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Secure Blockchain Technology for Healthcare by using Patient-Driven Interoperability

Priyanka Shendage[1], Lochan Bhoge[2], Akash Bhogil[3] , Dipika Ilag[4], Prof. Anjali Almale[5]

UG Student, Dept. of Computer Engineering, BSIOTR, Pune University, Pune, India[1]

UG Student, Dept. of Computer Engineering, BSIOTR, Pune University, Pune, India[2]

UG Student, Dept. of Computer Engineering, BSIOTR, Pune University, Pune, India[3]

UG Student, Dept. of Computer Engineering, BSIOTR, Pune University, Pune, India[4]

Assistant Professor, Dept. of Computer Engineering, BSIOTR, Pune University, Pune, India[5]

ABSTRACT: The pandemic situation of the world many medical patients are moved from hospital to hospital. As they are moving from one hospital to another, it is necessary to have all patient history and then operates the patient. This requires more time, so patient interoperability is good option to know patients history to decide further operates. Traditionally patient data interoperability is data exchange between hospitals to hospitals. The data exchange is patient-driven or patient-mediated [1]. The new challenges in the patient data exchange between various hospitals are like security, privacy, technology, incentives and governance. This paper mainly focused on security and technology used for transmission of the patient data. The most important aspect of the data exchange is security, to overcome on this challenge by using encrypted data transmission by using RSA algorithm. The second aspect of the data exchange is technology used: Block chain using patient driven interoperability.

KEYWORDS: Blockchain, Patient-driven interoperability, security, RSA algorithm, data exchange.

I. INTRODUCTION

Nowadays, interoperability in healthcare are being used for data exchange between different businesses. As patients admitted in hospitals, the patients data is centralised to distribute among the hospitals, medical systems healthcare etc. To get details information about the patient and proceed further to operates the patient. This methodology will help to understand the patient and patient's background to operate the patient with superior therapy. This information exchange among these system is held with patient's prior permission. This brings with it new challenges and requirements around security and privacy, technology, incentives, and governance that must be addressed for this type of data sharing to succeed at scale [1]. In this paper mainly focus on security and technology being used to transmission of the data between all the systems.

Medical industries mostly operates on patients' data in order to diagnose diseases and provide health care solutions. A technical problem is how will you implement the system where we can get all the details of patient. Physicians, medical researchers, and insurance companies can access and process data more conveniently with the effective use of electronic health record systems. However, the storage and transferring of patients' data among clinics, research institutions, and companies for medical, academic or commercial purposes remain challenged.

Issues regarding the storage and transferring of electronic health data had been discussed in multiple cases [4]. The blockchain technology is among the most recent trend in any developments and it is also revolutionary innovations of the Information Technology industry in healthcare. Also it is very important in digital world of information as it is beneficiary for physician and patient as well.

This paper is orgies as section I will introduce the paper title, the section II helps to understand the recent innovation in this technology and its cons and pros. The section III describes the methodology of this research and finally section IV and section V describes the final observation and its conclusion.

II. RELATED WORK

William J. Gordon et al [1], mainly focus upon patient driven interoperability of the data exchange between businesses. This paper describes the technology blockchain having different challenges like security, technology,

governance etc. This paper describes two types of healthcare interoperability: institution-driven and patient-driven. Institution-driven interoperability, which has historically been the main focus of interoperability efforts, relies on different healthcare entities exchanging data based on business or regulatory incentivessize.

Mohammad Tabrez Quasim et al [2], this paper describes about the concept of the blockchain and it's benefits. Also written for drawbacks or challenges to implement the blockchain in the healthcare industries. Paper analysed many research papers to analysis this block chain implementation in the health care industries.

Mohammad Zarour et al [3], this paper focused on various technology may use to implement the blockchain in the healthcare industries. Also describes the trustworthy implementation of the blockchain to exchange the data between the healthcare systems. Evolutionary study of implementation of trustworthy system in blockchain using Fuzzy-anp-TOPSIS method.

