Name of Student:

Date of Performance: **Date of Completion:**

Experiment No: 4

Title: Designing a Hospital Management System

Aim: To Design a hospital Management System

Requirements: Single Computer (preferably Pentium IV+) and any Open Source/Freeware/Shareware CASE Tool for Analysis & Design

Prelab:

Problem Definition

Hospital Management System is a system enabling hospitals to manage information and data related to all aspects of healthcare – processes, providers, patients, and more, which in turn ensures that processes are completed swiftly and effectively. When one thinks of the various aspects and departments of a hospital, it becomes apparent that an HMS is critical. The hospital database management system was introduced in 1960, and has greatly evolved since then with the ability to integrate with the existing facilities, technologies, software, and systems of a hospital. Today, patients can begin the process of healthcare in the palm of their hand – the mobile devices and apps – make this possible. This process then moves to the healthcare providers and hospitals.

Software Requirement Specification

Purpose

The purpose of this product is to bring together all the hospitals, doctors, staffs, patients and other respective parties related to medical care under a single system to facilitate interlinking between different parties and to facilitate more efficient and effective service to consumers. The application aims to maintain a global database of all parties to provide better service. The application is being developed taking into consideration the consumers who through this system will have more options to access and hospitals who can manage their daily needs efficiently

Scope

The scope of the system is as follows:
1) Maintaining a global database of all concerned Medicare parties.
2) Developing the Hospital Management System application.
3) Application will allow all concerned parties to access database and to choose services accordingly.
4) Application of the software is mentioned as under:
   - Present a login interface through which parties can access services making decisions based on available database.
   - Admin access to maintain and modify database

Feasibility study

The feasibility study for a proposed Management system will be widespread. There are several components that should be included in the study, and each will be discussed.

Overview

This Software Requirements Specification (SRS)is the requirements work product that formally specifies Hospital Management System (HMS).

It includes the results of both business analysis and systems analysis efforts Various techniques were used to elicit the requirements and we have identified your needs. analyzed and refined them.

Product Perspective

This Hospital Management System is a self-contained system that manages activities of the hospital as Patient Info. Various stakeholders are involved in the hospital patient info system..

Software requirement

- ➢ A database like DBMS to store the list of authors and the articles.
- ➢ A web browser like Chrome, Mozilla Firefox etc.
- ➢ Operating System - Windows, Linux, MacOS 32 bit and 64 bit

Hardware requirement

- ➢ A device (Computer/Laptop).
- ➢ Memory (RAM): Minimum 2GB RAM.
- ➢ Processor: Minimum 1GHZ; Recommended 2GHZ or more .
- ➢ Hard disk: 40GB ; Recommended 64GB or more.
- ➢ Ethernet connection (LAN) or, a wireless adapter (Wi-Fi)

product function

Registration:

When a patient is admitted, the front-desk staff checks to see if the patient is already registered with the hospital

➢ If he is, his/her Personal Health Number (PHN) is entered into the computer. Otherwise a new Personal Health Number is given to this patient

➢ The patient's information such as date of birth, address and telephone number is also entered into computer system.

Patient check out:

If a patient checks out, the administrative staff shall delete his PHN from the system and the just evacuated bed is included in available-beds list.

Generation:

The system generates reports on the following information: List of detailed information regarding the patient who has admitted in the hospital.

Specific Requirement External Interface Requirement

The interface should be simple, easy to understand and also must be interactive. The system should prompt for the user and administrator to login to the application and for proper input criteria.

User Interface

The software provides good graphical interface for the user any administrator can operate on the system, performing the required task such bed allotment , patient info the details of the book.

✓ Allows user to check bed are free , charges etc in between particular time.

✓ Stock verification and search facility based on different criteria.

Communication interface

➢ NIC (Network Interface Card) - It is a computer hardware component that allows a computer to connect to a network. NICs may be used for both wired and wireless connections.
➢ CAT 5 network cable- for high signal integrity
➢ TCP/IP protocol- Internet service provider to access and share information over the internet
➢ Ethernet Communications Interface- Ethernet is a frame-based computer network Internet technology for local area networks (LANs)
➢ Ubiquitous, easy to set up and easy to use. Low cost and high data transmission rates.

Functional requirements

Global healthcare database

First maintain a global database of all hospitals, doctors, healthcare experts, staff and workers and patients on a server which will be accessed in suitable form whenever the application is run. Updates to the database will be reflected in the application every 30 seconds. Updates to the database are performed by parties concerned and the database managers/admin.

Login Interface

After access to the database has been established, a login interface is shown with login options as follows:
• Login
• SignUp

If signup is chosen, party(hospital/patient/doctor/staff) registers with database.
If login is chosen, new screen is shown.
➢ Patient
➢ Doctor
➢ Staff
➢ Hospital
➢ Specialised medical expert
➢ Admin
➢ Exit

Choice is accepted and separate screens are displayed for respective party.

Patient features

Patient is allowed to view his own profile, download medical report or bill, change profile details, to choose doctor(if first time), to change doctor within same hospital or go to different hospital(only by notifying the doctor first and paying dues).Patient is allowed to pay money to hospital through Google Wallet/Paytm through the application. No patient is allowed to view the other's profile.

Doctor features

Doctor is allowed to view the patients under him/her, add or remove patients as necessary and prescribe treatments and medication for patients under him/her. Doctor receives payment from hospital through application using Paytm/Google Wallet.

Staff features

Staff can be categorized according to specialty as nurse, receptionist and so on and will be allowed access levels to hospital inventory/ accounts according to occupation. Staff can receive salaries through Google Wallet/Paytm. According to occupation, staff can either accept payment from patient, assign doctors to patients, place orders for inventory, access inventory and other features based on occupation.

Specialised Medical Experts

They have almost similar features as that of doctors, but only difference is that they will not be affiliated to any one hospital. They receive payments through Paytm/Google Wallet via application

Admin features

Admin access is only for the software developers and the people managing the database. They can make changes only to the database like adding new parties and removing new parties. They cannot access sensitive details of a party such as password, date of birth, account number and et al.

Hospital features

Each hospital can access its own localised database containing list of doctors, employees, patients and medical experts currently providing services in the hospital's name. Hospital access is given to the owner of the hospital with unique ID and password. Approved users can change the localised database without accessing sensitive details.

