Hospital management System

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1. Introduction

1.1 Purpose:

The main purpose of Software Requirement Specifications Document is to describe in a precisemanner all the capabilities that will be provided by the Software Application "Hospital Management System". It also states the various constraints which the system will be abide to. This document further leads to clear vision of the software requirements, specifications and capabilities. These are to be exposed to the development, testing team and end users of the software.

1.2 Scope

Patient Management:
Appointment Scheduling:
Admission and Discharge:
Doctor and Staff Management:
Billing and Payments:
Laboratory and Radiology Services
Pharmacy Management:
Reports and Analytics:

1.3 Technologies to be used:

Programming Languages: Java,Python,C#
Web Development: HTML, CSS, JavaScript, ReactJS, NextJS
Back-end Development : Node, Express
Database Management: MongoDB, Mongoose
Authentication : NextAuthJS

1.4 Definitions,Acroynyms and Abbreviations

CFD: - Context Flow Diagram
DFD: - Data Flow Diagram
IDE: -Integrated Development Environment

SQL: - Structured Query Language
SRS: - Software Requirement Specification.

2. Overall Description

2.1 Product Perspective

This Hospital Management System is a self-contained system that manages activities of thehospital as Patient Info. Various stakeholders are involved in the hospital patient informationsystem.

2.2 *User Characteristics and classes*

User Classes

Admin/Users:Admins have the highest level of access and control over the system.

Patients:Patients can register, schedule appointments, view their medical records, and communicate with healthcare providers.

Receptionists and Administrative Staff:Receptionists manage appointments, patient registration, and billing information

User Characterstics

Educational Level: At least graduate and should be comfortable with English language. Technical Expertise: Should be a high or middle level employee of the organization comfortable with using general purpose applications on a computer.

2.3 Operating Environment

The application operates within a web-based environment, accessible via modern web browserson various devices, including desktops, laptops, tablets, and smartphones. It is designed to be platform-agnostic, ensuring usability across different operating systems (e.g., Windows, macOS,iOS, Android).

2.4 Software Interfaces

Software Requirements deal with defining website resource requirements and pre-requisites that need to be installed on a computer to provide optimal functioning of an application. Theserequirements or pre-requisites are generally not included in the software installation package and need to be installed separately before the software is installed.

2.5 Hardware Interfaces

The most common set of requirements defined by any operating system or software applicationis the physical computer resources, also known as hardware. A hardware requirements list is often accompanied by a hardware compatibility list (HCL),such as CPUs,memory and storage.

2.6 External Forces

2.6.1 Dependencies

It is assumed that one hundred IBM compatible computers will be available before thesystem is installed and tested.

It is assumed that the Hospital will have enough trained staff to take care of the system

2.6 .2 Constraints

Database: The system shall use the MySQL Database, which is open source and free.

Operating System: The Development environment shall be Windows 2000.

Web-Based: The system shall be a Web-based application.

3. System features

3.1 Functional Requirements

Registration

Add patients:
The HMS shall allow front-desk staff to add new patients to the system.

Assign ID:-
The HMS shall allow front-desk staff to give each patient a ID and add it to the patient's record. This ID shall be used by the patient throughout his/her stay inhospital.

Delete Patient ID:-
The administrative staff in the ward shall be allowed to delete the ID of the patientfrom the system when the patient checks out

Report Generation

Patient information:-
The HPIMS shall generate reports on patients about the following information: patient's PHN, patient's name, ward name, bed number and the doctor's name which was assigned.

Bed Availability:-
The HPIMS shall generate reports on bed availability about the following information: wardname, bed number, occupied/unoccupied.

Database:-

Patient Mandatory Information:-
Each patient shall have the following mandatory information: first name, last name,phone number, personal health number, address, postal code, city, country, patient identification number.

Update Patient Information:-
The HPIMS shall allow the user to update any of the patient's information as described inSRS007.

Technical issues

Database
The system shall use the MySQL Database, which is open source and free.

Operating System
The Development environment shall be Windows 2000.

Web-Based
The system shall be a Web-based application.

3.2 Non Functional Requirements

Performance

Response Time :- The system shall give responses in 1 second after checking the patients information.

Capacity:- The System must support 1000 people at a time.

User-interface :-The user-interface screen shall respond within 5 seconds.

