Hospital Management System

Introduction

Purpose and Scope

The Hospital Management System (HMS) is a comprehensive software solution designed to streamline and enhance the management and administration of healthcare facilities. Its primary purpose is to facilitate efficient, accurate, and secure handling of various hospital operations, ultimately leading to improved patient care and administrative efficiency.

Objectives

Core Objectives of HMS:

Efficient Patient Management: The HMS aims to efficiently manage patient information, including personal details, medical records, and appointments, ensuring data accuracy and security.
Streamlined Appointment Scheduling: It simplifies the process of appointment scheduling, helping patients and staff schedule and manage appointments effortlessly.
Detailed Medical Records: The system maintains comprehensive medical records for patients, including diagnoses, prescriptions, lab results, and notes, enabling healthcare providers to make informed decisions.
Prescription Management: The HMS assists in managing prescriptions, including medication details, dosages, frequencies, and durations, facilitating the treatment process.
Billing and Payments: It offers robust billing and payment functionality, allowing for the smooth handling of financial transactions related to healthcare services.
User Authentication and Authorization: The system ensures secure access through user authentication and authorization, protecting patient data and system integrity.

Secondary Objectives:

Doctor Scheduling: Efficiently schedule and manage doctor appointments, including defining doctor schedules and availability.
Department Management: Organize hospital departments for better resource allocation and patient routing.
User Accountability: Maintain a detailed log of user activities to ensure accountability and track system usage.

Key Features

Key Features of HMS Include:

Patient Management: A centralized repository for patient details, simplifying registration, search, and retrieval.
Appointment Scheduler: A user-friendly interface for scheduling and managing patient appointments, ensuring efficient use of doctor and patient time.
Medical Records: Comprehensive patient medical records, including diagnosis, prescriptions, lab test results, and clinical notes.
Prescription Management: A dedicated module for doctors to manage prescriptions, including medication details, dosages, frequencies, and durations.

Billing and Payments: Easy billing and payment processing, including support for multiple payment methods.
Security: Robust user authentication and authorization mechanisms to safeguard patient data and system integrity.
User Accountability: Detailed logging of user activities for auditing and accountability.

Benefits of HMS

Improved Patient Care: Quick access to patient data ensures faster and more accurate diagnoses and treatment.
Enhanced Efficiency: Streamlined processes reduce administrative workload and improve operational efficiency.
Patient Satisfaction: Appointment scheduling and quicker access to medical records lead to higher patient satisfaction.
Data Accuracy: Centralized data management reduces errors and ensures data consistency.
Financial Management: Improved billing and payment handling leads to better financial management.

Target Users

The HMS is designed to cater to the needs of a wide range of healthcare professionals and staff, including:
Doctors and Medical Practitioners: For patient care, appointment management, and prescription management.
Administrative Staff: For patient registration, billing, and appointment scheduling.
Nurses and Clinical Staff: For accessing and updating patient medical records.
Hospital Management: For overall system monitoring and reporting.

System Architecture Overview

The HMS follows a modular architecture that consists of various interconnected components, including the database, application server, user interface, and security modules. This architecture ensures scalability, maintainability, and data security.

Column Name	Column Type	Description
PatientID	Int	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each patient in the database.
FirstName	Varchar	This column is of data type VARCHAR(50) and stores the first name of the patient. It is marked as NOT NULL, which means it must have a value and cannot be empty.
LastName	Varchar	This column is also of data type VARCHAR(50) and stores the last name of the patient. Like FirstName, it is marked as NOT NULL.
Gender	Char	This column is of data type CHAR(1) and typically stores the gender of the patient. It can hold a single character representing gender, such as 'M' for male, 'F' for female, or 'O' for other. It may be nullable, as gender information may not always be available.
DateOfBirth	Date	This column is of data type DATE and is used to store the patient's date of birth. It represents the birthdate in a date format.
Phone	Varchar	This column is of data type VARCHAR(20) and is used to store the patient's contact phone number. It can accommodate up to 20 characters, which is suitable for storing phone numbers.
Email	Varchar	This column is of data type VARCHAR(100) and is used to store the patient's email address. It can hold longer email addresses, making it suitable for storing email contact information.
Address	Varchar	This column is of data type VARCHAR(50) and is used to store the patient's physical address or residence. It can hold up to 50 characters of address information.
InsuranceInfo	Varchar	This column is of data type VARCHAR(50) and is used to store details related to the patient's insurance coverage or

		provider. It can hold information about insurance companies or policies.
MedicalHistory	Varchar	This column is of data type VARCHAR(50) and is used to store a summary or reference to the patient's medical history. It can contain relevant medical information about the patient's health and medical background.

