HOSPITAL MANAGEMENT SYSTEM

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Problem Statement for Hospital Management System

Hospitals face significant challenges in managing various operations efficiently due to reliance on manual systems and fragmented processes. Patient information management is a critical issue, with traditional paper-based records often being incomplete and difficult to access across departments. This can compromise patient care, as medical histories, lab results, and prescriptions may not be readily available. Additionally, appointment scheduling becomes complex when handled manually, leading to long patient wait times and scheduling conflicts. The lack of an integrated system also affects billing and invoicing, where errors due to manual input can cause disputes and poor financial management. Hospitals further struggle with inventory and supply chain management, as they need real-time tracking of medical supplies and equipment to avoid shortages or overstocking.

Other key areas of concern include staff management and regulatory compliance. Without a systematic approach, coordinating the schedules and workloads of doctors, nurses, and support staff can become chaotic, leading to inefficiencies. Regulatory compliance, such as adhering to patient privacy laws and safety standards, is also a challenge when relying on manual processes, increasing the risk of non-compliance and making accurate reporting difficult. Additionally, a lack of integrated communication channels between departments hampers smooth coordination, leading to delays and errors in patient diagnostics, treatments, and overall care. An efficient hospital management system is essential to address these issues, ensuring streamlined operations, enhanced care quality, and compliance with regulations.

Software Requirement Specification

For

Hospital Management System

Version 3.0 approved

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25-10-2024

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Revision History

Name	Date	Reason for changes	Version
Week-1	25/09/2024	SRS Template	1.0
Week-2	19/10/2024	SRS (DIAGRAMS)	2.0
Week-3	25/10/2024	SRS Final document	3.0

1. Introduction

The Software Requirement Specification is designed to document and describe the

agreement between the customer and developer regarding the specification of the software product

requested.

This documentation is done to provide a clear idea of customer requirements. This document can

be used as reference in further development of the software system.

1.1 Purpose:

The purpose of this SRS is to describe the software requirements for the Hospital Management System (HMS). The HMS will automate patient management, doctor management, appointment scheduling, billing, and reporting. This document outlines the system's functionality and intended use.

1.2 Document Convention:

Heading:

- Font-Size:16 Font-Style: Bold
- Font: Times New Roman

Subheading:

- Font-Size:14 Font-Style: Bold
- Font: Times New Roman

Content:

- Font-Size:12
- Font: Times New Roman.

1.3 Intended Audience and Reading Suggestions:

This document is intended for software developers, project managers, testers, and hospital administration staff. The document begins with a high-level overview of the system, followed by detailed system features and requirements. Developers should focus on Sections 2 and 4, while testers may concentrate on Sections 3 and 5.

1.4 Product Scope:

The Hospital Management System (HMS) is a comprehensive system that automates operations within a hospital, including patient registration, doctor management, appointment scheduling, billing, and report generation. It aims to streamline administrative tasks, improve patient care, and ensure accuracy in billing and reporting.

1.5 References:

- HMS User Interface Guidelines, Version 1.2
- Hospital Data Privacy Act, 2019

2. Overall Description

2.1 Product Perspective

The HMS will replace current manual or semi-automated systems in hospitals. It will interact with other systems such as inventory management and laboratory systems and must be easily integrable with electronic health record (EHR) systems for data transfer.

2.2 Product functions

- Patient registration and management
- Doctor information management
- Appointment scheduling
- Billing and payment processing
- Reporting and analytics
- User role management (Admin, Doctor, Nurse, etc.)

2.3 Operating Environment

- Windows/Linux server environment
- Web browser: Chrome, Firefox, Safari
- Database: MySQL/PostgreSQL
- Frontend: HTML5, CSS3, JavaScript (React/Angular

2.4 User Characteristics

- Admin: Manages system settings and user roles.
- Doctors: Access patient records and manage appointments.
- Nurses: Assist in patient management and access patient information.
- Patients: Can book appointments online.
- Billing Staff: Manage billing, payments, and reports.

