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Design A Framework Based On Cloud Healthcare From The Patter Of Tiny Feet And Genetic Outcomes

Nitisha[1*], Dr. Lakshmi Shankar Singh[2]

[1] *Scholar M.Tech CSE, SCRIET, Chaudhary Charan Singh University (Campus), Meerut, India neetivats.nt@gmail.com
[2]Assistant Professor, SCRIET, Chaudhary Charan Singh University (Campus), Meerut, India Shanker.laxmi@gmail.com

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ABSTRACT

Background: Between a person's birth and death more than a century ago, there were several health issues. Many issues exist that are not resolved for each individual.
Additionally, the analysis of my research aims to lessen the issue of cost and duration of care. And I draw the conclusion that this research will enable us to identify the appropriate medical issue. Additionally, research is being done to determine how to resolve the financial obstacle that arises throughout therapy. The criteria that prompted the creation of a certain system over a predetermined amount of time are captured and discussed together with the timed establishment of health information networks in this study. As a result, we shed light on such systems and offer recommendations and avenues for further research.
Objective: The research aims to figure out the root cause of the issue, cut down on diagnosis time, and conquer cost consequences. In order o foster better comprehension by the public, forecasts and assessment, this study sought to demonstrate the necessity of reliable and trustworthy health data management system that would enable both patients and physicians update disseminated medical information and embark on data analysis. The downsides of the present health data management systems are being studied.
Methods: Adhering to a summary of several research papers. I'm stopping myself in my tracks to gather effectively analyze data that comprises a patient's entire healthcare journey from the day there were born. Consequently, I use an innovative technique that enters all medical facilities using the Aadhar Card, transfers report files from doctor to doctor, and testing laboratories to testing laboratories.
An investigation was carried out to find research papers and data on medical litigation, health legislation, and actions in order to examine the development and specifications of health data management systems throughout time. These materials came from databases owned by Elsevier, the MEDLINE database PubMed, Scopus, Web of Science, and the Center for the Development of Computing Machinery, as well as the Institute of Electrical and Electronics Engineers.
Results: Over the years, Algorithms that oversee information on health have had a radical metamorphosis, moving from pen paper to computers, the online, the cloud based, on internet on things, big data analysis, and ultimately. Developing the criteria that follow for a wellness system for managing data have been made evident by descriptions of medical health files and how they are handled.: (1) data from medical records; (2) real-time data access; (3) patient participation; (4) data sharing; (5) data security; (6) patient identity privacy; and (7) public insights. Based on these seven requirements, which have been the subject of several research over the years, health data management systems. As far as we are aware, this is very earliest examination of historical development of systems for regulating health that provides information about the system needed to improve health care.
Conclusions: A thorough real-time health data management system is required, one that enables medical professionals, patients, and other users to enter their own health and lifestyle information. Better prognosis, diagnosis, and illness prediction will be made possible by the use of big data analytics. The outcomes of the predictions will aid in the creation of a successful preventative strategy.
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Keywords: Health care, health information management, eHealth, the bitcoin blockchain, massive data sets, and statistical mining, Internet of Things, medical research and mHealth.

