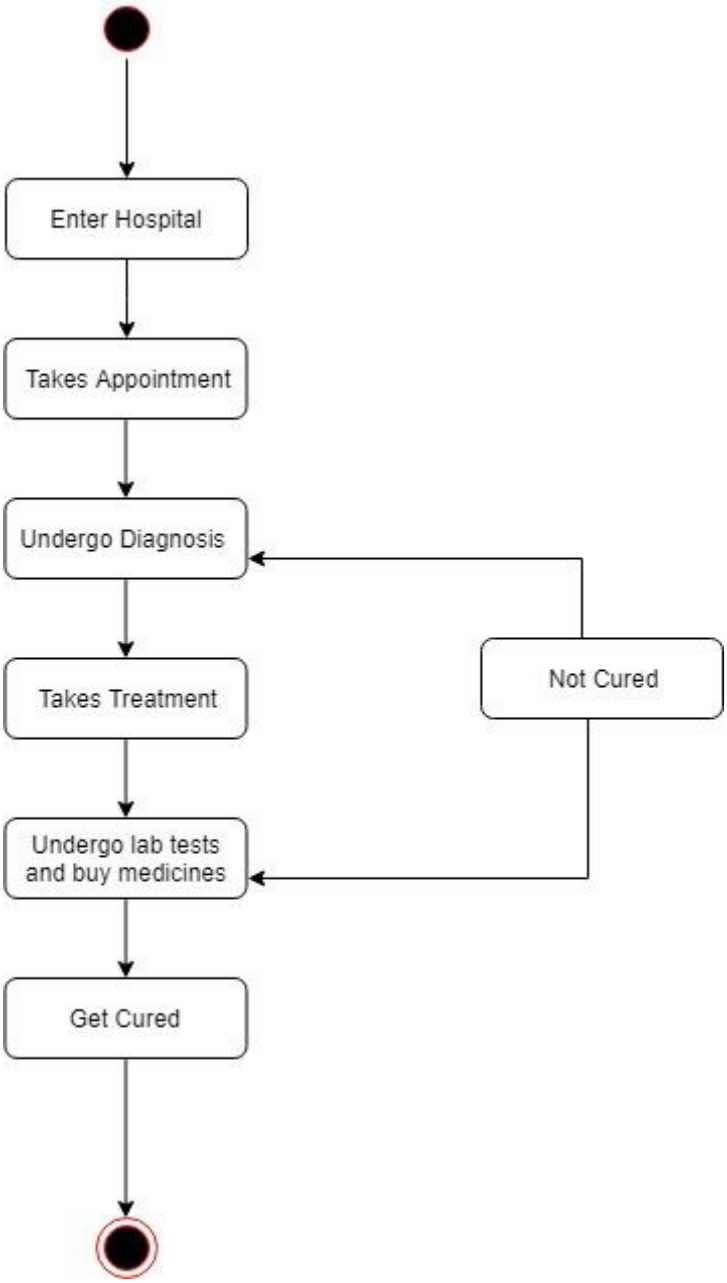


Figure 12 : Activity diagram

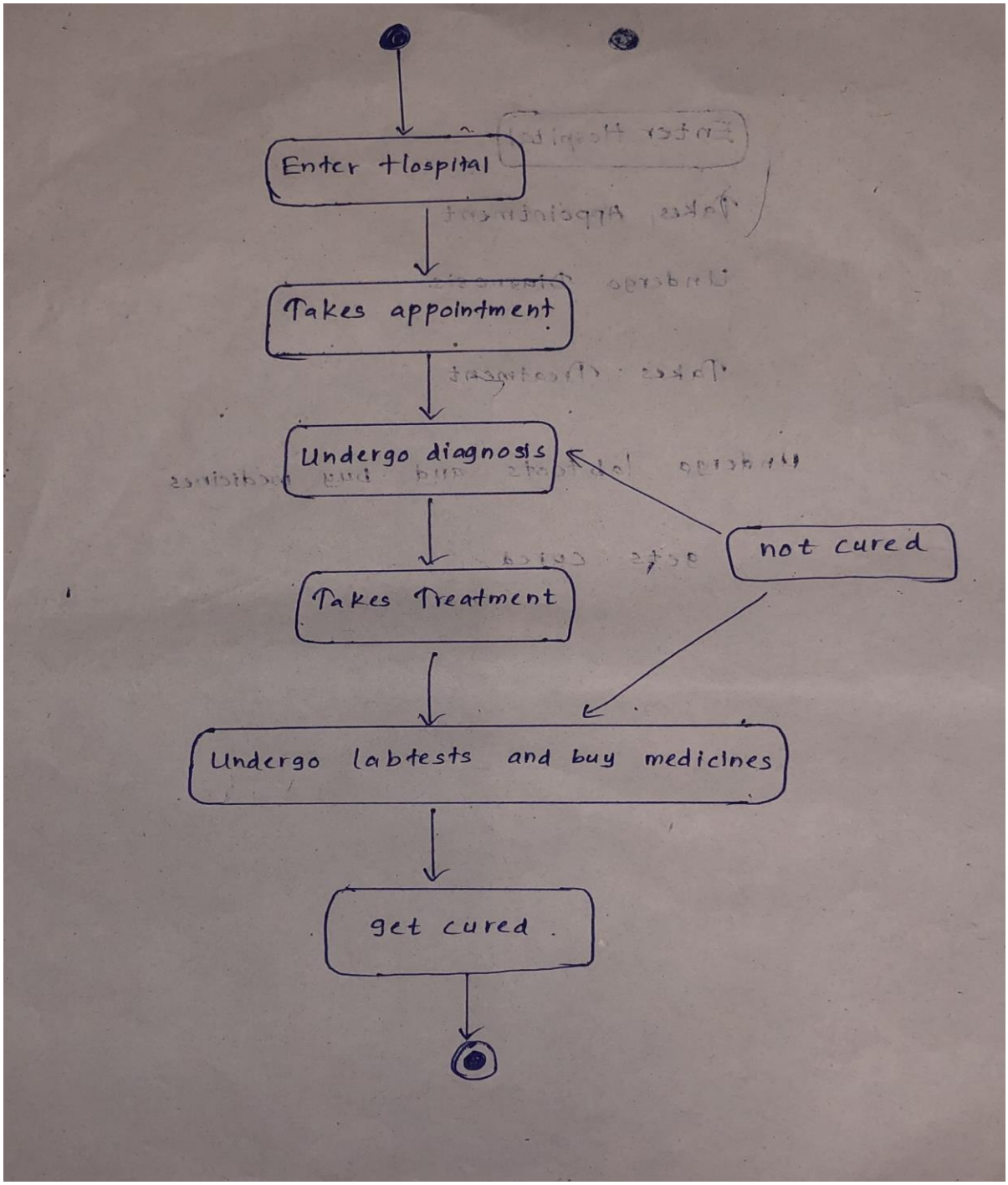


Figure 13 : Activity diagram(sketch)

