Software Requirements Specification (SRS) for Hospital Management System

1. Introduction

1.1 Purpose

The purpose of this document is to specify the software requirements for the **Hospital Management System (HMS)**. It will outline the system's core functionality, performance, and design constraints, serving as a blueprint for the development of an integrated system for managing hospital operations.

1.2 Scope

The system is a multi-user, role-based web application for managing all essential operations within a hospital environment. Its core functions include patient registration, appointment scheduling, electronic medical records (EMR), billing, and inventory management. The system is intended for use by administrative staff, doctors, nurses, and laboratory personnel to streamline patient care and hospital workflows.

1.3 Definitions and Acronyms

- **System (HMS):** The Hospital Management System.
- **User:** Any individual interacting with the system, including **Administrator**, **Doctor**, **Nurse**, and **Clerk**.
- **EMR:** Electronic Medical Record, a digital version of a patient's medical history.
- **OPD:** Outpatient Department, for patients receiving care without being admitted.
- **IPD:** Inpatient Department, for admitted patients requiring continuous care.
- **API:** Application Programming Interface.
- **HL7:** Health Level Seven, a standard for electronic data exchange in healthcare.

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2. Overall Description

2.1 Product Perspective

The system will be an integrated, centralized web application designed to replace disparate paper and digital systems within the hospital. It must prioritize data security and adherence to relevant healthcare data privacy regulations (e.g., HIPAA). It will use a robust backend to handle high transaction volumes and secure access.

2.2 Product Functions

The system provides the following major functionalities:

- **Patient Registration & Admission:** Manages the registration of new patients (OPD) and the admission/transfer/discharge process (IPD).
- **Appointment Scheduling:** Facilitates booking, viewing, and managing appointments for doctors and specific hospital resources.
- **EMR Management:** Allows authorized users (Doctors/Nurses) to record, view, and update patient medical records, diagnoses, and treatment plans.
- **Billing and Payments:** Manages the generation of invoices for services rendered (consultations, labs, procedures) and tracks payments.
- **Pharmacy/Inventory Management:** Tracks stock levels of medications and supplies, and manages drug dispensing.
- **Reporting:** Provides administrative and financial reports on patient statistics, revenue, and resource utilization.

2.3 User Characteristics

The system has multiple user roles with distinct needs:

- **Administrator/Clerk:** Staff responsible for patient registration, appointment booking, and billing. Requires training in clerical and administrative tasks.
- **Doctor:** Medical staff who need to access and update EMRs, order lab tests, and write prescriptions. Requires medical domain expertise and secure access.
- **Nurse:** Clinical staff who need to record patient vitals, administer medications, and manage ward patient records. Requires clinical domain expertise and mobile access.
- **Lab Technician:** Staff who record and manage results for ordered diagnostic tests.

2.4 Design and Implementation Constraints

- **Data Security & Privacy:** Must strictly adhere to all regional and national healthcare data privacy laws. All patient data must be encrypted both in transit and at rest.
- **Interoperability:** The system must be capable of exporting and importing clinical data using healthcare industry standards like **HL7**.

- **Scalability:** The architecture must be scalable to handle a growing number of patients, doctors, and simultaneous users.
- **Authentication:** Must implement strong, role-based access control (RBAC) to ensure users only access data relevant to their function (e.g., Nurses cannot edit billing details).

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3. Specific Requirements

3.1 Patient Management Module

- **3.1.1 Patient Registration:** The system shall provide a form to capture full patient demographics, insurance information, and assign a unique Patient ID.
- **3.1.2 Admission/Discharge:** The system shall track a patient's current status (OPD, Admitted, Discharged) and their assigned ward/room.

3.2 Clinical Module (EMR)

- **3.2.1 Record Vitals:** A Nurse shall be able to record patient vitals (temperature, blood pressure, etc.) with a timestamp.
- **3.2.2 Prescription Management:** A Doctor shall be able to digitally generate and view prescriptions, which should automatically notify the Pharmacy module.
- **3.2.3 Lab Order Management:** A Doctor shall be able to order diagnostic tests, which must generate a request in the Laboratory module.