Introduction

Beyond the past era, the concept of controlling wellness being collected at a rapid pace have presented additional information systems has changed. In order to deliver enhanced obstacles.
and more precise patient treatment, as well as making meaningful use of these records, health data management has experienced disruptive shifts as paper charts gave way to computerized medical records in the keeping of health information. This change is supported by the progress made in information technology, which gave rise to several concepts multiple tools to control health data. The objectives of organic treatment and scrutiny were frequently at odds with those health data management systems. The mismatch between modern technologies' acceptance for biomedical treatment and research and their actual application is the primary source of this misalignment. As a result, creating an altered layout for the wellness information system is essential to closing this gap. This paper presents a more comprehensive the origins and heritage of health data management schemes, supporting the expanding What makes up medical documentation. It also addresses the challenges that exist within these systems, introduces the contemporary features that support the growing volume of wellness details, and offers viewpoints and remedies aimed at improving the health care ecosystem.
A variety of a mechanism to handling data pertaining to health been created as a result of the advent of EHRs, which have revolutionised the health care sector by expanding service offerings, raising the standard of patient care, and increasing real-time data access [2]. According to our understanding, electronic health records (EHRs) give patients a longitudinal perspective of their medical history throughout their lives, as created by the many medical organisations or providers that have treated them. The patient's biographical and demographic data, previous and present hypersensitivity information, test and via radiography findings, diagnosis and medications, and notes on advancement, and vaccinations are all included in these well-organized and condensed records. However, documents demonstrating the person's assessment and course of care are kept for academic purposes in a previous version of EHRs known as paper charts. Next, the phrase was changed to electronic medical records, computer-based patient records, and, as of right now, computerized medical documentation. Management of health-related information systems have changed all through time, moving from technological devices to online, connectivity of everything, client to server based, and blockchain-based due to breakthroughs in technology and the need to deliver more efficient and cost-effective healthcare. Integrating big data analytics into Frameworks for tracking wellness information is becoming essential for the growth of massive health care datails and the realisation that medical datails may be utilized in research and governance. This creates new challenges for data aggregation and preprocessing from several sources to provide insights, data security, and privacy in response to the rising number of data breaches and hacker incidents. The categories and formats of health data This study examines the factors that must be taken into account while putting in place a mechanism to handling data pertaining to health in order to improve patient care and predictive analysis. mechanism to handling data pertaining to health will become greater precision, operational, and economical by taking these criteria into account. To the best of our knowledge, this is the first analysis to provide comprehension of the framework needs for improved health care by looking at the historical evolution of health data management systems.
This study offers three main contributions. The study first offers a taxonomy a mechanism to handling data pertaining to health according to their level of technical maturity, and it discusses the problems and challenges that come with it. In the second section, we outline the evolving definitions of medical records and derive a system's needs for managing health data. Third, the study offers perspectives on the field of health data management system research as well as recommendations for future directions.

Related Works:

Systems aimed at handling health data are expanding to provide improved medical care. Two categories encompass the literature assessments on these systems: Mobile health (mHealth) and electronic health (eHealth) .
Study examines the effect of an electronic framework on the standard of healthcare in relation to eHealth. The findings demonstrated that, with appropriate design, a health information system may both help physicians and other healthcare practitioners with diagnosis and avoid medical mistakes. A unified definition including the online, experienced players, recipients, online forums, and material related to health, and cooperation is the result of a two-year examination of definitions of health and medicine. In this study, we identify further needs for improved health care: patient engagement in monitoring and accessing medical data; privacy and security; and public insights. Cunningham et al.'s [8] and Hans et al.'s [7] investigations centre.
Silva et al.'s [9] evaluation of mHealth applications and services addresses mHealth. It emphasises how crucial coordination, integration, and interoperability across various mHealth apps are to enhance health care and mobile device performance in terms of battery life, storage, processing speed, and network capacity.
We evaluated systems for tracking health data in this study using the seven criteria listed below, which have been the subject of several studies over the years: Data from medical records, (2) real-time data access, (4) sharing of data, (5) safe datails, (6) the patient's moniker protection, (7) public ideas, and (5) patient engagement.

Methods

We examined studies published publications, states wellness data lawsuits, health care rules, actions regarding to the organisation of information from hospital files and the requirements of a technique for managing data pertaining to health in order to analyse and investigate the evolution of technique for managing data pertaining to health. A search of the literature from 1793 to 2020 was conducted via the databases of the electronic and electrical tools. We choose the articles that discussed events that changed the definitions technique for managing data pertaining to health, brought about the implementation of new systems, or included the application of technology to improve healthcare. These studies' study indicates that patients are receiving correct and effective care thanks to the adoption of new technology.

Results illustrates the many changes that health data management systems

have seen throughout time in tandem with the development of Governance of Health-related information System information technology. A number of initiatives were launched Domain and legislation was implemented during this development to raise Understanding the development of the underlying health data the standard of patient care. The circumstances that led to the management systems and their constraints is necessary before development of technique for managing data pertaining to meeting the demands of biomedical care and research. Patient health are shown in Table 1. The limitations of technique for care criteria should be fulfilled thanks to the capabilities of managing data pertaining to health shown in Table 2. technique for managing data pertaining to health. Figure 1

Figure1. Wellness data handling system's progression.

