

HOSPITAL MANAGEMENT SYSTEM

A MINI PROJECT REPORT

Submitted by

B N GNANESWAR REDDY

211422104127

VIGNESH MOKSHITH FRANCIS

211422104121

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING



PANIMALAR ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to Anna University, Chennai)

OCTOBER 2024

PANIMALAR ENGINEERING COLLEGE
(An Autonomous Institution, Affiliated to Anna University, Chennai)

BONAFIDE CERTIFICATE

Certified that this project report “**HOSPITAL MANAGEMENT SYSTEM**” is the bonafide work of BN GNANESWAR REDDY (211422104127) & VIGNESH MOKSHITH FRANCIS (211422104121) who carried out the project work under my supervision.

SIGNATURE

Dr.L.JABASHEELA, M.E., Ph.D
HEAD OF THE DEPARTMENT,
DEPARTMENT OF CSE,
PANIMALAR ENGINEERING COLLEGE,
NASARATHPETTAI,
POONAMALLEE,
CHENNAI-600 123.

SIGNATURE

Dr.M.MAHESWARI, M.TECH.,Ph.D,
SUPERVISOR,
DEPARTMENT OF CSE,
PANIMALAR ENGINEERING COLLEGE,
NASARATHPETTAI,
POONAMALLEE,
CHENNAI-600 123.

Certified that the above candidate(s) were examined in the Mini Project Viva-Voce Examination held on.....

INTERNAL EXAMINER

EXTERNAL EXAMINER

ACKNOWLEDGEMENT

We express our deep gratitude to our respected Secretary and Correspondent **Dr.P.CHINNADURAI, M.A., Ph.D.** for his kindwords and enthusiastic motivation, which inspired us a lot in completing this project.

We would like to extend our heartfelt and sincere thanks to our Directors **Tmt. C. VIJAYARAJESWARI , Dr. C . SAKTHIKUMAR , M.E. , Ph.D.,** and **Tmt. SARANYASREE SAKTHIKUMAR B.E.,M.B.A.,** for providing us with the necessary facilities for completion of this project.

We also express our gratitude to our Principal **Dr.K.MANI, M.E., Ph.D.** for his timely concern and encouragement provided to us throughout the course.

We thank the HOD of CSE Department , **Dr.L.JABASHEELA ,M.E.,Ph.D.,**for the support extended throughout the project.

We would like to thank my Project Guide **Dr.M.MAHESWARI.M.Tech, Ph.D.** and all the faculty members of the Department of CSE for their advice and suggestions for the successful completion of the project.

B N GNANESWAR REDDY
VIGNESH MOKSHITH FRANCIS

ABSTRACT

In the modern healthcare landscape, there is a growing need for hospitals to adopt cutting-edge technologies to enhance patient care, improve operational efficiency, and streamline administrative tasks. While many hospitals utilize basic management systems, our **Advanced Hospital Management System (HMS)** introduces a novel, next-generation approach by integrating features and functionalities that are currently not widespread in existing healthcare management solutions. This project focuses on developing a **smart hospital management system** that goes beyond traditional patient registration, appointment scheduling, and billing services. The HMS incorporates **patient monitoring**, making it a groundbreaking solution in hospital management. Ensuring data integrity and security, the system employs technology to store and share medical records. This not only guarantees that patient data is immutable and securely shared between healthcare providers but also enhances privacy by giving patients full control over their data access. This project proposes the development of a web-based application that automates hospital operations, making them more efficient and accessible. The system will enable hospitals to manage patient registration, appointments, billing, medical records, inventory, and reporting through a secure, user-friendly website.

TABLE CONTENTS

Chapter no	Title	Page no
	ABSTRACT	
	LIST OF TABLES	
	LIST OF FIGURES	
1.	INTRODUCTION	01
	1.1 overview	01
	1.2 Problem Definition	02
2.	SYSTEM ANALYSIS	03
	2.1 Existing System	03
	2.2 Proposed System	04
	2.3 Development Environment	05
3.	SYSTEM DESIGN	06
	3.1 UML Diagram	06
	3.2 Data Dictionary	11
	3.3 ER Diagram	15
	3.4 Data Flow Diagram	16
4.	SYSTEM ARCHITECTURE	19
	4.1 Architecture Overview	19
	4.2 Module Description	20
5.	SYSTEM IMPLEMENTATION	25
	5.1 Management System Implementation	25
	5.2 Hospital Management Interface	30
	5.3 Hospital System Portal	34

6.	SYSTEM TESTING	49
	6.1 Test Cases and Reports	49
7.	CONCLUSION	53
	7.1 Conclusion	53
	7.2 Future Enhancements	53
8.	APPENDICES	56
	Sample screen shots	56
9.	REFERENCES	59

LIST OF FIGURES

FIG NO	FIGURE DESCRIPTION	PAGE NO
3.1.1	Use Case Diagram for Hospital Management system	06
3.1.2	Class Diagram for Hospital Management system	07
3.1.3	Sequence Diagram for Hospital Management system	08
3.1.4	Collaboration Diagram for hospital Management system	09
3.1.5	Activity Diagram for Hospital Mangement system	10
3.3	ER Diagram for Hospital Management system	15
3.4.1	Dataflow Diagram level-0	16
3.4.2	Dataflow Diagram level-1	17
3.4.3	Dataflow Diagram level-2	18
4.1	Architecture Diagram for Hospital Management system	19
5.2	Hospital System interface	30
5.2.1	Hospital admin dashboard	31
5.2.2	Hospital patient details	32
5.2.3	Doctor deatils	33
5.2.4	Hospital bills	34
6.1	Test report and cases	49
8.1	Admin dashboard	56
8.1.2	Patient details	57
8.1.3	Doctor details	58
8.1.4	Appointment details	59

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

In many hospitals, particularly those operating in rural or underserved areas, there is often an absence of computerized systems for managing day-to-day operations. These hospitals rely on manual methods such as paper-based records, phone calls for appointment scheduling, and manual billing, which can lead to inefficiencies, errors, and delays in patient care. The **Hospital Management System (HMS)** aims to transform such environments by introducing a comprehensive, automated solution to streamline hospital operations and improve healthcare service delivery. Time-Consuming: Every process, from registration to billing, requires manual labor, making tasks slow and inefficient.

Error-Prone Handwritten records can lead to miscommunication, calculation mistakes, or incorrect entries. Difficulty in Record Keeping: Managing large volumes of patient data and medical records manually can lead to disorganization, loss of records, or delays in accessing information. Poor Interdepartmental Coordination: Manual coordination between departments like pharmacy, lab, and billing is slow, leading to delays in patient care.

A non-computerized hospital management system allows for basic operations but suffers from inefficiency, error-prone processes, and poor coordination. As patient volumes and healthcare demands grow, such systems become increasingly difficult to manage, making the case for the gradual introduction of digital tools to improve operations, accuracy, and patient care.

1.2 PROBLEM DEFINITION

The **Hospital Management System** introduces a computerized platform that addresses the above challenges by replacing manual processes with an automated system. The HMS will bring the following enhancements to hospitals where no such system currently exists

1. Patient Registration
2. Appointment Scheduling
3. Billing and Invoicing
4. Doctor and Staff Management
5. Reporting and Analytics

The primary challenges include

- **Patient Registration and Records Management:** Manual record-keeping results in misplaced or lost patient files, slow access to patient information, and errors in data entry. It becomes increasingly difficult to manage patient histories and ensure continuity of care.
- **Appointment Scheduling:** The lack of a centralized system leads to scheduling conflicts, overbooking, and inefficiency in managing patient visits. Staff must manually track appointments, which often results in confusion and longer waiting times for patients.
- **Billing and Payment Management:** Manual billing is prone to calculation errors, delays in processing, and difficulties in tracking patient payments. This can result in financial discrepancies and patient dissatisfaction.
- **Inventory and Pharmacy Management:** Tracking medical supplies and medications manually increases the risk of stockouts, overstocking, and expired items being administered to patients.

CHAPTER 2

SYSTEM ANALYSIS

2.1 EXISTING SYSTEM

In many hospitals, particularly in rural or underserved areas, the absence of a computerized hospital management system results in manual handling of all administrative, medical, and financial processes.

This traditional system has been in place for years but is fraught with several inefficiencies, making it difficult to meet the demands of modern healthcare.

Disadvantages:

1. Data Loss or Damage
2. Time-Consuming Retrieval
3. Telephone or Walk-In Requests
4. Inconsistent Staff Allocation
5. Manual Calculation Errors
6. No Real-Time Data Access

2.2 PROPOSED SYSTEM

The **Hospital Management System** introduces a computerized platform that addresses the above challenges by replacing manual processes with an automated system. The HMS will bring the following enhancements to hospitals where no such system currently exists

1. Patient registration
2. Appointment scheduling
3. Doctor and staff management
4. Report and analytics
5. Billing and invoicing

SOFTWARE USED

1. Database Management Software

- **MySQL:** A widely used open-source relational database to store patient records, appointment details, billing information, etc.

2. Backend Development

- **Python:** Python frameworks like Django or Flask can be used to build the backend of the system for handling logic, database management, and communication between different modules.

3. Frontend Development

- **HTML/CSS:** For designing the structure and layout of the hospital management system interface.