2.5 Design and Implementation Constraints

- System must comply with local hospital regulations and data privacy laws.
- The system should be built using secure coding practices, especially for handling sensitive patient data.
- The system will use HTTPS protocol for secure data transmission.

2.6 User Documentation

- User manual for Admin, Doctors, and Billing Staff
- Online help for patients (for appointment scheduling)
- Training tutorials

2.7 Assumptions and Dependencies

- The system assumes users will have access to modern web browsers and reliable internet connections.
- Third-party integration for payment gateways may be necessary.

3. Specific requirements

3.1 User Interfaces

- Intuitive dashboard for Admins, Doctors, and Billing Staff.
- Patient-friendly interface for online appointment scheduling.
- Reports section with printable and exportable formats (PDF/Excel).

3.2 Hardware Interfaces

- The system will interface with barcode scanners for patient registration.
- Integration with laboratory equipment to fetch diagnostic reports.

3.3 Software Interfaces

- Integration with hospital inventory management system for medication tracking.
- Connection to government health portals for reporting.

3.4 Communications Interfaces

- Email notifications for appointment confirmations and reminders.
- SMS gateway for alerts to patients and doctors.

4. System Features

4.1 Patient Registration

4.1.1 Description and Priority

- Allows patients to register their details into the system for appointment scheduling and hospital visits.
- Priority: High

4.1.2 Stimulus/Response Sequences

- Patient enters details.
- System generates a unique patient ID.
- Confirmation message sent to patient via email/SMS.

4.1.3 Functional Requirements

- REQ-1: The system must allow patients to register via an online form or at the hospital.
- REQ-2: The system must store patient records securely in the database.

4.2 Doctor Management

4.2.1 Description and Priority

- Manages doctor profiles, specializations, schedules, and availability.
- Priority: High

4.2.2 Functional Requirements

- REQ-3: The system must allow the admin to add, update, or remove doctor profiles.
- REQ-4: Doctors' availability should be updated in real-time for appointment scheduling.

4.3 Appointment Scheduling

4.3.1 Description and Priority

- Allows patients to schedule, reschedule, or cancel appointments with doctors.
- Priority: High

4.3.2 Functional Requirements

- REQ-5: Patients must be able to book appointments through the website.
- REQ-6: The system must prevent double booking by checking doctor's availability.

4.4 Billing and Payment

4.4.1 Description and Priority

- Manages patient billing, invoicing, and payment processing.
- Priority: Medium

4.4.2 Functional Requirements

- REQ-7: The system should calculate bills based on services availed by the patient.
- REQ-8: It must integrate with payment gateways for online payments.

4.5 Reporting

4.5.1 Description and Priority

- Generates various reports, including patient records, billing, and doctor performance.
- Priority: Medium

4.5.2 Functional Requirements

- REQ-9: Admin must be able to generate custom reports in PDF or Excel format.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- The system should support up to 1000 concurrent users with no significant performance degradation.
- Page load times must not exceed 3 seconds.

5.2 Safety Requirements

- Sensitive patient data must be encrypted both in transit and at rest.
- The system should have a backup mechanism in case of failure.

5.3 Security Requirements

- Role-based access control must be enforced.
- User authentication should include multi-factor authentication (MFA) for Admins and Doctors.

5.4 Software Quality Attributes

- Availability: 99.9% uptime
- Maintainability: The system should be easy to update with minimal downtime.
- Usability: User interfaces should be intuitive and accessible with minimal training.

5.5 Business Rules

- Only authorized personnel can access patient medical records.
- Billing data should be locked after final payment.

6. Other Requirements

- The system must support multiple languages.
- Must comply with GDPR and HIPAA regulations for data privacy.

