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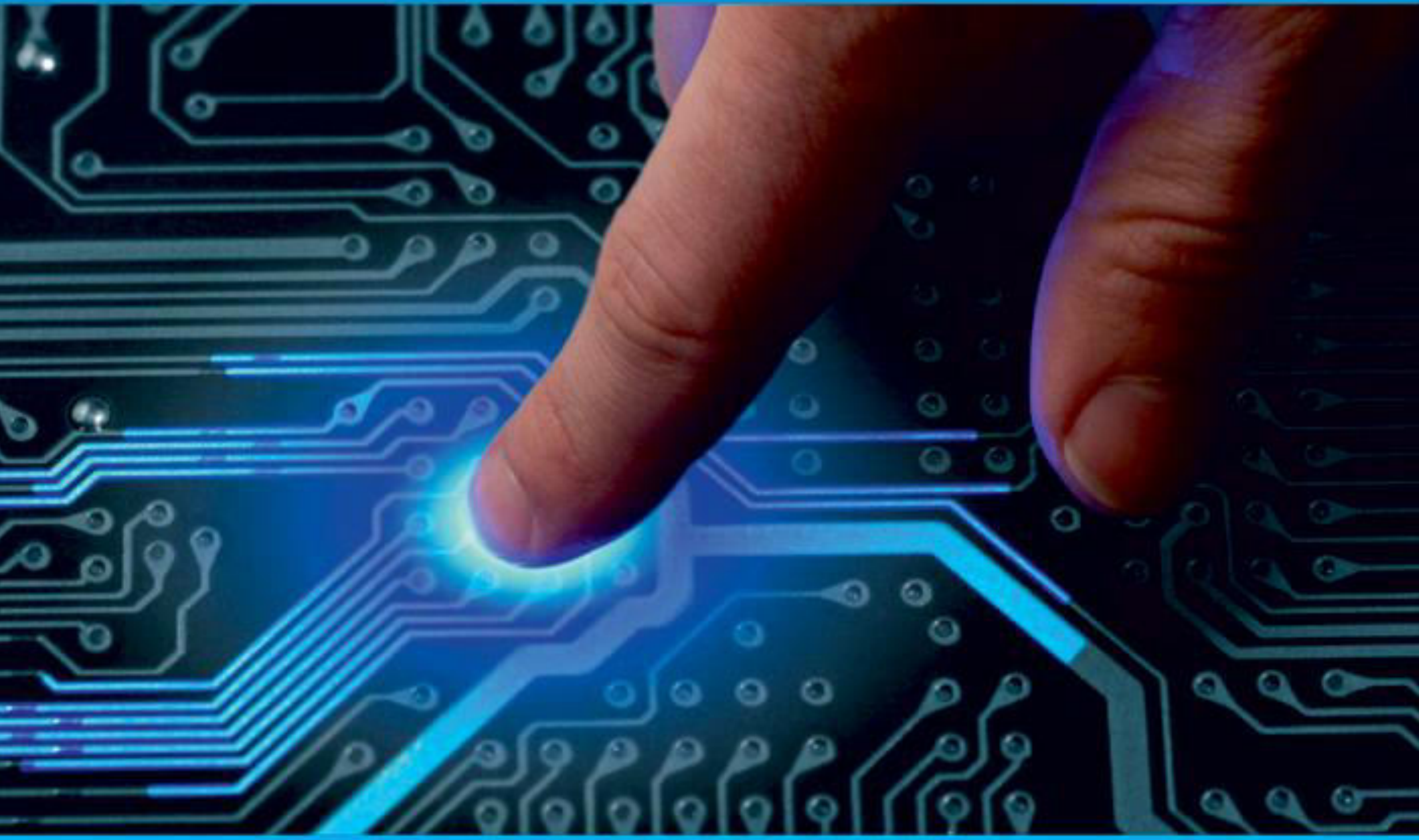

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Secure Sharing of Health Record Using Biometric Authenticity

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ABSTRACT: Personal Health Records (PHRs) is used to increase the interoperability between healthcare organizations and patient health information while preserving privacy and confidentiality of patient information. PHR is structured information that may include text, image(s) or both of them; its aims to have the features of decentralization, security, openness, and traceability. This systematic review aims to examine and identify the forms of implemented Personal health records with the available protection and privacy techniques. PHR could be enhanced by applying the processes of authentication, authorization, and access control in security, in addition to applying privacy for both information and image included in PHR. In the similar lines, some of the hospitals are exploring the use of fingerprint scanners for patient identification and accessing their personal health record. The system is designed for providing privacy and secrecy of sharing the PHR's through fingerprint authentication.

KEYWORDS: Health Care, privacy, security, PHR, authentication, fingerprint Scanner.