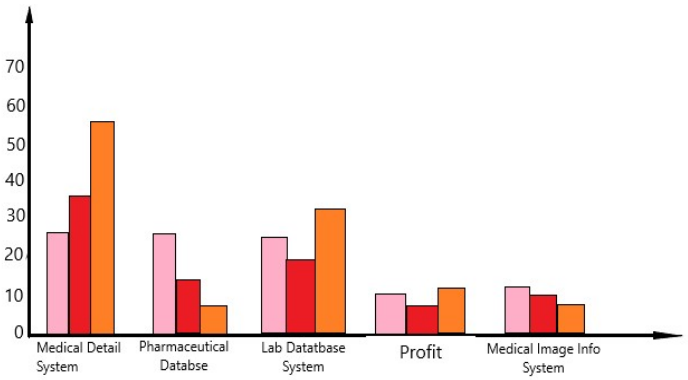


Table1. Prompted changes in health data management systems across time

Appropriate competence	Morphological shift
The Society of the New York University Council of Trustees	A rule was passed to record patient data for the purpose of mitigating hospital expenditures.
The Society of the New York University Council of Trustees	A deadly argument in an American statesperson and a politician led to the passage of a rule requiring the recording of noteworthy medical cases for purposes of education. The guideline stipulates that the cases that are documented must be bound in a book so that governors, medical professionals, students, and patients' friends may examine them.
The Society of the New York University Council of Trustees	Mandate that all medical cases be kept on file.
American College of Surgeons	To improve patient care, a hospital standardisation programme was created that standardised the format of medical documentation.
American College of Surgeons	To further raise the bar for medical record effectiveness, the The American Council of Canadian Record Librarians was founded in founded
Lawrence Weed	It was suggested that medical records be kept on computers to enable physicians to keep on the way of their patients' care histories and to substantiate their treatment strategies.
Medicare as well as Medicaid Centers Services	Medicare and Medicaid legislation mandate medical nurses to keep patient records for the purpose to be reimbursed by insurance.
Lockheed Corporation	The Clinical Information System, the first publicly accessible computer health data management system, was designed for El Camino care house. The system has capabilities for managing pharmacies, arranging appointments, and ordering lab tests .
Mormon Hospital, the school of Utah, and three	To help physicians with clinical operations, the initial clinical system of aiding decisions, named Logical Processing's Health Assessment, was established. Based on an examination of a patient's test results, the system assisted doctors in diagnosing cardiac contraction and in determining the right course of action for cases of viral illnesses.
Harvard University and Massachusetts General Hospital	Computer Stored Ambulatory Record, the initial technique to organize medical records on computers that is stackable, was put into use. Through clinical mapping, the system was able to recognise various terminology used for the same condition and adapt clinical vocabularies.
Indian Health Service	The objective of MPIc is to keep track of patient health data in order to prevent superfluous testing and unwanted medication side effects.
Health Level Seven	To solve the standardization obstacles associated with the creation and adaptation of health data management systems, electronic standards were developed. The standards made it possible mechanism for managing data related to health to incorporate parts from multiple manufacturers.
Institute of Medicine	A research study analysing the perks of electronic health record management initially employed "Computerized care records."
US Congress	In order safeguard patient the Health Insurance Portability and Accountability Act was approved, pertaining to medical records. It incorporates features such as role-based access control, data encryption, audit trails, and automated data backup.
JohnMitchell	Whenever technological innovation and digital interaction are used for the electronic transmission, preserving, and obtaining health records from both local and remote locations, the term "eHealth[4]" was created.
S Laxminarayan and Robert SH Istepanian	For the next mobility care system, the phrase "mHealth*" was coined to refer to free to wire mobile medicine exploiting mobile communications and multiple media technology .
Gunther Eysenbach	By combining public care and trading to body care services, as well as defining eHealth's stakeholders and accomplishments, the definition of eHealth has broadened.
Stephen S Intille	The phrase "uHealth[n]" originated to convey the software that makes use of medical equipment using biometric sensors to monitor and enhance the well being of patients
Health care institute	A well defined definition of the phrase "selfness care records" was proposed, enabling people to maintain and access their medical history, with some parts made available to authorised participants in accordance with access handle rights.
Institute for drugs	One person invented the term "health records by electric devices."