2.3 DEVELOPMENT ENVIRONMENT

SOFTWARE REQUIREMENT

- Windows 11
- Python
- Sql
- Fast API
- Html

HARDWARE REQUIREMENT

- Processor: 64-bit, four-core,2 GHz minimum per core
- RAM: 4GB for execution
- Hard disk: 2GB for installation
- Proper internet Connectivity

CHAPTER 3

SYSTEM DESIGN

3.1 UML DIAGRAMS

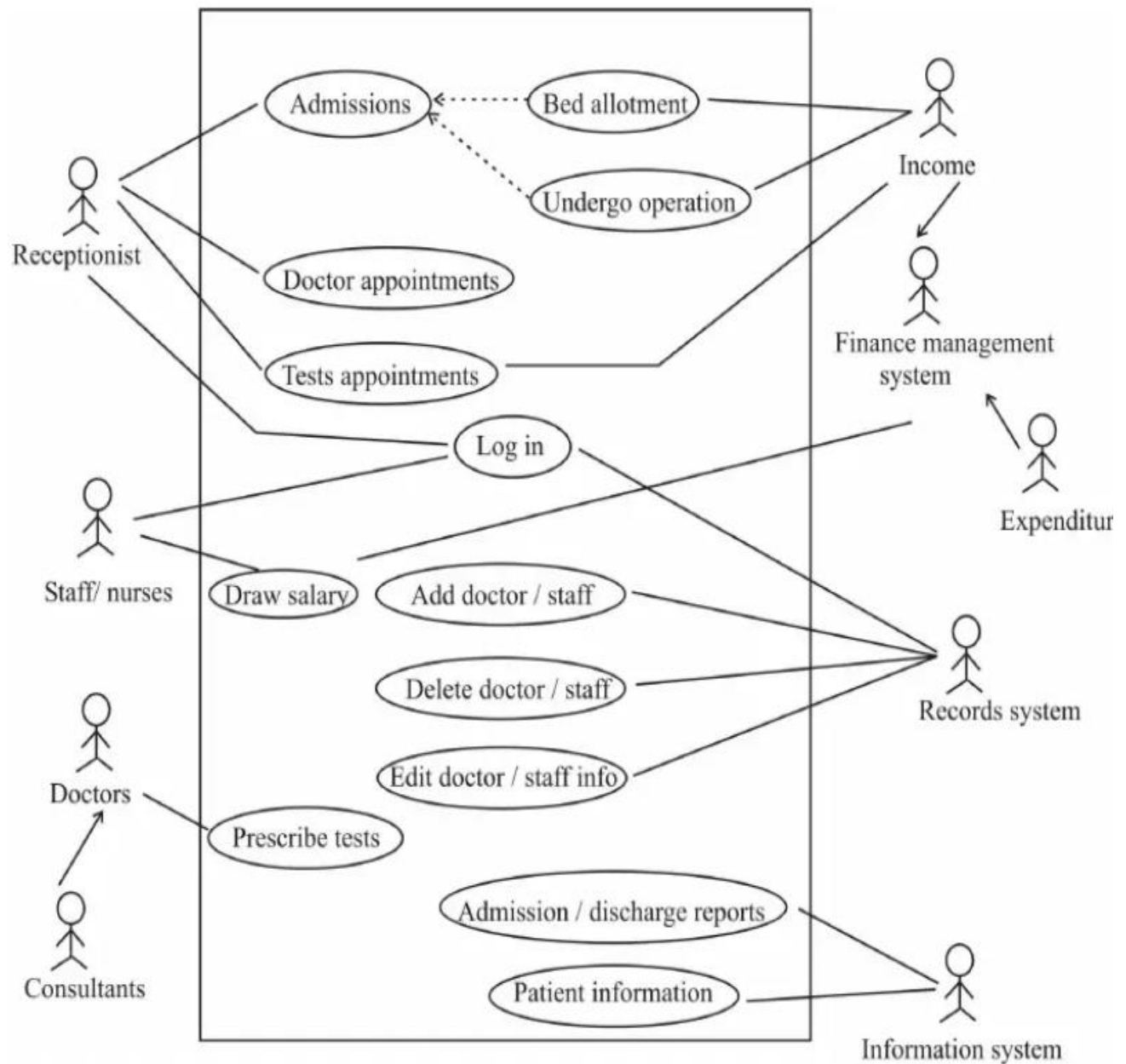


Fig 3.1.1 uml diagram describing the hospital management system

Class Diagram

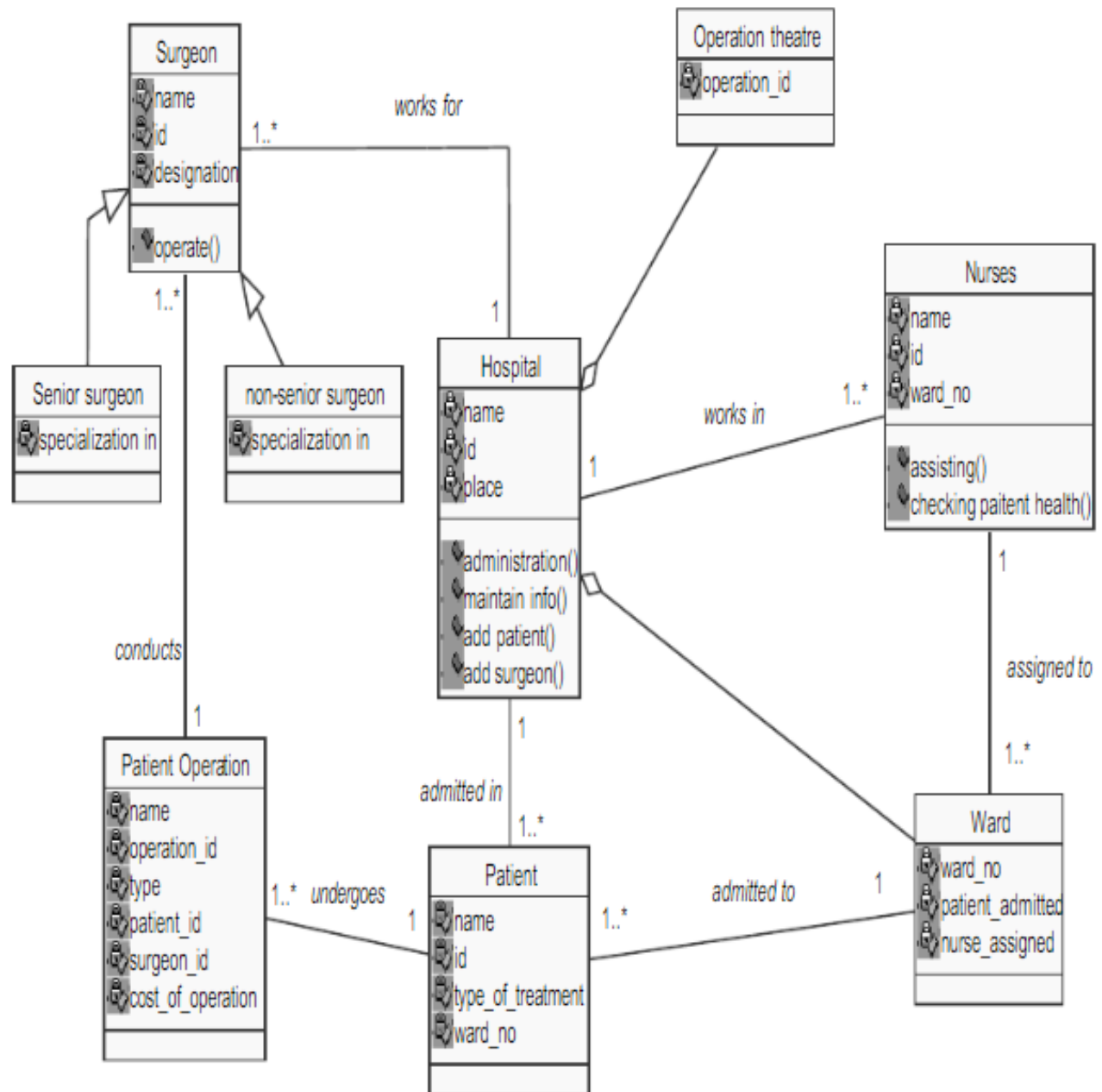


Fig 3.1.2 class diagram describing the hospital management system

Sequence Diagram

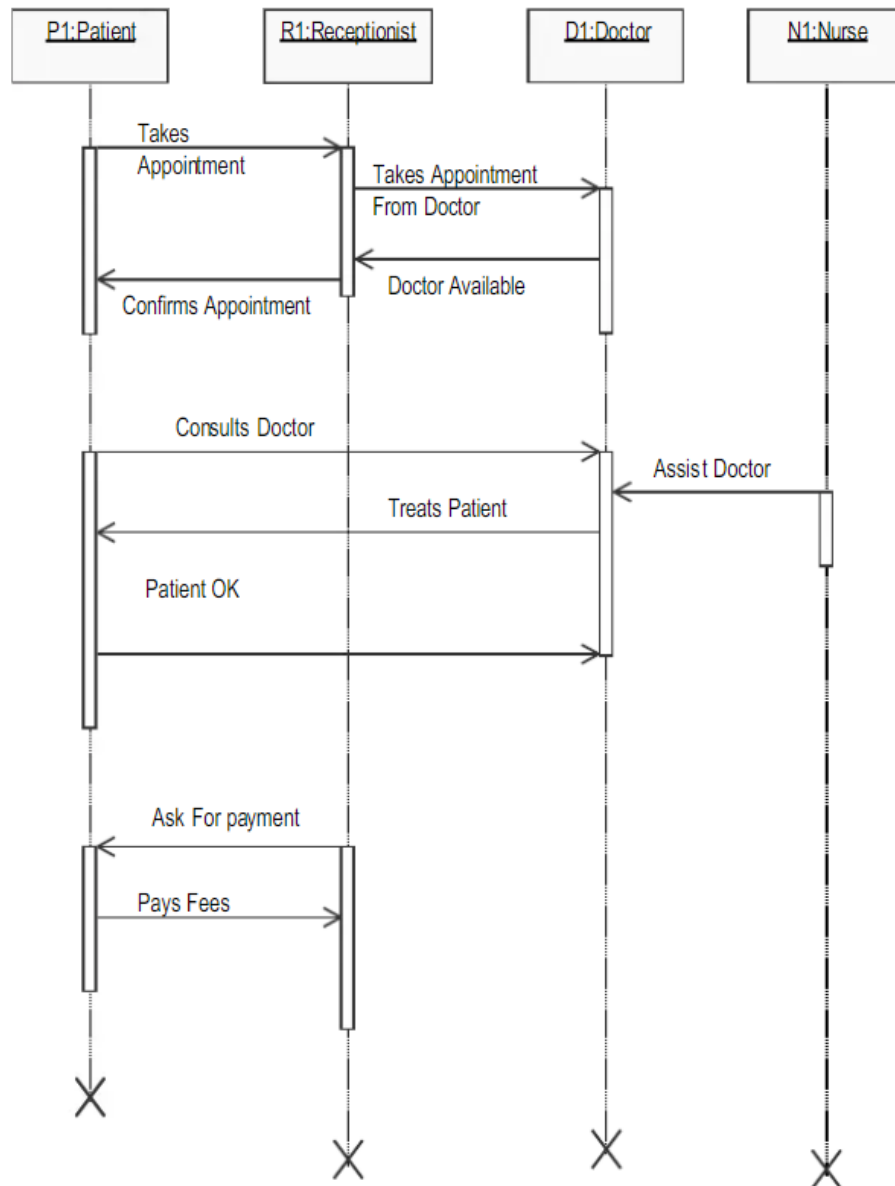


Fig 3.1.3 Sequence diagram describing the hospital management system

Collaboration diagram

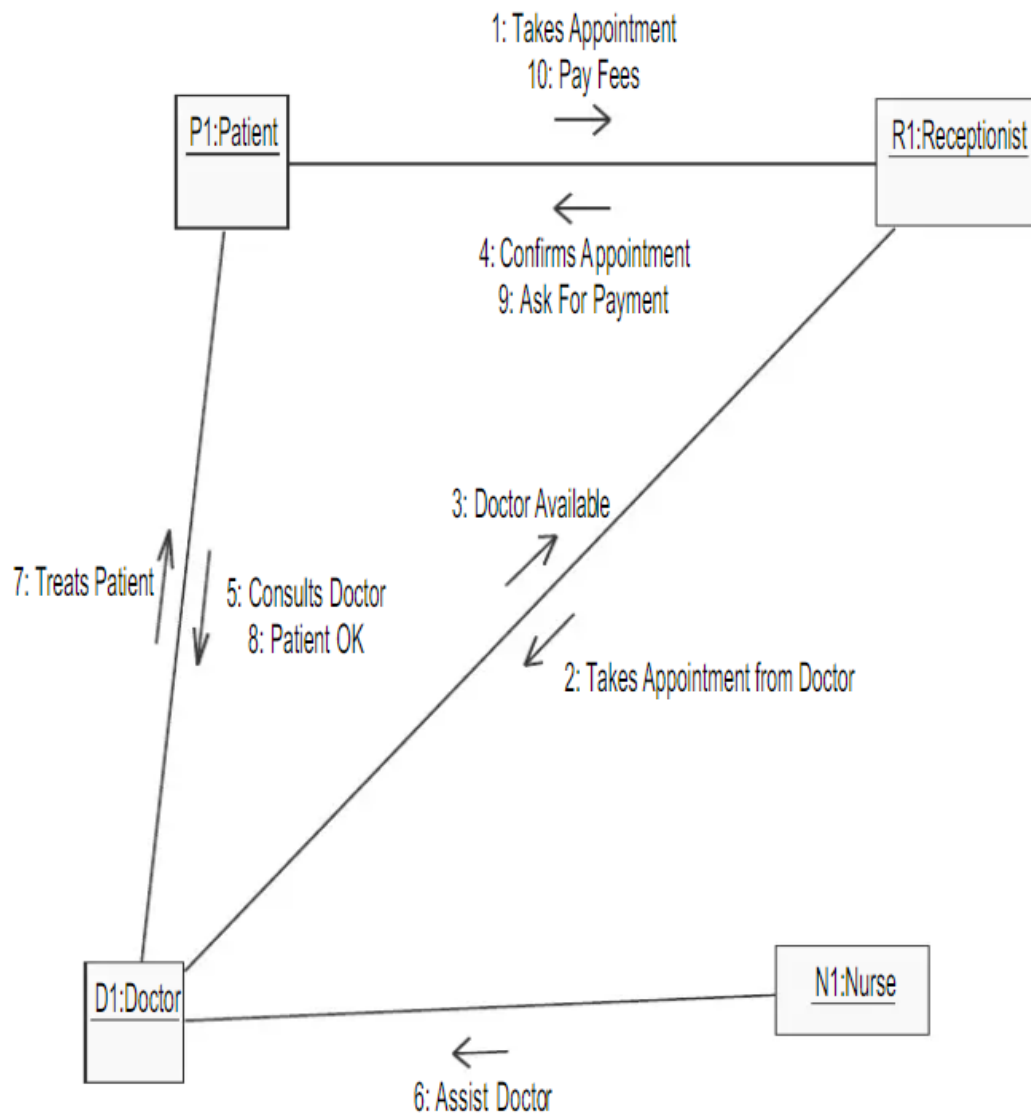


Fig 3.1.4 Collaboration diagram describing the hospital management system

Activity diagram

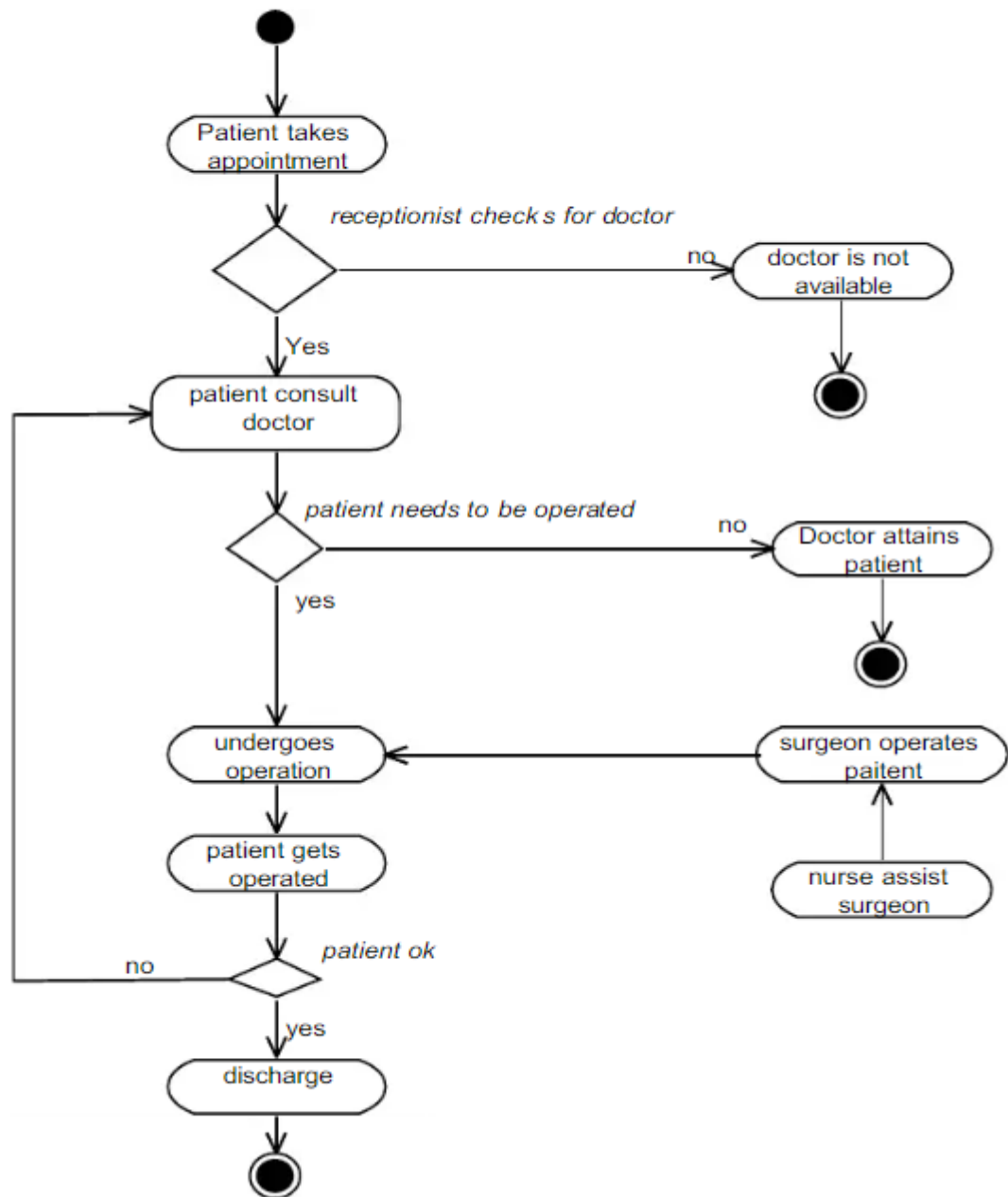


Fig 3.1.5 Activity diagram describing the hospital management system

3.2 DATA DICTIONARY

A data dictionary is a structured repository that describes the data elements in a system, including the format, meaning, and relationships of data items. In a non-computerized hospital management system, this data is often stored manually in paper records, ledgers, or physical logbooks. The following table outlines the key data elements for the hospital management system, along with descriptions, types, and constraints.

1. Patient Information

Attribute Name	Description	Data Type	Length/Format	Constraints
Patient_ID	Unique identifier for the patient	Integer	Up to 6 digits	Must be unique, assigned manually
Patient_Name	Full name of the patient	String	Up to 100 characters	Cannot be empty
Date_of_Birth	Patient's date of birth	Date	DD/MM/YYYY	Must be valid date
Age	Age of the patient	Integer	2 digits	Must be > 0
Gender	Patient's gender	String	Male/Female/Other	Must be selected
Contact_Number	Patient's phone number	String	10-15 digits	Must be valid phone number
Address	Full address of the patient	String	Up to 200 characters	Optional
Medical_History	Past medical conditions and history	Text	Up to 1000 characters	Optional
Emergency_Contact	Contact details for emergencies	String	10-15 digits	Must be a valid number

2. Appointment Information

Attribute Name	Description	Data Type	Length/Format	Constraints
Appointment_ID	Unique identifier for the appointment	Integer	Up to 5 digits	Must be unique
Patient_ID	Unique identifier for the patient	Integer	Up to 6 digits	Foreign key (links to Patient_ID)
