Hospital Management System

1. Project Overview

- **Name**: Hospital Management System
- **Team**: 12
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- **Purpose**: The Hospital Management System is designed to streamline and manage the various processes within a hospital, including patient registration, appointment scheduling, staff management, medical records, and billing. The system will provide a centralized, user-friendly interface for hospital staff and administrators while ensuring data integrity and security in managing patient information and hospital operations.

2. Problem Statement

Hospitals deal with large volumes of patient data, medical records, appointments, and billing information, often spread across different departments and systems. This can lead to inefficiencies, duplicate data, and errors, impacting patient care and hospital operations. Manual methods or disparate systems make it difficult to track patient histories, schedule appointments efficiently, or manage billing and insurance claims. There is also a need for secure and organized handling of sensitive medical data.

We aim to help combat these challenges by creating the Hospital Management System. This system will centralize and automate hospital workflows, allowing for seamless patient management, appointment scheduling, staff coordination, and billing. By integrating all major hospital processes into a single system, it will reduce manual errors, improve operational efficiency, and enhance the quality of care. The system will also ensure compliance with health regulations regarding patient data security and privacy.

3. Target User

- **Primary Users**:
    - **Hospital Administrators**: Responsible for overseeing hospital operations, including patient intake, staffing, and financial management.
    - **Doctors/Nurses**: Healthcare providers who need to access patient records, track treatments, and communicate with other staff.
    - **Patients**: Individuals receiving medical care, who can use the system to schedule appointments, access their medical records, and manage billing information.
    - **Support Staff**: Administrative staff managing patient registration, appointment booking, and records entry.
- **Database Administrator**: The database administrator will manage user access levels, data integrity, system security, and perform system maintenance.

4. List of Relations

- **Patients**: Stores patient demographic information, contact details, and relevant health data.
  - **Schema**: Patients (patient_id, first_name, last_name, date_of_birth, gender, contact_info, address, insurance_info, medical_history)
- **Staff**: Stores information about hospital employees, including their roles, departments, and schedules.
  - **Schema**: Staff (staff_id, first_name, last_name, role, department, contact_info, availability, assigned_patients)
- **Appointments**: Tracks scheduled appointments between patients and healthcare providers, including the appointment date, time, and reason for the visit.
  - **Schema**: Appointments (appointment_id, patient_id, staff_id, date, time, reason, status)
- **Medical_Records**: Stores detailed medical history and treatment records for each patient. This includes diagnoses, treatments, medications, and notes from healthcare providers.
  - **Schema**: Medical_Records (record_id, patient_id, diagnosis, treatment, doctor_notes, medications, record_date)
- **Billing**: Manages billing information for patients, including the cost of treatments, insurance details, payments, and outstanding balances.
  - **Schema**: Billing (billing_id, patient_id, total_cost, insurance_coverage, payment_received, outstanding_balance, billing_date)

5. Web Interface

- **Patient Registration and Profile Page**: A form for registering new patients, where staff input personal information, contact details, insurance information, and medical history. This page will allow staff to update patient profiles as needed.
- **Appointment Scheduling System**: Allows support staff and patients to book appointments with doctors. The system will check for the availability of healthcare providers, schedule based on department or specialty, and send notifications to both patients and staff. Patients can also view and manage their appointments through a patient portal.
- **Electronic Medical Records (EMR)**: A secure interface for doctors and nurses to view, update, and manage patient medical records. This section will display previous visits, treatment plans, test results, and any ongoing medical issues.
- **Staff Management Page**: A tool for hospital administrators to manage staff schedules, assign patients, and track the availability of doctors, nurses, and other healthcare providers. This page will allow administrators to ensure proper staffing levels across different departments and shifts.
- **Billing and Payment Portal**: A billing interface where hospital financial staff can manage patient invoices, track insurance claims, record payments, and generate billing reports. Patients can access their own billing information through the patient portal, view outstanding balances, and make payments online.

- **Dashboard and Reporting**: Dashboard for administrators to monitor hospital operations, track key metrics, and generate reports for hospital management or regulatory bodies.

6. Data

- **Manual Entry**: Hospital staff will input patient information, appointment details, and medical records manually through the system interface. Support staff will also handle billing data entry for treatments and services.
- **Patient Portal**: Patients will populate parts of their profile through the web portal, including contact details and appointment scheduling.
- **Integration with External Systems**: The system can be integrated with other hospital systems such as lab information systems, radiology, or pharmacy databases to automatically populate test results, prescriptions, and treatment records.
- **Pre-loaded Templates**: Pre-defined templates for common medical treatments or billing processes included to streamline data entry for healthcare providers and administrative staff.