Appropriate competence	Morphological shift
Massachusetts Commonwealth	A health care reform invoice gained support in Massachusetts, mandating firms with in excess of ten full-time employees to offer medical insurance coverage and enforcing a minimum requirement on people to obtain health insurance.
Elliott Fisher	A collection of physicians, hospitals, and other healthcare providers that volunteer to offer their patients with high-quality treatment in an effort to prevent needless duplication of services and lower medical mistakes are referred to as "Accountable Care Organisations."
US Department of Justice, Human and Health Services, and Office of Inspector General	In order to improve the current initiatives aimed at stopping and minimising the Health Care Fraud Prevention and Enforcement Action, Medicare and Medicaid fraud was founded.
US President Barack Obama	The goal of the Affordable Care and Patient Protection Act, when it was implemented, was to increase the coverage of insurance for health care.

Table2. Draw back of medical datails systems.

Medical data managementsystem	Drawback
Paper pen charts	Writing by palm too small to read, leading to misdiagnoses and mortality has to be legally stored, because they might be destroyed by unanticipated occurrences like fire, water, rats, and degeneration. physically difficult to read, recognize and look for accurate data on. It is exceptionally costly and time-consuming to request and then get paper charts for duplication.
Computer-based	Patients are forbidden to have access to their medical records, which are maintained by the doctors. When seeing a patient, doctors must jot down or commit to memory the patient's medical information so they can enter it digitally when they get back to the hospital, which could end up in mistakes.
Client-server-based	Patients are unable to track the usage of their data. the problems with one point of rejection, privacy, and security. In addition, it might be challenging to see a client's medical records from more institutions cohesively. sometimes necessitates repeated medical tests, which adds to the time, expense, and impact on health issues.
Cloud-based	Data reliability, only one point of rejection, a loss of datails stewardship and control, and the need for an ongoing connection to the internet.
IoT[a]-based	Patient privacy and data security are of the utmost importance.
Big-data–based	Data use from many locations is a costly, time-taking, and tipical procedure. The datails need to be preprocessed because they are stored in various forms. Furthermore, it might be difficult to ensure patient identify privacy and data security without compromising the data's value for research and assessment.
Blockchain-based	The ledger modifying procedure across multiple nodes is energy intensive and has low throughput problems. The ledger updating procedure across several nodes is energy intensive [38] and has low throughput problems.

[a]IoT: Internet of Thing.

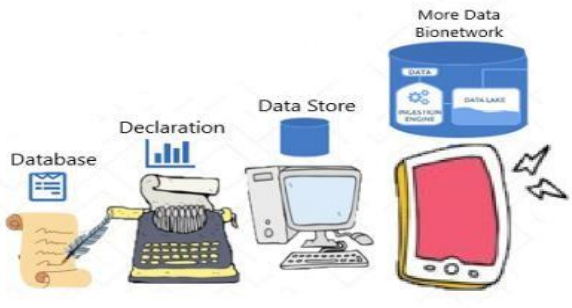
Prerequisites for a mechanism for managing data pertaining to health

The concept of managing data pertaining to health has evolved significantly over the last century in response to the need for both technical advancements and improved patient care. We analysed these disparate analyses and provided justification for the definition throughout the rest of the text. It is crucial to remember that, as the phrase "health data" management is rather recent, the listed define were receive from other "managing data pertaining to health" was not used specifically. Table 3 illustrates how definitions of managing data pertaining to health have changed over time, moving from being solely based on practice and education to be increasingly client and research-based. As seen in Figure 2, we categorised health data management systems according to seven criteria that support the development of the industry. Every figure number corresponds to a defined found in Table 3.

Table3. The meanings of medical records organization.

