SVKM’s NMIMS (Deemed-to-be-University)
Mukesh Patel School of Technology Management & Engineering, Shirpur

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REPORT ON

HOSPITAL MANAGEMENT SYSTEM

ADVANCED DATABASE MANAGEMENT SYSTEM

B-TECH COMPUTER SCIENCE

III Year Semester V

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HOSPITAL MANAGEMENT SYSTEM

1. INTRODUCTION:

A Hospital Database Management System (HDMS) is a computer or web-based system that facilities managing the functioning of a hospital or any medical set up. This system will help in making the whole functioning paperless. The hospital database includes all the necessary patient data. The disease history, test results, prescribed treatment can be accessed by doctors without much delay in order to make an accurate diagnosis and monitor the patient's health. It enables lower risks of mistakes.

A hospital is a place where Patients come up for general diseases. Hospitals Provide facilities like:

- Consultation by Doctors on Diseases.

- Diagnosis for diseases.

- Providing treatment facility.

- Facility for admitting Patients (providing beds, nursing, medicines etc.)

- Immunization for Patients/Children.

Various operational works that are done in a hospital are:

- Recording information about the Patients that come.

- Generating bills.

- Recording information related to diagnosis given to patients.

- Keeping record of the immunization provided to Children/Patients.

- Keeping information about various diseases and medicines available to cure them.

These are the various jobs that need to be done in a hospital by the operational staff and Doctors. All these works are done on papers.

2. DESIGN

2.1 Functionalities:

The main functionalities in this project are:

- Maintaining records of indoor/outdoor patients.
- Maintaining patient's test and examinations details.
- Providing different test facilities to a doctor for doctor for diagnosis of a patients.
- Maintaining patient's prescription, medicine and diet advice details.
- Providing billing details for indoor/outdoor patients.
- Results of tests, prescription, precautions and diet advice will be automatically updated in the database.
- In this project collection of data in form different pathology labs.
- Related test reports, patient's details report, billing reports can be generated as per user requirements.
- User or administrator can search a patient's record by his id.

2.2 Features:

There are seven (7) common features of Hospital Management System Database Design such as Managing Doctors, laboratory, Inpatient, Outpatient, Rooms, and Hospital Bills information.

- **Manage Doctor:** This table will be used for storing and managing the Doctor information and login account.
- **Manage Laboratory:** This table will be used for storing and managing the Laboratory transaction.
- **Manage Inpatient:** This table will be used for storing and managing the inpatient information and diagnosis.
- **Manage Outpatient:** This table will be used for storing and managing the inpatient information and diagnosis.
- **Manage Room:** This table will be used for storing and managing the room information and assigning of patient in every room.
- **Manage Bills:** The billing table will be used for managing the statement of accounts per patient and for the collection of bills.
- **Manage Staff:** This table will be used for storing and managing the Staff information.

