



A REPORT ON

Database Management System Mini Project

on

HOSPITAL MANAGEMENT SYSTEM

SUBMITTED TO THE SAVITRIBAI PHULE PUNE UNIVERSITY,
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THE DEGREE OF BACHELOR OF
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CERTIFICATE

This is to certify that the report entitled

“HOSPITAL MANAGEMENT SYSTEM”

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is a bonafide work carried out by them under the supervision of **Mrs. A. R. Kamble** and is approved for the partial fulfillment of the requirement of **HOSPITAL MANAGEMENT SYSTEM** course in Third Year Computer Engineering, in the academic year 2025-2026 prescribed by Savitribai Phule Pune University, Pune .

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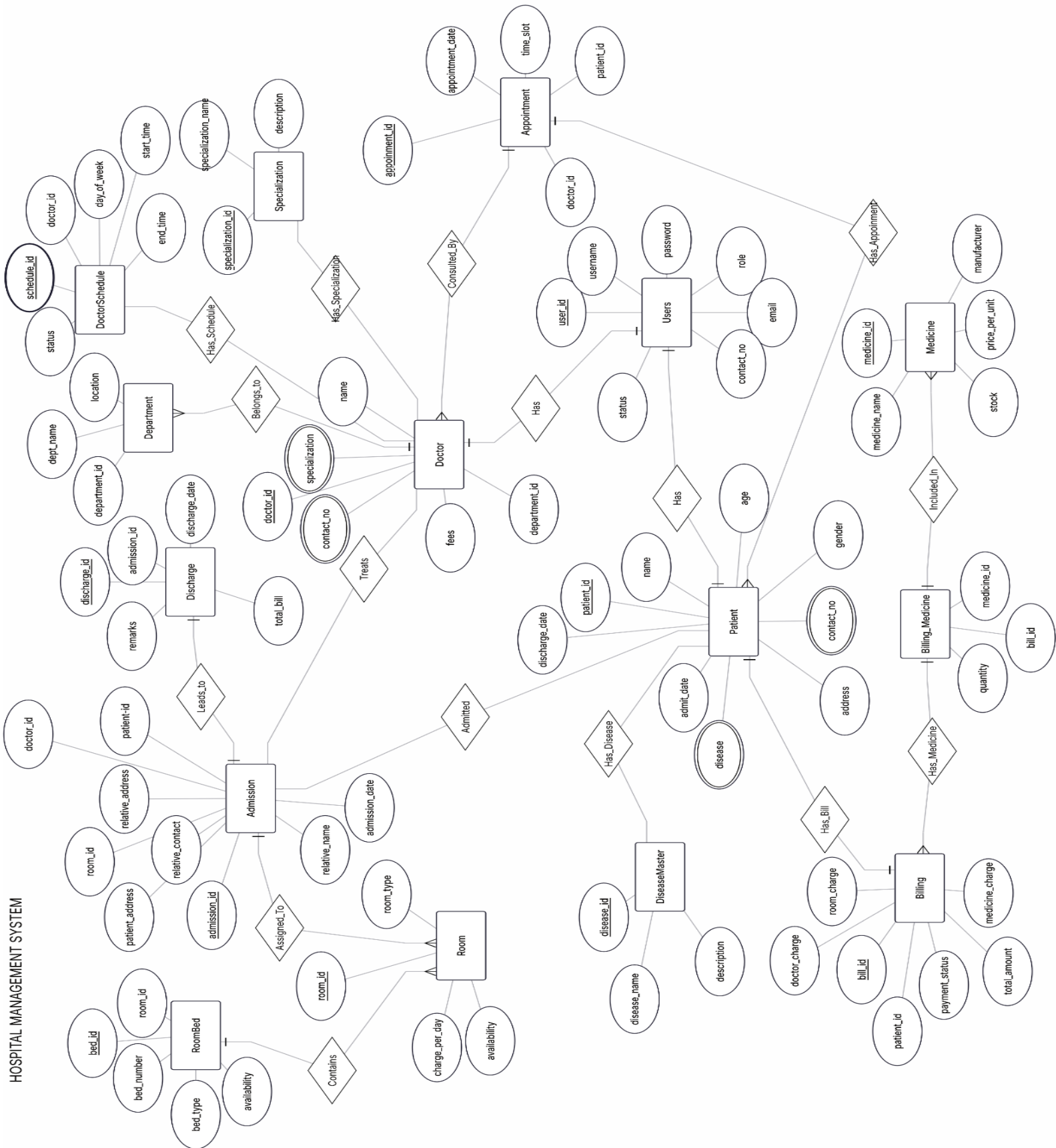
1. INTRODUCTION