S.No	Period	Origin Siegler	Discription
1	1793	Siegler	"[...]Name, illnesses, dates of each occurrence, and the location of the patients' most recent arrival for each person received, died orwas released in the same manner [...]"
2	1805	Sayles and Gordon[12]	"The house physician and his assistant will keep a record of every medical case that happens in the hospital and that the attending physician thinks should be kept on file, under the supervision of the attending physician. This paper will be properly bound and stored in the hospital library for use by visitors, governors, medical professionals, surgeons, and students.
3	1941	Weed[14]	"Precise and comprehensive medical records This comprises personal and family medical history, the complaint, the treatment for medical or surgical reasons, the overall or microscopical pathological findings, the progress states, the final diagnosis, the condition upon discharge, the follow-up visit, and, in the event of death, the postmortem findings, in addition to the bodily examination and any special examinations (such as consultations, laboratory tests, x-rays, and other examinations).."
4	1968	Weed[14]	"The computer is significantly contributing. The patient will receive instant empathy and comprehension from his doctor. Inadequate examination by the medical community can be prevented."
5	1968	Cynthia	"Organize facts around any issue. exhaustive list of all the issues facing the patient in addition, diagnosis along with any further surprising symptoms. Because the problems on the list are divided with categories, it is simple to identify those that are urgently important."
6	1993	[40]Dicketal	"Paper charts that a single practice's patients' medical and treatment histories are available digitally so that medical professionals can utilize them for diagnosis and treatment"
7	1997	Eysenbach[25]	"Users of electronic patient records are assisted by the presence of comprehensive and real data, alerts and alarm from practitioners, systems for clinical support of choices, access to medical knowledge bases, and other resources."
8	2001	Cameron and Turtle-Song[41]	"Biomedical informatics, public safety, and enterprise, which pertains to the delivery or improvement of Internet-based health services and information, along with related technologies a mindset and a commitment to networked, global thinking to leverage ICTs to improve health care locally, regionally, and worldwide- Communication technology."
9	2002	Markle Foundation[42]	"Details regarding the issue is contained in the subjective component. The counselor's observations comprise objective information. The plan part outlined the course of therapy, and the assessment section shows how data are generated, analyzed, and considered."
10	2003	HIMSS[a][1]	"Computer program that allows people to see, manage, and share personal health information—as well as the health information of those for who they have authorization—in a private, safe, and confident."
11	2003	HIMSS[43]	"A continuous electronic health record for the patient produced by one or more interactions subject characteristics, updates, problems, medicines, vital signs, and past illnesses, vaccinations, test results, and radiological reports simplifies and automates the process of the clinician. An EHR may produce a comprehensive record of a clinical patient interaction. In addition, based on proof guidance, quality management, and statistics monitoring.
12	2003	AHIMA[b][44]	"EHRs enable In order to deliver safe, real-time, point-of-care, patient-centric information retrieval, they also incorporate based on data guidance and allow patients to consult patient health record information whenever and wherever they need it. invoice, resource planning, results reporting, quality control, and the monitoring and reporting of public health diseases."
13	2005	BöckingandTro-janus[45]	"A lifetime supply of health information that people need to make decisions about their health. Information is kept in a private and secure setting, under the ownership and management of individuals, who also decide who has access rights."
14	2008	HIPAA[c][22]	"A lifetime supply of health information that people need to make decisions about their health. Information is kept in a private and secure setting, under the ownership and management of individuals, who also decide who has access rights."
15	2013		"One of the main objectives is to safeguard the confidentiality of personal health knowledge. embrace newly technology to raise the standard and effectiveness of client care."

Figure2. Specifications for a system that monitors data related to health.



Documentation for Surgical Files

Professional record data that depicts a patient's personality and health based on their personal and demographic data can often be needed by a health records administration system, medical condition history, ongoing therapy, laboratory test findings, and imaging results. Whether they are digital or printed papers, medical records have always been a key component in the development of frameworks for controlling medical data.

Actual Data

The definitions of health data management systems emphasised the need for real-time data availability as a means of enhancing the quality of patient treatment. This mandate lowers the number of medical events since doctors update their data later. Nevertheless, the computer- and paper-based health data management systems are unable to meet this need. The clientserver-based management system [46–52], which gives doctors real-time access to and updating power over patient medical information, brought about this demand.

Cooperation of Patients

Patients are unable to monitor the usage of their medical data since hospital or third-party cloud service providers hold their medical information. As a result, one of the most important prerequisites for building patient confidence in health data management systems is patient involvement in monitoring and accessing medical data. Better prognosis and diagnosis will result from patient engagement in sharing lifestyle and health condition information with doctors in addition to data access. Patients may now enter their medical issues into an Internet of Things (IoT)-based health data management system, which uses sensors and medical equipment to track their health and lifestyle [53–59]. A user-perceived examination of personal health record management platforms reveals that patients need a straightforward, user-friendly solution.

