

Survey Paper on Cloud-Based Secured Healthcare System

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Abstract - India and the healthcare system are facing many threats due to the pandemic, so we encouraged hospitals to switch from paper patient records to electronic health information. Additionally, as the population grows, tracking, documenting and evaluating patients as they move through the multiple channels of the healthcare system becomes more complex. A model must be created to collect patient data from different locations where care is provided in emergencies such as organ transplants. However, the model requires more storage space to store all patient data. Thus, Google Cloud enables healthcare companies to quickly generate insights using industry-specific data, visualization and privacy standards while consuming large amounts of clinical data. After user authentication, cloud services using encryption methods are used to centrally process user data. security of data transferred between the user and the cloud. The idea behind facial recognition technology is to use a smart card to obtain patient-specific medical information by combining and identifying facial features. It also provides users with medication reminders, which are now quite useful, and a chat that helps users understand the basic functions of the software. It aims to provide consumers with basic drug information and help them manage local hospital information. Keywords: electronic healthcare, electronic health records (EHR), data security, facial recognition technology, chat.

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1. INTRODUCTION

The digital revolution in the healthcare sector is being propelled by the utilization of electronic health records and data-driven decision-making. It is crucial to ensure the integrity and security of healthcare data in the digital era. The technologies that are enhancing the security of medical data now include smart cards and fingerprint authentication as vital parts. Moreover, integrating these technologies with cloud-based systems that are centralized offers a complete approach to patient data security. The essential ideas underlying improved healthcare data security are thoroughly examined in this survey research. We examine the vital roles that facial identification, centralized cloud-based systems, smart cards, and their interconnections play in the context of healthcare data protection. The primary objective of this study is to examine and elucidate the algorithms and

methodologies employed in research articles and studies, shedding light on their utility and real-world implementations.

In the following sections, we scrutinize each of these elements in detail and offer comprehensive justifications for their significance. We highlight the strategies and tools that academics are employing to address the pressing issues with healthcare data privacy, without naming any specific initiative. Our objective is to summarize the corpus of current literature, identify areas that warrant further investigation, and draw attention to recurring problems to provide a comprehensive resource for academics and business professionals. Robust data security protocols are crucial as the healthcare industry continues to adopt digitalization.

This survey contributes to the ongoing discussion on healthcare data security by providing a thorough evaluation of these technologies' present condition and potential for future advancements. By releasing this survey research, we hope to further equip the medical community with knowledge and insights that help fortify data security in an ever-evolving healthcare landscape.

1.2. LITERATURE SURVEY

[1] This study examines several symmetric key cryptography-related topics, emphasizing the role that information security plays in the development of new technologies. The study explores the topic of secure data independence and the role of cryptography, particularly symmetric key cryptography, in data authentication at the execution level. It focuses on encryption and decryption, which are the core processes of safe data transmission. The Advanced Encryption Standard is one of the symmetric key encryption algorithms that the authors review and compare. The study covers research on symmetric cryptography, including the usage of cryptographic microprocessors in virtual cards, self-testing cryptographic devices, and VLSI implementations like VINCI. It also examines public key certification and revocation techniques, oblivious transmission, and security protocols based on quantum wave functions. The paper looks at the properties, advantages, disadvantages, and applications of several cryptographic systems. Secure multiparty computations are ensured via oblivious transfer, while autonomous data transmission is made possible by a chip/card-based authentication system.

Procedures for public key certification and revocation deal with the validity of public keys. They also discuss protocols for mobile ad hoc network security, including the role of mobility in peer-to-peer security and self-organized key management systems.

[2] This research paper focuses on the development of an application that helps users find nearby places by utilizing the Google Places API and the Google Maps API. The article underlines the importance of their application, "Find Near Me," as a navigation aid that assists users in new places by rapidly recognizing their location and delivering information about local services. It describes how to use the Google Maps Android API. Maps and their functionality can be customized using this API. Obtaining an API key is a necessary step in integrating Google Places API and Google Maps API into the application. The manifest file connects the API key to the app.

Within the application, a fragment is used to display the Google Map. The paper describes the process of obtaining the user's current position by utilizing a callback system. Requesting location updates from the LocationManager class and establishing a LocationListener interface are both required. The comprehensive processes of leveraging the Google Places API to retrieve information regarding the user's current location are involved. HTTP GET requests include arguments for latitude, longitude, and location type. When a request is successful, Google servers return JSON-formatted data containing information on the establishments, such as names, vicinities, ratings, and locations.

