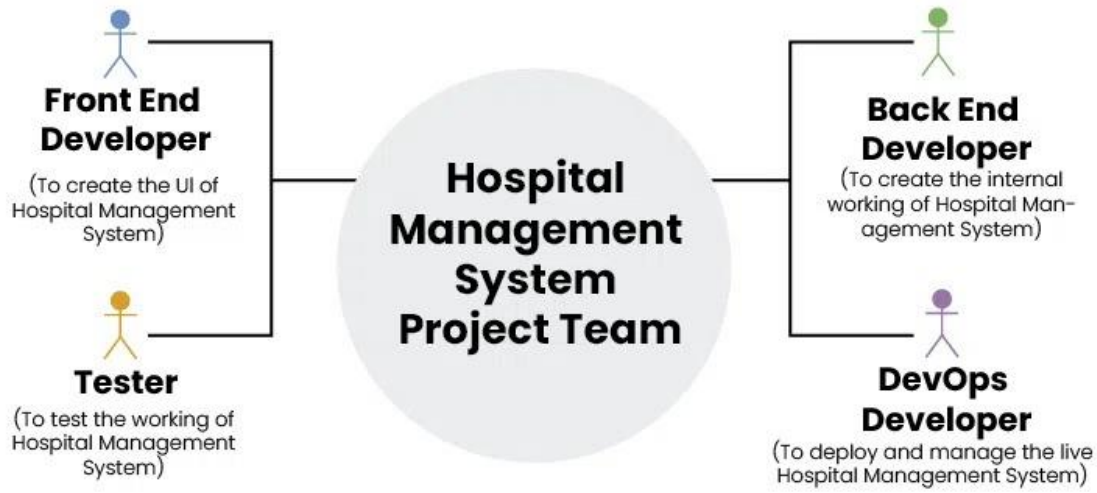
Software Requirements Specification (SRS)

Hospital Management System (HMS)

1. Introduction

In Our project as we will be exploring about web application for Hospital Management System so we will be required below skill sets



1.1 Purpose

This document specifies the software requirements for the **Hospital Management System (HMS)**. The HMS is designed to manage and automate various aspects of hospital operations, including patient management, staff management, appointment scheduling, billing, and medical records. This system aims to streamline hospital processes, improve efficiency, and provide better services to patients and healthcare providers.

1.2 Scope

The Hospital Management System (HMS) will cover the following areas:

- Patient registration and management
- Appointment scheduling
- Staff management (Doctors, Nurses, Admin)
- Billing and invoicing
- Inventory management
- Medical records management
- Reporting and analytics

1.3 Definitions, Acronyms, and Abbreviations

- **HMS**: Hospital Management System
- **Patient**: A person receiving or registered for medical treatment
- **Admin**: Administrative personnel responsible for managing hospital operations
- **DBMS**: Database Management System
- **UI**: User Interface

2. Overall Description

2.1 Product Perspective

The HMS will be a web-based application with a centralized database. It will provide a user-friendly interface for hospital staff, patients, and administrators. It will integrate with existing medical devices and electronic health record systems where necessary.

2.2 Product Features

- **Patient Management**: Allows staff to manage patient records, including demographics, medical history, and current condition.
- **Appointment Scheduling**: Allows patients and staff to book, view, and manage medical appointments.
- **Billing**: Automates invoicing and manages payment processing for treatments, surgeries, etc.

- **Medical Records**: Enables healthcare providers to record and retrieve patient health data.
- **Staff Management**: Admins can manage staff schedules, profiles, and roles.
- **Reporting**: Generates reports for hospital operations, finances, and performance metrics.
- **Inventory Management**: Manages hospital inventory like medicines, medical equipment, etc.

2.3 User Classes and Characteristics

- **Patients**: Can view their records, schedule appointments, and track billing information.
- **Doctors**: Can access patient records, provide diagnoses, schedule appointments, and prescribe treatments.
- **Nurses**: Assist in patient care, maintain records, and support docto
- **Administrators**: Manage users, oversee hospital operations, and generate reports.
- **Receptionists**: Handle patient check-ins, appointment scheduling, and basic administrative tasks.

2.4 Operating Environment

The HMS will be accessible via web browsers (Chrome, Firefox, Safari) on desktop and mobile devices. It will be hosted on a cloud server with a secure backend.