3.3 Appointment and Scheduling Module

- **3.3.1 Appointment Booking:** A Clerk shall be able to book, reschedule, or cancel appointments based on the Doctor's availability schedule.
- **3.3.2 Doctor Availability:** A Doctor shall be able to manage their schedule, blocking out times for unavailability.

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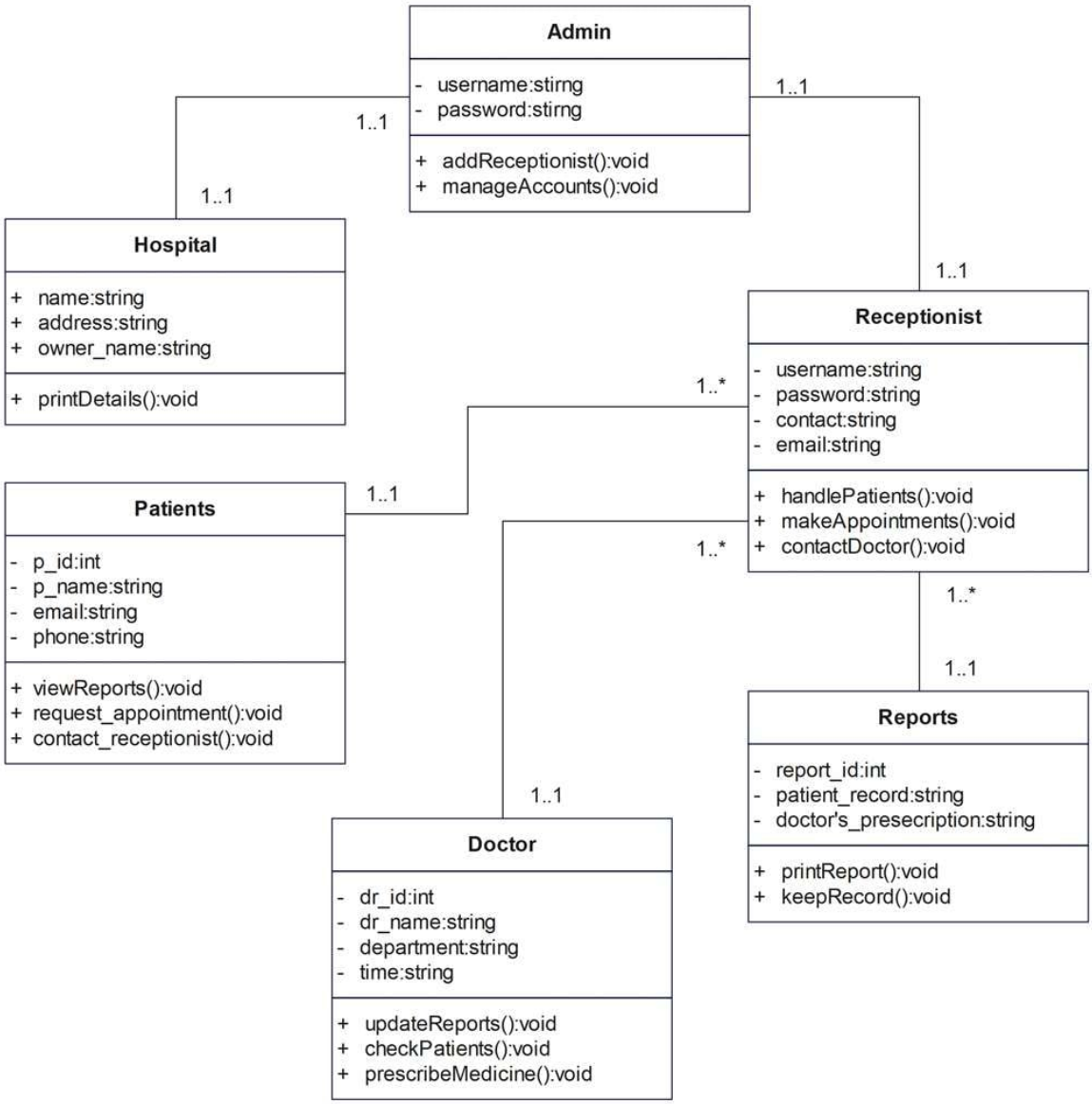
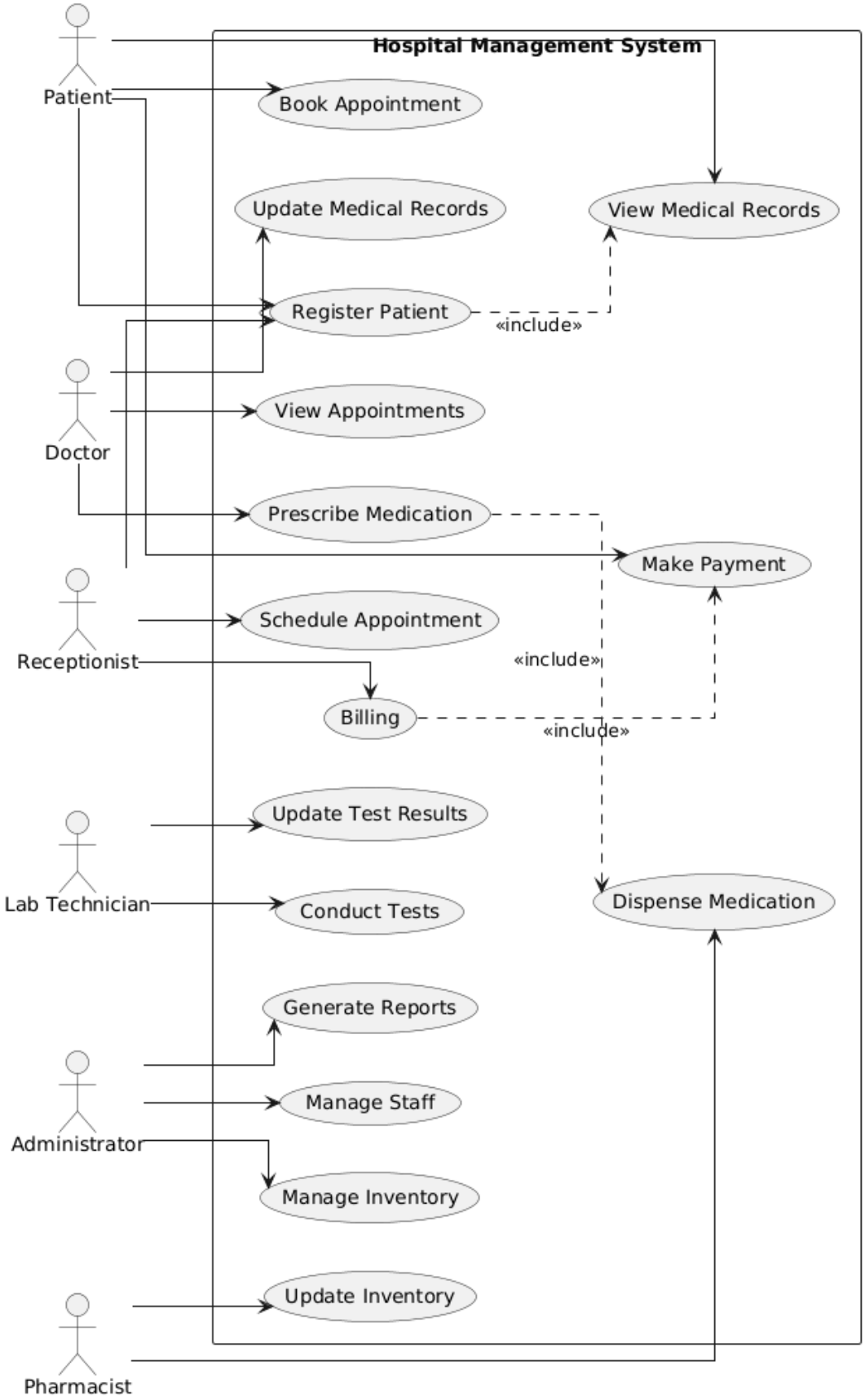
4. System Diagrams

