CHAPTER 1

INTRODUCTION

1.1 PROBLEM STATEMENT

In this busy world we don't have the time to wait in infamously long hospital queues. The problem is, queuing at hospital is often managed manually by administrative staff, then take a token there and then wait for our turn then ask for the doctor and the most frustrating thing we went there by traveling a long distance and then we come to knowthe doctor is on leave or the doctor can't take appointments. HMS will help us overcome all these problems because now patients can book their appointments at home, they can check whether the doctor they want to meet is available or not. Doctors can also confirm or decline appointments, this help both patient and the doctor because if the doctor declines' appointment then patient will know this in advance and patient will visit hospital only when the doctor confirms' the appointment this will save time and money of the patient.

1.2 PURPOSE

This software will help the company to be more efficient in registration of their patients and manage appointments, records of patients. It enables doctors and admin to view and modify appointments schedules if required. The purpose of this project is to computerize all details regarding patient details and hospital details.

1.3 SCOPE

The system will be used as the application that serves hospitals, clinic, dispensaries or other health institutions. The intention of the system is to increase the number of patients that can be treated and managed properly. If the hospital management system is file based, management of the hospital has to put much effort on securing the files. They can be easily damaged by fire, insects and natural disasters. Also could be misplaced by losing data and information.

1.4 DEFINITIONS, ACRONYMS AND ABBREVIATION

1.4.1 Definitions

- **Cardiologist** - treats heart disease.
- **Pediatrician** - treats infants, toddlers, children and teenagers.
- **Plastic Surgeon** - restores, reconstructs, corrects or improves in the shape and appearance of damaged body structures, especially the face.
- **Psychiatrist** - treats patients with mental and emotional disorders.
- **Ophthalmologist** - treats eye defects, injuries, and diseases.

1.4.2 Acronyms

- **SRS**: Software Requirement Specification.
- **DFD:** Data Flow Diagram.
- **ENT**- Ear, Nose and Throat Specialist.
- **BG** - Blood group

1.4.3 Abbreviations

- **Appt –** Appointment.
- **Sign up -** Creating New User.
- **Log in -** Logging in Existing User.
- **PhNo** - Mobile number.
- **Addr** – Address.
- **Expr** – Experience.

1.5 OVERVIEW

Our application contains two modules – the admin module and the user module. Our application will not only help the admin to preview the monthly and/or yearly data but it will also allow them to edit, add or update records. The software will also help the admin to monitor the transactions made by the patients and generate confirmations for the same. The admin will be able to manage and update information about doctors. The user module can be accessed by both the doctors and the patients. The doctor can confirm and/or cancel appointments. The doctors can even add prescriptions for their patients using our application. The patients will be able to apply for the appointment and make transaction for the same, and can even

cancel appointments with the doctors. They can track details about the previous transactions made by them.

1.5.1 Advantages

- The system automates the manual procedure of managing hospital activities.
- Doctors can view their patients' treatment records and details easily.
- It even generates an instant bill.
- The system is convenient and flexible to be used.
- It saves their time, efforts, money and resources.

1.5.2 Disadvantages

- Requires large database.
- The admin has to manually keep updating the information by entering the details in the system.
- Need internet connection.

CHAPTER 2

SOFTWARE REQUIREMENT SPECIFICATION

2.1 PRODUCT PERSPECTIVE

This E_Hospital System is a self-contained system that manages activities of the hospital. Due to improperly managed details medical center faces quite a lot of difficulties in accessing past data as well as managing present data. The fully functional automated hospital management system which will be developed through this project will eliminate the disadvantages caused by the manual system by improving the reliability, efficiency and performance. The usage of a database to store patient, employee, stock details etc. will accommodate easy access, retrieval, and search and manipulation of data. The access limitations provided through access privilege levels will enhance the security of the system. The system will facilitate concurrent access and convenient management of activities of the medical center.

2.2 SYSTEM INTERFACES

2.2.1 User Interfaces

- This section provides a detailed description of all inputs into and outputs from the system. It also gives a description of the hardware, software and communication interfaces and provides basic prototypes of the user interface.
- The **protocol used** shall be **HTTP**.
- The Port number used will be 80.
- There shall be logical address of the system in IPv4 format.

2.2.2 Hardware Interfaces

- **Laptop/Desktop PC**-Purpose of this is to give information when Patients ask information about doctors, medicine available lab tests etc. To perform such Action it need very efficient computer otherwise due to that reason patients have to wait for a long time to get what they ask for.
- **Laser Printer (B/W)** - This device is for printing patients' info etc.
- **Wi-Fi router** - Wi-Fi router is used to for internetwork operations inside of a hospital and simply data transmission from pc's to sever.

2.2.3 Software Interfaces

- **JDK 1.8** - Java is fast, secure, and reliable. From laptops to data centers, gameconsoles to scientific supercomputers, cell phones to the Internet,
- **Mysql server** - Database connectivity and management
- **OS Windows 7/8/8.1**- Very user friendly and common OS
- **JRE 1.8, Apache.**

2.3 SYSTEM SPECIFICATIONS

2.3.1 H/W Requirement

- Core i5 processor
- 2GB Ram.
- 20GB of hard disk space in terminal machines
- 1TB hard disk space in Server Machine

2.3.2 S/W Requirement

- Windows 7 or above operating system
- JRE 1.8
- Mysql server, Apache

2.4 COMMUNICATION INTERFACES

- **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 informationover the Internet
- **Ethernet Communications Interface**- Ethernet is a frame-based computer network technology for local area networks (LANs)
- Ubiquitous(widespread), easy to set up and easy to use. Low cost and high datatransmission rate.

2.5 PRODUCT FUNCTIONS

- Provide access to registered users only.
- Registration of new patients.
- Enable patient to view their record.
- Enable patient to update their record.
- Generate appointment date and timing.
- Confirmation by doctor.
- Patients can do Payment.
- Modification in schedule by patient.
- Admin access to patient's record.

