Integrated Electronic Health Record System For Hospital

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Abstract- In modern healthcare, patient medical records are often distributed across multiple hospitals, resulting in repeated medical tests, delayed diagnosis, and poor continuity of care. This project proposes a Reference Electronic Health Record (EHR) System that provides secure and centralized access to patient records across hospitals. The system includes two login modules: users (patients) can view their medical history, disease descriptions, and prescriptions, while hospitals manage multiple doctors who select their own name to add new records for specific users. All medical records are maintained in a reference based manner, ensuring that previous information remains preserved, while doctors from different hospitals can view earlier records as reference to support accurate diagnosis and treatment. The system promotes better coordination among healthcare providers by maintaining a consistent and complete patient medical history. By offering structured storage and role-based access to sensitive medical information, the system enhances continuity of care, minimizes redundancy in medical testing, and improves overall efficiency within the healthcare process.

Keywords – Electronic Health Record, role-based access, continuity of care, Medical History.

I. INTRODUCTION

Patient medical records are usually kept separately in different hospitals. This results in repeated tests and delays in diagnosis. Such a fragmented system disrupts continuity of care and makes healthcare less efficient. The proposed Reference Electronic Health Record (EHR) System offers a centralized platform for securely managing patient records. It lets patients access their medical history and allows doctors to refer to past records for better diagnosis and treatment. The system keeps historical data and improves overall coordination in healthcare.

II. SYSTEM ARCHITECTURE

The Modular Centralized System for Reference EHR serves as the architecture for EHR to manage the clinical record of patients in a modular structure. Within the system there are three modules - Patient Module, Medical Record & Authentication Module, and Hospital & Doctor Module, that will be storing data in MySQL through the Python-Django backend framework.

The Patient End will provide the patients the ability to register and sign into the portal securely, as well as access their clinical medical record, medication history, laboratory/diagnostic test results, and other reports. The Medical Record & Authentication Module is the core of the system that allows the patient to securely log in to their record using a combination of their email and password (Login Same as Patient). It additionally provides a role-based access control for authorized users to be able to view medical data stored in the patient's medical record. The record will have the ability to maintain a historical record and will provide the reference for the storage of clinical/medical data.

The Hospital/Doctor module will provide hospitals the ability to manage their physicians, update clinical records for their physician, and develop patient history for their medication history and add doctor notes to the patients' medical record.

All transactions will be processed through the Django backend framework, while all user information will be stored in the MySQL database for secure storage and efficient retrieval. The overall architecture of the Reference EHR will present an organized method of managing clinical records while presenting controlled access to medical records, and allow for better coordination within the healthcare system.
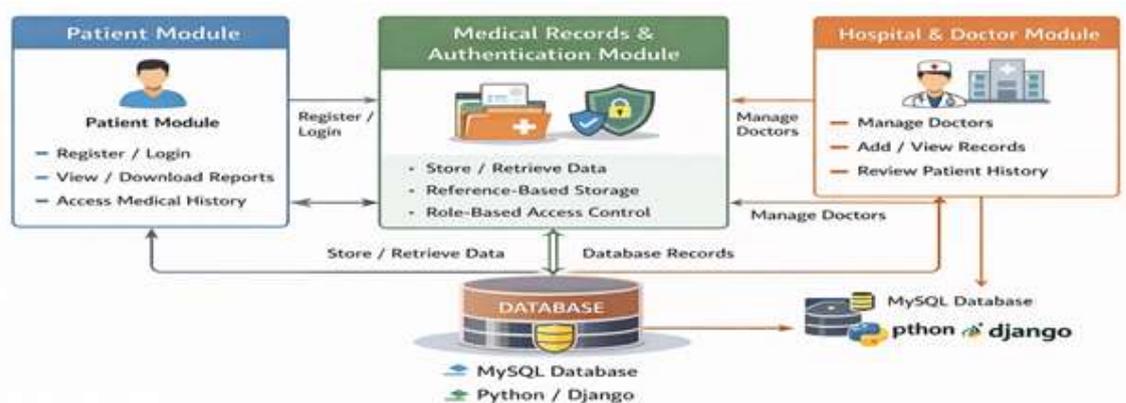
Fig 1.System Architecture

III. MODULE SPLIT UP

Patient Management Module
The module provides a complete system which enables patients to register and login. Patients can view their entire medical history along with their prescribed medications and received treatments. Patients have the ability to save their medical documents which they can use for later needs. The system provides structured methods for users to access their private medical information.

Hospital Administration Module
The module enables hospitals to handle their financial records together with their operational management tasks. The system allows users to create new doctor accounts and handle existing profiles. The system enables hospitals to register new patients while tracking their medical document progress. The system guarantees effective communication between hospital administrative staff and medical personnel.

Doctor Management Module
Doctors can log into the Doctor Management Module to view their allocated patient records. Doctors can view earlier medical records while entering fresh diagnostic and treatment information. The module establishes regular methods for updating patient records. The system enables medical professionals to make precise choices based on complete data. Medical Records Management Module The module maintains patient medical information by storing it in an organized system. The system uses reference-based methods to safeguard historical data by storing it without permanent deletion.

The system provides structured data management which enables users to retrieve their data efficiently. The module supports continuous patient treatment while eliminating unnecessary work.

Authentication and Security Module
The module controls patient and doctor and hospital administrator access to the system through their assigned roles. The system requires users to provide their credentials which the system uses to determine their access rights. The medical information system handles patient data through secure processing methods. The system prevents unauthorized users from accessing confidential healthcare information.

