

SMART SECURE AND SCALABLE: A MERN BASED MEDICAL RECORD: KEEPING PLATFORM FOR MORDEN HEALTH CARE

Mrs T Vinotha

Assistant Professor,

*Electronics and Communication Engineering,
Vivekanandha College of Engineering for
Women(Autonomous),
Namakkal, Tamil Nadu, India*

T. Gowshika

Student,

*Electronics and Communication Engineering,
Vivekanandha College of Engineering for
Women(Autonomous),
Namakkal, Tamil Nadu, India*

K.Hema

Student,

*Electronics and Communication Engineering,
Vivekanandha College of Engineering for
Women(Autonomous),
Namakkal, Tamil Nadu, India*

M.Jeevaharunya

Student,

*Electronics and Communication Engineering,
Vivekanandha College of Engineering for
Women(Autonomous),
Namakkal, Tamil Nadu, India*

N.Kalpana Chawla

Student,

*Electronics and Communication Engineering,
Vivekanandha College of Engineering for Women (Autonomous),
Namakkal, Tamil Nadu, India*

ABSTRACT

Nowadays, more and more government agencies, companies and health care organizations are moving towardselectronicsrecordsfromrecordonpaper. Inhealthcareorganization,MedicalRecordKeep is being used to capture, organize, maintain and retrieve patient's medical records.

This MERN based medicalrecord(MongoDB,Express.js,React,No de.js)exploresthedevelopmentofanappdesigne dto efficiently manage and access medico-legal records, aiming to reduce the effort required for record retrieval and organization.

The app will integrate user- friendly interfaces to ensure quick andaccurate access to important legal and medical data. Well, managed medical records at hospital improve efficiency, safety and quality of patient care. Furthermore, the app will prioritize data security and compliance with relevant legal regulations, ensuring the sensitive medico-legal information remains protected while being easily accessible for authorized users. This study aimed to explore the management of medical records, archiving and retrieving at a General Hospital.

Keywords: MERN, EHRs, Patient name, Case number, and date range.

INTRODUCTION

A medical record keeper is a professional responsible for managing and maintaining patient's health records and medical histories. This role is crucial in healthcare settings, as it ensures that accurate, confidential, and up-to-date patient information is consistently available for medical professional. The primary duties of a medical record keeper include organizing, filing, and safeguarding patient data, managing electronic health records (EHR), and ensuring compliance with legal and ethical standards. Their work contributes significantly to the quality of patient care, efficient healthcare delivery, and the smooth operation of healthcare organization. This individual ensures that patient data. The role involves organizing both paper and digital records, ensuring compliance with privacy laws such as HIPPA (Health Insurance Portability and Accountability Act), and facilitating smooth communication between medical professionals. By maintaining accurate and up-to-date records, a Medical Record Keeper plays a critical part in enhancing patient care, reducing errors, and ensuring the efficiency of healthcare system.

EXISTING SYSTEM

A Medical-Legal Record-Keeping is a digital system designed to securely store, manage, and retrieve medical record while ensuring legal compliance.

These platform are essential for healthcare providers, legal professional, and insuring companies, enabling them to maintain accurate, confidential, and legally admissible records. They help in litigation, medical malpractice cases and regulatory audits. Their role ensures that patient information, including medical history, diagnoses, treatments, and medications, is accurately documented and easily accessible for healthcare providers. By maintaining confidential and comprehensive medical records, medical record keepers support effective patient care, facilitate communication among healthcare teams, and ensure compliance with legal and regulatory standards. With the increasing use of electronic health records (EHRs), their role has expanded to include the management of digital system, enhancing the efficiency to security of patient data storage.

A Medical-Legal Record-Keeping is designed to address the secure, management, and legal compliance of medical records. It plays a critical role in healthcare, insurance, and legal proceedings, ensuring accuracy, accessibility, and security while complying with legal and regulatory standards. The platform's scope extends across multiple stakeholders, including hospitals, legal firms, insurance companies, government agencies, and patients. Medical record keepers handle various tasks, including recording patient history, test results, diagnoses, treatments, and medications, while ensuring confidentiality and compliance with healthcare regulation like HIPAA.

