COVID-19 HOSPITAL DATABASE DESIGN

The **objective of this project** is to develop a solution that effectively decreases COVID-19 exposure in hospitals and minimizes the transmission of the disease among medical professionals.

This database grants medical staff the ability to retrieve current and precise patient information, including admission dates, symptoms, treatments, and the assigned healthcare provider.

CONTENT

DATABASE
MODELING PROCESS

1.REQUIREMENT COLLECTION

- Collected user requirements and created a comprehensive Statement of Requirements.

2. DEVELOPING A CONCEPTUAL MODEL

- Developed a top-level representation of the hospital domain and its components.

3. CREATING A LOGICAL - PHYSICAL MODEL

- Implemented a Logical Model in MySQL, defining entities and relationships.
- Assigned primary keys and foreign keys to establish data integrity.
- Specified data types for each attribute.
- Ensured flexibility for future changes and applied normalization techniques (1NF, 2NF, 3NF) to eliminate data redundancy.

USER REQUIREMENTS

Surveyed with HCP staff to determine what they want from this database.

NURSE 1:

"I would like access to information regarding COVID patients, including their names, symptoms, treating doctors, and the date and method of their last COVID test. This will help us protect ourselves from exposure and plan accordingly."

NURSE 2:

"We need to track and store information about COVID patients, such as their names, contact numbers, and the specific room or floor they are located on. This will help us manage limited resources and allocate rooms and beds efficiently for COVID patients."

SOCIAL WORKER:

"We require a database to store patients' work numbers and immediate family contact information. This will enable us to advise them to get tested for COVID and initiate quarantine protocols."

DOCTOR:

"For the safety of our medical staff, we need detailed information about the doctors and staff members who treat COVID patients each day. This information should be accessible to our staff to minimize the risk of exposure to the virus."

HOSPITAL CEO:

"We aim to improve our operational efficiency during the COVID-19 pandemic and adhere to infection prevention and control recommendations. We need a database that minimizes disease transmission to patients, healthcare professionals, and others, thus reducing exposure to the virus."

STATEMENT OF REQUIREMENTS

This is a summary of all the users and stakeholders' requirements.

PATIENT:

- Full Name
- Phone Number
- Residential Address
- Contact Details
- Relationship.

SYMPTOM:

- Name of Symptom
- Symptoms Start Date

TESTING:

- COVID Testing Date
- COVID Testing Method

TREATMENT:

- Treatment Name
- Treatment Date/Time

MEDICAL PROFESSIONAL:

- Doctor: Full Name
- Nurse: Full Name
- Shift Start/End

ADMISSIONS:

- Floor Number
- Room Number

Conceptual Model

Patient

Full Name
Phone Number
City
State
Zip
Contact Name
Contact Number
Contact Relationship

admissions into →

COVID Department

Floor
Room

↑ treat

Medical Professionals

Doctor
Nurse
Shift Start Date/Time
Shift End Date/Time

checks for →

Symptom

Symptom Name
Symptom Start Date/Time

administers ↓

performs ↘

Treatments

Covid Treatment
Treatment Date/Time

Testing

Covid Testing Method
Covid Test Date

Covid Treatments
- 🔑 treatment_id TINYINT
- 🔷 name VARCHAR(255)
- Indexes ▶

Treatments
- 🔶 patient_id SMALLINT
- 🔶 treatment_id TINYINT
- 🔷 start_date DATETIME
- 🔶 doctor_id TINYINT
- Indexes ▶

Patients Symptoms
- 🔶 Patients_patient_id SMALLINT
- 🔶 Symptoms_symptom_id INT
- Indexes ▶

Symptoms
- 🔑 symptom_id INT
- 🔷 name VARCHAR(255)
- Indexes ▶

Doctors Shifts
- 🔑 shift_start DATETIME
- 🔑 shift_end DATETIME
- 🔶 doctor_id TINYINT
- Indexes ▶

Doctors
- 🔑 doctor_id TINYINT
- 🔷 first_name VARCHAR(50)
- 🔷 last_name VARCHAR(50)
- 🔷 phone VARCHAR(50)
- 🔷 email VARCHAR(255)
- 🔷 specialty VARCHAR(255)
- Indexes ▶

Nurses Shifts
- 🔑 shift_start DATETIME
- 🔑 shift_end DATETIME
- 🔶 nurse_id TINYINT
- Indexes ▶

Nurses
- 🔑 nurse_id TINYINT
- 🔷 first_name VARCHAR(50)
- 🔷 last_name VARCHAR(50)
- 🔷 phone VARCHAR(50)
- 🔷 email VARCHAR(255)
- Indexes ▶

Patients
- 🔑 patient_id SMALLINT
- 🔷 first_name VARCHAR(50)
- 🔷 last_name VARCHAR(50)
- 🔷 phone VARCHAR(50)
- 🔷 street VARCHAR(255)
- 🔷 city VARCHAR(50)
- 🔷 state CHAR(2)
- 🔷 zip_code INT
- 🔶 doctor_id TINYINT
- 🔶 nurse_id TINYINT
- Indexes ▶

Contacts Records
- 🔶 Patients_patient_id SMALLINT
- 🔶 Contact Information_contact_id INT
- Indexes ▶

Contact Information
- 🔑 contact_id INT
- 🔷 first_name VARCHAR(50)
- 🔷 last_name VARCHAR(50)
- 🔷 phone VARCHAR(50)
- 🔶 Contact Relationship_type_id TINYINT
- Indexes ▶

Testing Methods
- 🔑 method_id SMALLINT
- 🔷 name VARCHAR(255)
- Indexes ▶

Testing
- 🔑 test_id INT
- 🔷 test_date DATETIME
- 🔶 nurse_id TINYINT
- 🔶 patient_id SMALLINT
- 🔶 Testing Methods_method_id SMALLINT
- Indexes ▶

Admissions
- 🔶 patient_id SMALLINT
- 🔷 floor TINYINT
- 🔷 room SMALLINT
- 🔷 admission_date DATETIME
- Indexes ▶

Contact Relationship
- 🔑 type_id TINYINT
- 🔷 relationship_type VARCHAR(50)
- Indexes ▶

Covid Wings
- 🔑 floor TINYINT
- 🔑 room SMALLINT
- Indexes ▶