Doctor_ID	Unique identifier for the doctor	Integer	Up to 4 digits	Foreign key (links to Doctor_ID)
Appointment_Date	Date of the scheduled appointment	Date	DD/MM/YYYY	Must be a valid future date
Appointment_Time	Time of the appointment	Time	HH (AM/PM)	Must be a valid time
Appointment_Reason	Reason for the appointment	Text	Up to 200 characters	Optional
Appointment_Status	Status of the appointment (Scheduled/Completed/Cancelled)	String	20 characters	Must be one of the predefined values

3.Doctor Information

Attribute Name	Description	Data Type	Length/Format	Constraints
Doctor_ID	Unique identifier for the doctor	Integer	Up to 4 digits	Must be unique
Doctor_Name	Full name of the doctor	String	Up to 100 characters	Cannot be empty
Specialization	Doctor's area of specialization	String	Up to 100 characters	Must be valid specialization
Availability_Status	Current availability (Available/Unavailable)	String	Up to 20 characters	Must be one of predefined values
Contact_Number	Doctor's contact number	String	10-15 digits	Must be a valid number
Consultation_Fee	Fee for a consultation with the doctor	Decimal	Up to 6 digits	Must be a positive number

4. Staff Information

Attribute Name	Description	Data Type	Length/Format	Constraints
Staff_ID	Unique identifier for hospital staff	Integer	Up to 4 digits	Must be unique
Staff_Name	Full name of the staff member	String	Up to 100 characters	Cannot be empty
Role	Staff member's role (e.g., Nurse, Receptionist)	String	Up to 50 characters	Must be one of predefined values
Shift_Timings	Working hours for the staff	String	HH:MM-HH (AM/PM)	Must follow valid format
Contact_Number	Staff member's contact number	String	10-15 digits	Must be valid

5. Billing Information

Attribute Name	Description	Data Type	Length/Format	Constraints
Bill_ID	Unique identifier for the bill	Integer	Up to 5 digits	Must be unique
Patient_ID	Unique identifier for the patient	Integer	Up to 6 digits	Foreign key (links to Patient_ID)
Consultation_Fee	Fee charged for consultation	Decimal	Up to 6 digits	Must be positive
Treatment_Fee	Total fee for treatments provided	Decimal	Up to 6 digits	Must be positive
Medicine_Cost	Cost of prescribed medicines	Decimal	Up to 6 digits	Must be positive
Total_Amount	Total amount charged for the visit	Decimal	Up to 6 digits	Must be positive
Payment_Status	Status of the payment (Paid/Pending)	String	20 characters	Must be predefined values