With the increasing use of electronic health records, medical record keepers are proficient in using digital systems to store, retrieve, and update patient data efficiently. Their work is crucial in providing quality healthcare and supporting the administrative functions of healthcare institutions. Medical record keepers may work with various forms of documentation, such as electronic health records, paper files, and other medical data, ensuring compliance with legal and regulatory standards. The block diagram of the existing system is shown in Fig 1.

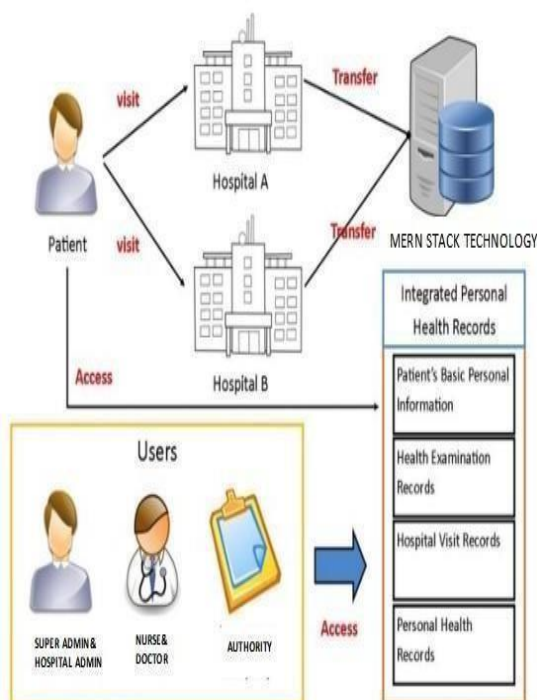


Fig1. Block diagram of Existing System

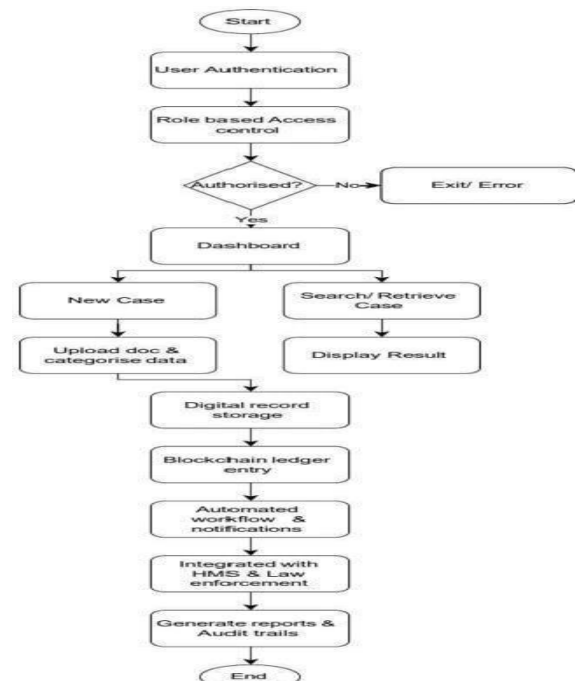


Fig2. Flow Chart of Existing system Dataflow

1. Legal Data Enrollment: Hospital staff (Doctors, Nurse, and Supports Staff) log into the system. Patient legal case details are enrolled using a structures form. The system records and stores the data securely in a centralized repository.

2. Data Search and Retrieval: Authorized legal authorities login to the system. They use the search functionality to query the database using parameters such as patient name, case number, or date. The system retrieves and display matching records.

3. Data Download: From the search results, authorized users can select a record. Users are provided with an option to download the case file containing all enrolled legal data.