Conformity:-The systems must conform to the Microsoft Accessibility

Security

Patient Identification:-The system requires the patient to identify himself/herself using PHN

Login ID:-Any user who uses the system shall have a Login ID and Password**.**

Modification Any modification (inert, delete, update) for the Database shall be synchronizedand only by the administrator in the ward.

Front Desk staff Rights:-Front Desk staff shall be able to view all information in HPIMS, addnew patients to HPIMS but shall not be able to modify any information in it.

Administrators' Rights:-Administrators shall be able to view and modify all information in HPIMS.

Reliability

How general the form generation language is Simplicity vs. functionality of the form language= Speeds up form development but does not limit functional.

Availability

The system shall be available all the time.

Safety

Humans are error-prone, but the negative effects of common errors should be limited. E.g.,users should realize that a given command will delete data, and be asked to confirm their intent or have the option to undo.

Software Quality

Good quality of the framework-produces robust, bug free software which necessary requirements Customer satisfaction.

Reusability

Is part of the code going to be used elsewhere- produces simple and independent codemodules that can be reused

Maintainability

Back Up The system shall provide the capability to back-up the Data.

Errors The system shall keep a log of all the errors.

4 Commitment to delivering a high-quality university website

- Our commitment to delivering a high quality hospital management system is unwavering.we prioritize performance,security, And reliability to create a digital environment that ot only meets but exceeds the expectations of all stakeholders,including Doctors,Patients families and staffs.

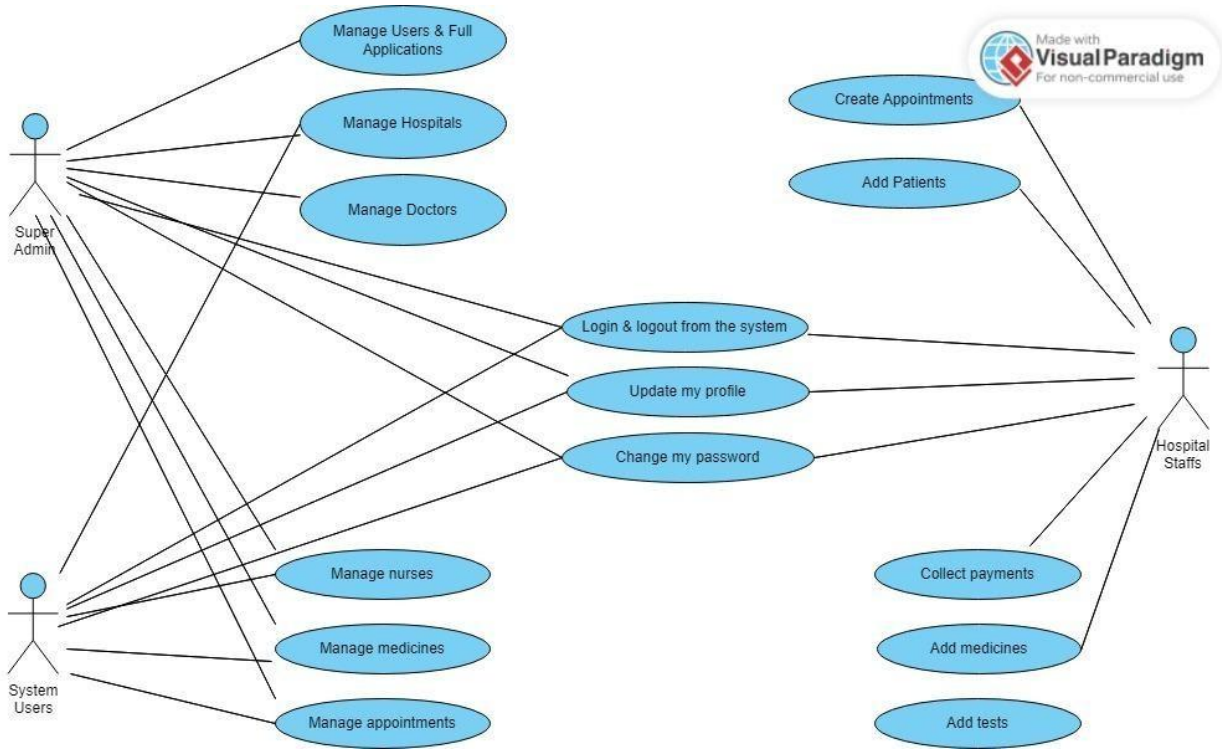
5 How testing contributes to user satisfaction and operational efficiency

- Thorough testing enhances user satisfaction by ensuring the website's functionality,performance and security.it also promotes operational efficiency by preventing downtime,data loss and security breaches.