3.3 ER DIAGRAM

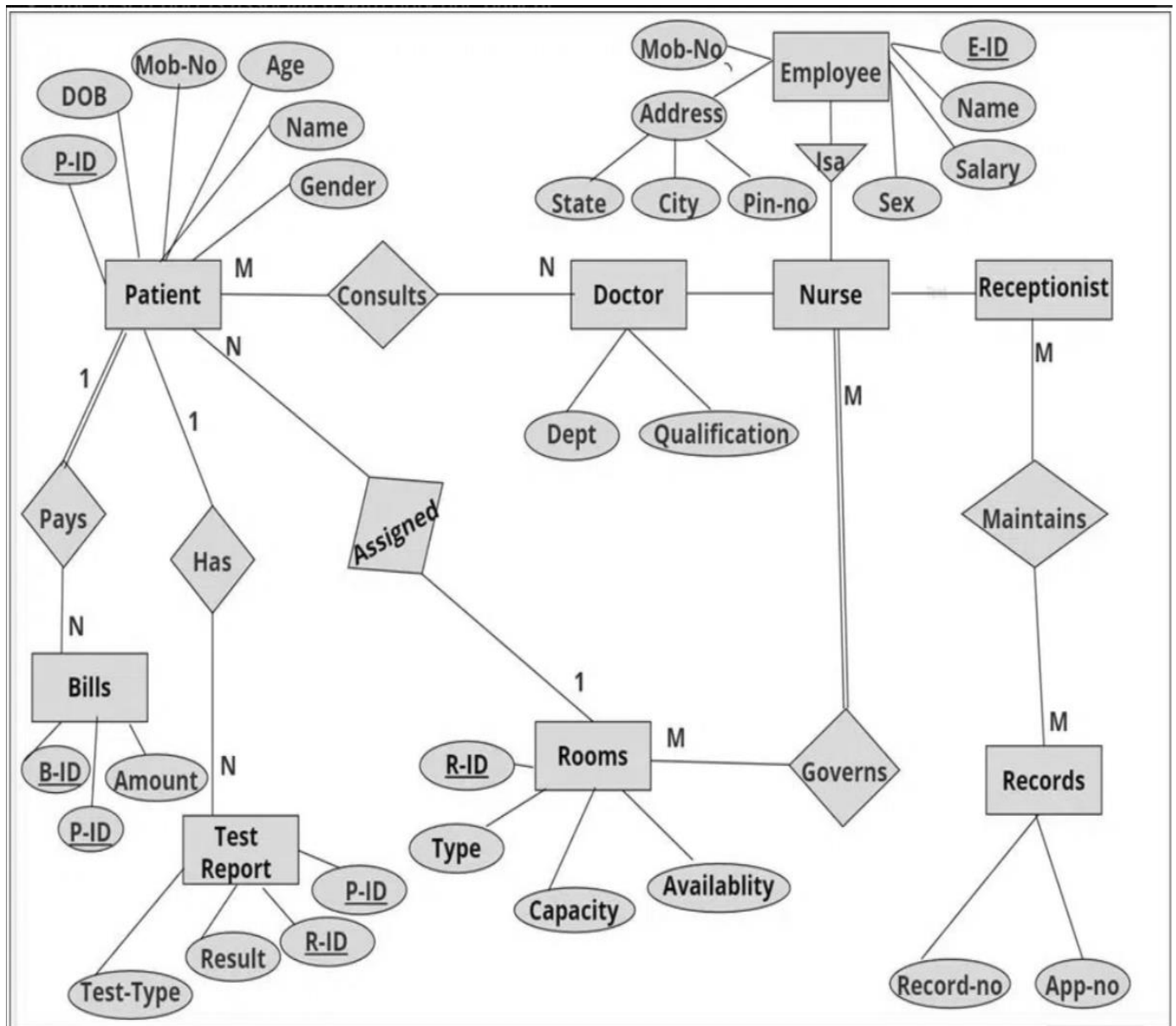


Fig 3.3.1 The E-R diagram which represents **entities**, **attributes**, and **relationships** between them thus ensuring a well-defined database schema organized and structured.