PROPOSEDSYSTEM

This proposed system is designed as Cloud-Based Health Record Management System (CHRSMS) aimed at digitizing and streamlining the management of medical record for patients in a secure, accessible, and interoperable manner. The system leverages modern cloud technologies to offer a scalable, and flexible solution to manage electronic health records (EHRs) across healthcare institutions, allowing seamless communication, secure access, and real-time updates. This Cloud-Based Health Record Management System will modernize healthcare system by providing efficient, secure, and scalable management of electronic health records.

It will empower healthcare providers with the tools to improve patient care while ensuring data privacy and compliance with regulations. The MongoDB and node based Medical Record Management system (MRMS) offers a modern, scalable and secure approach to managing patient health records. With its flexible database structure, real-time updates, secure access controls, and robust mobile and web interfaces, this system will streamline healthcare operations, improve patient care, and ensures the privacy and integrity of sensitive medical data. This system leverages MongoDB as the database Node.js and Express.js as the back-end framework, React.js as the front-end framework and Bootstrap as CSS framework (MERN STACK Technology) that offers a scalable, flexible, and efficient solution for management system (MRMS) that managing electronic health records (EHRs).

The system is designed to handle patient data in real time. A Medical-Legal Record-Keeping is designed to address the secure, management, and legal compliance of medical records. It plays a critical role in healthcare, insurance, and legal proceedings, ensuring accuracy, accessibility, and security while complying with legal and regulatory standards. The platform's scope extends across multiple stakeholders, including hospitals, legal firms, insurance companies, government agencies, and patients.

Data Enrollment: Hospital staff will enter patient details and legal case information into the system.

Data Search: Legal authorities will be able to search for a patient's legal case details using various search parameters.

Data Download: Logged-in users, with the appropriate permission, can download a file containing the legal case data for further processing or review.

System Architecture

User Roles

- 1. Super Admin:** Oversees overall system administration and manage user roles and system settings.
- 2. Hospital Admin:** Manages hospital-related data and staff permissions and monitors case entries from hospital staff.
- 3. Doctor:** Enters and updates patient legal case details and reviews case data for medical-legal accuracy.

The user list which is shows the Fig 8. It includes the patient ID, medicine type, age, nature of treatment which is shown in the user list.

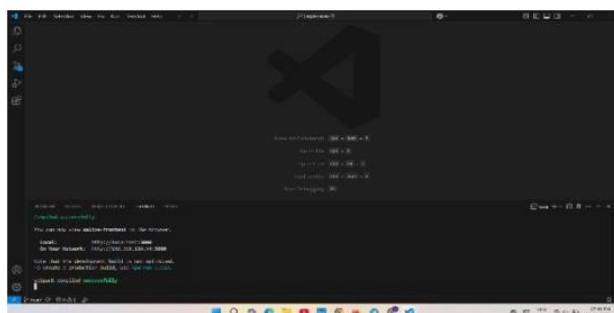


Fig5.BACKENDTERMINAL



Fig6.WEBPAGE

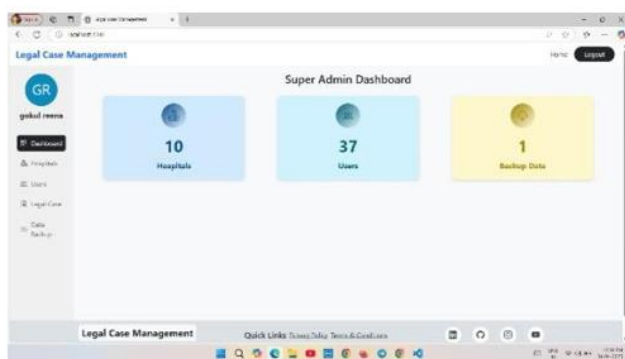
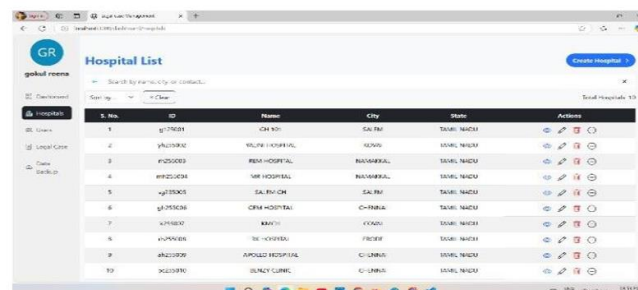
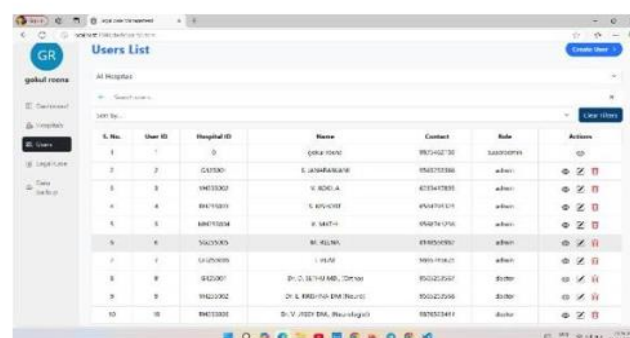