[3] The research delves into the importance of cloud computing, emphasizing Amazon Web Services (AWS) as a prominent supplier. It highlights the advantages of cloud computing, such as security, reliability, and ease of use, and how it affects enterprises and day-to-day operations. The research does point out that one major drawback of AWS is that it is susceptible to denial of service assaults. This is especially problematic for businesses whose operations heavily rely on the platform. The paper highlights how cloud computing, and specifically AWS, may help Small and Medium-sized Enterprises (SMEs) take advantage of new opportunities, become more competitive, and provide effective and affordable services. Owing to its affordability and market domination, AWS is a well-liked substitute for start-ups and growing companies. Notwithstanding the benefits, worries over the security of stored data persist. Small companies think that AWS offers better security, leveling the playing field for emerging companies. Lastly, the report attests to the vital importance of cloud computing—more specifically, AWS—in helping SMEs and modernizing business processes. Amazon Web Services (AWS) offers scalability, efficiency, and cost-effectiveness, yet security issues still exist.

[4] The study focuses on creating an English discussion chatbot with speech recognition and artificial intelligence technologies, with the Dialog Flow platform serving as the AI engine. The goal is to solve issues in English language acquisition, particularly in speaking skills, and to use technology to improve the learning experience. The report outlines concerns such as students being silent, apprehensive, and unable to express themselves in English. Traditional teaching methods and materials have also been chastised for being text-book-centric and uninteresting to students. The process entails researching current applications, developing a conversation storyline, implementing a branching storyline, and developing agents, intents, and entities using Dialog Flow. The writers also perform expert assessments to evaluate the chatbot's content's success in language learning metrics.

According to the data, the chatbot efficiently supports users in developing their English conversation abilities. Finally, the study indicates the feasibility and usefulness of utilizing a chatbot for English language learning, with a particular emphasis on speaking abilities. Speech recognition and AI integration, paired with a well-crafted dialog storyline, lead to a more interactive and engaging learning experience. The research opens the door to further development and improvement in the creation of digital language learning aids.

[5] This article used a homomorphic encryption approach to protect data stored in the cloud. The employment of a homomorphic encryption method is one tactic for cloud computing data security that is employed in several publications. It guarantees the security of information transferred between the user and the cloud. Additionally, it guarantees that the data in the Another issue facing today's Healthcare Management Systems is security in the Internet of Things. The primary concern is safeguarding the patient's private information that will be shared and kept on the internet. Security precautions must be taken when IoT devices are linked to networks to guarantee their security. The information is kept on the server as a stego file, which is an audio file. Consequently, even if someone manages to get access to the server, their access will be limited to the audio files. They won't know that these audio files include patient information that is sensitive to medicine. Even when the data is being transmitted, the audio files will still be sent. The process of decryption will take place when the data is required, at which point it may be extracted.

This guarantees the security of the data. Factors like the processing overhead of the encryption and decryption procedures and the difficulty of the necessary homomorphic calculations must be taken into account when using homomorphic encryption for cloud storage security. To guarantee total security, other security measures like access control and authentication can be needed.

[6] This study prepares a chatbot using a combination of AI and NLP. In chatbot implementation, the combination of Artificial Intelligence (AI) and Natural Language Processing (NLP) is critical. AI refers to a computer system's ability to execute tasks that normally require human intellect, such as interpreting natural language. NLP, on the other hand, refers to a computer system's ability to perceive, interpret, and generate human language. Chatbots are computer programs that use natural language discussions to connect with humans. They use AI and NLP to comprehend the user's intent and respond appropriately. Chatbots can handle complex discussions and provide personalized advice to users thanks to the combination of AI and NLP. A chatbot that answers common patient questions uses natural language processing (NLP) techniques to recognize and interpret the patient's questions.

The chatbot analyzes the patient's input and extracts pertinent information using NLP techniques. The NLP algorithms process the input to determine the question's intent and context. The appropriate data is retrieved by the chatbot from the knowledge base or database. The chatbot employs NLP algorithms and data retrieval techniques to understand and respond to the patient's general questions. Chatbots are getting more intelligent and sophisticated as AI and machine learning advances, and they can give individualized healthcare solutions to patients.

[7] To address the issue with existing healthcare systems, this paper integrates collaborative and decentralized artificial intelligence to create a collaborative virtual healthcare system. With the cooperation of the patients, a decentralized data storage module stores the transaction ID of each patient record in the cloud. Differential privacy has been employed in the data privacy module to safeguard the stored data. It creates national medical survey reports and trains several kinds of diagnostic machine-learning models using a collaborative AI module. One well-known statistic that is often used to evaluate a show's execution based on predicted course labels is its accuracy. This involves sending all of the securely stored medical data to the collaborative AI module while removing patient-identifying information.

