Use of Electronic Health Record for Managing Medical History of Patients

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ABSTRACT

With the increased use of technology in healthcare, Electronic Health Records (EHR) have become the preferred means of capturing patient information. EHRs provide advantages such as enhanced patient care, increased efficiency, and decreased mistakes of misplacement of patient reports. In order to take maximum benefits of EHRs, they must be managed and organized in a way that makes them easily accessible to healthcare practitioners. This paper investigates several EHR management solutions, such as developing standardized prescriptions and integrating all medical services on a single platform. EHR gives rapid and precise access to patient's medical information, it will assist healthcare organizations in optimizing their traditional management of healthcare records. The relevance of maintaining EHRs for simple access to patients' medical histories is discussed in this paper.

Keywords: - Electronic Health Record (EHR), patient's medical record, EHR management.

I. INTRODUCTION

The term "Electronic Health Record" (EHR) refers to a digital copy of a patient's medical file that is kept in a centralised database and is available to licenced healthcare professionals. Because they can raise the standard of care, boost productivity, and cut expenses, EHRs are becoming more common in the healthcare sector. With the goal of enhancing patient care and outcomes, the adoption of EHRs has been a top priority for many healthcare organisations and governments worldwide [2].

The ability to securely and effectively store and share patient information is one of the primary benefits of EHRs. This makes it quick and simple for medical professionals to access a patient's medical history, including test result, treatments, and prior diagnoses. By sending alerts & reminders to healthcare professionals about drug interactions, allergies, and other crucial patient information, EHRs can also lower the possibility of medical errors.

But there have been difficulties with EHR adoption as well. Healthcare organisations must make sure the system they select is functional for healthcare providers and compatible with their current infrastructure and regulatory standards. Furthermore, problems with data accuracy and private issues might need to be resolved.

Despite these difficulties, implementing EHRs has far more advantages than disadvantages. EHRs will be even more crucial to providing patients with high-quality care as healthcare continues to develop.

II. LITERATURE SURVEY

According to Swati Yanamadala, health information technology, in particular EHR, will boost the effectiveness and quality of healthcare organisations of all sizes. 1 Given these prospective advantages, the

federal government promoted the use of EHRs through the Health Information Technology for HITECH Act: Economic and Clinical Health. As a result, many hospitals are making a lot of effort to put these tools into practise and demonstrate significant utilization. 59% of US hospitals had an EHR system in place as of 2013. 2 Three phases for the timely adoption of EHR use were established by the federal incentive programme: EHR adoption is stage 1 of the process. EHR data interchange is stage 2, and using EHRs to enhance patient outcomes is stage 3. 3 Yet, only around 6% of hospitals satisfied all the requirements for stage 2 meaningful use, despite the widespread implementation of EHR systems. 2–4 As a result, the American healthcare system is still developing and implementing meaningful use for EHRs [1].

Elizabeth M Borycki suggested that over the next 10 years, clinical trial managers will need to adapt to this new healthcare landscape. The biggest of these challenges for clinical trial investigators are learning how to function effectively in a hybrid environment, where part of the patient record is electronic and part of it is paper-based. Clinical trial researchers must learn how to effectively use the power of extracting and analysing data from EHR databases, while at the same time effectively obtaining data from a paper patient record, as healthcare organisations transition from pure paper records to electronic record components with a partial paper record (i.e., hybrid environment), and finally to a full EHR [2].

Catharine M Hammack-Aviran conducted a program in which 120 patients participated in semi-structured interviews in four counties spread across the various southern United States areas. Participants were asked to weigh the benefits and drawbacks of three approaches to informing patients about or requesting permission for research use of their EHR data, as well as whether they thought it would be acceptable for their healthcare organisation to use each approach. They were also asked to identify which approach would be the most suitable [3].