- A **Hospital Management System (HMS)** is an integrated software solution designed to manage the day-to-day operations of a hospital efficiently. It automates and streamlines various administrative, financial, and clinical activities, thereby improving the overall quality of healthcare services.
- In modern healthcare environments, hospitals deal with large volumes of patient data, staff information, appointments, billing records, and medical histories. Managing such vast information manually is time-consuming, prone to errors, and inefficient. The Hospital Management System overcomes these challenges by providing a centralized digital platform that enables quick access, secure data storage, and real-time communication among departments.
- This system helps administrators manage patients, doctors, nurses, laboratories, pharmacies, wards, and billing sections effectively. It ensures accurate record-keeping, faster information retrieval, and better coordination between hospital staff. Additionally, it minimizes paperwork, reduces redundancy, and enhances decision-making through timely reports and analytics.
- By integrating modules such as **Patient Management, Doctor Management, Appointments, Admissions, Discharges, Billing, and Reports**, the Hospital Management System contributes significantly to operational efficiency and patient satisfaction.

2. PROBLEM STATEMENT

- Manual management of hospital data leads to errors, duplication, and loss of important records.
- Coordination between departments such as reception, pharmacy, and billing is time-consuming and inefficient.
- Retrieving patient history and generating reports manually causes delays and reduces service quality.
- There is a need for a computerized system to automate operations, maintain accurate records, and improve overall hospital efficiency and patient care.

3. ER MODEL DIAGRAM



4. IMPLEMENTATION DETAILS

The **Hospital Management System (HMS)** is implemented using modern web technologies and a relational database to ensure smooth functioning, scalability, and secure data management. The system architecture is modular, dividing responsibilities among multiple components such as frontend, backend, and database.

1. Technologies Used

- **Frontend:** HTML5, CSS3, Bootstrap, and JavaScript are used to design an interactive, responsive, and user-friendly interface for all users.
- **Backend:** Python (Flask Framework) handles server-side logic, request processing, and communication between the frontend and database.
- **Database:** MySQL is used for storing and managing data related to patients, doctors, rooms, appointments, admissions, and billing.
- **Server:** The system runs locally using Flask's development server (<http://127.0.0.1:5000>) and can be easily deployed to a live environment.

2. Functional Modules

1. Admin Module:

- Add, update, and delete records of doctors and patients.
- Manage room allocation, admissions, and discharges.
- View billing reports and hospital statistics.

2. Doctor Module:

- View and manage daily appointments.
- Update patient status, treatment details, and schedules.
- Manage weekly availability for consultations.

3. Patient Module:

- View assigned doctor, room details, and billing summary.
- Book, reschedule, or cancel appointments.
- Access personal medical and billing history.

4. Database Design

The system's database includes interrelated tables with **primary and foreign key constraints** to maintain data integrity and consistency.