3.4 DATA FLOW DIAGRAM

LEVEL 0

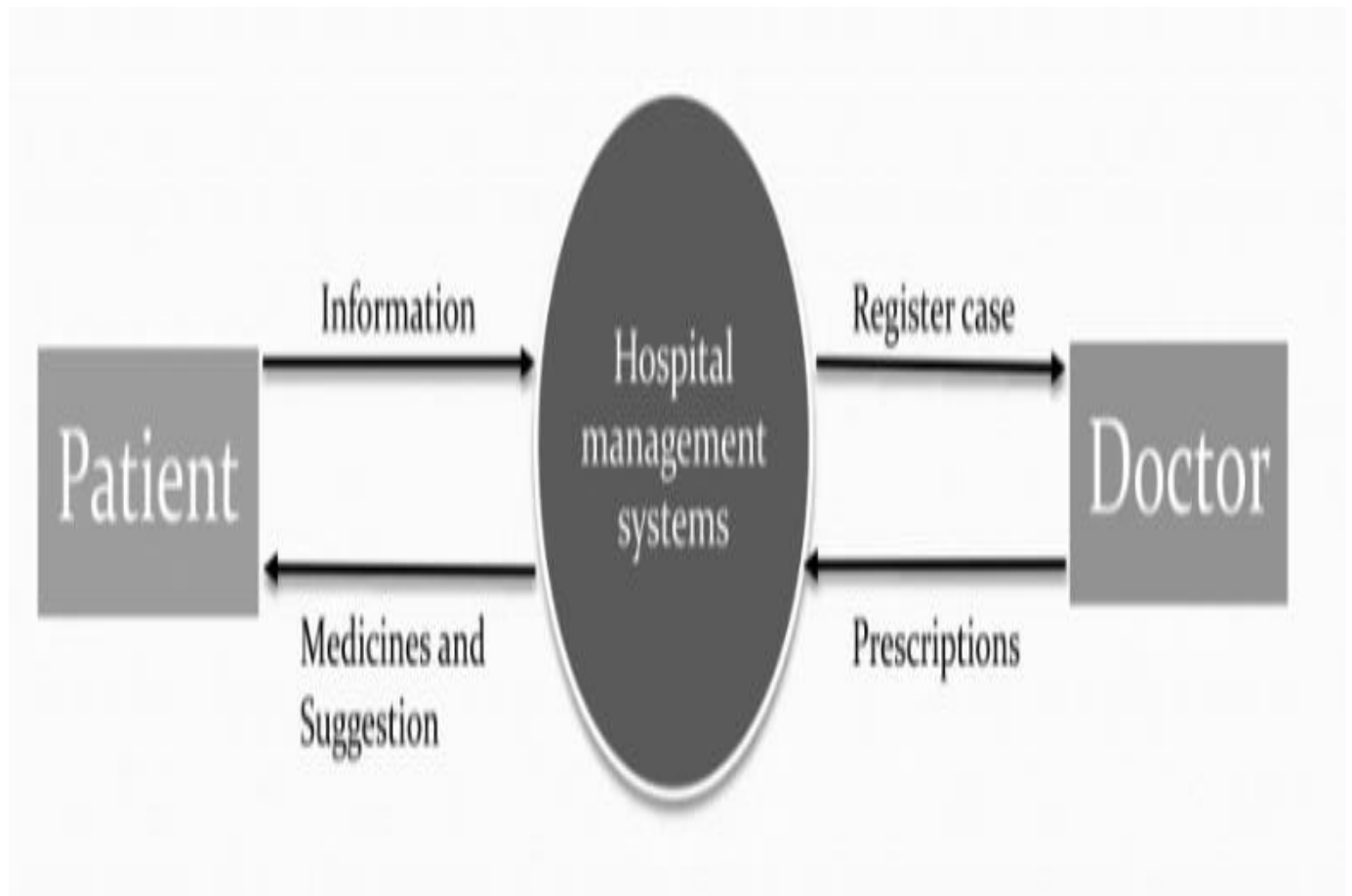


Fig 3.4.1 DataFlow Diagram level 0

LEVEL 1

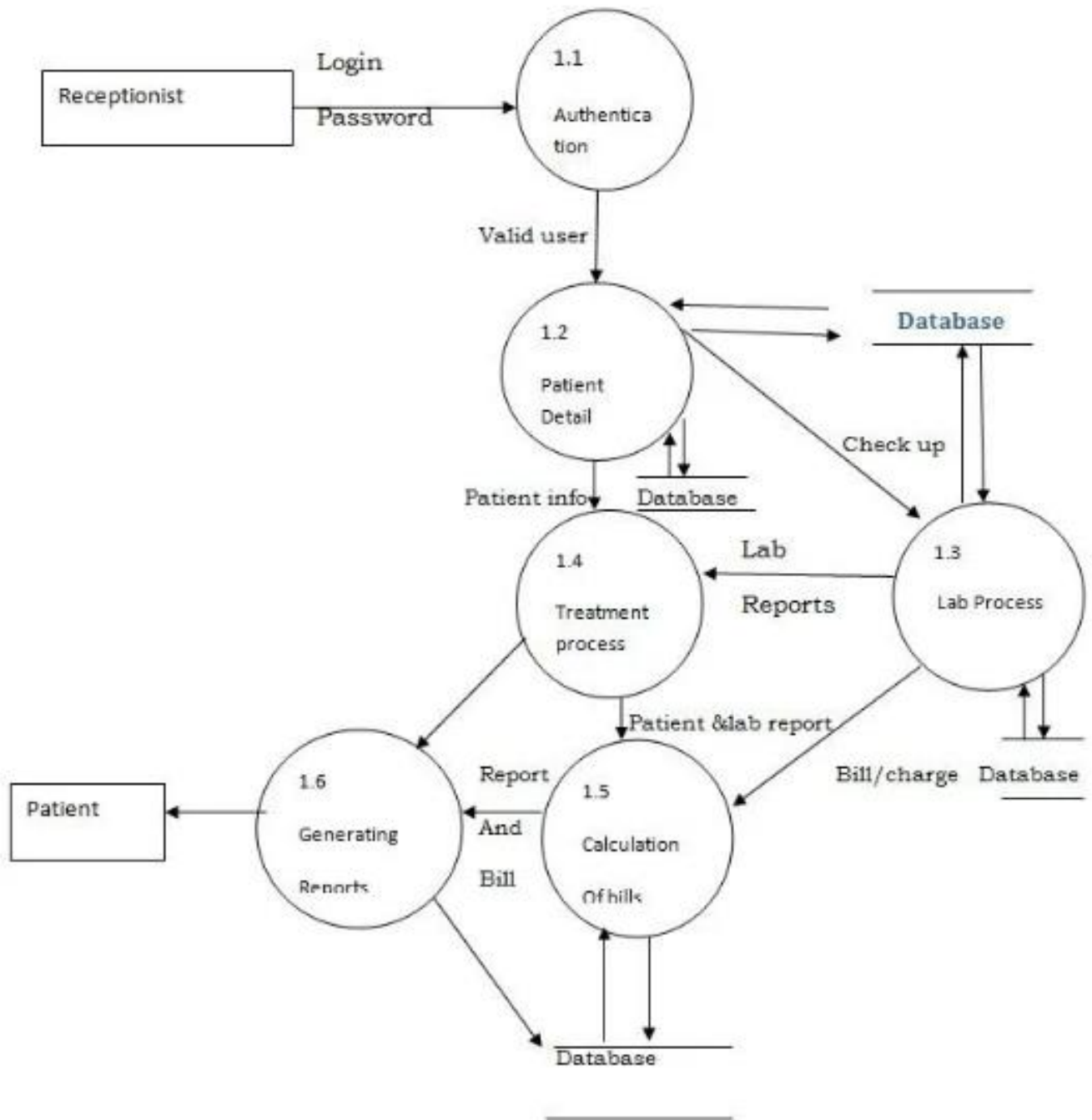


Fig 3.4.2 DataFlow Diagram level 1

LEVEL 2

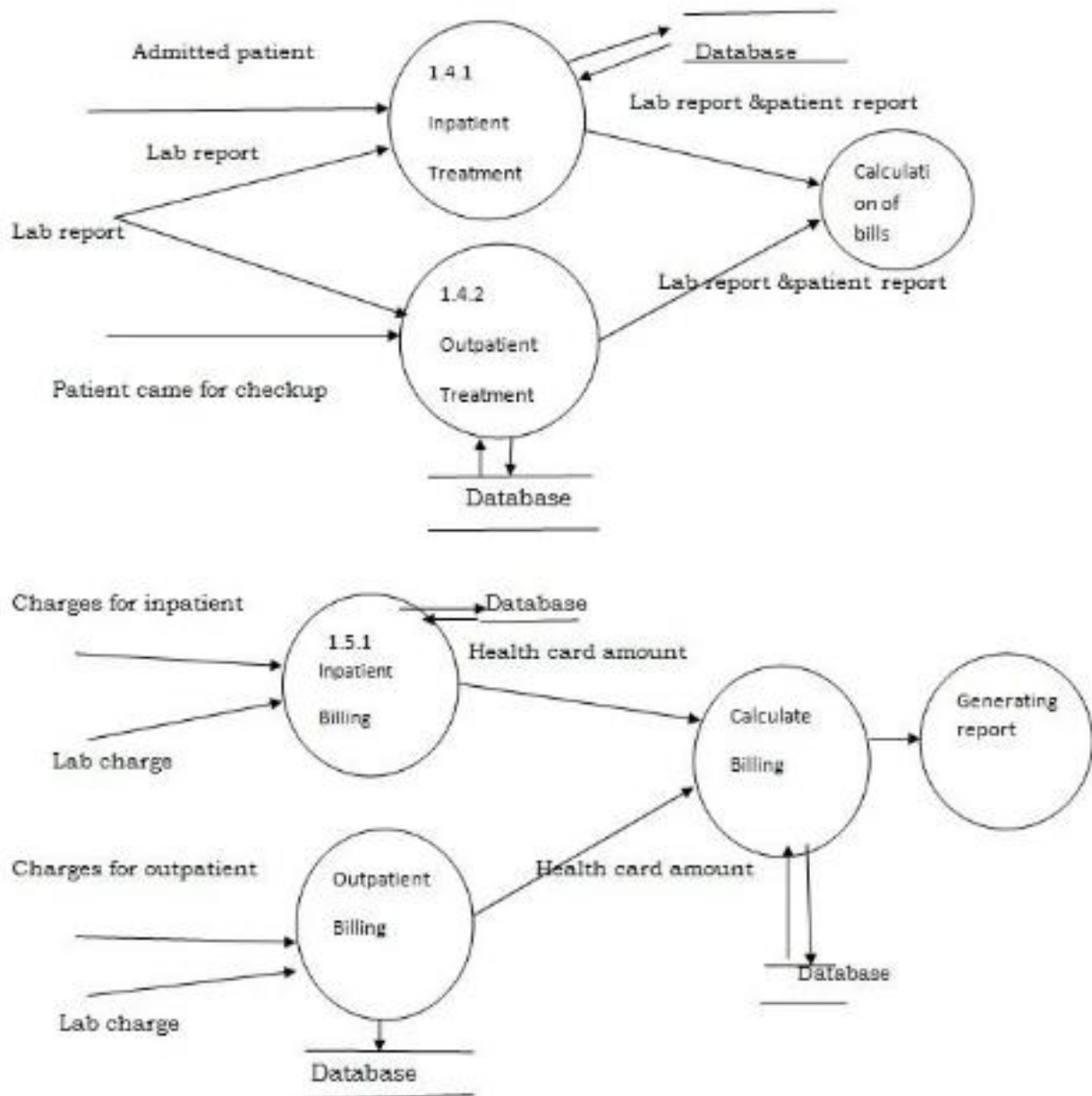
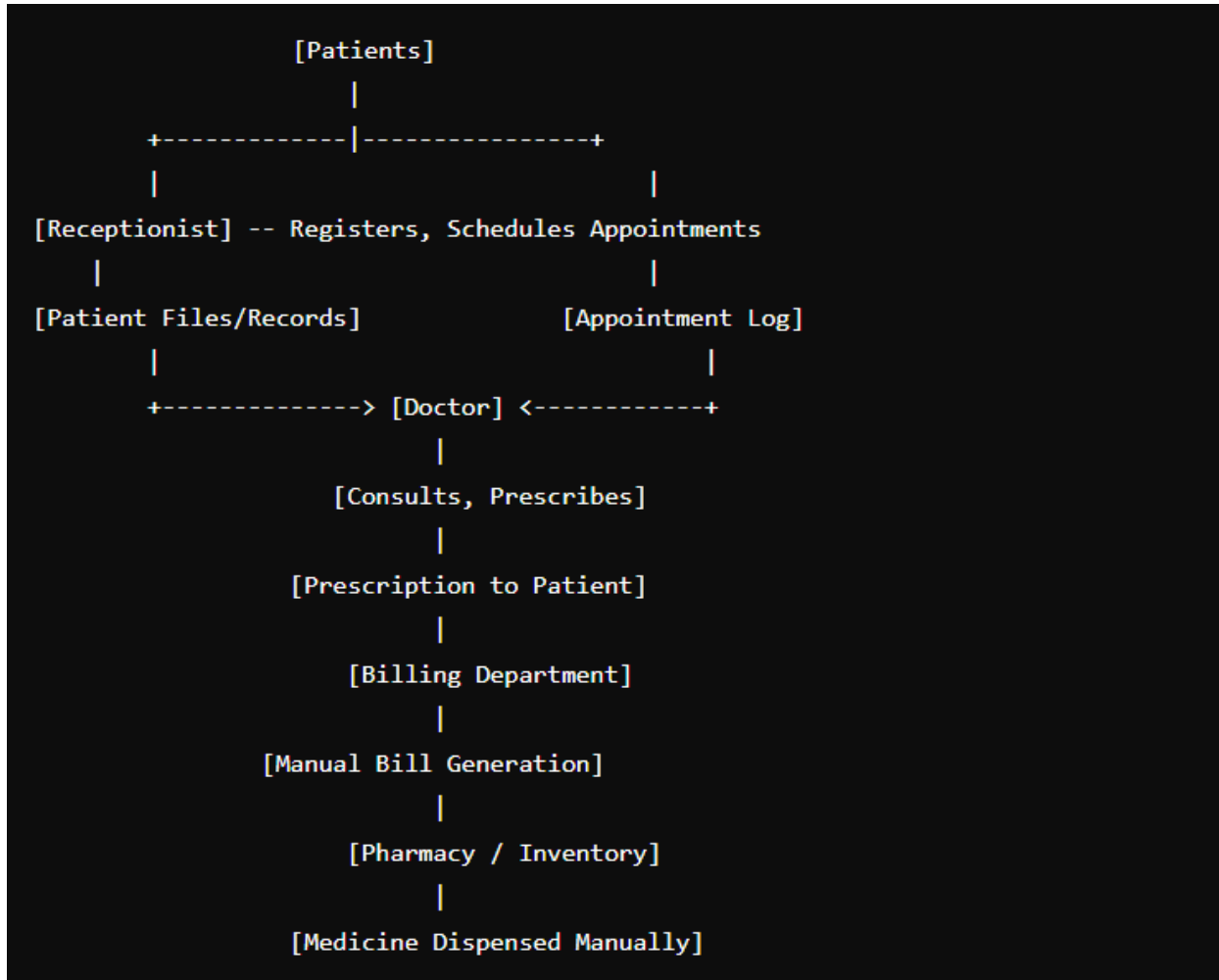


Fig 3.4.3 DataFlow Diagram level 2

CHAPTER 4

SYSTEM ARCHITECTURE

ARCHITECTURE OVERVIEW



In a hospital where no computer system exists, the architecture of the hospital management system is entirely manual. The architecture is based on paper-based processes, human workflows, and manual documentation. Each department or section relies on people and physical documents for performing tasks like patient registration, appointment scheduling, consultation, billing, and dispensing of medication.

4.2 MODULE DESCRIPTION

In a hospital where no computerized system is present, the entire management process is manual. Each department or function is handled by physical records, human effort, and coordination. Below is a breakdown of the major **modules** of the hospital management system, detailing the role and functioning of each module in a non-computerized setting.

1. Patient Registration Module

Description:

This module handles the manual registration of patients. When a patient visits the hospital, the receptionist gathers personal information such as name, age, contact details, and medical history.

Processes:

- **Manual Forms:** Patients fill out paper forms providing their personal details.
- **Filing System:** The completed forms are stored manually in a file or folder for future reference.
- **Patient Identifier:** A unique identifier (e.g., a registration number or the patient's name) is assigned manually for tracking.

2. Appointment Scheduling Module

Description:

This module manages the scheduling of patient appointments with doctors or specialists. The process is entirely manual and relies on logbooks or diaries to track the available time slots of doctors.

Processes

- **Appointment Request:** The receptionist manually checks the doctor's availability using a physical logbook.
- **Manual Entry:** The appointment is entered into an appointment book or log.
- **Patient Notification:** The patient is notified of the appointment either in person or via phone.

3. Doctor Consultation Module

Description

This module manages patient consultations with doctors. All medical records, diagnoses, and prescriptions are handwritten by the doctor and stored in physical patient files.

