

# **HOSPITAL MANAGEMENT SYSTEM (UDP)**

Semester- VIII

## **A PROJECT REPORT**

Submitted by

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*In partial fulfillment of the award of the degree of*

## **BACHELOR OF ENGINEERING**

in

## **COMPUTER ENGINEERING**



**Government Engineering College, Rajkot**

### **Internal Guide**

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**CERTIFICATE**



Date: 02-04-2020

This is to certify that the project entitled **Hospital Management System** has been carried out by **Mayank Vamja (160200107117)** under my guidance in partial fulfillment of the degree of Bachelor of Engineering in Computer (8th Semester) of Gujarat Technological University, Ahmadabad during the academic year 2019-20.

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## **ABSTRACT**

Hospital Management System (E-Hospital) allows hospitals to manage their large record of patients with ease. Hospital staff can add patient and all the data related to that patient will be attached to it from all different departments of hospital like Laboratories, Medical Store, Doctor, etc.

Pharmacist can also log in and view patient's e-prescription which is generated and verified from doctor of that hospital.

Patient's log in id and passwords are automatically generated at the time patient was registered by hospital staff. Patient can only view his reports generated, e-prescription.

Laboratory staff can login and attach report to patient dashboard. This project reduces complex paper work and management of those papers with automation.

# **1. INTRODUCTION**

## **1.1 CURRENT SYSTEM**

- Right now existing current system refers to the system that is being followed till now in which all the hospital functionalities are done manually. That is complex as well as bit of confusing to patients.
- If a patient wants to consult a doctor he can visit their till his chance called. Out Patient and in Patient tickets are distributed directly or sometimes not even exist any kind of system. In fact, it is done manually by staff. Reports that are generated has to manually attached to patient record and maintain that paper record itself is complex.
- If patient lost his reports given by hospital, then it is so much difficult to regain those or in some system it is even impossible as no digital records are maintained.
- The main disadvantage is time consuming as well as man power consuming.

## **1.2 LIMITATIONS OF CURRENT SYSTEM**

- Time consuming.
- Lack of data security
- Data searching complexity
- Large amount of papers and management of them
- Manual work for everything
- Difficulties for patient

## **1.3 OBJECTIVES & GOALS OF OUR PROPOSED SYSTEM**

The Hospital management system is web application which is user-friendly. The main objective of the system is to manage hospital's record in digital form.

### **ADVANTAGES OF OUR PROPOSED SYSTEM**

- Report generation of patient.
- Patient can view his data.
- E-prescription system.
- Reduce manual entries.
- Administrative control to the system.
- Reduce time consumption.
- Data management.

- Security of data.
- Manage accessibility to the data.

## **1.4 SCOPE OF SYSTEM**

- Our web application has scope limited to hospital staff registered in system and patients who are currently in hospital or patients who have treatment remaining from hospital.

## **1.5 TECHNOLOGY**

- Our hospital management system is web application.
- **Front-end**
  1. Html
  2. CSS
  3. Javascript
  4. Bootstrap and jquery, etc libraries.
- **Back-end**
  1. PHP
  2. MySQL

## **1.6 Literature Review**

- “A hospital resource and patient management system based on real-time data.
- “Study on information system of health care services management in hospital”

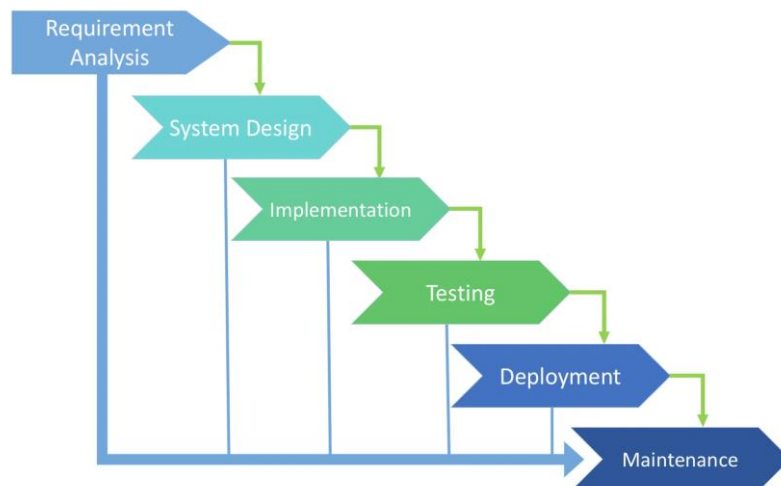
## 2. PROJECT MANAGEMENT

### 2.1 Project Planning and Scheduling

#### 2.1.1 Project Development Approach and Justification

- **Methodology:**

We have used Iterative and Incremental Development model (IID) for our Hospital Management System development. This development approach is also referred to as Iterative Waterfall Development approach. Iterative and Incremental Development is a software development process developed in response to the more traditional waterfall model. The waterfall model is well known for its repeated testing process. Hence we choose the waterfall model for developing our web application.



[FIG 1: Iterative Waterfall Model]

#### 2.1.2 Project Plan

##### 2.1.2.1 Milestones

- A complete system with responsive web design and greater user experience in hospital management system.
- Matching with all possible requirements and fulfill them.
- Project deployment in time.

### 2.1.2.2 Deliverables

- The project strategy is based on the assumption that the linguist would have complete specific deliverables

### 2.1.2.3 Roles and Responsibilities

- Front-end Developers:  
For development of front-end of hospital management system we require role of front-end developer with knowledge of html, css, js.
- Back-end Developers:  
We require role of back end developer with knowledge of php packages and security fundamentals.
- DBA:  
For database scheme design and database rules.

### 2.1.2.4 Resources

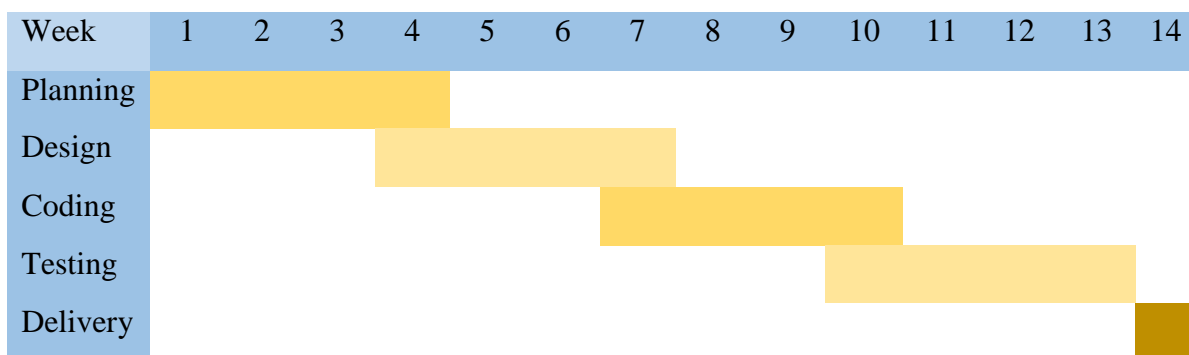
- A laptop or PC with IDE, browser, XAMPP, MySQL Server installed.

### 2.1.2.5 Dependencies

- There is no specific dependencies in development of our project but deployment of our web application requires web hosting availability.

## 2.1.3 Schedule Representation

- It involves deciding which tasks would be taken up when. In order to schedule the project activities, we used following approach shown in Gantt Chart.



[FIG 2: Gantt Chart]

## 2.2 Risk Management

- Software Risk Management is a proactive approach for minimizing the uncertainty and potential loss associated with a project. Some categories of risk include product size, business impact, customer related, process, technology, development environment, staffing (size and experience), schedule, and cost.
- Risk Management is a practice with processes, methods, and tools for managing risks in a project.
- Risk identification is a systematic attempt to specify threats to the project plan. By identifying known and predictable risks, we can take a first step toward avoiding them when possible and controlling them when necessary. To perform the risk identification, we categorized the risk into different categories as:

1. Project Risk
2. Technical Risk
3. Business Risk
4. Known Risk
5. Predictable Risk
6. Unpredictable

## 2.3 Estimation

### 2.3.1 Effort Estimation

- Since our project is web application and it admin, doctor, pharmacist, staff, patient modules. These requires large amount of kloc (Kilo Line of Code).
- If we estimate each module 1kLOC.
- But admin module may require 4-5 times of it.
- So, effort estimation for code could be 8-10kLOC.
- Testing also requires writing test cases efforts.

### 2.3.2 Cost Analysis

- Cost for our project contains web hosting pricing, cloud storage pricing, domain name buying cost.



## 3. SYSTEM REQUIREMENT STUDY

### 3.1 User Characteristics

The system will be used in the hospital. The administrators, doctors, nurses and front-desk staff will be the main users. Patient will also use this. Given the condition that not all the users are computer-literate. Some users may have to be trained on using the system. The system is also designed to be user-friendly.

- **Front-desk staff:**

They all have general reception and secretarial duties. Every staff has some basic computer training. They are responsible for patient's check-in or notification of appropriate people (e.g. notify administrator or nurse when an event occurs).

- **Administrators:**

They all have post-secondary education relating to general business administration practices. Every administrator has basic computer training. They are responsible for all of the scheduling and updating day/night employee shifts. Administrators in the wards are responsible for assigning doctors and nurses to patients.

- **Nurses:**

All nurses have post-secondary education in nursing. Some nurses are computer literate. Consulting nurses to whom patients give short descriptions of their conditions are also responsible for assigning patients to appropriate wards if the beds are available, otherwise putting patients on the waiting list. Nurses in wards will use the system to check their patient list.

- **Doctors:**

All doctors have a medical degree. Some have further specialized training and are computer literate. Doctors will use the system to check their patient's list all his/her data.

- **Patients:**

All patients can only view his/her data.

### 3.2 Hardware and Software Requirements

#### 3.2.1 Software required (For development)

- Operating System : Windows/Linux/Mac (Any)
- XAMPP or any other MySQL server with php support.
- Text Editor (VS Code)

### 3.2.2 Hardware required (For development)

- PC with javascript supported browser and having minimum specification:
  1. Processor: 64-bit with 1700MHz and up clock speed
  2. RAM: 4GB or more
- Server to host web app or any hosting facility that support php applications with C-panel hosting.

### 3.2.3 Materials required (For usage)

- Computers with any operating system at every department that may have low specification (minimum 2GB RAM) but js ES5/ES6 and up supported browser is necessary.
- Patient requires any smart device or PC to access.

## 3.3 Constraints

The system must be delivered by deadline.

The system must be user-friendly.

#### **Maintainability**

- Back-up: The system Should do backup consistently.
- Error: The system should keep log of errors generated.

## **4. SYSTEM ANALYSIS**

### **4.1 CURRENT SYSTEM**

- Right now existing current system refers to the system that is being followed till now in which all the hospital functionalities are done manually. That is complex as well as bit of confusing to patients.
- If a patient wants to consult a doctor he can visit their till his chance called. Out Patient and in Patient tickets are distributed directly or sometimes not even exist any kind of system. In fact, it is done manually by staff. Reports that are generated has to manually attached to patient record and maintain that paper record itself is complex.
- If patient lost his reports given by hospital, then it is so much difficult to regain those or in some system it is even impossible as no digital records are maintained.
- The main disadvantage is time consuming as well as man power consuming.

### **4.2 PROBLEMS OF CURRENT SYSTEM**

- Time consuming.
- Lack of data security
- Data searching complexity
- Large amount of papers and management of them
- Manual work for everything
- Difficulties for patient

### **4.3 Requirements of New System**

- The software requirement engineering determines the functional or non-functional requirements for engineering software. The requirements engineering is the first stage of any software project development.
- It is the process of determining functions of the software systems. This process encompasses all activities concerned with the requirements eliciting, analyzing, documenting, validating and managing software or systems. In requirement engineering the real world goals are explored and established for the software system that is being developed.
- In this phase of project development, we focused on gathering all the general requirements of a hospital and negotiated with the requirements.

### 4.3.1 Functional Requirement

#### Registration

- Add patients- The hospital management system should allow front-desk staff to add new patient to the system.
- Assign Id- The hospital management should allow front desk staff to give each patient an id and add it to the patient's record. This id should be used by the patient through-out his/her stay in hospital.

#### Consultation

- Assign Ward: The administrative staff should use system to assign the patient to an appropriate ward. Assign to Waiting List The consulting nurse should use system to assign Patient to a waiting list if no bed is available.
- Assign Doctor: The administrative staff in the ward should use system to assign a doctor to a given patient.
- Inform Doctors: The system should inform doctors of new patients.
- Emergency Case: In an emergency case, the administrative staff should use system to assign an emergency room, doctors to the patient immediately.
- Surgery case: In a surgery case, the administrative staff should use system to assign a surgery room, surgeon to the patient.

#### Report generation

- Patients information- The hospital management system should generate report on patient about the following information like patient's name, patient's phone number and doctor name which was assigned.
- Patient Mandatory Information- Each patient should have the following mandatory information like first name, last name, phone number, address, city, patient number.
- Generate Report (normal): The system should generate the patient's situation record every time for normal patients.
- Generate Report(Severe): The system should generate patient's situation record every half hour for severe patients.
- Record procedure: The whole treatment procedure for the patient should be recorded by the system.

#### Check Out

- Delete Patient ID: The administrative staff in the ward should be allowed to delete the ID from current to be added in historical database of the patient from the system when the patient checks out.
- Add to beds-available list: The administrative staff in the ward should be allowed to put the beds just evacuated in beds-available list.

### Database

- Patient Mandatory Information: Each patient should have the following mandatory information: first name, last name, phone number, personal health number, address, postal code, city, country, patient identification number.
- Update Patient Information: The system should allow the user to update any of the patient's information
- Search for Patient: The system should allow the user to search for patient's information by last name or PHN or patient ID.
- Staff Mandatory Information: Each staff in hospital should have the following mandatory information: identification number, first name, last name, phone number, address, postal code, city, country, employee type, duty schedule.
- Update Staff Information: The system should allow the user to update any of the staff's information as described in SRS023.
- Employee Information: The system should allow the user to search for employee information by last name, or ID number.
- Ward Types: The ward may be categorized into different types like Maternity, Surgical, Cancer and Cardiac.
- Ward Information: Each ward in system should include the following mandatory information: ward name, ward number, list of rooms in ward.
- Room Information: Each room in system should include the following mandatory information: room number, list of beds in room, full/not full.

## 4.3.2 Non-Functional Requirement

### Performance

- Response time – This system should give response as fast as possible when checking the patient information.

### UX/UI Requirements

- User Interface – UI should be lightweight so that it doesn't affect the performance and speeds up loading speed.
- Crash Report – The system should have facility to keep log of crashes so that system can be improved
- UI should be responsive that it can be used in any device.

### Security

- Patient Identification: The system requires the patient to identify himself using his/her any ID proof.
- Login ID: Any user who uses the system should have a Login ID and Password.