Non Functional Requirements

Performance Requirements

The primary performance requirement is speed of internet network so that updates to database done elsewhere are accessible in real time. In case of large number of users accessing the database at once, the speed at which updates are refreshed might go down due to traffic.

Software Quality Attributes

➢ **Availability**

The users should be able to download the software or get access to the cd if they have basic internet connection or nearby store cell cd.

➢ **Reliability**

The software is reliable and unforeseen calamities like power shortage or system crash will not do harm to your profile or undergoing cash transactions. They will simply be put on hold.

➢ **Portability**

The software is basically built for home computers but if it is used on laptop it is portable.

➢ **Maintainability**

Software updates will be made available every month to maintain smooth running.

➢ **Security**

The system is highly secure. All confidential information of user in their accounts are hidden from other parties upto required extent.

➢ **Modifiability**

Application is not open source and hence cannot be modified without developer consent.

➢ **Safety requirements**

There are no safety requirements with this application. In case of device hazards, data flow is stopped and reverted to previous safe state hence not corrupted or compromised.

> ➢ **Flexibility**

Application is easily modifiable by developer to maintain and update with changing environment.

Constraint:

- ✓ Database: The system shall use the MySQL Database, which is open source and free.

- ✓ Operating System The Development environment shall be Windows 2000.

- ✓ Web-Based

- ✓ The system shall be a Web-based application.
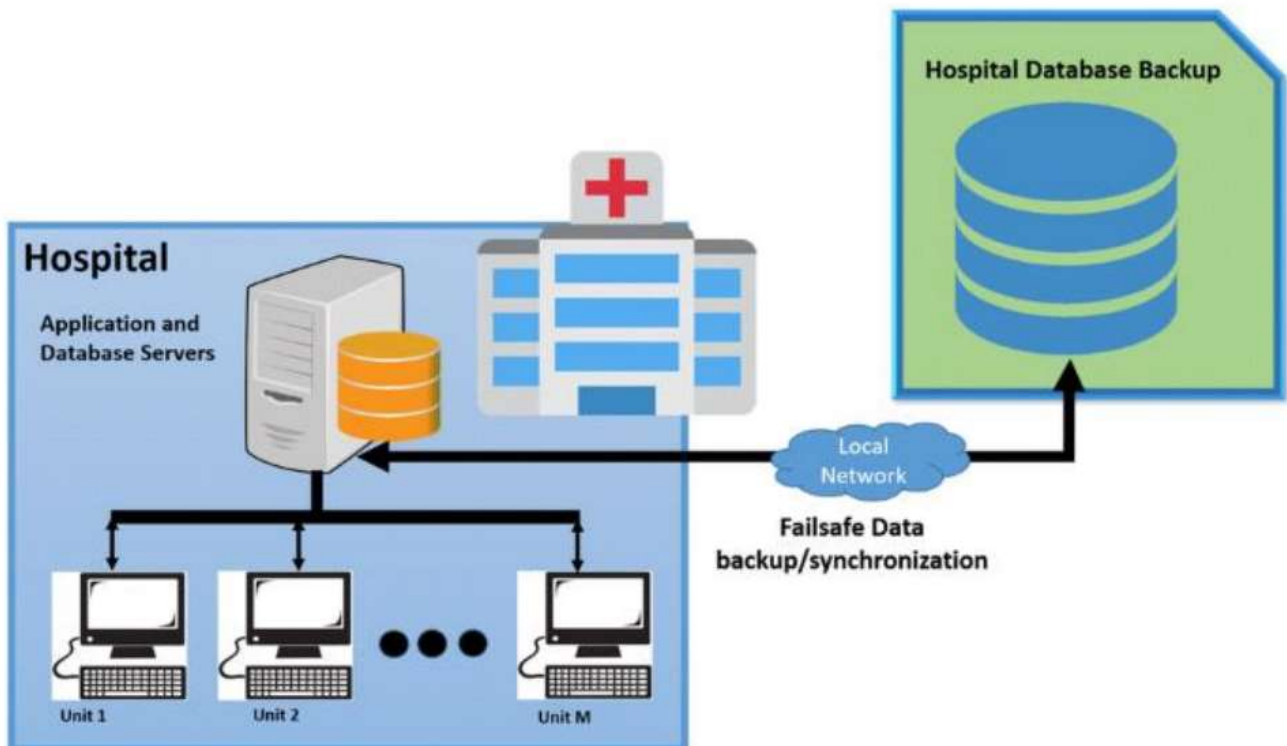
System architecture

Fig 1: system architecture diagram of Hospital management system

System development Model:

system design is the process of defining the architecture, components, modules, interface, and data for a system to satisfy specified requirement through system modelling. One could see it as the application of system theory to produce development. The design of this system will be user friendly. It shall be designed in such a way that employees will be able to navigate easily through the information supplied on the system. In other words, system design consists of design activities that produces system specification satisfying the functional requirement that were developed in the system analysis process. System design specifies how the system will accomplish. System design is the structural implementation of the system analysis.
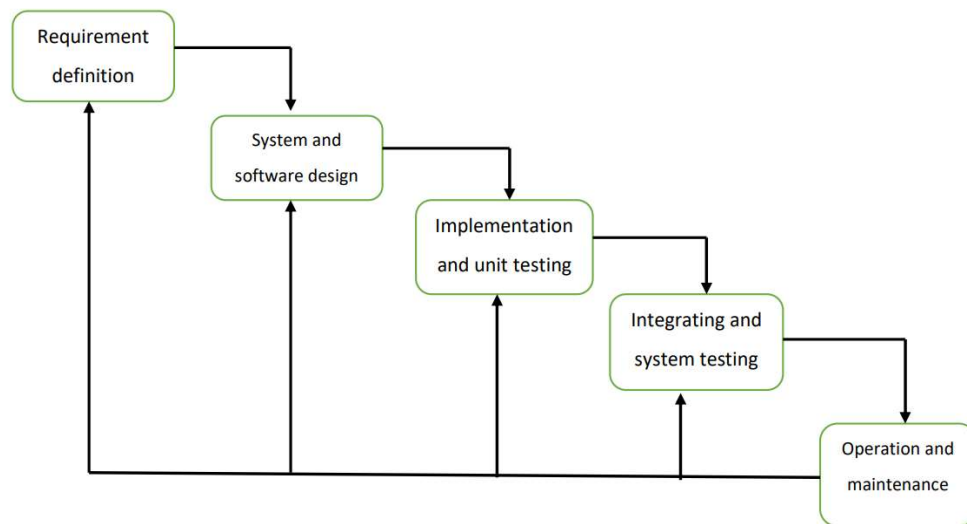
Fig 2: waterfall model

The diagram above is a system development life cycle that illustrate how the design of the project is broken down into five different phases, requirement definition, system and software design, implementation and unit testing, integrating and system testing, operation and maintenance.