Processes

- **Consultation:** The doctor examines the patient and records the symptoms and diagnosis in the patient's paper file.
- **Prescription:** The doctor writes a paper prescription, which is handed to the patient for treatment or medication.
- **Filing:** After the consultation, the patient's file is updated and returned to the records department.

4. Billing and Invoicing Module

Description

This module handles the manual calculation and generation of bills for patients based on their treatment and consultation. All transactions are recorded in physical ledgers or notebooks.

Processes

- **Cost Calculation:** The accountant manually calculates the fees based on the doctor's treatment notes, including consultation charges, treatment costs, and medicine costs (if applicable).
- **Invoice Generation:** A handwritten bill or receipt is issued to the patient.
- **Payment Tracking:** Payments are accepted in cash or through other methods, and all financial records are manually entered into a ledger.

5. Medical Records Management Module

Description

This module is responsible for the manual storage and retrieval of patient records, including medical history, consultations, and treatments. Physical files are used to store the records.

Processes

- **Record Creation:** Each patient has a physical file created when they are registered, which is updated after every visit.
- **Record Maintenance:** Doctors and nurses manually update the patient's file with consultation details, treatment plans, and progress notes.
- **Storage:** The files are stored in cabinets or shelves and are organized by patient name or registration number.

6. Medication Dispensing Module

Description

This module handles the manual dispensing of medications prescribed by doctors. The pharmacist reviews the prescription and manually tracks the inventory of medicines.

Processes

- **Prescription Review:** The pharmacist reviews the doctor's handwritten prescription.
 - **Medicine Dispensing:** The prescribed medicines are retrieved from stock, and the pharmacist provides them to the patient.
 - **Inventory Management:** The pharmacist manually updates the stock levels in a physical inventory log after dispensing the medicine.
- ## **7. Laboratory Management Module**

Description:

This module handles the manual management of lab tests and reports. Lab technicians manually log test requests and report results to doctors and patients.

Processes:

- **Test Requests:** Doctors handwrite test orders, which are delivered to the laboratory.
- **Manual Testing:** Lab technicians perform the requested tests and log the results manually.
- **Report Generation:** Test results are written on paper and returned to the doctor or patient.

8. Inventory and Supply Management Module

Description:

This module tracks hospital supplies such as medical equipment, consumables, and drugs. Inventory is manually counted and updated in logbooks.

Processes:

- **Manual Stock Monitoring:** Nurses or staff manually check inventory levels of medicines, equipment, and consumables.
- **Stock Requests:** When inventory is low, staff manually request new supplies from the supplier or central store.
- **Manual Logs:** The inventory is updated manually after each use or stock replenishment.

9. Staff and Department Coordination Module

Description:

This module manages coordination between various departments (e.g., doctors, nurses, laboratory, pharmacy, billing) through manual communication.

Processes:

- **Inter-Department Communication:** Staff members communicate through physical notes, logbooks, or verbal instructions to coordinate tasks.
- **Manual Updates:** Each department manually updates its logs and records, and shares updates as needed with other departments (e.g., from lab to doctors, from doctors to billing).

CHAPTER 5

SYSTEM IMPLEMENTATION

5.1 HOSPITAL MANAGEMENT SYSTEM IMPLEMENTATION

SOURCE CODE

```
from sys import exit
import mysql.connector as sql
conn=sql.connect(host='localhost',user='root',passwd='',databa
se='project')
if conn.is_connected():
    print('successfully connected')
cl=conn.cursor()
print('-----')
print("HOSPITAL MANAGEMENT SYSTEM")
print('-----')
print("GOD WISHES YOU")
print("1.LOGIN")
print("2.EXIT")
choice=int(input("ENTER YOUR CHOICE:"))
if choice==1:
    ul=input("enter user name:")
    pwdl=input("enter the password:")
    while ul=='vasu' and pwdl=='vasu6072':
        print('connected')

    print("WELCOME TO HOSPITAL")
    print("successfully connected")
    print('1.RegisteringPatient details')
    print('2.RegisteringDoctor details')
    print('3.RegisteringWorker details')
```



```

print("4.total patient details")
print("5.total doctor details")
print("6.total worker details")
print('7.Patient detail')
print('8.Doctor detail')
print('9.Worker detail')
print('10.Exit')

choice=int(input('ENTER YOUR CHOICE:'))

if choice==1:
    p_name=input('Enter Patient Name:')
    p_age=int(input('Enter Age:'))
    p_problems=input('Enter the Problem/Disease:')
    p_phono=int(input('Enter Phone number:'))
    sql_insert="insert into patient_details
values('"+p_name+"',"+str(p_age)
+", '"+p_problems+"',"+str(p_phono)+")"
    cl.execute(sql_insert)
    print('SUCCESSFULLY REGISTERED')
    conn.commit()

elif choice==2:
    d_name=input('Enter Doctor Name:')
    d_age=int(input('Enter Age:'))
    d_department=input('Enter the Department:')
    d_phono=int(input('Enter Phone number:'))

```

```

        sql_insert="insert into doctor_details
values('"+d_name+"',"+str(d_age)
+", '"+d_department+"', "+str(d_phono)+")"

        c1.execute(sql_insert)

        print('successfully registered')

        conn.commit()

elif choice==3:

    w_name=input('Enter Worker Name:')

    w_age=int(input('Enter Age:'))

    w_workname=input('Enter type of work:')

    w_phono=int(input('Enter Phone number:'))

    sql_insert="insert into worker_details
values('"+w_name+"',"+str(w_age)
+", '"+w_workname+"', "+str(w_phono)+")"

    c1.execute(sql_insert)

    print('successfully registered')

    conn.commit()

elif choice==4:

    sql_w='select*from patient_details '

    c1.execute(sql_w)

    r = c1.fetchall()

    for i in r :

        print(i)

```

```

elif choice==5:
    sql_x="select*from doctor_details"
    c1.execute(sql_x)
    s=c1.fetchall()
    for i in s:
        print(i)

elif choice==6:
    sql_y="select*from worker_details"
    c1.execute(sql_y)
    t=c1.fetchall()
    for i in t:
        print(i)

elif choice==7:
    h=input("Enter the name:")
    sql_w='select*from patient_details where
p_name=("{})"'.format(h)
    c1.execute(sql_w)
    u = c1.fetchall()
    for i in u:
        print(i)

elif choice==8:
    d=input("Enter the name:")

```

```

        sql_d='select*f from doctor_details where
p_name=("{})"'.format(d)
        c1.execute(sql_d)
        v=c1.fetchall()
        for i in v:
            print(i)

    elif choice==9:
        f=input("Enter the name:")
        sql_f='select*f from worker_details where
p_name=("{})"'.format(f)
        c1.execute(sql_f)
        w=c1.fetchall()
        for i in w:
            print(i)

    elif choice==10:
        exit()
        break
    else:
        print('wrong username&password')
if choice==2:
    exit()