3. System Features

3.1 Patient Registration

- **Description**: Patients can register in the system by providing personal information such as name, contact details, and medical history.
- **Functional Requirements**:
    - Patients can create new records or update existing ones.
    - System validates the data entered.
    - Admins and receptionists can manage patient records.

3.2 Appointment Scheduling

- **Description**: Allows patients to book appointments with doctors. Doctors can confirm or reschedule appointments.

- **Functional Requirements**:
    - Patients can view available time slots and book an appointment.
    - Doctors can accept or reject appointments.
    - Automated reminders for patients and doctors.

3.3 Medical Records Management

- **Description**: Doctors and healthcare providers can record and retrieve medical records.

- **Functional Requirements**:
    - Doctors can input diagnosis, treatment plans, and prescriptions.
    - Patients can view their health records with proper permissions.
    - Data is stored securely and can be accessed by authorized personnel only.

3.4 Billing and Payment

- **Description**: Handles the creation of invoices for patients and processes payments.
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- **Functional Requirements**:
    - Invoices are generated based on treatments, procedures, and consultations.
    - Patients can view and pay bills online.
    - Admins can monitor payment statuses and generate billing reports.

3.5 Staff Management

- **Description**: Admins can manage staff schedules, roles, and profiles.
- **Functional Requirements**:
    - Admins can assign roles to staff (e.g., doctors, nurses, etc.).
    - Staff can log in and view their schedules.
    - Admin can monitor staff attendance and performance.

4. External Interface Requirements

4.1 User Interfaces

- **Web-based Interface**: Responsive design to ensure compatibility with various devices.
- **Login Page**: A secure login page for all users with role-based access control.
- **Dashboard**: User-specific dashboards for quick access to relevant features (appointments, billing, etc.).

4.2 Hardware Interfaces

- The system will be hosted on cloud-based servers and will require a stable internet connection to function.

4.3 Software Interfaces

- **Database**: The system will interact with a relational database (e.g., MySQL, PostgreSQL).
- **Payment Gateway**: Integration with online payment gateways (e.g., PayPal, Stripe).
- **Medical Equipment**: Interfaces for integrating medical devices for real-time data collection (optional).

5. System Attributes

5.1 Performance Requirements

- The system must support at least 500 concurrent users without significant performance degradation.
- Page load time should not exceed 3 seconds under normal conditions.

5.2 Security Requirements

- **Authentication**: All users must authenticate via username and password.
- **Authorization**: Role-based access control to ensure appropriate data access.

- **Data Encryption**: Sensitive data like patient information must be encrypted at rest and in transit.
- **Audit Logs**: All access and modifications to data must be logged for security purposes.

5.3 Reliability

- The system must have 99.9% uptime.
- Backup of patient and hospital data must occur daily.

5.4 Scalability

- The system should be able to scale to accommodate more users as the hospital grows.
- Cloud infrastructure should be able to dynamically allocate resources based on traffic.

6. Other Non-Functional Requirements

6.1 Usability

- The system should have an intuitive user interface.
- Users should be able to complete tasks with minimal training.

6.2 Compliance

- The system must comply with relevant healthcare regulations (e.g., HIPAA in the U.S.).

6.3 Backup and Recovery

- The system must have a disaster recovery plan in place.
- Automated backups must be performed regularly.