Yiheng Liang et al [4], this paper describes about identification of individuals of electronics health records. This papers mainly focus on methodology used for sharing and ease of the data access.

Jinglin Qiu et al [5], this paper mainly focus on the secure and smart implementation of the blockchain in the healthcare industries or city hospitals. Also states about advantages of decentralised data to securely data exchange the patient data among health care industries.

Many research papers are covers the implementation of the blockchain in the healthcare industries. The main challenge to implementation of the blockchain are security and technology to blockchain easy to access and securely transmission of the data with patient driven

III. METHODOLOGY

As earlier stated the security and technology are main aspects of this system, we considering only this two aspects while designing this methodology. Fig 2 details view of the proposed methodology concept.
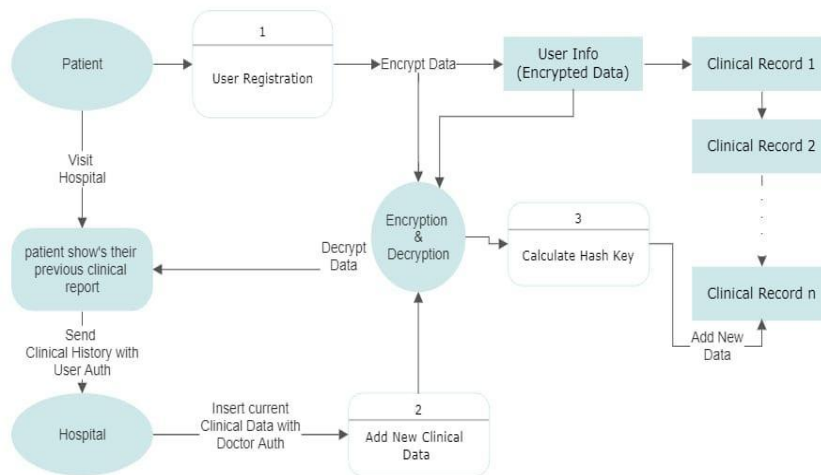
IV. PROPOSED WORK

The healthcare system included hospitals, medical industries and mainly patients. The data exchange among these healthcare system is very beneficial to overcome on the disease. The physician can operates the patients based upon the patient's historical data present on the system and again physician fill current data in the system. This will help for next time with different system. The detailed understanding this system, we need to understand some terms are as bellows:

A. Interoprability

The ability of different information technology system and software applications to communicate, exchange data, and use the information that has been exchanged this is known as interoperability [1]. This data exchange will happen on agreement of the patient is known are patient driven interoperability.

B. Blockchain

The blockchain is a decentralised patient data sf all transactions or electronic activities that have been conducted between healthcare systems or exchanged between the involved parties. A blockchain includes a definite and provable documentation of each transaction that has been made [3].

C. Proposed system

Generally, the health care can use data stored in decentralised to fulfilment of the system requirement and complete the patients treatment. Fig 1 gives you details explanation the proposed system
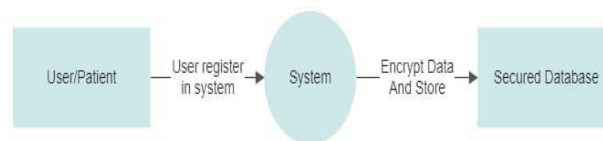

Figure 1 Proposed system

The patient will fill the all the personal details in the system. The all the patient's data will be stored in secured database. This data will be shared with requested healthcare system with prior permission of the patient. The data transmission over the network is encrypted with security algorithm to provide data security of the patient's information. In this system healthcare system also fill current state of the patient and approved by the patient again to double verification by patient or double agreement of the patient.

V. CONCLUSION

Encryption based secure transmission in blockchain used in the data exchange between healthcare industries is used to provide high security and privacy. Also provides fast and ease to access the data among the system for further treatment of the Patient.

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📱 9940 572 462   🟢 6381 907 438   ✉ ijircce@gmail.com