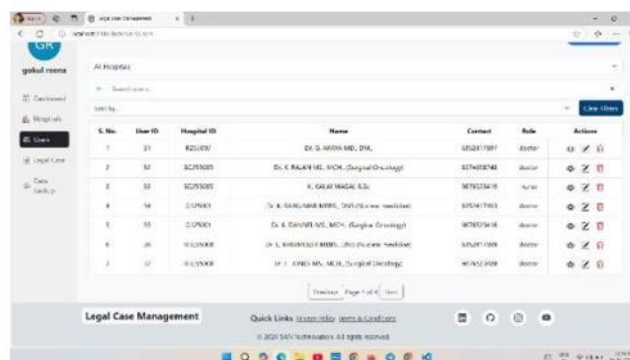
Fig7.DASHBOARD



S. No.	ID	Name	City	State	Actions
1	g719011	CHITRA	CHITRA	INDIA	
2	g719012	CHITRA HOSPITAL	CHITRA	INDIA	
3	g719013	CHITRA HOSPITAL	CHITRA	INDIA	
4	g719014	CHITRA HOSPITAL	CHITRA	INDIA	
5	g719015	CHITRA HOSPITAL	CHITRA	INDIA	
6	g719016	CHITRA HOSPITAL	CHITRA	INDIA	
7	g719017	CHITRA HOSPITAL	CHITRA	INDIA	
8	g719018	CHITRA HOSPITAL	CHITRA	INDIA	
9	g719019	CHITRA HOSPITAL	CHITRA	INDIA	
10	g719020	CHITRA HOSPITAL	CHITRA	INDIA	

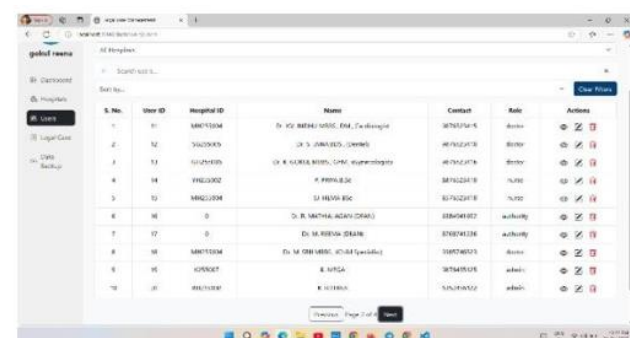


S. No.	User ID	Hospital ID	Name	Contact	Role	Actions
1	1	1	CHITRA	9876543210	ADMINISTRATOR	
2	2	2	CHITRA	9876543210	ADMINISTRATOR	
3	3	3	CHITRA	9876543210	ADMINISTRATOR	
4	4	4	CHITRA	9876543210	ADMINISTRATOR	
5	5	5	CHITRA	9876543210	ADMINISTRATOR	
6	6	6	CHITRA	9876543210	ADMINISTRATOR	
7	7	7	CHITRA	9876543210	ADMINISTRATOR	
8	8	8	CHITRA	9876543210	ADMINISTRATOR	
9	9	9	CHITRA	9876543210	ADMINISTRATOR	
10	10	10	CHITRA	9876543210	ADMINISTRATOR	