Main tables include:

- **Doctor**(DoctorID, Name, Specialization, Contact, ScheduleID)
- **Patient**(PatientID, Name, Age, Gender, Address, Contact)
- **Room**(RoomID, RoomType, ChargesPerDay, Status)
- **Admission**(AdmissionID, PatientID, DoctorID, RoomID, AdmissionDate, RelativeName, RelativeContact)

- **Discharge**(DischargeID, AdmissionID, DischargeDate, TotalBill)
- **Appointment**(AppointmentID, PatientID, DoctorID, Date, Time, Status)
- **Billing**(BillID, PatientID, DoctorFees, RoomCharges, MedicineCharges, TotalAmount)
- **Medicine**(MedicineID, MedicineName, Type, Stock, UnitPrice)
- **DoctorSchedule**(ScheduleID, DoctorID, DayOfWeek, StartTime, EndTime)
- **Department**(DeptID, DeptName, Description)
- **Specialization**(SpecializationID, SpecializationName, DeptID)
- **DiseaseMaster**(DiseaseID, DiseaseName, Description)
- **RoomBed**(BedID, RoomID, BedNumber, Status)
- **Billing_Medicine**(BillMedID, BillID, MedicineID, Quantity, TotalCost)
- **SpecializationMaster**(SpecMasterID, SpecializationName, Department)
- **Users**(UserID, Username, Password, Role, ReferenceID)

4. Data Flow

- The **Admin** manages and updates all hospital data.
- **Doctors** access their schedules, appointments, and assigned patients.
- **Patients** log in to check appointments, billing, and medical records.

All data transactions occur through MySQL queries executed via Flask routes, ensuring secure CRUD (Create, Read, Update, Delete) operations.

5. Security and Validation

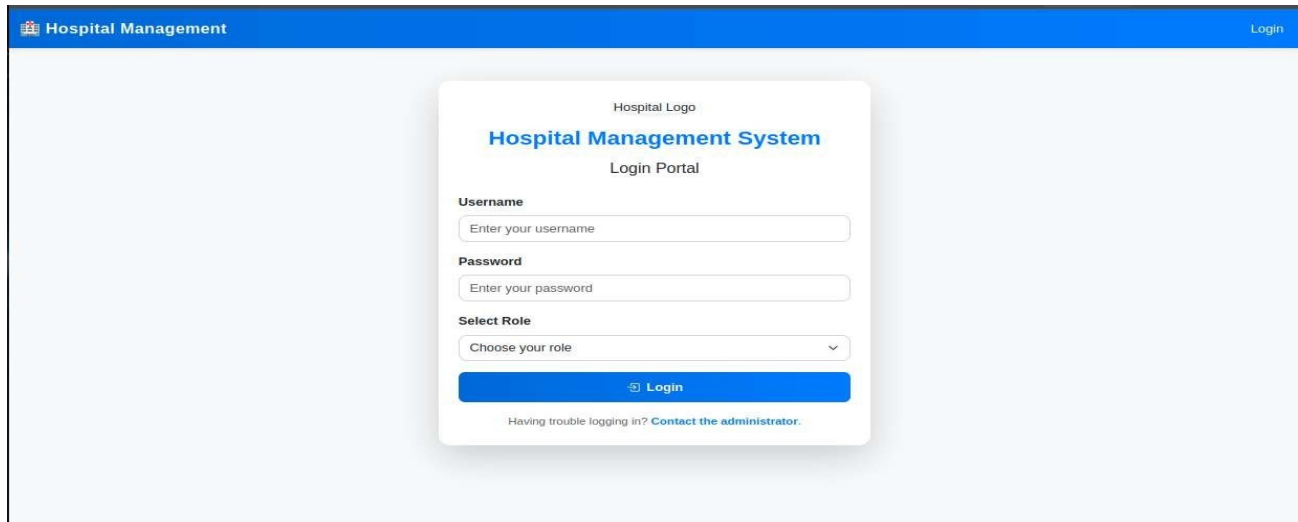
- Role-based login ensures that users can only access features permitted to them.
- Passwords are stored securely using hashing techniques.
- Form validations are implemented for accurate data entry and prevention of SQL injection.

6. Output

The system provides dynamic dashboards and visual reports (using Chart.js integration) for real-time insights into hospital performance, including doctor availability, patient count, and room occupancy.

5. GRAPHICAL USER INTERFACE

Execution Procedures: The **Hospital Management System** provides a clean and user friendly login interface. The login portal ensures that only authorized users such as Admin, Doctor, or Patient can access the system.



