**Hospital ERP Management System**

* Team Name: HealthWise
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* Problem Statement: Hospitals and medical centres face significant challenges in managing their patient records, appointments, billing, and staff allocations. The current systems are fragmented, leading to inefficiencies in patient care and long wait times. A unified solution is required to streamline hospital operations, enabling better coordination among departments, timely patient care, and simplified administrative tasks such as billing and scheduling.

**1. Understanding of the Problem statement**

**a. Explanation of the Problem Context:** Hospitals face challenges due to fragmented systems for managing patient records, appointments, billing, and staff allocation. These inefficiencies lead to delays in patient care, long wait times, and administrative errors. The project is intended to hospital administrators, doctors, patients, and pharmacists, all of whom need a unified platform to streamline operations and improve coordination to reduce inefficiencies.

**b. Key Requirements Identified:**

* **User Management**: Role-based access for Admins, Doctors, Patients, and Pharmacists.
* **Patient Management**: Patient registration, record management, appointment scheduling, and billing.
* **Doctor Management**: Appointment scheduling, access to patient records, and prescription management.
* **Pharmacist Management**: Prescription fulfilment and medication inventory
* **Admin Dashboard**: Overview of hospital operations, user management, and reports.
* **Integration**: Synchronization of data across all modules (Admin, Doctor, Patient, Pharmacist).

**2. Solution Overview**

**a. Solution Summary**: HealthWise Application System is an integrated software solution designed to streamline hospital operations such as Admin Management, Patient Management, Doctor Management, and Pharmacist Management into a single platform. By centralizing patient records, appointment scheduling, billing, and staff coordination, HealthWise eliminates the inefficiencies present today. Administrators can easily manage users and hospital resources, while doctors and pharmacists have real-time access to patient data, prescription management, and appointment scheduling.

**b. Objective:**

* **Streamlining Hospital Operations**: Centralizing patient records, appointments, billing, and staff management to eliminate fragmentation and inefficiencies.
* **Improving Coordination**: Enabling real-time access to critical information across departments (administration, doctors, pharmacists), improving communication and reducing delays.
* **Enhancing Patient Experience**: Reducing wait times by automating appointment scheduling and facilitating faster access to care.
* **Simplifying Administrative Tasks**: Automating billing, inventory management, and staff allocation, reducing manual effort and administrative errors.

**3. Features and Functionalities**

**a. Core Features:**

* **User Management**: Role-based access for Admins, Doctors, Patients, and Pharmacists.
* **Patient Management**: Patient registration, record management, appointment scheduling, and billing.
* **Doctor Management**: Appointment scheduling, access to patient records, and prescription management.
* **Pharmacist Management**: Prescription fulfilment and medication inventory
* **Admin Dashboard**: Overview of hospital operations, user management, and reports.

**b. Additional Features:**

* **Booking appointments for Dependents:** Appointment scheduling, managing appointments
* **Notification Service:** E-mail notifications
* **Payment Gateway:** Integrating payment in the system.
* **Download Generated Bills:** For record purposes.

**c. User Flows:**

**Admin User Flow:**

* Dashboard: View hospital operations overview, including active appointments, staff schedules, and system notifications.
* Manage Users: Add, edit, or remove users (Doctors, Patients, Pharmacists).
* Resource Management: Allocate hospital resources (e.g., rooms, equipment).
* Generate Reports: Create and download reports on hospital performance, billing, and staffing.

**Patient User Flow:**

* Sign Up / Log In: Patient registers for an account or logs into an existing one.
* Book Appointment: Select a doctor, view available slots, and schedule an appointment.
* View Medical History: Access past treatments, test results, and doctor notes.
* Make Payment: Pay for consultations or treatments via integrated billing system.
* Receive Appointment Reminder: Notification about upcoming appointments.

**Doctor User Flow:**

* Log In: Doctor enters credentials to access the system.
* View Appointments: Check the day’s schedule, upcoming patient appointments.
* Patient Records: Access patient medical histories, treatment plans, and lab results.
* Write Prescription: Create and update prescriptions for patients.
* Update Medical Notes: Add notes or updates to patient records based on consultations.

**Pharmacist User Flow:**

* Log In: Pharmacist enters login credentials.
* View Prescriptions: Access prescriptions created by doctors.
* Prepare Medication: Fulfil prescriptions and prepare medication for patients.
* Update Inventory: Track and update medication stock levels.

**4. Architecture Diagram**

**a. System Architecture:**



**b. Key Components**

* **Patient**: This entity represents the patients of the healthcare system. It stores information such as ID, name, age, sex, phone number, email address, address, and description. It also has operations like login, signup, viewing medical history, creating appointments, updating appointments, paying bills, and retrieving billing information.
* **Doctor**: This entity represents the doctors of the healthcare system. It stores information like ID, name, age, sex, email address, phone number, specialization, and login credentials. It has operations like login, updating information, marking appointments, giving prescriptions, retrieving patient history, generating reports, and managing medical reports.
* **Appointments:** This entity represents appointments made by patients with doctors. It stores information like ID, patient ID, doctor ID, date, time, and whether the appointment is completed. It also has operations like creating appointments, updating appointments, deleting appointments, and marking appointments as completed.
* **Medical History**: This entity represents the medical history of patients. It stores information like ID, patient ID, and medical history details in JSON format.
* **Billing**: This entity represents the billing information of patients. It stores information like ID, patient ID, due date, and total cost.
* **Medical Report**: This entity represents medical reports generated by doctors. It stores information like ID, appointment ID, and report details in JSON format.
* **Timing**: This entity represents the timings of appointments. It stores information like ID, doctor ID, date, and time.

**5. Technical Stack**

**a. Frontend:** React JS with Typescript. Material UI for styling

**b. Backend:** Node JS microservices with Express.

**c. Database:** Mongo DB as database. Mongoose for schema modelling.

**6. Prerequisites and Requirements**

**a. Technical Requirements:** Node Package Manager should be installed. Mongo DB should be installed in the system.

**7. Future Improvements**

**a. Planned Enhancements:**

* **Notification Service:** E-mail notifications
* **Payment Gateway:** Integrating payment in the system.

**8. Conclusion**

**a. Summary of Achievements:** The HealthWise ERP system streamlines hospital operations, reduces errors, and improves communication between departments, leading to faster, more efficient care. The system enhances collaboration, simplifies administrative tasks, and provides a user-friendly interface for staff and patients.

**b. Value Provided:**

* **Improving Patient Experience**: Faster appointments, easier billing, and better care coordination.
* **Enhancing Staff Efficiency**: Streamlined workflows for doctors, pharmacists, and admins.
* **Optimizing Operations**: Reduces manual tasks, minimizes errors, and enables data-driven decision-making.

Attachments [Optional]

Any additional diagrams, screenshots, or reference materials can be attached here.