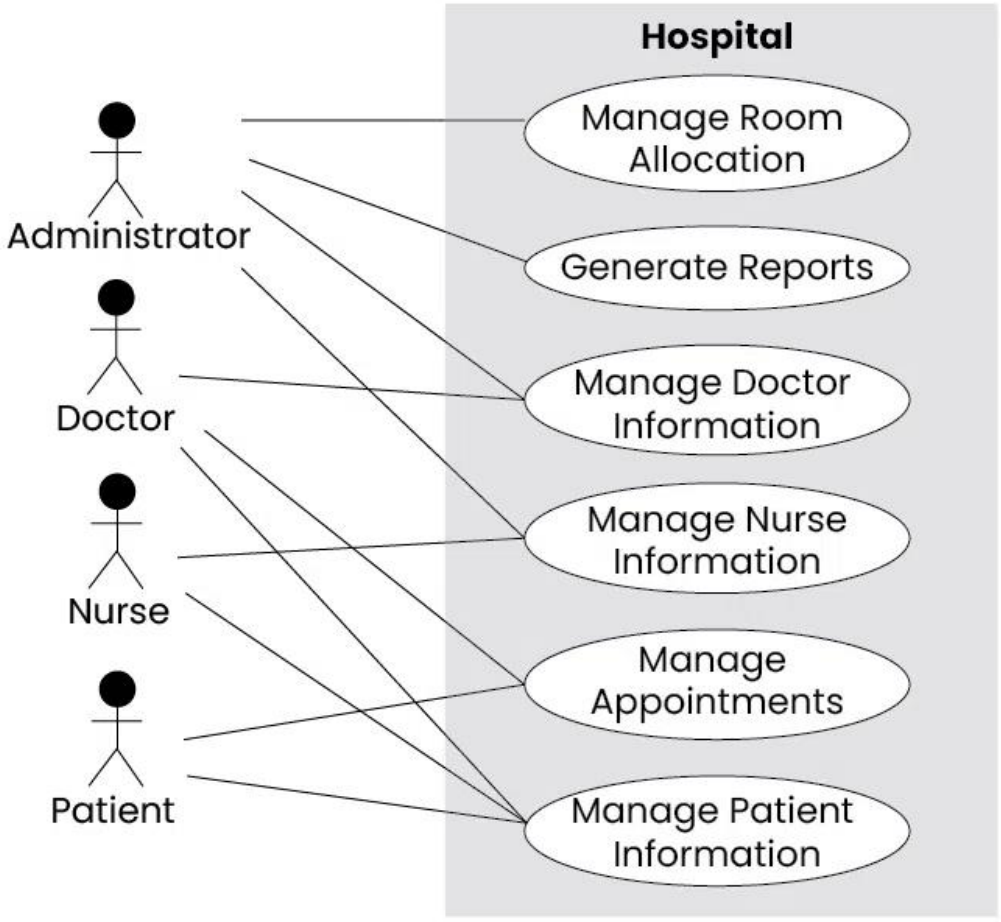
Which Model is Best for Hospital Management System?

Agile Model is the most recommended for the following reasons:

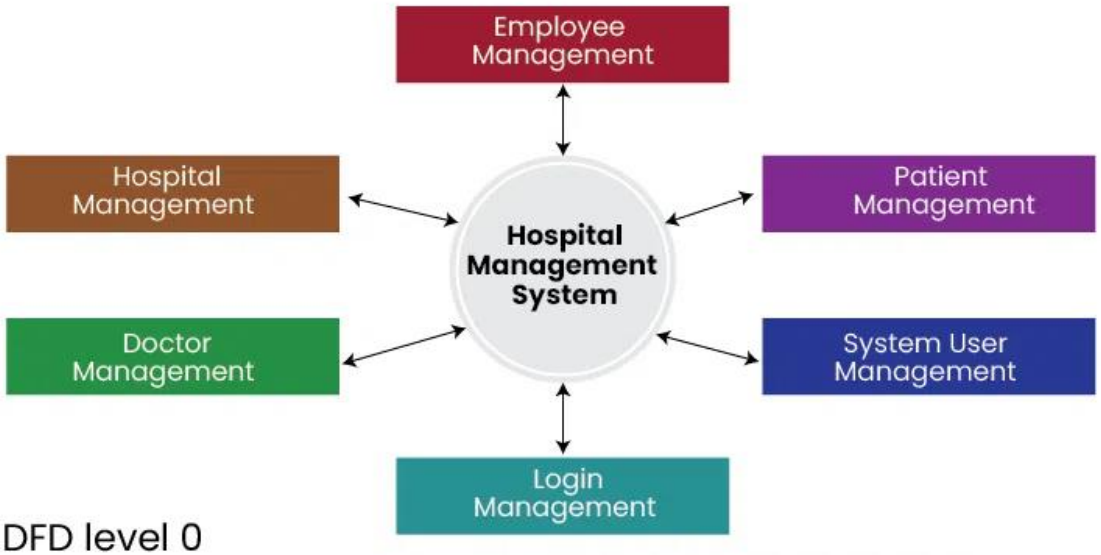
- **Adaptability**: In the healthcare industry, the requirements may change based on evolving regulations, user feedback, and technological advances.
- **Continuous Feedback**: Regular feedback from hospital staff (doctors, administrators, nurses) allows for improvements and adjustments during development.
- **Faster Releases**: By working in sprints, the system can be partially deployed, and functional features can be delivered sooner to meet urgent needs.
- **User-Centered**: Hospital staff, being end-users, can suggest features and improvements, ensuring the system meets actual operational needs.

