Project Report On

eHOSPITAL

Submitted in partial fulfillment for the award of

Diploma in Advance Computing (E-DAC) from
C-DAC, ACTS (Pune)

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Centre for Development of Advanced Computing (C-DAC), Pune

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This project "**eHospital**" was a great learning experience for us and we are submitting this work to Advanced Computing Training School (CDAC ACTS).

We are very glad to mention the name of *Mr. Suleman Soudagar* for his valuable guidance to work on this project. His guidance and support helped me to overcome various obstacles and intricacies during the course of project work.

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From

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CHAPTER -1

1. INTRODUCTION

1.1 Introduction

E-Hospital System is an organized computerized system designed and programmed to deal with day to day operations and management of the hospital activities. 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 E-Hospital System can be entered using a username and password. It is accessible either by an administrator and 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.

The major problem for the patient nowadays to get report after consultation , many hospital managing reports in their system but it's not available to the patient when he / she is outside. In this project we are going to provide the facility to store the report in the database and make available from anywhere in the world. The E-Hospital System is a software product suite designed to improve the quality and management of hospital management in the areas of clinical process analysis and diagnosis. E-Hospital System enables to develop the organization and improve its effectiveness and quality of work. Managing the key processes efficiently is critical to the success of the hospital

User Interface, developed in React uses user email to authenticate and data is imported using REST. UI makes secure calls to Spring Boot. In the backend, JAVA is used to fetch and manipulate the data and used MySQL as database

For all this a lot of API's is used for the ease of user. API allows two applications to talk to each other and then the application interprets that data and presents the user with the information the user wanted in a readable way.
For the login of users into this website we use the user email authentication, which allows users to sign up with their email. This platform is based on REST services and it tends to independency of all services. This platform is rapid and frequent due to this technique.

1.2 Description

This project is a web application in which Receptionist can register patient who will be getting diagnosed in accordance with heath standards, the Doctors will write the report which can be viewed by the ward-in charge, Pharmacist and the Patient. The portal will provide information about the patient diagnosis report after every diagnosis with prescribed medicines or suggestions specified by the doctor. This diagnostic report will be maintained by the Doctor and Lab Incharge. For selected Patient and Doctor will be verified by the respective database. If entered data is correct then it will give information about Patient details, selection of tests and assigned diagnostic report that are available in the database. The project E-Hospital System' is based on the database, objectoriented programming and networking techniques. As there are many areas where we keep

the records in database for which we are using MY SQL software which is one of the best and the easiest software to keep our information. This project uses Angular with Bootstrap as the frontend software and has connectivity with MY SQL

1.3 Problem Formulation

Since Hospitals are associated with the lives of common people and their day-to-day routines so we decided to work on this project. The manual handling of the record is time consuming and highly prone to error. The purpose of this project is to automate or make online, the process of day-to-day activities like Patient diagnosis, medication report, admission of New Patient, retrieving their record, etc. We have tried our best to make the complicated process of Hospital Management System as simple as possible using Structured & Modular technique & Menu oriented interface. We have tried to design the software in such a way that the user may not have any difficulty in using this package & further expansion is possible without much effort. Even though we cannot claim that this work to be entirely exhaustive, the main purpose of our exercise is to perform each activity in computerized way rather than manually which is time consuming.

1.4 Motivation

1. **Easy Access to Patient Data**
   One of the main advantages of hospital management software is easily available patient data to the care providers. It is only a matter of few clicks and all the required information about a patient, from various departments in the hospital, can be available on the screen.

2. **Cost Effective**
   Well-Implemented clinic management system reduces a lot of manual work that is essentially performed in hospitals, especially the ones where documentation and record keeping is required. It also saves much on storage and the related operational costs.

3. **Improved Efficiency**
   Using software enables the processes automated to mean that the processes will be taken care of mechanically without any human intervention and this will instantly ensure improved efficiency.

4. **Reduces Scope of Error**
   Because processes on hospital software are automated and a lot of tasks are assigned to the software to perform with utmost accuracy with minimum human intervention, the scope of error is reduced dramatically.
5. **Data Security & Retrieve-ability**
   All the important data is stored on the server or cloud, keeping it safe. Since hospital software works on logins, data security is becoming a non-issue offering data access based on the role of the person – Receptionist, doctor, nurse, radiologist etc.

6. **Improved Patient Care**

Improved access to patient data and it improves work efficiency means better and quick clinical decisions. In this era of evidence-based medicine, the faster the clinician gets the diagnostic reports and the quicker her orders are implemented the faster is the patient recovery and the better it is on the patient care index.

1.5 Scope

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. Bills are generated by recording price for each facility provided to Patient on a separate sheet and at last they all are summed up.

3. 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.

4. Immunization records of children are maintained in pre-formatted sheets, which are kept in a file.

5. 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. **1.6 Objective:-**

1) Define hospital

2) Recording information about the Patients that come.

3) Generating bills.

4) Recording information related to diagnosis given to Patients.

5) Keeping record of the Immunization provided to children/patients.

6) 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.

1.7 MODULES:

1. Admin
2. Doctor
3. Patient
4. Receptionist
5. Lab-Incharge
6. Pharmacist
7. Ward-Incharge

CHAPTER-2

2. **LITERATURE REVIEW:**

Automated Hospital Ward Management System Interacting with Mobile Robot Platform WDBOT

- This paper presents a novel intelligent Automated

Hospital Ward Management System (AHWMS) based on a mobile robotic platform named WDBOT for a hospital ward. The need of an automated system including an assisting robot for performing activities in the hospital system is great importance for doctors, nurses, patients and other healthcare assistants due to demanding work load and limited number of personnel. The aim of this research is to provide an automated mobile robot-based solution to improve the effectiveness of ward management and medicine management and distribution processes. AHWMS interacts with WDBOT via wireless network to achieve the abovementioned tasks with the help of controlling, image analysis, processing and communication. Verification of the system was done with the help of simulation and physical modeling of some units. This system shows its use can improve the effectiveness of the present hospital ward management system

CHAPTER-3

3. SYSTEM ANALYSIS

3.1 FUNCTIONAL REQUIREMENTS:

3.1.1 Admin Login

- System will allow Admin to register all the hospital employees details (Doctor, Receptionist, Lab-Incharge, Pharmacist, and Ward-Incharge).
- System will allow Admin to view all the hospital employees details (Doctor, Receptionist, Lab-Incharge, Pharmacist, and Ward-Incharge).
- System will allow Admin to login using email & password
- System will allow Admin to access all functionalities of other roles.
- Admin should be able to add departments to/from hospital.
- System will allow Admin to remove departments to/from hospital.

3.1.2 Doctor Login

- System will allow Doctor to provide prescription to patients. System will allow Doctor to view test reports of any patient.
- System will allow Doctor to check availability of medicines.
- System will allow Doctor to suggest admit a patient.
- System will allow Doctor to suggest discharge a patient.
- System will allow Doctor to trace the history of the patient.

3.1.3 Patient Login

- System will allow patient to view his/her prescription
- System will allow patient to view his/her appointments
- System will allow patient to view his/her reports
- System will allow patient to pay his/her bill
- System will allow patient to view his/her details

3.1.4 Receptionist Login

- System will allow receptionist to register incoming patient to hospital
- System will allow receptionist to update details of patient along with bill amount.
- System will allow receptionist to schedule appointment for patient
- System will allow receptionist to search patient by its ID

3.1.5 Lab-In charge Login

 System will allow Lab-In charge to be upload test reports of any patient. System will allow Lab-In charge to introduce any newly added report type.

3.1.6 Pharmacist Login

- System will allow Pharmacist to provide medicines to patients according to prescription.

- System will allow Pharmacist to update stock medicine status.
- System will allow Pharmacist to introduce any newly added medicine System will allow Pharmacist to generate bill of medicines for a patient.

3.1.7 Ward-In charge Login

- System will allow Ward-In charge to check availability of beds and allot bed to a patient.
- System will allow Ward-In charge to update newly added beds.

3.2 Non-functional Requirements

3.2.1 Performance

System performance is the most important quality in non-functional requirements and affects almost all the other preceding ones. The system should store all the database records of each patient and admin staff properly and the application should be available for use 24*7 through the server. Also, the application should be user friendly with a proper user interface which makes it easy for the user to understand. All the options should be present in properly accessible places for user convenience. Admin staff personnel should be properly trained to operate the application so provided. Patient prescriptions, test details, administered food details, feedback details, allocation of nurse details, records are to be backed up securely across database servers. In case database is hacked by someone and data is deleted a backup server should be present for such purpose.

All login ids and passwords of the Admin, Police Admin and FIR Entry Operator should be protected for privacy using whatever constraints required in the database or the application.

3.2.2 Reliability

Reliability is the probability and percentage of the software performing without failure for a specific number of uses or amount of time.

3.2.3 Availability

This feature defines the amount of time the system is running, the time it takes to repair a fault, and the time between lapses.

3.2.4 Maintainability

This feature indicates the average time and ease and rapidity with which a system can be restored after a failure.

The system should be easy to maintain. There should be a clear separation between the interface and the business logic code. There should be a clear separation between the data access objects that map the database and the business logic code.

3.2.5 Security

All login ids and passwords of the Admin, Doctor, Nurse, and Patient should be protected for privacy using whatever constraints required in the database or the

application. The system requires the individual to acknowledge the person making use of the phone. Any adjustments like insert, erase, update, etc. for the data source can be integrated promptly as well as executed only by the Nurse and Doctor. The Admin can consider as well as alter any kind of information in the Hospital Management System

3.3 Technology Used

3.3.1 **BACK END**

Spring Boot
MYSQL for storage of data.

3.3.2 **FRONT END**

React
CSS
REDUX

Platform:
Web Development: J2EE Spring Boot, React, MySQL

J2EE Spring Boot

Spring Boot has been built for Rapid Application Development. The goal of Spring Boot is to provide a way to create Java applications quickly and simply, through an embedded server. By default, it used an embedded version of Tomcat and hence eliminating the need of Java EE containers.

It is a framework to ease the bootstrapping and development of new Spring Applications. Bootstrapping with defaults included in the configuration/ jar-dependencies. Easy to create standalone applications with embedded Tomcat/Jetty/Undertow. It provides defaults for code and annotation configuration to quick start new spring projects within no time. Plenty of Spring Boot Starter to quickly get up and running.

No code generation and no requirement for XML configuration. It reduces lots of development time and increases productivity.

React

React is a JavaScript library for building user interfaces. It has transformed the way we think about front-end development. React.js has clasped the engagement of the opensource community. And its demand is irreversible in the coming future. It is here to stay. Improved performance: React uses Virtual DOM, thereby creating web applications faster. Virtual DOM compares the components' previous states and updates only the items in the Real DOM that were changed, instead of updating all of the components again, as conventional web applications do.

MySQL

MySQL is an open-source relational database management system (RDBMS).A list of commonly used MySQL queries to create database, use database, create table, insert record, update record, delete record, select record, truncate table and drop table etc.

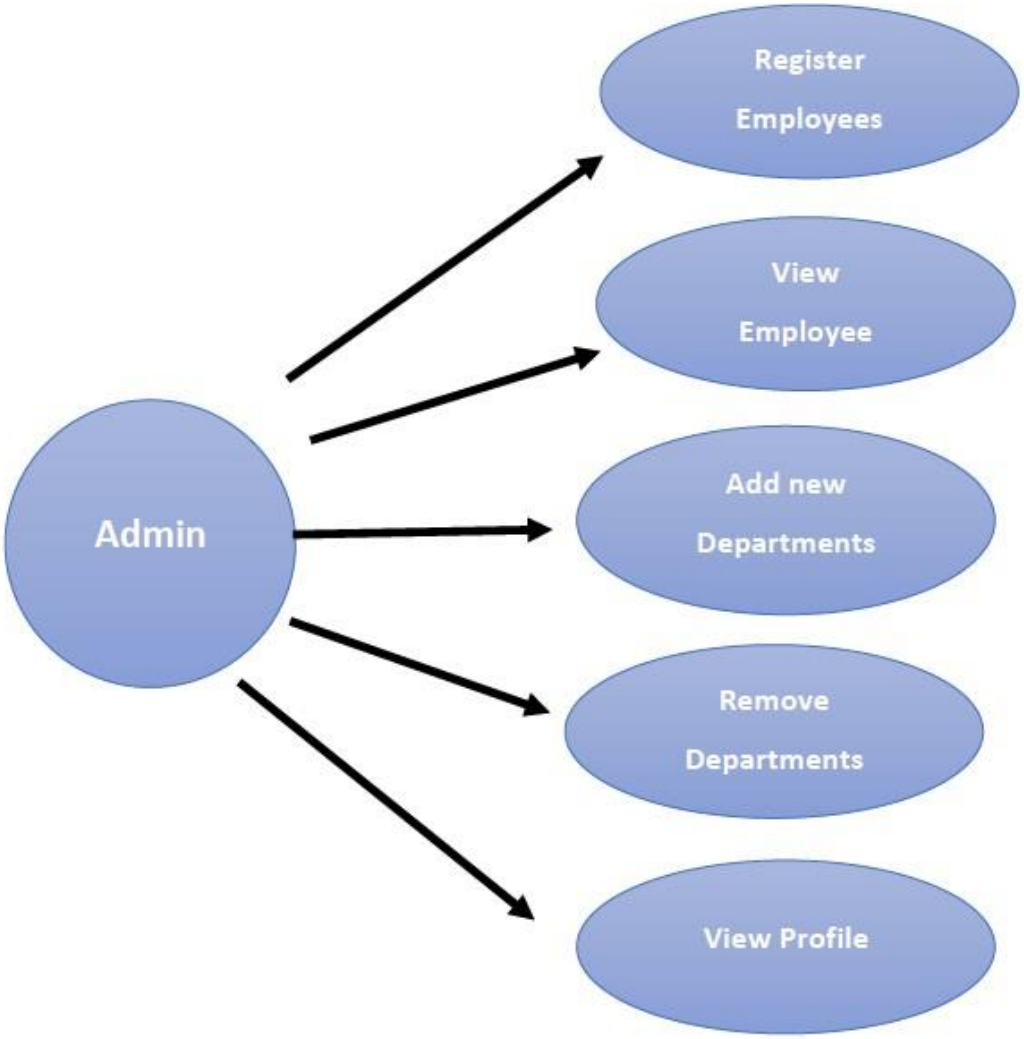
MySQL is a relational database management system based on SQL – Structured Query Language. The application is used for a wide range of purposes, including data warehousing, e-commerce, and logging applications.
The most common use for MySQL, however, is for the purpose of a web database. It can be used to store anything from a single record of information to an entire inventory of available products for an online store. In association with a scripting language such as PHP or Perl (both offered on our hosting accounts) it is possible to create websites which will interact in real- time with a MySQL database to rapidly display categorized and searchable information to a website user.