### 3.1.6.ER diagram

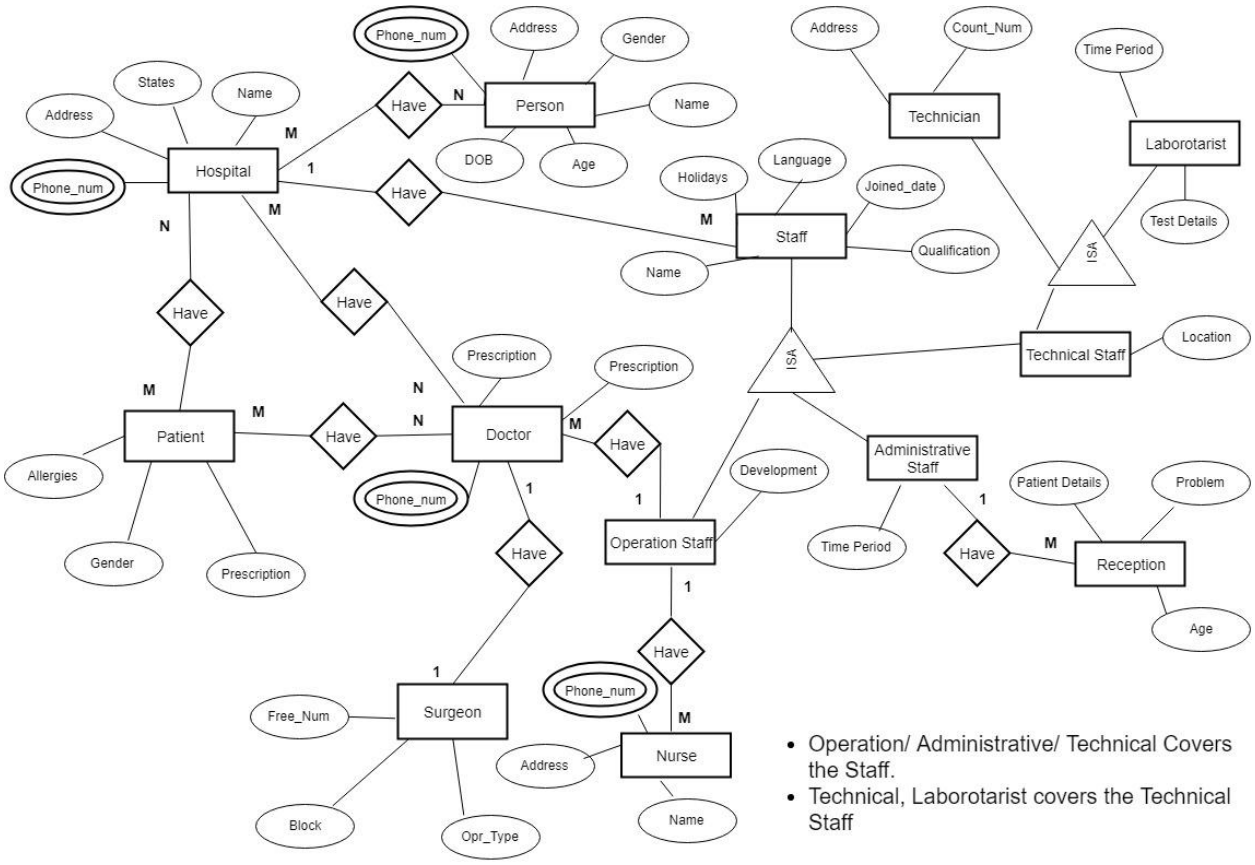


Figure 14: ER diagram

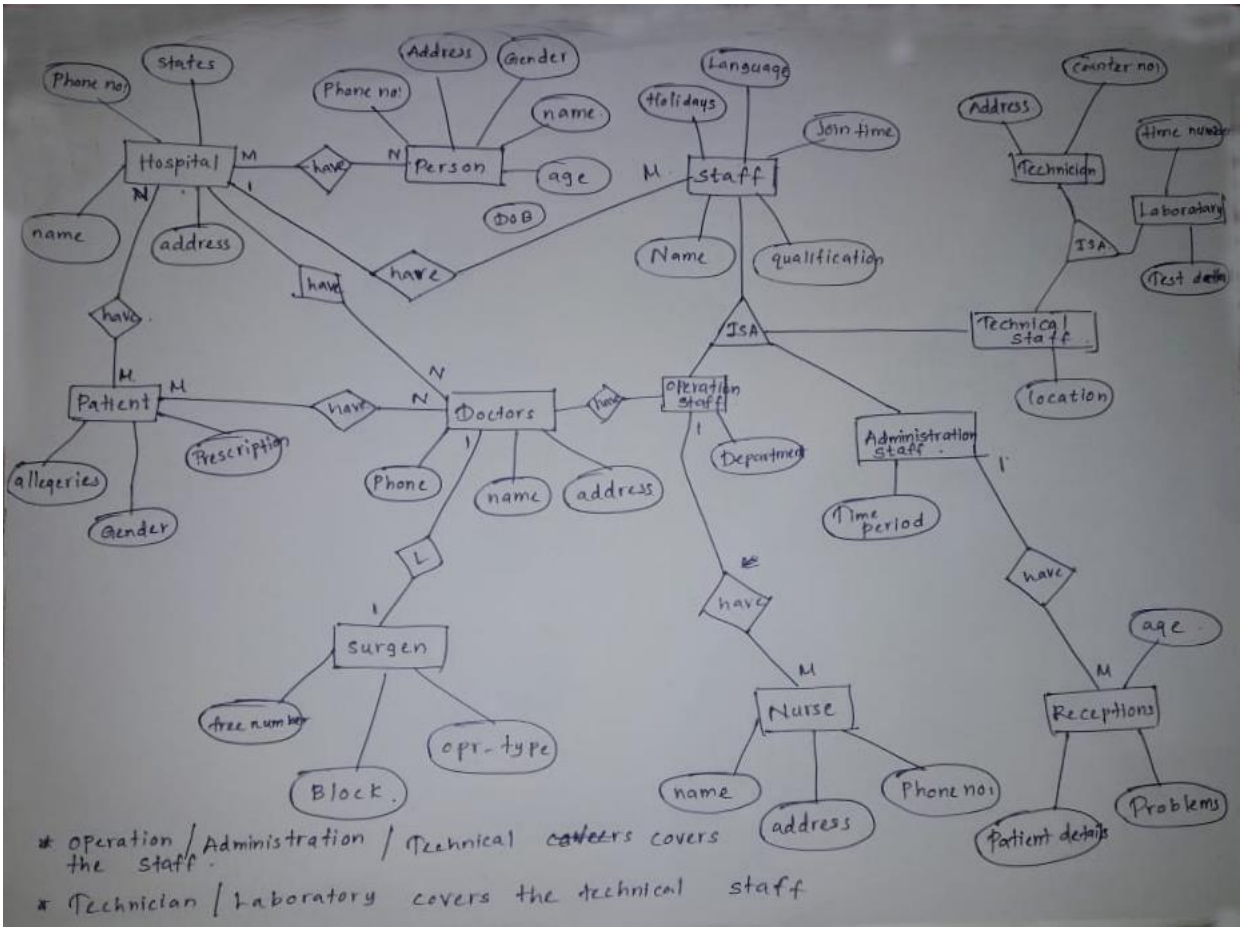


Figure 15: ER diagram (sketch)

### 3.2. Advantages of the Architecture

1. Hospital management system doesn't have to be public buildings filledwith stacks of document.
2. These document stay in one place and so nothing needs reshelving, and they're easy to search through.
3. System catalogue is inputted into a computer so hospital users can then find anything in the hospital with a search.
4. Public hospital have operating hours; if an individual arrives too late, she won't be able to access the hospital's resources.

### 3.3.Disadvantages of the Architecture

1. Some texts and other resources are simply not available in an electronic format.
2. If new technology will not evolve to increase the speed of technology, then in near future Internet will be full of error messages.
3. If the software is corrupted, whole data will be collapsed.

## Chapter 4: Implementation

### 4.1.System Implementation

- Development environment:  Windows 10 operating system and SQL server as the database server.
- Development tool : NetBeans IDE