Manisha Wadhwa addressed that a paradigm shift in the collection, storage, use, and dissemination of patient clinical data has been brought about by information and communications technology (ICT). The switch from paper-based to electronic recordkeeping has undoubtedly been gradual. There are many words used to describe the switch from paper-based to electronic recordkeeping. Among these terms are Automated Health Records (AHR), Computer-based Patient Records (CPR), Electronic Medical Records (EMR), and EHR. [4].

According to Sophie H. Bots, the digitalization of the healthcare system has made a vast amount of clinical data accessible to academics. These EHR data represent the patient population that receives routine care; as a result, they include individuals who are usually underrepresented in clinical trials, such as women, the elderly, and those with numerous co-morbid diseases. Additionally, EHR data frequently includes a big sample size, a variety of metrics, and details on therapeutic outcomes. A study on long-term clinical outcomes in Cushing's illness, as an example, found that the outcomes of interest (mortality, infections, and thrombosis) were consistently documented in registries with national coverage [5].

Martin R. Cowie proposed that the EHR offer chances to improve patient care, integrate performance measurements into clinical practise, and enhance the identification and recruitment of qualified patients and healthcare professionals for clinical research. By enabling practical clinical trials, EHRs can aid in the macroeconomic assessment of whether novel medicines or changes in healthcare delivery result in better outcomes or lower healthcare costs. The current status of cardiovascular clinical research has drawn criticism due to its difficult recruitment process, laborious data gathering, and hazy clinical practise generalizability. These elements raise the price of clinical research, which is regarded to be a reason in the field's diminishing investment [6].

Tom Seymour spoke to the American people Federal and state laws, regulations, and rules are mixed together quite intricately in the healthcare system. Healthcare records become confusing when you add this to the thousands of private insurance companies that each have their own set of guidelines. It goes without saying that administrators in the modern healthcare system are overburdened with extremely complex external regulations, much alone the demands of competition and the need to provide their patients with high-quality care. The importance of it has been highlighted by the unstable healthcare environment. The current healthcare system in the United States is prepared to alter and undergo a revolution thanks to EHRs. The use of EHR by healthcare providers has slowed down, Nonetheless, the US government recently approved laws mandating the adoption and usage of EHR by all healthcare practitioners by the year 2015 [7].

Sr. no.	Name of Author	Important points	Technology used	Future scope
1.	Swati Yanamadala [1]	They created descriptive statistics using univariate regression analysis.	PHP Laravel	The integration of electronic health records (EHR) with cutting-edge technologies like blockchain, machine learning, and artificial intelligence will improve patient outcomes, cut costs, and improve healthcare delivery in the future.
2.	Elizabeth M Borycki [2]	Access information that is necessary for patient treatment. Use patient data from the past to enhance the standard and layout of clinical trials in the future.	LAMP stack	The future scope of EHRs is vast and exciting. It consists of better patient treatment, increased effectiveness, better population health management, increased patient participation, and research improvements.
3.	Catharine M Hammack-Aviran [3]	Because to the amount and breadth of the information they hold as well as new technology capabilities to mine, assimilate, analyse, link, reproduce, and transfer information, EHRs are being used more and more for research and clinical trial recruitment.	Java Springboot	EHRs offer vast potential to revolutionize healthcare by improving patient care, increasing efficiency, and enabling advancements in research, patient engagement, and population health management.
4.	Manisha Wadhva [4]	In this essay, the use of electronic health records (EHRs) in India is reviewed. The publication provides information about the government of India's EHR-related efforts. The report also covers the possible advantages of EHRs.	PHP Laravel	EHRs have vast potential to transform healthcare by improving patient care, increasing efficiency, and enabling advancements in research, patient engagement, and population health management.
5.	Sophie H Bots [5]	This article discusses the challenges involved in using EHR data for study-related purposes.	-	The future scope of EHR management is to use emerging technologies to enhance interoperability, data security, and healthcare delivery efficiency.
6.	Martin R Cowie [6]	This document outlines the key steps that must be taken to advance the use of	-	-

		electronic health records in cardiovascular clinical research.		