CHAPTER-4

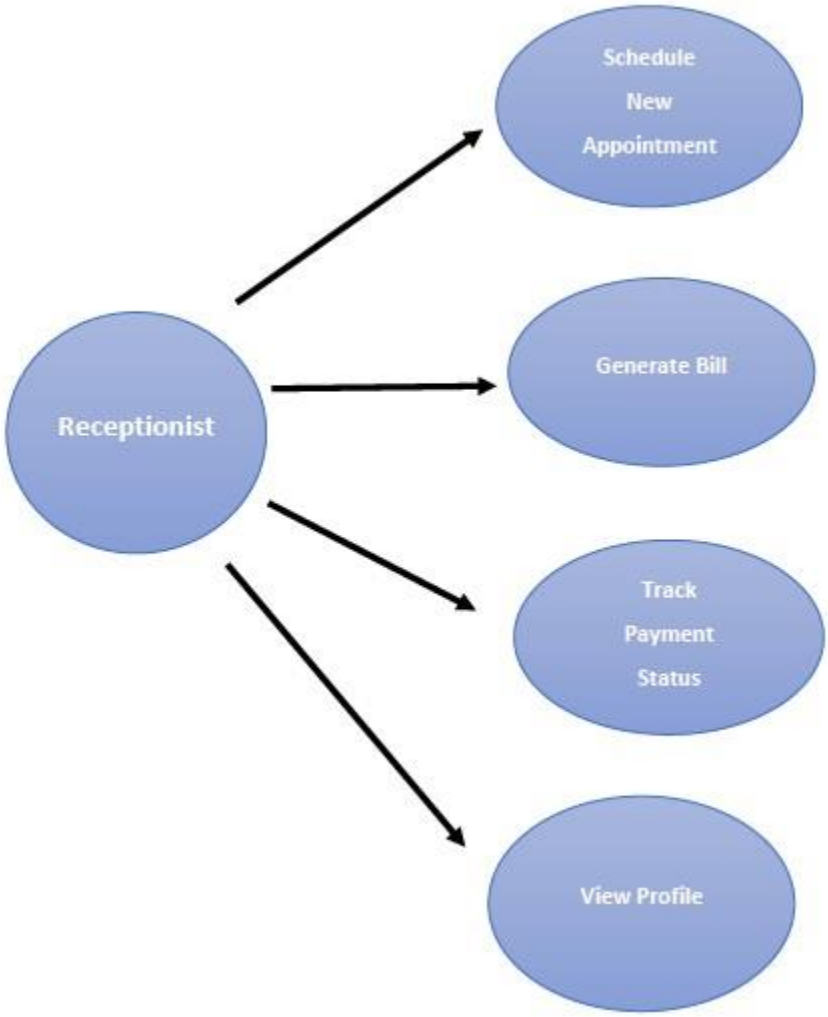
4. Analysis Modeling

4.1 Use case Diagram

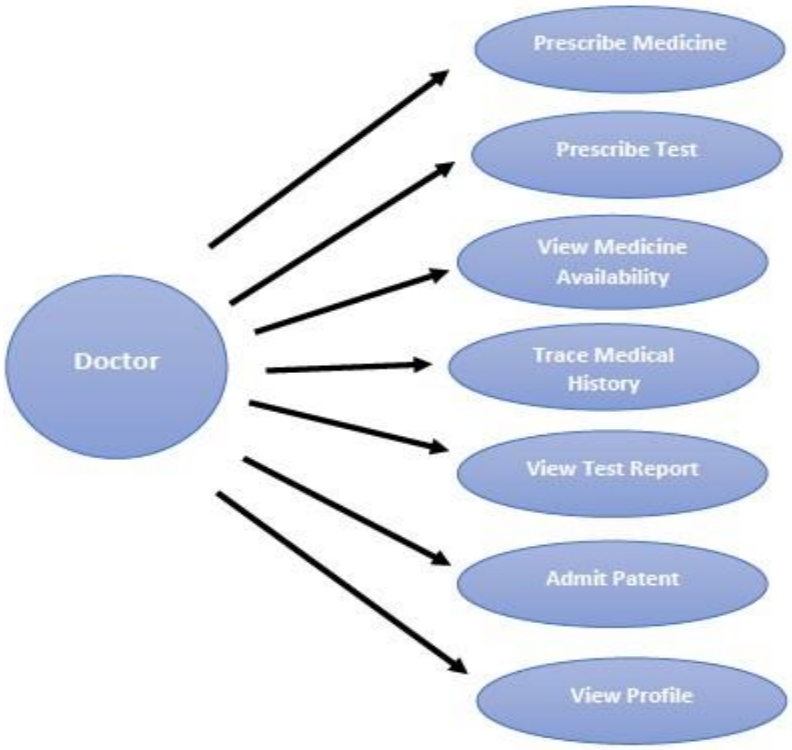
4.1.1 Admin Module



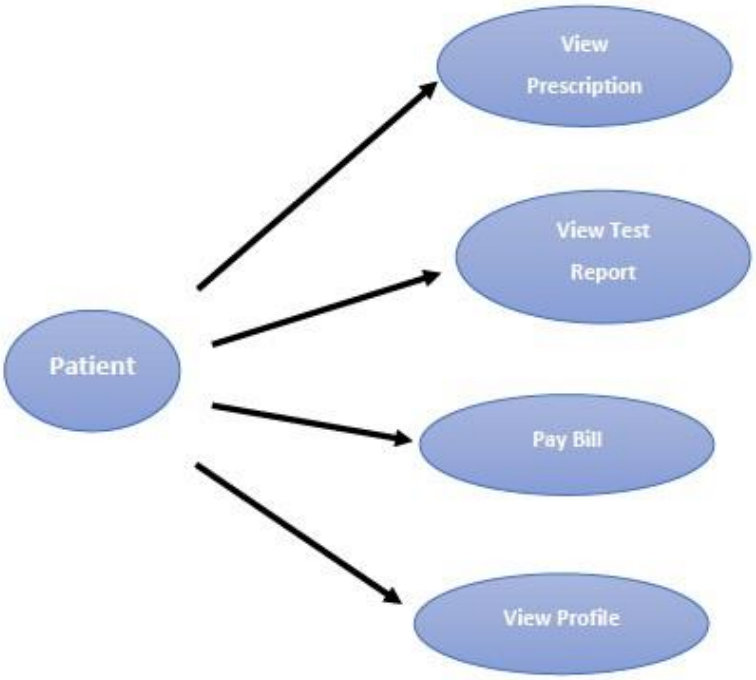
4.1.2 Receptionist Module



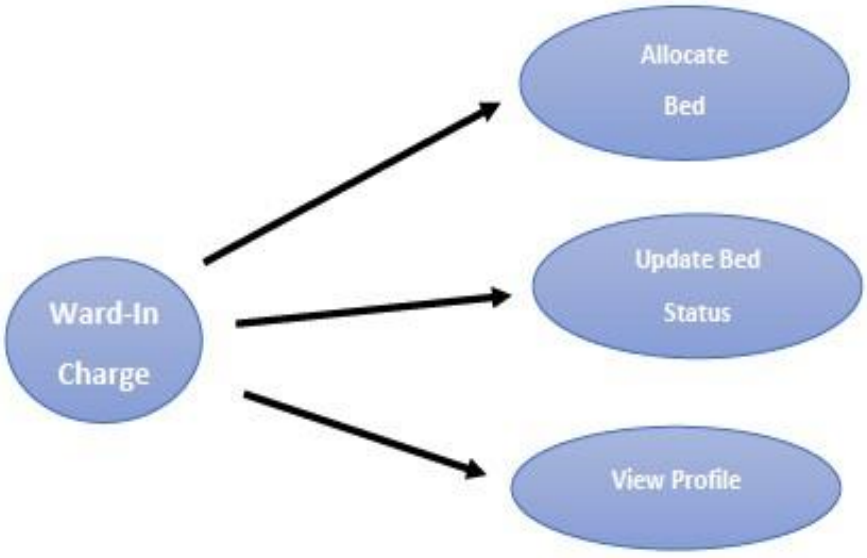
4.2.3 Doctor Module



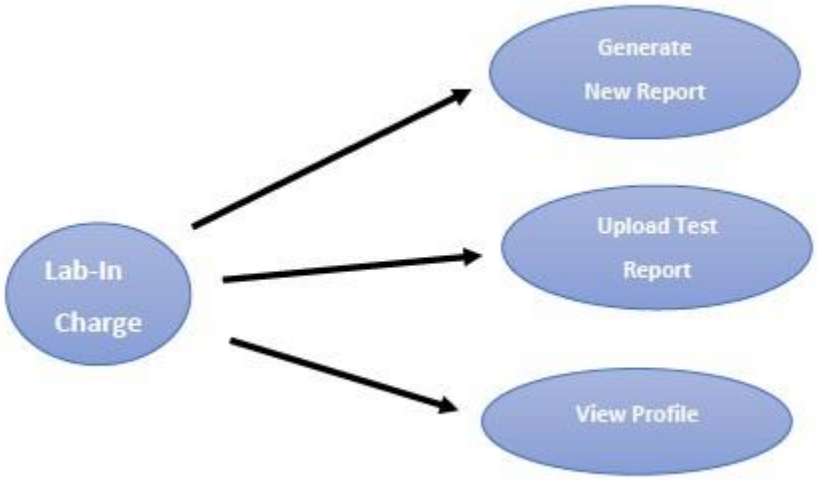
4.1.4 Patient Module



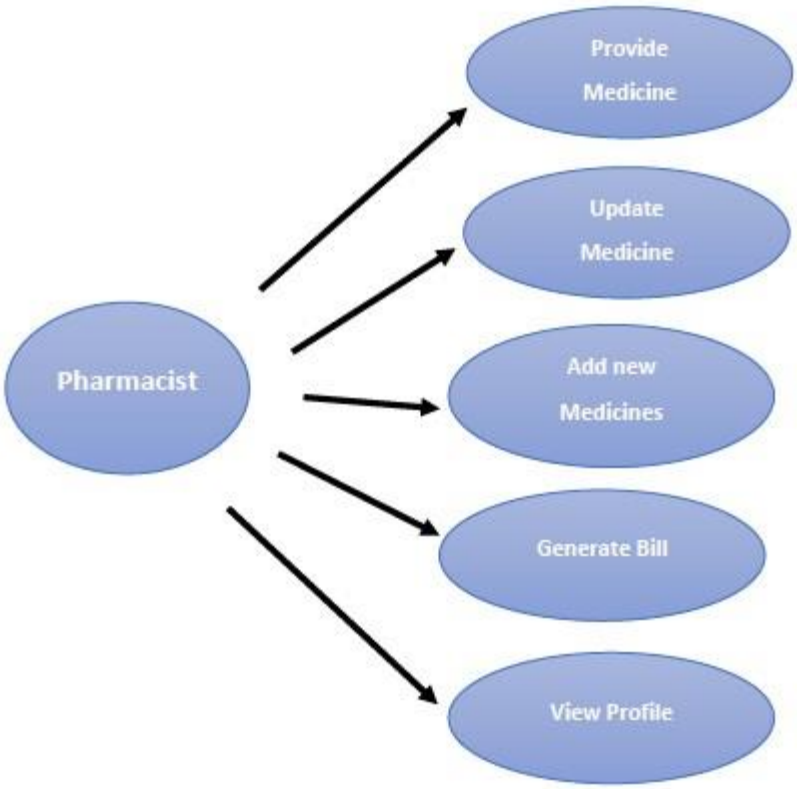
4.1.5 Ward In-Charge Module



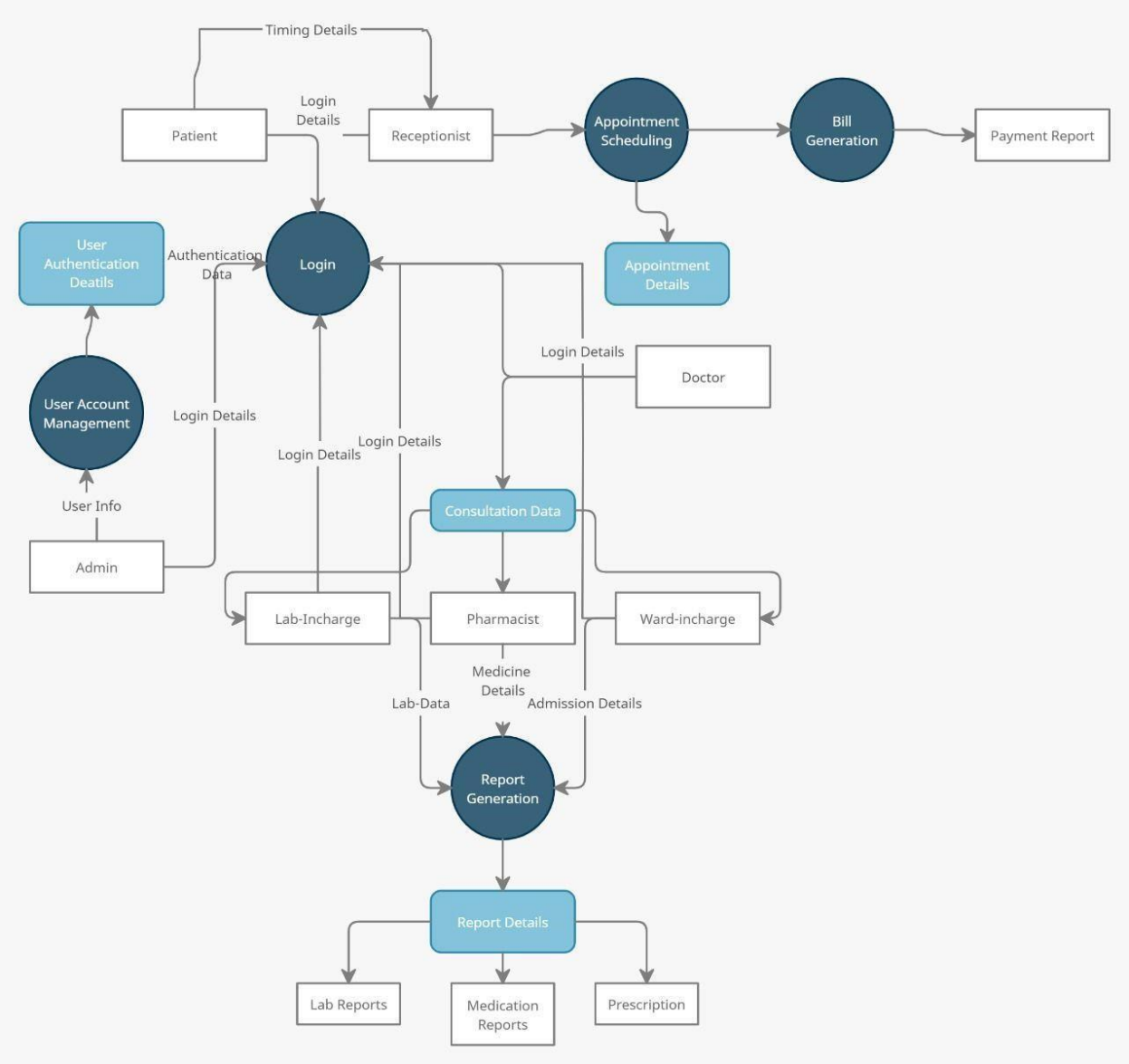
4.1.6 Lab In-Charge Module



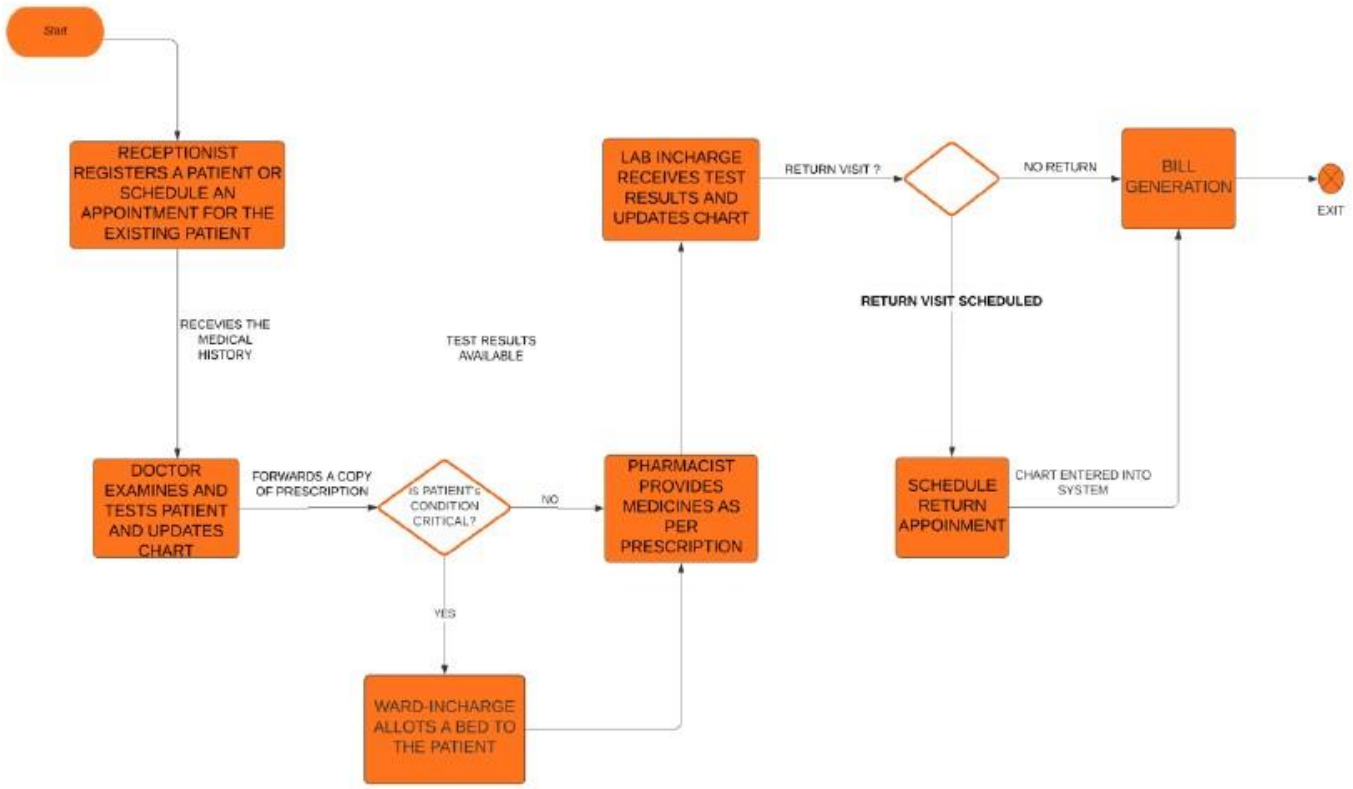
4.1.7 Pharmacist Module


Provide
Medicine
Update
Medicine
Pharmacist
Add new
Medicines
Generate Bill
View Profile