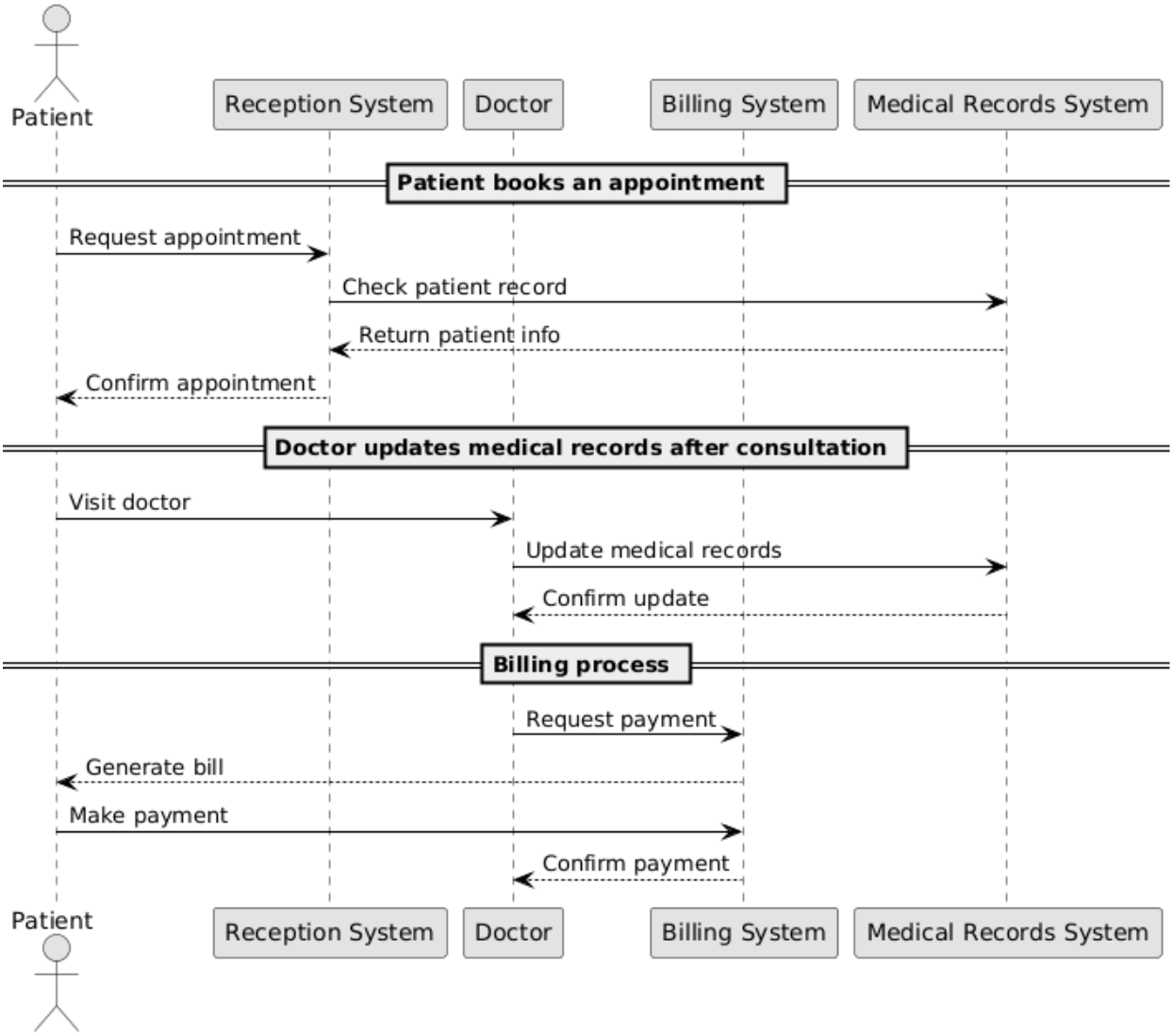
4.1 Class Diagram



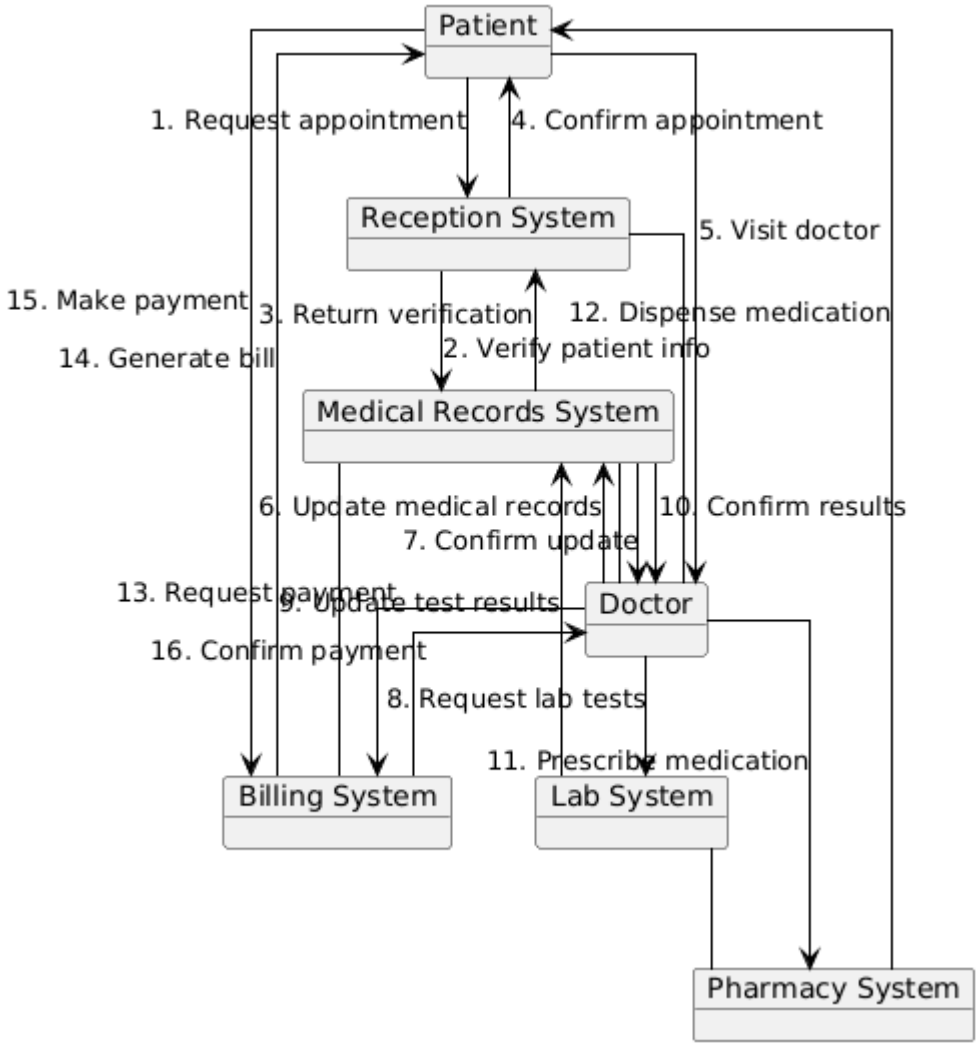
4.2 Usecase Diagram


Hospital Management System
Patient
Book Appointment
Update Medical Records
View Medical Records
Register Patient
«include»
Doctor
View Appointments
Prescribe Medication
Make Payment
Receptionist
Schedule Appointment
«include»
Billing
«include»
Update Test Results
Lab Technician
Conduct Tests
Dispense Medication
Generate Reports
Administrator
Manage Staff
Manage Inventory
Update Inventory
Pharmacist