The screenshot shows the login portal of the Hospital Management System. The header includes the system name and a login link. The login form is centered and contains fields for Username, Password, and Role selection, followed by a Login button and a link for administrators.

Hospital Management System
Login Portal

Username
Enter your username

Password
Enter your password

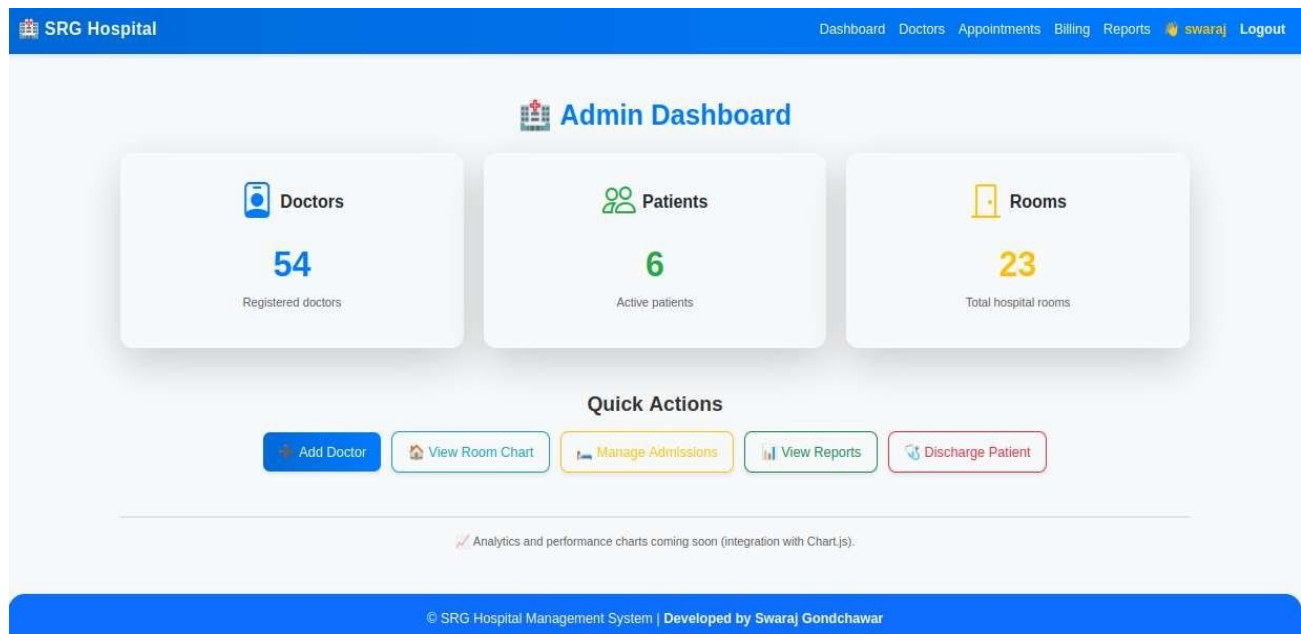
Select Role
Choose your role

Login

Having trouble logging in? [Contact the administrator.](#)

Admin Interface :

Once an administrator logs into the **Hospital Management System**, they are directed to the **Admin Dashboard**, which provides a complete overview of hospital operations and real-time statistics.



The **Admin Dashboard** allows administrators to manage doctors, patients, and rooms efficiently. It provides quick actions such as adding doctors, managing admissions, viewing reports, and discharging patients.

The **Patient Admission Management** page allows the admin to admit patients by selecting a doctor, room, and entering relative details with addresses.

Discharge Page:

The **Discharge Patients** page enables the admin to record discharge details, calculate total charges, and update patient records efficiently.

7 | Page

Patient–Room Chart Page:

The **Patient–Room Chart** displays the status of all hospital rooms, showing total, occupied, and vacant rooms along with room type, charges, assigned patients, and doctors.