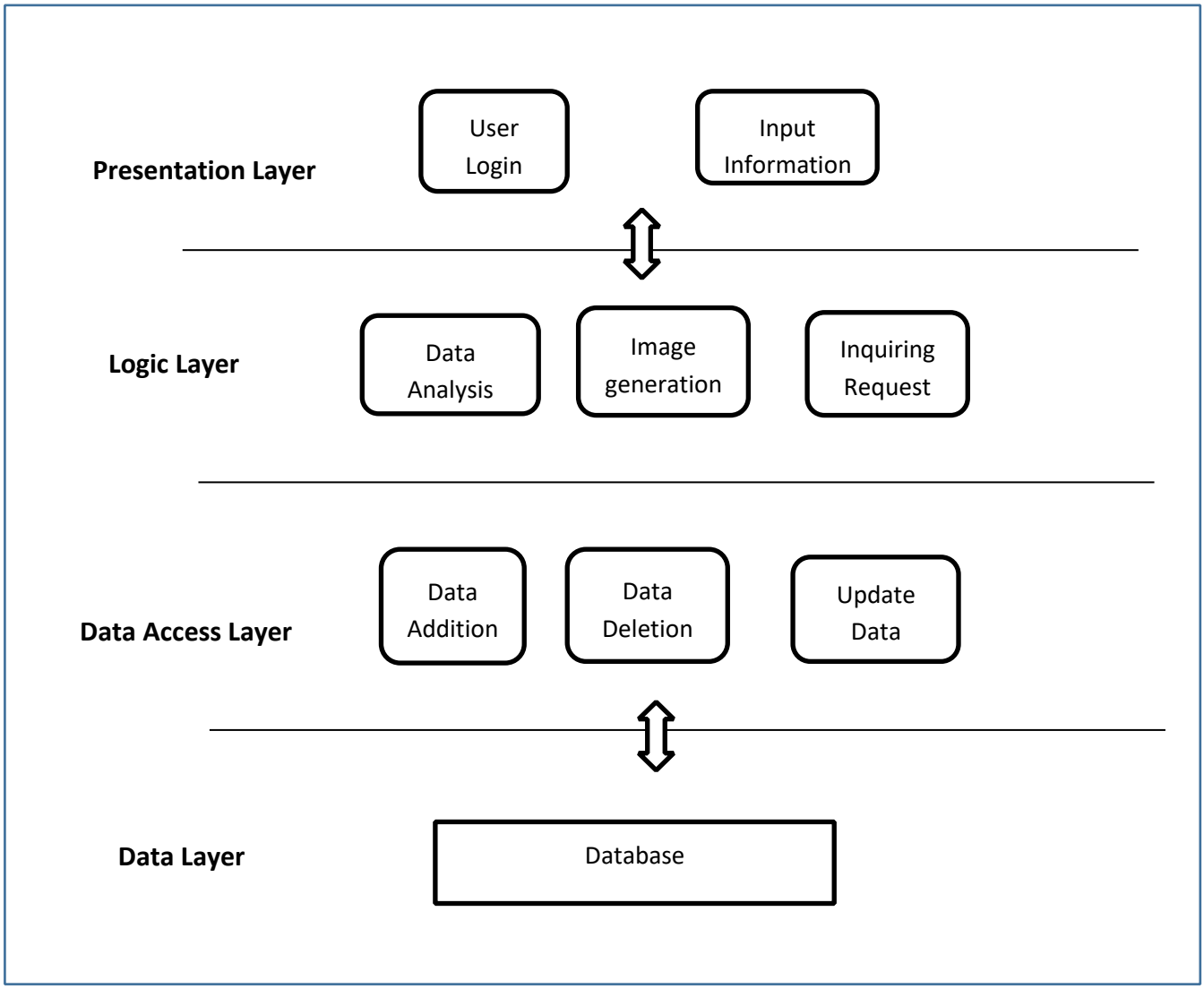


Figure 16: Multitier architecture

## 4.2. Platform Architecture

The hospital server architecture mainly consists of the client layer,business layer, and data layer. Data layer includes the database that provides operation data for basic platforms while document management, registry management and patient management is included in the business layer.The client layer provides interfaces for users to access the system through the developed software.