III. PROPOSED WORK

A patient's medical history, which includes diagnoses, prescriptions, test findings, and other pertinent medical data, is stored digitally in an EHR. Due to their ability to securely and effectively share patient data among healthcare practitioners, enhance patient care coordination, and lower medical errors, EHRs have emerged as a crucial component of contemporary healthcare systems.

The proposed work aims to develop and implement an EHR system in a healthcare organization. The system will be designed to improve the quality of patient care, increase efficiency, and reduce costs associated with paper-based medical records. The project will involve the selection of appropriate EHR software, customization to meet the specific needs of the organization, data migration from existing paper records, training of staff members on the new system, and ongoing support and maintenance.

Implementing an EHR system has advantages such as better patient safety, more accurate medical records, quicker access to patient data, less administrative work, and enhanced communication between healthcare providers. EHRs can also support initiatives for study and quality improvement, manage population health, and provide useful information for reporting on public health.

Overall, the proposed work is aimed at enhancing the quality of patient care, increasing efficiency, and improving the overall healthcare experience for patients, healthcare providers, and administrators.

IV. FLOWCHART
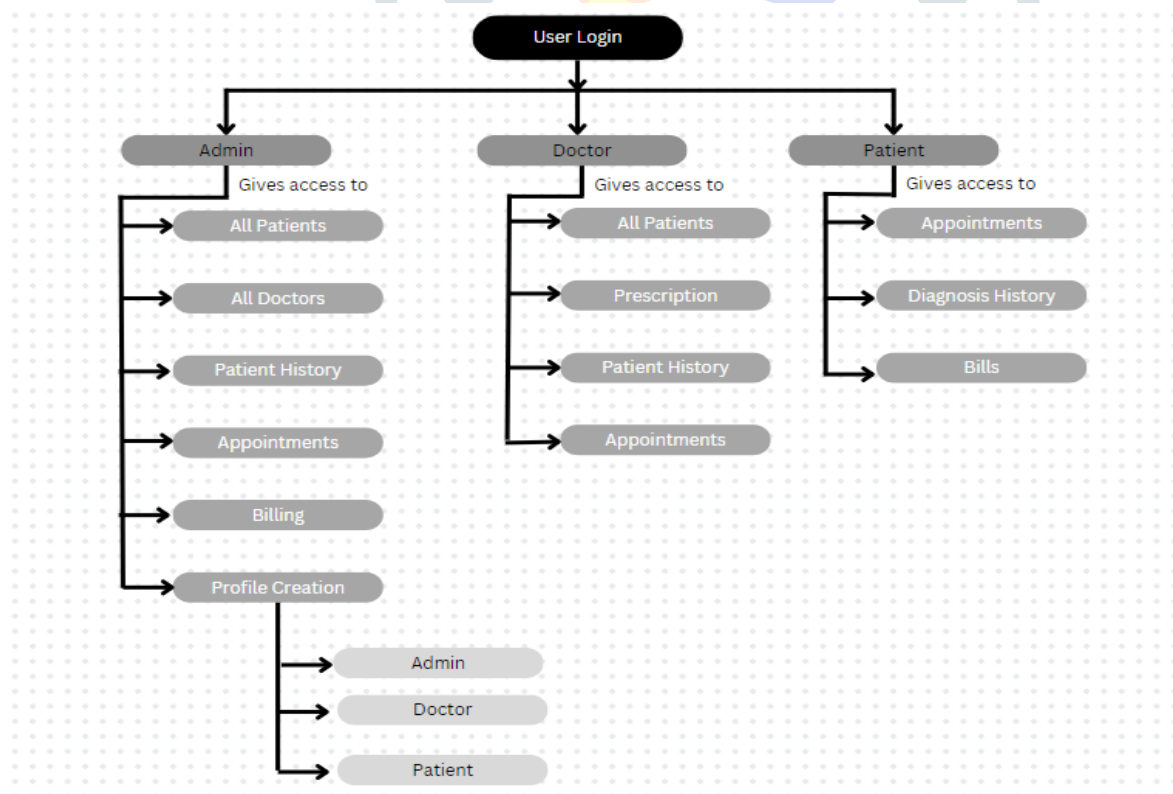
Fig 1: Flow of Access Control in EHR