2.6 DATA FLOW DIAGRAMS

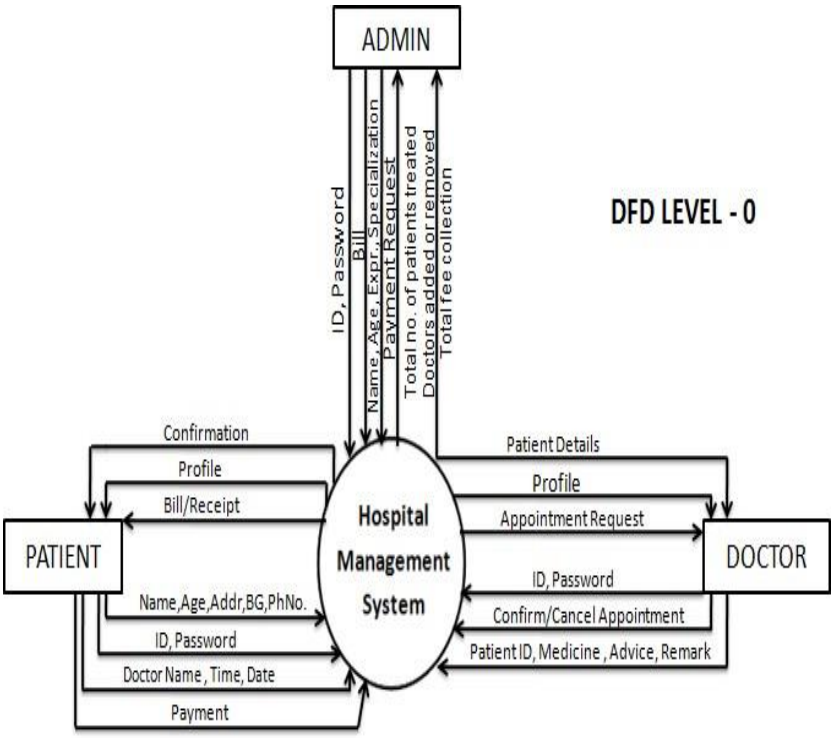

Fig 2.1 Context level DFD

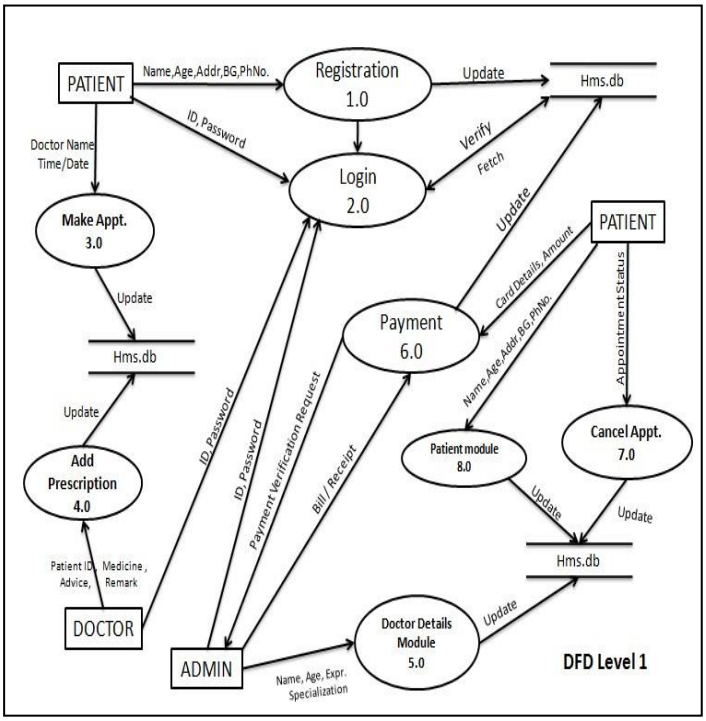

Fig 2.2 Level 2 DFD

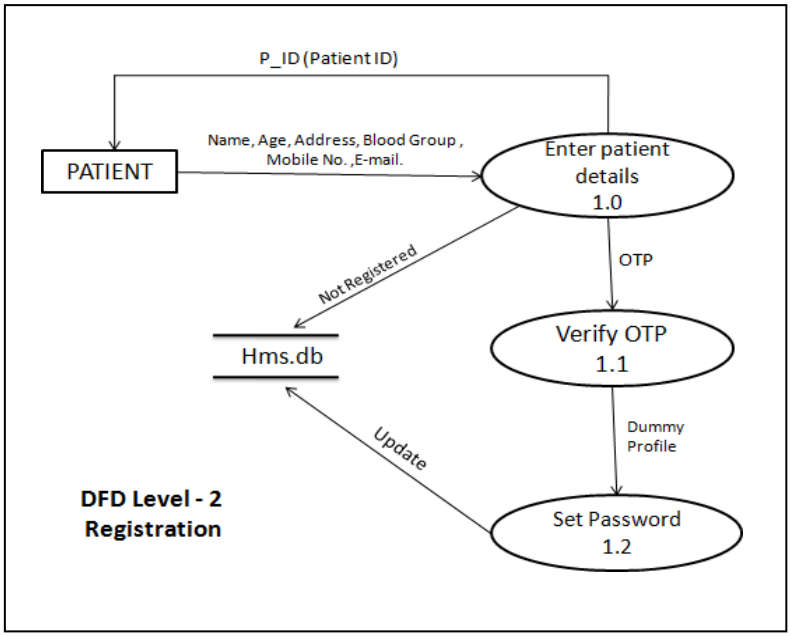

Fig 2.3 Level 2 DFD (Registration)

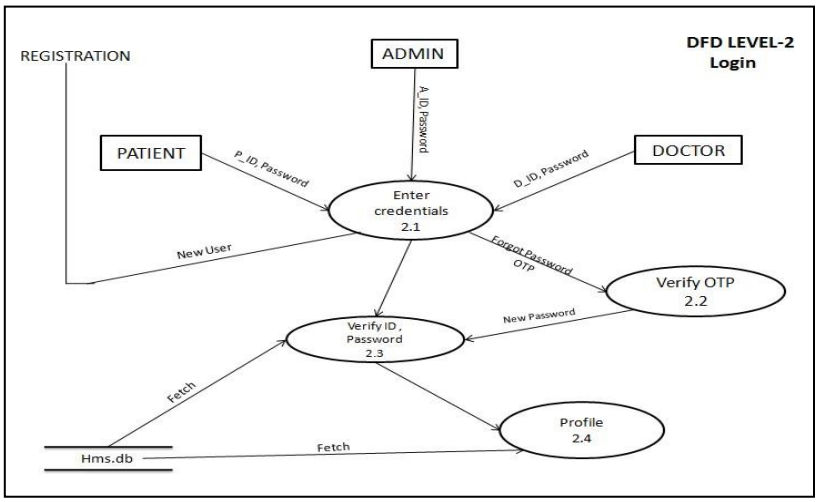

Fig 2.4 Level 2 DFD(Login)

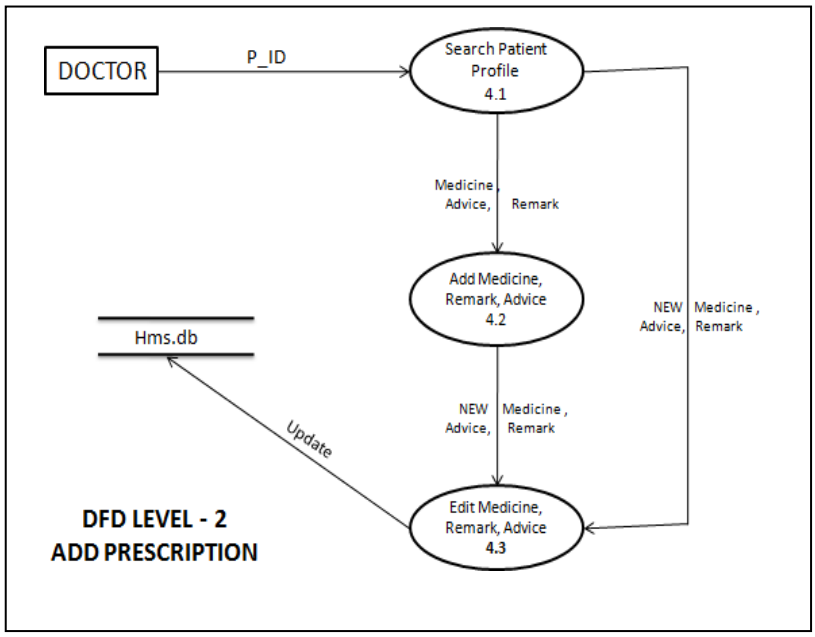

Fig 2.5 Level 2 DFD(Add Prescription)