Doctor Information Table

Column Name	Column Type	Description
DoctorID	Int	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each doctor in the database. It is a required field and cannot be left empty.
First Name	Varchar	This column is of data type VARCHAR(50) and stores the first name of the doctor. It is marked as NOT NULL, which means it must have a value and cannot be empty.
Last Name	Varchar	This column is also of data type VARCHAR(50) and stores the last name of the doctor. Like FirstName, it is marked as NOT NULL.
Specialization	Varchar	This column is of data type VARCHAR(100) and is used to store information about the doctor's medical specialization or field of expertise. It can hold up to 100 characters of text, allowing for detailed descriptions of the doctor's specialization.
Contact Info	Varchar	This column is of data type VARCHAR(50) and is used to store contact information for the doctor, such as a phone number or email address. It can accommodate up to 50 characters of contact information.

Appointment Table

Column Name	Column Type	Description
AppointmentId	INT	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each appointment in the database. It is a required field and cannot be left empty.
PatientId	INT	This column is of data type INT and stores the unique identifier of the patient who has the appointment. It serves as a foreign key, linking each appointment to a specific patient in the PatientDetails table.
DoctorId	INT	This column is of data type INT and stores the unique identifier of the doctor who will be attending the appointment. It serves as a foreign key, linking each appointment to a specific doctor in the DoctorInformation table.
AppointmentDateTime	Date	This column is of data type DATE and stores the date and time of the appointment. It is marked as NOT NULL, meaning it is a required field and must have a valid date and time.
Purpose	Varchar	This column is of data type VARCHAR(50) and is used to describe the purpose or reason for the appointment. It can hold up to 50 characters of text, allowing for a brief description of the appointment's purpose.
Status	Varchar	This column is of data type VARCHAR(20) and indicates the status of the appointment, such as "Scheduled," "Completed," or "Canceled." It can hold up to 20 characters of text.

Medical Records Table

Column Name	Column Type	Description
RecordID	Int	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each medical record in the database. It is a required field and cannot be left empty.
PatientID	Int	This column is of data type INT and stores the unique identifier of the patient associated with the medical record. It serves as a foreign key, linking each record to a specific patient in the PatientDetails table.
DoctorID	Int	This column is of data type INT and stores the unique identifier of the doctor who created the medical record. It serves as a foreign key, linking each record to a specific doctor in the DoctorInformation table.
DateOfVisit	Date	This column is of data type DATE and stores the date of the patient's visit for which the medical record is created. It is marked as NOT NULL, meaning it is a required field and must have a valid date.
Diagnosis	Varchar	This column is of data type VARCHAR(50) and is used to describe the diagnosis or medical condition of the patient. It can hold up to 50 characters of text, allowing for a brief description.
Prescription	Varchar	This column is of data type VARCHAR(50) and is used to store information about any prescribed medications or treatments. It can hold up to 50 characters of text.
LabTestResults	Varchar	This column is of data type VARCHAR(50) and is used to record the results of any laboratory tests conducted during the visit. It can hold up to 50 characters of text.
Notes	Varchar	This column is of data type VARCHAR(50) and is available for general notes or comments related to the medical record. It can hold up to 50 characters of text.

Prescription Table

Column Name	Column Type	Description
PrescriptionID	Int	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each prescription record in the database. It is a required field and cannot be left empty.
PatientID	Int	This column is of data type INT and stores the unique identifier of the patient associated with the medical record. It serves as a foreign key, linking each record to a specific patient in the PatientDetails table.
DoctorID	Int	This column is of data type INT and stores the unique identifier of the doctor who created the medical record. It serves as a foreign key, linking each record to a specific doctor in the DoctorInformation table.
Day	Date	This column is of data type DATE and stores the date on which the prescription is issued. It is marked as NOT NULL, meaning it is a required field and must have a valid date.
MedicationName	Varchar	This column is of data type VARCHAR(100) and is used to store the name of the medication prescribed. It can hold up to 100 characters of text, accommodating longer medication names.
Dosage	Varchar	This column is of data type VARCHAR(50) and is used to specify the dosage instructions for the prescribed medication. It can hold up to 50 characters of text.
Frequency	Varchar	This column is of data type VARCHAR(50) and is used to indicate how often the medication should be taken. It can hold up to 50 characters of text.
Duration	Varchar	This column is of data type VARCHAR(50) and is used to specify the duration of the prescription, such as the number of days or weeks the medication should be taken.