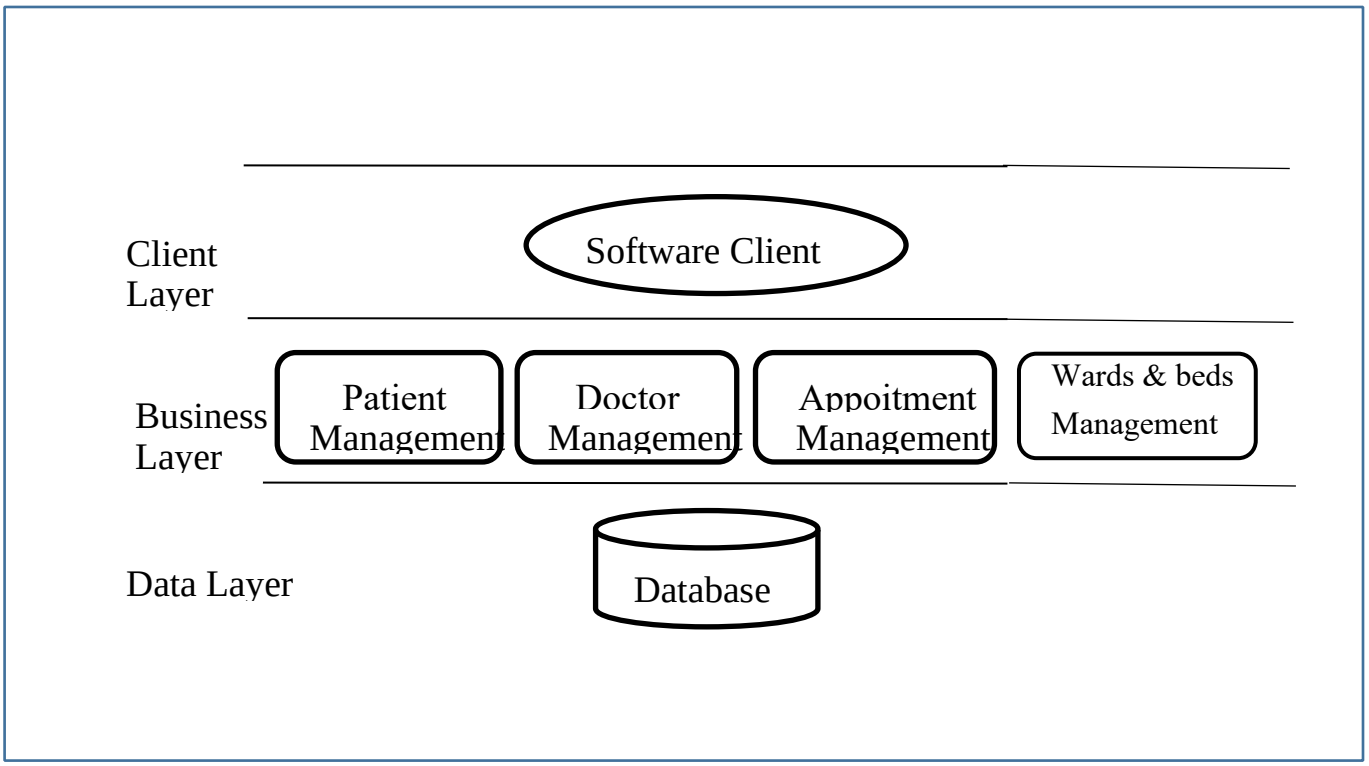


Figure 17: Platform Architecture

### 4.3. Development Environment

#### 4.3.1. Application development environment

The application development environment of this project is NetBeans which is an open source integrated development environment (IDE) for java. This also contains a GUI design-tool which enables developers to prototype and design GUIS by dragging and positioning components.

#### 4.3.2. Basic structure

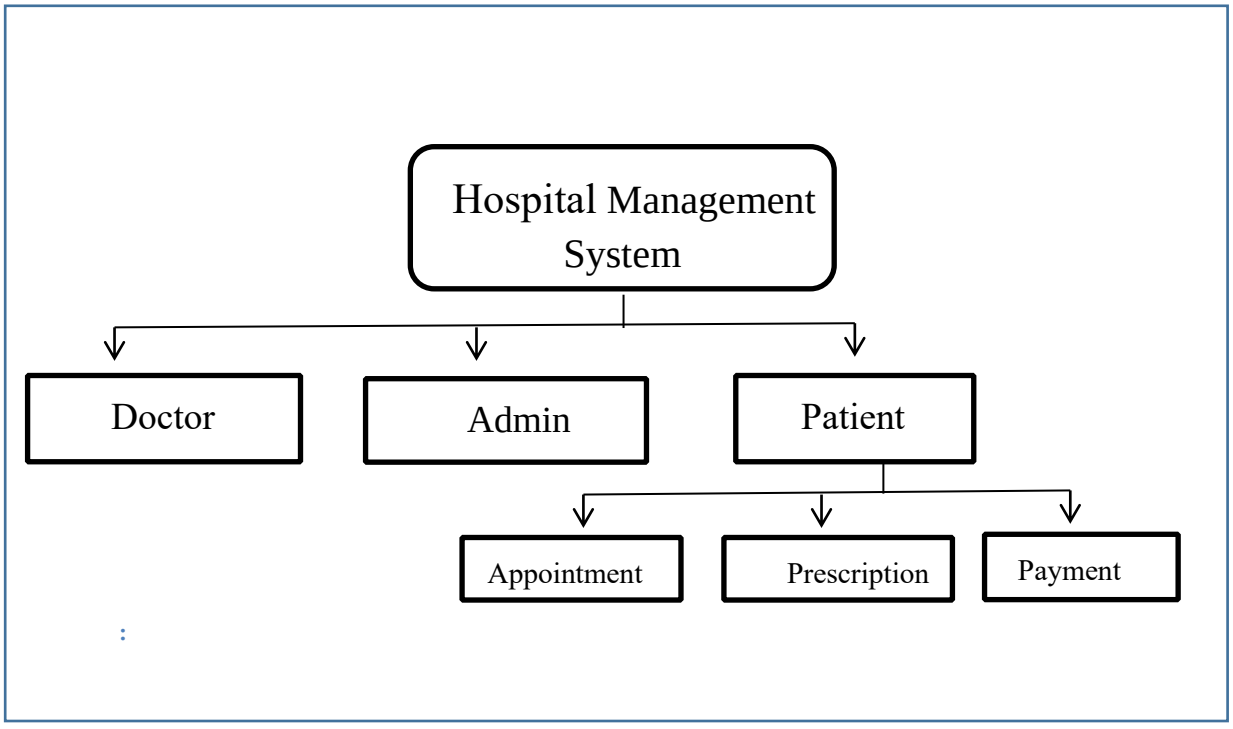


Figure 18 : Basic structure

### 4.3.3. User interface designing

Before making the interfaces we roughly sketched them on a paper. This is an intuitive method of expressing the concept.