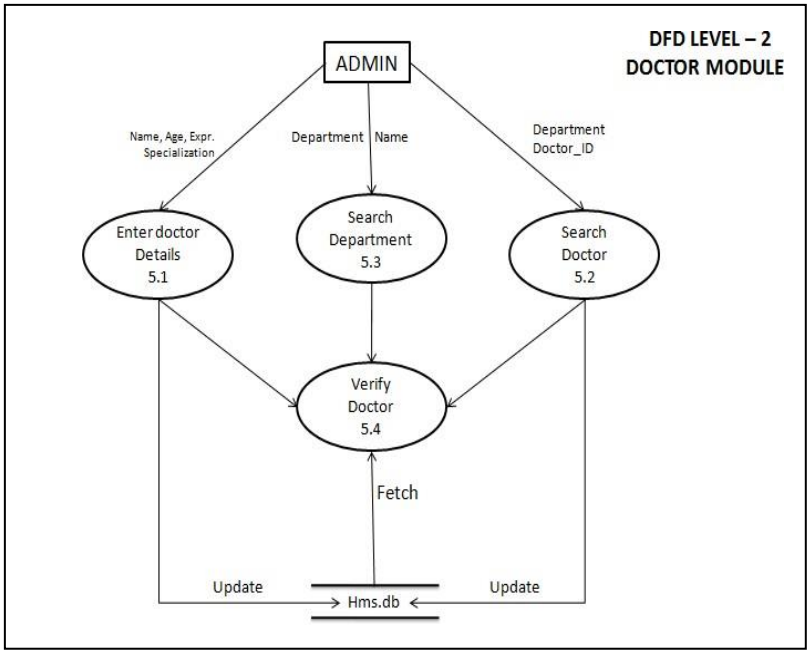

Fig 2.6 Level 2 DFD(Doctor Module)

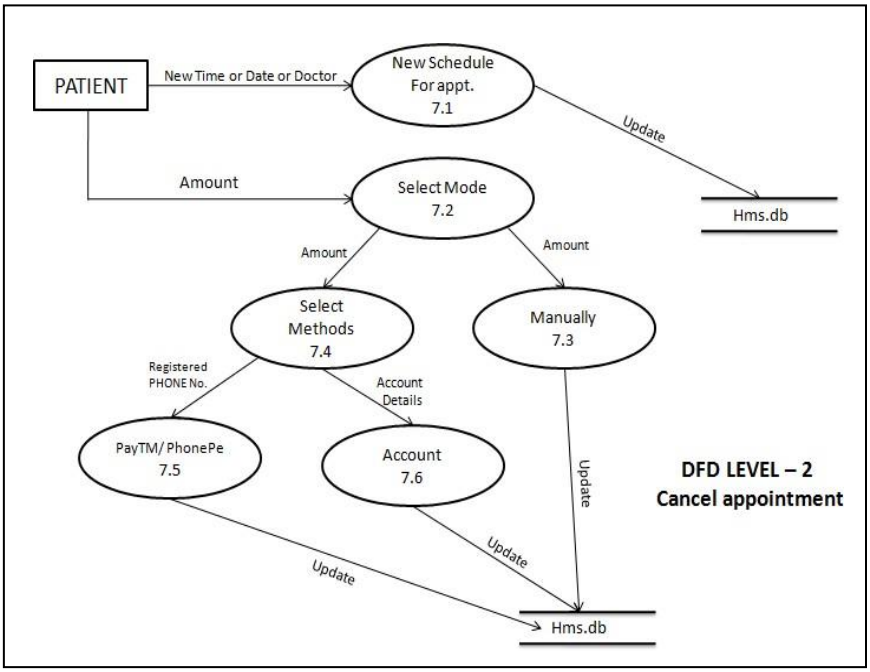

Fig 2.7 Level 2 DFD(Cancel Appointment)

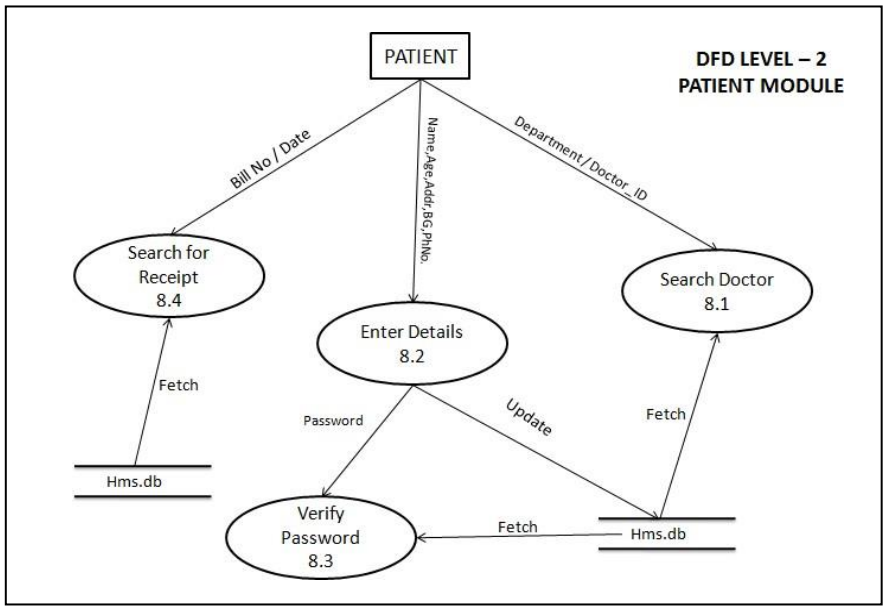

Fig 2.8 Level 2 DFD(Patient Module)

2.7 USE CASE DIAGRAM

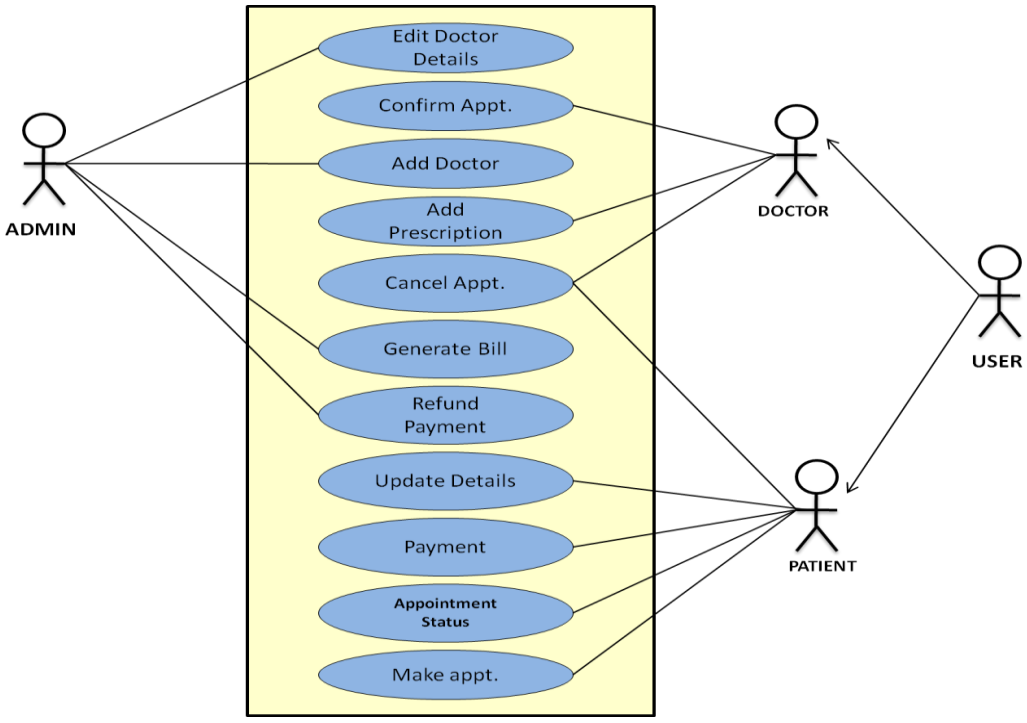

Fig 2.9 Use Case Diagram

2.8 USER CHARACTERISTICS

2.8.1 Admin

Admin has the full access to the system which means he is able to manage any activity with regard to the system. He is the highest privileged user who can access to the system.

2.8.1.1 Key Functions

- Access patient record, doctor Record.
- Add new doctor entry in system database.
- Confirm Payment and Generate Bill, View Records.

2.8.2 Patient

Patients can choose the best preferred appointments from the options provided and can also change the appointment schedule or cancel it. After appt. is confirmed by the respective doctor they can pay their consultant fee online. Patients have access to only their records.

