# Review On Secure Medical Tags For Reducing Medical Error And Drug Interaction With EHR System

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***Abstract-*** *As a fact due to increase in medical errors ,the patient can retain all records and can manage the privacy concerns of which portion of the records are to be accessible. The records can occasionally be synced to the central server for backup or storing past history. EHR on Health cards retained by people can also help in providing the right care in an emergency situation when the patient is unconscious. This paper helps determine location of the patient in case of emergency through location service on recent mobile devices. The business logic of using Healthcare on mobile devices can be beneficial to a medical professional since it can securely identify patients using simple portable mobile devices and also get a concise health report. This paper also explains the proposed work to develop secure medical tags and advancement of medical field.*

***Keywords***- Temp Sensor, BP Sensor, Pulse Sensor, NFC Tag, Embedded C

## I. INTRODUCTION

Mobile phones now-a-days are largely used in almost every part of our life as they are easy to carry and are easily accessible. They can be used for inefficient healthcare management. The architecture for improving health care system with the help of Android based mobile devices with NFC. Simple touch of NFC enabled mobile devices can benefit both the patient as well as the doctors by providing a robust and secure health flow. It can also provide portability of devices and usability for health management in emergency situation, overpopulated hospitals and remote locations.

Healthcare is a requirement for both developed countries, where the cost of healthcare is high and security and privacy are critical issues and developing countries like India, where there is a mass population to handle in hospitals and robust healthcare procedures are required [7],[9],[12]. An efficient, reliable, robust and secure health flow is important to manage patients, their health records using (EHR) for smooth and for the right care to reach to the patient at the right time. Identification of patients for secure medical procedures is very essential for a secure workflow. Secure identifiers on the medicines can help healthcare professional to administer correct medication to a patient to reduce errors[4],[13],[29]. Along with this issue the Patient Health Record management is important both for patients as well as hospital management.

Common causes of these errors include irregular medicine in-takes due to the patient's busy or erratic lifestyles, complicated in-take schedules due to many medicines and doses taken by patient, Adverse drug reactions caused by un-reconciled prescriptions obtained from different sources, lack of knowledge about proper use of medicines, Lack of monitoring mechanisms to keep track of patient's medicine in-take[9],[13],[18].

The improvements in data quality, patient referral and emergency response benefit of NFC Card Allows People to Enjoy the Pleasant Payment with NFC-enable for, Hospitality services[15],[22],[26]. The purpose entitled as NFC secure mobile based healthcare system is to computerize the front office management of hospital to develop software which is user friendly, simple, fast, and cost effective[11],[23],[28]. It deals with the collection data of patient's information, diagnosis details. The main function of the system is to register and store patient details and doctor details and retrieve these details as and when required and also to manipulate these details meaningfully [8],[15],[20]. System input contains patient details, diagnosis details, while system output is to provide proper treatment .The privacy of patients and their medical records which reveal highly confidential personal information such as disease history and undergoing treatment [5],[10],[24]. There are good reasons for keeping the records private and limiting the access to only minimum necessary information. One of which is the exponential increase in the use of computers and automated information systems for health record. It is now common to see physicians use computers connected to a network to store and retrieve patients' electronic health records .EHR systems are used in place of paper systems to increase physician efficiency, reduce costs and medical errors, improve data availability and sharing. An exemplary successful implementation of EHR system in the United States is the Veterans Administration healthcare system[3][27],[30]. It is one of the largest

integrated healthcare information systems worldwide and has been using single EHR system for years. Despite all the promising factors, Personal Health Record is defined by the American Health Information Management Association (AHIMA)[2],[19],[21] .

## II. LITERATURE SURVEY

VedatCoskun, BusraOzdenizci and Kareem[1], have proposed the techonology on A Survey on Near Field Communication (NFC) Technology. Near Field Communication (NFC) as a promising short range wireless communication technology facilitates mobile phone usage of billions of people throughtout the world .Eventually NFC technology integrates all such services into one single mobile phone. NFC technology has emerged lately, and consequently not much academic source is available yet. This paper presents the concept of NFC technology in a holistic approach with different perspectives, including communication essentials with standards, ecosystem and business issues, applications, and security issues. This comprehensive survey will be a valuable guide for researchers and academicians as well as for business world interested in NFC technology.