SRG Hospital

DashboardDoctorsAppointmentsBillingReportsswarajLogout

Patient–Room Chart

Total Rooms

23

Occupied Rooms

2

Vacant Rooms

21

Room No.	Room Type	Charges/Day	Bed Count	Patient	Doctor	Status
GW-01	General Ward	₹500.00	8	—	—	<div>Vacant</div>
GW-02	General Ward	₹500.00	8	—	—	<div>Vacant</div>
GW-03	General Ward	₹500.00	8	—	—	<div>Vacant</div>
GW-04	General Ward	₹500.00	8	—	—	<div>Vacant</div>
ICU-01	ICU	₹5000.00	1	—	—	<div>Vacant</div>
ICU-02	ICU	₹5000.00	1	—	—	<div>Vacant</div>
ICU-03	ICU	₹5000.00	1	—	—	<div>Vacant</div>
ICU-04	ICU	₹5000.00	1	—	—	<div>Vacant</div>
ICU-05	ICU	₹5000.00	1	—	—	<div>Vacant</div>
ICU-06	ICU	₹5000.00	1	—	—	<div>Vacant</div>
ICU-07	ICU	₹5000.00	1	—	—	<div>Vacant</div>
ER-01	Emergency Ward	₹3000.00	1	—	—	<div>Vacant</div>
ER-02	Emergency Ward	₹3000.00	1	—	—	<div>Vacant</div>
PR-01	Private Room	₹2500.00	1	Ravi Patil	Dr. Mehta	<div>Occupied</div>
PR-02	Private Room	₹2500.00	1	Sneha Kulkarni	Dr. Sharma	<div>Occupied</div>
PR-03	Private Room	₹2500.00	1	—	—	<div>Vacant</div>
PR-04	Private Room	₹2500.00	1	—	—	<div>Vacant</div>
PR-05	Private Room	₹2500.00	1	—	—	<div>Vacant</div>
PR-06	Private Room	₹2500.00	1	—	—	<div>Vacant</div>
PR-07	Private Room	₹2500.00	1	—	—	<div>Vacant</div>
PR-08	Private Room	₹2500.00	1	—	—	<div>Vacant</div>
PR-09	Private Room	₹2500.00	1	—	—	<div>Vacant</div>
PR-10	Private Room	₹2500.00	1	—	—	<div>Vacant</div>

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The **Admin** can add new patients and doctors, manage appointments and doctors schedule, view patient billing details, and monitor daily hospital reports for efficient administration.

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Billing Records

Generate Invoice

#	Patient Name	Doctor Name	Doctor Fee (₹)	Room Charge (₹)	Medicine Charge (₹)	Total Bill (₹)	Date
1	Rahul Verma	Dr. Mehta	1500.00	-	-	₹2000.00	-
2	Sneha Kulkarni	Dr. Sharma	2000.00	-	-	₹2500.00	-
3	Ravi Patil	Dr. Mehta	1500.00	-	-	₹2000.00	-
4	Anita Joshi	Dr. Sharma	2000.00	-	-	₹2500.00	-
5	Karan Mehta	Dr. Reddy	1000.00	-	-	₹1500.00	-
6	Priya Deshmukh	Dr. Patel	800.00	-	-	₹1300.00	-

Total Revenue: ₹11800.00

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Add New Doctor Page:

The **Admin** can add a new doctor by entering details such as name, specialization, contact information, and availability to register them in the hospital database.

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+ Add New Doctor

Full Name

Rahul Kumar

Fees (₹)

800

Department

Cardiology

Specializations

{specialization_name: 'General Medicine'}

{specialization_name: 'General Surgery'}

{specialization_name: 'Cardiology'}

{specialization_name: 'Neurology'}

{specialization_name: 'Neurosurgy'}

Hold Ctrl (or Cmd) to select multiple specialties

Contact Numbers

+91

xxxxxxxx91

+91

xxxxxxxx76

+91

xxxxxxxx86

+ Add Another

Save Doctor

Cancel

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Appointments Page:

The **Appointments** page allows scheduling and managing appointments between patients and doctors, including date, time, and consultation details for efficient hospital workflow.