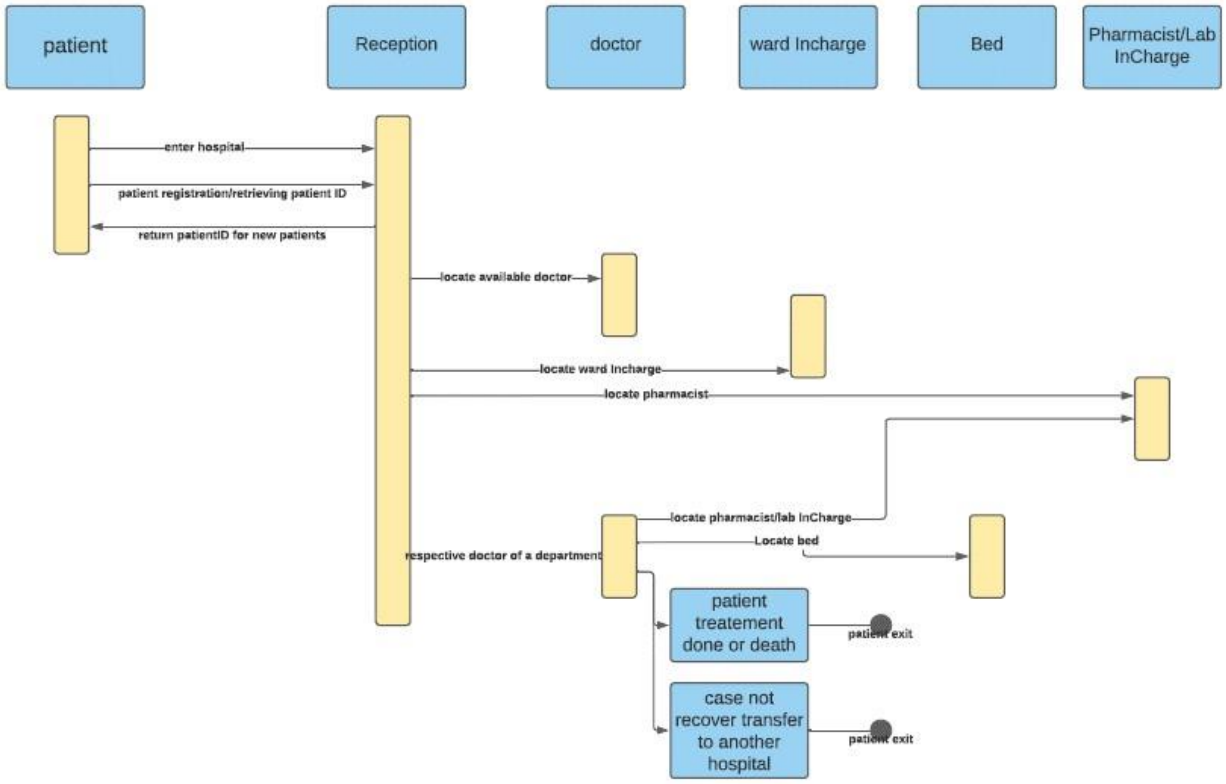
4.2 Data Flow Diagram



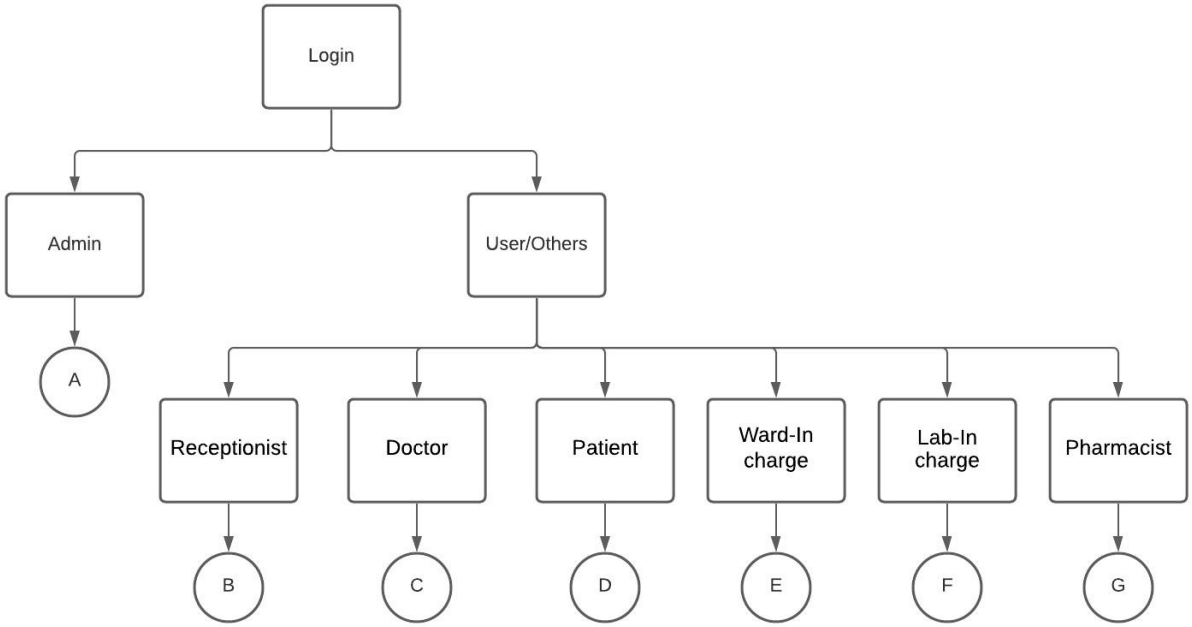
4.3 Activity Diagram

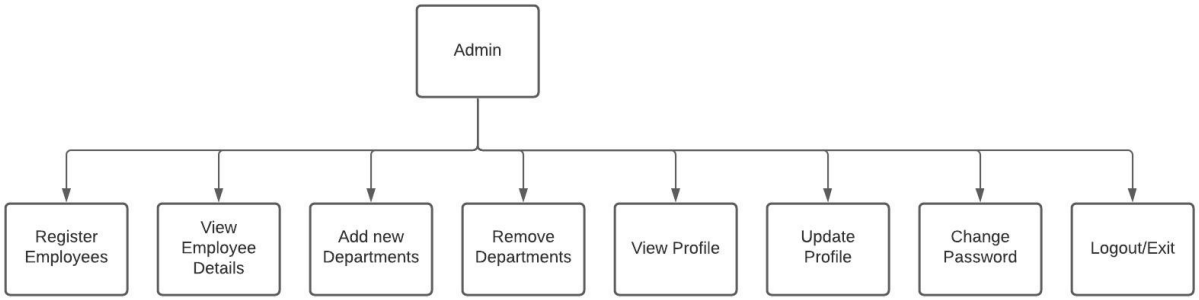


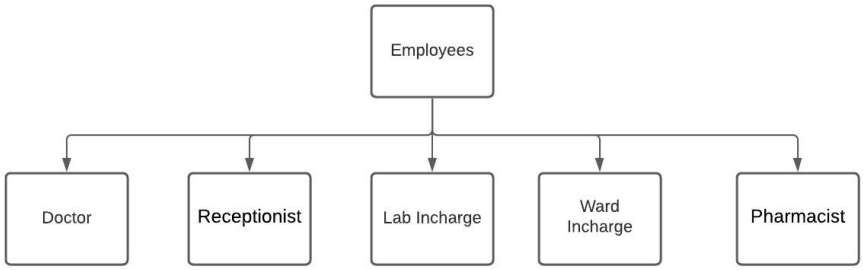
4.4 Sequence Diagram

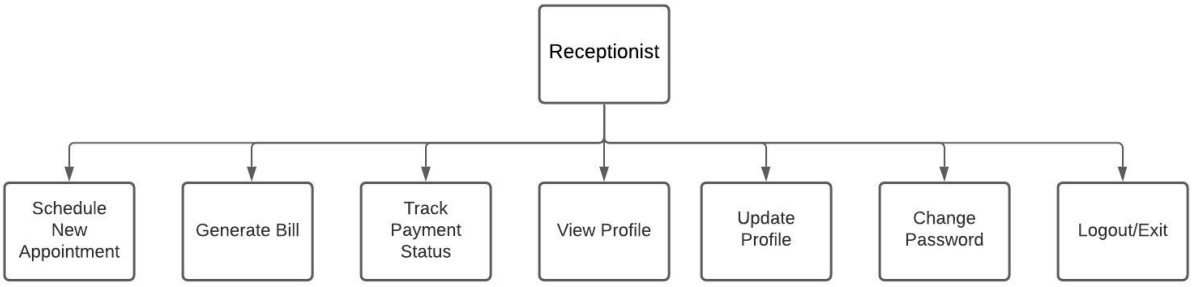


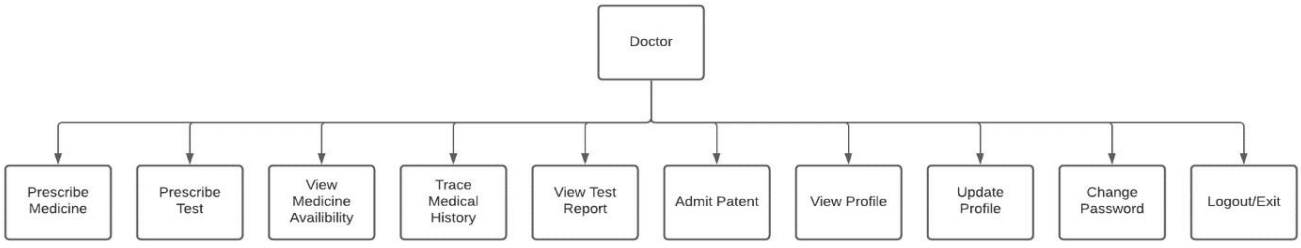
4.5 Functional Flow Chart

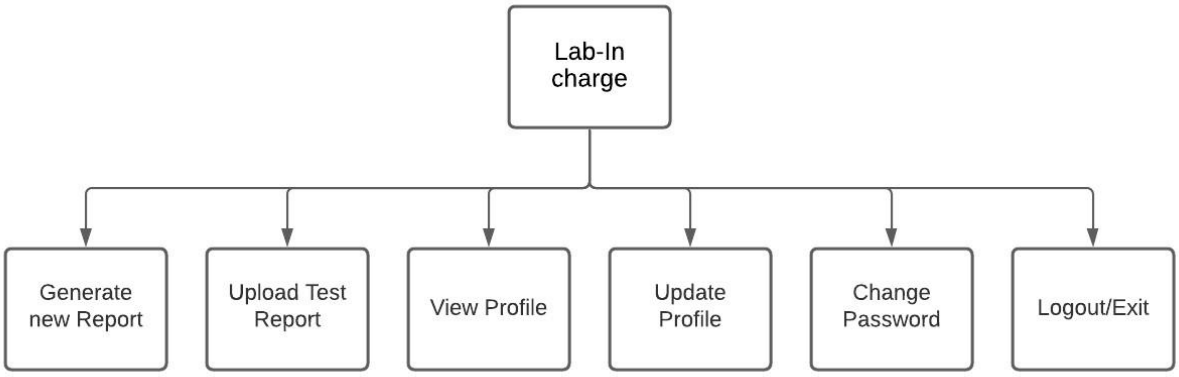


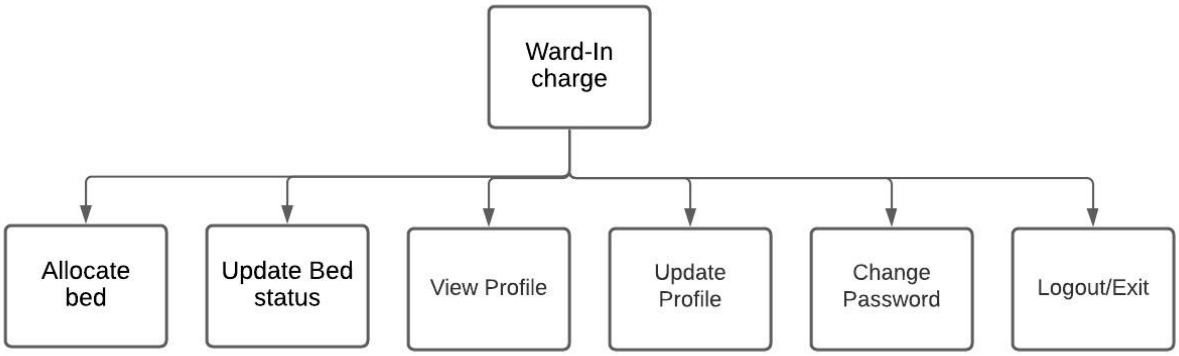

Admin
Register Employees
View Employee Details
Add new Departments
Remove Departments
View Profile
Update Profile
Change Password
Logout/Exit

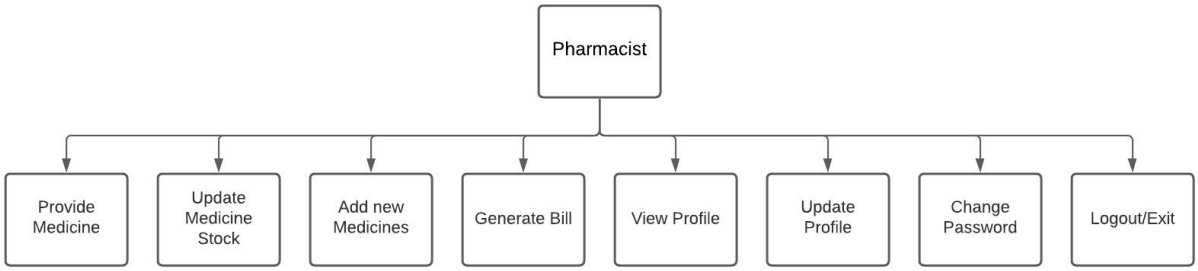

Employees
Doctor
Receptionist
Lab Incharge
Ward Incharge
Pharmacist


Receptionist
Schedule New Appointment
Generate Bill
Track Payment Status
View Profile
Update Profile
Change Password
Logout/Exit

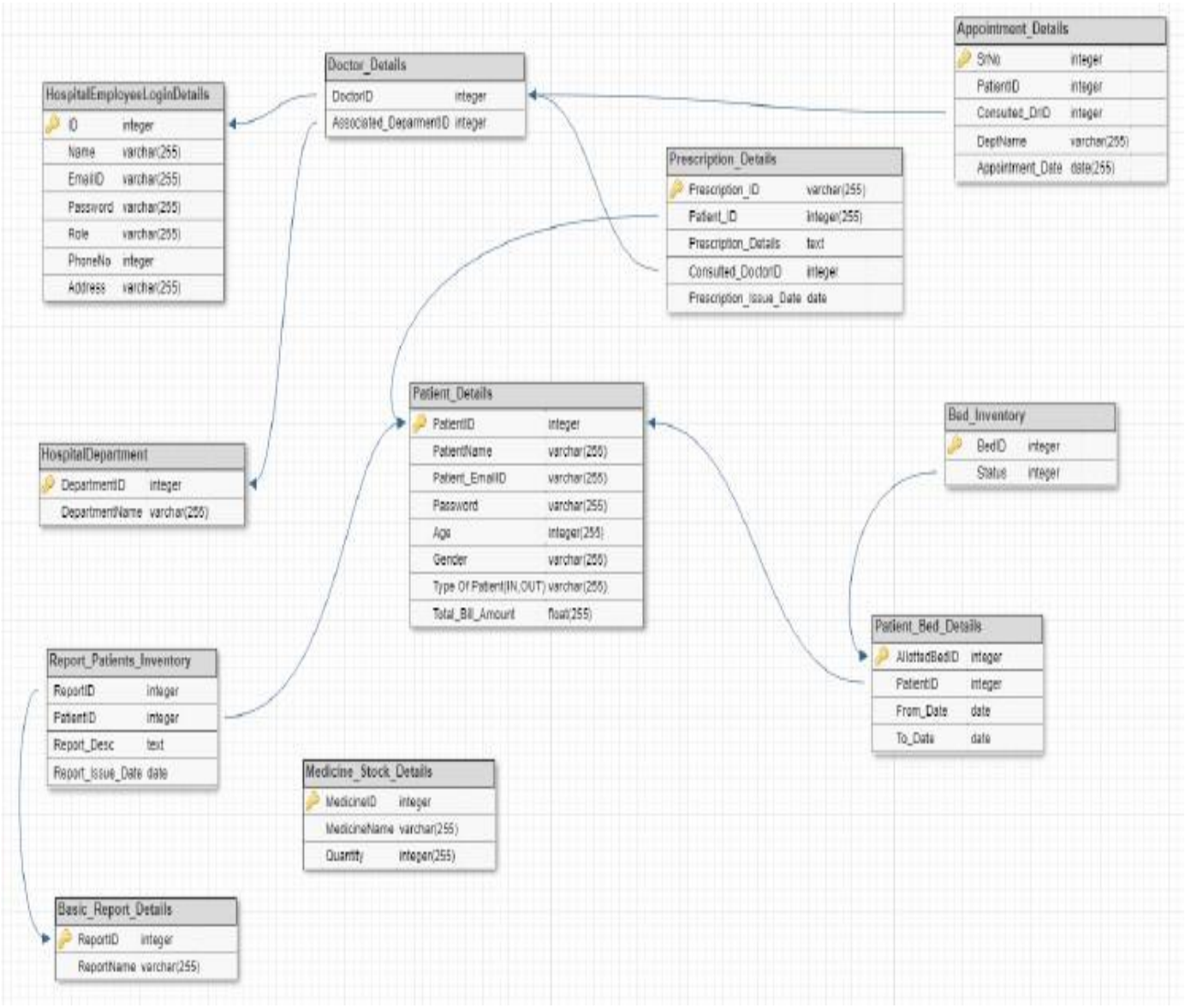

Doctor
Prescribe Medicine
Prescribe Test
View Medicine Availibility
Trace Medical History
View Test Report
Admit Patent
View Profile
Update Profile
Change Password
Logout/Exit


Lab-In charge
Generate new Report
Upload Test Report
View Profile
Update Profile
Change Password
Logout/Exit


Ward-In charge
Allocate bed
Update Bed status
View Profile
Update Profile
Change Password
Logout/Exit


Pharmacist
Provide Medicine
Update Medicine Stock
Add new Medicines
Generate Bill
View Profile
Update Profile
Change Password
Logout/Exit