The purpose Hospital management system information about hospital and store will start with project planning by determining the user of the system, aims and objective of the project. After these, extensive research will be done to determine how to design an effective system, as well as to review the current system. Then the design was with an initial prototype of the system, and then refined it based on their suggestion. Phases of analysis, design and implementation were performed iteratively until users and designers agreed on a final system specification. At this point, the project could move to final implementation phase.

Inlab:

The UML diagrams developed during the laboratory session for Library Management System are as follows:
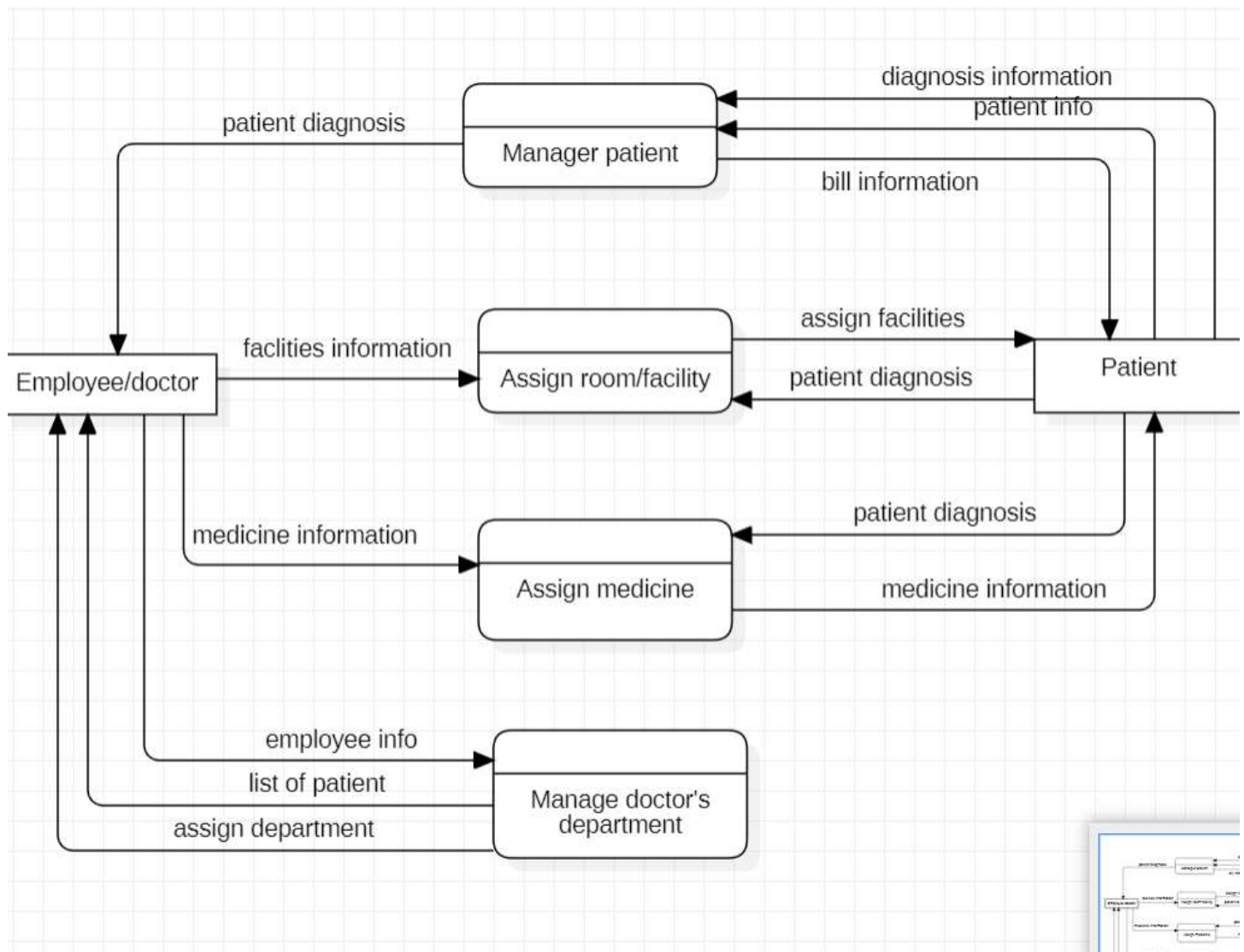
1. Data flow diagram(DFD):