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DashboardDoctorsAppointmentsBillingReportsswarajLogout

Appointments

Book New Appointment

Upcoming Appointments

ID	Date	Time	Patient	Doctor
4	2025-10-13	11:30	Rahul Verma	Dr. Mehta

Completed Appointments

ID	Date	Time	Patient	Doctor
2	2025-10-06	11:30 AM	Sneha Kulkarni	Dr. Sharma
1	2025-10-05	10:00 AM	Rahul Verma	Dr. Mehta
3	2025-10-04	11:00 am	Rahul Verma	Mayur


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Doctor Dashboard:

The **Doctor Dashboard** provides doctors with an overview of their daily schedule, including today's appointments, active patients, and upcoming consultations, allowing them to manage their schedule efficiently.

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DashboardAppointmentsdoctorsLogout

 **Doctor Dashboard**

Welcome, Dr. doctors

Here's an overview of your day and patients.

Manage My Schedule

Today's Appointments

0

Active Patients

0

Upcoming Appointments

0

Today's Appointments

Time	Patient Name	Disease	Room
No appointments scheduled for today.			

My Patients

Patient Name	Age	Gender	Disease	Room
No patients assigned.				


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Doctor Weekly Schedule Page:

The **Doctor Weekly Schedule** page allows doctors to set, update, or delete their weekly availability by selecting specific days and defining start and end times for patient consultations.

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 **Doctor Weekly Schedule**

Dr.

Day of Week

Start Time

End Time

+ Add

Day	Start Time	End Time	Action
Monday	10:00	15:00	Delete
Tuesday	09:00	15:00	Delete


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Patient Dashboard:

The **Patient Dashboard** provides patients with an overview of their assigned doctor, room status, upcoming appointments, and billing summary, helping them track their medical and financial details easily.

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DashboardMy Appointmentsrahul_vermaLogout


Patient Dashboard

Welcome, rahul_verma!
Here's your medical summary and upcoming appointments.

Assigned Doctor
Not Assigned


Room
Not Assigned

Next Appointment
No Upcoming

17

Your Appointments

Date	Time	Doctor	Status
No appointments found.			

Billing Summary

Doctor Fee (₹)	Room Charge (₹)	Medicine (₹)	Total (₹)	Status
No billing information available.				

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Patient Appointments Page:

The **Appointments** page enables patients to view their upcoming and completed appointments with respective doctors and allows them to book new appointments easily.

SRG Hospital

DashboardMy Appointmentsrahul_vermaLogout

Appointments

Book New Appointment

Upcoming Appointments

ID	Date	Time	Patient	Doctor
4	2025-10-13	11:30	Rahul Verma	Dr. Mehta

Completed Appointments

ID	Date	Time	Patient	Doctor
1	2025-10-05	10:00 AM	Rahul Verma	Dr. Mehta
3	2025-10-04	11:00 am	Rahul Verma	Mayur

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6. CONCLUSION

The **Hospital Management System (HMS)** developed in this project is a comprehensive solution designed to handle the essential functions of hospital administration efficiently. It integrates various modules such as patient registration, doctor management, room allocation, appointment scheduling, billing, and reporting — all within a single, centralized platform.

This system eliminates the inefficiencies of manual record keeping by providing secure, accurate, and real-time data access to authorized users. The role-based dashboards for **Admin**, **Doctor**, and **Patient** ensure that each user interacts only with relevant functionalities, improving both data privacy and ease of use.

The project also demonstrates the practical application of **database management principles** and **web technologies** to create a responsive and interactive interface. It improves communication between departments, enhances resource utilization, and supports data-driven decision-making through detailed reports.

In conclusion, the Hospital Management System not only modernizes hospital operations but also significantly enhances productivity, accuracy, and patient satisfaction. It reflects how well-structured software solutions can transform traditional healthcare management into an efficient, digital, and intelligent system.

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6. GitHub and Stack Overflow, for community discussions and troubleshooting during project implementation.
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