- Patient's Login: The system should generate patient's login id with random one-time password automatically.
- Modification: Any modification (insert, delete, update) for the Database should be synchronized and done only by the administrator of the system.
- Administrators' Rights: Administrators should be able to view and modify all information in system. Also admin should define rights for all the staff.
- E-prescription signature: E-prescription should be verified through the digital signature.
- Accurate: Reports generated should be accurate and non-modifiable.

## 4.4 Feasibility Study

### 4.4.1 Technical Feasibility

This is concerned with specifying equipment and software that will successfully satisfy the user requirement; the technical needs of the system may vary considerably, but might include:

- The facility to produce outputs in a given time:
  1. Response time under conditions like
    - Different internet speed and different bandwidth.
    - Traffic highness and lowness.
  2. Ability to process a certain volume of transaction at a particular seep.
    - Task concurrency.
    - Transaction synchronization.
  3. Facility to communicate data to distant location.
    - Different places and times.

### 4.4.2 Operational Feasibility

It is mainly related to human organization and political aspects. The points to be considered are:

- i. What changes will be brought with the system?
  - Staff's technical knowledge
- ii. What organizational structures are distributed?
  - No of systems availability.
  - System specifications.
- iii. What new skills will be required? Do the existing staff members have these skills?
  - Few technical skills related to the application should be known to employees.

- Employee should get training to get use to our system.

#### **4.4.3 Economic Feasibility**

- Economic analysis is the most frequently used technique for evaluating the effectiveness of a proposed system. More frequently known as cost/benefit system and compare them with costs. If benefits outweigh costs, a decision is taken to design and implement the system.

#### **4.4.4 Management Feasibility**

- It is a determination of whether a proposed project will be acceptable to management. If does not accept a project of gives a negligible support to it; the analyst will tend to view the project as a no feasible one.

#### **4.4.5 Social Feasibility**

- Social feasibility is a determination of whether the project will be acceptable to the people or not. This determination typically examines the probability of the project accepted by the group directly affected by the proposed system change.

### **4.5 Requirements Validation**

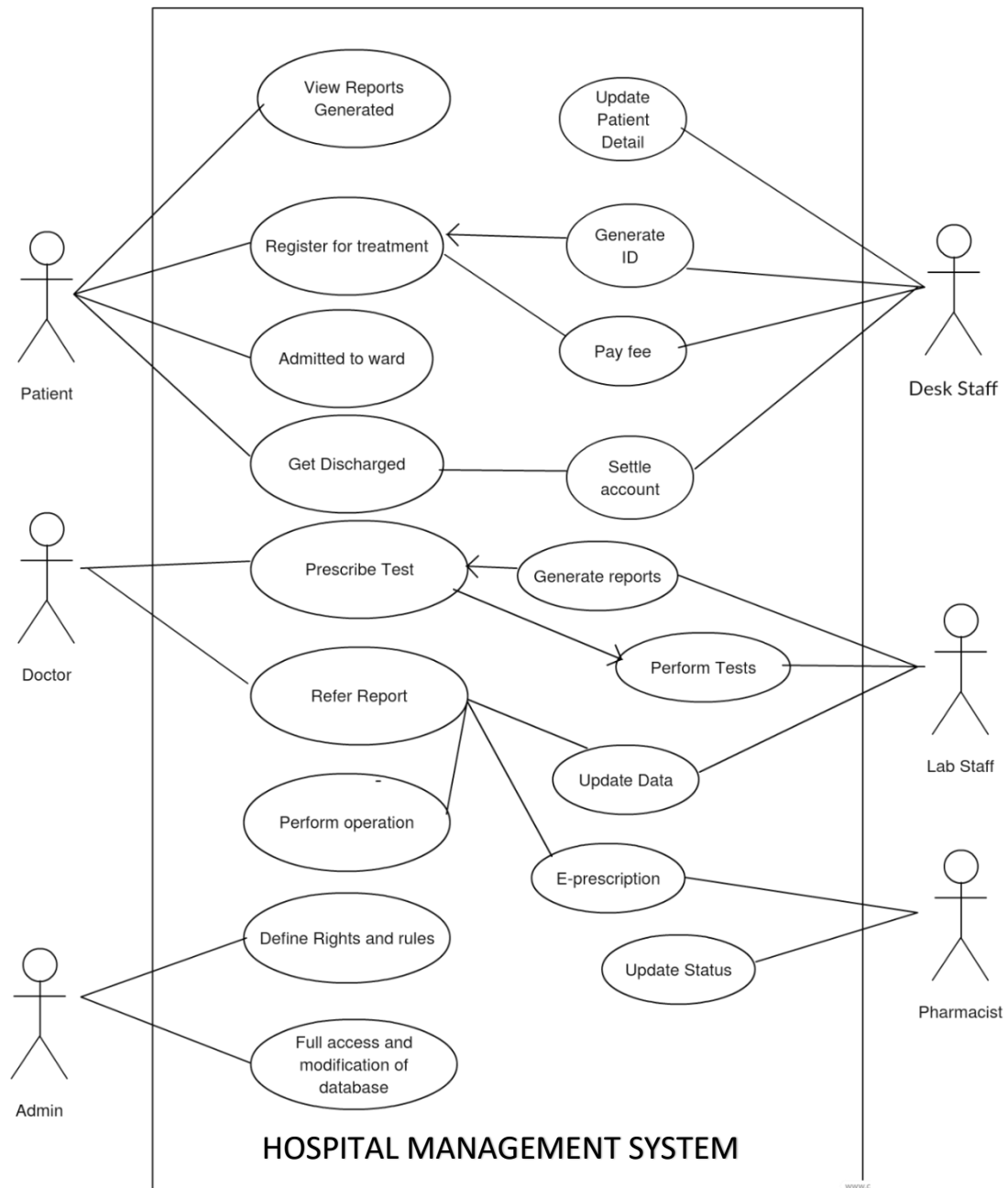
- In this phase, for requirement validation whether the requirements are fulfilled or not we check for all requirements and their validations.

## 4.6 Functions of System

### 4.6.1 Use case Diagram:

- Admin:  
Define rights and rules, Full access and modification to the database.
- Desk Staff:  
Generate patient id and password, pay fee validation, settle account when patient discharged, ward and roll allocation.
- Doctor:  
Prescribe test and update data into database, refer report generated, perform operation accordingly.
- Laboratory Staff:  
Perform test, generate reports, and update data.
- Medical staff:  
Read and view also verify e-prescription generated by doctors, update status for it.
- Patient:  
Register, Admin to ward or room, log in, view reports generated.

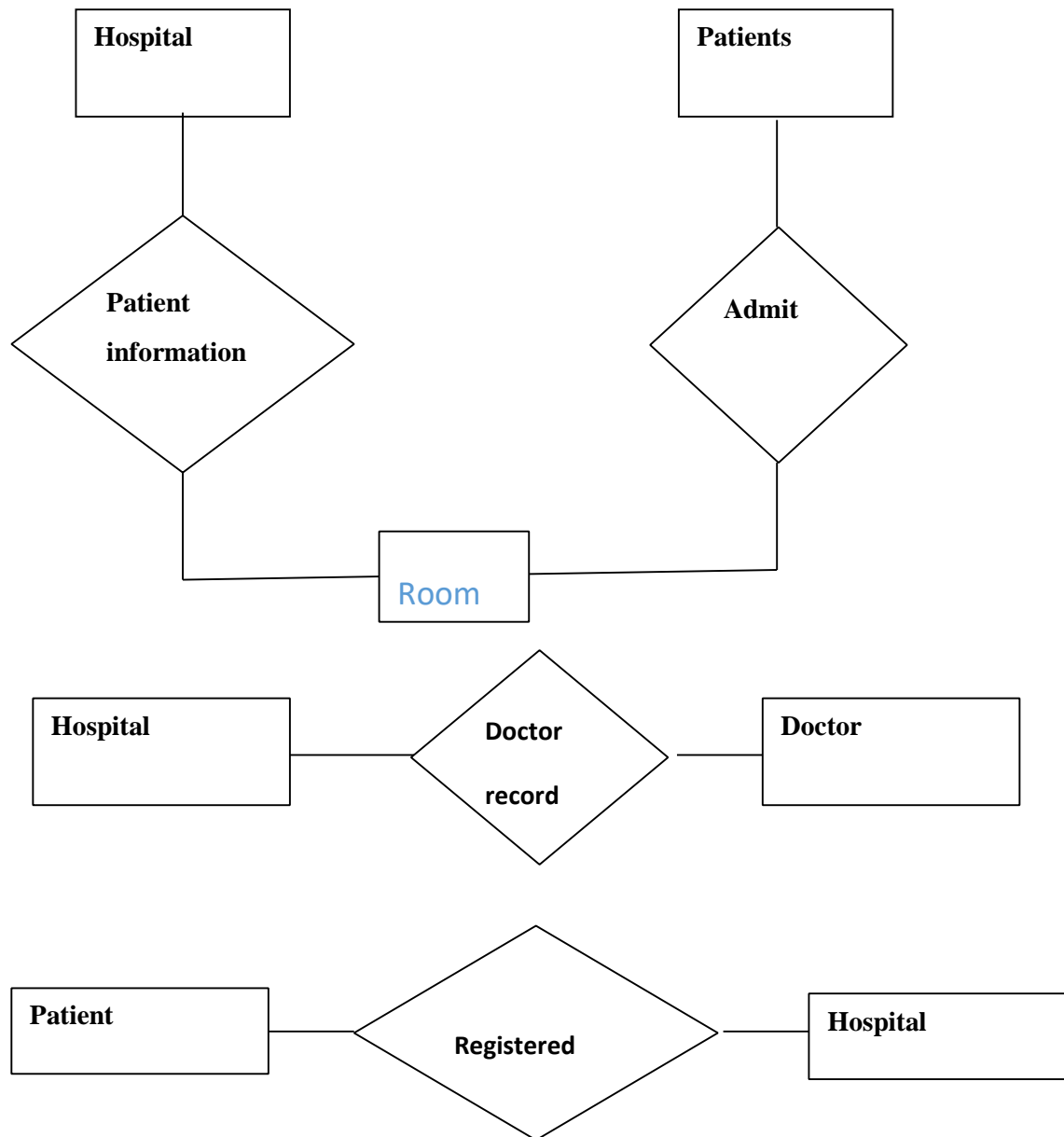




[FIG 3: Use case diagram]