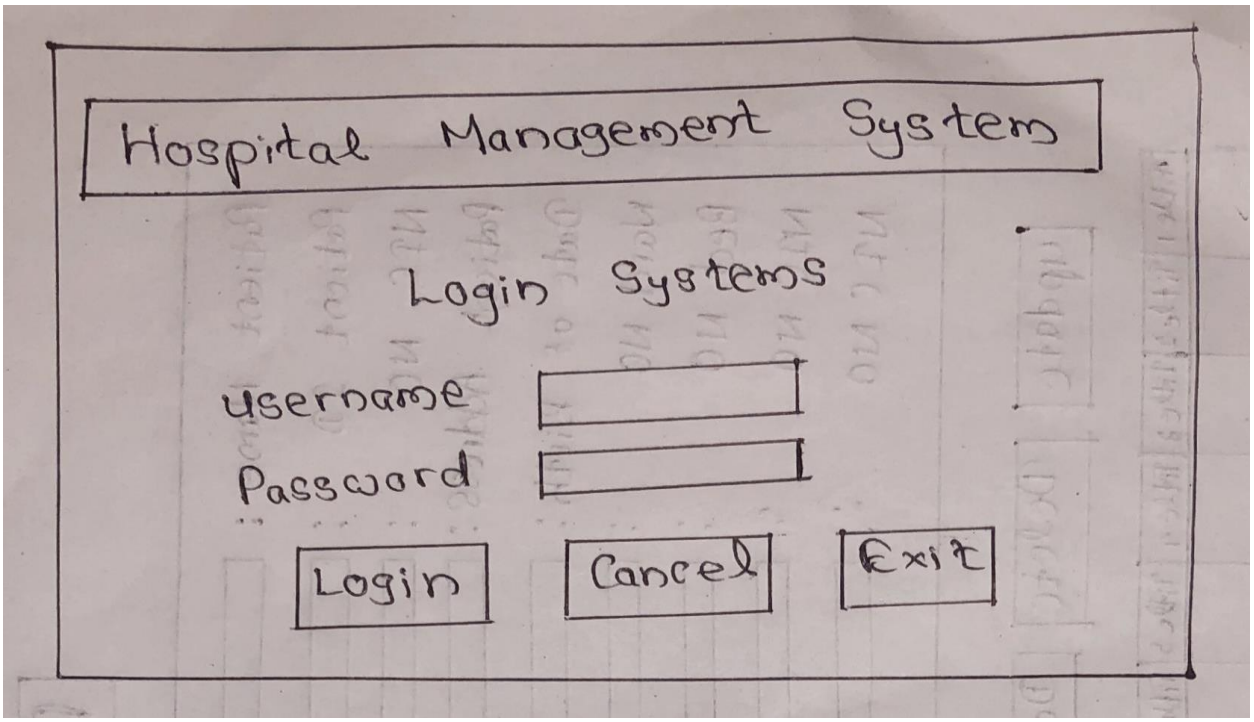


Figure 19 : Login page design(sketch)