Algorithms and methods like machine learning and deep learning are used by these AI systems. AI systems are supplied with data using statistical methods and machine learning algorithms. In this case, the suggested AI model is assessed using five distinct methods. We obtain an accuracy of 69% for SVM, 73% for KNN, 82% for the decision tree, 80% for the random forest, and 72% for logistic regression prior to adding scale to the dataset. Upon scaling the data set, we obtain a 69% accuracy rate. We obtain an accuracy of 69% for SVM, 74% for KNN, 89% for decision trees, 88% for random forests, and 70% for

logistic regression after scaling the data set. The suggested solution increases the effectiveness of data exchange in the healthcare sector and addresses the drawbacks of the conventional centralized healthcare system.

3. DATA & SURVEY RESULTS

We performed a comprehensive survey of healthcare professionals, primarily doctors, to acquire useful information into the integration of e-health services within the medical community. Our study sought to elicit clinicians' viewpoints on the efficacy and implications of e-health services in comparison to traditional healthcare practices. We gathered opinions on a variety of topics, including digitalization in the healthcare industry, online medical treatment, problems encountered, and general satisfaction with electronic health services, using a properly crafted questionnaire. Following are the set of questions taken as a survey:-

Do you feel there is a need for digitization in the health and care sector?

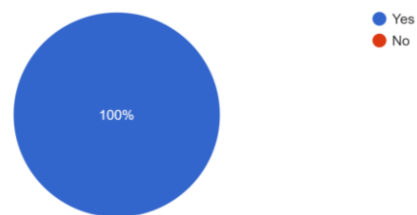


Fig.1 Need for digitalization

The above chart shows the need for digitalization in the health and care sector, with 100% of the responses indicating yes.

Is there any need for a system that will give patients data in a single instance?

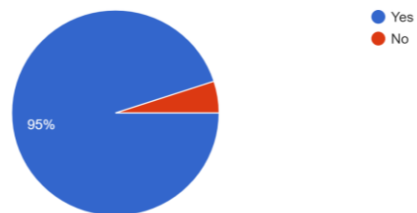


Fig.2 Need for proposed system

Fig.2 shows that 95% of the respondents believe there is a need for a system that provides patients' data at a single instance.

Which method would you prefer for treatment?

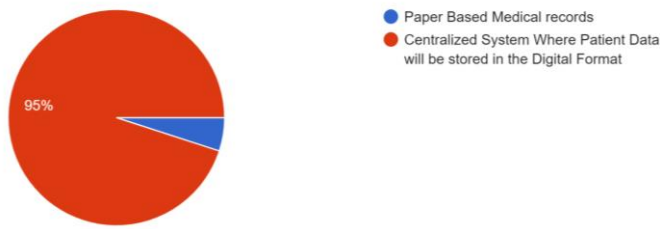


Fig.3 Preferred treatment

Fig.3 shows that 95% of the respondents prefer a centralized system where patient data will be stored in digital format for treatment over paper-based medical records.

During an emergency, what are the chances of getting organs or blood on time?

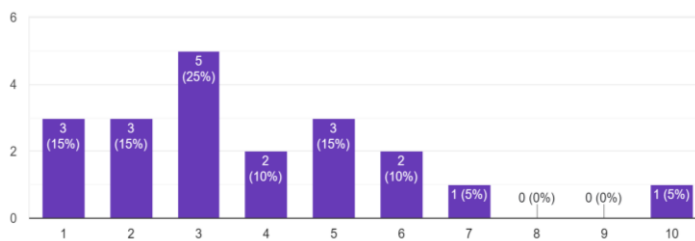


Fig.4 Chances of getting organ/blood on time

The above bar graph shows "Chances of Getting Organ or Blood on Time". The graph depicts the percentage of people who believe they will be able to get organs or blood in an emergency, with 10% representing a high likelihood, 35% suggesting a moderate possibility, and 55% indicating a poor chance.

4. CONCLUSION

Our study paper investigated the relationship between technology and healthcare, highlighting its transformational potential. We are witnessing the promise of more efficient care delivery and improved patient outcomes as technology such as smart cards, fingerprint verification, and centralized cloud systems merge with healthcare. However, in this digital healthcare context, data security is critical. To protect patient information, strong encryption and ethical data procedures are required. Ethical concerns are paramount, and we must ensure ethical AI use and transparent data governance. Recent global health crises highlight the necessity of international collaboration and equitable access to healthcare resources. Finally, as we negotiate this digital healthcare frontier, let us pledge to provide safe, patient-centered, and morally sound treatment. By doing so, we pave the way for a future in which healthcare serves as a beacon of hope and comprehensive well-being for all.

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