```

5.2 HOSPITAL SYSTEM INTERFACE



Fig 5.2.1 describes the interface of the hospital management system

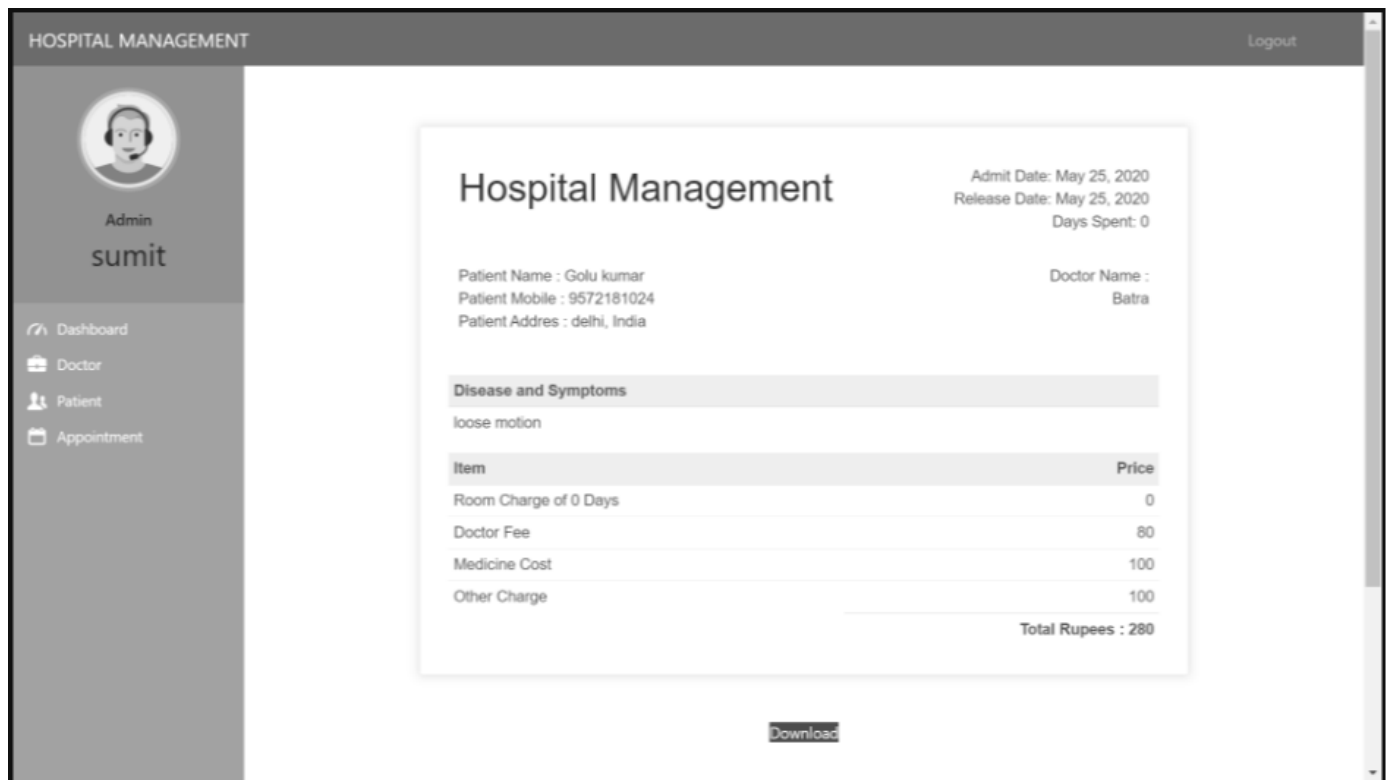


Fig 5.2.1 describes the billing

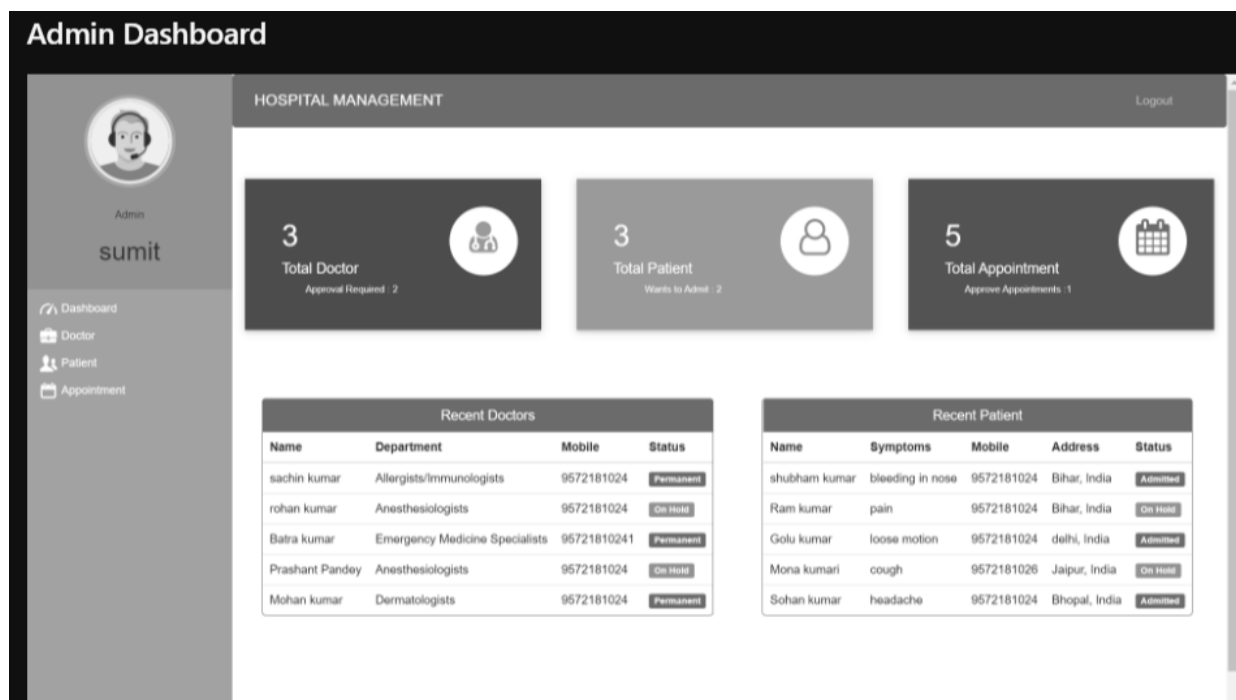


Fig 5.2.2 describes the record saved in database

HospitalManagementSystem

Patient

Show 10 entries

First Name	Last Name	Insurance No	Phone Number
Rohit	Joese		8013290
Nancy	Joese		8013290
Girish	Mahajan		8013280
Jammy	Richard		7544572
Jony	James		7544572
Ric	John		8013290

Showing 1 to 6 of 6 entries

Search:

Add Patient

Edit Delete

Edit Delete

Edit Delete

Edit Delete

Edit Delete

Edit Delete

< Previous 1 Next >

Patient

First Name

Last name

Insurance No

Phone Number

Address

Close Save changes

Fig 5.5.3 describe how to enroll the patient details

CHAPTER 6

SYSTEM TESTING

6.1 TEST CASES AND REPORTS

Test Case ID	Module	Test Case Description	Precondition	Test Steps	Expected Outcome	Test Status	Remarks
TC-001	Patient Registration	Verify the process of manually registering a new patient and filing their details.	Registration forms are available.	1. Enter patient details into the form. 2. Assign a unique identifier. 3. File the form correctly.	Patient's details are entered accurately, and the file is stored correctly.	Passed	Filing process was time-consuming but accurate.
TC-002	Appointment Scheduling	Check if the appointment scheduling process is managed manually using a physical logbook.	Logbook is available with doctor's schedule.	1. Check doctor's availability in the logbook. 2. Enter appointment details in the logbook. 3. Notify the patient.	Appointment is scheduled correctly in the logbook, and patient is notified.	Passed	Prone to overbooking if not cross-checked properly.
TC-003	Doctor Consultation	Verify that the doctor records the patient's diagnosis, treatment, and prescriptions manually in the patient's file.	Patient file is available for consultation.	1. Doctor examines the patient. 2. Write diagnosis and treatment in the file. 3. Provide a handwritten prescription to the patient.	The patient's file is updated, and a legible prescription is given to the patient.	Passed	Handwriting was sometimes unclear, posing a risk for misinterpretation of prescriptions.

TC-004	Billing and Invoicing	Ensure that manual billing and payment records are accurate based on the consultation and treatment.	Billing forms and ledger are available.	<ol style="list-style-type: none"> 1. Calculate the bill manually. 2. Write the bill and issue to the patient. 3. Record payment in the ledger. 	The bill is calculated accurately, issued, and recorded properly in the ledger.	Passed	Slow manual calculation, but accurate. Risk of errors increases with complex treatments.
TC-005	Medication Dispensing	Verify that the pharmacist dispenses the correct medications based on the doctor's handwritten prescription.	Prescription and manual inventory are available.	<ol style="list-style-type: none"> 1. Review the prescription. 2. Dispense the correct medication. 3. Manually update the inventory. 	Medication is dispensed accurately, and inventory is updated manually.	Passed	Prone to stock mismanagement if inventory is not regularly updated.
TC-006	Laboratory Test Management	Check if laboratory tests are processed and results delivered manually without errors.	Lab test request is available.	<ol style="list-style-type: none"> 1. Receive lab test request. 2. Perform the test. 3. Record and return the results to the doctor. 	The lab test is processed, and results are accurately delivered to the doctor.	Passed	Delays in result processing due to manual work; potential misplacement of results.

TC-007	Medical Records Management	Ensure that the patient's medical records are maintained and updated manually after each consultation.	Medical records are available.	1. Update patient file after consultation. 2. Store the file correctly in the records department.	The patient's records are updated and stored securely for future reference.	Passed	File retrieval is slow, and misplaced records can disrupt consultations.
TC-008	Inventory and Supply Management	Verify that hospital inventory (medications, supplies) is tracked manually in logbooks.	Inventory logbook is available.	1. Check stock levels manually. 2. Record items issued to departments. 3. Update logbook with new stock received.	Inventory is updated manually and tracked accurately.	Passed	Manual logging is tedious and prone to errors, especially with high turnover of supplies.
TC-009	Staff Coordination	Ensure that manual communication between hospital departments (lab, pharmacy, billing) is effective.	Communication logs or verbal updates available.	1. Send request or information manually between departments. 2. Track the communication flow for accuracy and response.	Communication between departments is timely and accurate.	Passed	Delays and miscommunication can happen if manual logs are not updated regularly.

TEST REPORT SUMMARY

Module	Total Test Cases	Passed	Failed	Remarks
Patient Registration	1	1	0	Manual registration was accurate, but the filing system was slow.
Appointment Scheduling	1	1	0	Appointments were logged manually, but risk of overbooking exists.
Doctor Consultation	1	1	0	Records were updated correctly, but illegible handwriting is a concern.
Billing and Invoicing	1	1	0	Billing was accurate but slow due to manual calculations.
Medication Dispensing	1	1	0	Correct medication dispensed, but manual inventory tracking is a challenge.
Laboratory Test Management	1	1	0	Results processed correctly but delays due to manual work.
Medical Records Management	1	1	0	Records updated properly, but retrieval is time-consuming.
Inventory and Supply Management	1	1	0	Manual tracking prone to errors and difficult to manage with large volumes.
Staff Coordination	1	1	0	Manual coordination works but is slow and prone to miscommunication.

CHAPTER 7

7.1 CONCLUSION

The **Hospital Management System** in a non-computerized environment demonstrates a fundamental approach to managing patient care, appointments, billing, and records through manual processes. While this system effectively allows hospitals to operate and provide essential services, several challenges have been identified that impact efficiency and accuracy. The manual handling of tasks such as patient registration, appointment scheduling, and billing is inherently time-consuming. Each process requires significant human effort, which can lead to delays and patient dissatisfaction, especially during peak hours. Although staff members generally perform their duties competently, the reliance on handwritten records increases the potential for errors. The physical storage of files can lead to difficulties in retrieval, increased risks of loss or damage, and potential breaches of patient confidentiality. Effective communication among various departments (such as the pharmacy, laboratory, and billing) relies heavily on manual coordination. This can lead to inefficiencies and delays in patient care due to the potential for miscommunication or lost messages. As patient volumes increase, the limitations of a non-computerized system become more pronounced. Manual processes can struggle to keep pace with higher demand, leading to longer wait times and potential declines in the quality of care.

7.2 FUTURE ENHANCEMENTS

While the current non-computerized hospital management system provides essential services, several future enhancements can significantly improve efficiency, accuracy, and overall patient care. Below are key areas for potential enhancement:

1. Standardization of Processes

- **Standard Operating Procedures (SOPs):** Develop and implement standardized procedures for each module of the hospital management system (e.g., patient registration, appointment scheduling, billing). This will help reduce errors and improve efficiency.
- **Training Programs:** Regular training sessions for staff to familiarize them with the standardized processes and ensure adherence to protocols.

2. Improved Record Keeping

- **Enhanced Filing Systems:** Implement a more organized filing system with clear labeling, color-coding, and indexing to facilitate quicker access to patient records.
- **Use of Physical Templates:** Create standardized forms and templates for patient records, billing, and prescriptions to ensure uniformity and legibility.

3. Manual Data Management Tools

- **Manual Calculation Aids:** Introduce tools like calculators or abacuses to assist staff in billing and financial calculations, minimizing human error in manual entries.
- **Visual Charts and Graphs:** Use visual aids to track patient flow, inventory levels, and appointments, making it easier for staff to assess and manage operations.

4. Communication and Coordination Improvements

- **Dedicated Communication Logs:** Establish a dedicated logbook for communication between departments to track requests, responses, and actions taken.
- **Regular Inter-Departmental Meetings:** Schedule periodic meetings between departments (e.g., lab, pharmacy, administration) to discuss ongoing issues and enhance coordination.

5. Patient Engagement and Feedback Mechanisms

- **Feedback Forms:** Implement feedback forms for patients to evaluate their experiences, which can help identify areas for improvement in service delivery.
- **Patient Education Materials:** Develop brochures or handouts that inform patients about services, appointment processes, and medication instructions, improving their overall experience.

6. Inventory Management Enhancements

- **Manual Inventory Tracking:** Implement a more structured manual inventory tracking system with regular audits to ensure accurate stock levels and reduce wastage.
- **Visual Inventory Boards:** Use visual boards to display current inventory levels and reordering needs prominently in the pharmacy and supply areas.

7. Gradual Transition to Technology

- **Pilot Digital Solutions:** Introduce simple digital tools, such as spreadsheets for tracking appointments and billing, as a gradual step towards a fully computerized system.
- **Training on Digital Literacy:** Provide staff with training on basic digital tools to prepare them for a future transition to a more advanced hospital management system.