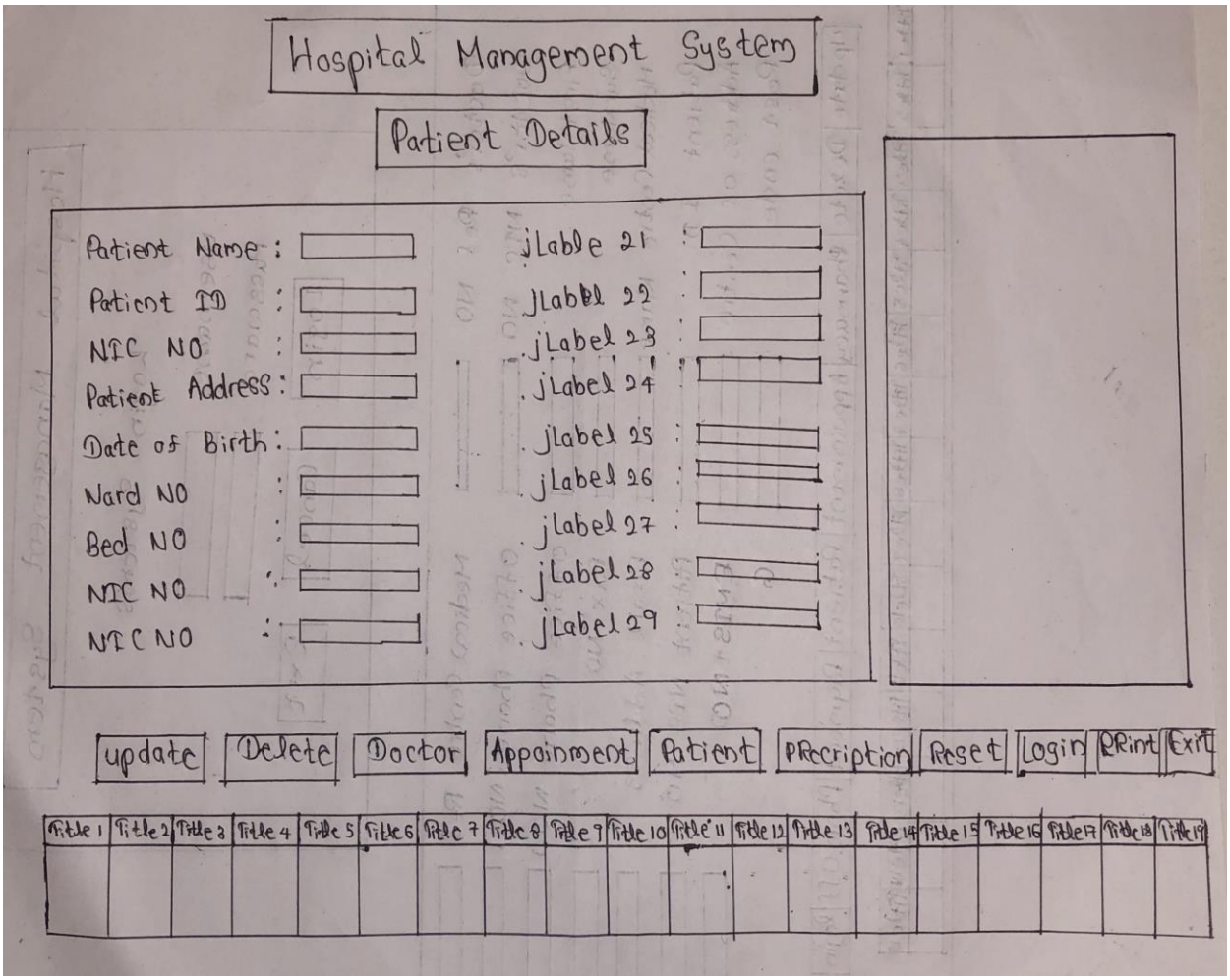


Figure 20 : Patient details page (sketch)

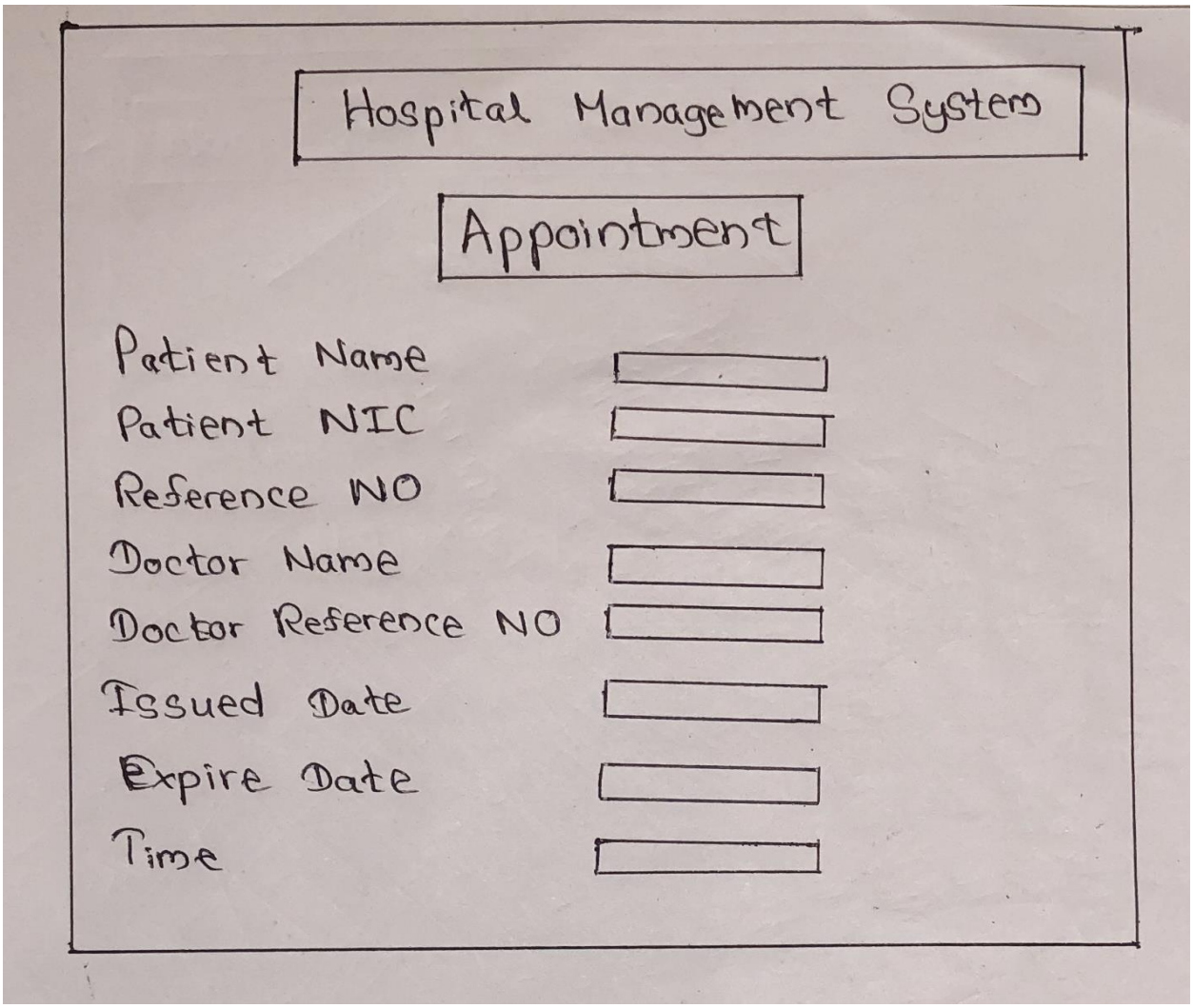


Figure 21 : Appoinment page (sketch)