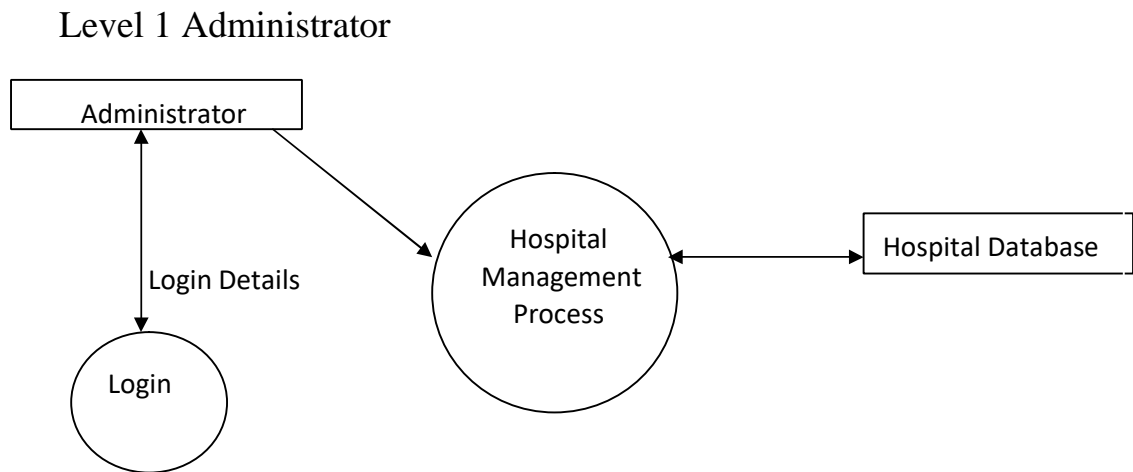
## 4.7 Modeling and Diagrams

### 4.7.1 E-R Diagram

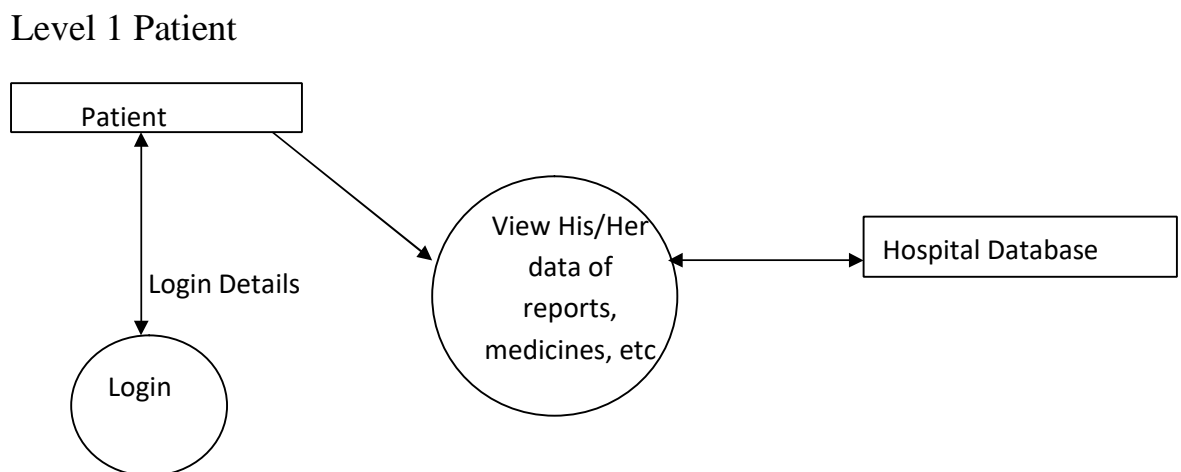


[Fig: 4] E-R Diagram

### 4.7.2 Data Flow Diagram

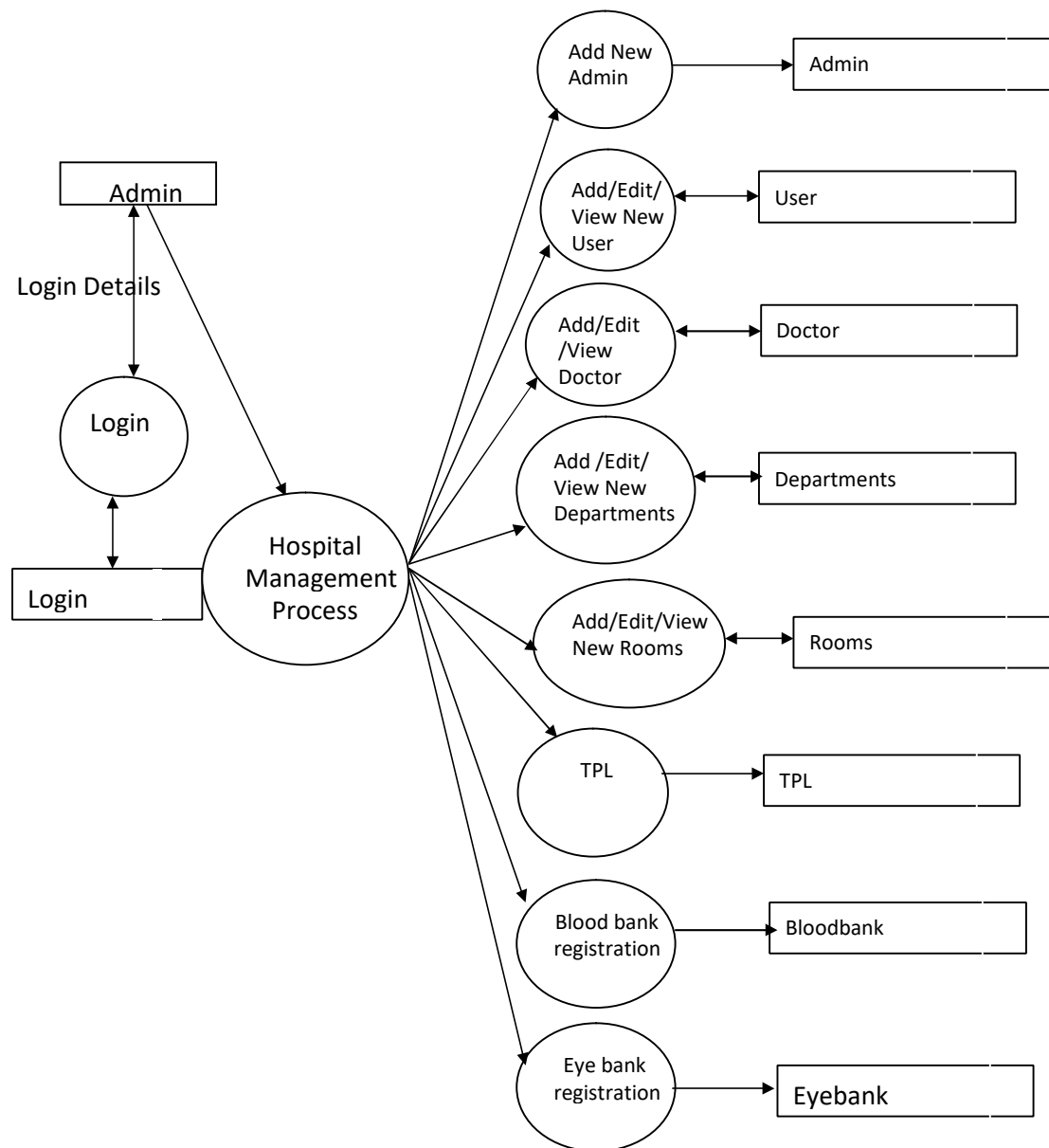


[FIG 5: Level 1 Admin DFD]



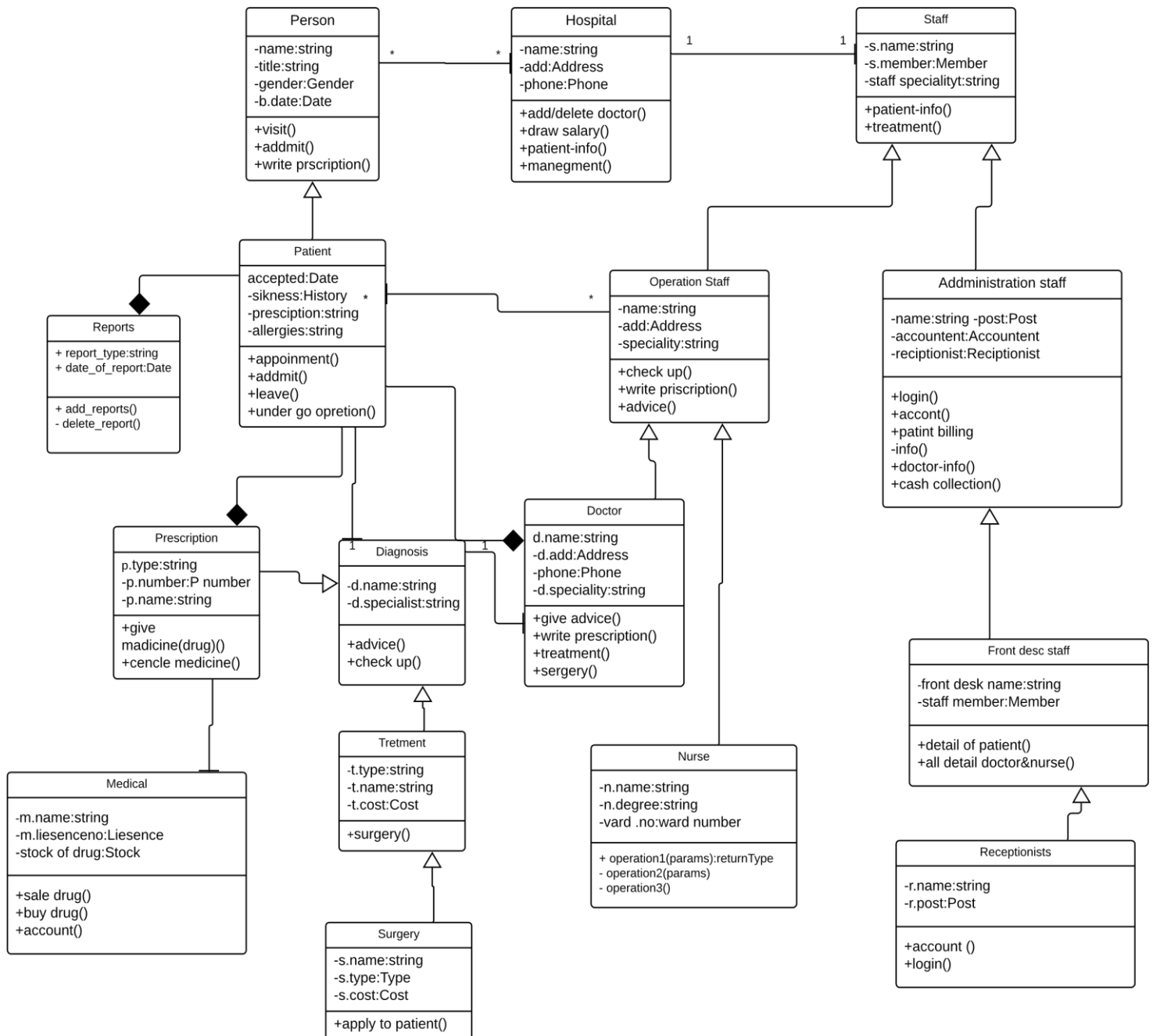
[FIG 6: Level 1 Patient DFD]

## Level 2 DFD



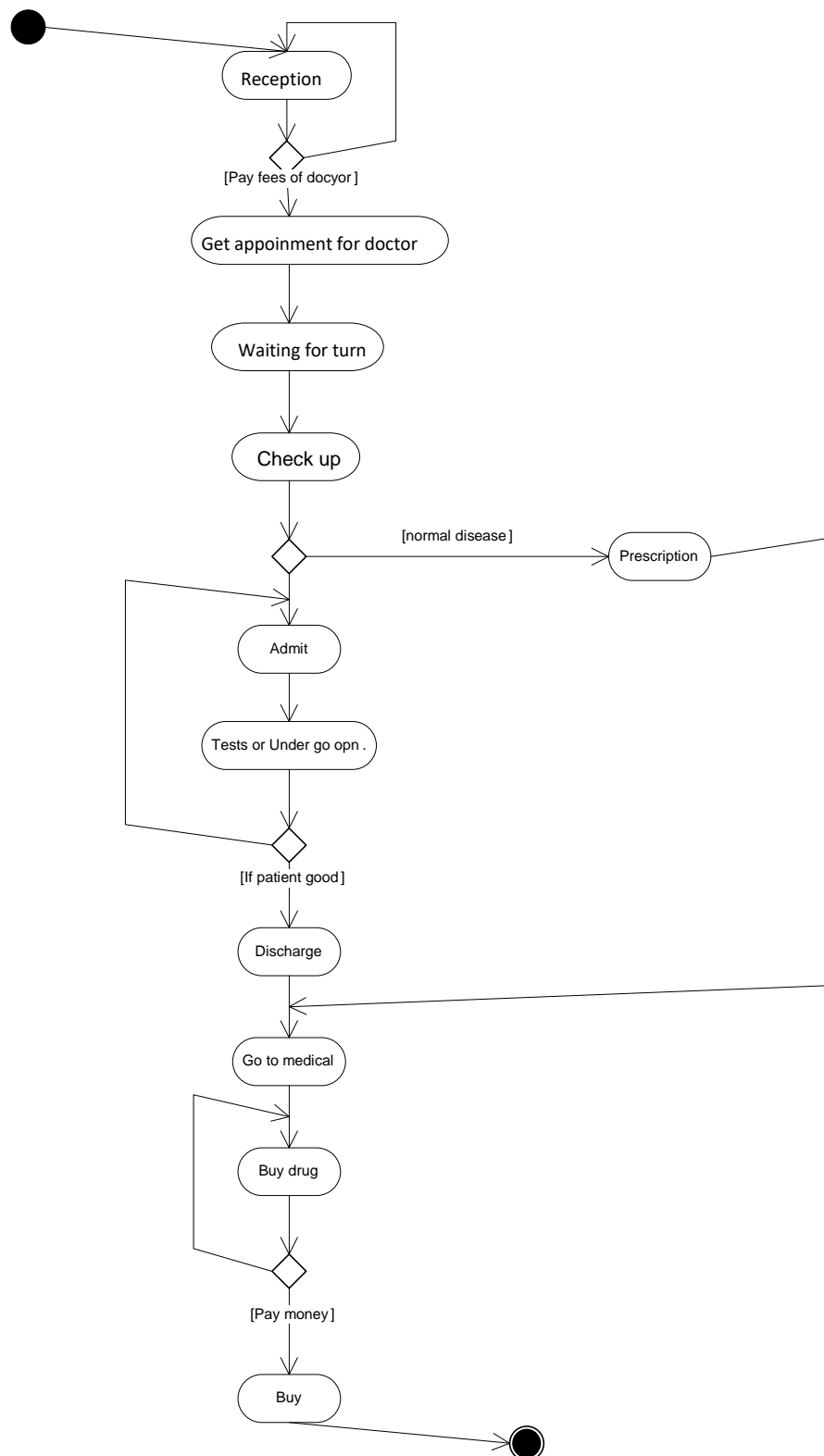
[FIG 7: Level 2 DFD]

### 4.7.3 Class Diagram



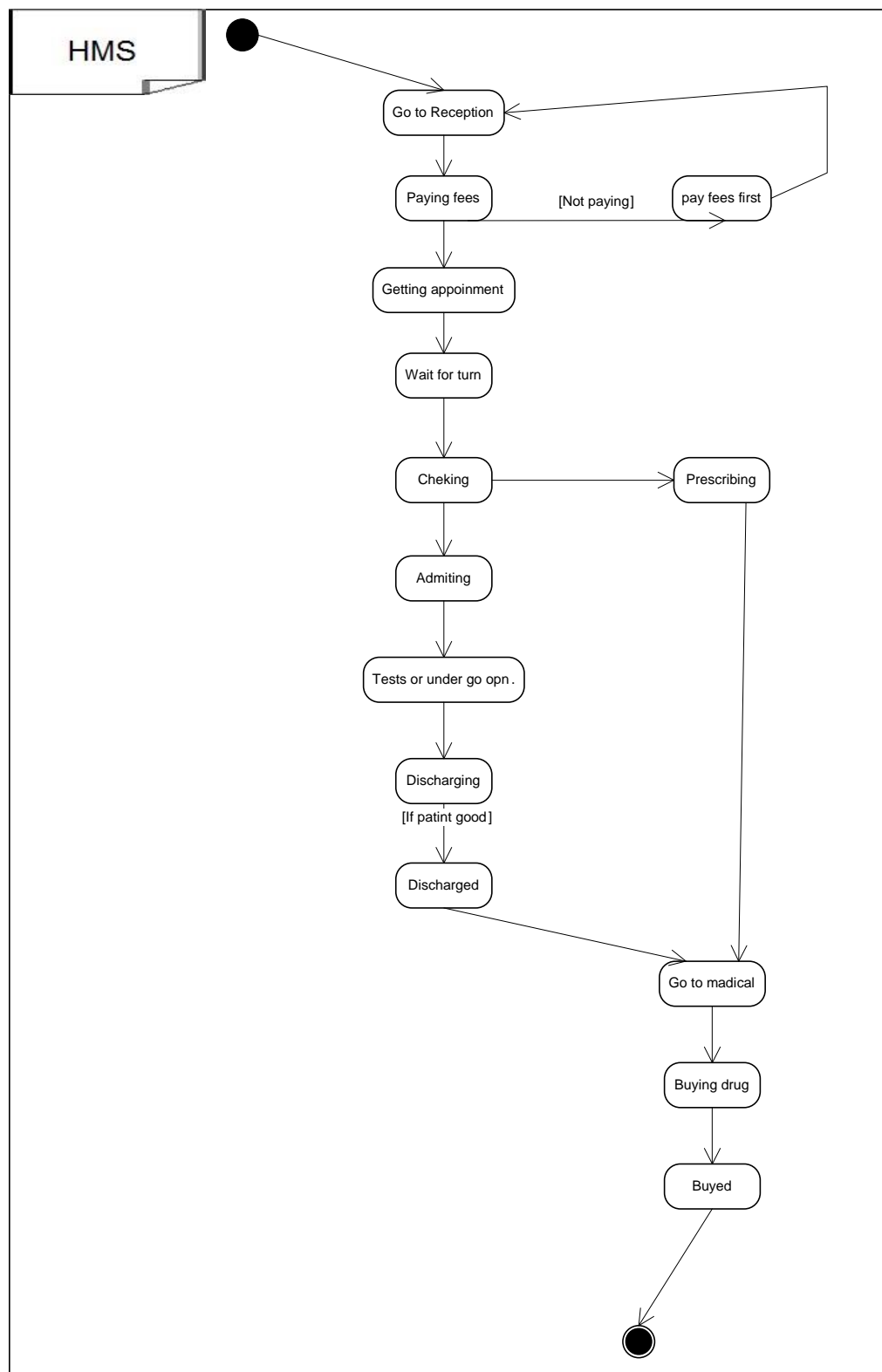
[FIG 8: Class Diagram]