As shown in Fig. 1, the user first has to login through their assigned ID. There are three types of users in total: administrators, doctors, and patients. The admin has access to all patient, doctor, billing, and appointment

booking data and is also in charge of creating user IDs. Through the Doctor login, users can access the histories of patients that are assigned to them, advise on prescriptions, and manipulate and check appointments for a given date and time. Through patient login, users can get access to all the prescriptions provided by their doctor, book appointments, and go through their diagnostic history.

V. MODULES

a. User ID Creation

In this section, one can create an ID for their respective designation and then login to access the portal. There are three types of IDs that can be created: admin, patient, and doctor.

b. Login

In the login module, various types of users, like doctors, patients, and administrators, can login using their specific credentials and then access the services of their choice. To use this service, user ID creation is required.
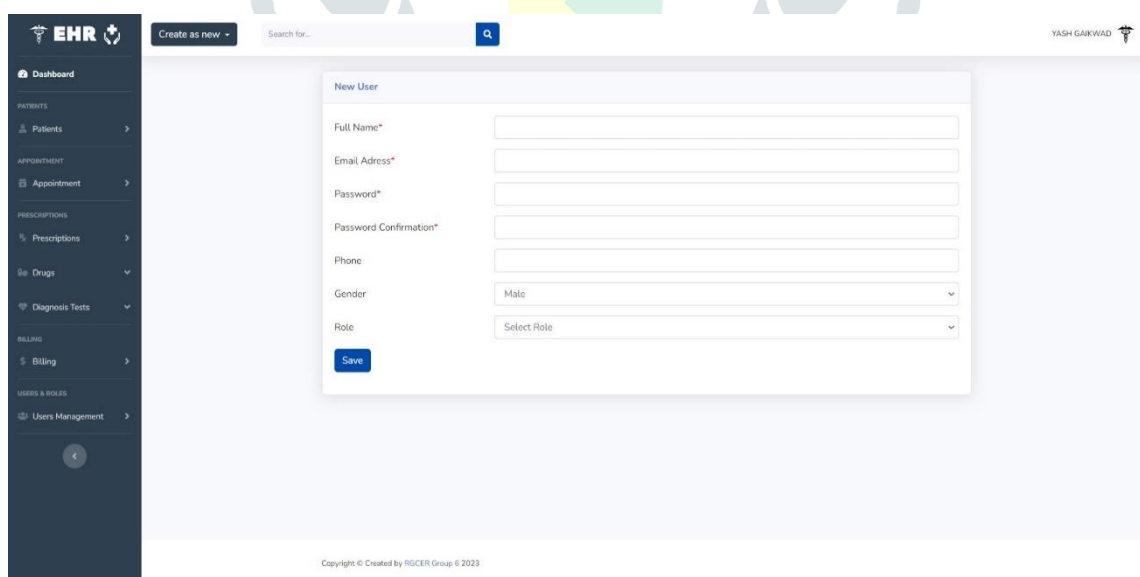
c. Admin's dashboard

Admin can create users of respective designations and can also access all doctors and patients that are registered in the app, book appointments, and generate invoices for the patients. Admin gets the list of all patients and doctors in the system and can manipulate the data of any user. Admin can also book appointments and assign patients to respective doctors.

d. Doctor's dashboard

Doctors can access their assigned patients and their medical histories, provide prescriptions, and confirm or cancel appointments.