Fig 3: Data flow diagram of Hospital Management System
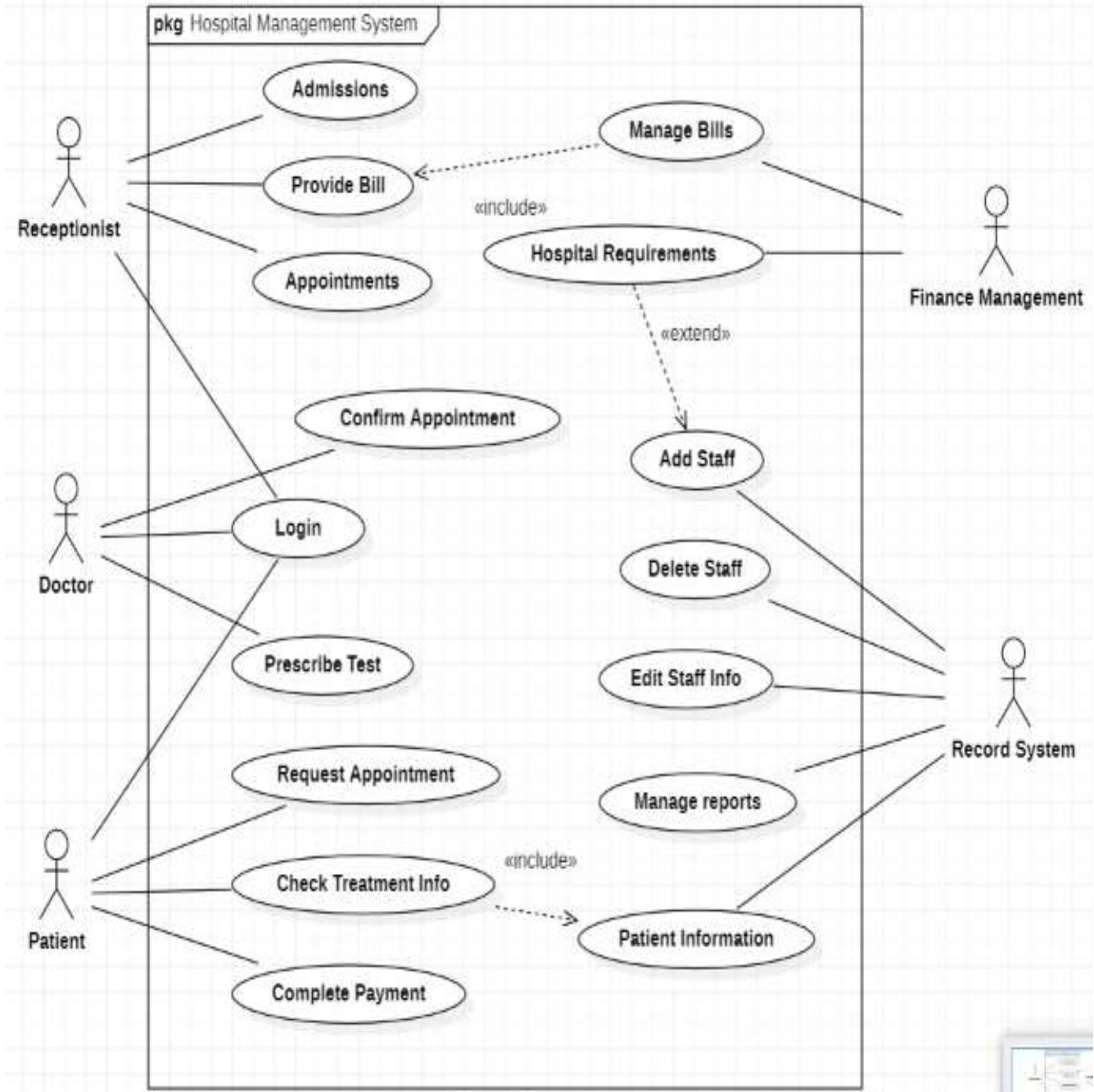
2. Use case diagram:

Fig4: Use case diagram of Hospital Management System
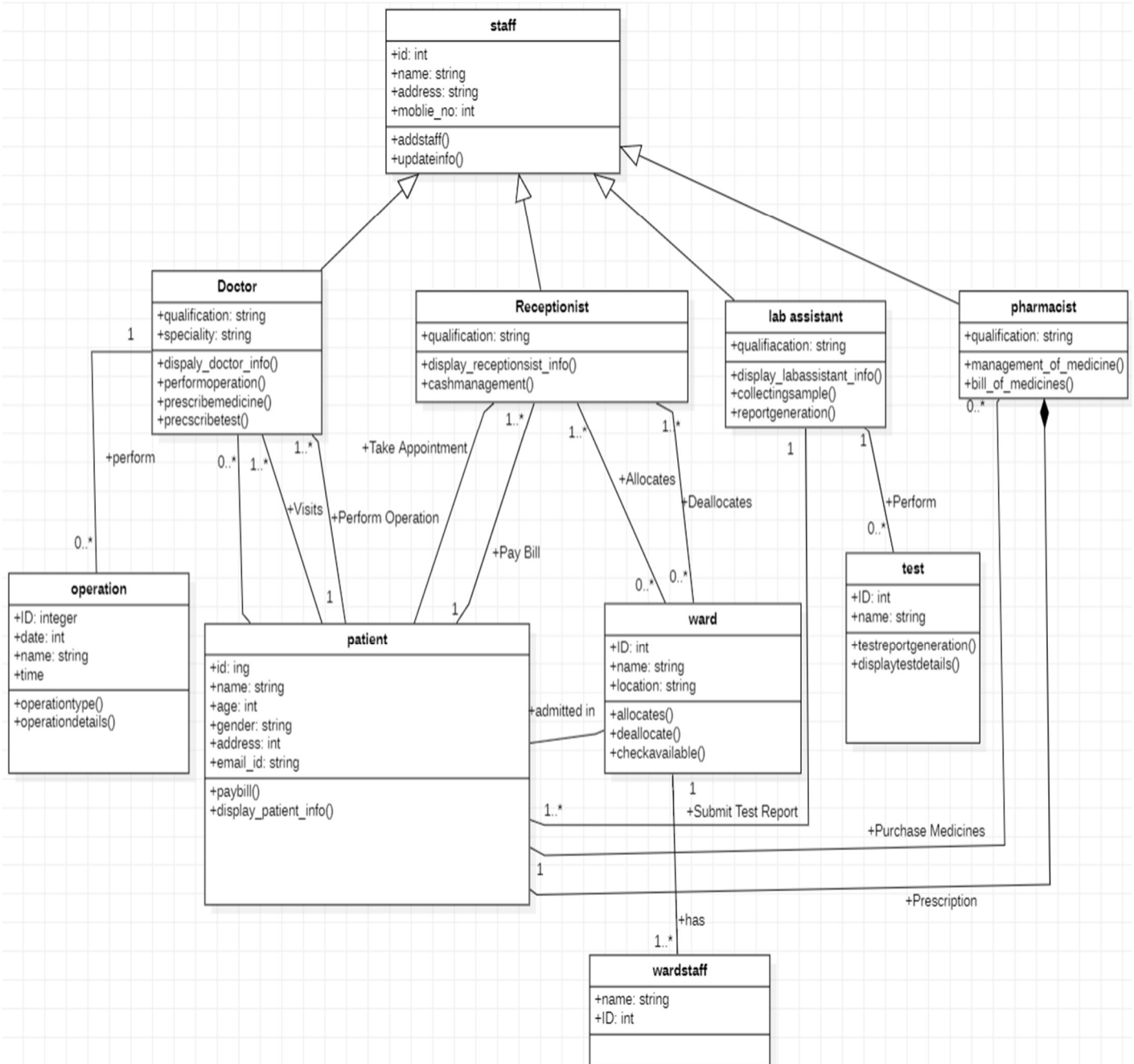
3. Class diagram:

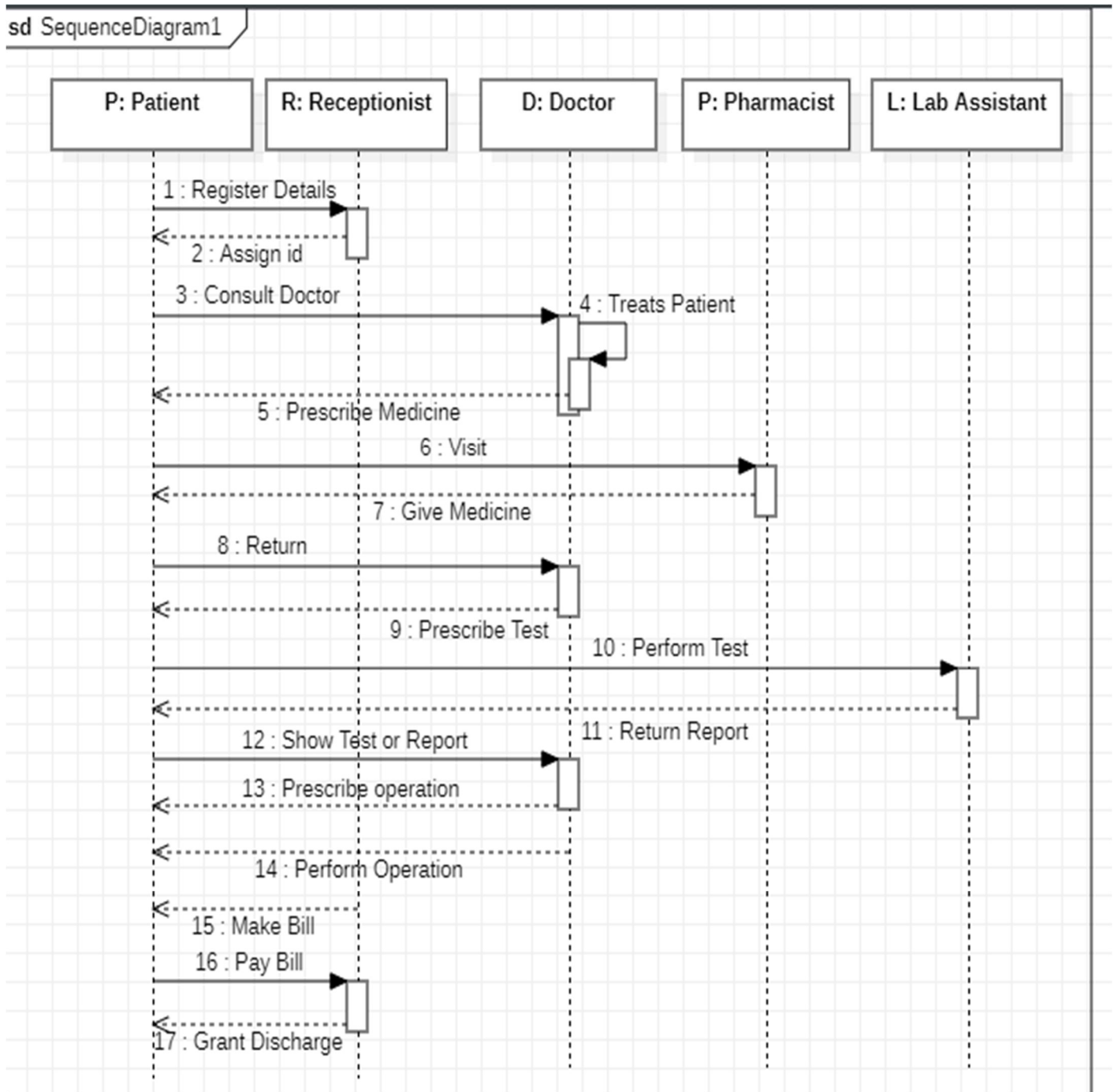**Fig 5: Class diagram of Hospital Management System**