#### 4.7.4 Activity Diagram



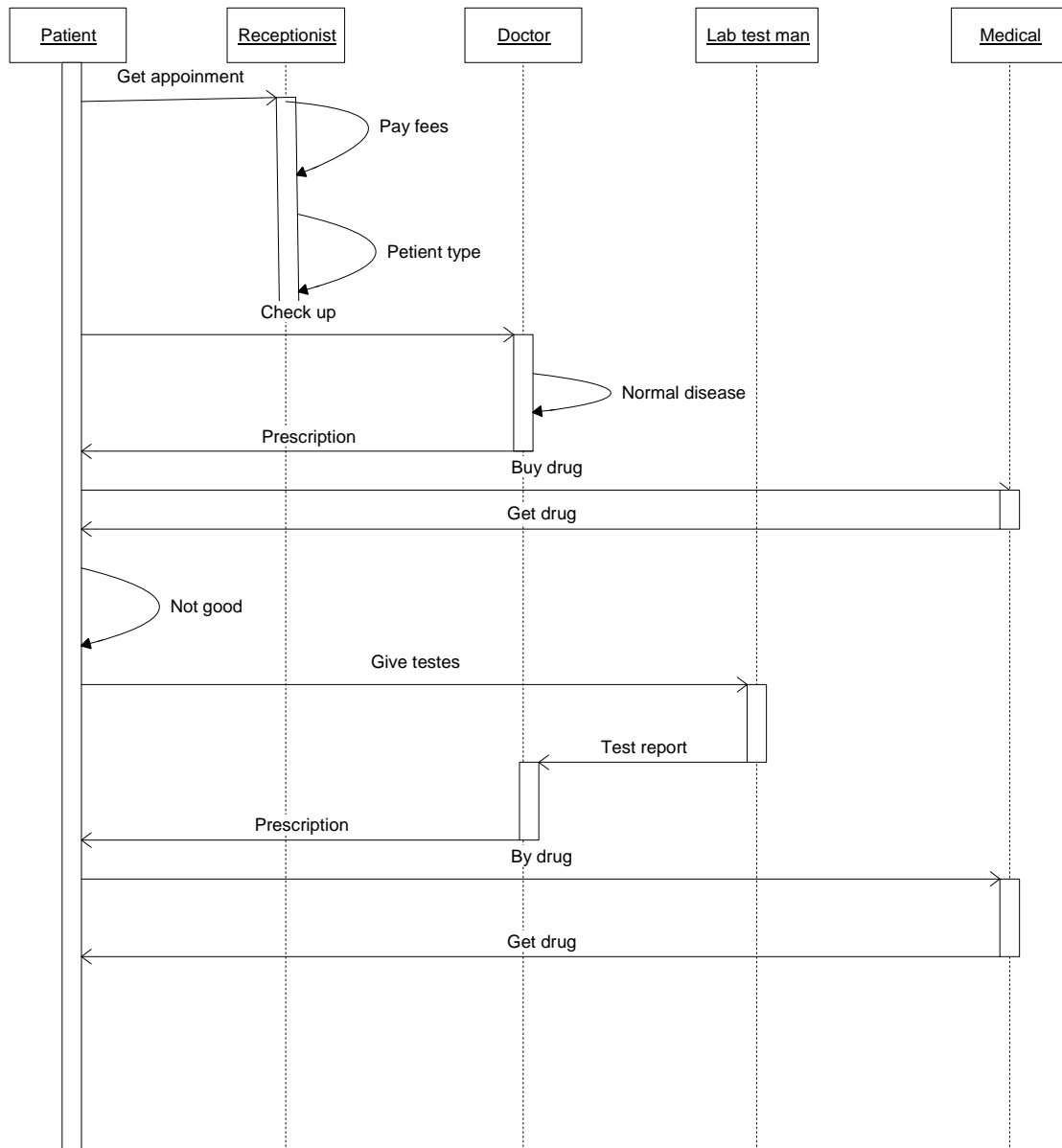
[FIG 9: Activity Diagram]

### 4.7.5 State Diagram



[FIG 10: State Diagram]

### 4.7.6 Sequence Diagram



[FIG 11: Sequence Diagram]

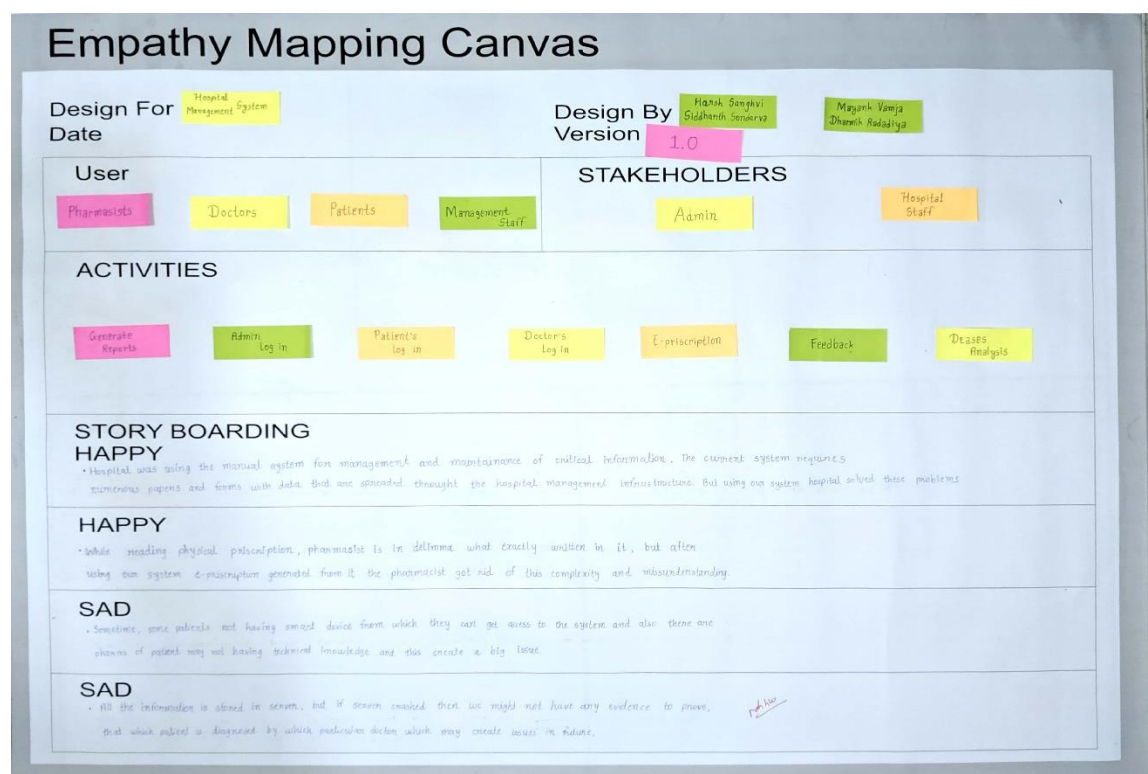


## 5. DESIGN CANVASES

### 5.1 Empathy Canvas

Empathy mapping canvas contains users, stakeholders, activities and story boarding with happy and sad stories.

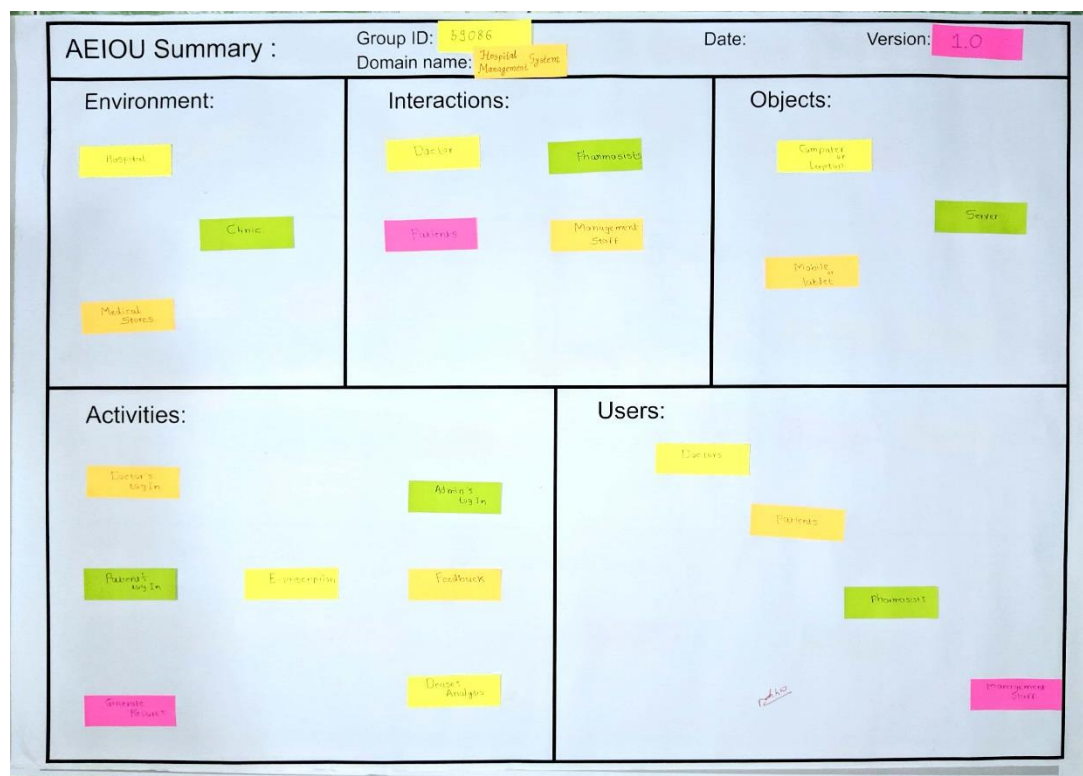
- Users:  
Doctors, Hospital Management Staff, Patients
- Stakeholders:  
Administrator, Hospital Admin Staff
- Activities:  
Register patient, generate reports, e-prescription, log in for doctors, pharmacist, staff and patients as well.



[FIG 12: Empathy Canvas]

## 5.2 AEIOU Canvas

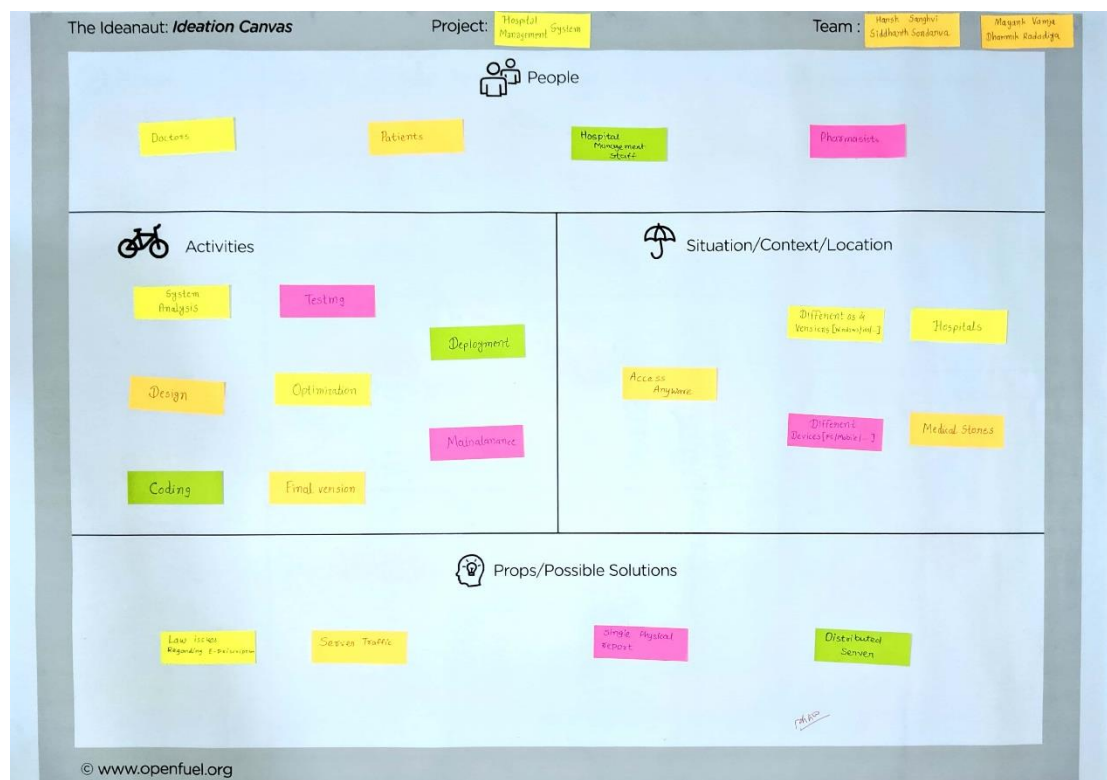
- Activities:  
Register patient, generate reports, e-prescription, log in for doctors, pharmacist, staff and patients as well.
- Environment:  
Hospital, Clinic, medical stores.
- Interactions:  
Doctor, Patients, Pharmacist.
- Objects:  
Computer, laptop, mobile, tablet, Server.
- Users:  
Doctors, Hospital Management Staff, Patients



[FIG 12: AEIOU Canvas]

### 5.3 Ideation Canvas

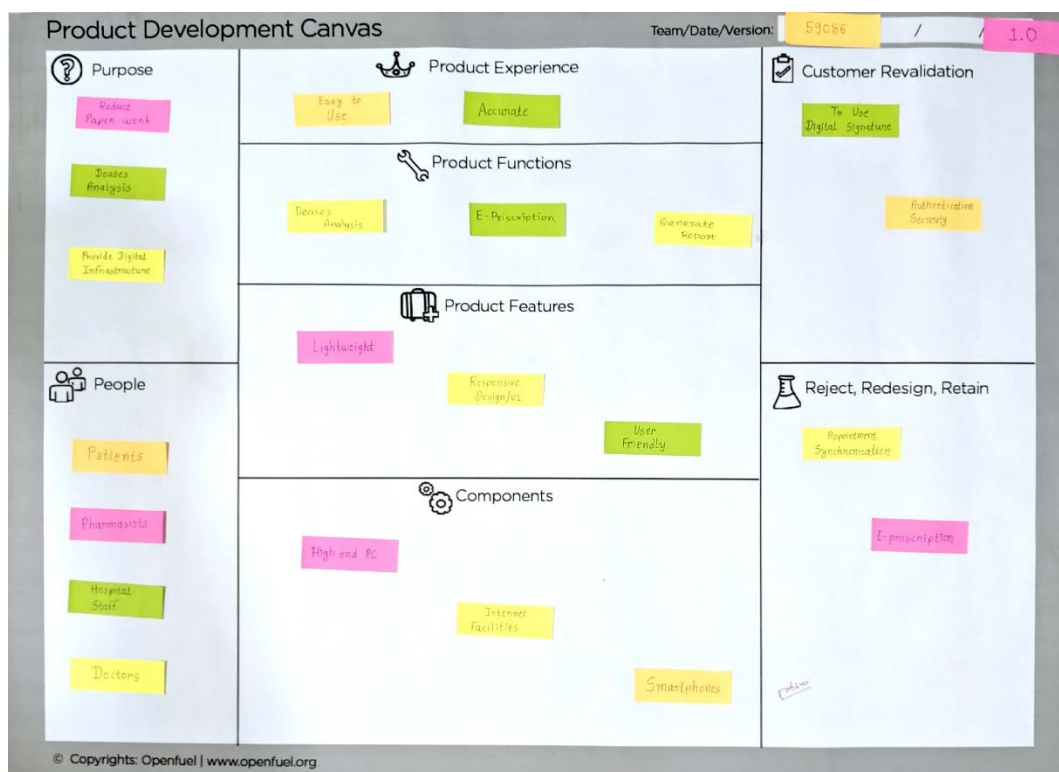
- People:  
Doctors, Hospital Management Staff, Patients, pharmacist.
- Activities:
  1. System Analysis
  2. Design
  3. Coding
  4. Testing
  5. Optimizations
  6. Final Version
  7. Deployment
  8. Maintenance
- Situation/Context/Location:  
Hospitals, Stores, Different OS, Different devices, anywhere access.
- Props/Possible Solution:  
Server traffic problem: distributed highly capable server.  
Law issue regarding e-prescription: single physical prescription.