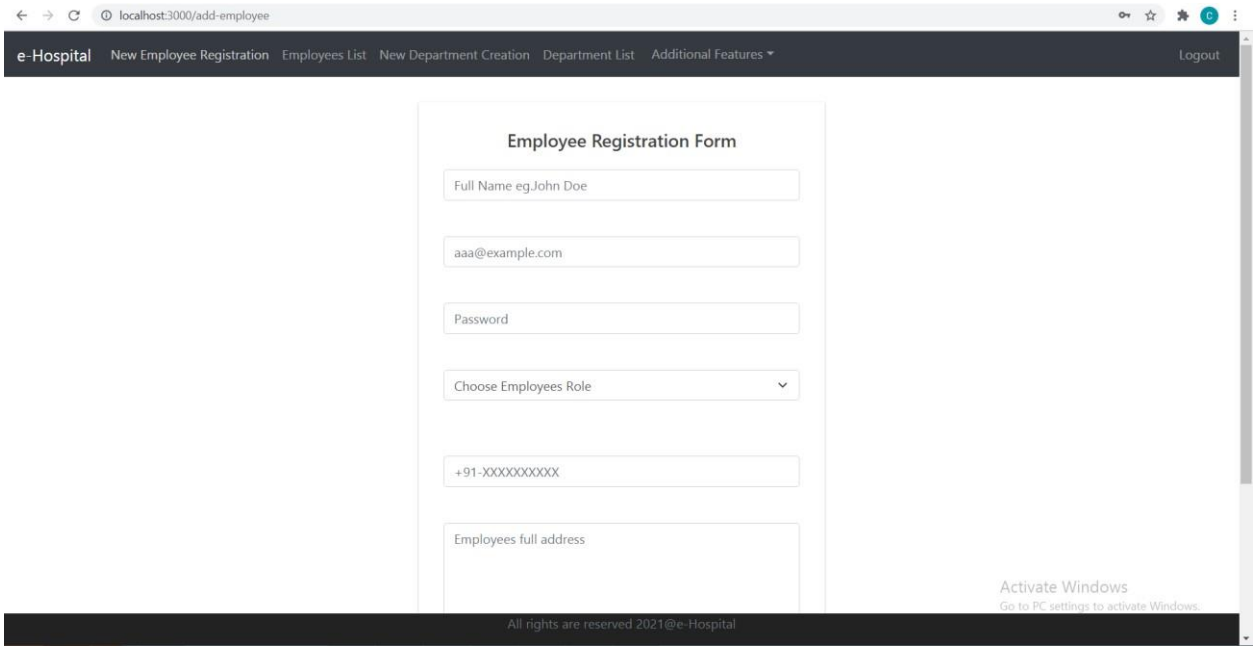
4.6 Database Diagram



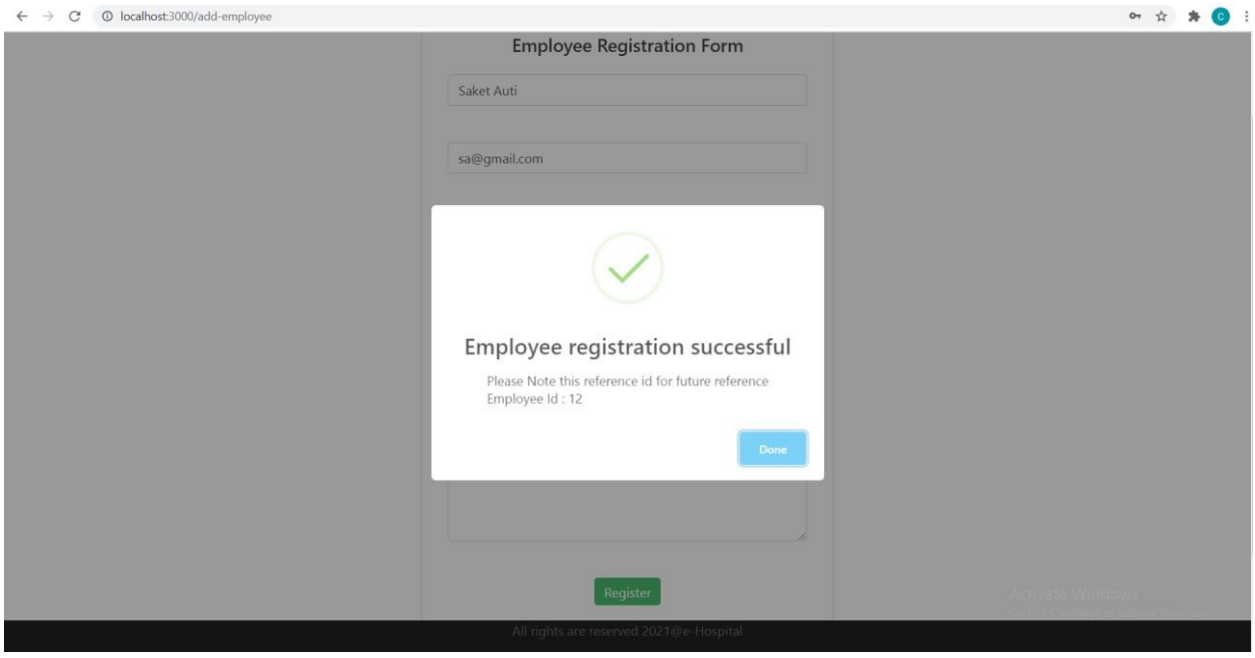
4.7 Home Page

4.8 Admin Role Landing Page

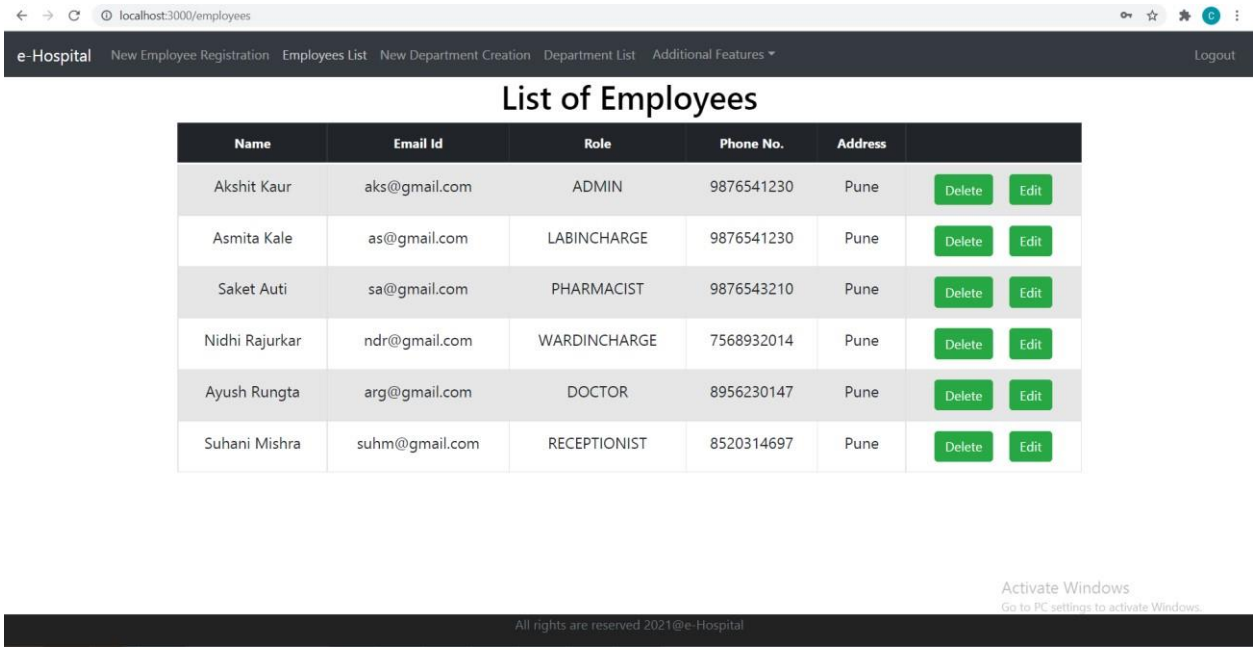
New Employee Registration



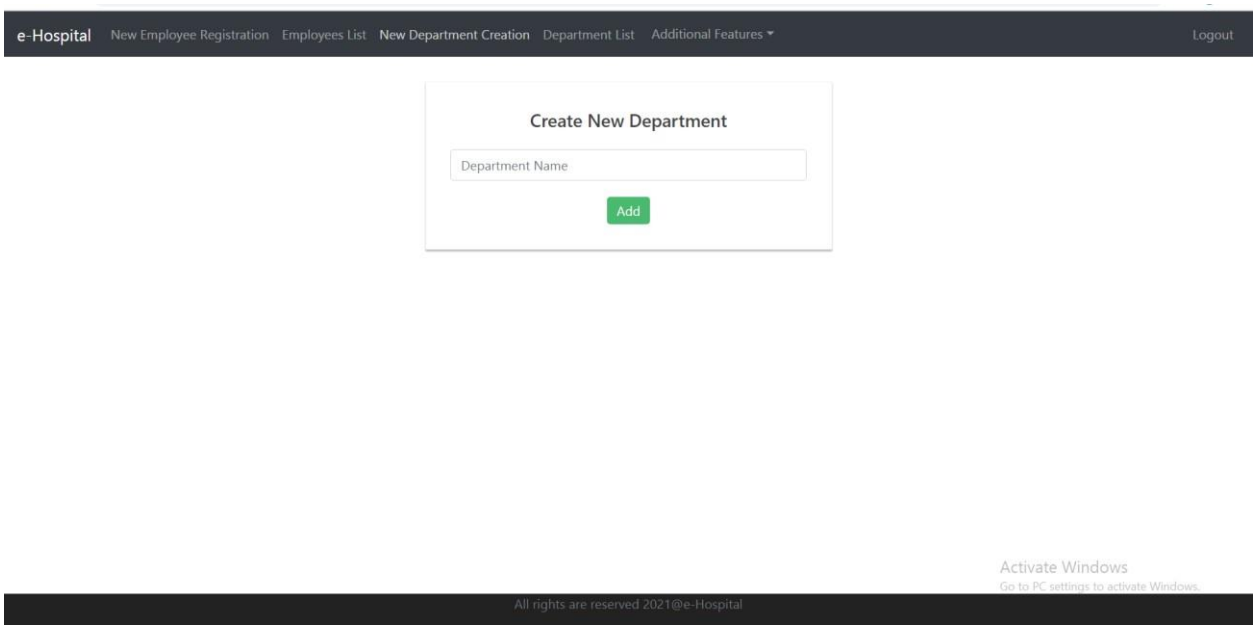
Registration Successful with employee Id:-



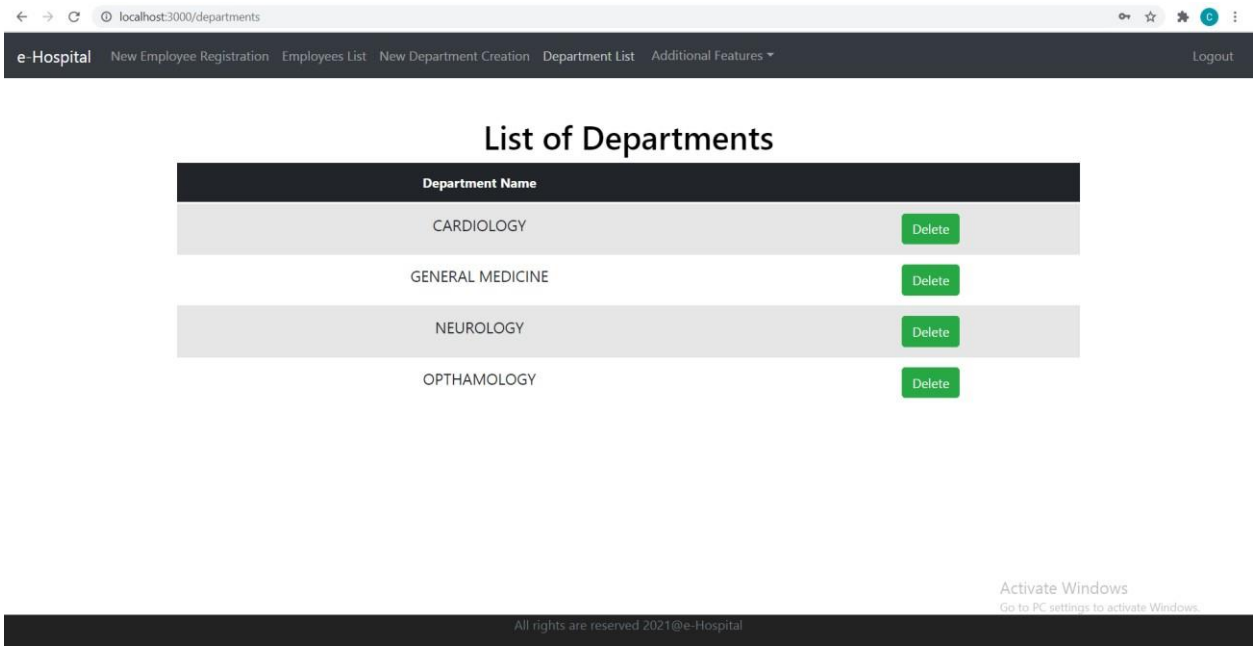
List of Employees



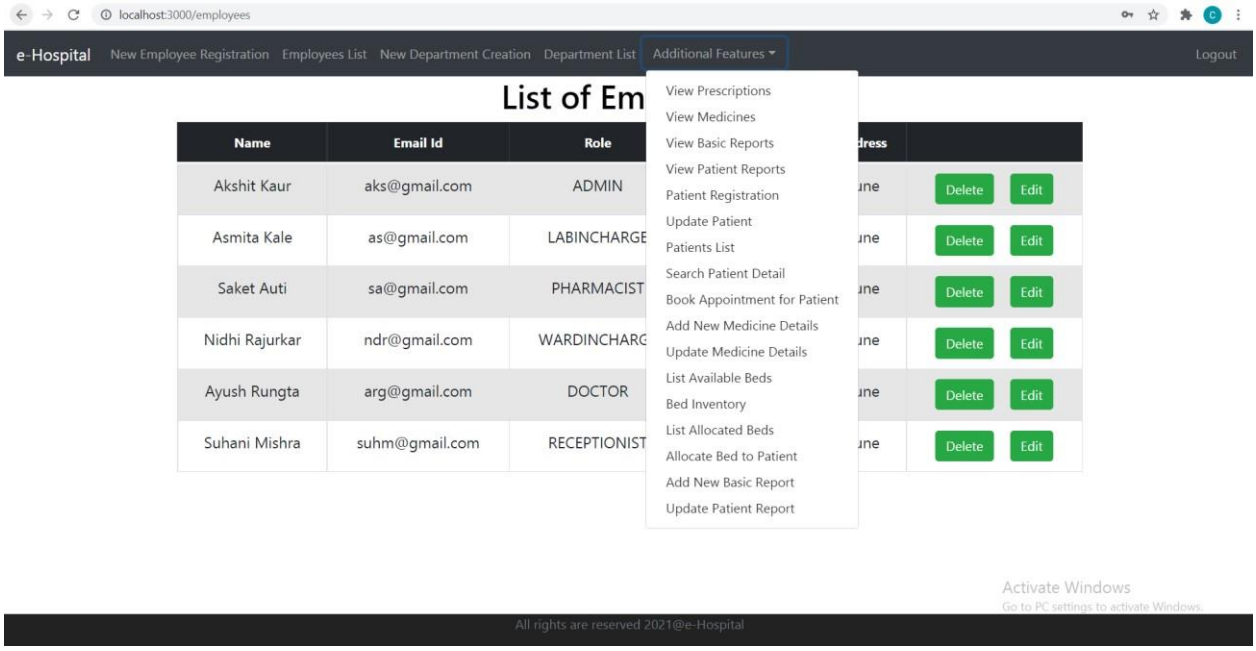
Create New Department



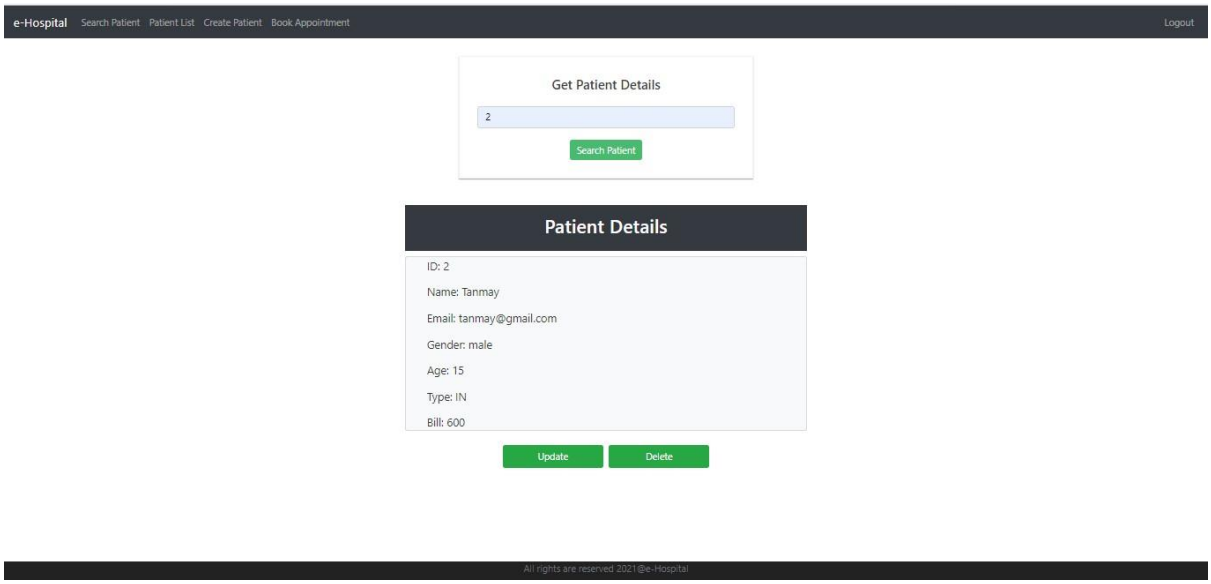
List Of All Departments



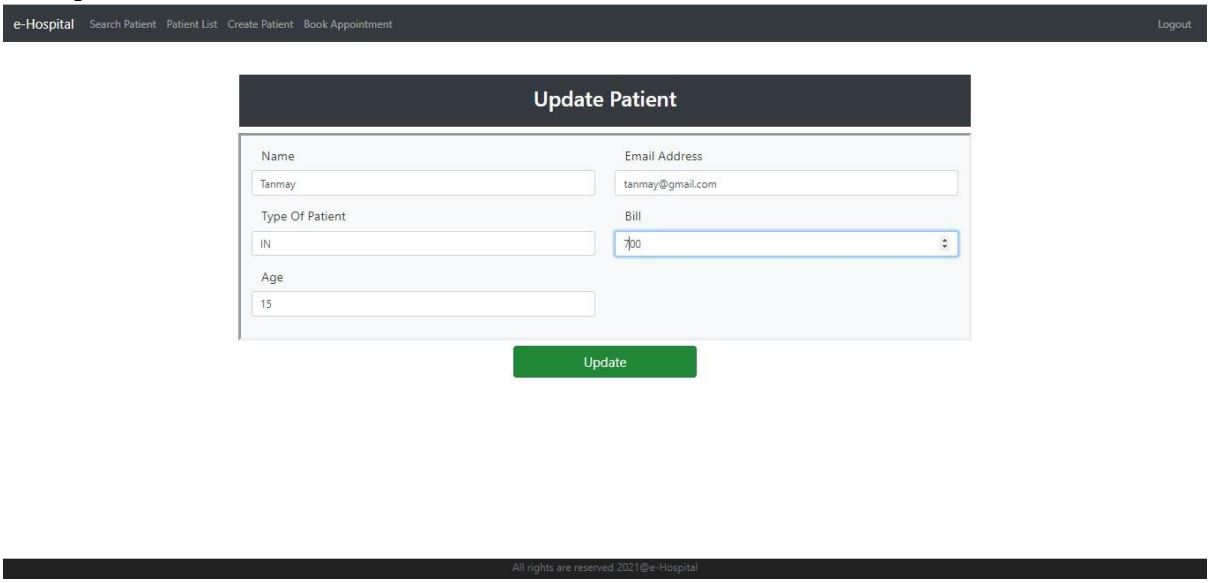
Additional Features : (Access to all functionalities of employees)