2.8.2.1 Key Functions

- Make and cancel appointment
- Update Details.

2.8.3 Doctor

Doctors can view the patient appointment list and provide the confirmation or make changes in the appointment list if required. Doctors have access to only records of thosepatients whom they are treating.

2.8.3.1 Key Functions

- Confirmation of appointment.
- Cancellation of appointment.
- Modification of appointment list.
- Add Prescription.

2.8.4 Constraints

- System is wirelessly networked with an encryption.
- System is only accessible within the hospital's website only.
- Database is password protected.
- Should use less RAM and processing power.
- Each user should have individual ID and password.
- Only administrator can access the whole system.

2.8.5 Assumptions and dependencies

- Each user must have a valid user id and password
- Server must be running for the system to function
- Users must log in to the system to access any record.
- Only the administrator can delete records.

CHAPTER 3

FEASIBILITY STUDY

3.1 INTRODUCTION

A feasibility study is a detailed analysis that considers all of the critical aspects of a proposed project in order to determine the likelihood of it succeeding. Success in business may be defined primarily by return on investment, meaning that the project will generate enough profit to justify the investment. However, many other important factors may be identified on the plus or minus side, such as community reaction and environmental impact. Although feasibility studies can help project managers determine the risk and return of pursuing a plan of action.

3.2 TECHNICAL FEASIBILITY

The technical feasibility of an e-hospital refers to the assessment of whether it is possible to implement and maintain the required technology infrastructure to support electronic health services. Here are key aspects to consider:

- **Hardware Requirements:** Ensure that the necessary hardware components such as servers, computers, networking equipment, and storage facilities are available and can handle the anticipated workload.

- **Software Systems:** Identify and implement appropriate software systems for electronic health records (EHR), appointment scheduling, billing, and other hospital management functions. Ensure compatibility and integration among different software components to streamline processes.

- **Interoperability:** Establish standards for data interoperability to enable seamless exchange of information between different systems and healthcare providers.

- **Security and Privacy:** Implement robust security measures to safeguard patient data and comply with privacy regulations such as HIPAA (Health

Insurance Portability and Accountability Act). Utilize encryption, access controls, and regular security audits to protect against potential breaches.

- **Network Infrastructure:** Ensure a reliable and high-speed network infrastructure to support real-time communication, data transfer, and telemedicine services. Consider redundancy and failover mechanisms to minimize downtime.

- **Telemedicine Platform:** Implement a telemedicine platform to facilitate remote consultations and virtual health services. Ensure the platform supports video conferencing, secure messaging, and other necessary features.

- **Data Backup and Recovery:** Establish robust data backup and recovery mechanisms to prevent data loss and ensure quick restoration in case of system failures or disasters.

- **Scalability:** Design the e-hospital system to be scalable, accommodating potential growth in patient numbers, data volume, and additional functionalities.

- **Training and Support:** Provide training programs for healthcare professionals and staff to effectively use the electronic systems. Establish a support system to address technical issues promptly and efficiently.

- **Regulatory Compliance:** Ensure that the e-hospital system complies with relevant healthcare regulations and standards in the region or country of operation.

- **Costs:** Evaluate the initial setup costs, ongoing maintenance expenses, and potential return on investment to determine the financial viability of the e-hospital project.

- **User Experience:** Consider the user experience for both healthcare professionals and patients to ensure that the system is user-friendly and encourages adoption.

3.3 OPERATIONAL FEASIBILITY

Operational feasibility is one of the key aspects to consider when implementing an e-hospital system. It assesses whether the proposed system can be successfully integrated into the existing healthcare environment and whether it aligns with the organizational goals and objectives. Here are some considerations for operational feasibility in the context of an e-hospital:

- **Compatibility with Existing Systems:** Evaluate the compatibility of the e-hospital system with existing hospital management systems, electronic health records (EHRs), and other relevant software. Ensure seamless integration with laboratory information systems, pharmacy management systems, and other ancillary services.

- **User Acceptance and Training:** Assess the willingness of healthcare professionals, administrators, and other staff to adopt and use the new system. Provide comprehensive training programs to ensure that users are proficient in using the e-hospital system.

- **Workflow Integration:** Analyze how the e-hospital system will fit into existing workflows and processes. It should enhance efficiency and not disrupt daily operations. Identify potential bottlenecks or challenges in workflow and address them during the implementation phase.

- **Resource Requirements:** Evaluate the hardware and software requirements of the e-hospital system. Ensure that the organization has the necessary resources and infrastructure to support the system. Consider the financial and human resources needed for maintenance, updates, and ongoing support.

- **Regulatory Compliance:** Ensure that the e-hospital system complies with relevant healthcare regulations and standards. Address any legal and regulatory issues related to the storage, access, and sharing of patient information.

- **Scalability and Flexibility:** Assess whether the system can scale to accommodate the growing needs of the hospital. Ensure that the e-hospital system is flexible enough to adapt to changes in healthcare practices, regulations, and technologies.

- **Security and Privacy:** Implement robust security measures to protect patient data and ensure privacy. Address concerns related to data breaches, unauthorized access, and other security threats.

- **Interoperability:** Ensure that the e-hospital system can exchange information with other healthcare systems, facilitating seamless communication and collaboration. Consider standards such as HL7 and FHIR for interoperability.
- **Change Management:** Develop a change management plan to address resistance to change and foster a positive attitude towards the new system. Communicate the benefits of the e-hospital system to stakeholders and involve them in the decision-making process.

- **Monitoring and Evaluation:** Establish metrics to monitor the performance and effectiveness of the e-hospital system. Regularly evaluate the system's impact on patient care, operational efficiency, and overall organizational goals.

By thoroughly assessing these operational feasibility factors, we can increase the likelihood of a successful implementation of an e-hospital system. Conducting a thorough technical feasibility study that addresses these factors will help assess the viability of implementing an e-hospital and provide a solid foundation for successful implementation and operation.

3.4 BEHAVIOURAL FEASIBILITY

Behavioral feasibility is one aspect of feasibility analysis that assesses the willingness and ability of users to accept and adopt a proposed system or project. In the context of an e-hospital, which involves the implementation of electronic systems and technology in healthcare facilities, behavioral feasibility becomes crucial. Here are some considerations for behavioral feasibility in the context of an e-hospital:

- **User Acceptance:** Evaluate the acceptance level of healthcare professionals (doctors, nurses, administrative staff) towards the e-hospital system. Assess their willingness to embrace new technology and workflows. Understand how patients perceive the transition to electronic systems. It's important that patients feel comfortable and confident in the new technology.

- **Training and Support:** Assess the feasibility of providing adequate training programs for the staff to use the e-hospital system effectively. Training should cover both technical aspects and changes in workflow. Evaluate the availability of ongoing support mechanisms to address issues and concerns that may arise during the implementation and post-implementation phases.

- **Cultural and Organizational Impact:** Consider the impact of the e-hospital system on the existing organizational culture. Resistance to change is common, and efforts should be made to manage and mitigate any negative effects. Evaluate how the new system aligns with the values and practices of the healthcare organization. Ensure that it complements the existing processes and enhances rather than disrupts the current workflow.

- **Patient Interaction and Experience:** Assess how the e-hospital system will affect the overall patient experience. It should enhance communication, accessibility, and the quality of care. Understand the potential concerns or resistance from patients, and develop strategies to address these concerns through effective communication and education.

- **Legal and Ethical Considerations:** Evaluate the impact of the e-hospital system on patient confidentiality, privacy, and data security. Compliance with legal and ethical standards is crucial. Ensure that the system aligns with existing healthcare regulations and standards, and that all stakeholders are aware of and comfortable with the legal and ethical aspects.

- **Communication and Change Management:** Develop a comprehensive communication plan to keep all stakeholders informed about the e-hospital implementation. Clear communication can help manage expectations and address concerns. Implement effective change management strategies to facilitate a smooth transition, addressing any resistance or challenges as they arise.