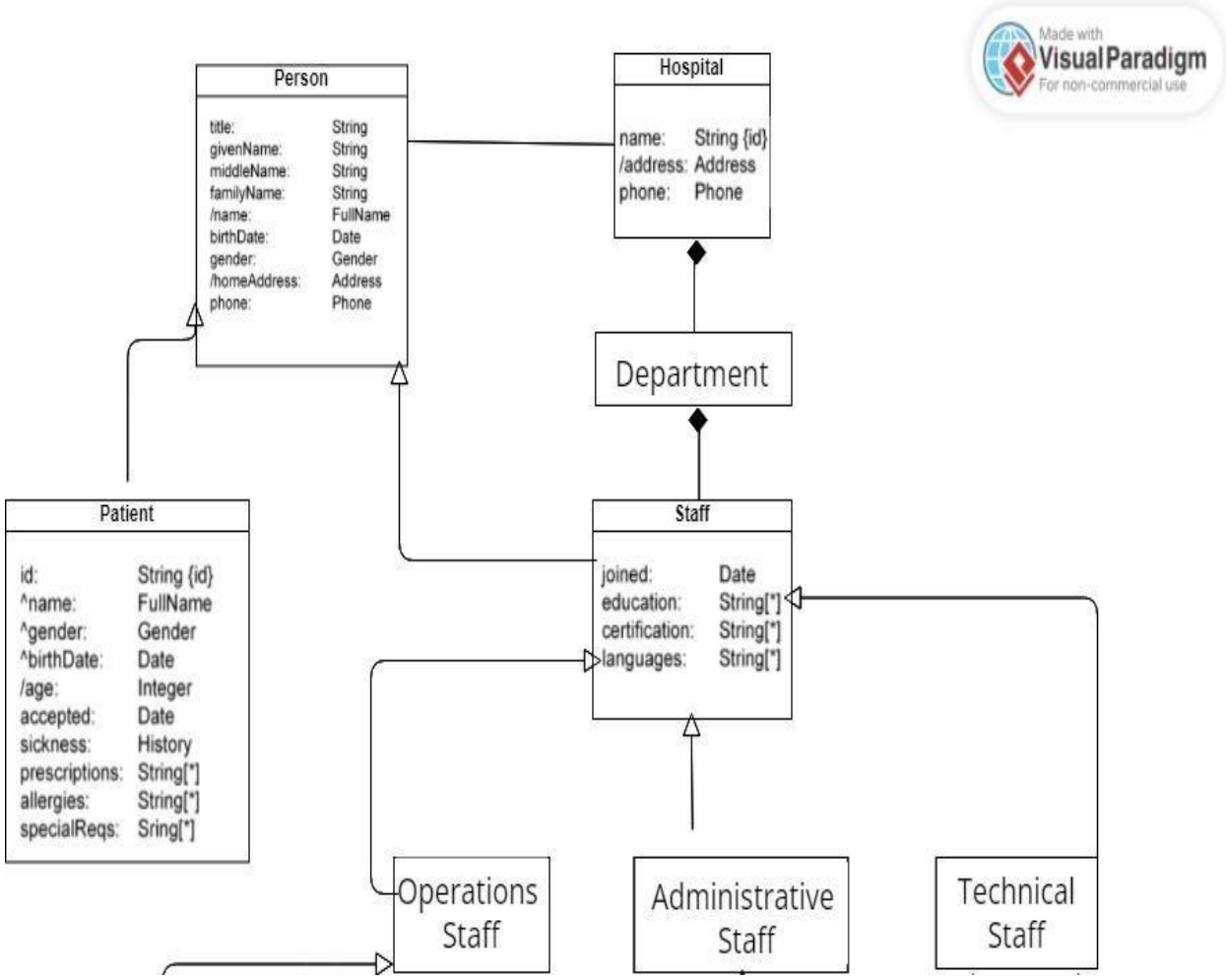
Hospital Management System Design Document