Appendix A: Glossary

- **HMS**: Hospital Management System
- **EHR:** Electronic Health Record
- **HIPAA**: Health Insurance Portability and Accountability Act

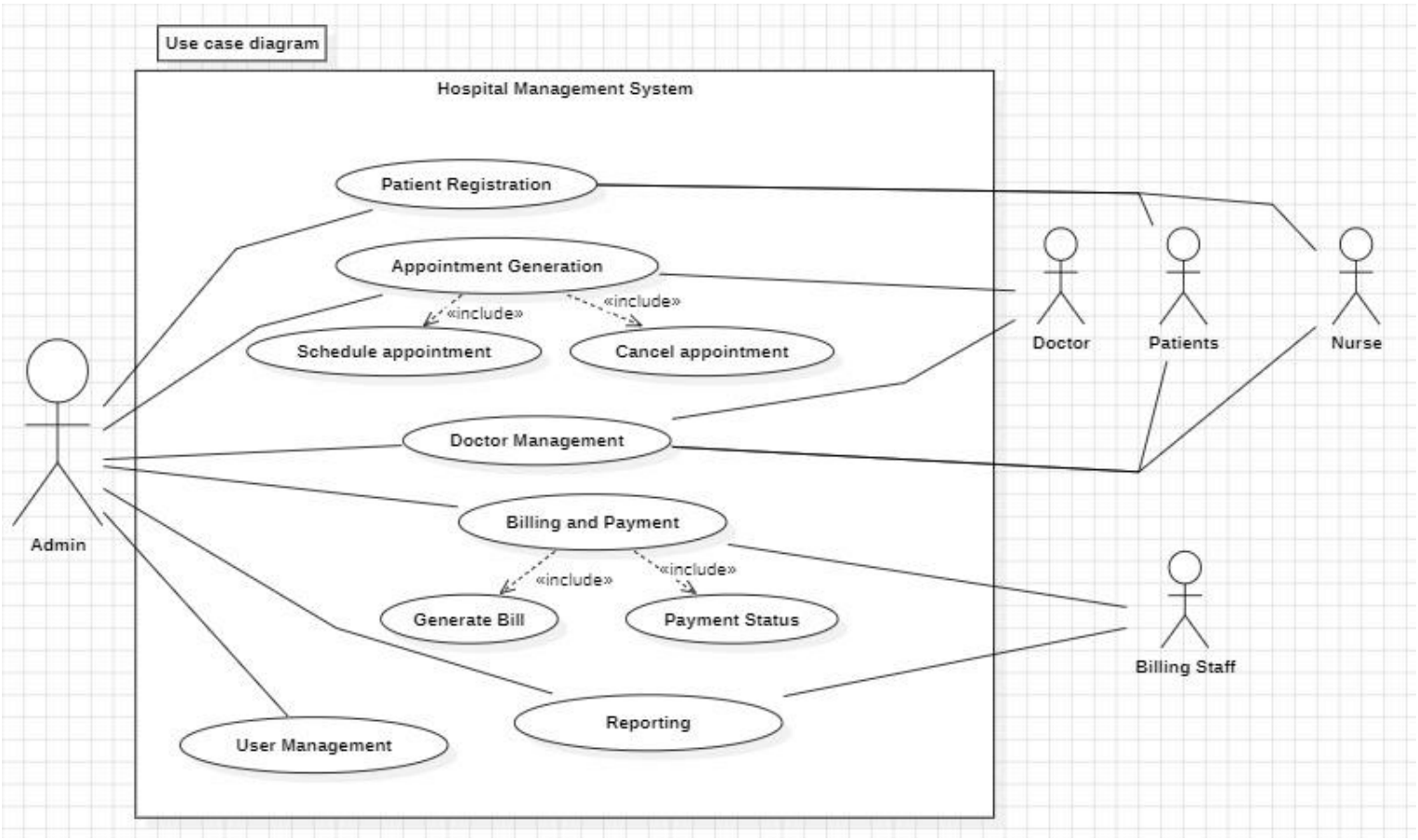
Appendix B: Analysis Models

Use case template

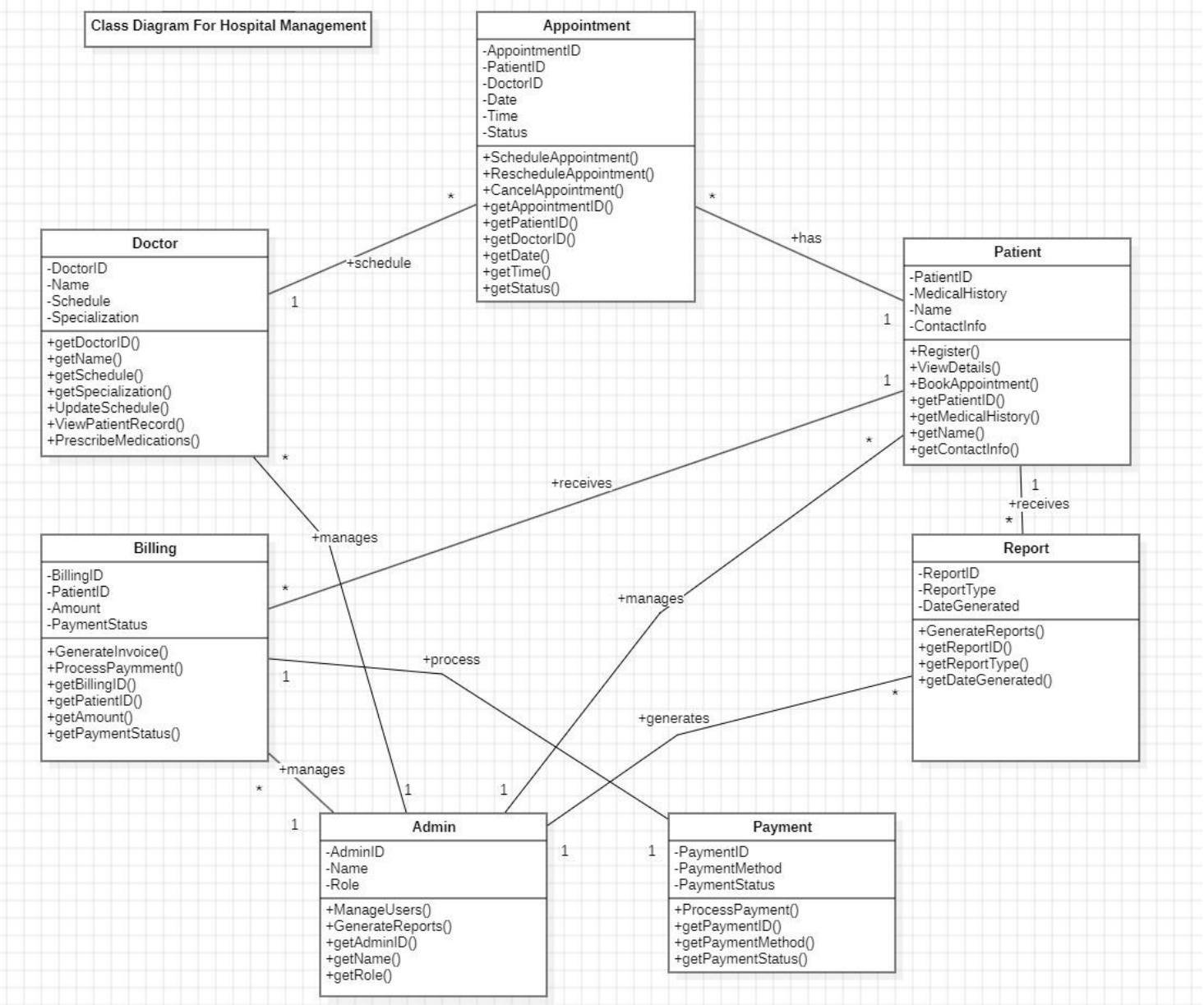
Use Case ID:	20241018201		
Use Case Name:	Hospital Management System		
End Objective:	Enable hospital staff to manage patient registrations, appointments, billing, and reporting efficiently, ensuring smooth operations.		
Created by:	1. Rohit 2. Siddhant 3. Rishith 4. Shravan 5. Venkatramana	**On (date):**	October 18,2024
User/Actor:	Admin, Doctor, Nurse, Patients, Billing Staff		

