HOSPITAL MANAGEMENT SYSTEM

INTRODUCTION:

Hospitals are the most important part of our lives, trying to provide the best medical facilities to people suffering from various types of illness, which may be due to changes in climate conditions, increased workload, emotional trauma stress, etc. It is very difficult for the hospital to maintain its day-to-day activities and records manually. That is why a database is required to keep records of all types of activities of a hospital. A hospital database is a vital and complex system that serves as the central repository for all healthcare-related information within a medical facility. It stores and manages patient data, including personal details, medical records, and billing information, enabling healthcare professionals to provide optimal care. Additionally, it tracks appointment scheduling, manages financial aspects such as billing and insurance claims, stores diagnostic data, and keeps inventory records up to date. With the capability to securely store, organize, and retrieve vast amounts of data, a hospital database ensures the seamless functioning of a healthcare institution, from patient care to administrative tasks, contributing to improved patient outcomes and efficient hospital operations. They empower healthcare providers to streamline appointment booking, access and update patient records with ease, generate accurate bills and insurance claims, and manage critical medical supplies efficiently. Furthermore, the database caters to the needs of medical staff by maintaining staff records, ensuring their qualifications are up-to-date, and managing work schedules. This comprehensive and dynamic system allows for the seamless exchange of information between different departments, fostering improved patient care, operational efficiency, and research opportunities within the hospital. SQL databases are not only data repositories but also analytical tools, supporting reporting and data analysis, thereby enabling hospitals to make data-driven decisions, enhance the quality of healthcare services, and ensure the well-being of their patients while adapting to the ever-evolving landscape of healthcare technology.

LIST OF TABLES IN THE HOSPITAL DATABASE:

- physician
- department
- affiliated_with
- procedure
- trained_in
- patient
- nurse
- appointment
- medication
- prescribes
- block
- room
- on_call
- stay
- undergoes

ER DIAGRAM:

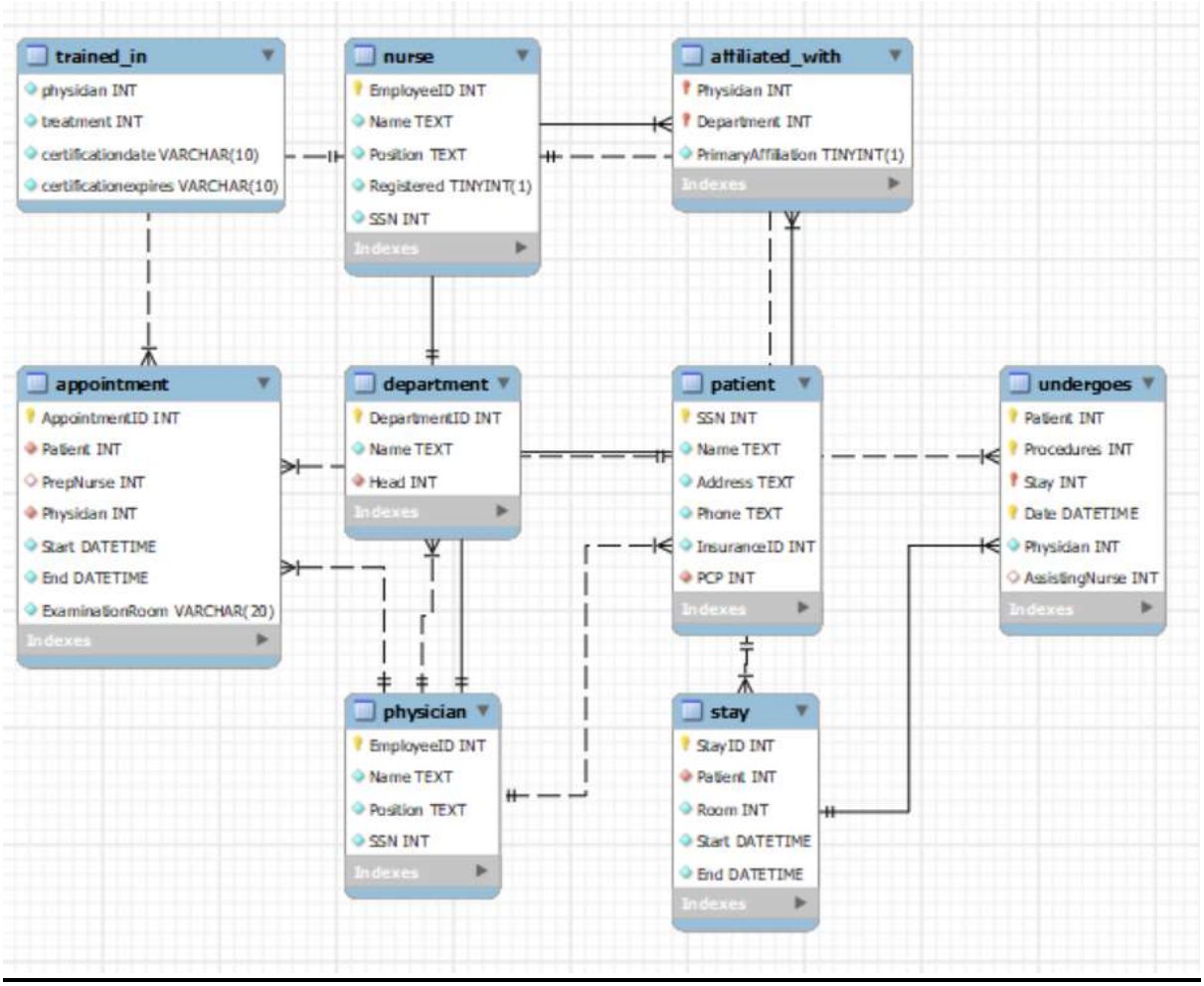

TABLE DESCRIPTION

Physician:

- employeeid – this is a unique ID of a physician
- name – this is the name of a physician
- position – this is the designation of a physician
- ssn – this is the security number of a physician

Department:

- departmentid – this is a unique ID for a department
- name – this is the name of a department

- head – this is the ID of the physician who is the head of a department, referencing the column employeeid of the table physician

affiliated_with:

- physician – this is the ID of the physicians which is referencing the column employeeid of the physician table
- department – this is the ID of the department which is referencing the column departmentid of the department table
- primaryaffiliation – this is a logical column indicates that whether the physicians are yet to be affiliated or not
- *Note: The combination of physician, and department will come once in that table.*

procedures:

- code – this is the unique ID of a medical procedure
- name – the name of the medical procedure
- cost – the cost of the procedure

trained_in:

- physician – this is the ID of the physicians which is referencing the column employeeid of the physician table
- treatment – this is the ID of the medical procedure which references the column code of the procedure table
- certificationdate – this is the starting date of the certification
- certificationexpires – this is the expiry date of the certification
- *Note: The combination of physician and treatment will come once at that table.*

patient:

- ssn – this is a unique ID for each patient
- name – this is the name of the patient
- address – this is the address of the patient
- phone – this is the phone number of the patient
- insuranceid – this is the insurance id of the patient

- pcp – this is the ID of the physician who primarily checked up on the patient which is referencing the column employeeid of the physician table

nurse:

- employeeid – this is the unique ID for a nurse
- name – name of the nurses
- position – the designation of the nurses
- registered – this is a logical column indicating whether the nurses are registered for nursing or not
- ssn – this is the security number of a nurse

appointment:

- appointmentid – this is the unique ID for an appointment
- patient – this is the ID of each patient which is referencing the ssn column of the patient table
- prepnurse – the ID of the nurse who may attend to the patient with the physician, which is referencing the column employeeid of the nurse table
- physician – this is the ID of the physicians which is referencing the employeeid column of the physician table
- start_dt_time – this is the scheduled date and approximate time to meet the physician
- end_dt_time – this is the scheduled date and approximate time to end the meeting
- examinationroom – this is the room where to meet a patient the physician

medication:

- code – this is the unique ID for a medicine
- name – this is the name of the medicine
- brand – this is the brand of the medicine
- description – this is the description of the medicine

prescribes:

- physician – this is the ID of the physician referencing the employeeid column of the physician table

- patient – this is the ID of the patient which is referencing the ssn column of the patient table
- medication – the ID of the medicine which references the code of the medication table
- date – the date and time of the prescribed medication
- appointment – the prescription made by the physician to a patient who may taken an appointment which is referencing to column appointmentid of appointment table
- dose – the dose prescribed by the physician
- *Note: The combination of physician, patient, medication, and date will come once in that table.*

block:

- blockfloor – ID of the floor
- blockcode - ID of the block
- *Note: The combination of blockfloor, and blockcode will come once in that table.*

room:

- roomnumber – this is the unique ID of a room
- roomtype – this is a type of room
- blockfloor - this is the floor ID where the room in
- blockcode – this is the ID of the block where the room in
- unavailable – this is the logical column indicating whether the room is available or not
- *Note: The blockfloor and blockcode columns reference the combination of the blockfloor and blockcode columns of the table block.*

on_call:

- nurse – this is the ID of the nurse which is referencing the employeeid column of the table nurse
- blockfloor - this is the ID of the floor
- blockcode – this is the ID of block
- oncallstart - the starting date and time of on-call duration
- oncallend – the ending date and time of on-call duration

- *Note: The combination of nurse, blockfloor, blockcode, oncallstart, oncallend will come once in that table and the combination of blockfloor, blockcode columns are referencing to the combination of blockfloor and blockcode columns of the table block.*

stay:

- stayid - this is a unique ID for the admission
- patient – this is the ID of the patient which is referencing the ssn column of the patient table
- room - this is the ID of the room where the patient was admitted and which references to the room number column of the room table
- start_time – this is the time when a patient admitted
- end_time – this is the time how long a patient is staying

undergoes:

- patient - this is the ID of the patient which is referencing the ssn column of the patient table
- procedure – this is the ID of the procedure and referencing to the code column of the procedure table
- stay - this is the ID admission of a patient, which is referencing the stayid column of the stay table
- date – this is the date when a patient undergoes a medical procedure
- physician – this is the ID of a physician which is referencing the column employeeid of the table physician
- assistingnurse – this is the ID of a nurse who will assist the physician, referencing to the column employeeid of the table nurse

CONCLUSION:

In conclusion, a hospital database built using SQL is an indispensable backbone of modern healthcare systems, serving as the bedrock for efficient and secure data management in hospitals and healthcare facilities. This comprehensive database system centralizes critical aspects of healthcare administration and patient care, from managing patient information and electronic health records to appointment scheduling, billing, inventory management, and staff records. SQL databases offer structured and scalable data storage, allowing healthcare professionals to access, update, and analyse vast amounts of data with precision and speed. They enable hospitals to provide higher-quality patient care, streamline administrative tasks, and maintain strict compliance with healthcare regulations such as HIPAA, safeguarding patient confidentiality and data integrity. Furthermore, as technology continues to advance, the role of SQL databases in healthcare becomes even more pivotal, enabling healthcare organizations to leverage data for informed decision-making and improving overall hospital operations. In essence, a hospital database in SQL represents a vital tool in the pursuit of excellence in patient care and healthcare management.