S. No.	User ID	Hospital ID	Name	Contact	Role	Actions
1	21	21	CHITRA	9876543210	ADMINISTRATOR	
2	22	22	CHITRA	9876543210	ADMINISTRATOR	
3	23	23	CHITRA	9876543210	ADMINISTRATOR	
4	24	24	CHITRA	9876543210	ADMINISTRATOR	
5	25	25	CHITRA	9876543210	ADMINISTRATOR	
6	26	26	CHITRA	9876543210	ADMINISTRATOR	
7	27	27	CHITRA	9876543210	ADMINISTRATOR	

Fig8.USER LIST



S. No.	User ID	Hospital ID	Name	Contact	Role	Actions
1	31	31	CHITRA	9876543210	ADMINISTRATOR	
2	32	32	CHITRA	9876543210	ADMINISTRATOR	
3	33	33	CHITRA	9876543210	ADMINISTRATOR	
4	34	34	CHITRA	9876543210	ADMINISTRATOR	
5	35	35	CHITRA	9876543210	ADMINISTRATOR	
6	36	36	CHITRA	9876543210	ADMINISTRATOR	
7	37	37	CHITRA	9876543210	ADMINISTRATOR	
8	38	38	CHITRA	9876543210	ADMINISTRATOR	
9	39	39	CHITRA	9876543210	ADMINISTRATOR	
10	40	40	CHITRA	9876543210	ADMINISTRATOR	

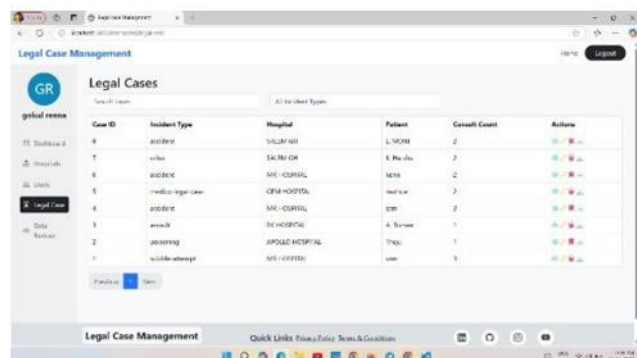


Fig 9. LEGAL CASES

CONCLUSION

This project provides a simplified yet robust solution for managing medico-legal case data. By enabling hospital staff to enroll patient legal details and allowing legal authorities to search and download these records, the system ensures efficient and secure handling of sensitivity information. While the current implementation focuses on the core functionalities, the design has been structured to allow future enhancements if additional features or modules are required.

REFERENCE

1. Adegboire AM, Omowumi AT. Factors influencing electronic medical record systems success in selected tertiary health care facilities in South-West, Nigeria Inf Impact J Inf Knowl Manage. 2021;12:14-32.
2. Barua PK, Saha AK, Borua JP, Barua S, Akhter N, Begum M, et al Medical record keeping practices in a tertiary-level hospital Asian J Med Biol Res. 2021;6:723-30.
3. Gan Qian, Li Yangxin, Hu Ying, et al. Theoretical considerations on information resource sharing of medical records [J]. Lantai World, 2012, (17):6-7.
4. Guo Ying. Exploration of Countermeasures to Promote Information Sharing Service of Qinghai Medical Archives under the Background of Big Data [J]. Qinghai Social Science, 2015, (06):200- 204.
5. Jiang Qiang. Current Situation and Strategy of Hospital File Management Based on Big Data Platform [J]. Lantai World 2019, (S1):194-195.
6. Liu Peng. Research on the application of bigdata technology in hospital file management [J]. Lantai World, 2023,(11):90-92.
7. Nijor S, Rallis G, Lad N, Gokcen E. Patient safety issues from information overload in electronic record.