1 System Design (front-end design)

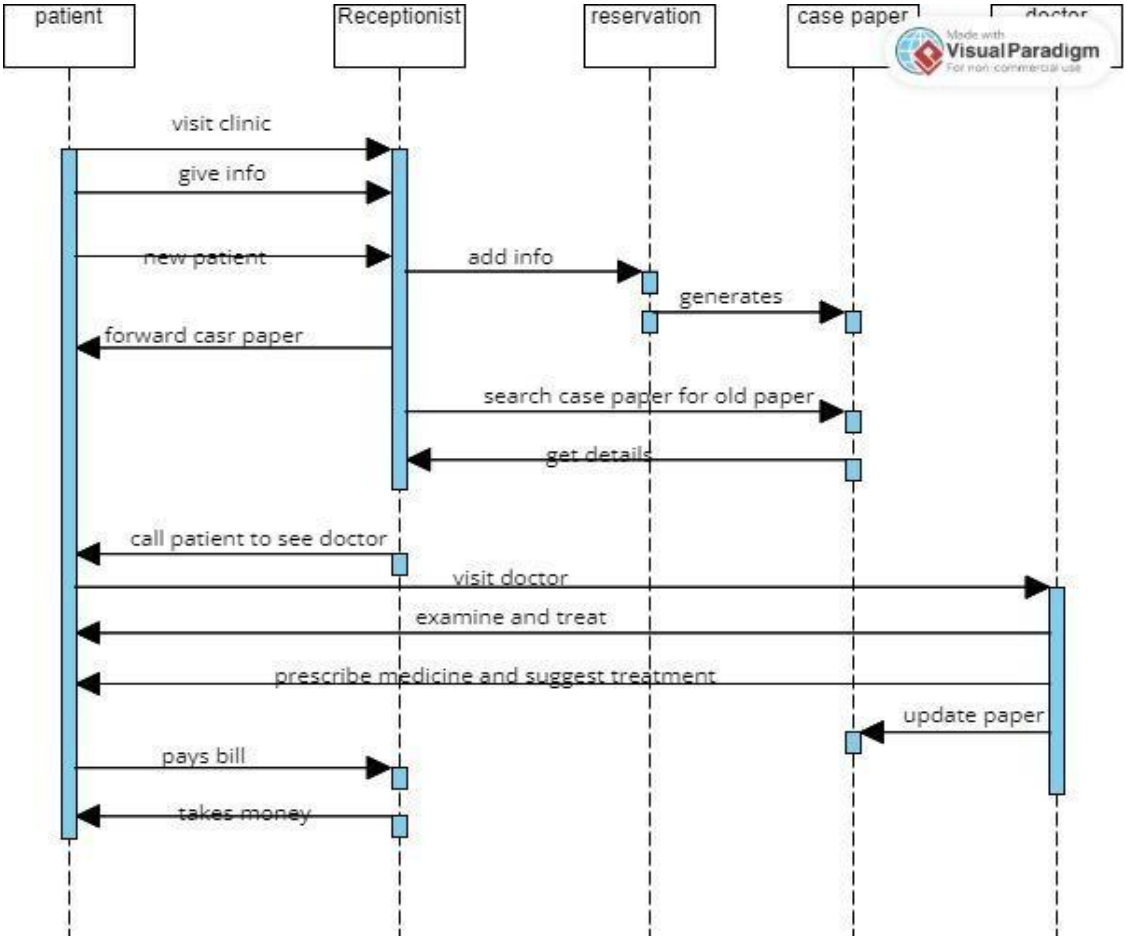
1.1 Use case diagram



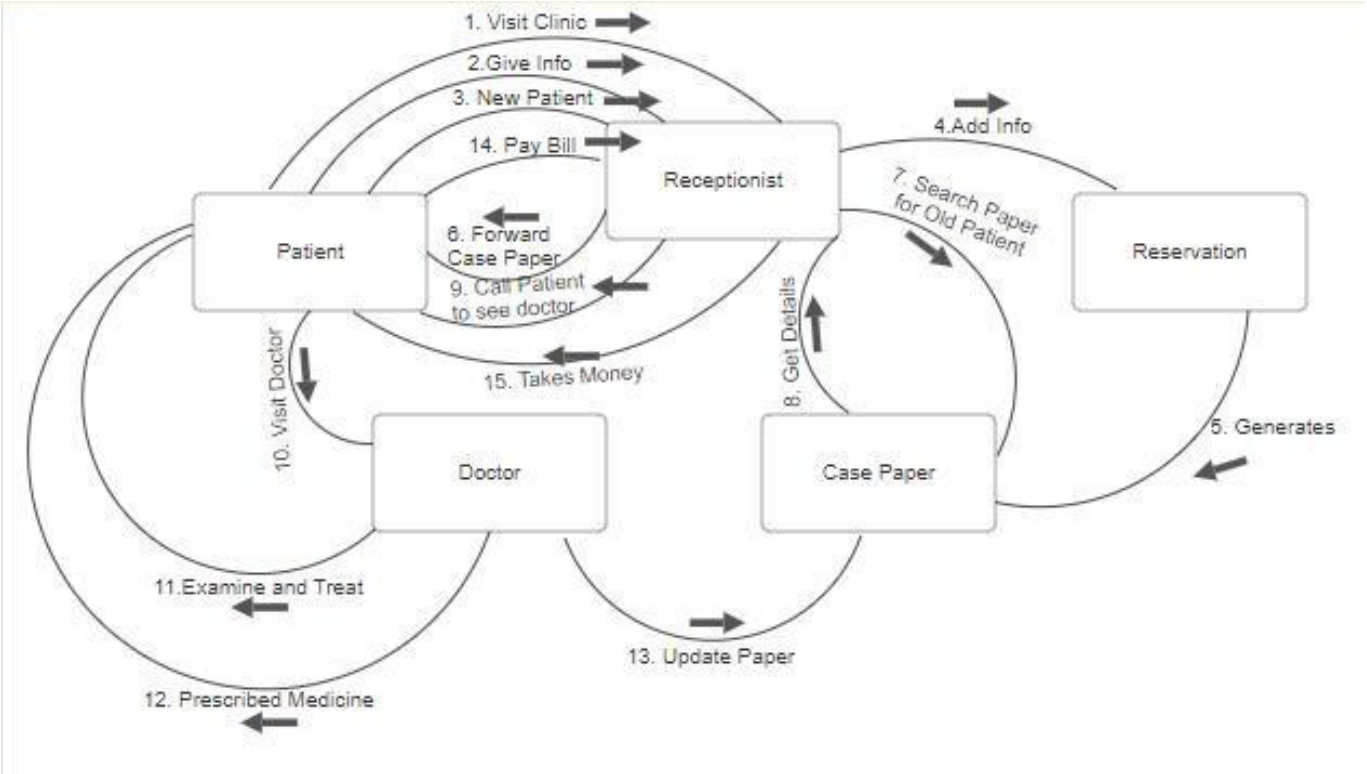
4.1.3 Class Diagram