VI. RESULTS

Fig 2: User Id Creation

The Fig 2 shows the page where user can create their respective Id, there types of Id can be created those are
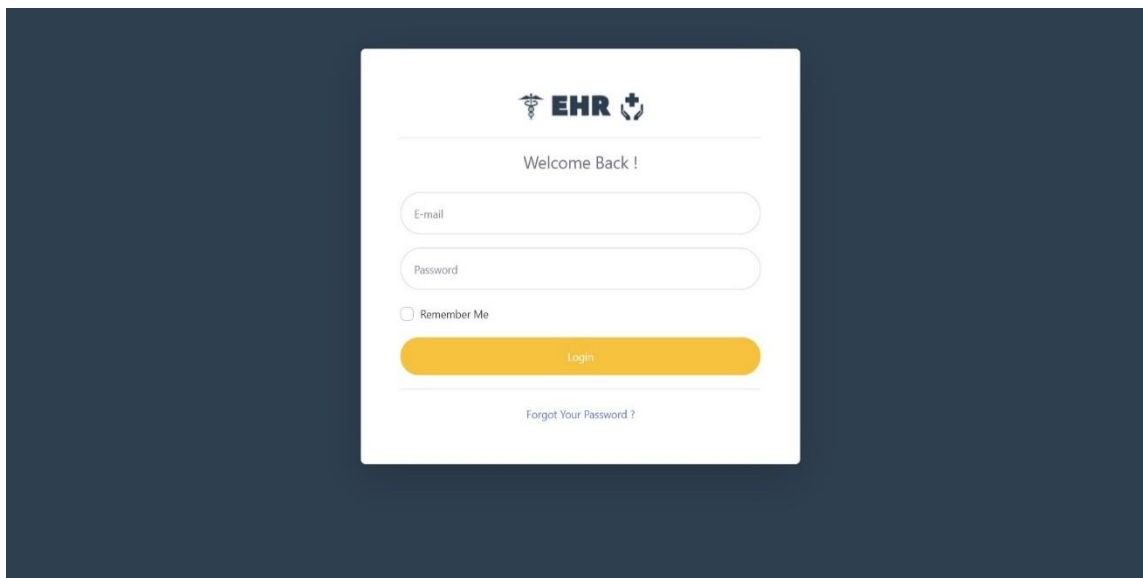
Admin, Patient and Doctor.

Fig 3: All User Login Page

After creation of the Id user can login through their respective Id by using their valid credentials as shown in Fig 3.
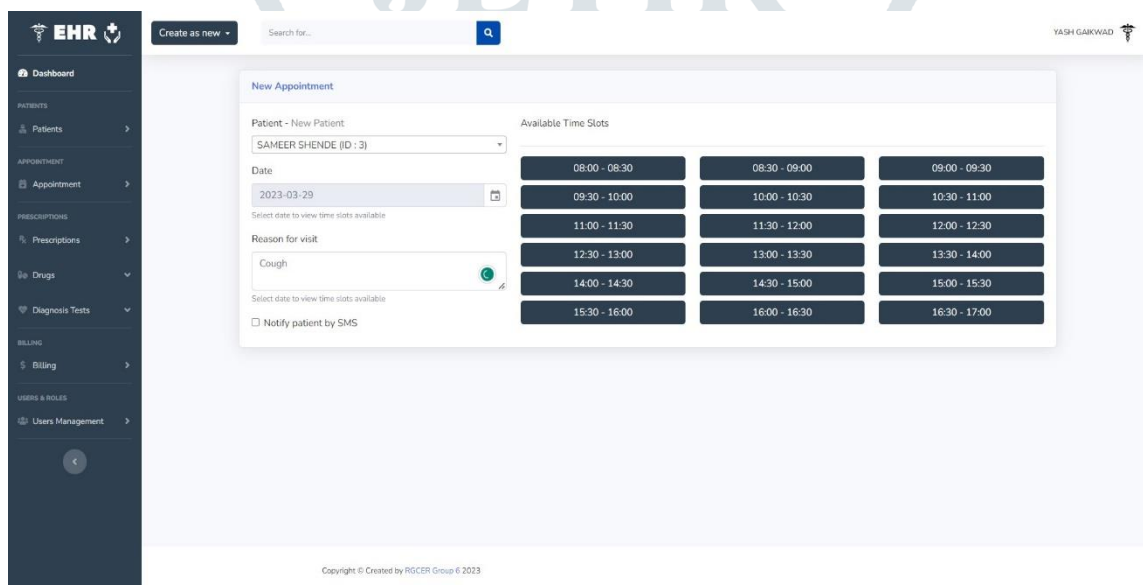