[FIG 12: Ideation Canvas]

## 5.4 Product Development Canvas


- People:  
Doctors, Hospital Management Staff, Patients, pharmacist.
- Purpose:  
Reduce paper work, provide digital infrastructure.
- Reject, Redesign, Retain:  
Appointment Synchronization, E-prescription.
- Customer Revalidation:  
Authentication Security, to use digital signature in e-prescription.



[FIG 12: Product Development Canvas]

## 6. MySQL Database Modals


### Admin Table

#	Name	Type
1	id 	int(11)
2	username	varchar(255)
3	password	varchar(255)
4	updatetime	varchar(255)


### Doctors

#	Name	Type
1	id 	int(11)
2	specilization	varchar(255)
3	doctorName	varchar(255)
4	address	longtext
5	docFees	varchar(255)
6	contactno	bigint(11)
7	docEmail	varchar(255)
8	password	varchar(255)
9	creationDate	timestamp
10	updatetime	timestamp

### Doctors Log

#	Name	Type
1	id 	int(11)
2	uid	int(11)
3	username	varchar(255)
4	userip	binary(16)
5	loginTime	timestamp
6	logout	varchar(255)
7	status	int(11)

### Users

#	Name	Type
1	id 	int(11)
2	fullName	varchar(255)
3	address	longtext
4	city	varchar(255)
5	gender	varchar(255)
6	email 	varchar(255)
7	password	varchar(255)
8	regDate	timestamp
9	updatetime	timestamp

**Users Log**

#	Name	Type
1	<b>id</b>	int(11)
2	<b>uid</b>	int(11)
3	<b>username</b>	varchar(255)
4	<b>userip</b>	binary(16)
5	<b>loginTime</b>	timestamp
6	<b>logout</b>	varchar(255)
7	<b>status</b>	int(11)

**Staff**

#	Name	Type
1	<b>id</b>	int(11)
2	<b>type</b>	varchar(20)
3	<b>name</b>	varchar(100)
4	<b>gender</b>	int(11)
5	<b>age</b>	int(11)
6	<b>address</b>	varchar(1000)
7	<b>shiftTimings</b>	longtext
8	<b>createdAt</b>	timestamp
9	<b>updatedAt</b>	timestamp

**Patients**

#	Name	Type
1	<b>ID</b>	int(10)
2	<b>Docid</b>	int(10)
3	<b>PatientName</b>	varchar(200)
4	<b>PatientContno</b>	bigint(10)
5	<b>PatientEmail</b>	varchar(200)
6	<b>PatientGender</b>	varchar(50)
7	<b>PatientAdd</b>	mediumtext
8	<b>PatientAge</b>	int(10)
9	<b>PatientMedhis</b>	mediumtext
10	<b>Diseaseld</b>	int(1)
11	<b>isAdmit</b>	tinyint(1)
12	<b>CreationDate</b>	timestamp
13	<b>UpdationDate</b>	timestamp


**Appointment**

#	Name	Type
1	<b>id</b>	int(11)
2	<b>doctorSpecialization</b>	varchar(255)
3	<b>doctorId</b>	int(11)
4	<b>userId</b>	int(11)
5	<b>consultancyFees</b>	int(11)
6	<b>appointmentDate</b>	varchar(255)
7	<b>appointmentTime</b>	varchar(255)
8	<b>postingDate</b>	timestamp
9	<b>userStatus</b>	int(11)
10	<b>doctorStatus</b>	int(11)
11	<b>updationDate</b>	timestamp


**Notification**

#	Name	Type
1	id 	int(11)
2	userId	int(11)
3	doctorId	int(11)
4	type	varchar(50)
5	message	varchar(500)
6	messageDoc	varchar(100)
7	link	varchar(100)
8	isRead	tinyint(1)
9	isReadDoc	tinyint(1)
10	createdAt	timestamp


**Departments Types**

#	Name	Type
1	value 	varchar(15)
2	name	varchar(50)


**Departments**

#	Name	Type
1	id 	int(11)
2	type	varchar(20)
3	name	varchar(20)
4	floor	int(5)
5	maxPatients	int(5)
6	currentPatients	int(11)
7	booked	varchar(5000)
8	updatedAt	timestamp


**Admit Patients**

#	Name	Type
1	id 	int(11)
2	userId	int(11)
3	admittedBy	int(11)
4	departmentId	int(11)
5	bedNo	int(11)
6	fromDate	date
7	toDate	date
8	updatedBy	int(11)
9	discharged	tinyint(1)
10	updatedAt	timestamp


### Doctor Specialization

#	Name	Type
1	id 	int(11)
2	specilization	varchar(255)
3	creationDate	timestamp
4	updationDate	timestamp


### Disease

#	Name	Type
1	id 	int(11)
2	Disease	varchar(100)
3	Discription	varchar(500)

### Medical History

#	Name	Type
1	ID 	int(10)
2	PatientID	int(10)
3	BloodPressure	varchar(200)
4	Blood Sugar	varchar(200)
5	Weight	varchar(100)
6	Temperature	varchar(200)
7	OtherData	longtext
8	MedicalPres	mediumtext
9	CreationDate	timestamp

### Reports

#	Name	Type
1	id 	int(11)
2	PatientId	int(11)
3	ReportType	varchar(200)
4	ReportDescription	varchar(500)
5	Priority	int(1)
6	ReportData	longblob
7	RequestedBy	int(11)
8	RequestDate	timestamp
9	UploadDate	timestamp
10	UploadedBy	int(11)

### Contact Us

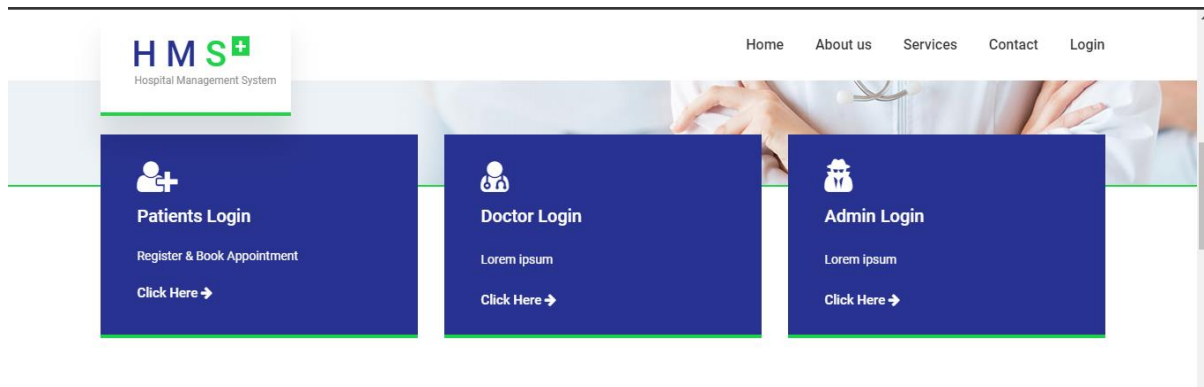
#	Name	Type
1	id 	int(11)
2	fullname	varchar(255)
3	email	varchar(255)
4	contactno	bigint(12)
5	message	mediumtext
6	PostingDate	timestamp
7	AdminRemark	mediumtext
8	LastupdationDate	timestamp
9	IsRead	int(11)



## 7. Project Proof Of Concept (Screenshots)

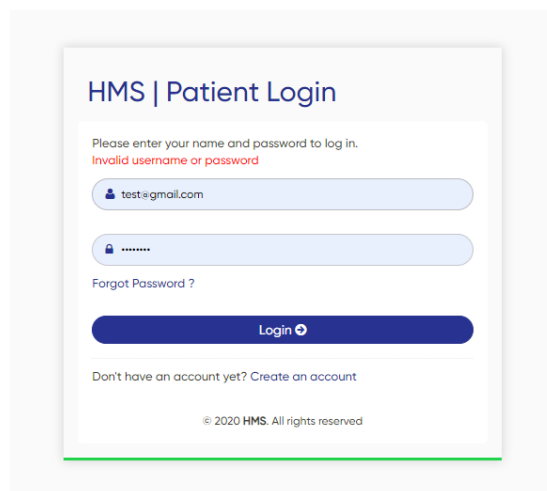
### ➤ GENERAL:

#### ▪ Starting



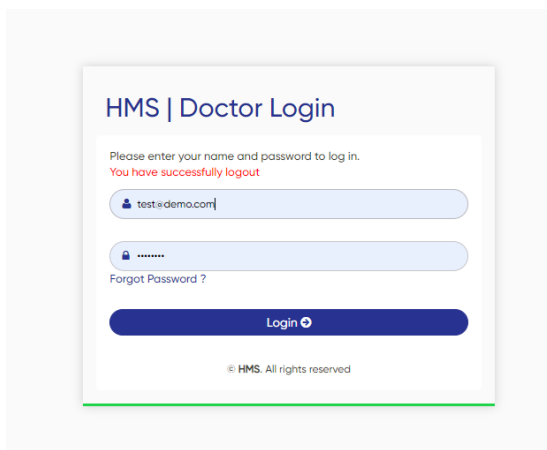
[Fig 7.1 Starting Page]

#### ▪ User/Patient Login



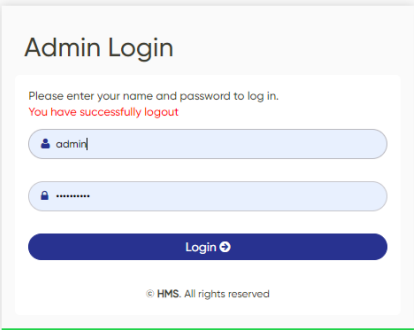
[Fig 7.2 Patient Login]

#### ▪ Doctor Login



[Fig 7.3 Doctor Login]

## ▪ Admin Login

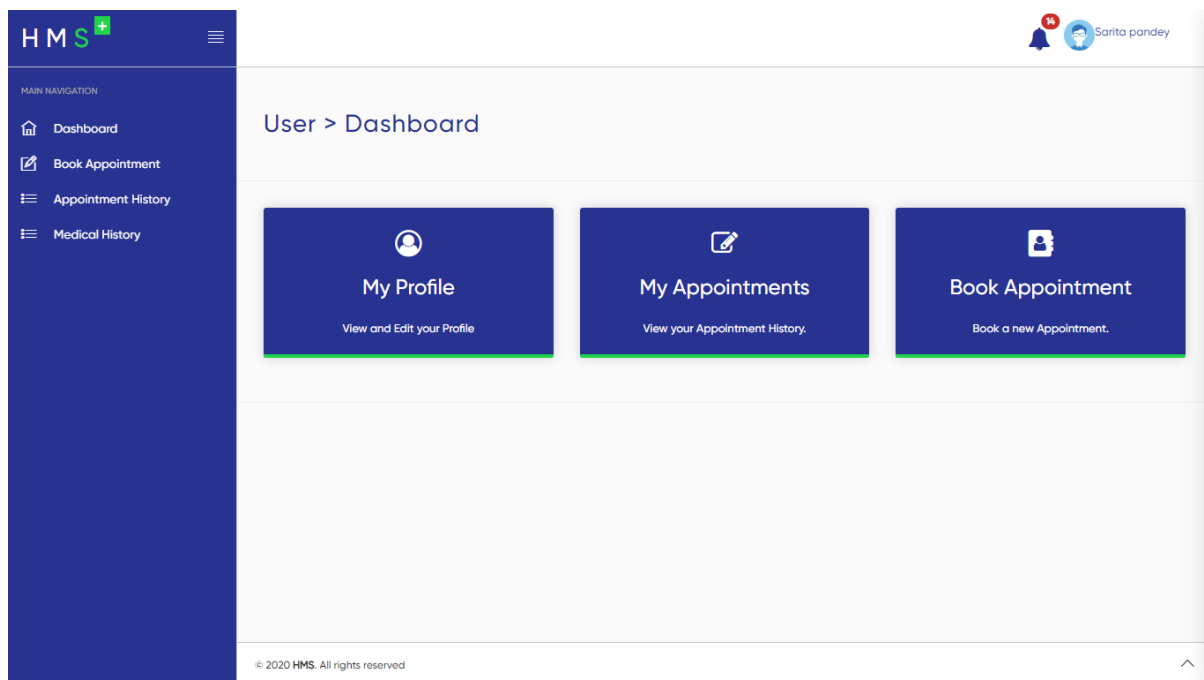


The Admin Login form is a white card with a light gray border. It has a title 'Admin Login' at the top. Below the title, it says 'Please enter your name and password to log in.' and 'You have successfully logout' in red. There are two input fields: the first is for the username 'admin' and the second is for the password '\*\*\*\*\*'. Below the password field is a 'Login' button with a right arrow icon. At the bottom, it says '© HMS. All rights reserved'.

[Fig 7.4 Admin Login]

## ➤ PATIENT:

### ▪ Patient Dashboard



[Fig 7.5 Patient Dashboard]

### ▪ Patient Profile with edit option

The screenshot shows the 'User > Profile' page. On the left is a dark blue sidebar with the 'HMS' logo and a menu: Dashboard, Book Appointment, Appointment History, and Medical History. The top right shows a user profile for 'Sarita pandey' with a notification bell. The main content area displays the user's profile card, which includes a profile picture, name 'Sarita pandey', location 'Delhi', email 'test@gmail.com', and address 'New Delhi India'. An edit icon (pencil) is in the top right corner of the profile card. The footer contains the copyright notice '© 2020 HMS. All rights reserved'.