1.2 Sequence Diagram



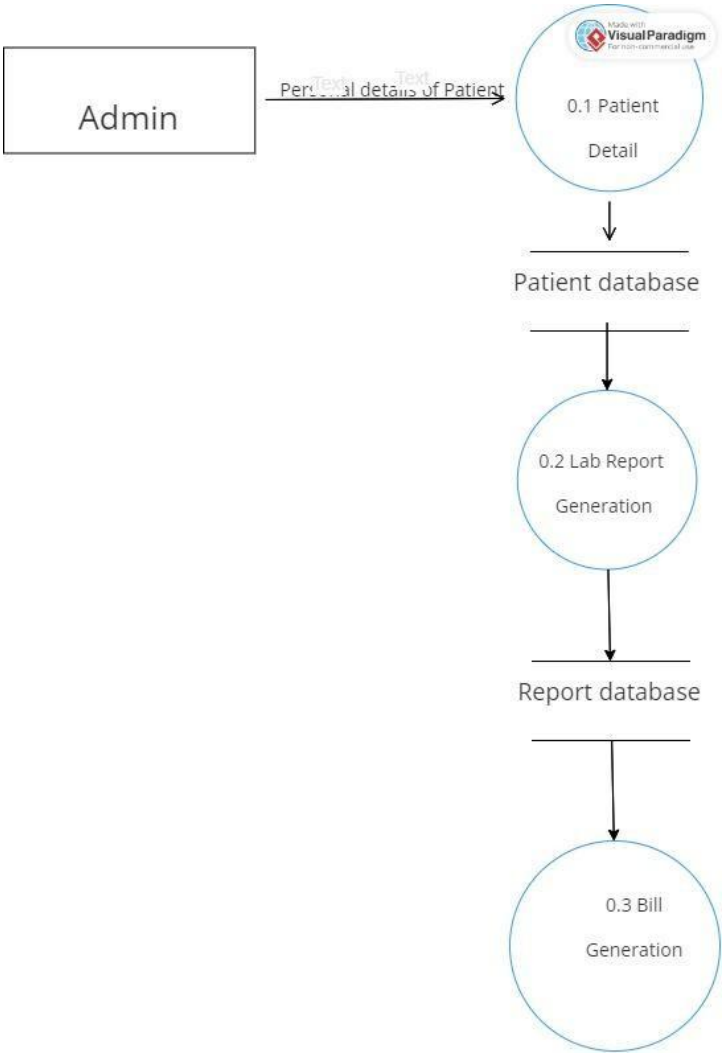
1.3 Collaboration Diagram



1. 4 Data Flow Diagram

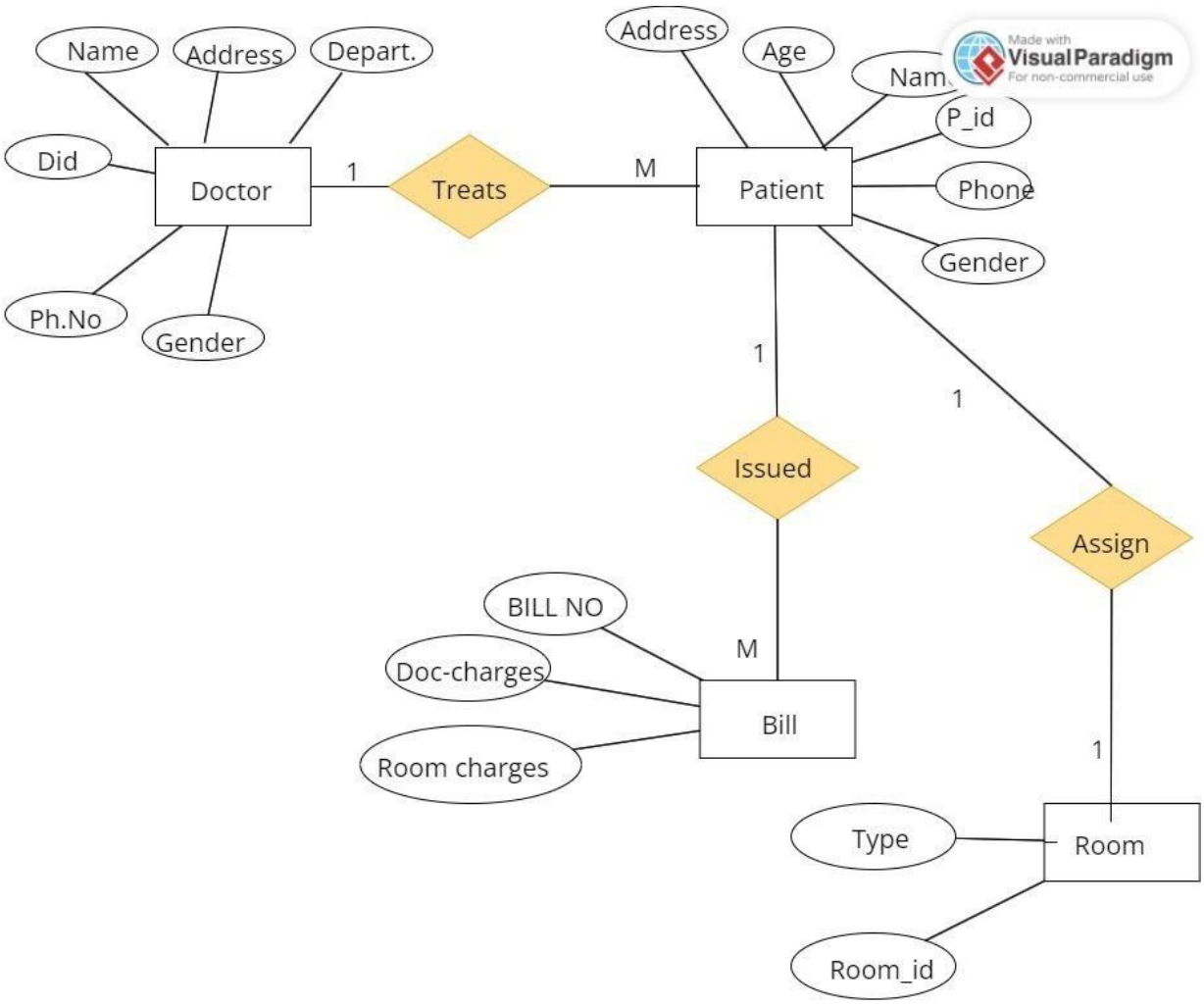
Level 0 DFD

Level 1 DFD


Admin
Personal details of Patient
0.1 Patient Detail
Patient database
0.2 Lab Report Generation
Report database
0.3 Bill Generation