Partaking

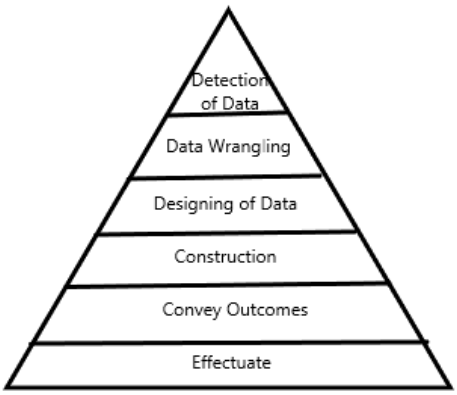
Since a patient's care is being provided by several healthcare professionals, partaking medical records is essential. This will make it easier for other medical professionals to review the patient's medical history, improve therapy, and reduce the need for repeat radiological and laboratory testing. We divided sharing into three categories based on who was allowed access to the data, using the definitions listed in Table 3: (1) degree 1, which is sharing the patient's deliver medical organization; (2) degree 2, which involves sharing with the patient's relatives and close associates; and (3) degree 3, and incorporates sharing with different medical organisations and the government. The emergence of cloud-based health data management systems complements the need for sharing [61–63]. However, the systems should allow interoperability in order to transfer medical record data among other healthcare organisations and to make effective use of the shared information. By managing, sharing, and storing medical data in a common manner, interoperability may be attained. Medical data and photos can be stored in a number of common formats [64]. Analyse [65], Neuroimaging Informatics The internet Vision and Technology Partnership [66], Minc [67], and Communications in Medicine [68] are a few of the most used file formats for medical pictures. The American National Standards Institute established Health Level 7 International as a health details care framework for exchanging medical care data [20]. It contains guidelines for the administration, interchange, and integration of EHRs. The interoperability of Taiwan's eHealth systems for data exchange was evaluated by Wen et al. [69]. This will improve health care by lowering the need for recurrent medical exams and prescription drugs. They came to the conclusion that interoperability should be enforced.

Safeguarding

The protection of patients' private information is crucial in light of the rise in phishing and data breaches in addition to the utilization of other service providers. Compared to the 477 alleged breaches of health data in 2017,

When health and lifestyle data is acquired using medical sensors and equipment from patients, or when cloud service providers manage patient medical information, the need for security is even more critical. A research published by Intel Security states that the health care provider's utilisation of cloud services has decreased since the cloud service provider has not adopted cyber security procedures [71]. According to a survey, hospitals often lose around thirty percent of their networked medical devices, which makes vulnerability protection more difficult [72]. Nearly 61% of all IoT gadgets and sensors on a hospital network are susceptible to cyberattacks. Blockchain technology has become widely popular and has entered the healthcare industry in recent years [73,74]. Its goals include improving patient care by connecting disparate systems, increasing the accuracy of electronic health records [75–81], and providing a more over patient-centric support system for official.

Figure3. Era of big data.



Confidentiality

Because medical fraud and counterfeit medicine sales are on the rise, a hospital information administration system needs to protect patient privacy. Patient privacy needs to be weakened, thereby especially in view of the expanding area of data analytics, which analyzes data from patient medical records. The goal of the a blockchain-based health data management system is to remedy this issue.

Open Perspectives

To prevent potentially fatal scenarios, health condition prediction is essential. If appropriately examined, the growing volume of health care datail [82] can help with health condition prediction. "Big data analytics" refers to the collection, organisation, archiving, and analysis of large amounts of data in order to find patterns, correlations, and other important information. Era of big data is depicted in Figure 3