Trigger:	User interaction with the hospital management system for patient, appointment, and billing management.
Basic/Normal Flows	
User Actions	**System Actions**
Admin logs into the system	System authenticates and grants access based on roles
Admin registers a patient	System creates and stores the patient record
Admin schedules an appointment	System saves the appointment and notifies the patient
Admin generates a bill	System calculates charges and generates a bill
Admin checks payment status	System retrieves payment details and shows status
Admin manages doctor availability	System updates doctor records and availability
Admin generates reports	System compiles and displays requested data reports

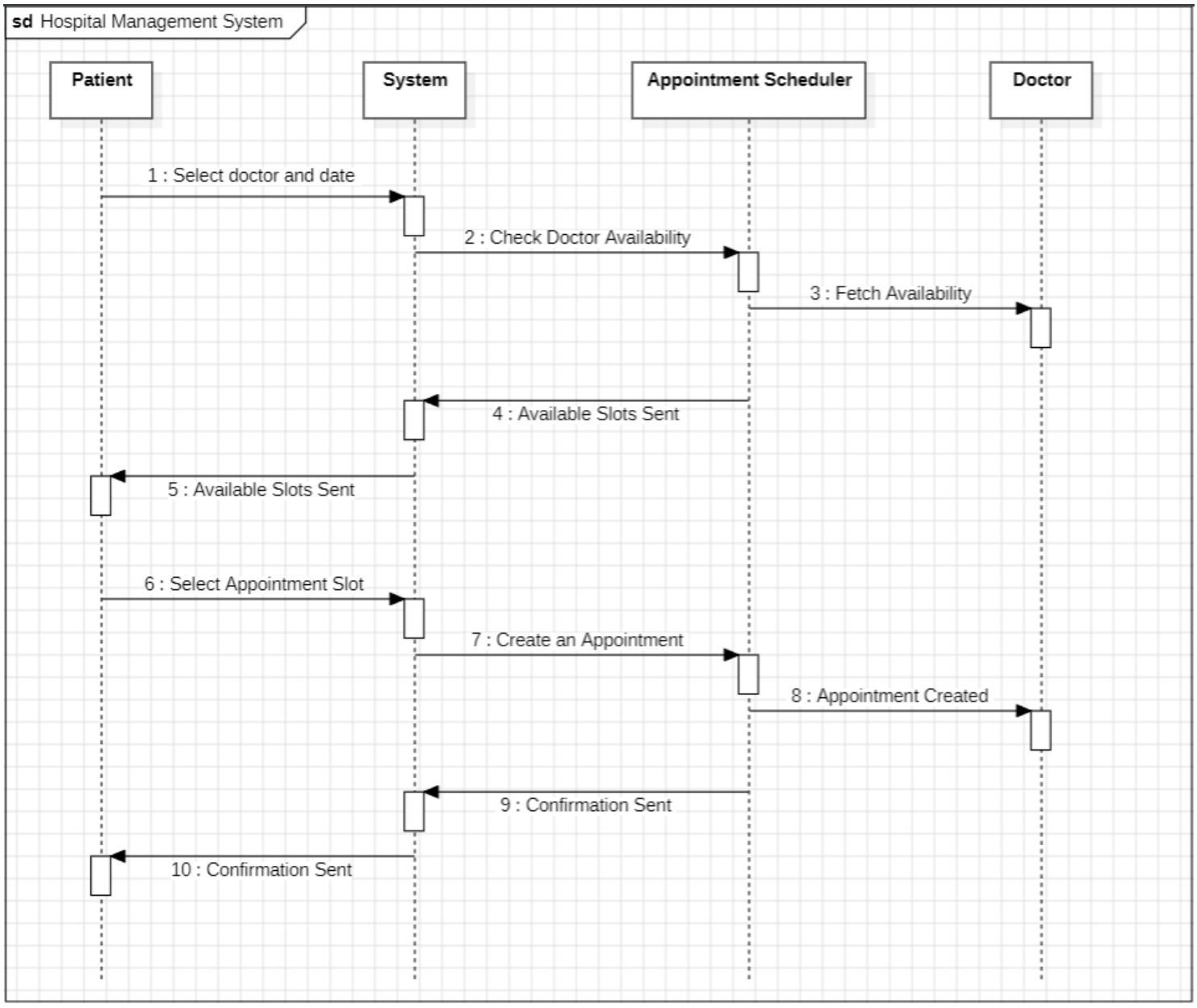
Use Case Diagram:



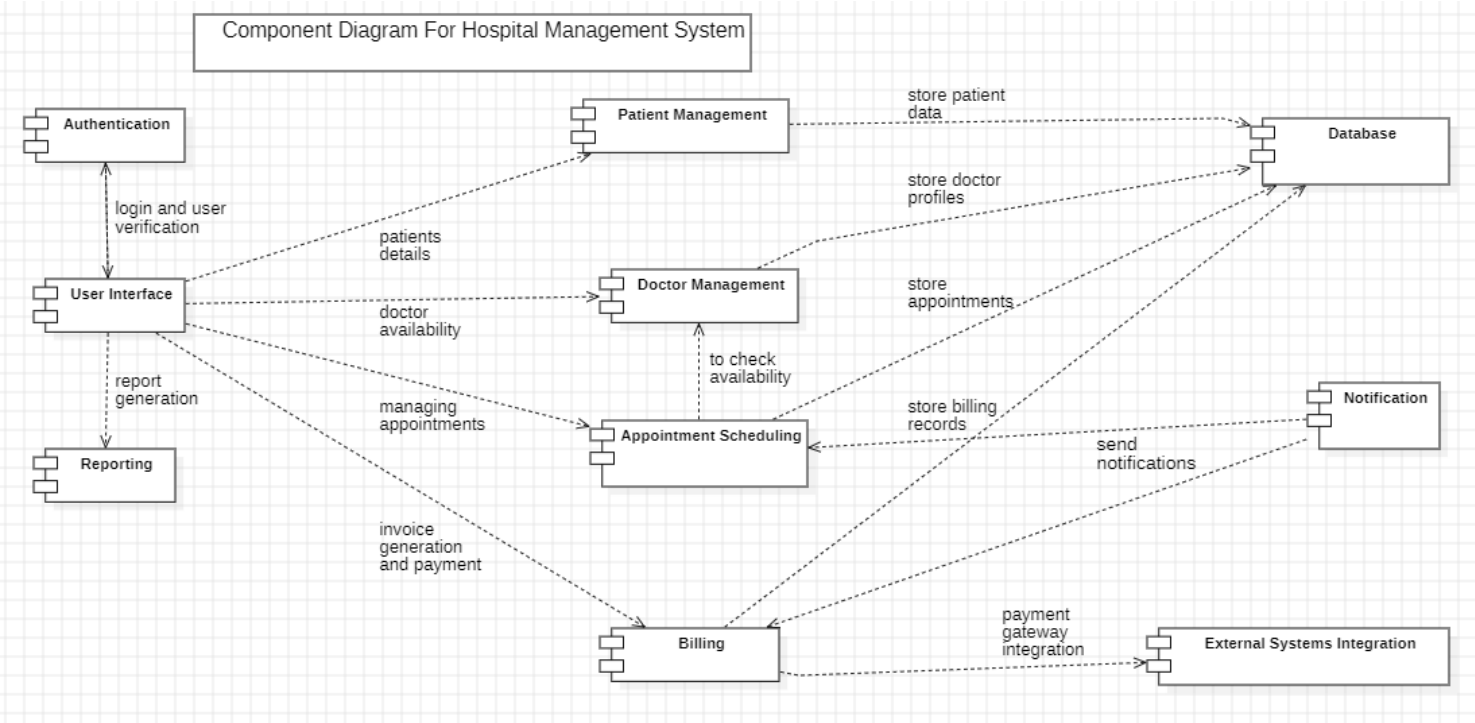
Class Diagram:



Sequence Diagram:



Component Diagram:



Appendix C: To be Determined List

- Specific third-party lab systems to be integrated.
- Finalized user roles and permissions for different staff members (doctors, nurses, administrative staff, etc.).
- Detailed performance metrics and benchmarks to evaluate system efficiency during peak hours.