M. Roland and .I. Langer[2], have proposed a work on "Digital Signature Records for the NFC data exchange fondant. The NFC data exchange format (NDEF) is a standardized format for storing formatted data on NFC (Near Field Communication) tags and for transporting data across a peer-to-peer NFC link. Through NDEF and its various record types, events can be triggered on an NFC device by simply touching an NFC-enabled object. Therefore, the NFC Forum - which is responsible for the specification of data formats, protocols and applications in regard to the NFC technology - is working on adding digital signatures to their NDEF format. While their signature record type is still in draft status and has not been released to the public, this paper discusses the various aspects of digitally signing NDEF records. First, we introduce the readers to the NFC Data Exchange Format, its use cases and its potential security threats. After that, they describe the potential of digital signatures for NDEF messages. Finally, they discuss the advantages and disadvantages of various ways to digitally sign an NDEF message

Antonio J. Miguel A. Zamora [3], have researched on Smart Card Technology in U.S. Healthcare. The project aims providing corporate information and hospital statistics can be viewed in a web on the Internet. Information is to be integrated into the existing web page of the company but the access to it would be restricted to the Chairman and Directors or anybody who has been authorized or register users. According patients needs the hospital management introduce Smart Card Schemes like one year smart card, two year smart card and lifelong Smart Cards First Patient chooses the smart card according to the patient requirement, depending on Smart card patient get the discount on medical bill. This information is shared to all the branches of the Hospital group so that they can maintain global information of the group. If the subscriber of the Smart Card is suffering with ill they will be given initial treatment without any consultancy charges.

Sasikanth Avancha, Amit Baxi, and David Kotz [4], they have worked on the mobile technology for personal healthcare information technology can improve the quality efficiency, and cost of healthcare. In this survey, we examine the privacy requirements of mobile computing technologies that have the potential to transform healthcare. Such mHealth technology enables physicians to remotely monitor patients' health and enables individuals to manage their own health. Despite these advantages, privacy is essential for any personal monitoring technology. Through an extensive survey of the literature, they develop a conceptual privacy framework for Health Itemize the privacy properties needed in mHealth systems.

Lahtela, A., Hassinen, M.and .Iylha, V[5], have worked on this technology of dRFID and NFC in healthcare safety of hospitals medication care. Use of information technology has become commonplace in health care .In an ideal world a patient always gets first class treatment and everything goes smoothly and as planned. Applications of information technology are created to help the hospital staff achieve this. However, hospital staff is often working under a heavy workload and minimal workforce. This may contribute to human error, for example, in medication that may have adverse effects on patient psilas treatment. In their paper they demonstrate how to improve patient psilas safety in healthcare and especially in medication care by using RFID (Radio Frequency Identification) and NFC (Near Field Communication) technologies. They concentrate on the technologies itself and how they could be used in different parts of healthcare.

Stefan Krone, Bjoern Almeroth, Falko Guderian and Gerhard Fettweis[6], have researched on a technology towards a wireless medical smart Card the "International Health Card" is a portable USB based smart health card to carry the entire medical records of a person. It can act as a medical passport while the person travels from one place to other. Full medical treatment history, and diagnosis details. An application with graphical user interface has been developed to store and

manage the entire medical records of the patient on the card and in a server to avoid loss of data due to the damage of the card. Adequate privacy and security of the data is ensured by providing patient credentials and credentials are encrypted in the SQL database to provide an adequate protection.

Bankar Kartik, Joshi Bhargav, Mungal Mahajan, Subhash Rathod[7],have researched near field communication based android API health care system . The proposed system is very easy to operate with NFC card. Speed and accuracy are the main advantages of proposed system. There is no redundancy of data. The data are stored in the computer's secondary memories like hard disk. It can be easily receive and used at any time. They have proposed system will easily handle all the data and the work done by the existing systems. Their proposed systems eliminate the drawbacks of the existing system to a great extent and it provides tight security to data. The Limitations of the existing system is that it is very difficult to retrieve data from case files. It is difficult to handle the whole system manually and it is less accurate and to keep the data in case files for future reference because it may get destroyed. Moreover it is very difficult to retrieve data. Redundancy of data may occur and this may lead to the inconsistency .

Gail M. Keenan PhD, RN Elizabeth Yakel PhD Yingwei Yao PhD Dianhui Xu PhD Laura Szalacha EdD Dana Tschannen PhD, RN Yvonne Ford PhD, RN Yu-Chung Chen PhD Andrew Johnson PhD Karen Dunn Lopez PhD, RN Diana J. Wilkie PhD [8],they have worked on Use of a Web- based POC EHR System. They have studied first to demonstrate real- time use of a web- based electronic POC EHR system, hands, in a multi- institutional setting on multiple nursing care units over a substantial time period. They have provided clear and compelling evidence that a standardized hand system can be successfully implemented and used consistently across different organizations and different units. Their RN outcomes included POC training rate, POC submission rate, satisfaction with terminologies, and perceptions of usefulness. The data outcomes included validity, reliability, and availability of standardized POC data. Only RNs and medical- surgical units participated

## III. RESEARCH GAPS

From the survey of so many papers we found many limitations in the medical field. The limitations are as follows:

- The researchers and acadamicians who are in business world are interested in NFC technology.
- Security threats are more.
- Its been limited for only few types of sensors like temperature or pulse sensors.
- It is very difficult to retrieve data from case files.