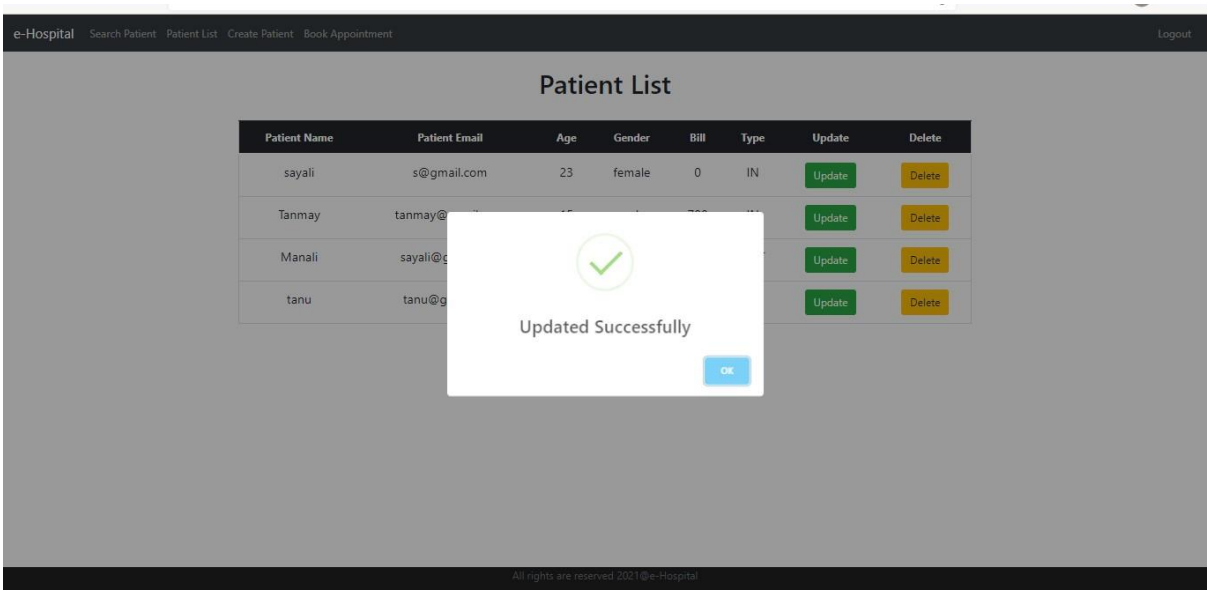


4.9 Receptionist Role

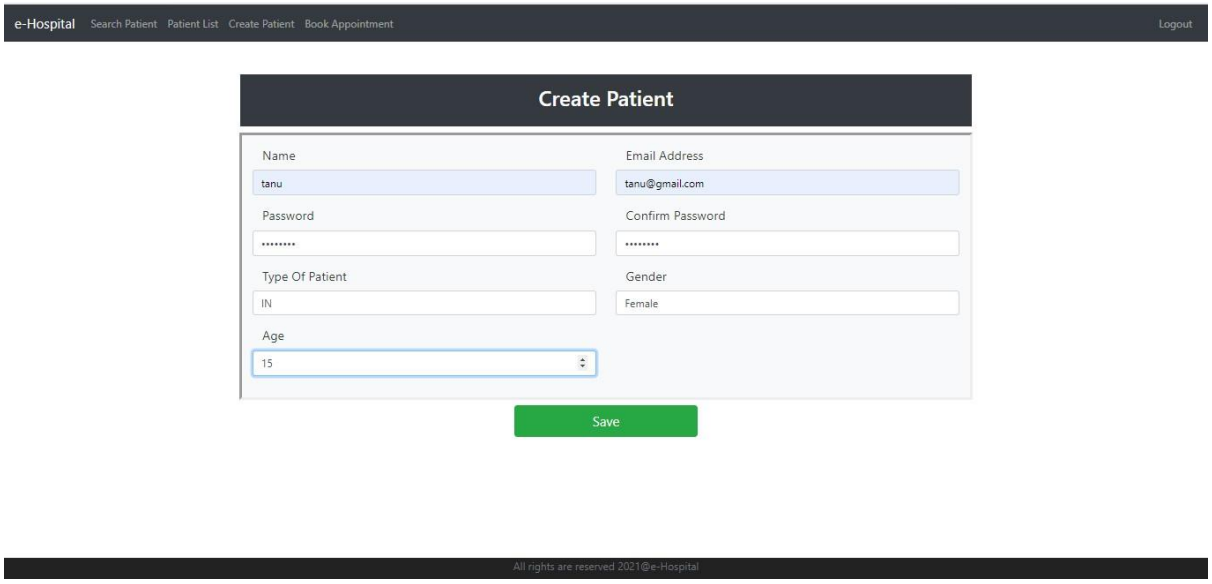


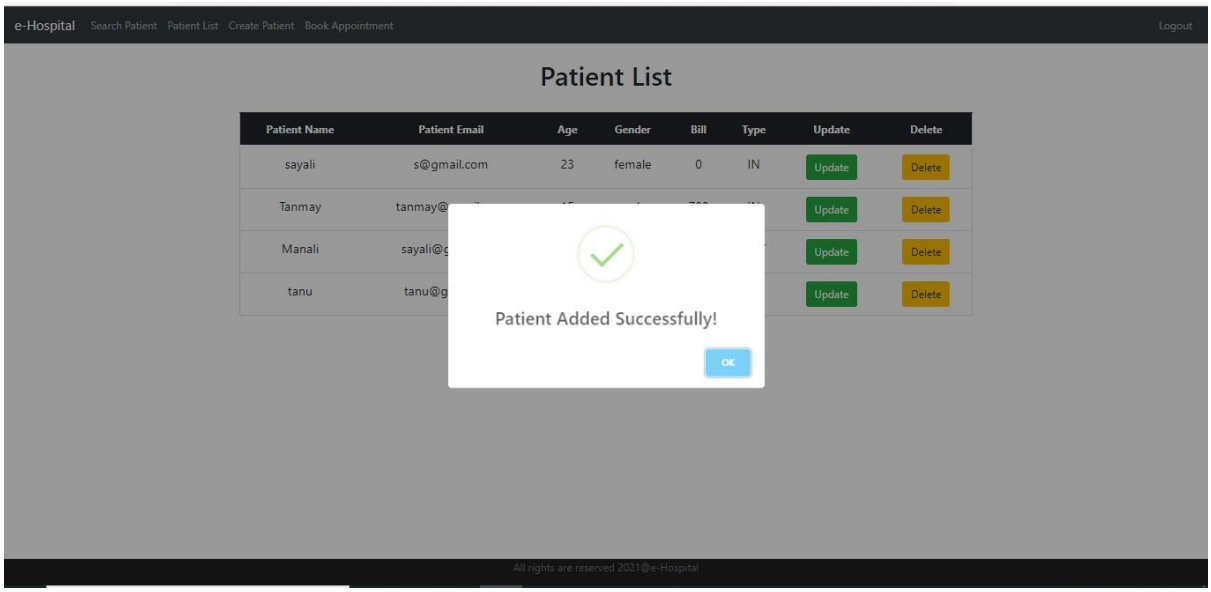
Update Patient



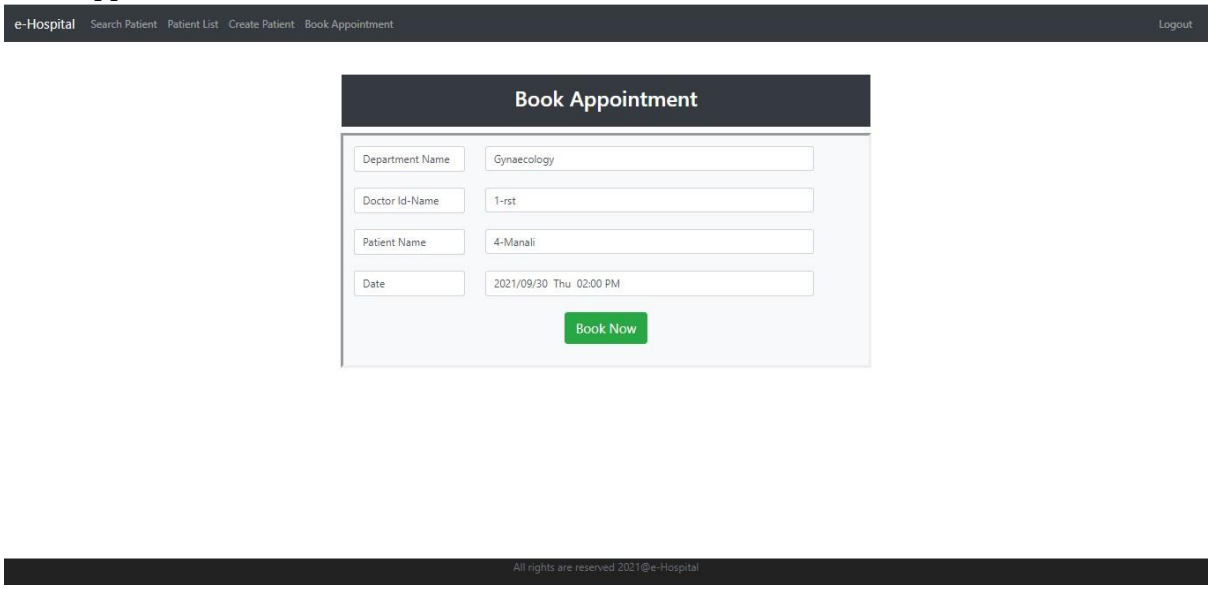


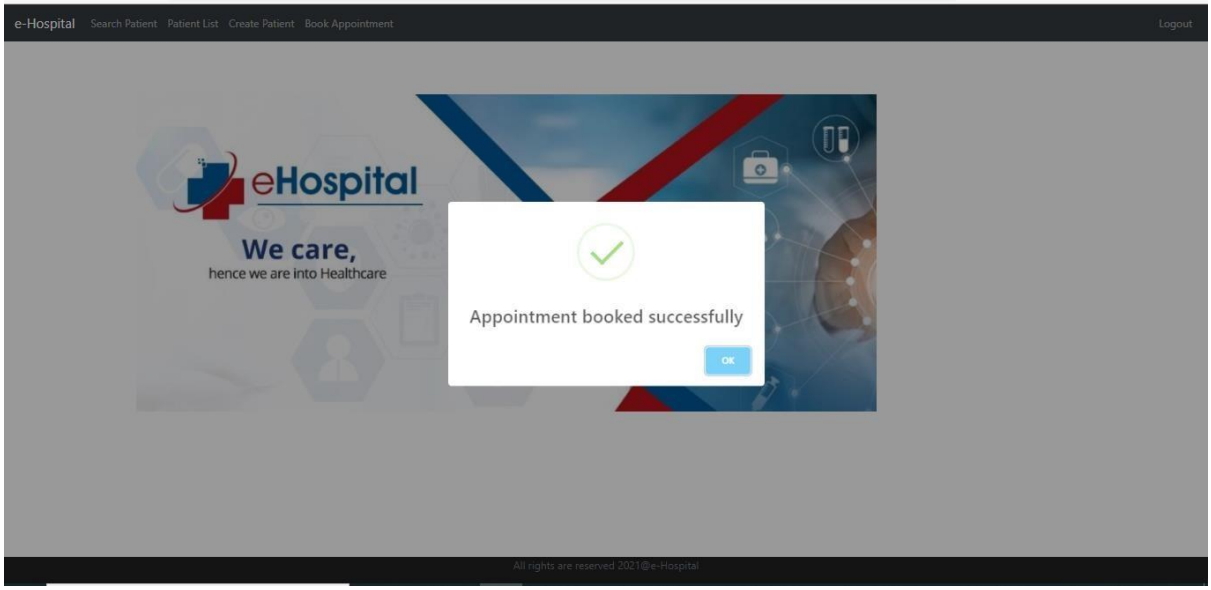
Create Patient





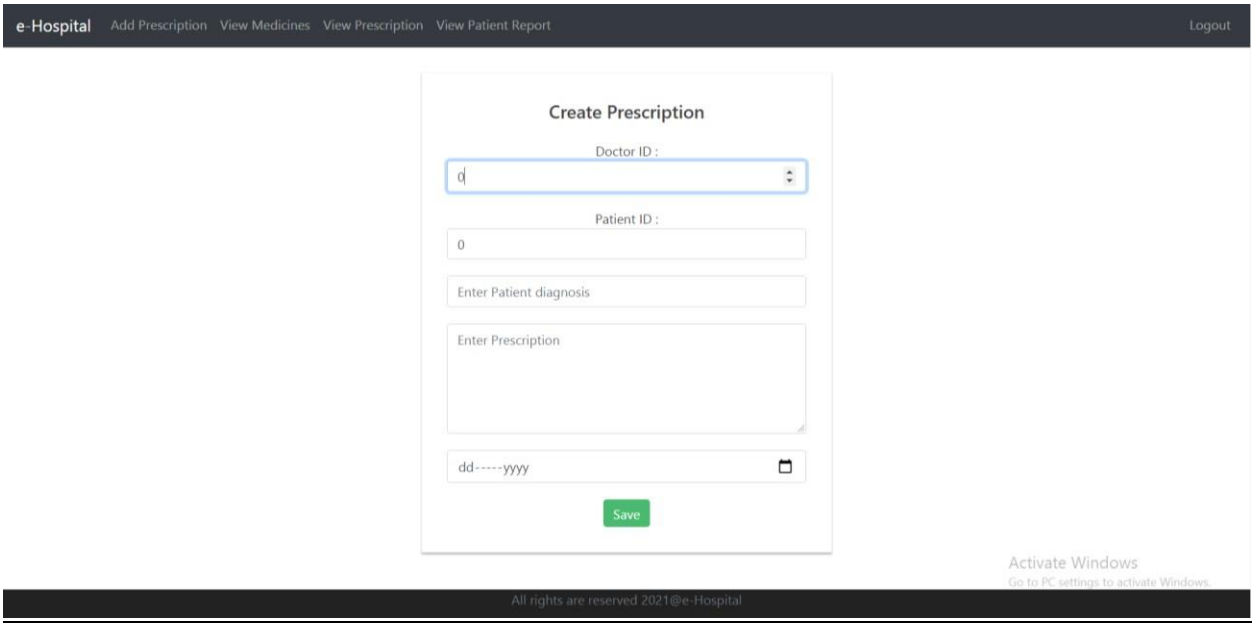
Book Appointment

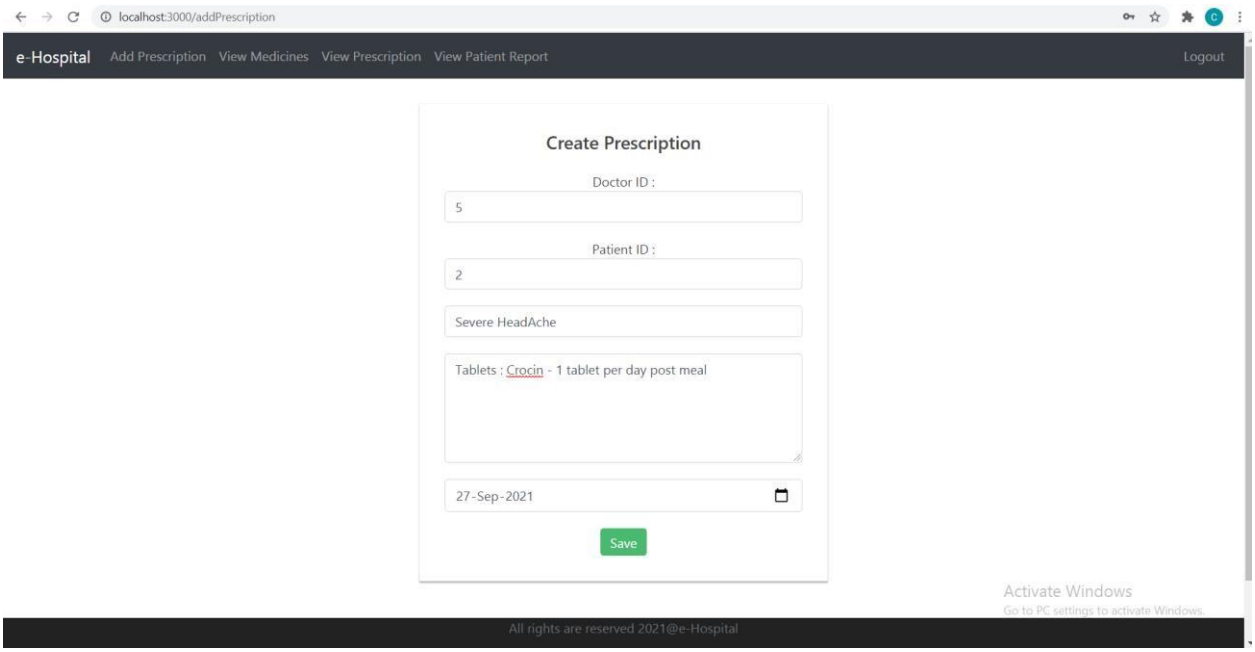


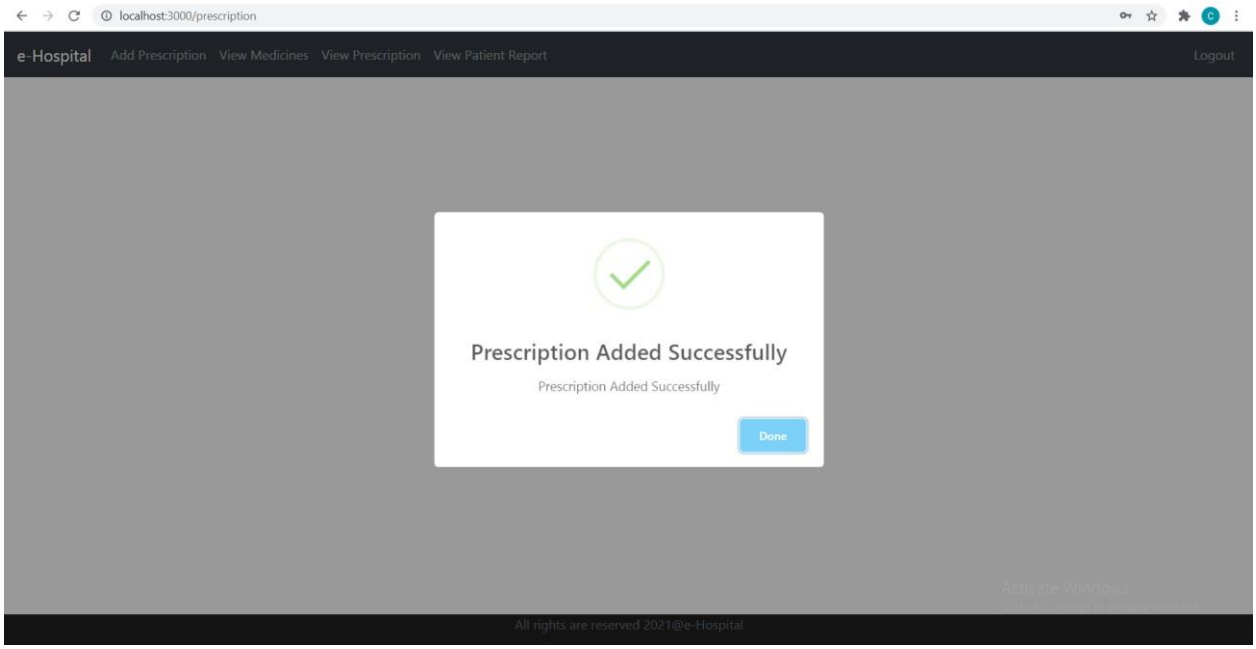


4.10 Doctor Role

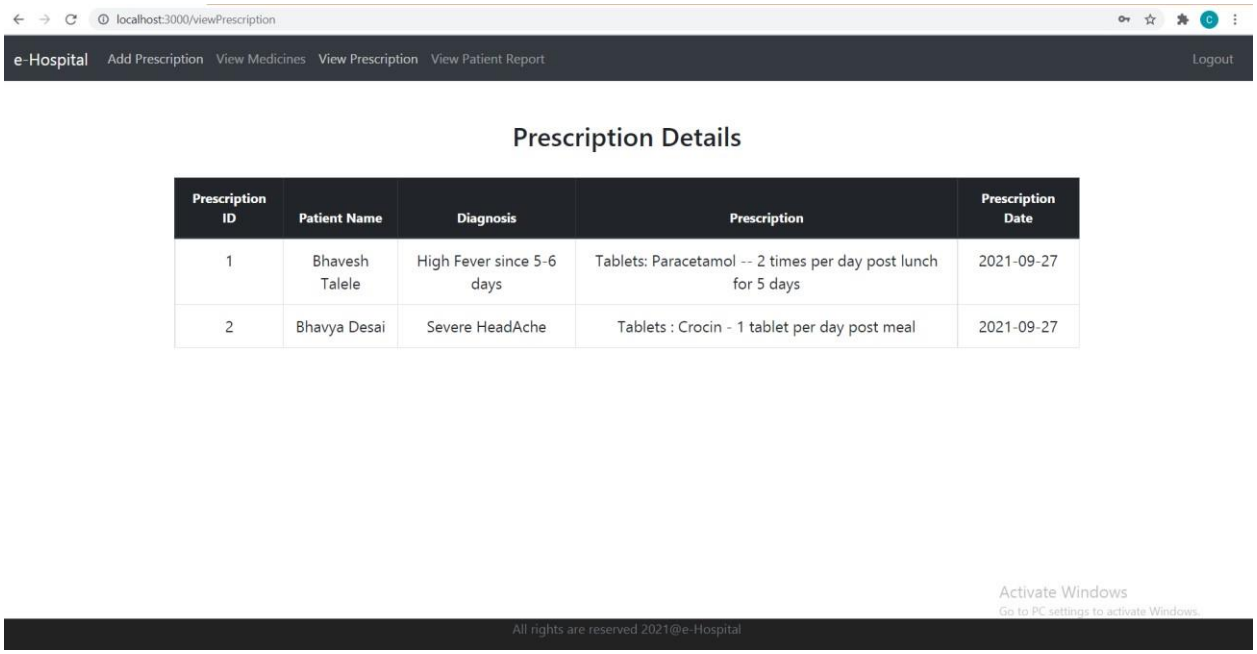
Create Prescription



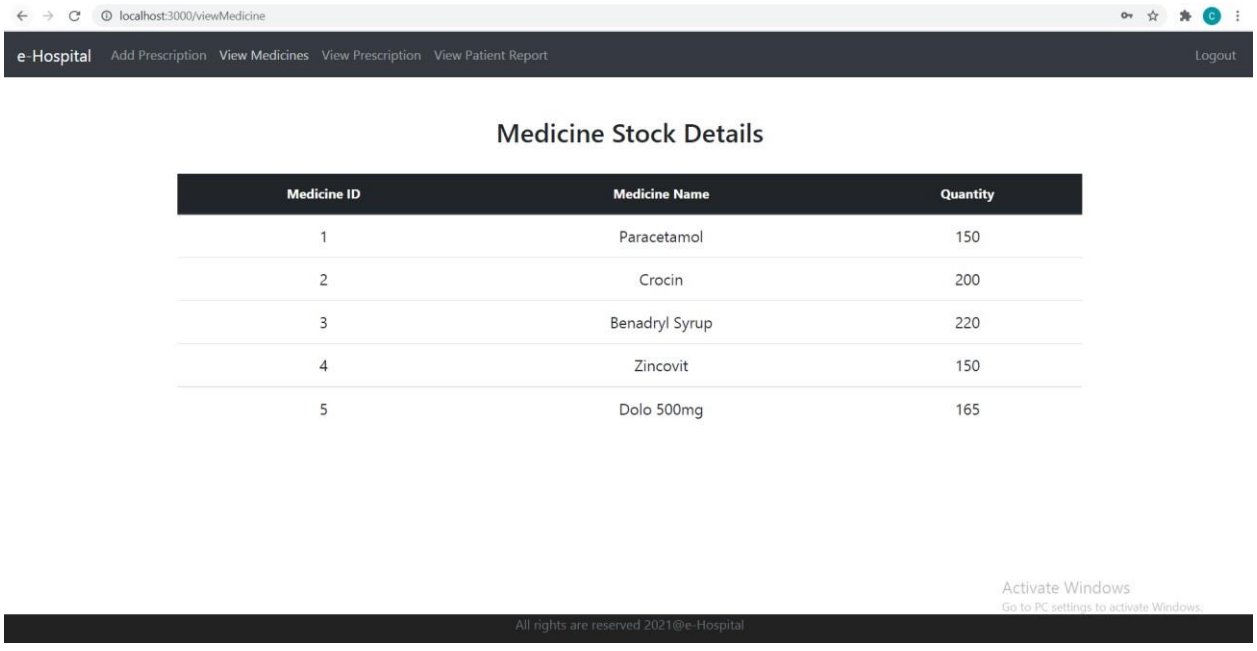

localhost:3000/addPrescription
e-Hospital
Add Prescription
View Medicines
View Prescription
View Patient Report
Logout
Create Prescription
Doctor ID :
5
Patient ID :
2
Severe HeadAche
Tablets : Crocin - 1 tablet per day post meal
27-Sep-2021
Save
Activate Windows
Go to PC settings to activate Windows.
All rights are reserved 2021@e-Hospital


localhost:3000/prescription
e-Hospital
Add Prescription
View Medicines
View Prescription
View Patient Report
Logout
Prescription Added Successfully
Prescription Added Successfully
Done
All rights are reserved 2021@e-Hospital