[Fig 7.6 Patient Profile Page]

### ▪ Book appointment with doctor [Patient]

The screenshot shows the 'User > Book Appointment' page. The sidebar and top navigation are identical to the previous page. The main content area features a 'Book Appointment' form. The form has the following fields: 'Doctor Specialization' (with a 'Select Specialization' button), 'Doctors' (with a 'Select Doctor' button), 'Consultancy Fees' (a text input field), 'Date' (a date picker), and 'Time' (a time picker). A blue 'Submit' button is at the bottom of the form.

[Fig 7.7 Book appointment]

## Appointment History [Patient]

#	Doctor Name	Specialization	Consultancy Fee	Appointment Date / Time	Appointment Creation Date	Current Status	Action
1.	Amrita	General Physician	2500	2020-03-16 / 10:45 AM	2020-03-10 10:42:55	Cancel by You	Canceled
2.	Amrita	General Physician	2500	2020-03-16 / 10:45 AM	2020-03-10 10:44:22	Active	Cancel
3.	Amrita	General Physician	2500	2020-03-17 / 10:45 AM	2020-03-10 10:46:22	Active	Cancel
4.	Amrita	General Physician	2500	2020-03-17 / 10:45 AM	2020-03-10 10:49:03	Active	Cancel
5.	Amrita	General Physician	2500	2020-03-17 / 10:45 AM	2020-03-10 10:50:31	Active	Cancel
6.	Vijay Verma	Homeopath	700	2020-03-23 / 11:00 AM	2020-03-10 10:51:43	Active	Cancel
7.	Vijay Verma	Homeopath	700	2020-03-23 / 11:00 AM	2020-03-10 10:54:17	Active	Cancel
8.	Vijay Verma	Homeopath	700	2020-03-23 / 11:00 AM	2020-03-10 10:54:47	Active	Cancel
9.	Vijay Verma	Homeopath	700	2020-03-23 / 11:00 AM	2020-03-10 10:58:59	Active	Cancel
10.	Vijay Verma	Homeopath	700	2020-03-23 / 11:00 AM	2020-03-10 10:59:37	Active	Cancel
11.	Amrita	General Physician	2500	2020-03-28 / 1:30 PM	2020-03-10 13:24:06	Active	Cancel
12.	Amrita	General Physician	2500	2020-03-28 / 1:30 PM	2020-03-10 13:25:36	Active	Cancel
		General Physician	2500	2020-03-28 / 1:30 PM	2020-03-10 13:25:53	Active	Cancel

[Fig 7.8 Appointment History (Patient) ]

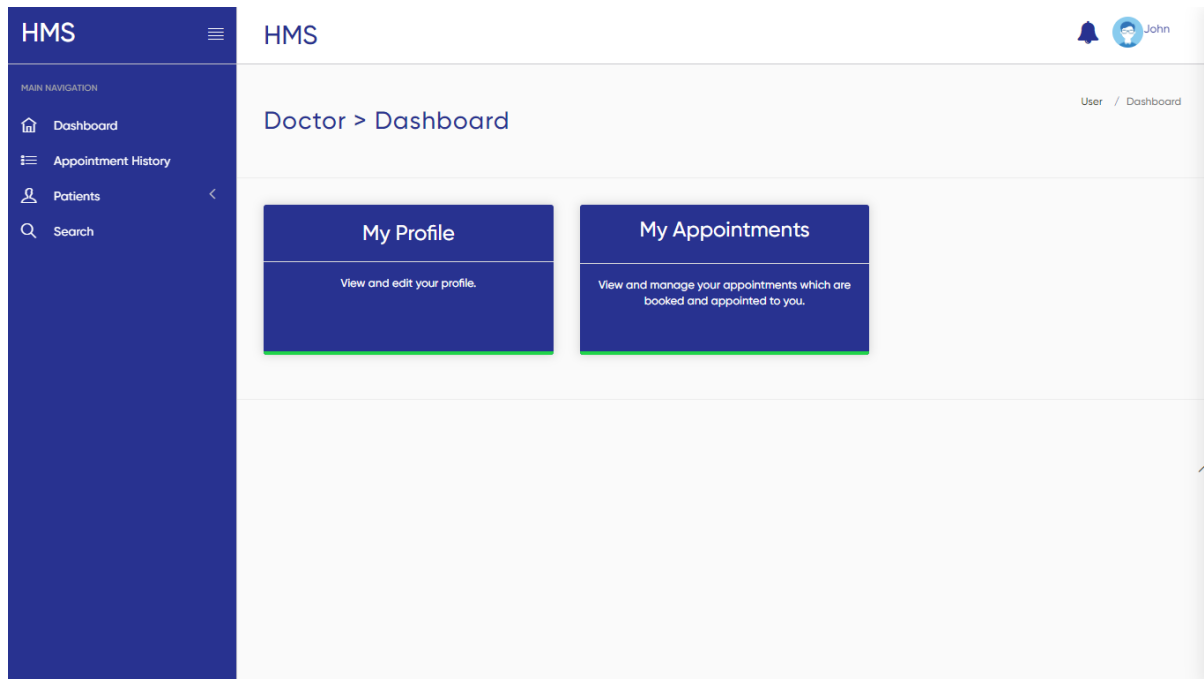
## Medical History [Patient]

Patient Details						
Patient Name	Manisha Jha		Patient Email	test@gmail.com		
Patient Mobile Number	4558968789		Patient Address	""J&K Block J-127, Laxmi Nagar New Delhi		
Patient Gender	Female		Patient Age	26		
Patient Medical History (if any)	She is diabetic patient		Patient Reg Date	2019-11-05 03:08:06		

Medical History						
#	Blood Pressure	Weight	Blood Sugar	Body Temperature	Medical Prescription	Visit Date
1	125/200	56 kg	86/120	98 deg	# blood pressure is high 1.koil cipla	2019-11-06 10:22:42
2	96/120	57 kg	98/120	102 deg	#Viral 1.gijh-1MI 2.kjhuiy-2M	2019-11-06 10:26:55

[Fig 7.9View Medical History (Patient) ]

➤ **DOCTOR:**▪ **Doctor dashboard**

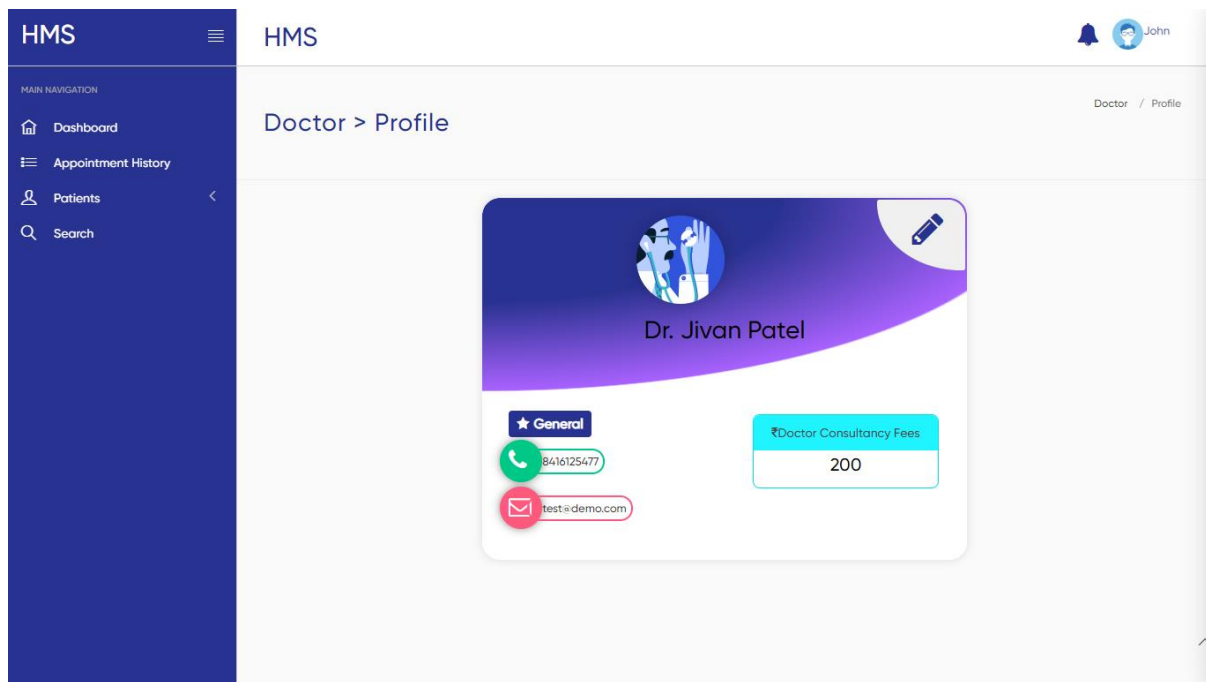
[Fig 7.10 Doctor Dashboard ]

▪ **Appointment History (Dector)**

#	Patient Name	Specialization	Consultancy Fee	Appointment Date / Time	Appointment Creation Date	Current Status	Action
1.	Test user	Demo test	600	2019-06-29 / 9:15 AM	2019-06-24 00:01:28	Cancel by you	Canceled
2.	Sarita pandey	Demo test	200	2020-03-21 / 3:45 PM	2020-03-10 15:37:54	Active	Cancel
3.	Sarita pandey	Demo test	200	2020-03-21 / 3:45 PM	2020-03-10 15:38:12	Cancel by Patient	Canceled
4.	Sarita pandey	Demo test	200	2020-03-21 / 3:45 PM	2020-03-10 15:38:17	Cancel by Patient	Canceled
5.	Sarita pandey	Demo test	200	2020-03-27 / 3:45 PM	2020-03-10 15:40:27	Active	Cancel
6.	Sarita pandey	Demo test	200	2020-03-27 / 3:45 PM	2020-03-10 15:41:04	Active	Cancel
7.	Sarita pandey	Demo test	200	2020-03-07 / 3:45 PM	2020-03-10 15:42:07	Active	Cancel

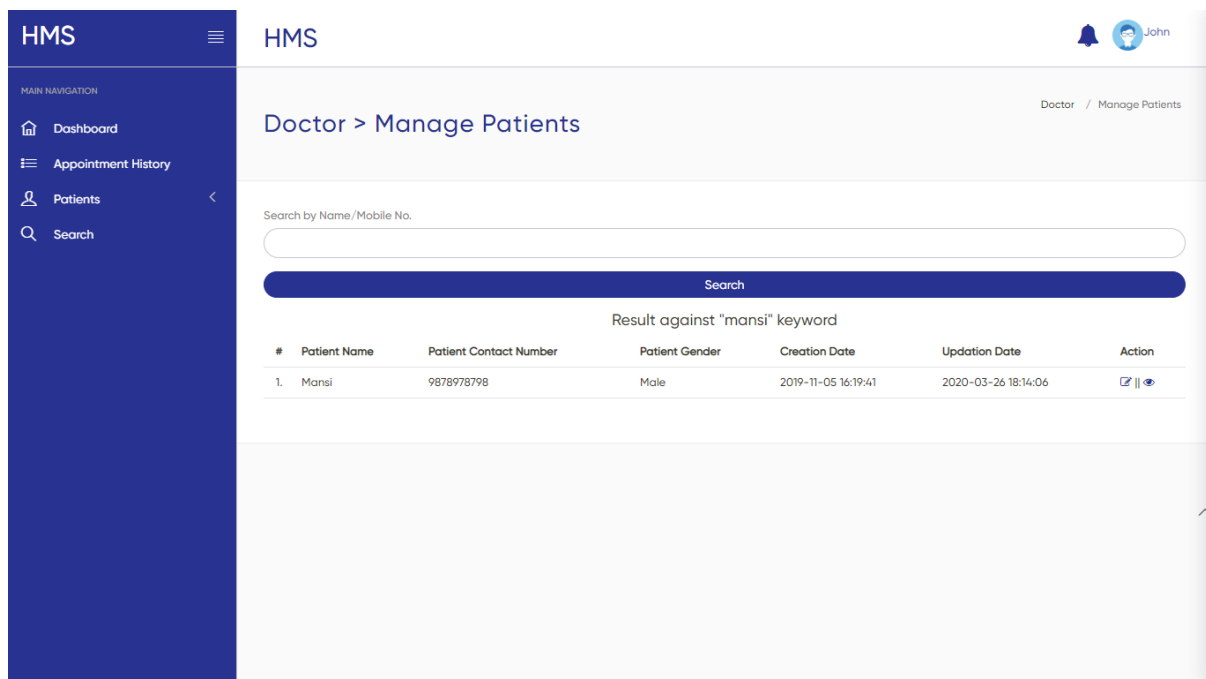
[Fig 7.11 Appointment History (Doctor) ]

## ▪ Doctor Profile



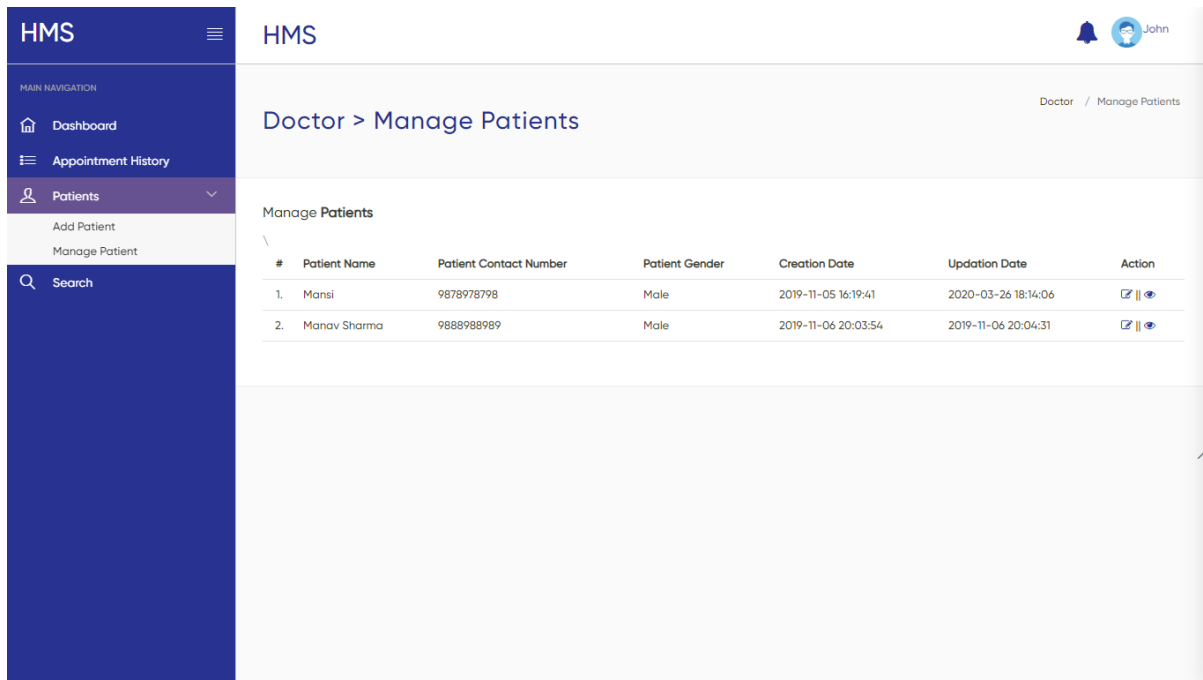
[Fig 7.12 Doctor Profile ]