By addressing these behavioral feasibility considerations, you can better ensure the successful adoption and integration of an e-hospital system within the healthcare organization.

CHAPTER 4

DESIGN

4.1 DATA DICTIONARY

1.	legal_character	[a-z|A-Z]
2.	Digit	[0-9]
3.	special_ch	[@|$|#|+|-]
4.	Blood	[A|B|AB|O]

Table 4.1 Type of Data

1.	Name	first_name+(middle_name)+last_name
2.	first_name	{legal_character}*
3.	middle_name	{legal_character}*
4.	last_name	{legal_character}*
5.	P_ID	{legal_character+digit}*
6.	D_ID	{legal_character+digit}*
7.	A_ID	{legal_character+digit}*
8.	Password	{legal_character+digit+special_ch}*
9.	Address	House_no+(Street)+City
10.	House_no	{legal_character+digit}*
11.	Street	{legal_character}*
12.	City	{legal_character}*
13.	MobileNo.	{digit}*
14.	Blood_Group	{Blood+special_ch}*
15.	Specialization	{legal_character}*
16.	ConsultantFee	{digit}*
17.	Medicine	{legal_character+digit}*
18.	Advice	{legal_character+digit}*
19.	Remark	{legal_character+digit}*

Table 4.2 Data Dictionary

4.2 ER – DIAGRAM

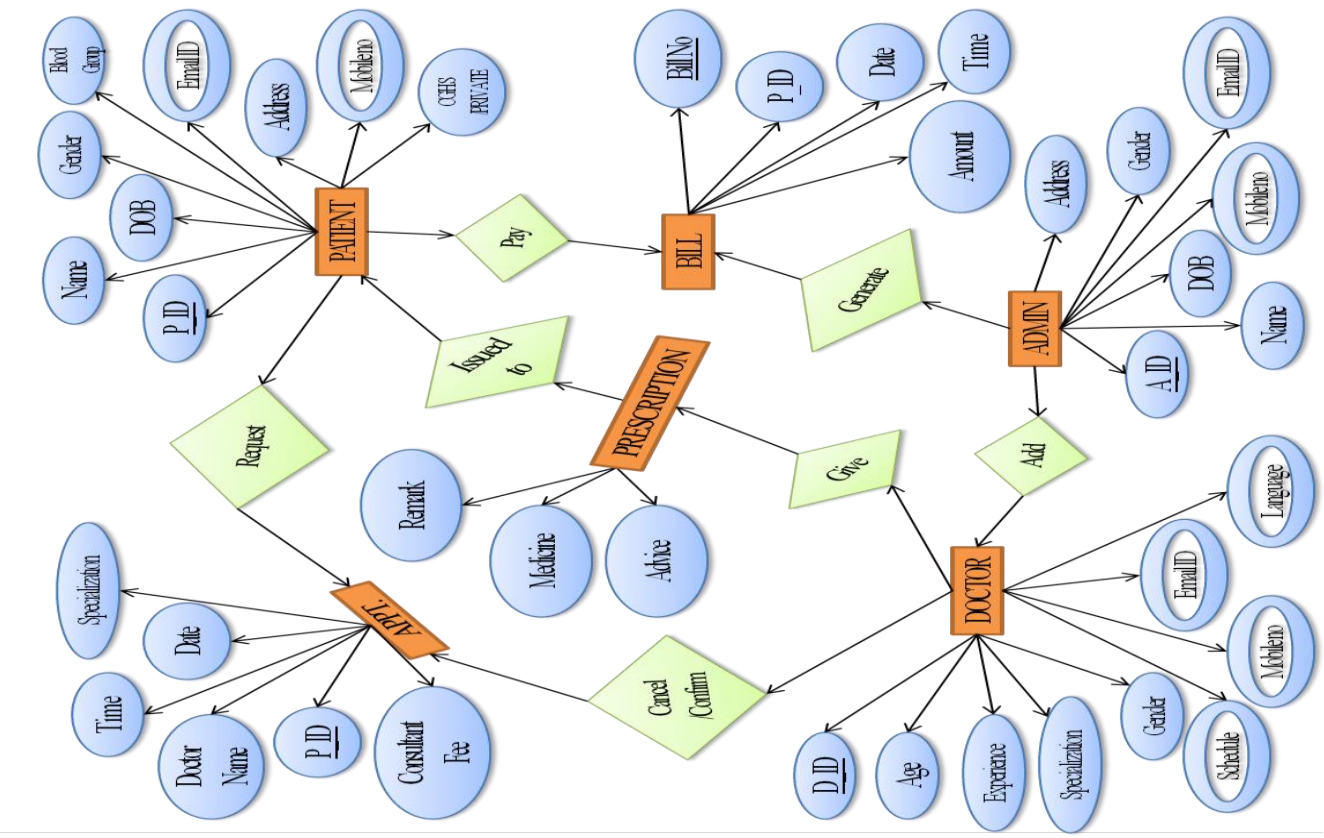

Fig 4.1 ER-Diagram

4.3 DATA DESIGN

SNO.	COLUMN NAME	DATA TYPE	CONSTRAINTS	DESCRIPTION
1.	P_ID	Varchar(50)	PrimaryKey	ContainsUniqueId
2.	Name	Varchar(50)	-	ContainsName
3.	DOB	Varchar(50)	-	ContainsDateOf Birth
4.	Gender	Varchar(50)	-	ContainsGender
5.	BloodGroup	Varchar(50)	-	ContainsBloodGroup

6.	EmailID	Varchar(50)	-	ContainsEmailId
7.	Address	Varchar(50)	-	ContainsAddress
8.	MobileNo.	Integer	-	ContainsMobileNo.
9.	CGHS/Private	Varchar(50)	-	ContainsCategory

Table 4.3 Patient

SNO.	COLUMN NAME	DATA TYPE	CONSTRAINTS	DESCRIPTION
1.	P_ID	Varchar(50)	PrimaryKey	Contains UniqueId Patient
2.	Specialization	Varchar(50)	-	Contains Name of the Department in which Patient wants to visit
3.	Doctor's Name	Varchar(50)	-	Contains Doctor Name Patient Wants To Visit
4.	Consultant Fee	Integer	-	Contains Consultant Fee Of Doctor
5.	Date	Date	-	Contains Date For The Appoint

				ment
6.	Time	Time	-	Contains Time For The Appointment

Table 4.4 Appointment

SNO.	COLUMN NAME	DATA TYPE	CONSTRAINTS	DESCRIPTION
1.	D_ID	Varchar(50)	PrimaryKey	Containsuniq ueID
2.	Age	Integer	-	Containsage
3.	Gender	Varchar(50)	-	Containsgender
4.	Specialization	Varchar(50)	-	Contains Specialization
5.	Experience	Varchar(50)	-	Containsexperienceofthedoctor (Inmonths)
6.	Language	Varchar(50)	-	Contains in howmanylanguages doctorcanspeak.
7.	MobileNo.	Integer	-	Containsmobile

				Number
8.	EmailID	Varchar(50)	-	ContainsEmailId
9.	Schedule	Varchar(50)	-	Contains day andtimefor whichthe Doctoris availabl e

Table 4.5 Doctor

SNO.	COLUMN NAME	DATATYPE	CONSTRAINTS	DESCRIPTION
1.	D_ID	Varchar(50)	-	ContainsuniqueID
2.	P_ID	Varchar(50)	PrimaryKey	ContainsuniqueID
3.	Medicine	Varchar(50)		Containsnameoft he medicine.
4.	Remark	Varchar(50)		Contains Remarkgivenbythe doctor forthepatient.
5.	Advice	Varchar(50)		Contains any advice For the patient.