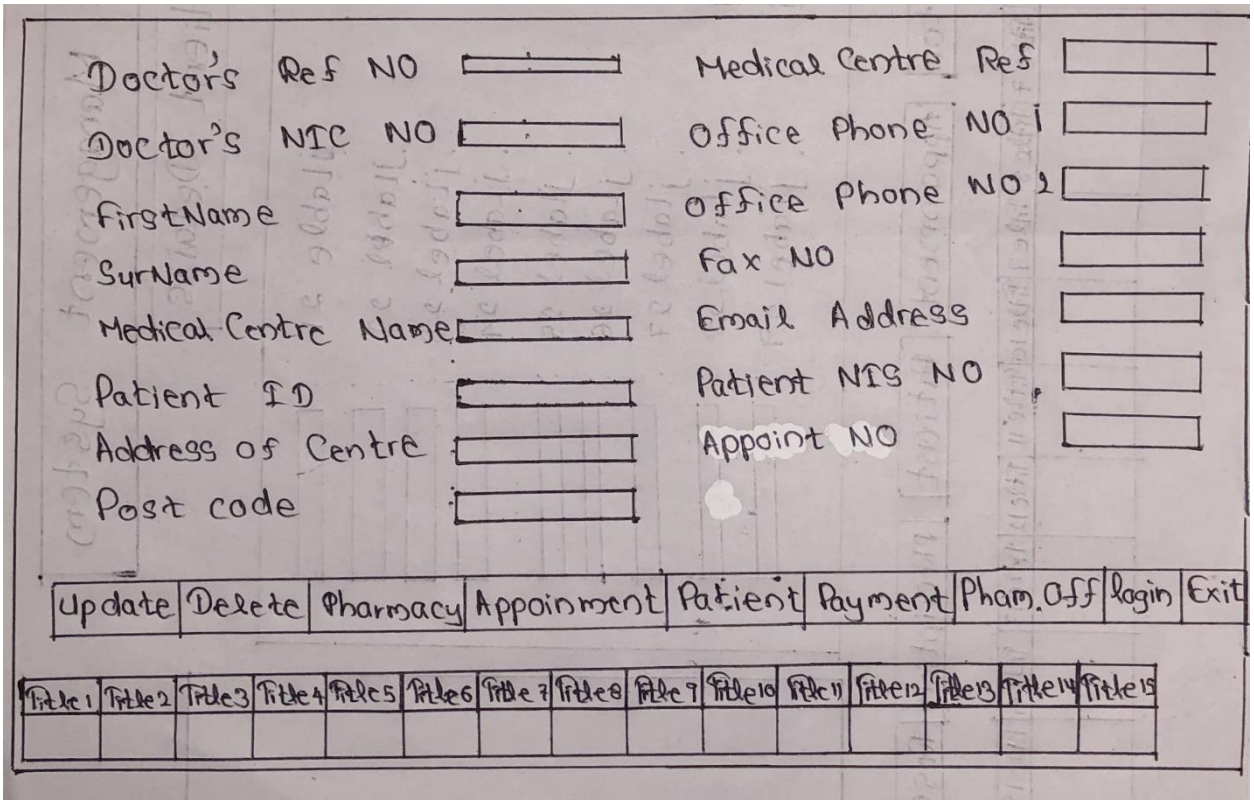


Figure 22 : Doctor's page (sketch)

## 4.4.Testing

Software testing is the process of testing a software in order to find its bugs. Testing is done to verify and validate the system to ensure it meets systems requirements.

Features to be tested :

- Login
- Add patient details
- Update doctor details
- Appointment updates
- Exit from system

**Login**

| Step | Action | Expected response | Pass √ / Fail X |
|---|---|---|---|
| 1 | Select division | Select item from combo box | √ |
| 2 | Enter user name | System excepts username | √ |
| 3 | Enter password | System excepts password | √ |
| 4 | Click on login Button | System displays home page | √ |

**Add patient details**

| Step | Action | Expected response | Pass √ / Fail X |
|---|---|---|---|
| 1 | Click on add button | Display page to add details | **X** |

**Update doctor details**

| Step | Action | Expected response | Pass √ / Fail X |
|---|---|---|---|
| 1 | Click on doctor button | Display page to doctor details | **X** |

**Appointment updates**

| Step | Action | Expected response | Pass √ / Fail X |
|---|---|---|---|
| 1 | Click on appointment button | Display page to appointment details | - |

**Exit from system**

| Step | Action | Expected response | Pass √ / Fail X |
|---|---|---|---|
| 1 | Click on exit button | Exit from programme | √ |

## 4.5.Features of the management system

- Classify the document according to genre
- Can easily enter new documents into the database
- Keep record of complete information of a document like : Patients name, doctors name, prescription
- Easy way to make a check-out
- Easy way to make a check-in
- Automatic fine calculation for late appoinment
- Cloud based hospital management system
- Full tracking details of patient in
- Full tracking details of patient out
- Full tracking details of doctors past details
- Fine balances of patients
- Hospital reservation system

# Chapter 5.Conclution

## 5.1. Summary of the complete project

After we have completed the system and we are sure the problems in the existing system would overcome. The system has been developed from java programming language. Also the system able to process and update the database with more easily. This application is working properly and it is very useful to a hospital and patients. On the other hand, those records can maintain easily.

## 5.2. Future works

We have many scopes for developing our application. We can make this application as Server based application. We can make this application as an android application which is very helpful to the user and the hospital saff.

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