Fig 4: Appointment Booking for Patient

Fig 4 shows the patient login page where patient can book their preferred time slots and can also access their previous records and prescription provided by doctors.
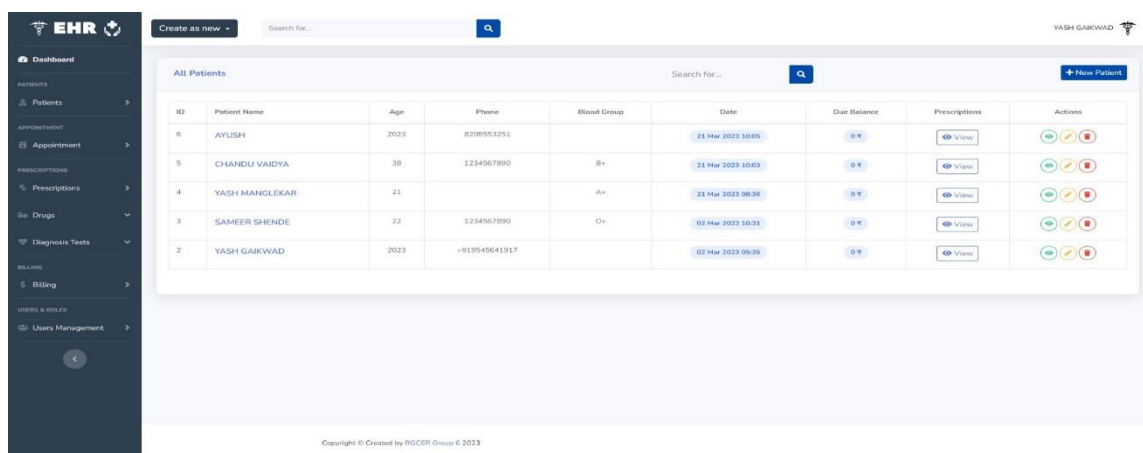

Fig 5: Patient List

The Fig 5 shows the list of patients in the system it can only be accessed by Admin and Doctor Ids only.

Fig 6: Prescription Given by Doctor to Patient

The page shown in Fig 6 is where doctor advice prescription to the patient. Patient can get access to this using their ID.

Fig 7: Invoice Generation

Admin can generate Invoice for any respective patient and can also add the mode of payment.

VII. CONCLUSION & FUTURE SCOPE

EHRs have revolutionised the way healthcare is delivered. Better patient outcomes are the result of increased patient safety, improved clinical judgement, and optimised healthcare processes. The adoption of EHRs has also brought about a number of difficulties, such as data security issues, privacy concerns, and the potential for information overflow. After analysing multiple research papers on EHR management, it is concluded that there is a great need for proper utilization of EHR system. It is also required that training to the staff for EHR utilization is necessary. EHR also improves the communication between various entities in hospital like doctor, patient, admin etc. We have developed a project in which all these issues are addressed where all entities are able to co-operate with each other on one platform

In the future, EHR systems is likely to be characterized by increased interoperability, advanced data analytics, patient engagement, mobile optimization, and telemedicine integration. These developments will help to improve the quality of healthcare and make it more accessible to patients, regardless of their location or healthcare provider.

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