However, the Spiral model might also be good choices for highly complex, large-scale HMS systems that require risk management, continuous integration, or long-term operation and updates

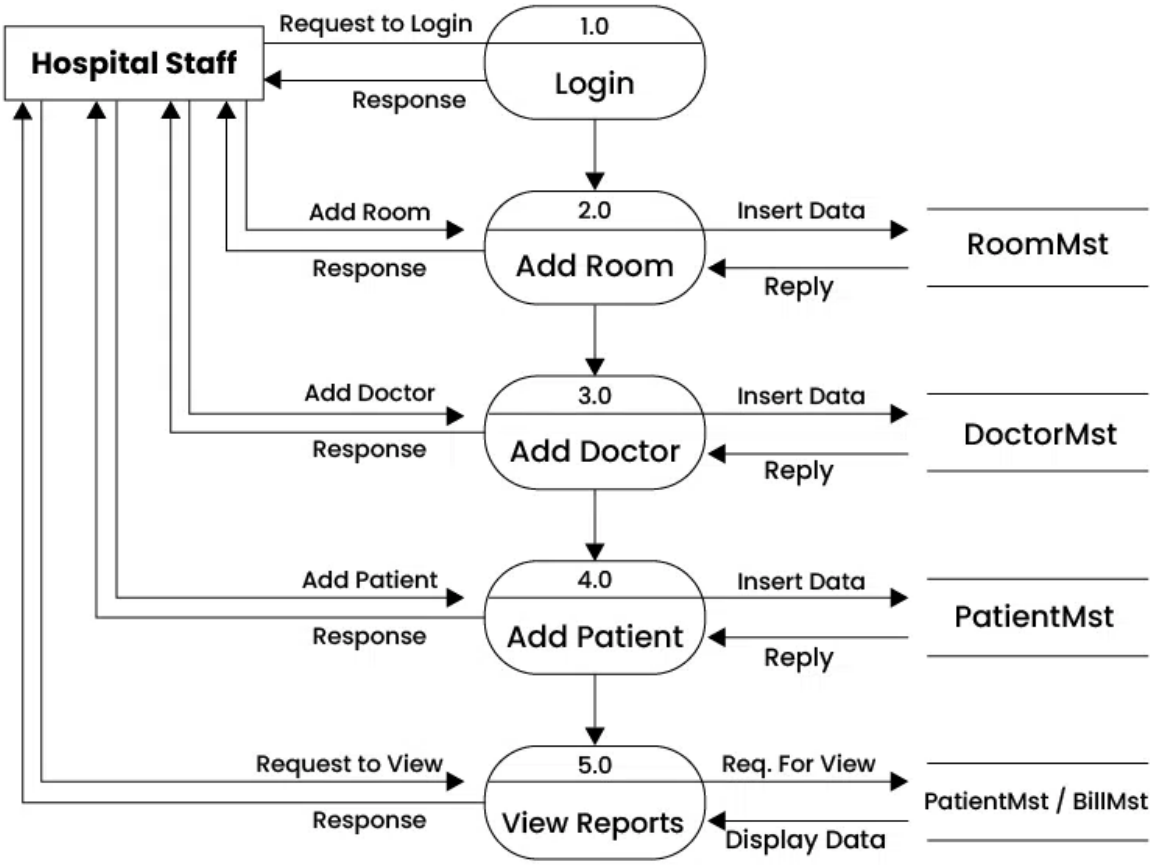
Hospital Management System USE Case

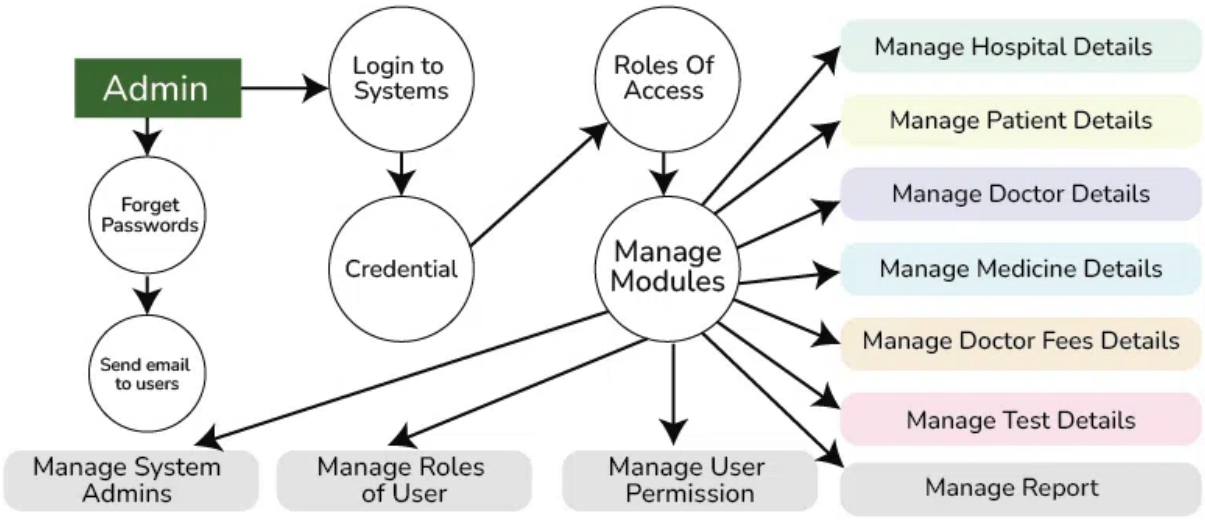


Task Perform by Hospital Management System


Employee Management
Hospital Management
Hospital Management System
Patient Management
Doctor Management
System User Management
Login Management