DoctorSchedule Table

Column Name	Column Type	Description
ScheduleID	Int	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each schedule record in the database. It is a required field and cannot be left empty.
DoctorID	Int	This column is of data type INT and stores the unique identifier of the doctor whose schedule is being managed. It serves as a foreign key, linking each schedule entry to a specific doctor in the DoctorInformation table.
DayofWeek	Varchar	This column is of data type VARCHAR(20) and is used to specify the day of the week for the schedule entry. It can hold up to 20 characters of text, accommodating various day names (e.g., "Monday," "Tuesday").
StartTime	Date	This column is of data type DATE and stores the starting time of the doctor's availability on the specified day. It represents the time when appointments or other activities begin.
EndTime	Date	This column is of data type DATE and stores the ending time of the doctor's availability on the specified day. It represents the time when appointments or other activities conclude.

BillingAndPayments Table

Column Name	ColumnType	Description
TransactionID	Int	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each transaction or payment record in the database. It is a required field and cannot be left empty.
PatientID	Int	This column is of data type INT and stores the unique identifier of the patient associated with the medical record. It serves as a foreign key, linking each record to a specific patient in the PatientDetails table.
DoctorID	Int	This column is of data type INT and stores the unique identifier of the doctor whose schedule is being managed. It serves as a foreign key, linking each schedule entry to a specific doctor in the DoctorInformation table.
Day	Date	This column is of data type DATE and stores the date on which the transaction or payment occurred. It represents the day of the transaction.
Serviceorprocedure	Varchar	This column is of data type VARCHAR(100) and is used to describe the service or medical procedure for which the payment was made. It can hold up to 100 characters of text.
Amount	Number	This column is of data type NUMBER and stores the monetary amount associated with the transaction. It represents the payment amount made by the patient for the provided service or procedure.
PaymentMethod	Varchar	This column is of data type VARCHAR(50) and specifies the payment method used for the transaction, such as "Cash," "Credit Card," or "Insurance." It can hold up to 50 characters of text.
Paymentstatus	Varchar	This column is of data type VARCHAR(20) and indicates the status of the payment, such as "Paid" or "Pending."

Department Table

ColumnName	Column Type	Description
DepartmentId	Int	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each department within the organization. It is a required field and cannot be left empty.
DepartmentName	Varchar	This column is of data type VARCHAR(100) and stores the name or title of each department. It provides a human-readable label for identifying and referring to different departments within the organization. It can hold up to 100 characters of text.

UserAccount Table

ColumnName	Column Type	Description
UserID	Int	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each user account in the system. It is a required field and cannot be left empty.
UserName	Varchar	This column is of data type VARCHAR(50) and stores the username associated with each user account. Usernames are used for authentication and login purposes. They are typically unique and should not be left empty. Usernames can have a maximum length of 50 characters.
Password	Varchar	This column is of data type VARCHAR(100) and stores the hashed and salted password associated with each user account. Passwords are securely stored in a hashed and salted format to enhance security. Passwords are used for authentication and should not be left empty. The length of hashed passwords is typically set to 100 characters to accommodate the hashed and salted representation.

UserType	Varchar	This column is of data type VARCHAR(20) and stores the user type or role associated with each user account. User types define the privileges and access rights of users within the system. Common user types may include "Admin," "Doctor," "Nurse," "Patient," or other roles specific to the application. It is a required field and should not be left empty. The length of user types is typically limited to 20 characters.

Logs1 Table

ColumnName	Column Type	Description
LogID	Int	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each log entry in the system. The primary key ensures that each log entry has a unique identifier.
UserID	Int	This column is of data type INT and serves as the primary key for the table. It uniquely identifies each user account in the system. It is a required field and cannot be left empty.
ActivityAction	Varchar	This column is of data type VARCHAR2(50) and stores information about the activity or action that occurred. It describes what the user did or the event that triggered the log entry. For example, it could contain values like "Login," "Logout," "Record Update," "Payment Made," or other relevant descriptions of user actions.
TimeStamp	Date	This column is of data type Date and records the date and time when the log entry was created. It provides a timestamp for when the activity or action occurred, allowing you to track the chronological order of events.