2.3 Relational Schema

1. Doctor:(Doctor_id, Doctor_name, Dept)

2. Staff: (s_id, s_name, NID, salary)

3. Lab: (lab_no, patient_id, Doctor_id, weight, visit_date, category, patient_type, amount)

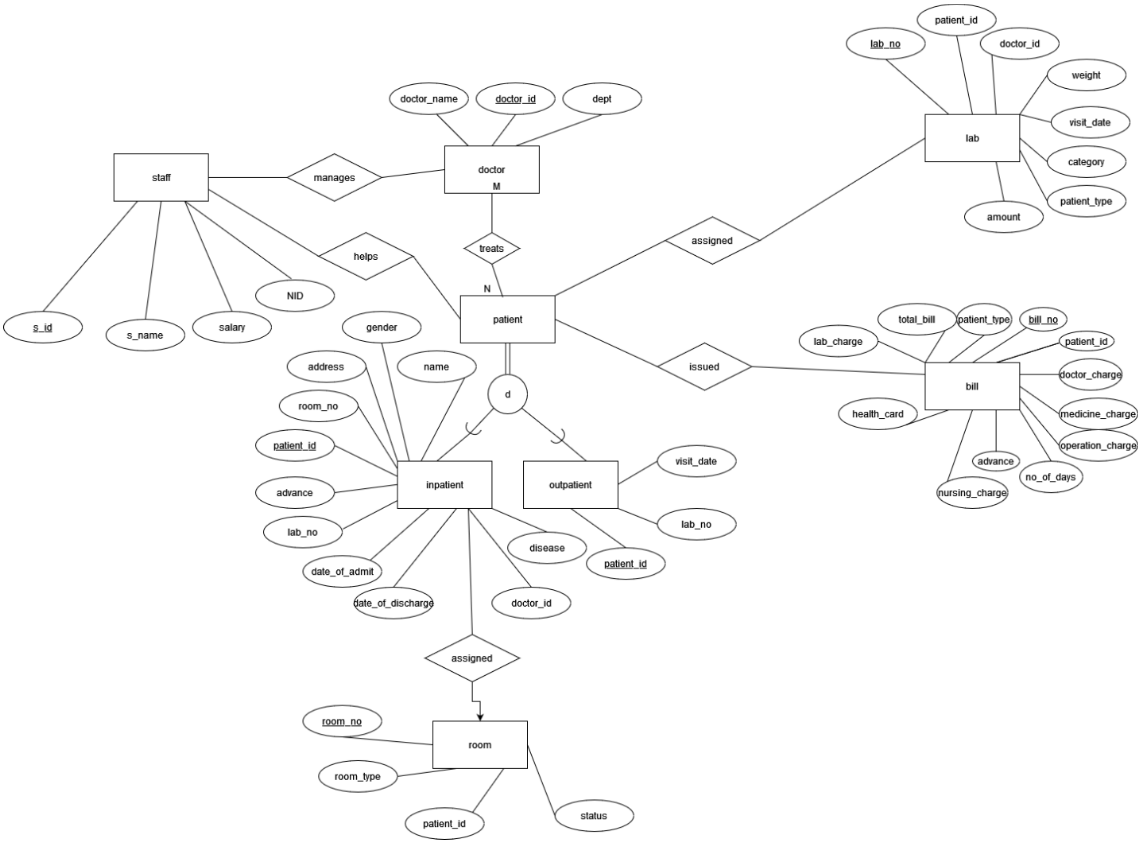
4. Inpatient: (patient_id, name, gender, address, room_no, date_of_admit, date_of_discharge, advance, lab_no, Doctor_id, disease)

5. Outpatient:(patient_id, visit_date, lab_no)

6. Room: (room_no, room_type, status, patient_id)

7. Bill:(bill_no, patient_id, patient_type, doctor_charge, medicine_charge, operation_charge, number_of_days, nursing_charge, advance, health_card, lab_charge, total_bill)

2.4 EER DIAGRAM



3. IMPLEMENTATION

3.1 SOFTWARE AND HARDWARE REQUIREMENTS

SOFTWARE REQUIREMENTS:

- VS Code
- Microsoft SQL Server
- Windows or MAC OS
- Technology usage : HTML, CSS and PYTHON FLASK

HARDWARE REQUIREMENTS:

- Laptop/Pc supporting above software requirements

3.2 Code:

3.2.1 Trigger:

```
-- Trigger to Auto-Update Room Status on Insertion into Inpatient
CREATE TRIGGER Update_Room_Status
ON Inpatient
AFTER INSERT
AS
BEGIN
    UPDATE Room
    SET status = 'Occupied',
        patient_id = i.patient_id
    FROM Room r
    JOIN inserted i ON r.room_no = i.room_no;

    PRINT 'Room status updated to Occupied.';
END;
```

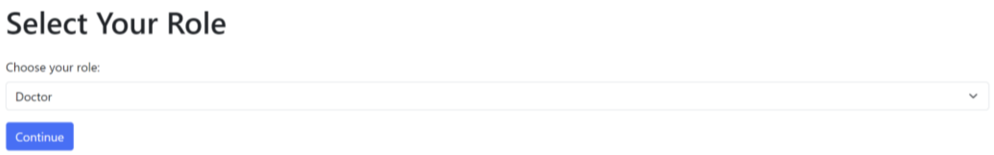
3.2.2 Procedure:

```
CREATE PROCEDURE delete_outpatient(
    @Patient_id INT
)
AS
BEGIN
    BEGIN TRY
        DELETE FROM Outpatient
        WHERE patient_id = @Patient_id;

        PRINT 'Outpatient record deleted successfully';
    END TRY
    BEGIN CATCH
        PRINT 'Error deleting outpatient record: ' + ERROR_MESSAGE();
    END CATCH
END;
GO
```