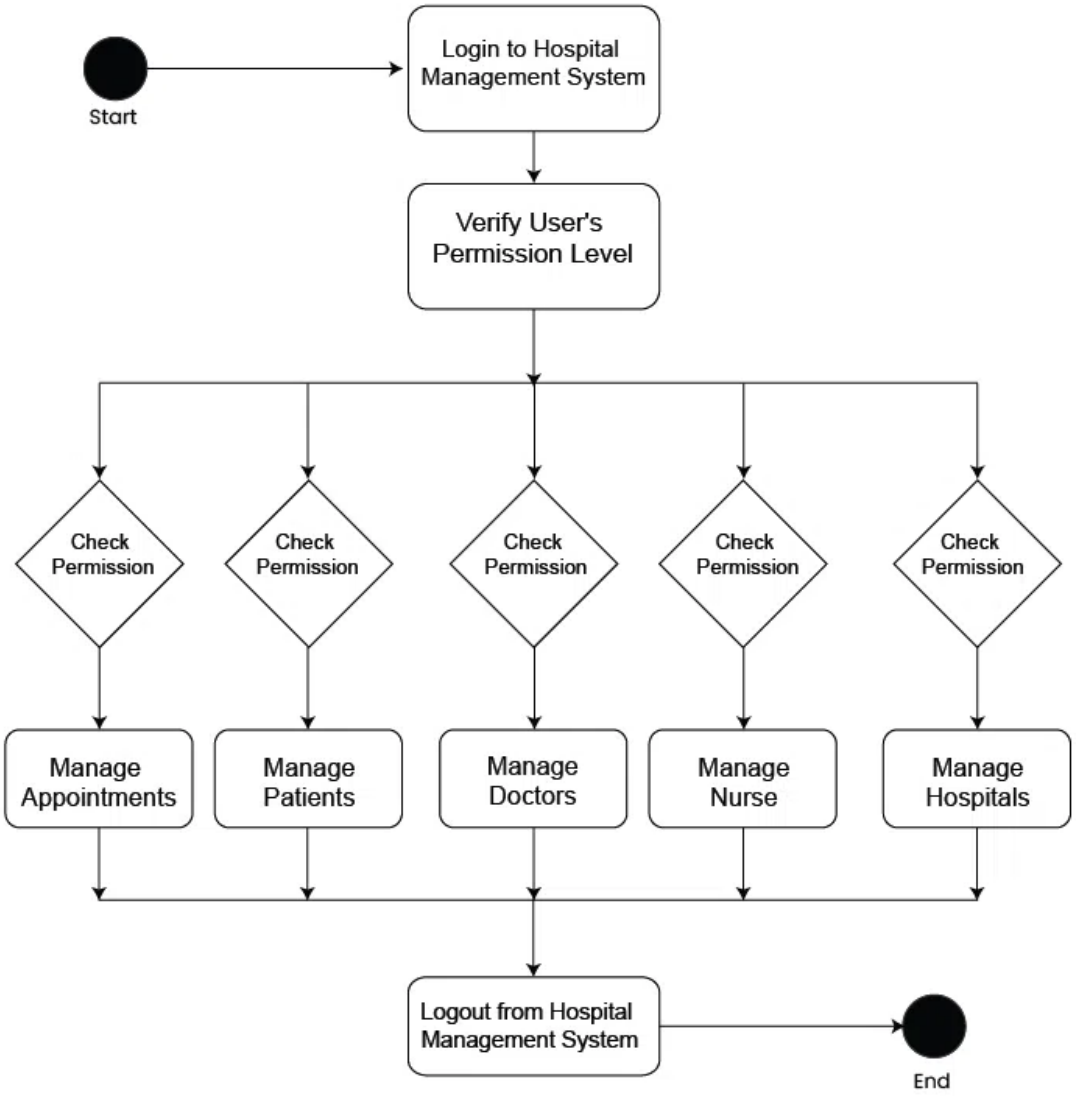
DFD level 0


Hospital Staff
Request to Login
Response
1.0
Login
Add Room
Response
2.0
Add Room
Insert Data
Reply
RoomMst
Add Doctor
Response
3.0
Add Doctor
Insert Data
Reply
DoctorMst
Add Patient
Response
4.0
Add Patient
Insert Data
Reply
PatientMst
Request to View
Response
5.0
View Reports
Req. For View
Display Data
PatientMst / BillMst



Activity Diagram

This activity diagram outlines the main activities and interactions within the Hospital Management System, including booking appointments, patient check-in, accessing medical records, billing, inventory management, staff management, and report generation. Each activity



User Interaction:

Book Appointment

Check in

View Medical Records

Pay Bills

Manage Inventory

Manage Staff

Generate Reports

Log Out

Book Appointment:

User selects "Book Appointment."

System displays available doctors and time slots.

User selects a doctor and preferred time.

System confirms the appointment booking.

Check in:

Patient arrives at the hospital.

Receptionist greets the patient and verifies their appointment.

Receptionist checks the patient in and assigns a queue number.

View Medical Records:

User selects "View Medical Records."

System prompts user to enter patient ID or name.

System retrieves and displays the patient's medical history.

Pay Bills:

User selects "Pay Bills."

System displays a list of outstanding bills for the user.

User selects the bill(s) to pay and enters payment details.

System processes the payment and updates the billing records.

Manage Inventory:

Authorized staff member selects "Manage Inventory."

System displays options to add, update, or remove items from inventory.

Staff member performs the desired inventory management tasks.

System updates the inventory database accordingly.

Manage Staff:

Authorized administrator selects "Manage Staff."

System displays options to add, update, or remove staff members.

Administrator performs the desired staff management tasks.

System updates the staff database accordingly.

Generate Reports:

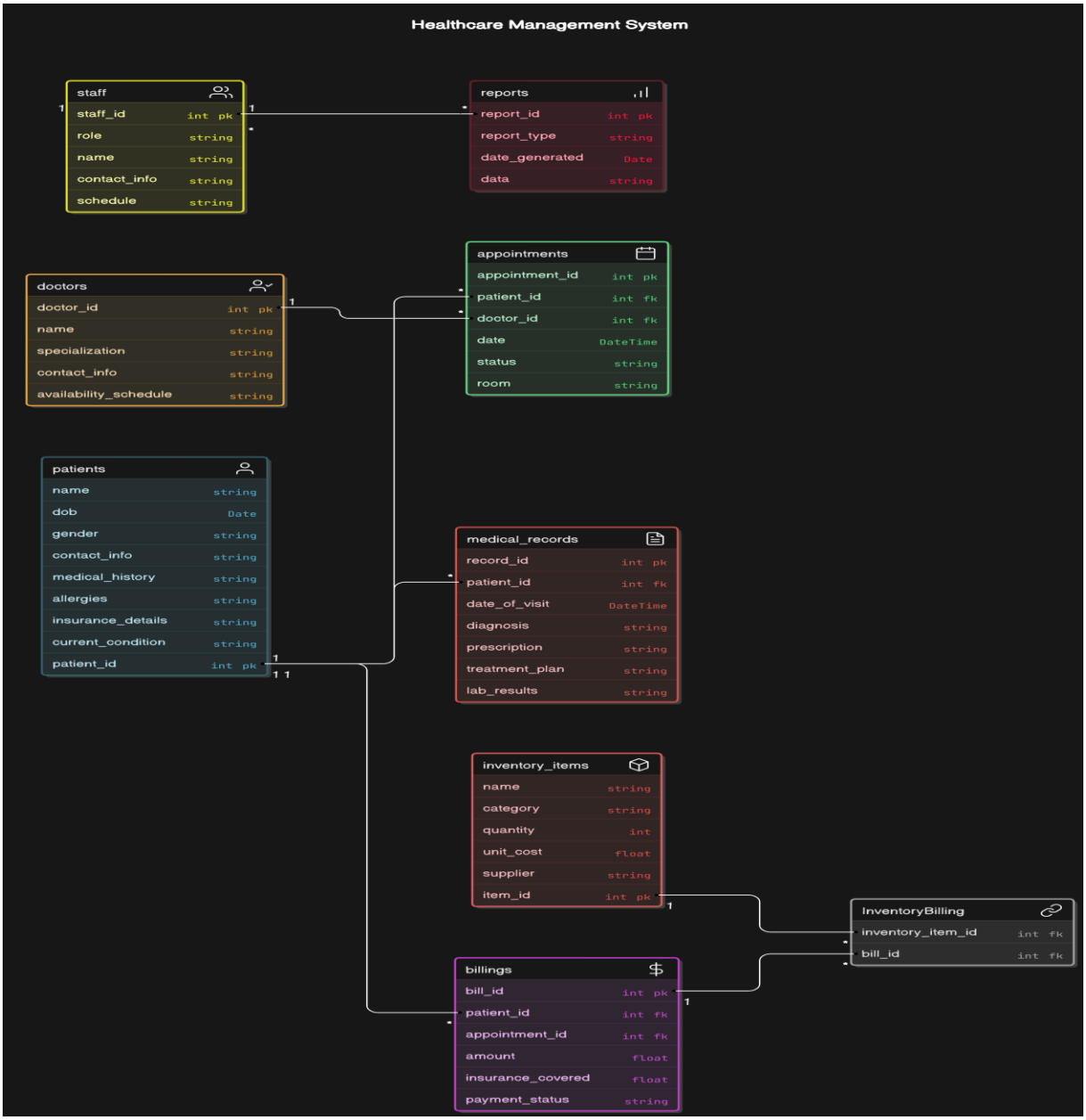
Authorized user selects "Generate Reports."

System provides options to generate various reports such as patient statistics, financial summaries, etc.

User selects the type of report to generate.

System generates the report and displays it to the user.

Hospital Management System Class Diagram


Healthcare Management System
staff
staff_id int pk
role string
name string
contact_info string
schedule string
reports
report_id int pk
report_type string
date_generated Date
data string
doctors
doctor_id int pk
name string
specialization string
contact_info string
availability_schedule string
appointments
appointment_id int pk
patient_id int fk
doctor_id int fk
date DateTime
status string
room string
patients
name string
dob Date
gender string
contact_info string
medical_history string
allergies string
insurance_details string
current_condition string
patient_id int pk
medical_records
record_id int pk
patient_id int fk
date_of_visit DateTime
diagnosis string
prescription string
treatment_plan string
lab_results string
inventory_items
name string
category string
quantity int
unit_cost float
supplier string
item_id int pk
InventoryBilling
inventory_item_id int fk
bill_id int fk
billings
bill_id int pk
patient_id int fk
appointment_id int fk
amount float
insurance_covered float
payment_status string