I. INTRODUCTION

In the Healthcare industry, when it comes to Patient Safety and Security, the most debated and talked about subjects are Patient Identification and Patient Data Integrity. Fingerprint Recognition Technology has become part of our daily lives. Few of its most common uses are, timekeeping systems for payroll purpose and Smart-phones with the ability to identify users based on their finger prints. In the similar lines, some of the hospitals are exploring the use of fingerprint scanners for patient identification and accessing their personal health record. Cloud computing has emerged as an important computing paradigm to offer pervasive and on demand availability of various resources in the form of hardware, software, infrastructure, and storage. The cloud computing also integrates various important entities of healthcare domains, such as patients, hospital staff including the doctors, nursing staff, pharmacies, and clinical laboratory personnel, insurance providers, and the service providers. Numerous methods have been employed to ensure the privacy of the PHR stored on the cloud servers. The privacy preserving approaches make sure confidentiality, integrity, authenticity, accountability, and audit trial. Confidentiality ensures that the health information is entirely concealed to the unsanctioned parties, whereas integrity deals with maintaining the originality of the data, whether in transit or in cloud storage. Authenticity guarantees that the health-data is accessed by authorized entities only, whereas accountability refers to the fact that the data access policies must comply with the agreed upon procedures. We present a methodology called Secure Sharing of PHRs in the Cloud to administer the PHR access control mechanism managed by patients themselves. The methodology preserves the confidentiality of the PHRs by restricting the unauthorized users

Paper is organized as follows. Section II describes automatic text detection using morphological operations, connected component analysis and set of selection or rejection criteria. The flow diagram represents the step of the algorithm. After detection of text, how text region is filled using an Inpainting technique that is given in Section III. Section IV presents experimental results showing results of images tested. Finally, Section V presents conclusion.

II. RELATED WORK

PieterVan Gorp Marco Comuzzi,"Lifelong Personal Health Data and Application Software via Virtual Machines in the Cloud",IEEE Journal of Biomedical and Health Informatics (Volume: 18 , Issue: 1 , Jan. 2014).In this paper, authors presented MyPHRMachines, a novel PHRsystem. Leveraging virtualization techniques, MyPHRMachines allows patients to build lifelong PHRs. The records can be shared by the patient with any stakeholder interested in those. MyPHRMachines allows also the controlled sharing of application software that is required to view and/or analyze health records. Patients seeking care by caregivers in different geographical areas will be able to reproduce their original health records, no matter the limitations imposed by the heterogeneity of local health care information systems. Michael S. Dohan , Mohamed Abouzahra and Joseph Tan,"Mobile Personal Health Records: Research Agenda for Applications in Global Health",[2]IEEE,47th Hawaii International Conference on System Science,2014.This paper discusses six research areas in which mPHRs are applied to global health issues. These research areas are: applications that are disease specific and otherwise; ensuring local relevance of initiatives; using mPHRs for the collection of data for epidemic intelligence; innovative devices and infrastructures; integration with other technologies; and issues with global health initiatives that can apply these technologies. Despite the challenges with mPHRs, they remain a viable option for addressing the various global health concerns of today. M. H. Au, T. H. Yuen, J. K. Liu, W. Susilo, X. Huang, Y. Xiang, and Z. L.Jiang,"A general framework for secure sharing of personal health records in cloud system",[3]Journal of Computer and System Sciences, 2017. In this paper, authors proposed a general framework of secure sharing of PHRs.The system enables patients to securely store and share their PHR in the cloud server to their carers or family members. Treating doctors can further refer the patient's medical record to specialists for research purposes, while the patient's personal information remain private. In addition, cross domains operations can be supported. They provided a concrete instantiation of system. They also gave a simulation result for it. Mazhar Ali, Member, Saif U. R. Malik, Samee U. Khan,"DaSCE: Data Security for Cloud Environment with Semi-Trusted Third Party "[4],IEEE,2015 The authors (a) implement a working prototype of DaSCE and evaluate its performance based on the time consumed during various operations, (b) formally model and analyze the working of DaSCE using High Level Petri nets (HLPN), and (c) verify the working of DaSCE using Satisfiability Modulo Theories Library (SMT-Lib) and Z3 solver. The results reveal that DaSCE can be effectively used for security of outsourced data by employing key management, access control, and file assured deletion. Assad Abbas, Samee U. Khan,,"A Review on the State-of-the-Art Privacy Preserving Approaches in the e-Health Clouds",[5]IEEE 2014. This paper aimed to encompass the state-of-the-art privacy preserving approaches employed in the e-Health clouds. Moreover, the privacy preserving approaches are classified into cryptographic and non-cryptographic approaches and taxonomy of the approaches is also presented. Furthermore, the strengths and weaknesses of the presented approaches are reported and some open issues are highlighted.

III. METHODOLOGY

A) Block Diagram:

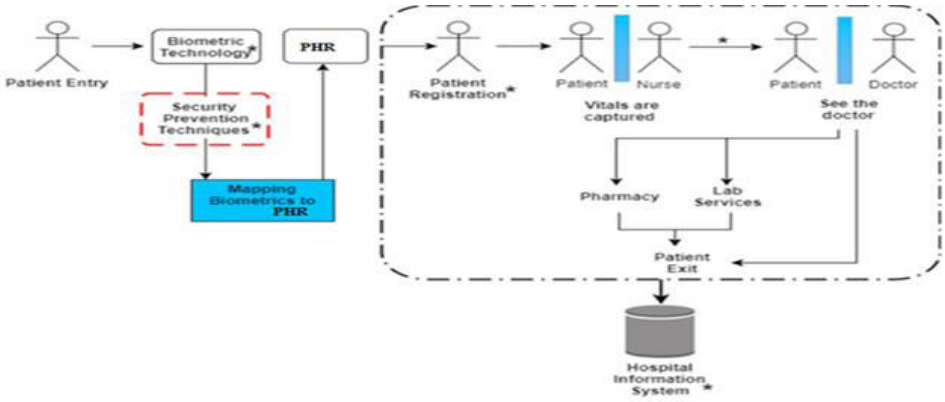


Fig 1: Bock Diagram.