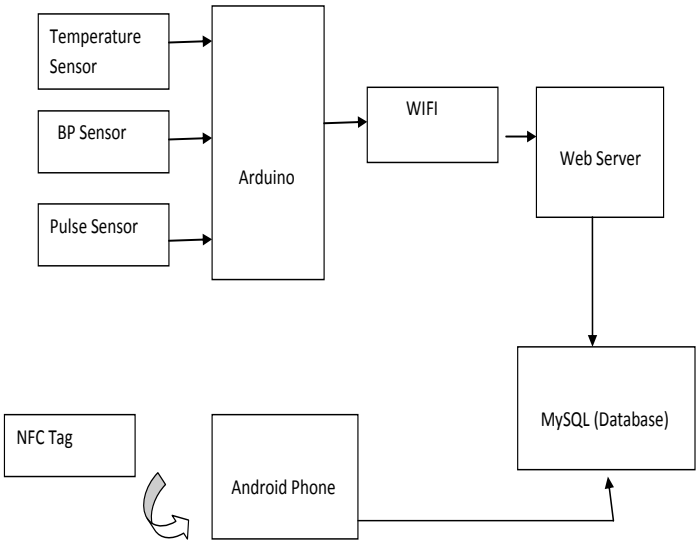
## IV. PROPOSED SYSTEM

From the literature survey we have found that there are many errors and limitations in the medical field to overcome these problems we are proposing an architecture for NFC based secure health care as illustrated, secure medical identifiers as in flow. Health card retaining EHR using Android mobile devices as in flow. A secure healthcare service like Health Secure on a hybrid cloud to which all hospitals can subscribe. The Health Secure hybrid cloud provides service for maintaining Cryptographic servers for secure framework and Storage server to provide backup as well as space for extended EHR. Android application is the patient mobile device with the Health card and Mobile Doc is the doctor mobile device. For NFC P2P based and card emulation based Health cards, we use patient and doctor set of public and private keys. Asymmetrical shared key is used for encrypting data. Hospital administration has an application for securely reading/writing with a mobile device, Mobile ADMIN to manage smartcard based tags and patient Health cards Mobile ADMIN. They can register with the proposed Health Secure cloud service on a hybrid cloud, which can issue security keys for our architecture. The mobiles use simple interfaces of NFC and Bluetooth for credential storage and communication. With the help of android application and with patient related data stored in database using in local server it helps to understand the patients better.

## TECHNOLOGY

NFC is an upcoming wireless technology which provides simple interfaces for device to device communication as well as access to NFC, RFID and smartcard tags. NFC enabled mobile device can operate in three modes: Reader mode in which device can read and write to NFC based passive tags. Peer to Peer (P2P) mode in which NFC devices can interact and exchange information with each other. Card emulation mode in which NFC device canoperate as a contactless card. NFC tags are of different types and use NDEF (NFC Data Exchange Format) for storing and sending data. NFC tags must have a secure read and write access for Critical applications such as those related to healthcare. NDEF provides no protection against data manipulation, overwrite protections and digital signature records cannot avoid malicious modification of tags. NFC enabled mobile devices have a secure element (SE)which is a secure microprocessor (a smart card chip) that includes a cryptographic processor to facilitate transaction with authentication and security, and provides secure memory for storing applications and credentials. It comes in different form factors such as

embedded, micro SD card or a UICC (SIM) card. Due to simplicity of accessibility .




Proposed Block Diagram For Her System Using Nfc Tags

## V. CONCLUSION

In this work, we have surveyed NFC enabled Android cell phones for enhancing Healthcare process for secure medical ID and patient Health card on an outside tag, another way health cards can be endorsed by a health Cards Secure organization on a half and half cloud, to offer administration to redesigned security and broadened stockpiling for wellbeing records. The applications are easy to use with an essential touch of NFC for secure healthcare. The plan of action will profit the patients and in addition therapeutic expert since they can utilize the ordinarily held cell phones advantageously. The proposing configuration can be used for applications other than social protection with secure identifiers and secure exchange of extensive information between gadgets. A point by point design, execution, testing and field association of the security structure is advanced and will be tended to in our future work.

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