IV. WORK FLOW

Step 1: User Registration and Login
The workflow begins with user registration and login. The system assigns each patient a specific Patient ID during the registration process which serves as their unique identifier throughout medical record management. The Authentication Module verifies user credentials to grant patients doctors and hospital administrators access according to their assigned roles.
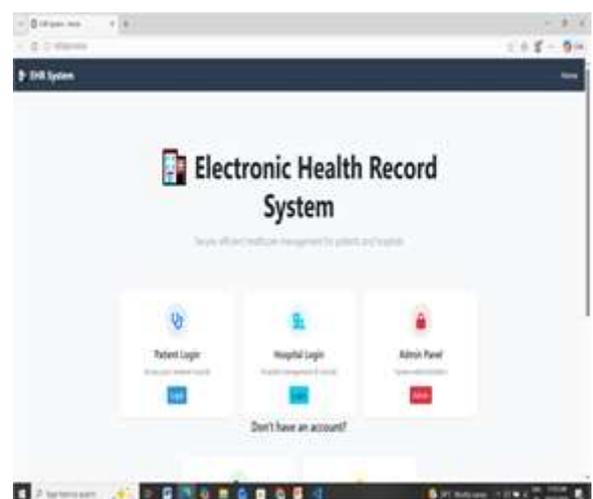

Fig 2. Login page

Step 2: Patient Record Access
After successful login patients can access their medical history and prescriptions and treatment details through their unique Patient ID. The patients have the ability to download their medical reports at any time they need it. The process enables precise identification of individuals while making it easy to obtain their personal healthcare records.
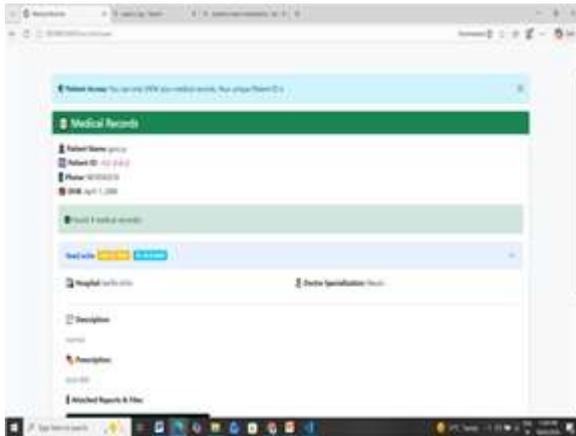

Fig 3. Patient previous record accessing page

Step 3: Hospital and Doctor Operations
Hospitals use the system to create doctor accounts and to register new patients. Doctors use Patient ID to log into the system which enables them to check patient records and study medical history and to enter new diagnosis and treatment information. The system saves all new information which maintains the original documents intact.
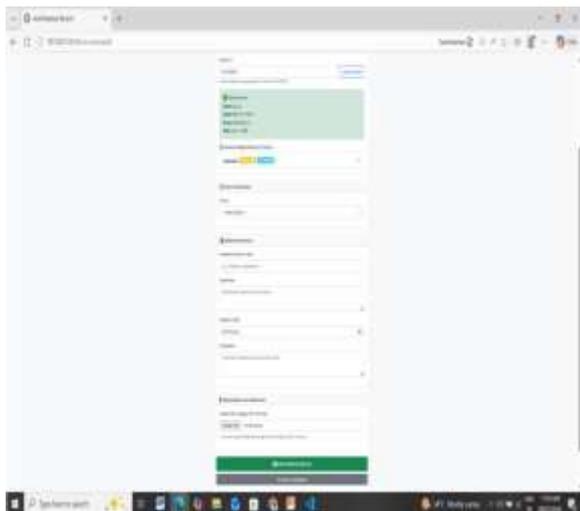

Fig 4. Add new medical record page

Step 4: Medical Record Storage
The Medical Records Management Module stores all medical information through its reference-based system. The system uses the unique Patient ID to connect all past and current information which allows for easy access to any saved data.

Step 5: Data Retrieval and Continuity of Care
Authorized users can retrieve patient records from the centralized database using the Patient ID. The system enables healthcare providers to work together more effectively while decreasing the need for duplicate tests and ensuring patients receive ongoing medical treatment.

V. ADVANTAGES

- Provides doctors controlled access to patient medical history from multiple hospitals.
- Stores records in a reference-based system that preserves historical data while allowing new entries.
- Reduces duplicate medical examinations, saving time and cost for patients.
- Enables faster and more accurate medical decision-making by doctors.
- Connects hospitals to improve treatment coordination and continuity of care.
- Implements role-based access control to ensure secure management of medical data.

VI. FUTURE SCOPE

The Reference Electronic Health Record (EHR) System needs cloud-based storage integration because it will provide better scalability and remote access to its users. Mobile application support will enable patients and doctors to access medical records at any time and from any location. The system needs advanced data analytics together with artificial intelligence because these technologies will help create predictive diagnosis and treatment solutions. The system will achieve better automation of healthcare operations through its connection with laboratory systems and pharmacy management systems.

VII. CONCLUSION

The Reference Electronic Health Record (EHR) System provides a centralized and structured platform for managing patient medical records efficiently. The system enables hospitals to share medical records securely which allows doctors to access complete patient history whenever they need it. The system maintains historical records in a reference-based format which permits authorized users to make updates. Patients can easily access their medical information while doctors use previous treatment records to make better diagnoses and treatment choices. The system improves healthcare provider coordination and medical testing efficiency through its implementation of role-based access control and secure data management features which result in better patient care quality and continuous treatment.

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