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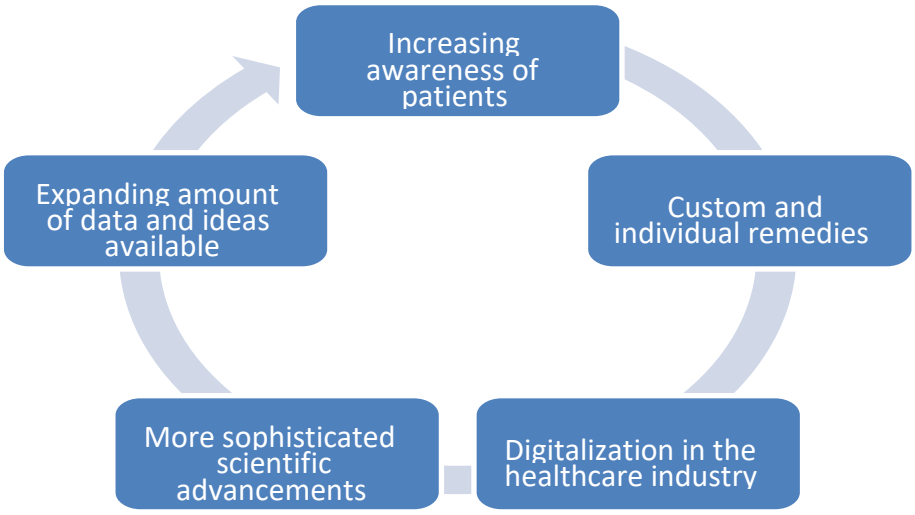
Figure4. Personal medical information ecology.



The diabetes mellitus crisis, the rise in coronary artery disease restored on by eating habits and conduct Personal health care data would be a huge public good in a variety of nations and areas of worldwide about the growing patterns of Alzheimer's and dementia, research on the the gut microbiome and antibiotic abuse [93,94]. Combining the knowledge obtained from significant programs like the Computational Health Sciences and the Health Statistics Exploration Project [92,94] is essential for future developments in the field of both commercial and people's health.

Care data for the benefit of the public. Researchers and government officials may benefit from health care data analytics in a number of ways, including improved chronic illness prediction, the creation of therapeutic medications that work, more precise patient care, and the creation of a nationwide preventative strategy. Table 4 presents systems for managing medical records are included in the ontology and assesses how well they comply with the specified standards.

Table4. The genre's health information handling systems and the correct ones.

Device	Healthcare datails	Actual/ Real data	Partaking		Cooperation of Patients			Safeguarding	Confidentiality	Open perspectives
			Access data	Input data	Stage1	Stage2	Stage3			
Paper pen based	Permit The capturing of medical data for future use	Major postponements	Prevents Patients from seeing howtheir medicalhealthdata is used	Refuses to let patients disclose their issues	Supports Data disclose only with in the same carehouse	Permits patients' friends and family to access their info	Prohibits the sharing of Patient data with Friends and family	Lacks defenses against cyberattacks	Lacks strategies to protect a patient's privacy	Should not validate forcast
Computer-based	Permit the capturing of medical data for future use	Major Postponements	Prevents patientsto let from seeing how their medical healthdata is used	Refuses patients disclose their issues	Solely supports data sharing between hospitals	Permits patients' friends and family to access their data	Permits data exchange With federal and other medical entities	Lacks defenses against cyberattacks	Lacks strategies to protect a patient's privacy	Should not validate forcast
Customer based service	Permit The capturing of checkup data for future use	Major postponements	Prevents patients from seeing howtheir medical data is used	Refuses to let patients disclose their health issues	Solely supports data sharing between hospitals	Permits patients' friends and family to accessthe ir data	Permit data exchange With federal And other medical entities	Lacks defenses against cyberattacks	Lacks strategies to protect a patient's privacy	Should not validate forcast
Cloud-based	Permit The capturing of medical data for future use	Major Postponements	Prevents patients from seeing howtheir medical data is used	Refuses to let patients disclose their health issues	Solely supports data sharing between hospitals	Permits patients' friends and family to accessthe ir data	Permit data exchangewith Federal and other medical entities	Lacks defenses against cyberattacks	Fails to disclose a patient's persona	Should not validate forcast
IoT[a]-based	Permit The capturing of checkup data for future use	Permit immediate data recuperation	Prevents patientsfr omseeing how theirmedi caldata is used	Permitt oletpati entdiscl oscondi -tions	Solelysup portsdata sharingbet weenhospi tals	Permits patients' friends andfamil y to access their data	Permit dataexchange with federal andother medical entities	Lacks defenses againstcyber attacks	Lackstra tegi-es to protect apatient' sprivacy	Offers way of anticip-atingwe llne-ss issues
Big data analyt-ics	Permit the capturing of checkup data for future use	Permit immediate data recuperation	Prevents patientsfro m seeinghow theirmedic aldata is used	Permit patients for their health issues	Solelysup ports data sharing between hospitals	Permits patients'fri ends and family to accesstheir data	Permits dataexchange with federal andother medical entities	Lacks defensesagai nst cyberattacks	Fails to disclose a person's persona	offersw ay ofantici p-atingwe llne-ess issues