## ▪ Search Patient



[Fig 7.13 Search Patient ]

## View and manage patient

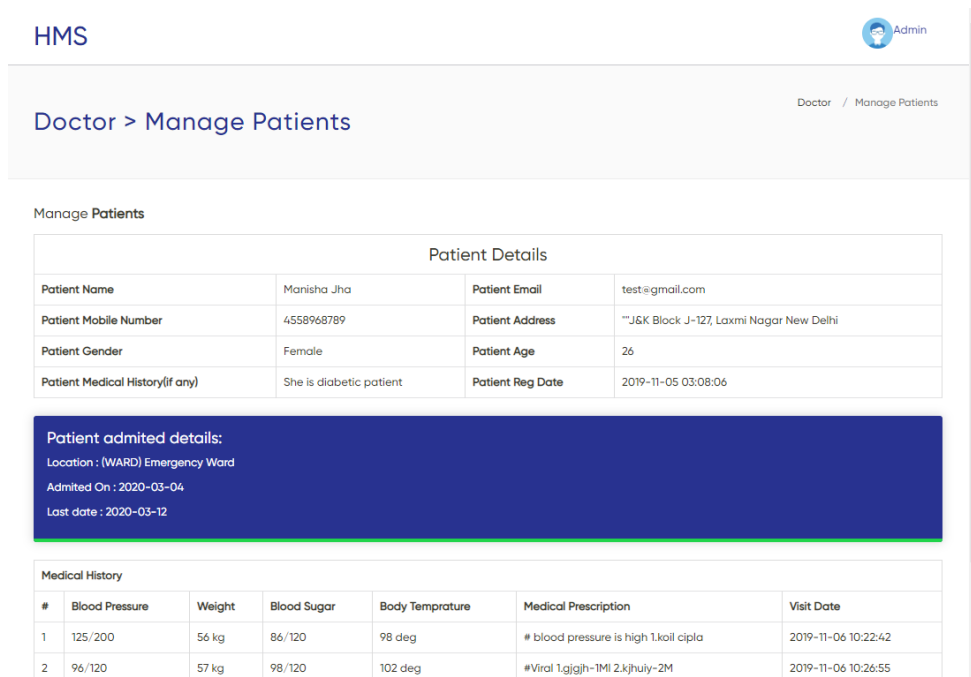


The screenshot shows the HMS interface for a Doctor. The left sidebar contains navigation options: Dashboard, Appointment History, Patients (selected), Add Patient, Manage Patient, and Search. The main content area is titled 'Doctor > Manage Patients' and displays a table of managed patients.

#	Patient Name	Patient Contact Number	Patient Gender	Creation Date	Updation Date	Action
1.	Mansi	9878978798	Male	2019-11-05 16:19:41	2020-03-26 18:14:06	<a href="#">Edit</a> <a href="#">View</a>
2.	Manav Sharma	9888988989	Male	2019-11-06 20:03:54	2019-11-06 20:04:31	<a href="#">Edit</a> <a href="#">View</a>

[Fig 7.14 View and manage Patient (Doctor) ]

## View patient details



The screenshot shows the HMS interface for a Doctor, displaying detailed patient information for Marisha Jha. The left sidebar is the same as in Fig 7.14. The main content area is titled 'Doctor > Manage Patients' and shows the 'Manage Patients' section with a 'Patient Details' table.

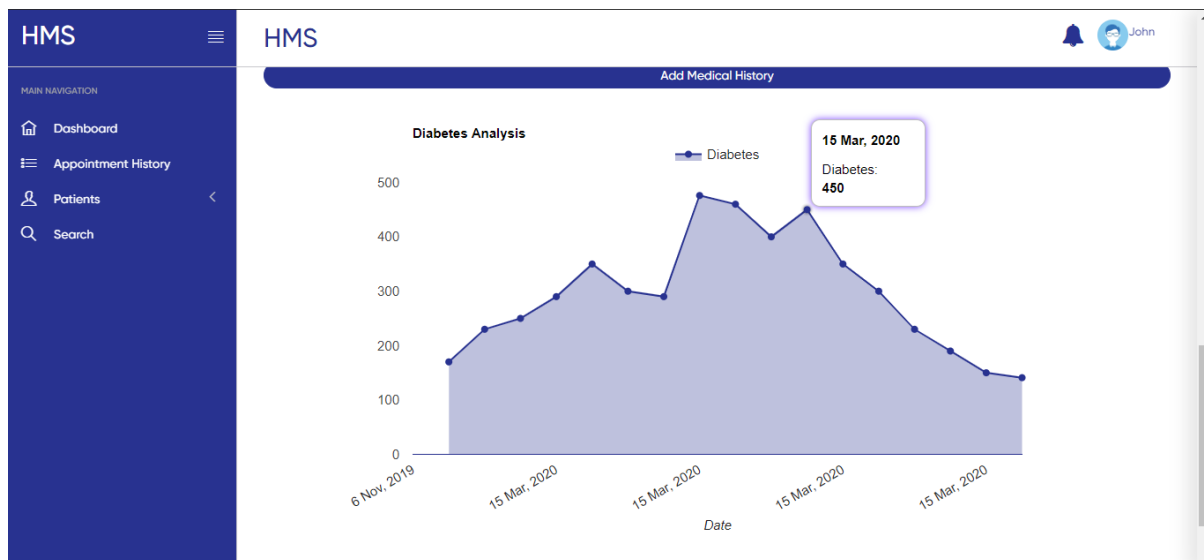
Patient Details			
Patient Name	Marisha Jha	Patient Email	test@gmail.com
Patient Mobile Number	4558968789	Patient Address	"J&K Block J-127, Laxmi Nagar New Delhi
Patient Gender	Female	Patient Age	26
Patient Medical History(if any)	She is diabetic patient	Patient Reg Date	2019-11-05 03:08:06

**Patient admitted details:**  
 Location : (WARD) Emergency Ward  
 Admitted On : 2020-03-04  
 Last date : 2020-03-12

Medical History						
#	Blood Pressure	Weight	Blood Sugar	Body Temperature	Medical Prescription	Visit Date
1	125/200	56 kg	86/120	98 deg	# blood pressure is high 1.koil cipla	2019-11-06 10:22:42
2	96/120	57 kg	98/120	102 deg	#Viral 1.gjgjh-1MI 2.kjhuiy-2M	2019-11-06 10:26:55

[Fig 7.15 View Patient ]

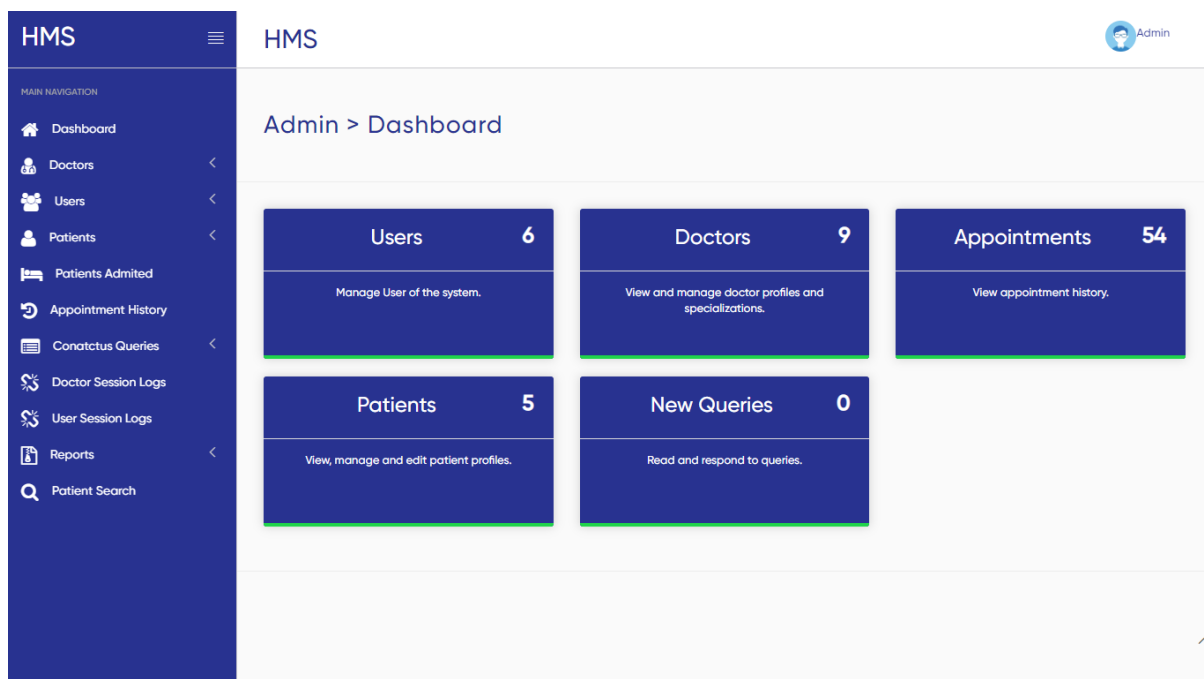
### ■ Graphical representation of Disease data history of patient



[Fig 7.16 Graphics for disease medical history data ]

### ➤ ADMIN:

### ■ Admin Dashboard



[Fig 7.17 Admin Dashboard ]



### ▪ Add and delete doctor specialization

**HMS** Admin > Add Doctor Specialization

Admin / Add Doctor Specialization

**Doctor Specialization**

Doctor Specialization

Enter Doctor Specialization

Submit

**Manage Doctor Specialization**

#	Specialization	Creation Date	Updation Date	Action
1.	Gynecologist/Obstetrician	2016-12-28 12:07:25	0000-00-00 00:00:00	<a href="#">Edit</a> <a href="#">Delete</a>
2.	General Physician	2016-12-28 12:08:12	0000-00-00 00:00:00	<a href="#">Edit</a> <a href="#">Delete</a>
3.	Dermatologist	2016-12-28 12:08:48	0000-00-00 00:00:00	<a href="#">Edit</a> <a href="#">Delete</a>
4.	Homeopath	2016-12-28 12:09:26	0000-00-00 00:00:00	<a href="#">Edit</a> <a href="#">Delete</a>
5.	Ayurveda	2016-12-28 12:09:51	0000-00-00 00:00:00	<a href="#">Edit</a> <a href="#">Delete</a>

[Fig 7.18 Doctor specialization ]

### ▪ Add update and manager doctors

**HMS** Admin

Admin

**Doctor Specialization**

Select Specialization

**Doctor Name**

Enter Doctor Name

**Doctor Clinic Address**

Enter Doctor Clinic Address

**Doctor Consultancy Fees**

Enter Doctor Consultancy Fees

**Doctor Contact no**

Enter Doctor Contact no

**Doctor Email**

admin

**Password**

.....

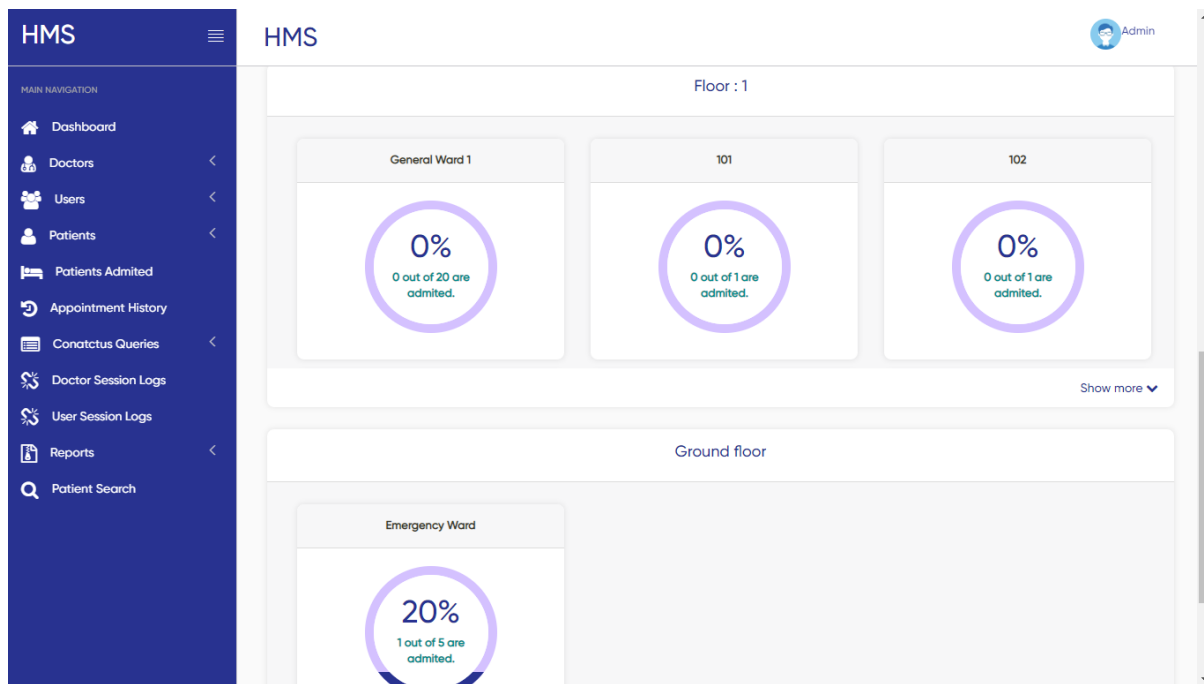
**Confirm Password**

Confirm Password

Submit

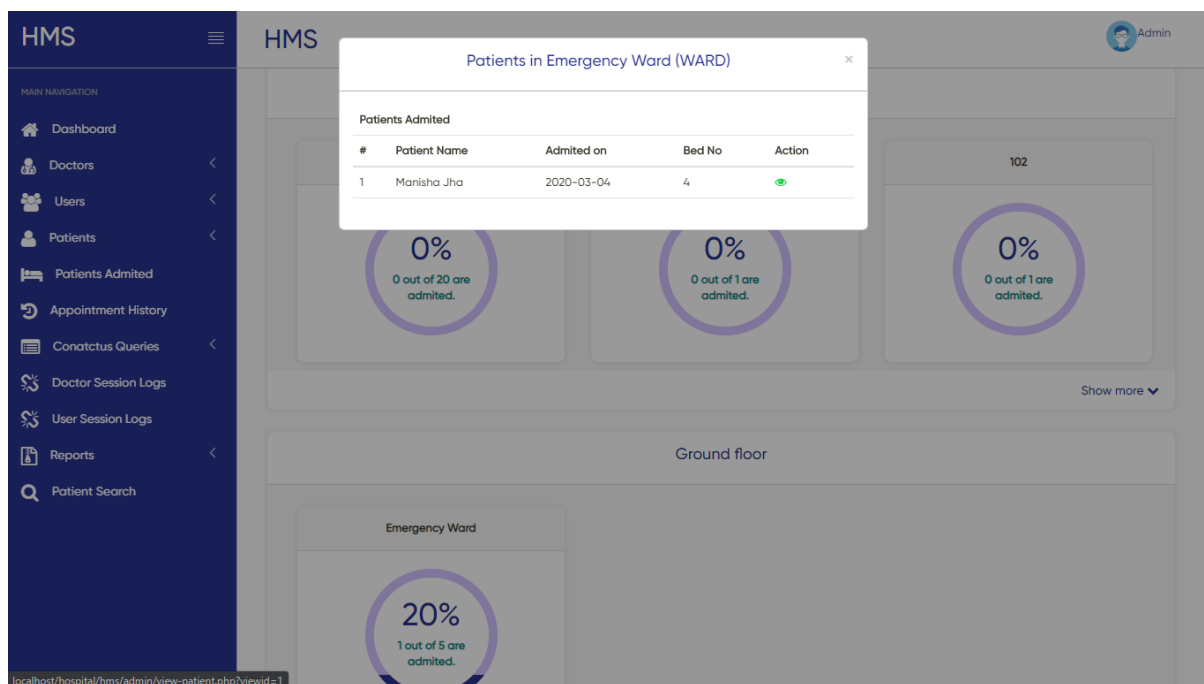
[Fig 7.19 Doctors Management]