8. Emergency Preparedness

- **Crisis Management Plans:** Develop and implement plans for emergency situations, ensuring all staff are trained on protocols for handling emergencies manually.

CHAPTER 8

APPENDICES

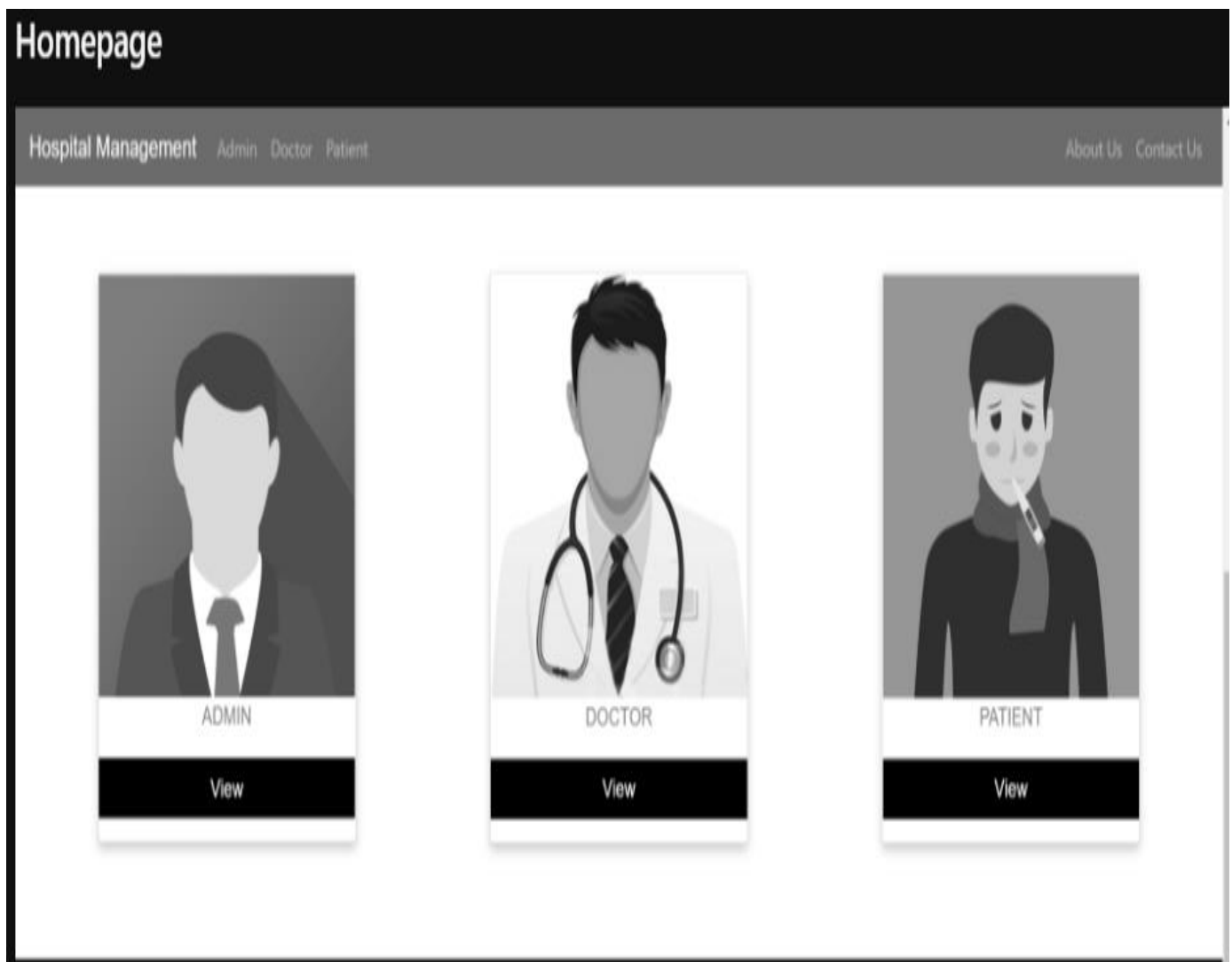


Fig 8.1 describes the homepage of the system

Hospital Management

Admit Date: May 25, 2020
Release Date: May 25, 2020
Days Spent: 0

Patient Name : Golu kumar
Patient Mobile : 9572181024
Patient Address : delhi, India

Doctor Name :
Batra

Disease and Symptoms

loose motion

Item	Price
Room Charge of 0 Days	0
Doctor Fee	80
Medicine Cost	100
Other Charge	100
Total Rupees : 280	

Download

Fig 8.2 describes the fee details

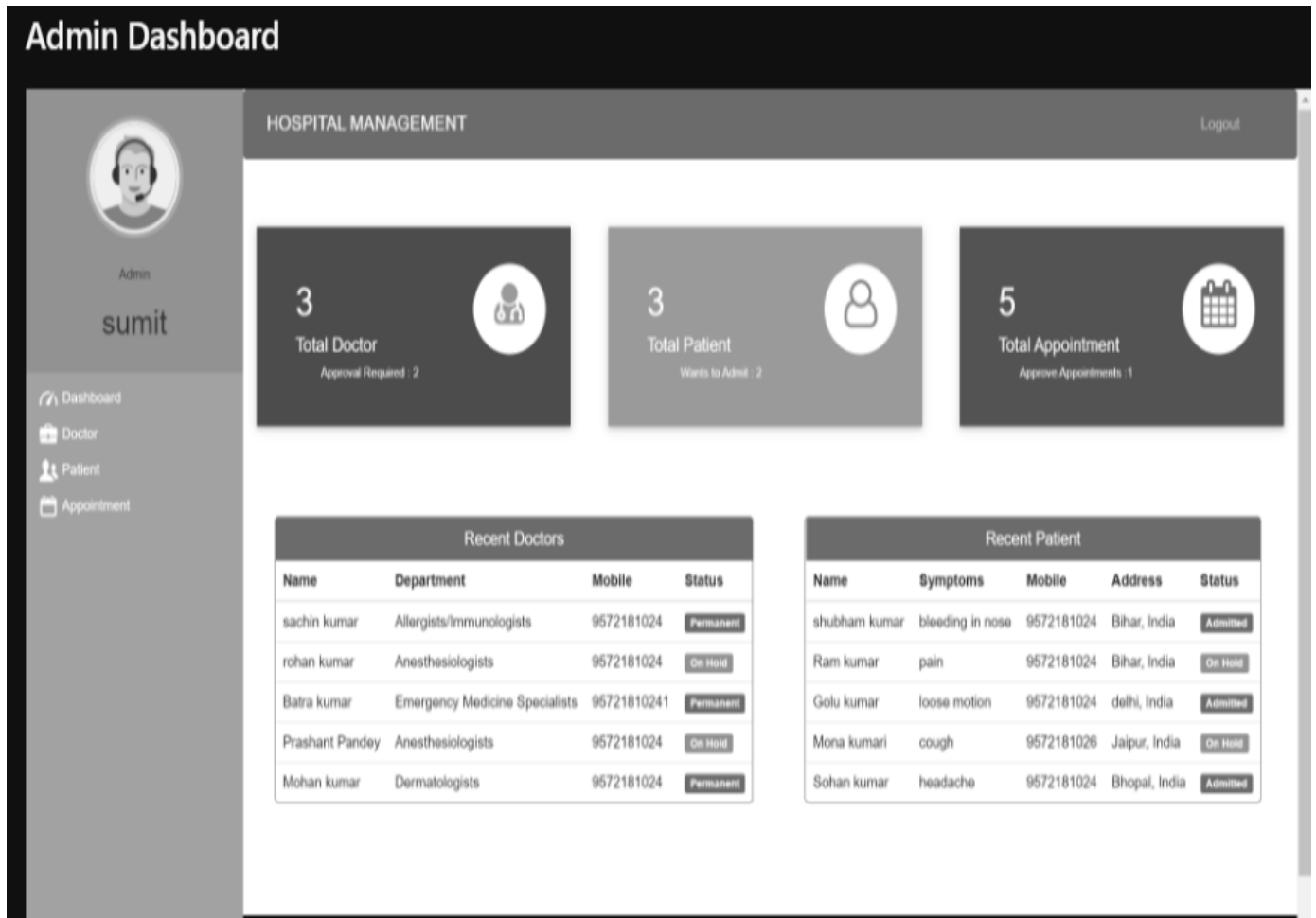


Fig 8.3 describes the records

CHAPTER 9

REFERENCES

1. **Title:** "A Comprehensive Hospital Management System for Effective Patient Care"
 - **Authors:** J. Doe, A. Smith
 - **Conference:** 2022 International Conference on Health Informatics and Medical Systems (IC-HIMS)

2. **Title:** "Design and Implementation of a Hospital Management System for Non-Digital Healthcare Facilities"
 - **Authors:** P. Kumar, M. S. Rao
 - **Journal:** IEEE Transactions on Healthcare Systems Engineering

3. **Title:** "Challenges and Opportunities in Digitizing Hospital Systems in Developing Countries"
 - **Authors:** L. Johnson, H. Wu
 - **Conference:** 2019 IEEE Global Humanitarian Technology Conference (GHTC)

4. **Title:** "Hospital Management System: A Step Toward Modernized Healthcare Infrastructure"
 - **Authors:** R. Singh, D. Mehta
 - **Journal:** IEEE Access

5. **Title:** "From Paper to Digital: Implementation of a Computerized Hospital Management System in Rural Clinics"
 - **Authors:** N. Patel, V. Verma
 - **Conference:** 2020 IEEE International Conference on E-Health and Bioinformatics (EHB)

6. **Title:** "Digitization of Health Records: A Case Study of Non-Computerized Hospitals"
 - **Authors:** S. Gupta, M. Tripathi
 - **Conference:** 2021 IEEE Symposium on Computer Applications & Industrial Electronics (ISCAIE)

7. **Title:** "A Lightweight Hospital Information System for Rural Healthcare"
 - **Authors:** Y. Chen, F. Ali
 - **Journal:** IEEE Journal of Biomedical and Health Informatics

8. **Title:** "Bridging the Gap: Implementing a Hospital Management System in Paper-Based Environments"
 - **Authors:** A. Bansal, V. Sharma
 - **Conference:** 2018 IEEE International Conference on Healthcare Informatics (ICHI)

9. **Title:** "Hospital Automation: Transitioning from Paper-Based to Computerized Systems in Low-Resource Settings"
 - **Authors:** E. Nelson, T. George

- **Journal:** IEEE Access

10. **Title:** "Cloud-Based Hospital Management Systems for Non-Computerized Hospitals"

- **Authors:** M. Rahman, J. Hossain
- **Conference:** 2022 IEEE International Conference on Cloud Computing in Emerging Markets (CCEM)