Table 4.6 Prescription

SNO.	COLUMNNAME	DATATYPE	CONSTRAINTS	DESCRIPTION
1.	A_ID	Varchar(50)	PrimaryKey	ContainsuniqueID.
2.	Name	Varchar(50)	-	ContainsName

3.	DOB	Varchar(50)	-	ContainsDateOf Birth
4.	Gender	Varchar(50)	-	ContainsGender
5.	EmailID	Varchar(50)	-	ContainsEmailId
6.	MobileNo.	Integer	-	ContainsMobileNo.
7.	Address	Varchar(50)	-	ContainsAddress

Table 4.7 Admin

SNO.	COLUMNNAME	DATATYPE	CONSTRAINTS	DESCRIPTION
1.	P_ID	Varchar(50)	-	ContainsuniqueID.
2.	BillNo.	Varchar(50	PrimaryKey	Containsnumberof thebill.
3.	Date	Varchar(50	-	ContainsDateofThe bill.
4.	Time	Varchar(50	-	ContainsTimeofthe billgenerated.
5.	Amount	Int	-	Containsamountof thebill.

Table 4.8 Bill

CHAPTER 5

SAMPLE SCREENSHOTS

The following screenshots show the various process involved in this e_hospital solution. They include creation of account, sign-in process, transaction details, and delete account.