4.1 Database Design

4.1.1 ER Diagram



6. ***Future Scope***

1. **Blockchain for Data Security:**
Blockchain technology can be implemented to enhance the security and integrity of patientrecords, ensuring data privacy and compliance with healthcare regulations.

2. **Patient Engagement and Portals:**
Expanding patient portals to allow patients to access their medical records, book appointments,and communicate with healthcare providers. This can improve patient engagement and satisfaction.

3. **Mobile Health (mHealth) Apps:**
Developing mobile applications that allow patients to manage their health, track medications,and interact with the hospital, enhancing the continuity of care.

7. ***Conclusion***

In conclusion, the Software Requirement Specification (SRS) for a Hospital Management System (HMS) outlines the essential features, functionalities, and technical requirements necessary for the development of an effective and efficient healthcare management system. The HMS SRS serves as a foundational document that guides the design, development, andimplementation of the system.

Hospital Management System Testing Document

1. Introduction

1.1 Purpose
The purpose of this document is to outline the testing strategy and procedures for the Hospital Management System (HMS)
.

1.2 Scope
This document covers functional, performance, security, and usability testing of the HMS.

1.3 Objectives
- Ensure the reliability and correctness of the HMS.
- Validate that the system meets specified requirements.
- Identify and rectify any defects or issues in the system.

2. Test Plan

2.1 Test Strategy
Define the overall testing approach, including types of testing to be performed (functional, performance, security, usability), test levels, and entry/exit criteria.

2.2 Test Environment
Describe the hardware, software, and network configurations for the test environment.

2.3 Test Schedule
Provide a timeline for testing activities, including start and end dates for each testing phase.

3. Functional Testing

3.1 Test Cases
List and describe test cases for functional requirements, including:
- Patient registration
- Appointment scheduling
- Billing and invoicing
- Doctor and staff management
- Inventory management

3.2 Test Scenarios
Identify and document various scenarios to be tested, covering different use cases and workflows within the HMS.

3.3 Test Data
Specify the data to be used during testing, including valid and invalid inputs.

3.4 Test Execution
Outline the procedures for executing functional tests, including test case execution, defect reporting, and retesting.

4. Performance Testing

4.1 Load Testing
Define the approach for testing the system under normal and peak load conditions.

4.2 Stress Testing
Detail stress testing scenarios to evaluate system behavior under extreme conditions
.
4.3 Performance Metrics
Identify key performance metrics to be measured, such as response time, throughput, and resource utilization
.
5. Security Testing

5.1 Authentication and Authorization
Verify that user authentication and authorization mechanisms are secure and effective.

5.2 Data Encryption
Ensure that sensitive data is appropriately encrypted during transmission and storage.

5.3 Access Control
Test and validate access controls to prevent unauthorized access to sensitive information.

6. Usability Testing

6.1 User Interface
Evaluate the user interface for intuitiveness, accessibility, and overall user experience.

6.2 Workflow Testing
Assess the efficiency of common user workflows within the HMS.

6.3 Accessibility
Verify that the system is accessible to users with disabilities
.
7. Defect Management

7.1 Defect Reporting
Define the process for reporting and tracking defects, including severity and priority classification.

7.2 Regression Testing
Describe the strategy for regression testing to ensure that new changes do not introduce additional defects.

8. Conclusion
Summarize the testing activities, results, and any recommendations for improvements.
This is a generic template, and you may need to customize it based on the specific requirements and features of your Hospital Management System. Additionally, you should update this document as the system evolves and new features are added.

4 Reference

1. **Mohapatra, H., & Rath, A. K. (2020). Fundamentals of software engineering: designed to provide an insight into the software engineering concepts. BPB Publications.**
2. www.google.com
3. https://app.smartdraw.com/editor.aspx?credID=-54798249&depoId=50591310&flags=128#depoId=50591310&credID=-54798249
4. https://online.visual-paradigm.com/drive/#diagramlist:proj=0&dashboard
5. https://chat.openai.com/