4. Sequence diagram:

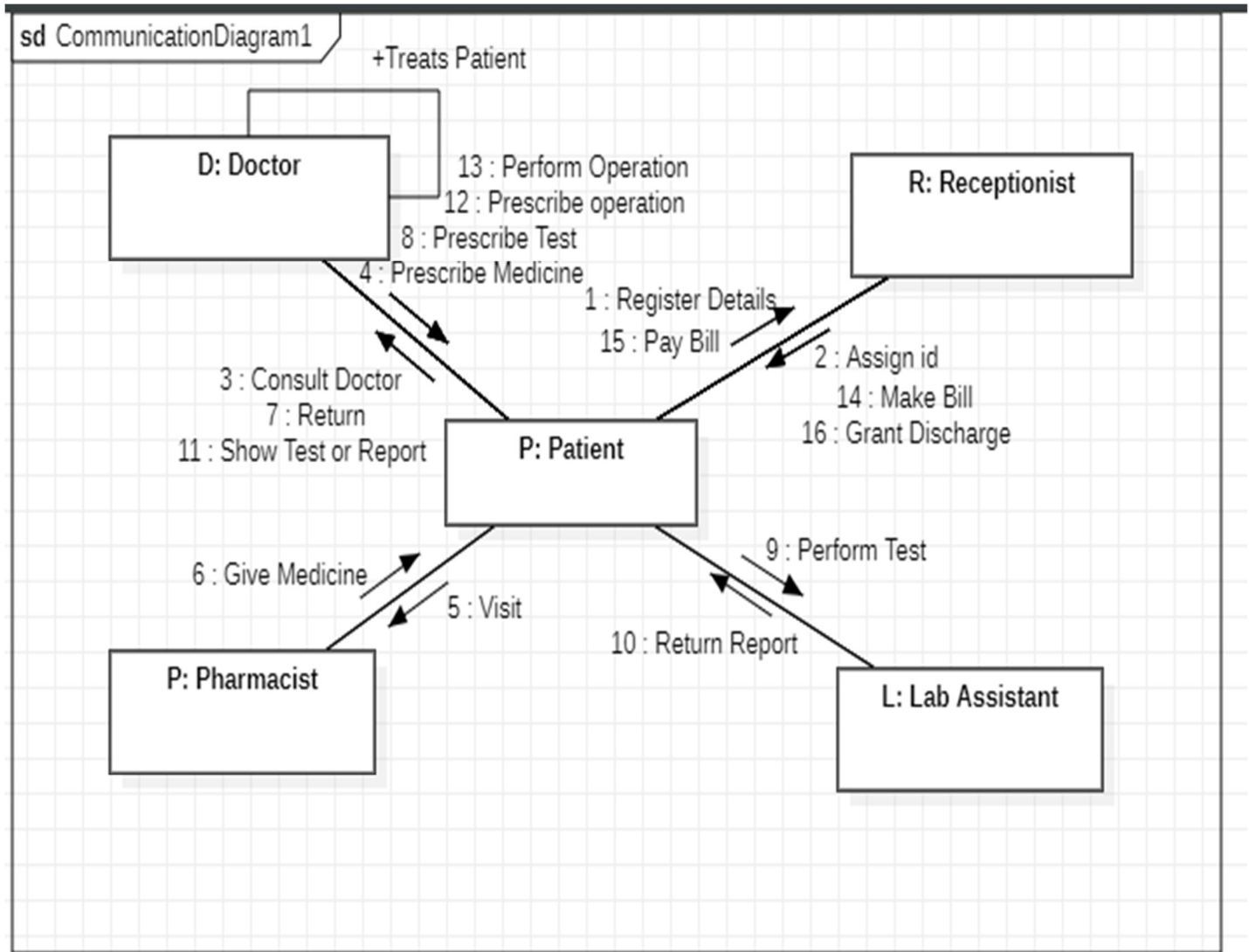**Fig 6: Sequence diagram of Hospital Management System**