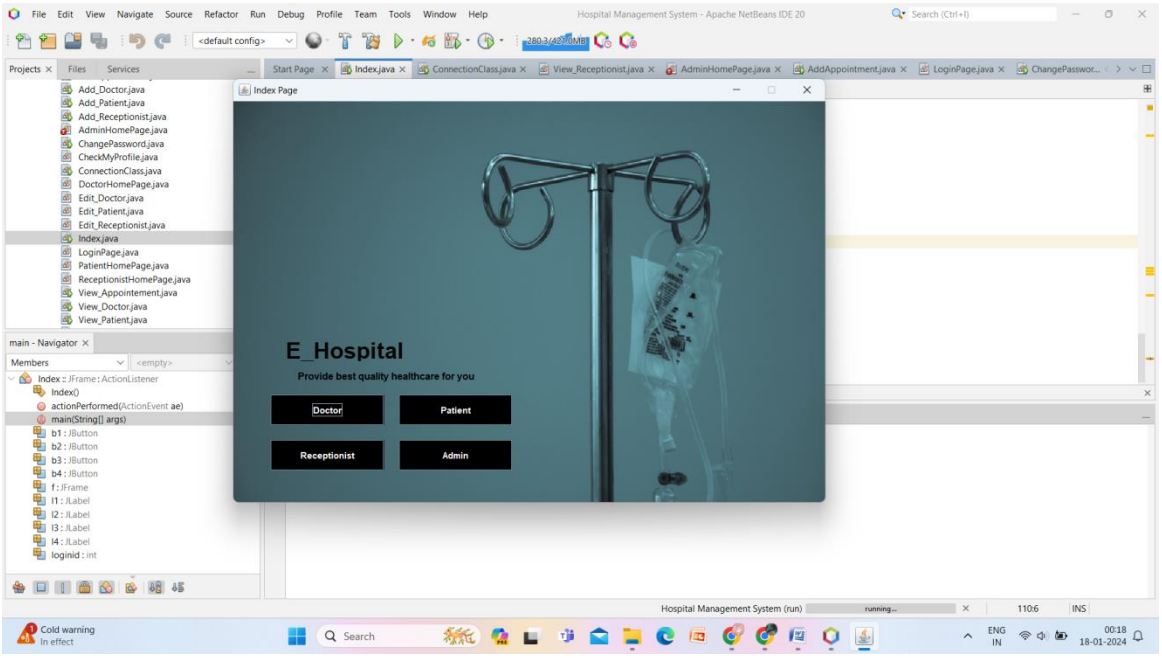

Fig 5.1 Dashboard Page

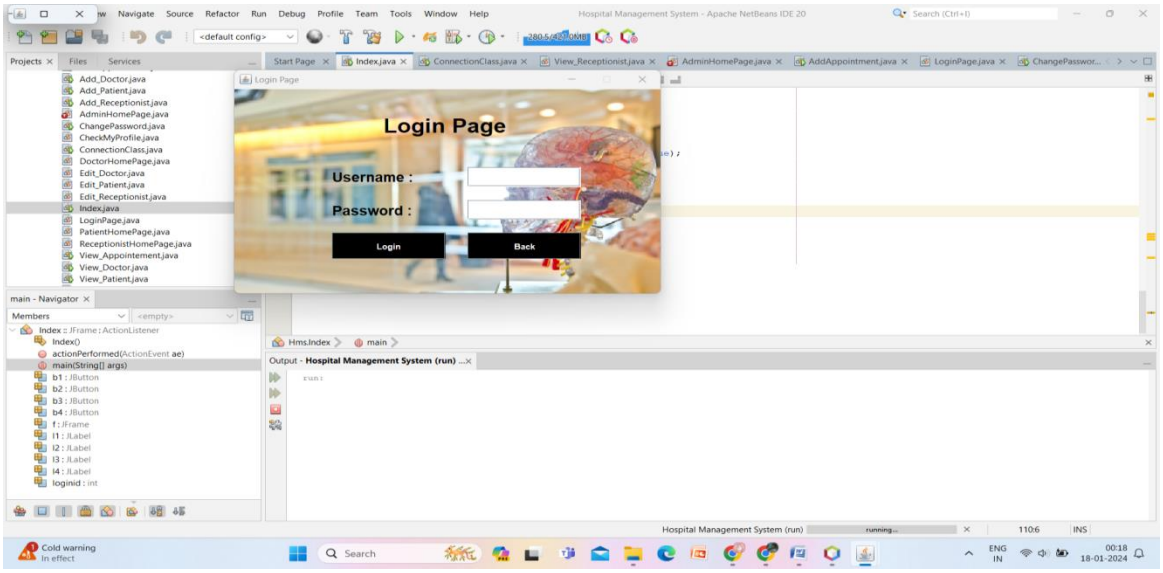

Fig 5.2 Member Login

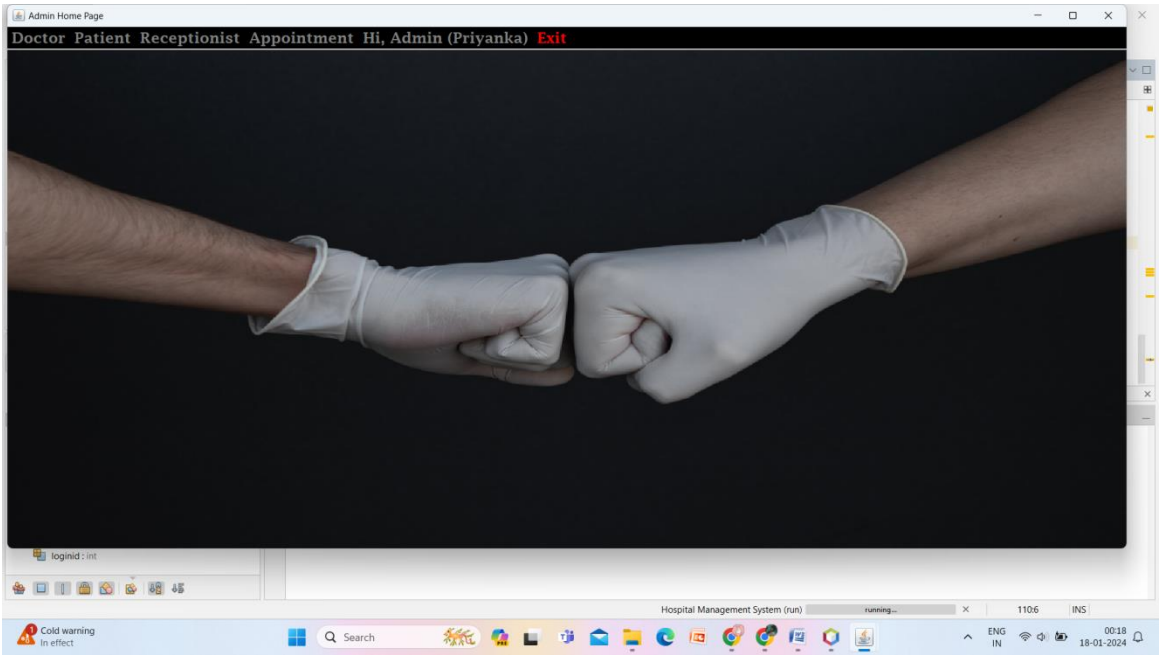

Fig 5.3 Admin Page

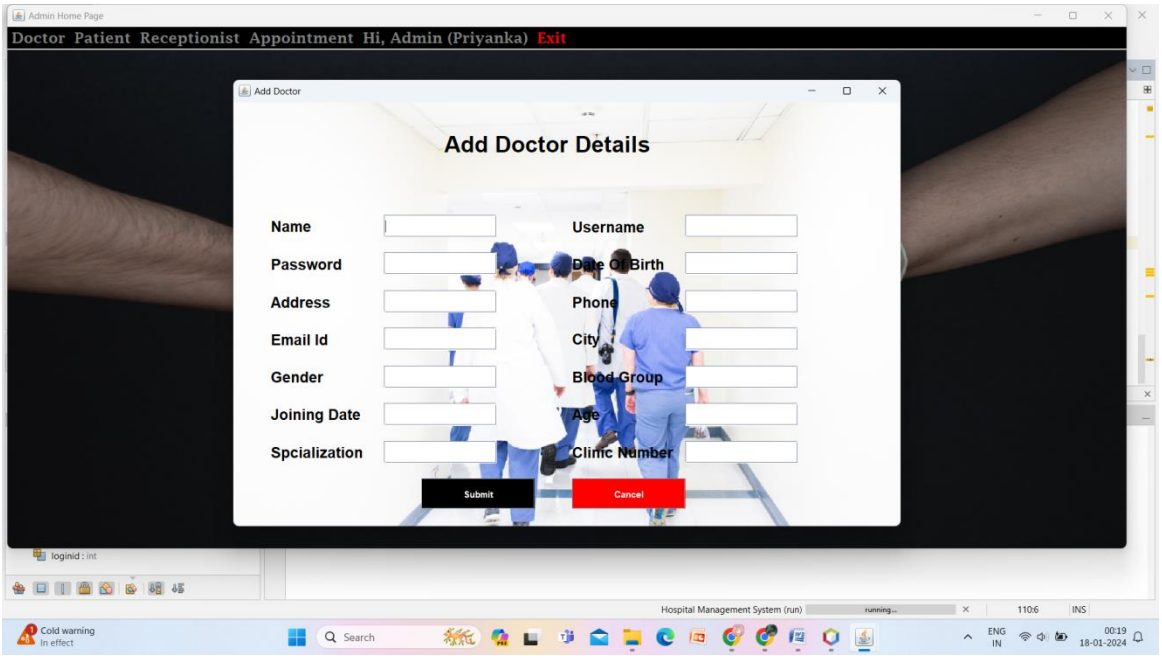

Fig 5.4 Add Doctor Details

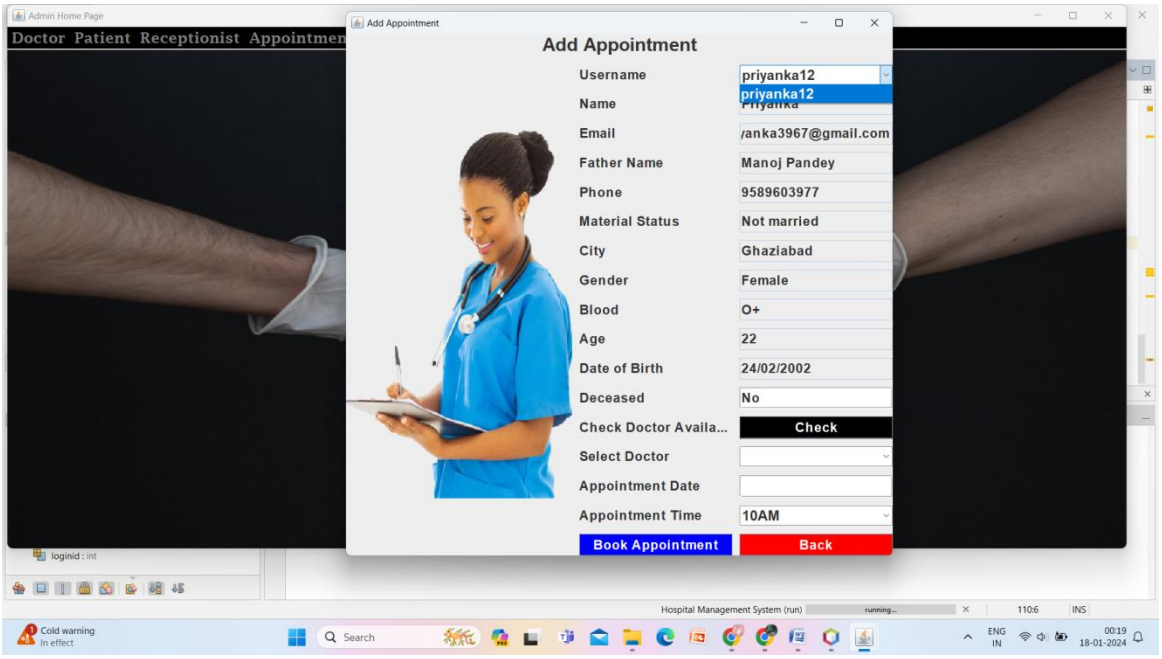

Fig 5.5 Add Appointment

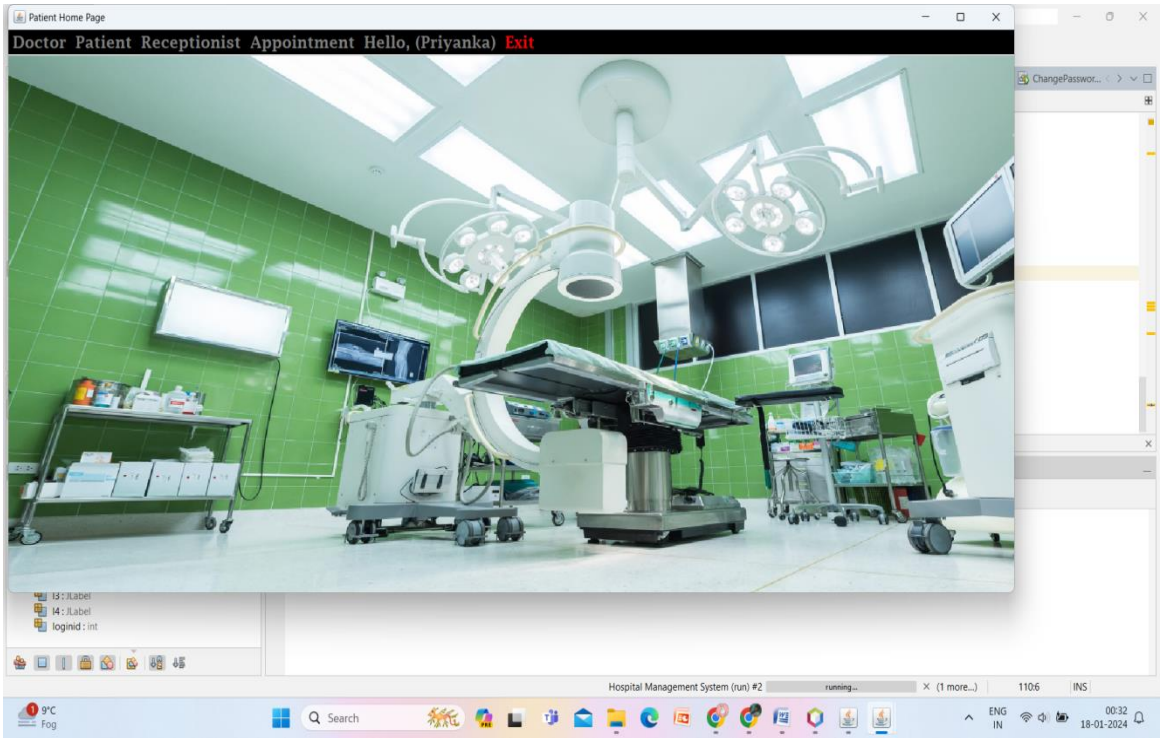

Fig 5.6 Patient Home Page

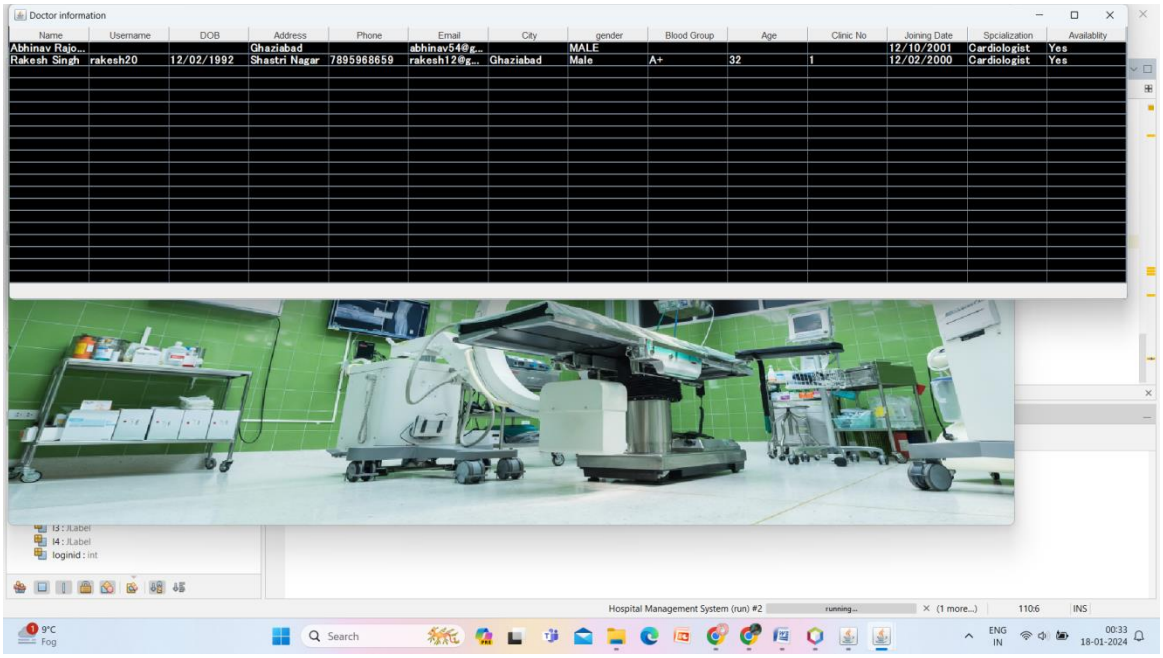

Fig 5.7 View Doctor

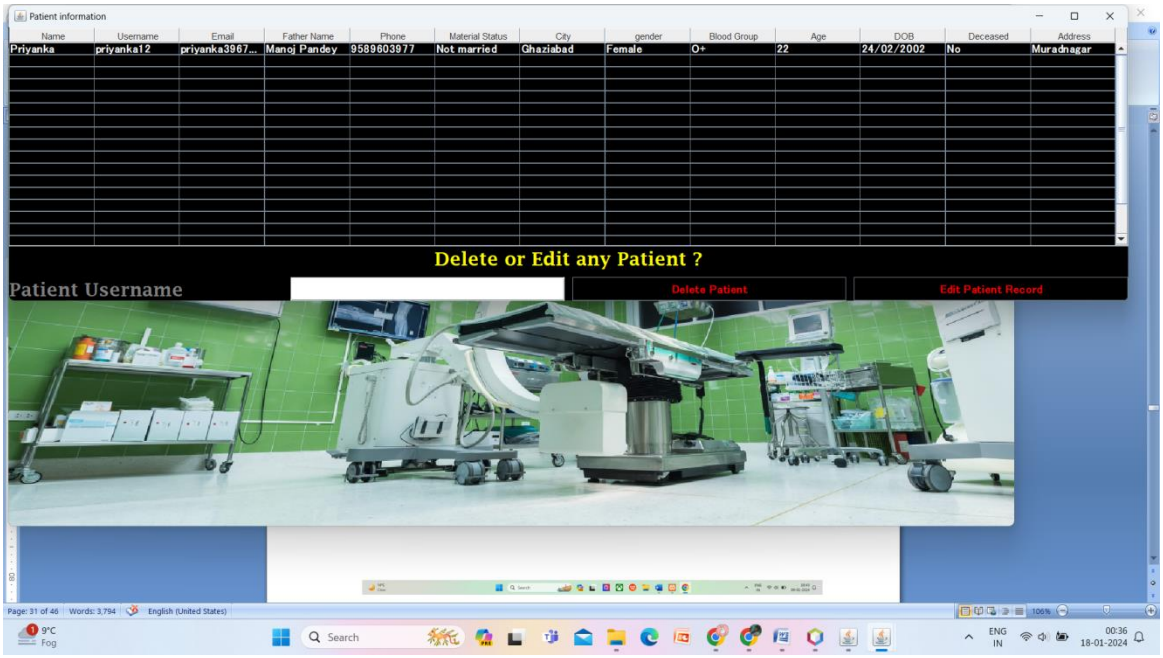

Fig 5.8 View Patient

CHAPTER 6

TESTING

After completing every part of the software there is the need for software testing to prove that the module are functioning properly or not and it fulfills all requirement of the user. For this, the programmer use various type of software testing techniques and strategies. Software can be tested in one of two ways -

- **Black - Box Testing -:** Knowing the specified function that a product has been designed to perform, tests can be conducted that demonstrate each function is fully operational while at the same time searching for errors in each function.

- **White - Box Testing -:** Knowing the internal working of product, tests can be conducted to ensure that "all gears mesh", that is internal operations are performed according to specification and internal component have been adequately exercised.

- **Unit Testing:** Verify the correctness of individual components and functions.

- **Integration Testing:** Validate the interactions between different modules and components.

- **System Testing:** Ensure the entire system works as intended.

BIBILIOGRAPHY

The E_Hospital stands as a beacon of innovation in the realm of hospital services, conceived and developed by a dedicated team and librarians with a vision to transform traditional hospital operations into a seamless digital experience. From its inception in [Year], E_Hospital underwent meticulous development phases, resulting in a robust platform that prioritizes efficiency, accessibility, and a delightful user experience. Boasting a user-friendly interface, E_Hospital empowers both patients and doctors to navigate the system effortlessly. The project was successfully completed after a lot of efforts and work hours. This project underwent number of compiling, debugging, removing errors, making it bug free, adding more facilities in E_Hospital and interactivity making it more reliable and useful. This project focused that scheduling a project and adhering to that schedule creates a hard sense of time-management. It has also let us known that co-operative team work always produce effective results. The entire project has been developed and deployed as per the requirements stated by the user. It is found to be bug free as per the testing standards that are implemented.