- All department details with patients admitted



[Fig 7.20 Departments Details]

- All department details with patients admitted



[Fig 7.21 Patients admitted in department]

## Admit Patient with location and duration selection

**HMS**

MAIN NAVIGATION

- Dashboard
- Doctors
- Users
- Patients
- Patients Admitted
- Appointment History
- Contact Queries
- Doctor Session Logs
- User Session Logs
- Reports
- Patient Search

**HMS**

Doctor / Manage Patients

**Admit Patient**

Department  
General Ward 3 (WARD)

Bed number  
Select from Available beds ⓘ

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20		

Duration for admit  
Tap here to select

**Submit**

Patient Name  
Patient Mobile  
Patient Gender  
Patient Medical History

#	Blood Pressure	Weight	Blood Sugar	Body Temperature	Medical Prescription	Visit Date
1	90/120	86 kg	92/190	99 deg	#Sugar High 1.Petz 30	2019-11-06 10:01:24

[Fig 7.22.1 Admit Patient - 1]

**HMS**

MAIN NAVIGATION

- Dashboard
- Doctors
- Users
- Patients
- Patients Admitted
- Appointment History
- Contact Queries
- Doctor Session Logs
- User Session Logs
- Reports
- Patient Search

**HMS**

Doctor / Manage Patients

**Admit Patient**

Duration for admit  
From : 2020-04-14 - To : 2020-04-16

Please select two dates for duration.

« April 2020 »

Su	Mo	Tu	We	Th	Fr	Sa
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	1	2
3	4	5	6	7	8	9

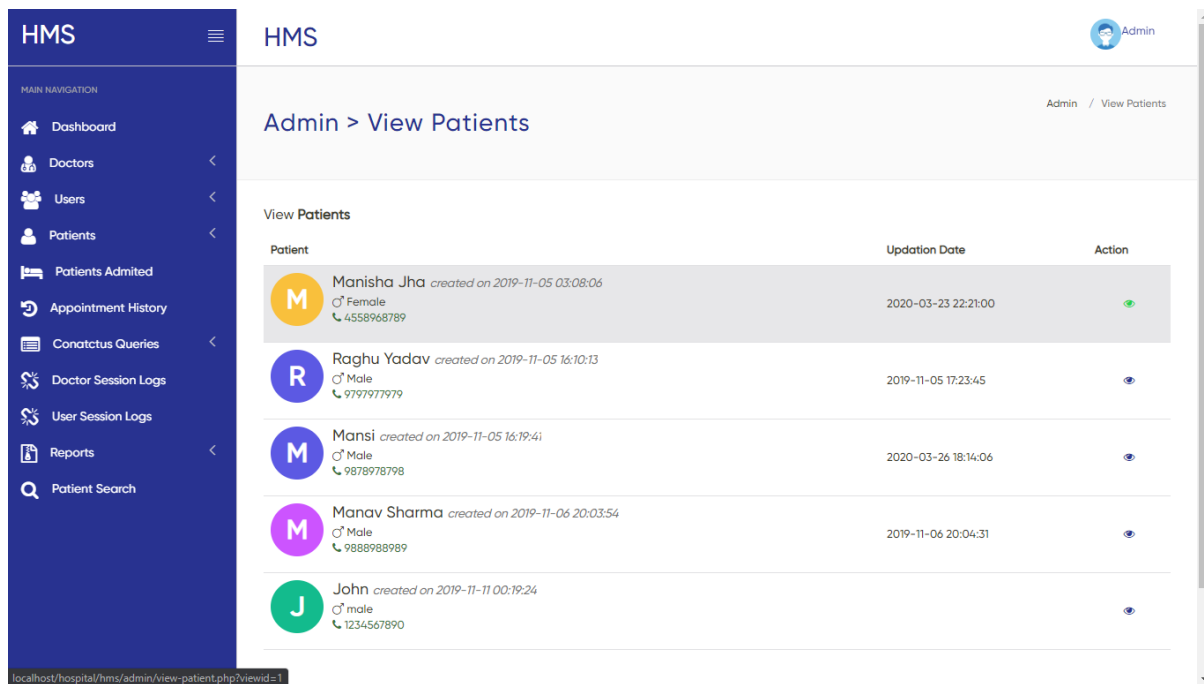
**Submit**

Patient Name  
Patient Mobile  
Patient Gender  
Patient Medical History

#	Blood Pressure	Weight	Blood Sugar	Body Temperature	Medical Prescription	Visit Date
1	90/120	86 kg	92/190	99 deg	#Sugar High 1.Petz 30	2019-11-06 10:01:24

[Fig 7.22.2 Admit Patient - 2]

## View and Manage Patients (Admin)



The screenshot displays the 'Admin > View Patients' interface. On the left is a dark blue sidebar with navigation options: Dashboard, Doctors, Users, Patients, Patients Admitted, Appointment History, Contact Queries, Doctor Session Logs, User Session Logs, Reports, and Patient Search. The main content area shows a table of patients.

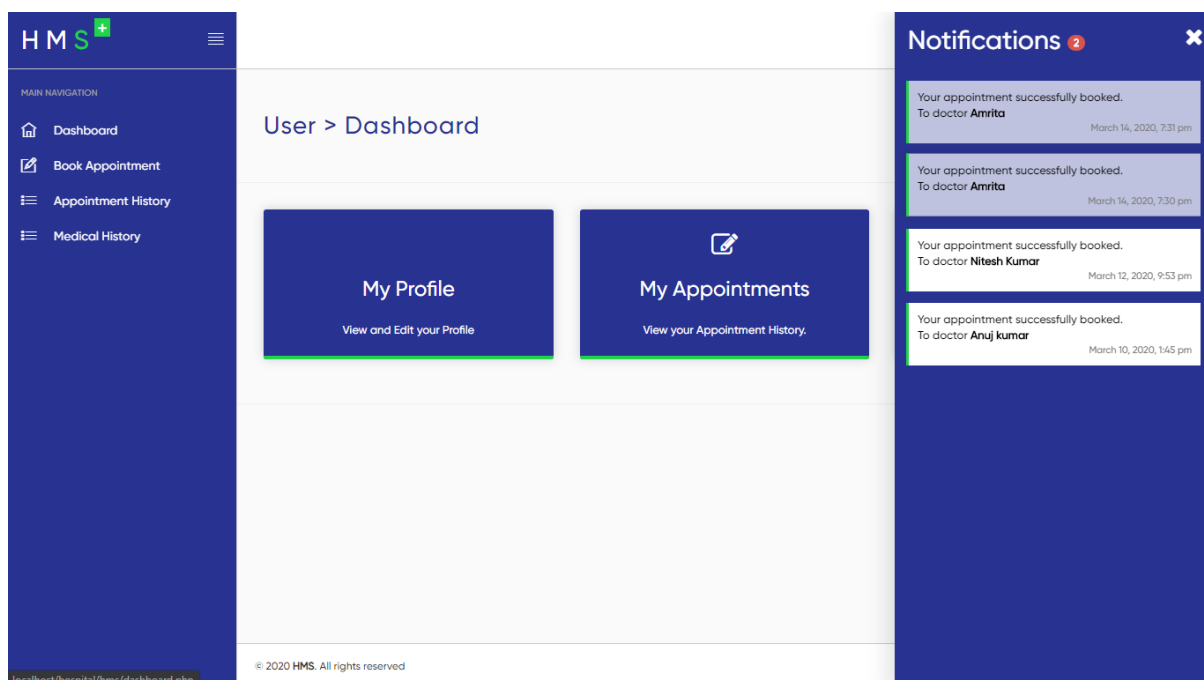
Patient	Update Date	Action
<b>M</b> Manisha Jha <small>created on 2019-11-05 03:08:06</small> <small>♀ Female</small> <small>4558968789</small>	2020-03-23 22:21:00	
<b>R</b> Raghu Yadav <small>created on 2019-11-05 16:10:13</small> <small>♂ Male</small> <small>9797977979</small>	2019-11-05 17:23:45	
<b>M</b> Mansi <small>created on 2019-11-05 16:19:41</small> <small>♀ Female</small> <small>9878978798</small>	2020-03-26 18:14:06	
<b>M</b> Manav Sharma <small>created on 2019-11-06 20:03:54</small> <small>♂ Male</small> <small>9888988989</small>	2019-11-06 20:04:31	
<b>J</b> John <small>created on 2019-11-11 00:19:24</small> <small>♂ male</small> <small>1234567890</small>		

At the bottom left, the URL `localhost/hospital/hms/admin/view-patient.php?viewid=1` is visible.

[Fig 7.23 View Patient]

## Notifications:

### In-app notifications



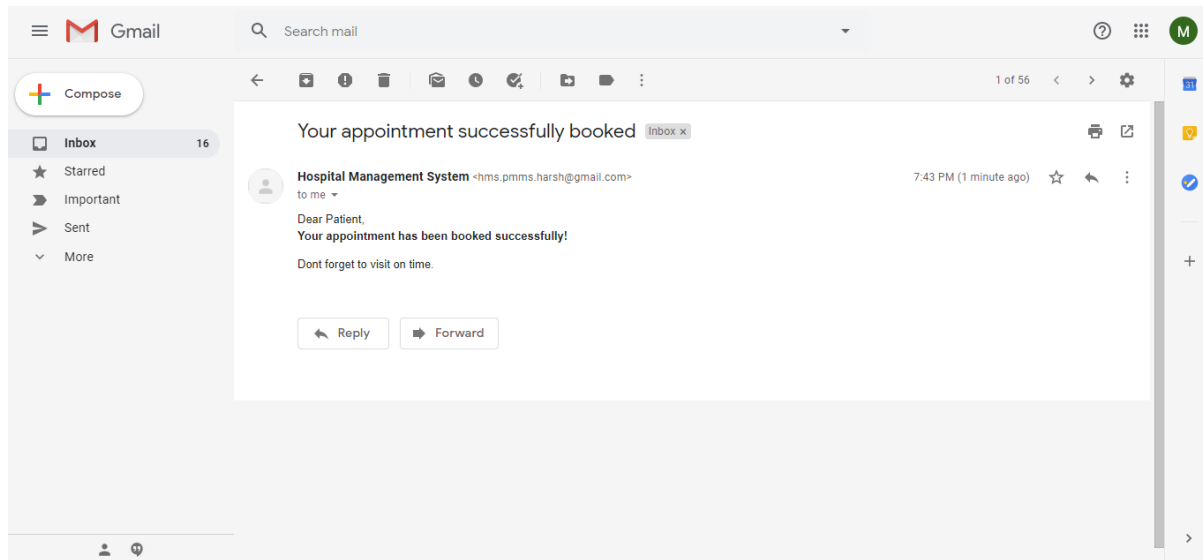
The screenshot shows the 'User > Dashboard' page. The sidebar on the left includes: Dashboard, Book Appointment, Appointment History, and Medical History. The main area contains two large buttons: 'My Profile' (View and Edit your Profile) and 'My Appointments' (View your Appointment History). A 'Notifications' overlay is present on the right, showing four messages:

- Your appointment successfully booked. To doctor **Amrita** (March 14, 2020, 7:31 pm)
- Your appointment successfully booked. To doctor **Amrita** (March 14, 2020, 7:30 pm)
- Your appointment successfully booked. To doctor **Nitesh Kumar** (March 12, 2020, 9:53 pm)
- Your appointment successfully booked. To doctor **Anuj kumar** (March 10, 2020, 1:45 pm)

At the bottom left, the URL `localhost/hospital/hms/dashboard.php` is visible. At the bottom center, the text '© 2020 HMS. All rights reserved' is displayed.

[Fig 7.24 Notifications in-app]

## ▪ Email notifications



[Fig 7.25 Email Notifications]

## **8. CONCLUSION AND FUTURE SCOPE**

### **8.1 Future Scope**

The hospital management system, our system is limited to one hospital. But what if we want to analyse data of all hospitals of a district or area and perform data mining and machine learning concepts to perform tasks like disease analysis, patient numbers per area, no of doctors required per area. By doing so we have to implement common data warehouse of all hospitals and by government permissions, we can have this system implemented in all hospitals and have centralized system at government office of that district and use modern technologies in this field.

### **8.2 CONCLUSION**

Our system is fully capable of maintaining and managing a hospital with automation in different departments of hospital and integrating these departments. By this we conclude that our project will help hospitals reducing their overhead, confusion and complexity. It will also help society by making people use digital technology. Also our system is implemented using niche technologies like mysql, php, bootstrap.

## REFERENCES

### 1. Internal Guide:

Prof. M D Titiya, Assistant professor, GEC Rajkot.

### 2. Websites:

Documentations:

- PHP: <https://www.php.net/manual/en/>
- MySQL: <https://dev.mysql.com/doc/refman/8.0/en/>
- Bootstrap: <https://getbootstrap.com/docs/3.3/>
- jQuery: <https://api.jquery.com/>

Others:

- <https://existek.com/blog/hospital-managment-system/>
- <http://programmerblog.net/create-mysql-trigger-php/>
- PHPMailer: <https://github.com/PHPMailer/PHPMailer>
- Hosting Guides: <https://www.comparethehosts.com/web-hosting-security-guide/>
- PHP security: <https://medium.com/@advanceidea/php-security-guide-1d725c92bf12>
- Data related to healthcare: <https://www.who.int/data/gho/info/gho-odata-api>