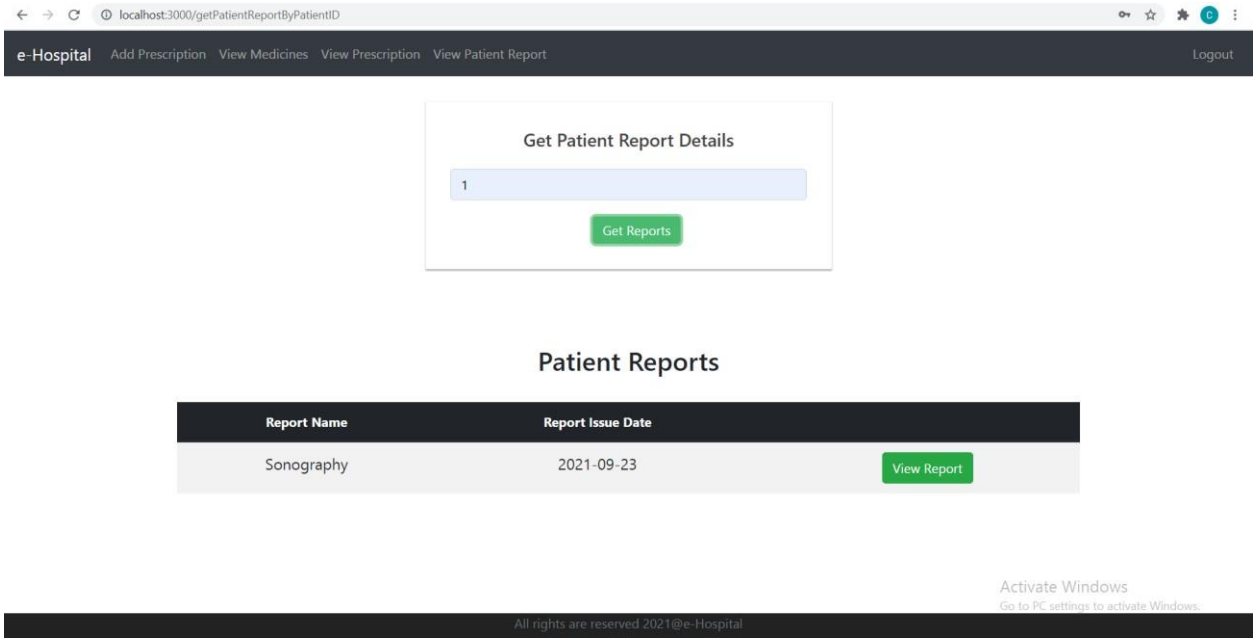
View Prescriptions



View Medicine Stock

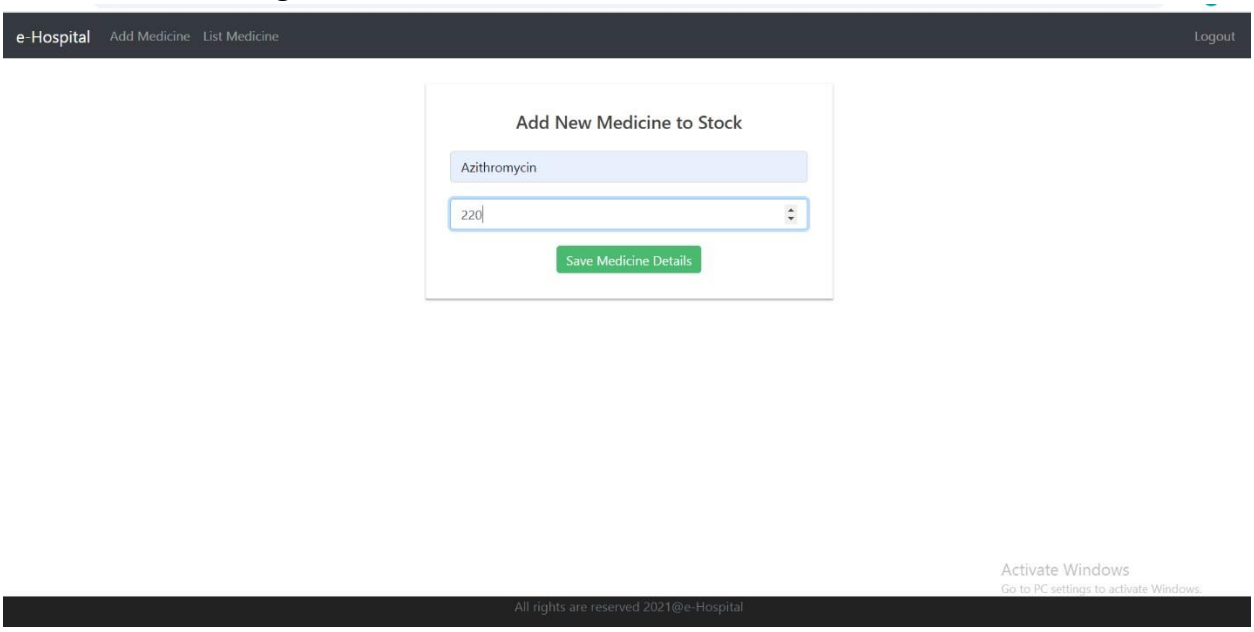


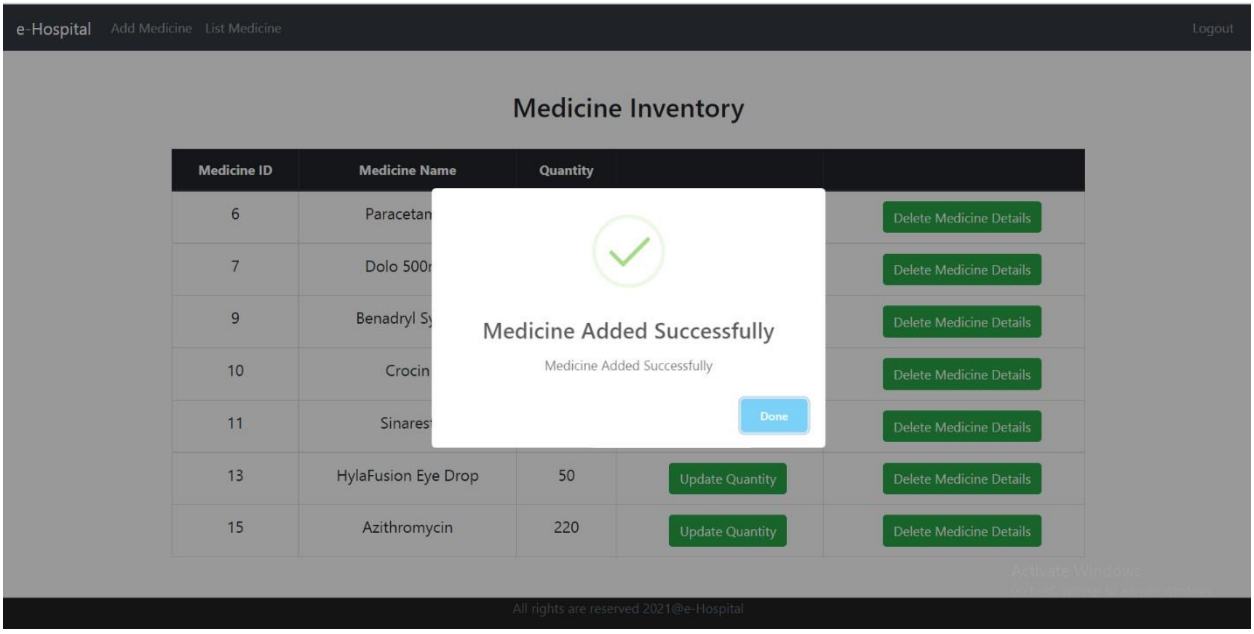
Get Patient Report



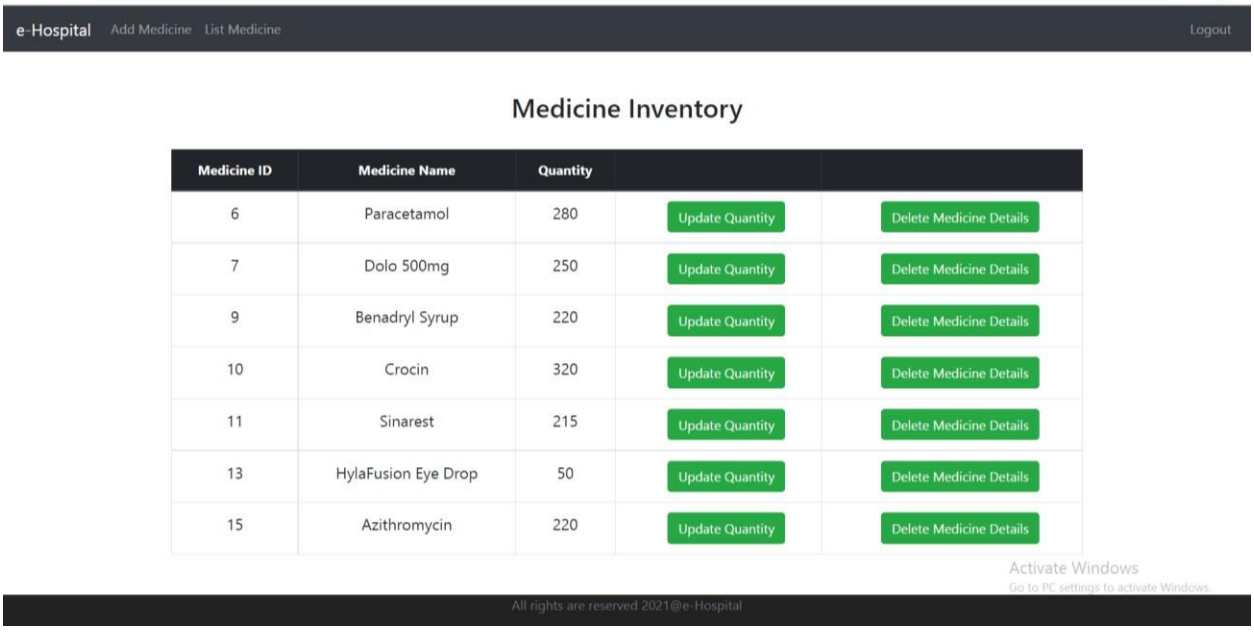
4.11 Pharmacist Role

Add Medicine Page

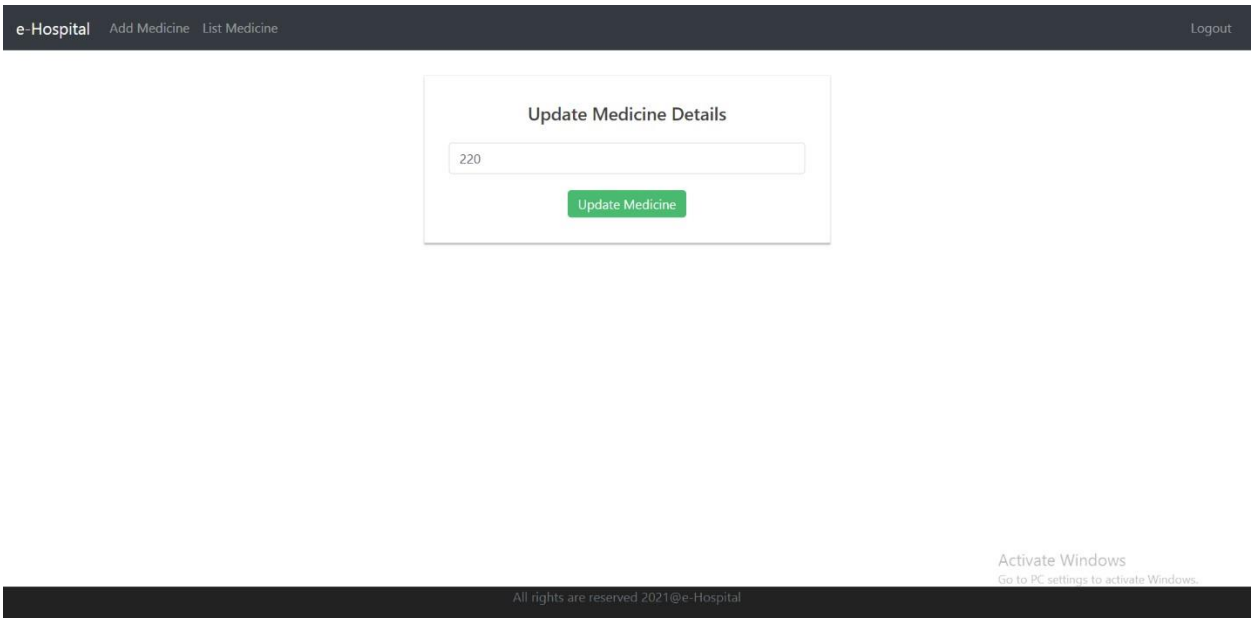




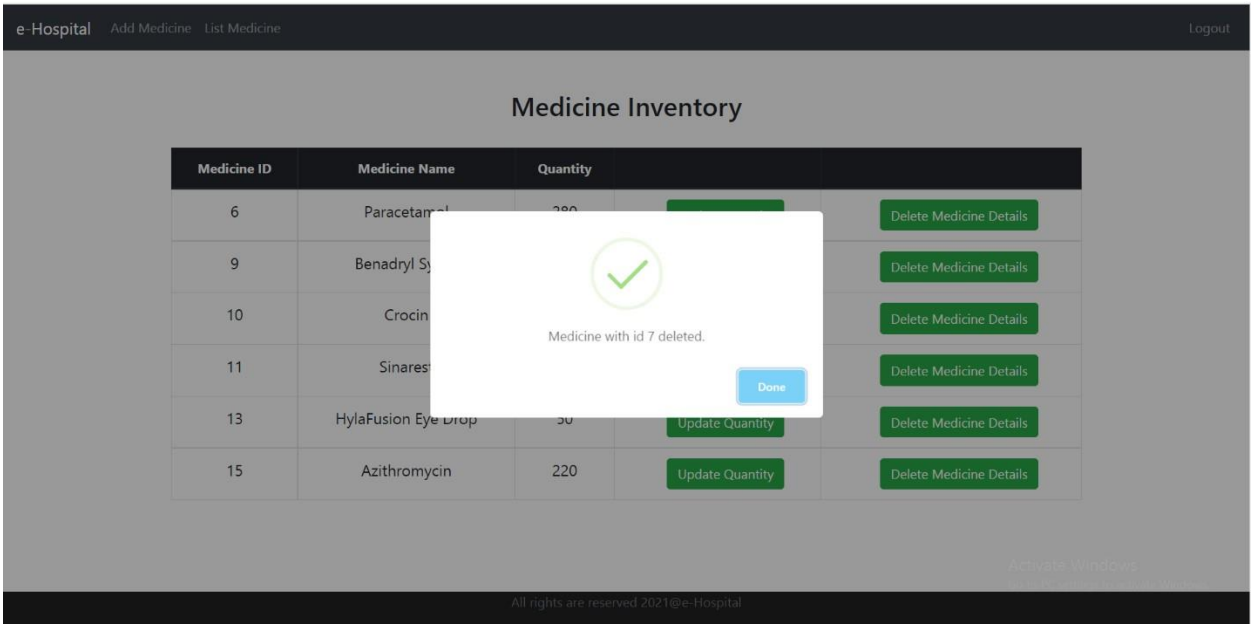
List Medicine



Update Medicine Page

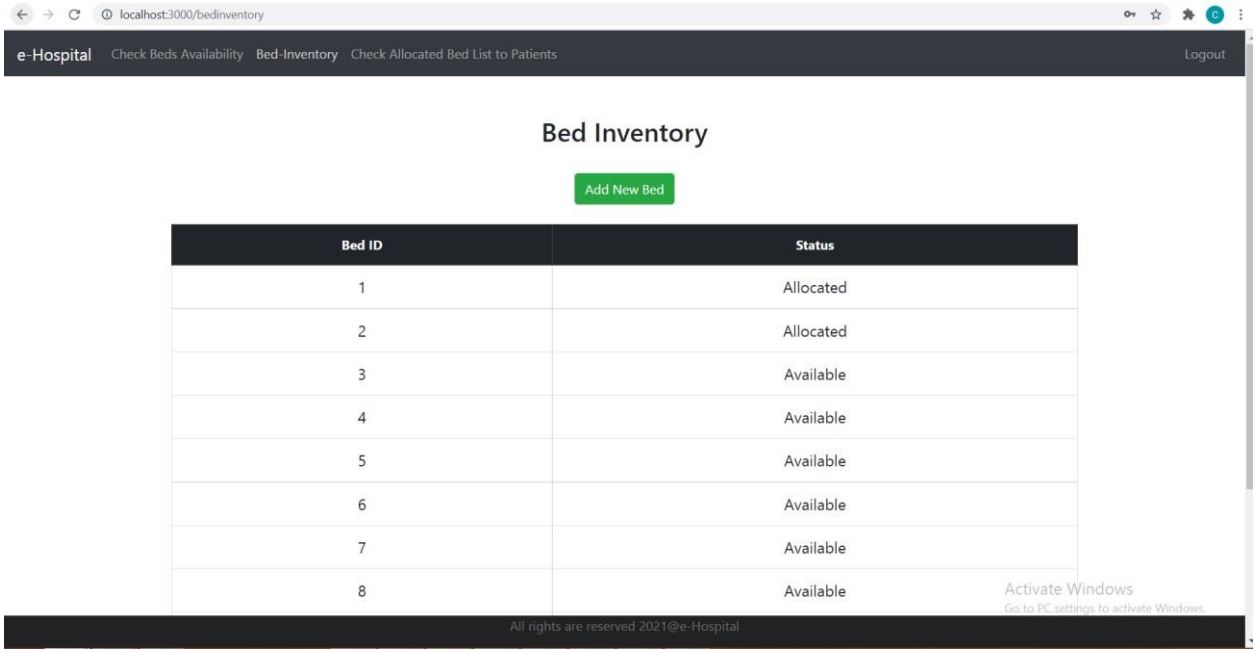


Delete Medicine

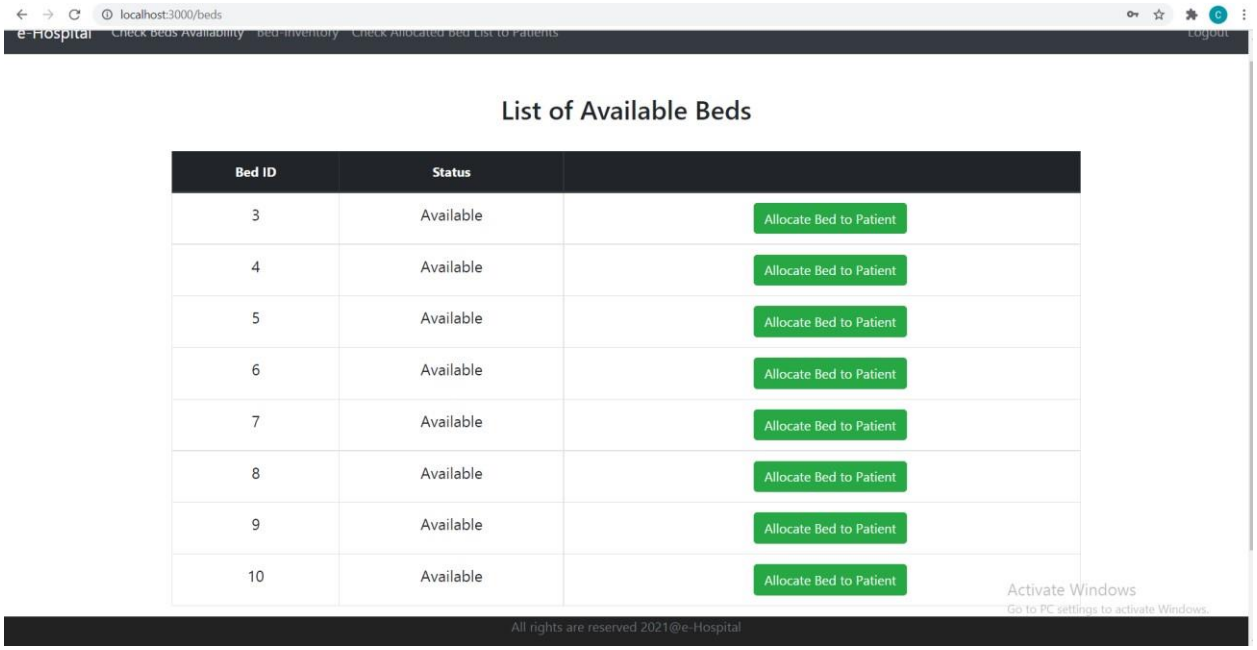


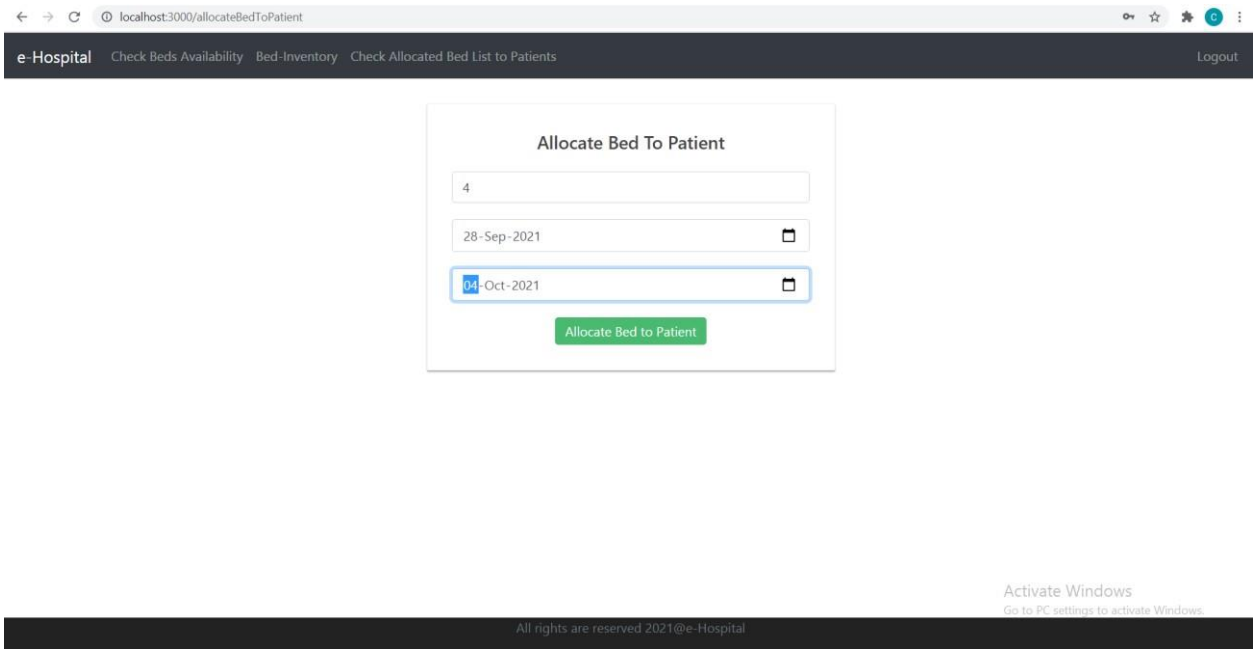
4.12 Ward Incharge Role:

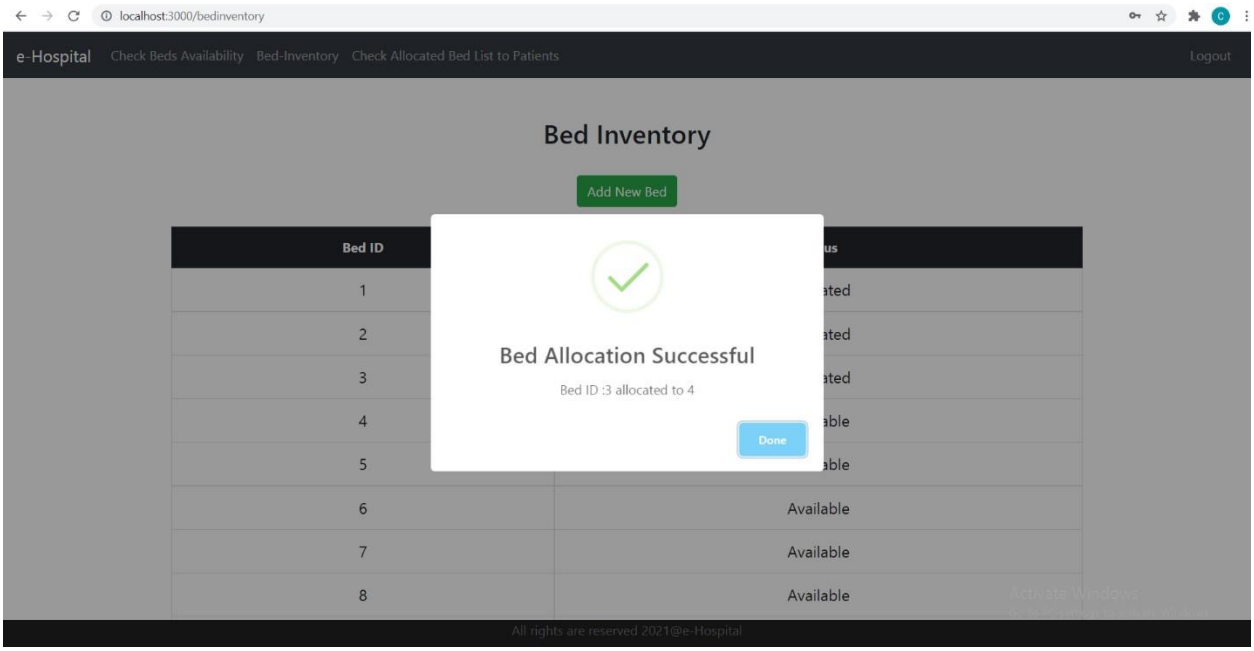
Check Bed Statue:



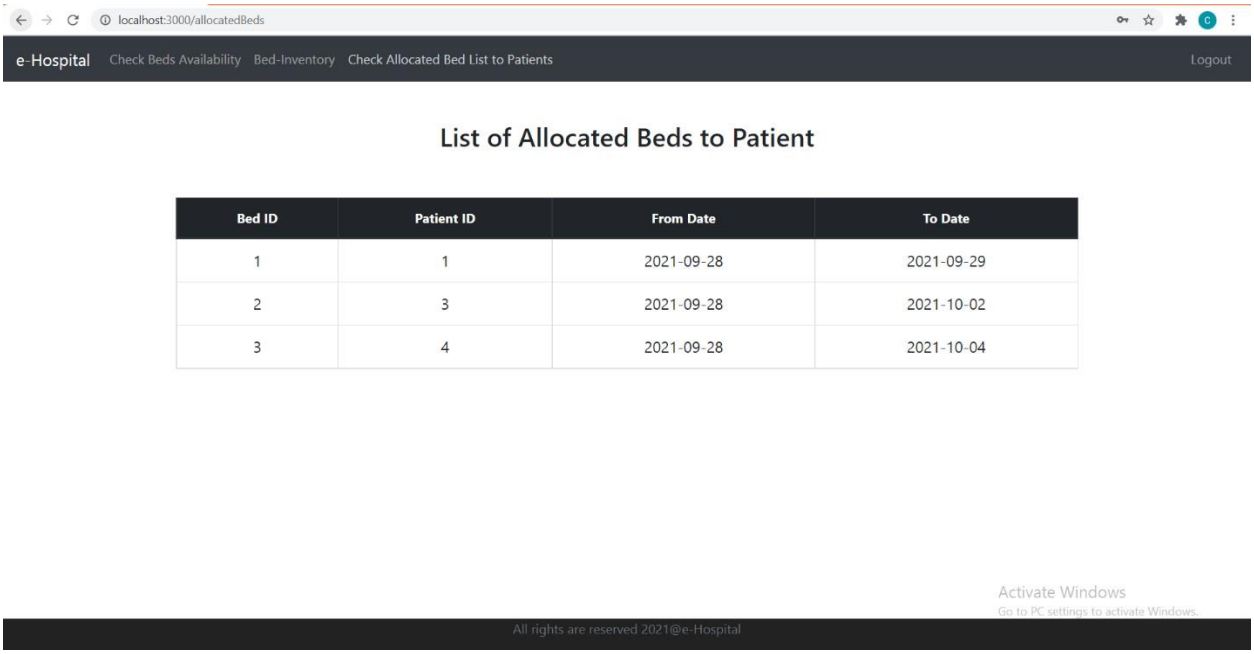
Allocate Bed





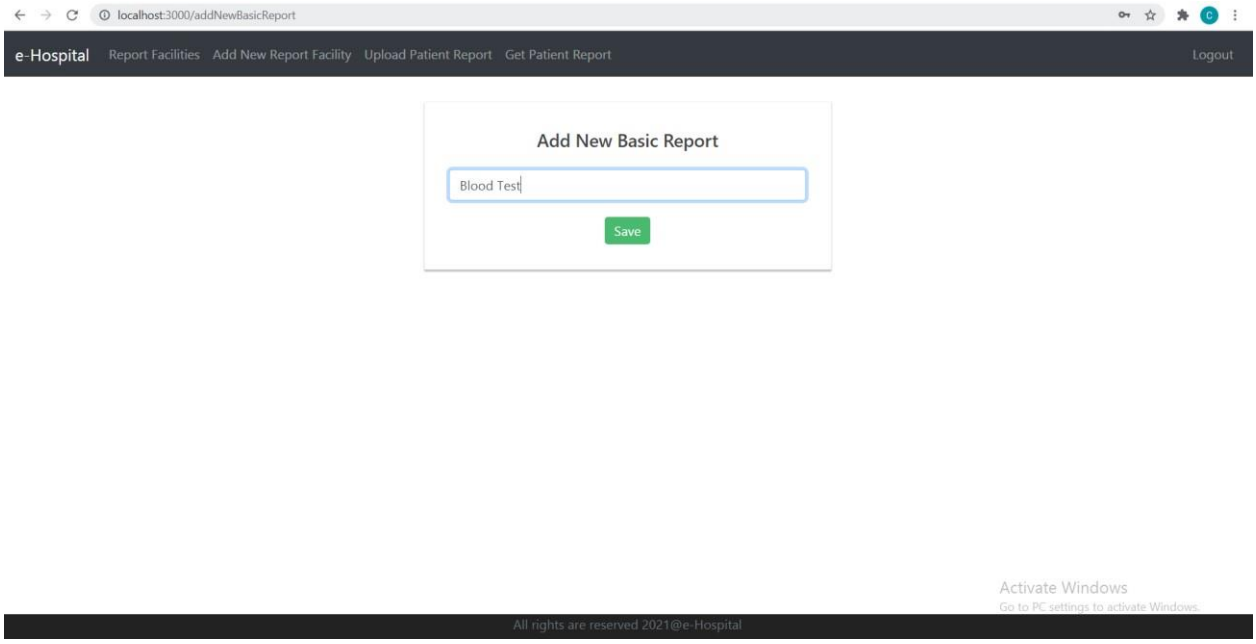


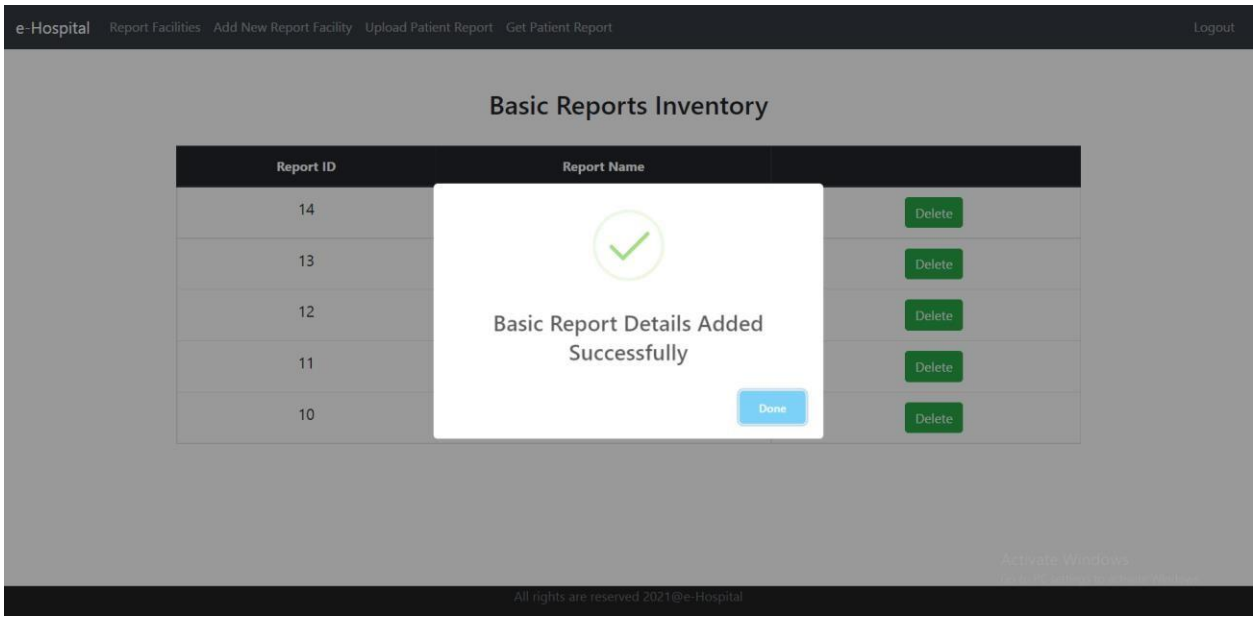
Allocated Bed Status:

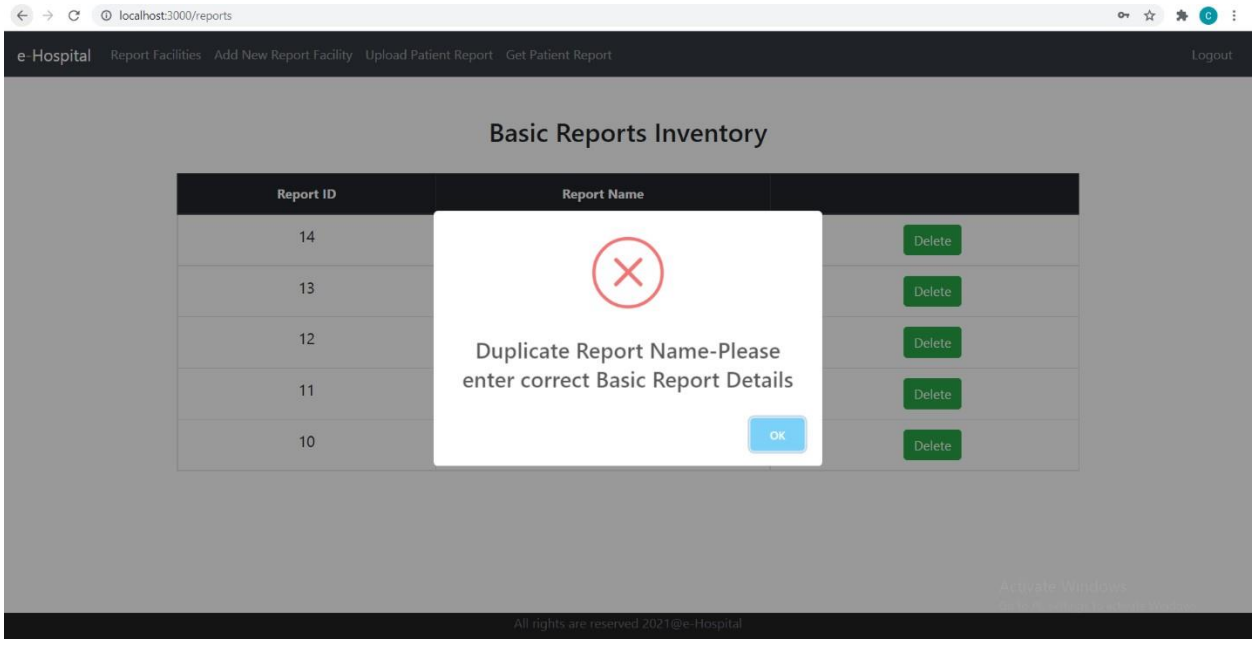


4.13 Lab Incharge Role:

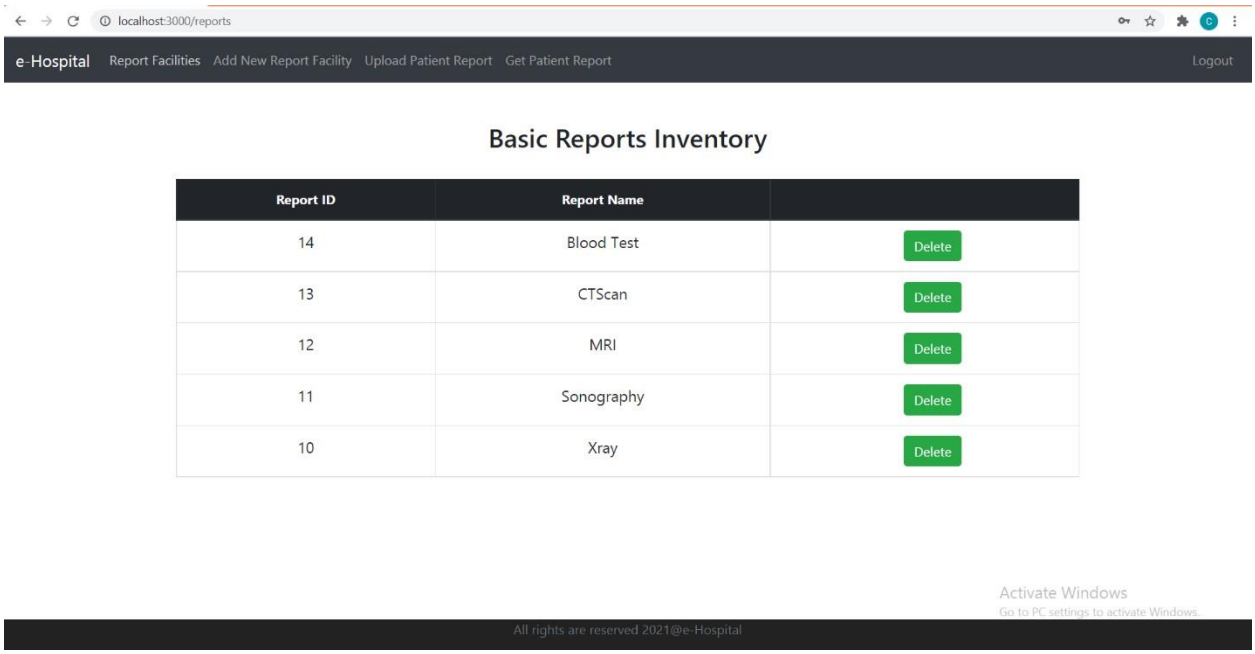
Add New Basic Report



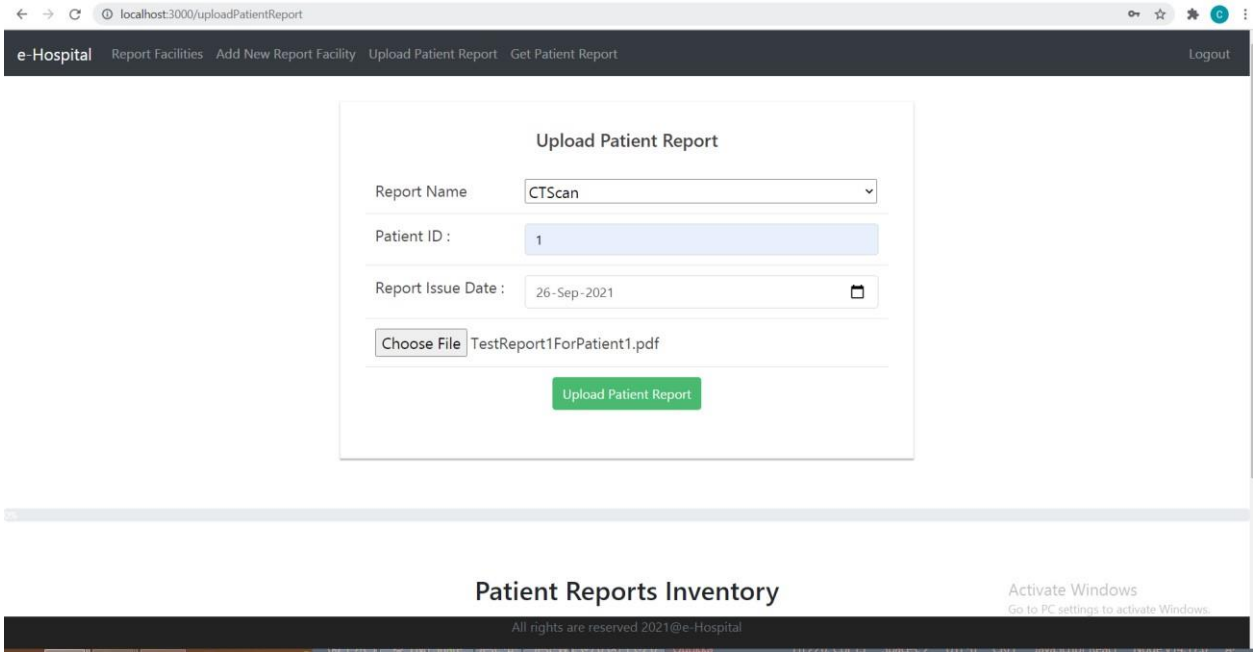




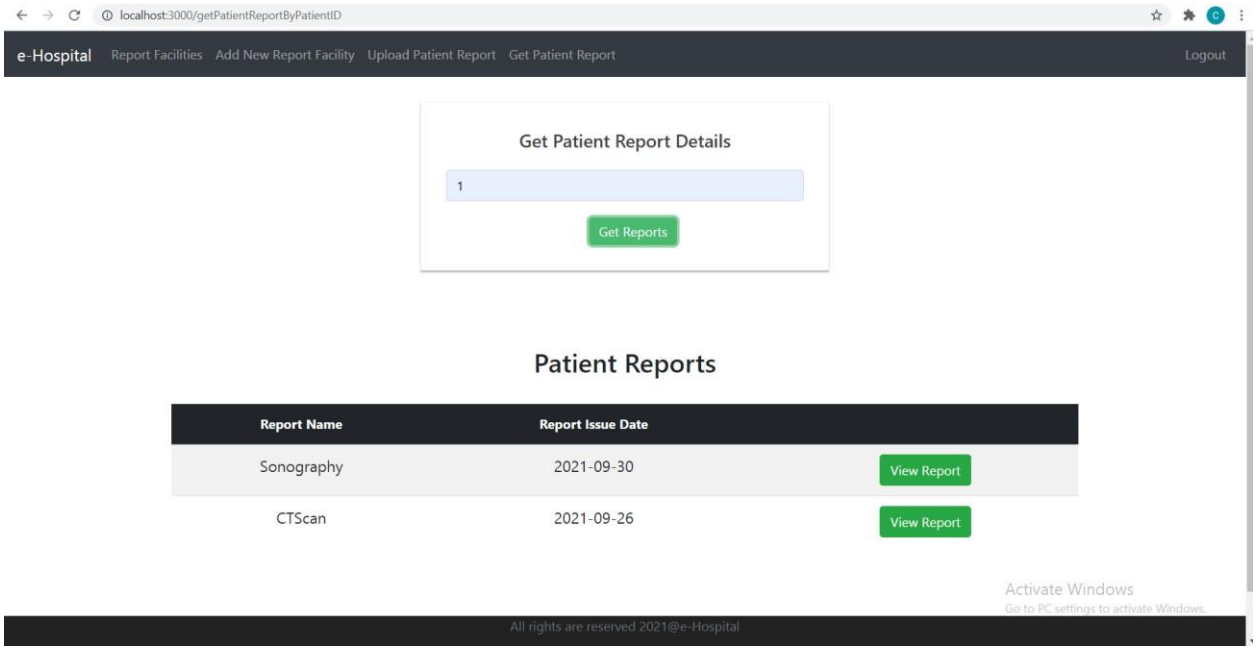
List of Basic Reports



Update Patient Report

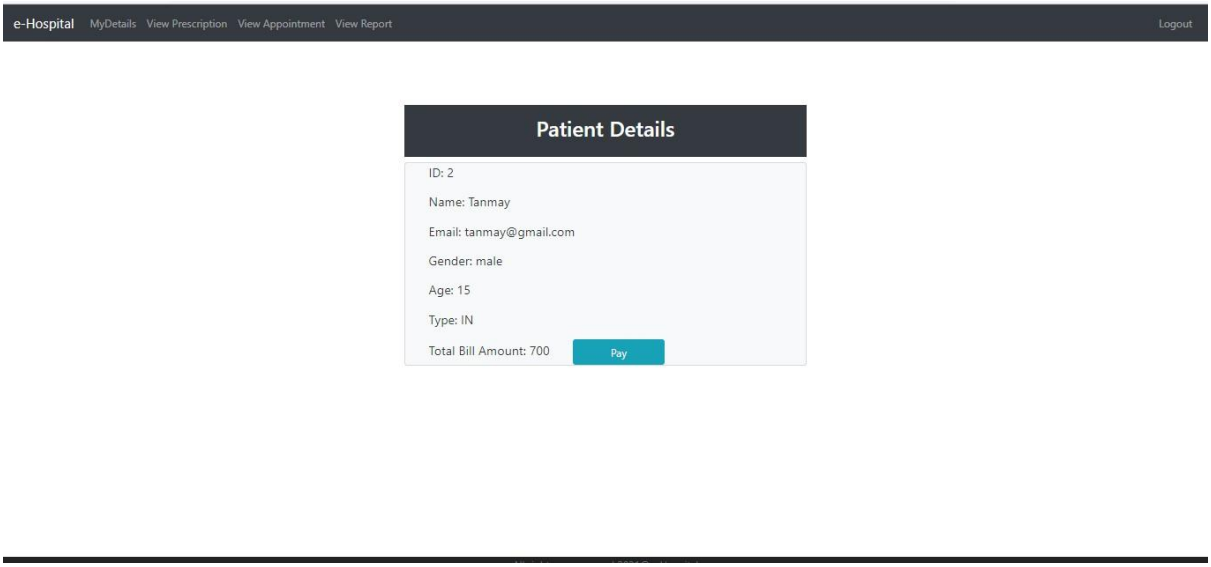


Search Patient Report

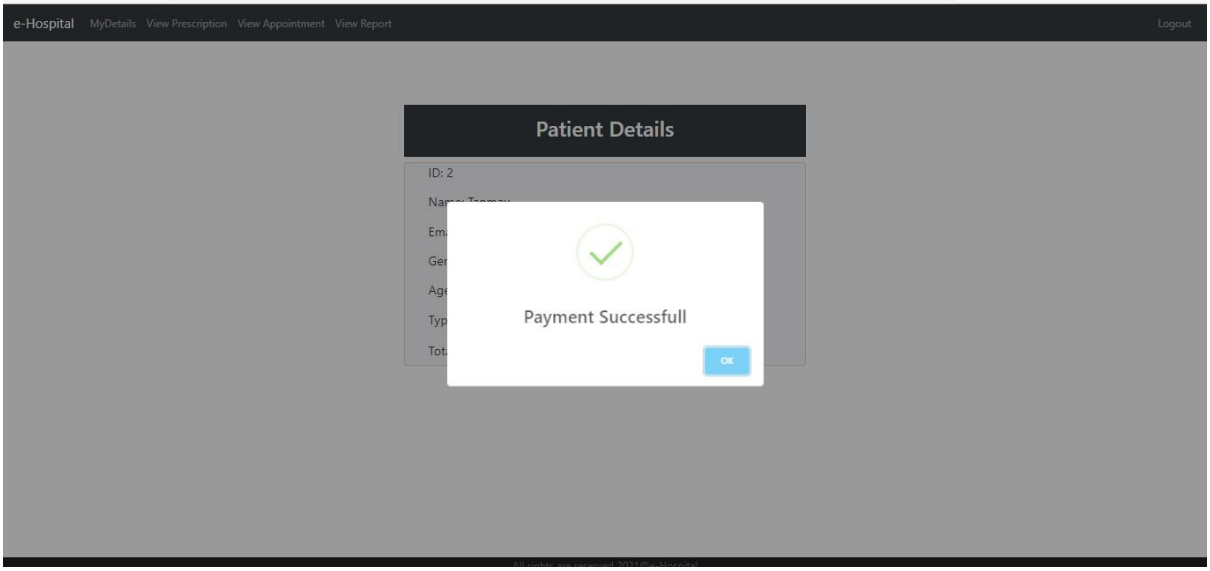


4.14 Patient Login

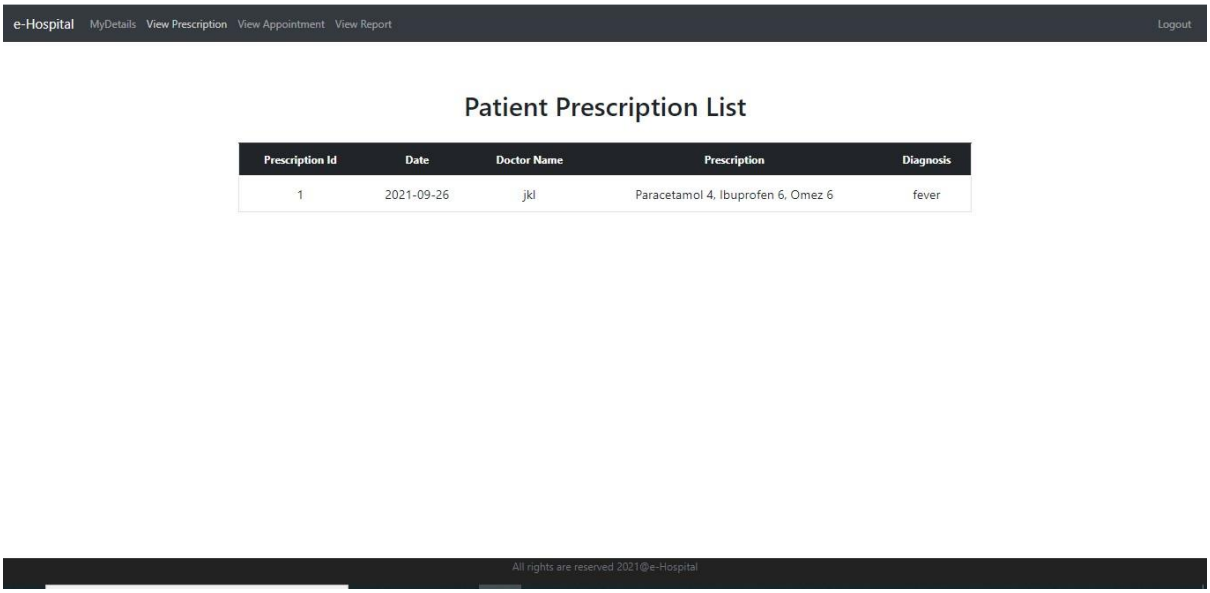
Profile Details



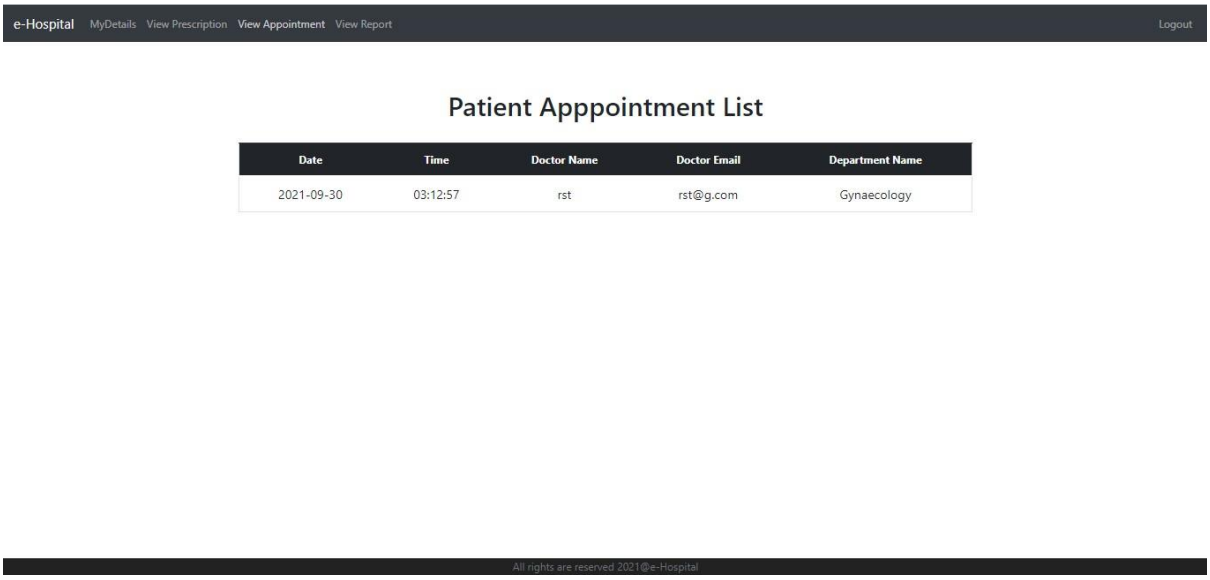
Payment Successful



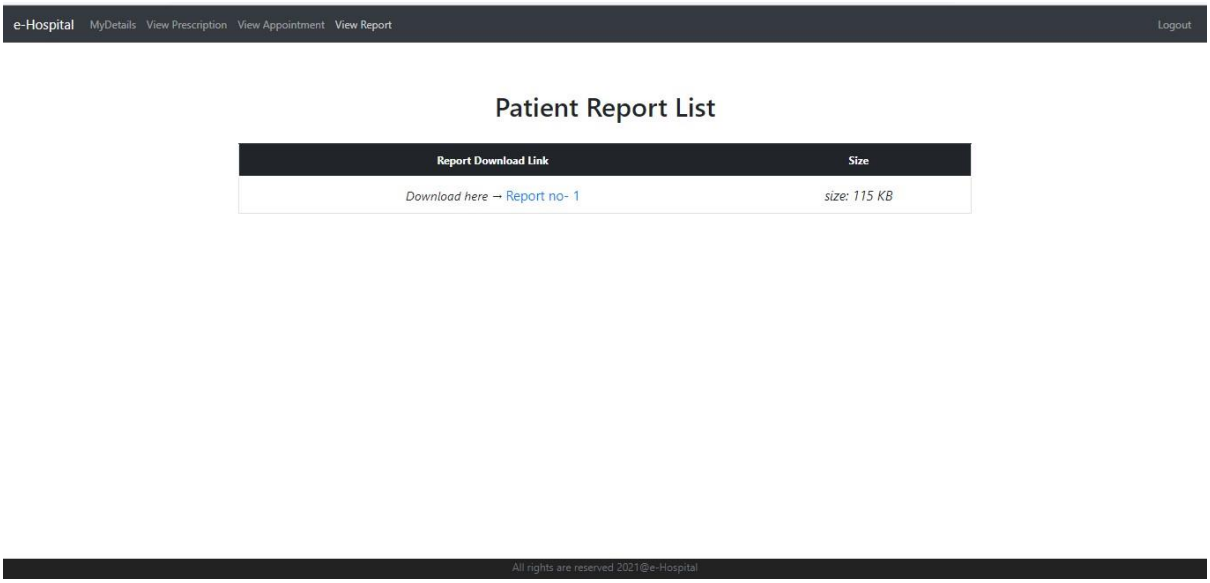
Prescription History of Patient



Appointment History



Patient Report



CHAPTER-5

5.Testing:

The report of the testing is given here under.

Test Cases

Sr. No	Test Case Title	Description	Expected Outcome	Error Message	Result
1.	Home Page	Hospital employee or patient should see login page when he will enter email and password.	After signing in user to be directed to home page of their respective role	Invalid Login	Passed
2.	Admin Login Landing Page	Admin should be able to create or delete new or old departments. And should be able to edit, add or delete the existing or new employee details.	After committing changes to the database, an alert should pop up with a respective message.	No error	Passed
3.	New Employee Registration	Admin should be able to register a new employee	Employee registered successfully	Invalid Input	Passed
4.	New Department Creation	Admin should be able to Create a new Department in the Hospital	New Department Created successfully	Invalid Input	Passed
5.	List Of All Departments	Admin should be able to view the list of all departments	list of all registered departments in the Hospital	No error	Passed
6.	Receptionist Login	Receptionist should be able to fetch the Patient data. As well	After committing changes to the database, an alert	No error	Passed

	Landing Page	as being able to create appointments for new patients and edit or add new or existing patient data.	should pop up with a respective message.		
7.	Create Patient	Receptionist should be able to register a new patient	Patient added successfully	Invalid Input	Passed
8.	Update Patient	Receptionist should be able to update the details of the registered patients	Updated successfully	Invalid Input	Passed
9.	Book Appointment	Receptionist should be able to book an appointment for the patient	Appointment booked successfully	Invalid Input	Passed
10.	Doctor Role Landing Page	Doctors should be able to fetch Patient reports and Medicine sock details. And also they can create and view prescriptions for any patient.	After committing changes to the database, an alert should pop up with a respective message.	No error	Passed
11.	Create Prescription	Doctor should be able to add a prescription to a registered patient of the hospital	Prescription added successfully	Invalid Input	Passed
12.	Get Patient Report	Doctor can view the report of a patient	Report List of the patient	Empty list	Passed
13.	Pharmacist Role Landing Page	Pharmacists should be able to add, view and delete the medicines list in the medicine stock database. And they can also edit any medicine details.	After committing changes to the database, an alert should pop up with a respective message.	No error	Passed
14.	Add Medicine Page	Pharmacist can add any new medicine to the hospital stock	Medicine added successfully	Invalid Input	Passed

15.	Update Medicine Page	Pharmacist can update the medicine stocks	Medicine updated successfully	Invalid Input	Passed
16.	Delete Medicine Page	Pharmacist can delete the medicine available in the hospital	Medicine deleted successfully	No Error	Passed
17.	Ward Incharge Page	Ward Incharge should be able to check the bed availability status and will be able to allocate the available beds.	After committing changes to the database, an alert should pop up with a respective message.	No Error	Passed
18.	Check Bed Status	Ward Incharge can check the bed status of patient admitted in the hospital	Bed status of the patient	No Error	Passed
19.	Bed Inventory	Ward Incharge can add a new bed for a patient in the hospital	Bed allocation successful	Invalid Input	Passed
20.	Lab Incharge Page	Lab Incharge should be able to add or delete the report. And he will be able to view and update any patient details.	After committing changes to the database, an alert should pop up with a respective message.	Duplicate Report Name	Passed
21.	Add New Report facility	Lab Incharge can upload the reports of patients to the hospital database	Report added successfully	Invalid Input	Passed
22.	Search Patient Report	Lab Incharge can view the reports of patients from the hospital database	Report list	No Error	Passed
23.	Patient Login Page	Patients will be able to fetch data of Report, Appointment History, Prescription History and Profile details. And also will	After payment an alert should pop up with a respective message.	No Error	Passed

		be able to make payments.			
24.	Profile Details page	Patient can view his details and payment status	Payment successful	No Error	Passed
25.	View prescriptio n page	Patient can view his prescription list prescribed by different doctors of the hospital	List of prescription	No Error	Passed
26.	View appointme nt page	Patient can view his appointment list here	History of appointments of the patient	No Error	Passed
27.	Sign Out	Employee/Patient should be able to logout from the web application	User will logout and will be redirected to the Home page.	No Error	Passed

CHAPTER-6

6.FUTURE SCOPE :

1. We will provide payment gateway to the user so that he can also pay through online mode.
2. We will be adding an online help for the users and chatting with website administrator.