5. Collaboration/ communication diagram:

Fig 7:collaboration diagram of Hospital Management System

6. State chart diagram:
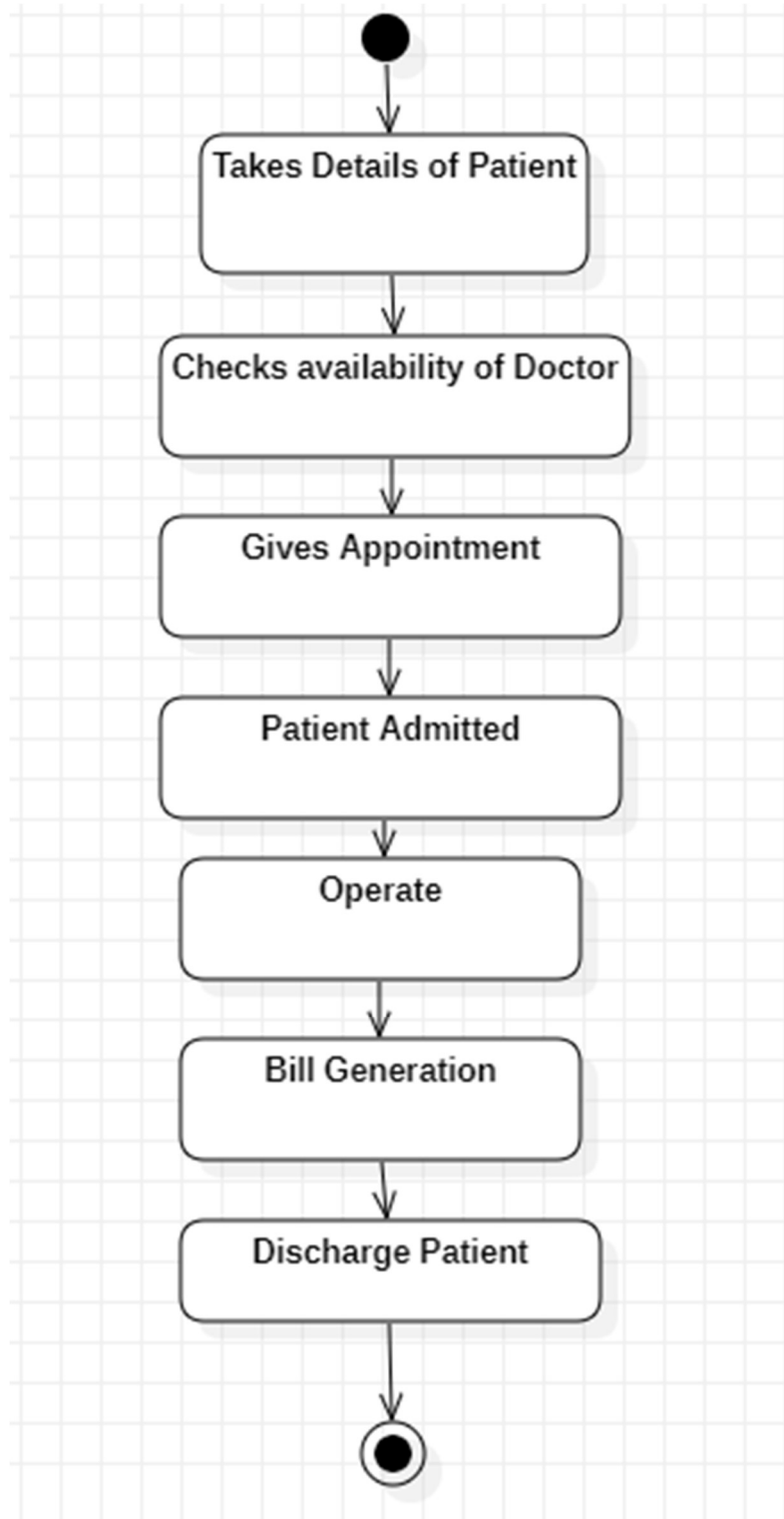
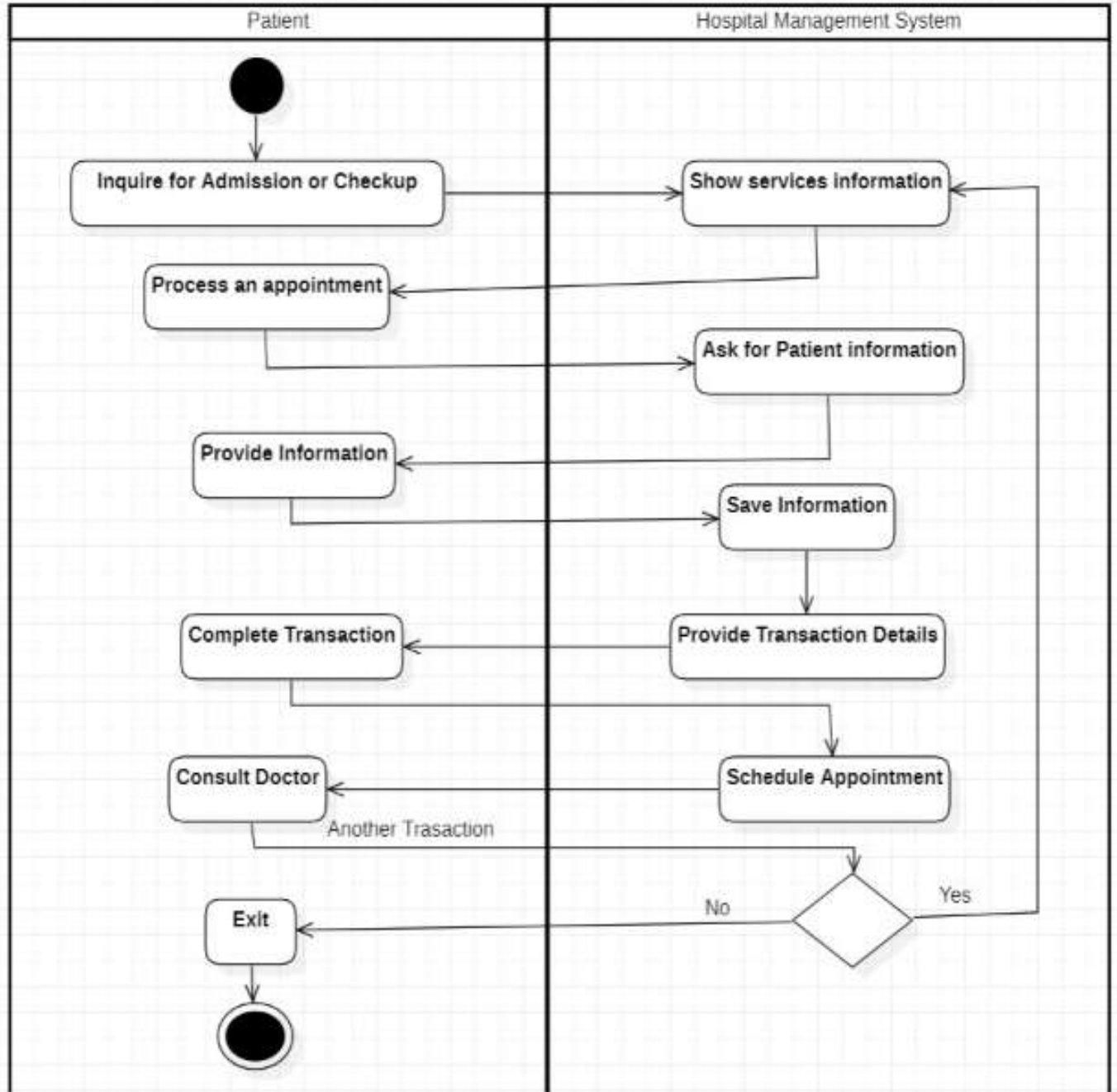**Fig 8:state chart diagram of Hospital Management System**