B) Block Diagram Description:

1. When a patient registers at the hospital, he is required to scan his finger on a fingerprint scanner and provide some associated personal information.

2. This enrolment process helps the patient on his follow ups, as on each successive visit his fingerprint scan will be compared with the pre-scanned image in the hospital's database.

3. Thus, eliminating the need to check the patient's credential on paper and provide a quick access to his/her personal and medical information. The quick and accurate access to the medical history also reduces the chances of wrong diagnosis and medication.

4. Further, the fingerprint door lock would restrict the entry of unregistered members and enhance the security measure.

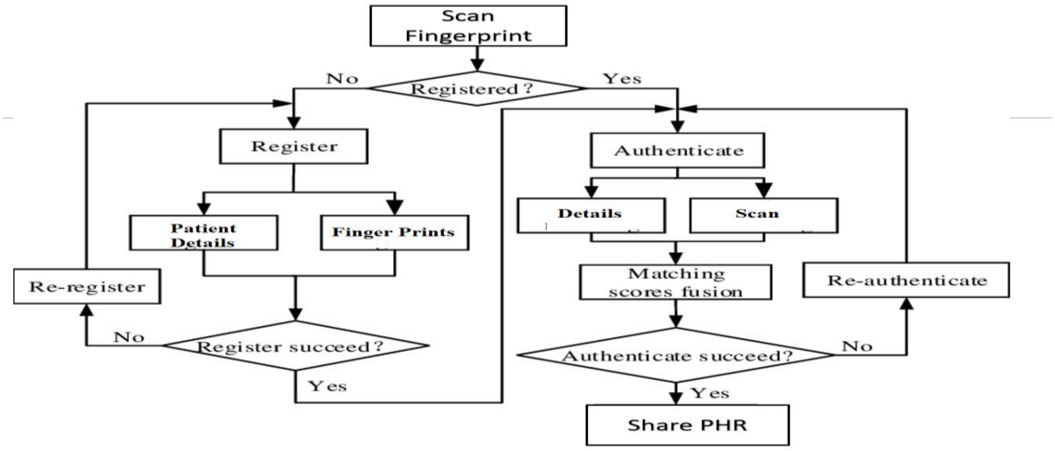
5. Another important implementation of fingerprint scanner in hospitals is during the emergency admissions.

6. Even if a patient arrives in an unconscious state, a simple finger scan can help identify the patient and provide access to the patient's medical history.

7. After a finger scan, the fingerprint image is sent to the main system for verification.

8. If it is authorized, the requested information is delivered to the patient.

C) Flowchart



D) Algorithm:

AES algorithm helps to encrypt the PH. The algorithm uses 10 or 14 rounds for encryption with given key depending on 128 bytes or 256 bytes respectively. Each Round consist of 4 steps which includes Sub Byte where one each byte is substituted

with another byte. The next is row shifting were whole row is shifted. Next is mix column where columns are mixed and the last one is adding round key.

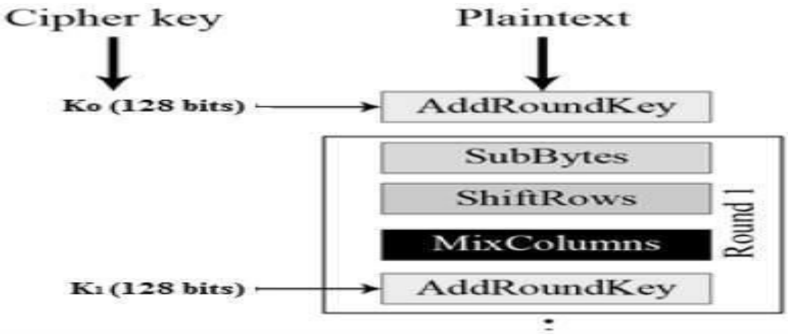


Fig 2: AES

IV. CONCLUSION

System will be developed to provide secure sharing of personal heath record across different hospitals under bio-metric authentication. Fingerprint is used for bio-metric as it is unique and easy to access even in emergency. A blockchain system can be considered as a virtually incorruptible cryptographic database where critical medical information could be recorded. The system is maintained by a network of computers, that is accessible to anyone running the software. Blockchain operates as a pseudo-anonymous system that has still privacy issue since all transactions are exposed to the public, even though it is tamper-proof in the sense of data-integrity. The access control of heterogeneous patients' healthcare records across multiple health institutions and devices needed to be carefully designed. Blockchain itself is not designed as the large-scale storage system. In the context healthcare, a decentralized storage solution would greatly complement the weakness of blockchain in the perspective.

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