3.2.3 Function:

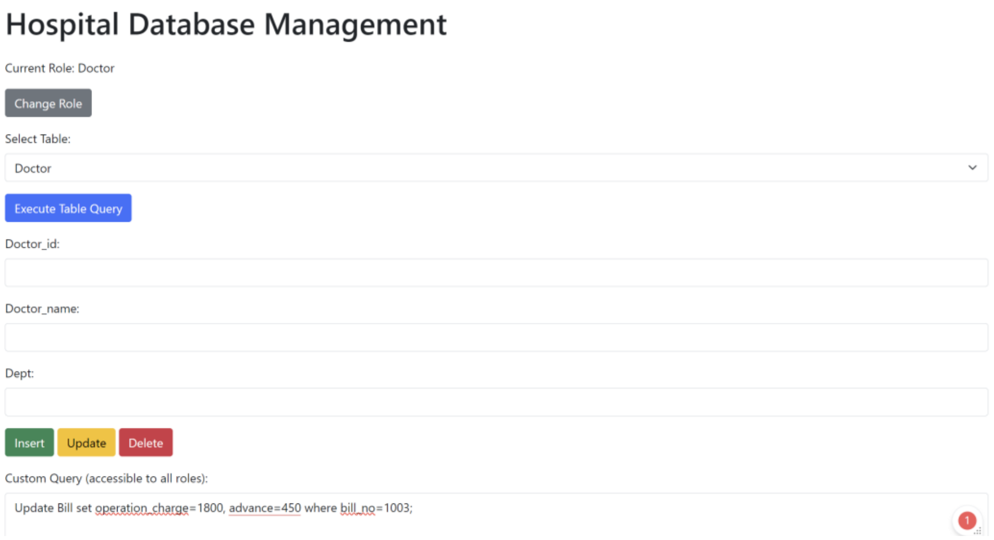
```sql
-- Function to Calculate Total Bill for a Patient
CREATE FUNCTION get_total_bill(@patient_id INT)
RETURNS DECIMAL(10, 2)
AS
BEGIN
    DECLARE @total_bill DECIMAL(10, 2) = 0;

    -- Safely retrieve the total bill or return 0 if no bill exists
    SELECT @total_bill = ISNULL(total_bill, 0)
    FROM Bill
    WHERE patient_id = @patient_id;

    RETURN @total_bill;
END;
GO
```

4. RESULT



Select Your Role

Choose your role: Doctor



Hospital Database Management

Current Role: Doctor

Select Table: Doctor

Doctor_id:

Doctor_name:

Dept:

Custom Query (accessible to all roles):

```
Update Bill set operation_charge=1800, advance=450 where bill_no=1003;
```

5. CONCLUSION

The Hospital Management System developed as part of this project showcases the importance of using advanced database techniques such as triggers, procedures, and functions to streamline hospital operations. Triggers were implemented to automate critical tasks like updating patient records, ensuring data integrity, and managing hospital resources efficiently. Stored procedures allowed us to encapsulate complex business logic, making the system more modular, reusable, and easier to maintain. Functions played a crucial role in executing calculations and returning specific values that enhanced reporting and decision-making capabilities.

6. REFERENCES

1. Hennery Korth and Abraham Silberschatz, “Database System Concepts”, McGrow Hill, 7th Edition, 2019

2. Elmarsi and Navathe, “Fundamentals of Database Design”, Addison Wesley 7th Edition, 2019

3. Database Systems: The Complete Book" by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom

4. Database Internals: A Deep Dive into How Distributed Data Systems Work" by Alex Petrov

5. Database Design - 2nd Edition" by Adrienne Watt

6. Beginning Database Design" by Clare Churcher

7. Mastering Database Design" by Erik R. Gunther