7. Activity diagram:

Fig 9: Activity diagram of Hospital Management System
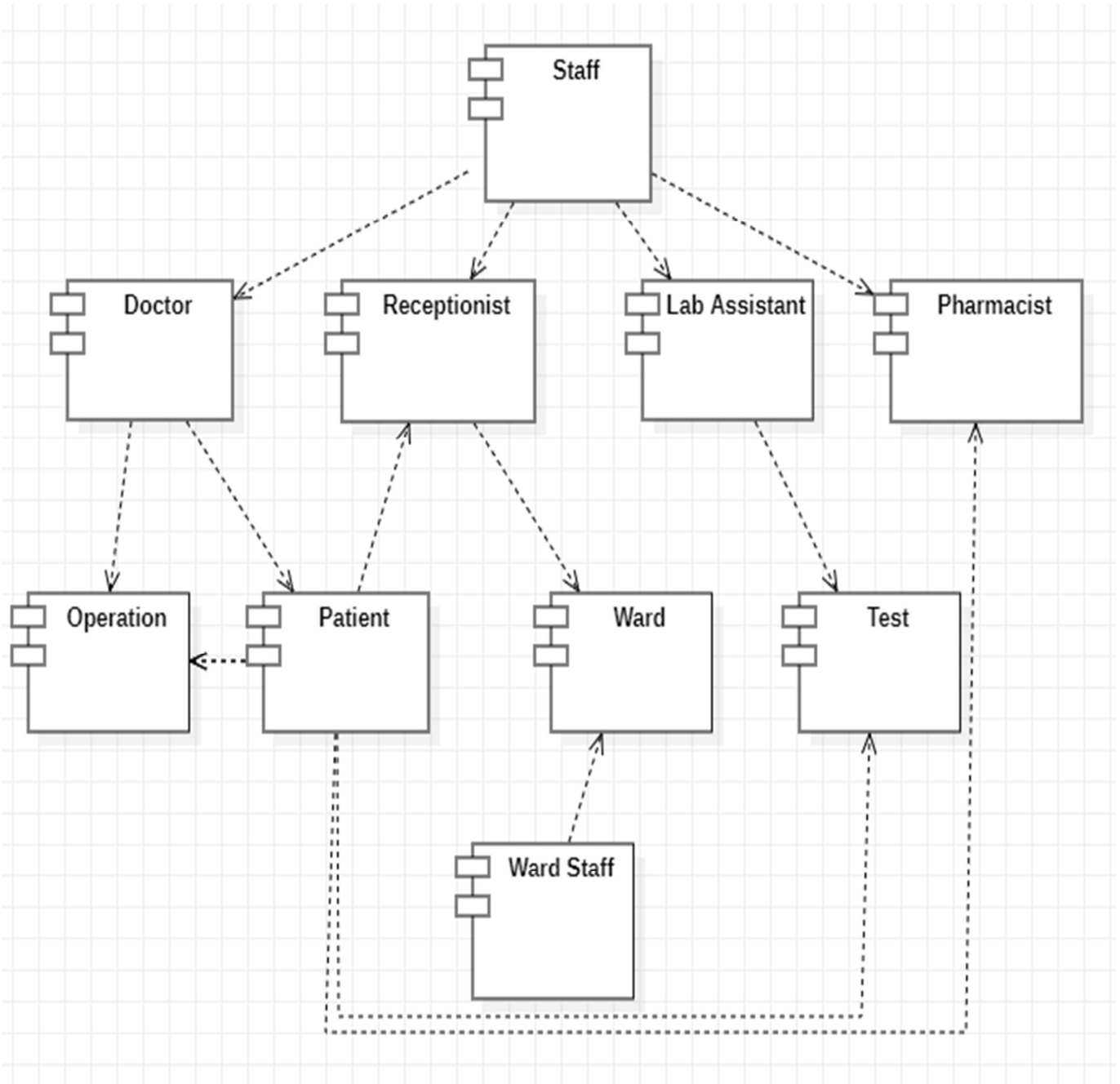
8. Component diagram:

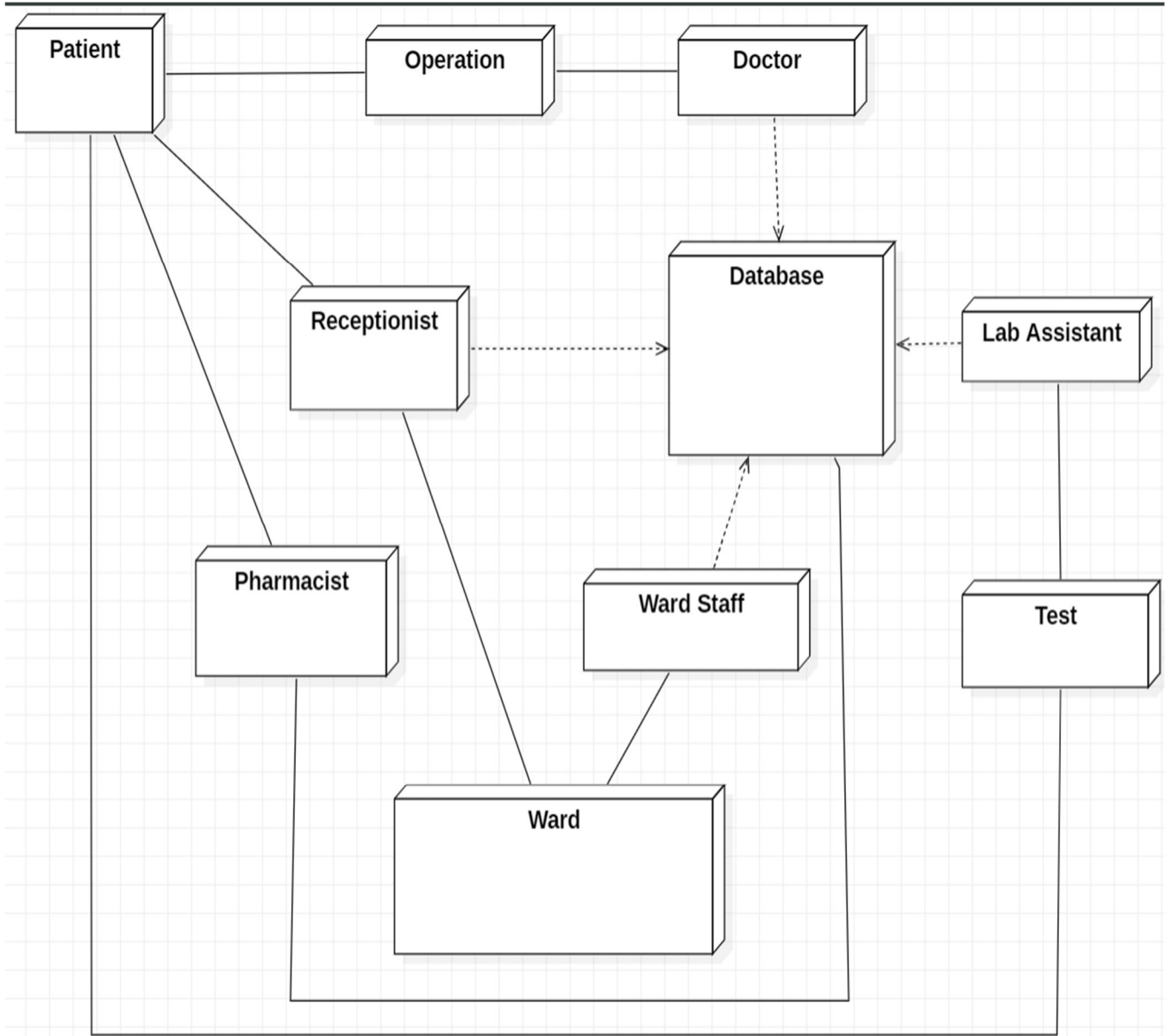**Fig 10: Component diagram of Hospital Management System**

9. Deployment diagram:

Fig 11: Deployment diagram of Hospital Management System

Questions

Name:

Class:

Section:

Roll No:

Signature:

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