Discussion

Principal Findings

In order to support more accurate determination, outlooks, investigations into biology, and public understanding, this study has demonstrated the necessity of a secure and efficient health data management system. Doctors and patients will be able to update and evaluate data from decentralized medical records thanks to this technology. The original version of health data management was introduced about a century ago, and it entailed physically inputting a patient's diagnosis and treatment plan on parchment paper. Later, based on a bitcoin, internet, cloud, Internet of Things, big data analytics, and cloud-based health data management systems emerged as a result of technological advancements. Together with the system's historical history, the concept of medical records has also undergone modification. These definitions include the following needs for a mechanism for managing health data: real-time data, data from medical records. The criteria for exchanging and storing medical record data are met by the paper-based health data management system. On the other hand, paper charts need a costly and time-consuming data exchange procedure, are easily misplaced, and take up a lot of physical space. With time, Paper pen diagrams were replaced by digital ones in the same specifications technological devices system.

In addition to clinical data, a client-server communication based health data management system was established to satisfy the needs for real-time data access and exchange. With this technology, medical data may be accessed online by patients and healthcare practitioners on desktop or mobile computers. One point of failure, data division, system fragility, insufficient scalability, and significant dangers to patient privacy and data security are some of its shortcomings. A cloud-based approach was used by medical organisations and health care providers in order to reduce infrastructure costs and manage data fragmentation. In addition to guaranteeing the patient's identify privacy, the cloud service provider does not guarantee the data's security.With the introduction of the IoTbased management system, the demand of patient engagement to feed their lifestyle conditions and medical data for improved prognosis and diagnosis was realised. Nevertheless, given the rise in data breaches and medical sensor and device hacks,

An increasing supply of information related to healthcare is being examined to obtain insights to enhance illness diagnosis and prognosis as big data analytics advances. Still, there are concerns about patient privacy about how they are identified.

The blockchain technology, which has lately caught industry interest, has potential applications in the medical area. Better patient care is possible when using a blockchain-based mechanism for managing data pertaining to health, which meets all standards. Nevertheless, it has a limited throughput [39] and significant energy consumption [95,96]. Increasing amounts of research are being done to address that outcomes. For example, Milutinovic et al. [97] suggested the proof of luck consensus mechanism to solve the problems of energy taken and provide low-latency, energy-efficient transaction validation. Scalable blockchain designs for healthcare were developed by Ismail et al. [98] and Dorri et al. [99]. These architectures employ a clustering technique to boost transaction performance. The essential requirements of a health care system are security and privacy, especially for patients in light of the rise in hacking and data breaches. Furthermore, with the advent of disruptive technologies like the Internet of Things and big data analytics, the use of patient engagement to contribute health data to a health system is growing. In order to obtain insights and predictive analysis from the data, big data analytics necessitates the exchange of medical records amongst institutions. This opens the door for the development of a health data management system that will assist medical practitioners in diagnosing and treating chronic illnesses more accurately. Furthermore, a system like this enables the public to get insights from data in order to create a national preventative strategy for certain illnesses. The blockchain's traceability feature guarantees the accuracy of the data, outlook and the system for decision support. We propose an integrated digital currencies-, IoT-, and substantial data-based health data management system to ensure the requirements of smart health care: instantaneous fashion access to data by doctors and consumers, patientinputted health data through sensors for medicine and lifestyle choices, security, privacy, and public insights. This integrated health management system should be scalable and energyefficient in the research era of smart health data management systems, opening potentially new research problems.

Conclusions

This report aimed to emphasize the necessities of a health data management system for biomedical research and treatment. In summary, it covered the chronological development of blockchain-based health data management systems from paper charts, as well as the reformation of the explanation of what modern EHRs are called. Information from medical records, instant access, patient participation, communication of data, data security, patient privacy, and general thoughts should all be met by the system. Better disease prognosis, diagnosis, and risk prediction for the onset of chronic illnesses are made possible by the use of big data analytics.

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Abbreviations

EHR: electronic health record
eHealth: electronic health
IoT: Internet of Things
mHealth: mobile health