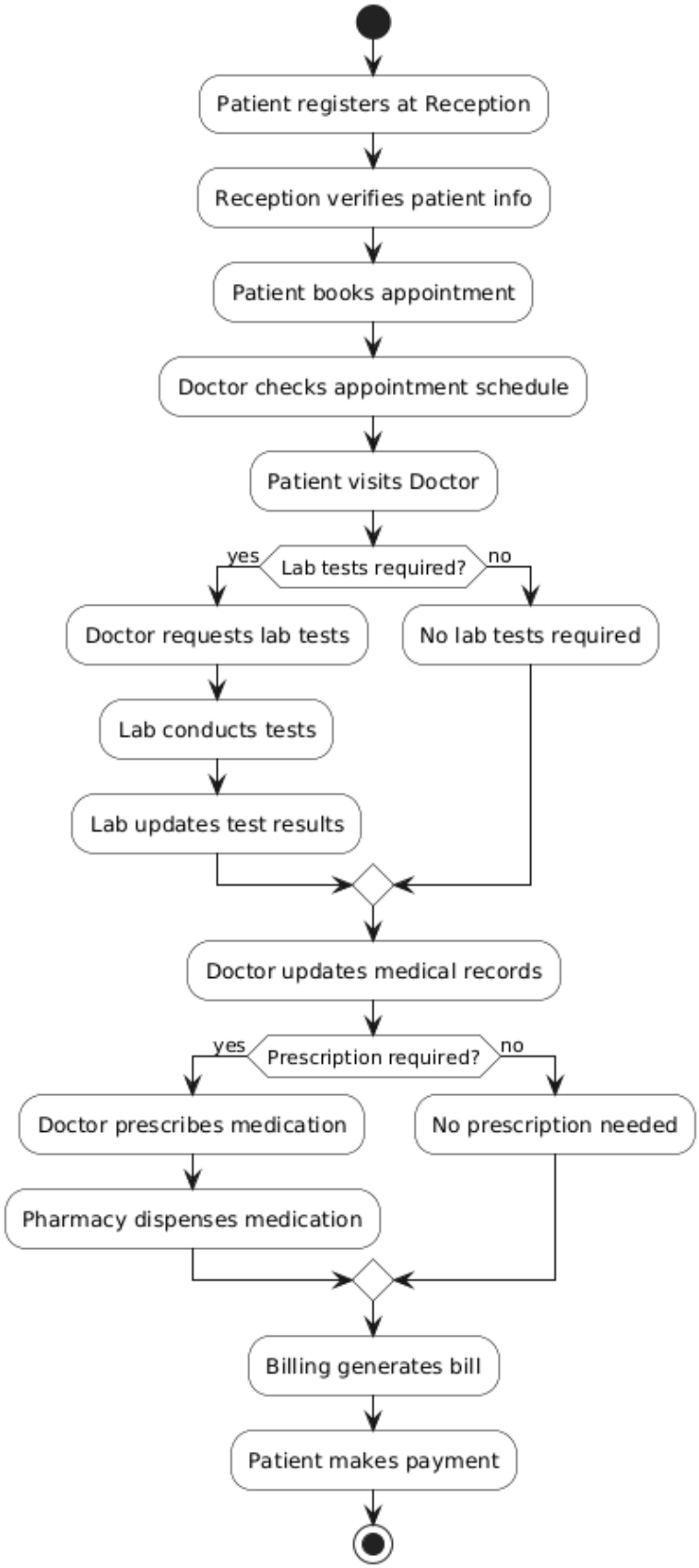
4.3.1 Sequence Diagram



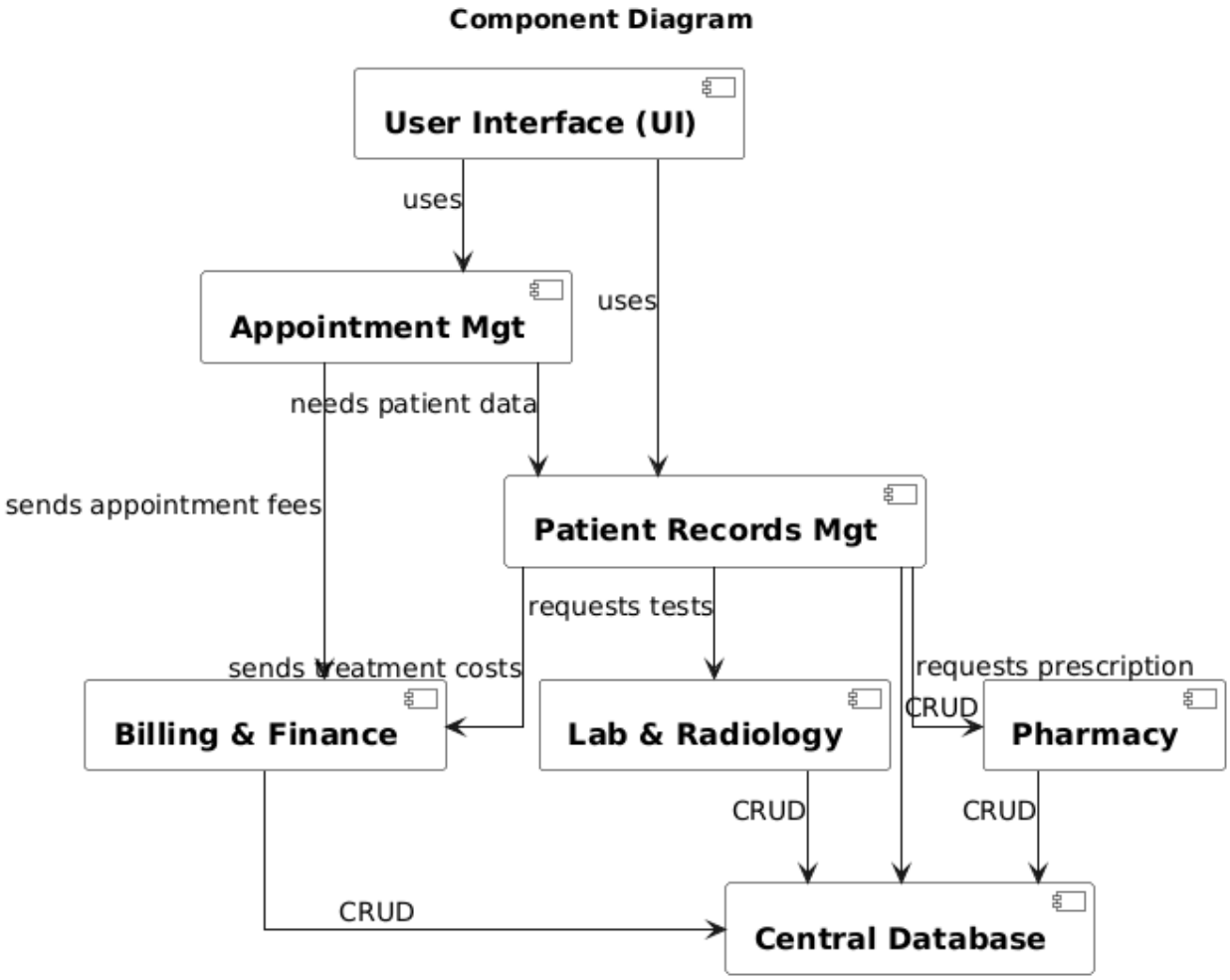
4.3.2 Collaboration Diagram



4.4 Activity Diagram


Patient registers at Reception
Reception verifies patient info
Patient books appointment
Doctor checks appointment schedule
Patient visits Doctor
Lab tests required?
yes
no
Doctor requests lab tests
No lab tests required
Lab conducts tests
Lab updates test results
Doctor updates medical records
Prescription required?
yes
no
Doctor prescribes medication
No prescription needed
Pharmacy dispenses medication
Billing generates bill
Patient makes payment

4.5 Component / Deployment Diagram



Conclusion:

This SRS provides a detailed and structured overview of the requirements for the Hospital Management System. The document and its accompanying diagrams will serve as a foundational guide for the development team. By clearly defining the scope, functionalities, and technical constraints, particularly those relating to security and patient privacy, we ensure the final product will be a reliable and integrated solution for the hospital's operational needs.