

SURVEY PAPER ON NFC BASED DATA RETRIEVAL

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Abstract- An overview of recent advances in the field of battery-less near-field communication (NFC) sensors is provided, along with a brief comparison of other short-range radio-frequency identification (RFID) technologies. After reviewing power transfer using NFC, recommendations are made for the practical design of NFC-based tags and NFC readers. A list of commercial NFC integrated circuits with energy-harvesting capabilities is also provided. Finally, a survey of the state of the art in NFC-based sensors is presented, which demonstrates that a wide range of sensors (both chemical and physical) can be used with this technology. Particular interest arose in wearable sensors and cold-chain traceability applications. The availability of low-cost devices and the incorporation of NFC readers into most current mobile phones make NFC technology key to the development of green Internet of Things (IoT) applications. Keywords - Cloud, NFC Card, Data Retrieval.

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1. INTRODUCTION

We undertake a step-by-step approach in the design of Near Field Communication (NFC) products for pervasive healthcare monitoring. One of the largest IT challenges in the health and medical fields is the ability to trace large numbers of patients. As mobile handiness has become wide-ranging round the world, the use of Near Field Communication (NFC) with mobile phones is streaming as a promising solution to this challenge. The drowning worth and increasing handiness of mobile phones and NFC permits North American country to use these technologies to developing countries like Bharat so as to beat patient identification and unwellness police investigation limitations, and permit improvements in data quality, patient referral, and emergency response. We are developing a basic architecture for healthcare services using NFC to facilitate the healthcare to people anywhere, anytime using mobile devices. In this paper, we present a system using NFC-enabled mobile phones for facilitating the patients in a low-resource environment. Nowadays, using computerized systems and software programs instead of documenting the clinical trials in a paper has become common. The data collected by nurses, physicians and investigators are manually entered using a common

graphical user interface on a standard computer. Mobile devices are personal, always with the patient and are location aware. The patient can use them for self-help and to communicate with the doctors or to monitor the patient health, this makes the cell phone an appropriate device for remote healthcare than any other media. From a marketing point of view, future devices with communication capabilities should not be more expensive, more complex to use, or provide significantly shorter operation time than those available now. Hence, current state-of-the-art standard short-range wireless communication technologies, such as Bluetooth and IrDA, are sub optimal and not competitive solutions for health monitoring devices. Identification of objects for secure medical procedures is extremely essential for a secure work flow. For example, identification of medicines can help healthcare professional to administer correct medication to a patient to reduce errors. The Patient Health Record management is important both for patients as well as hospital management. There is no centralized management of health records in the developing countries like India. The patients' records that are maintained within the paper format are cumbersome and unreliable. Work remains being current for secure maintenance, patient records as a Health card on a Smartcard in developing countries like India and other nations.

Most of the hospitals issue a health card, which only tries to stores just the primary information of the patient and major part of the records are stored on a centralized medical storage server. With the recent emerging technologies in mobile devices involving secure credential storage, larger storage capability, wireless communication interfaces they can be used in the healthcare for gathering health parameters and also for healthcare. The very important aspect of health care is Privacy and security. We propose that the patient should retain only primary part of the record in EHR electronically. A health card maintained on a mobile device will retain the complete EHR together with reports and tests. An authorized medical provider can access securely the permitted portion by a simple tap of mobile device. A simple tap of NFC enabled mobile device, will not only improve the workflow of medical professionals but also prove to be beneficial in emergency and chaotic conditions like mass populated hospitals.

Simplified workflows can lead to quicker and additional economical patient-doctor interaction.

2. PROBLEM STATEMENT

Developing secured NFC based data retrieval system using Android Application & NFC API to access patient data at the time of emergency.

3. LITERATURE REVIEW

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. Open research areas and further recommended studies in terms of academic and business point of view are also explored and discussed at the end of each major subject's subsection. [1].

The main contribution of this paper is proposal of applications for i) Secure Medical Tags for reducing medical errors and ii) Secure Health card for storing Electronic Health Record (EHR) based on Secure NFC Tags, mobile device using NFC P2P Mode or Card Emulation Mode. We have also briefly mentioned a basic security framework requirement for the applications. It can also provide portability of devices and usability for health management in emergency situation, overpopulated hospitals and remote locations [2].

This product is useful for wearable sensor devices and provides a convenient way of recharging the batteries without the need for any connectors in the device. This allows devices to be hermetically sealed, besides enabling smaller form factors. The second product is an NFC based battery-less medical grade thermometer. To obtain the temperature of a single patient, a maximum of 10 seconds is sufficient to read the sensor value starting from placement of a smartphone over the product [3].

Implementing a software system that modifies the work habit of employees can often lead to disapproval of the system and potentially make their jobs worse. This is often the case when implementing new healthcare system in medical centers, where the system is intended to help medical personnel and patients, but due to bad implementation or miscommunication leads to bad healthcare system. In this paper we are using ergonomic factors in order to improve the design of the proposed NFC-based healthcare system. Using these factors, modifications can be made to the system in order to provide better user experience and better healthcare [4].

In healthcare, the incorrect identification of patients remains one of the most common problems with resultant incidents and adverse events commonplace. This paper presents the design of an intelligent system which will allow for the identification and monitoring of patients in health centers. The purpose of this system is to provide the correct information transfer, keep track of patients and allow health staff to control them. This will increase security and minimize accidents and mistakes made in health centers while also achieving better quality in healthcare [5].

4. PROPOSED SYSTEM

System presents NFC-enabled mobile phones for facilitating the patients in a low-resource environment. Nowadays, using computerized systems and software programs instead of documenting the clinical trials in a paper has become common. The data collected by nurses, physicians and investigators are manually entered using a common graphical user interface on a standard computer. Mobile devices are personal, always with the patient and are location aware. The patient can use them for self-help and to communicate with the doctors or to monitor the patient health, this makes the cell phone an appropriate device for remote healthcare than any other media. From a marketing point of view, future devices with communication capabilities should not be more expensive, more complex to use, or provide significantly shorter operation time than those available now. Hence, current state-of-the-art standard short-range wireless communication technologies, such as Bluetooth and IrDA, are sub optimal and not competitive solutions for health monitoring devices. Identification of objects for secure medical procedures is extremely essential for a secure work flow.

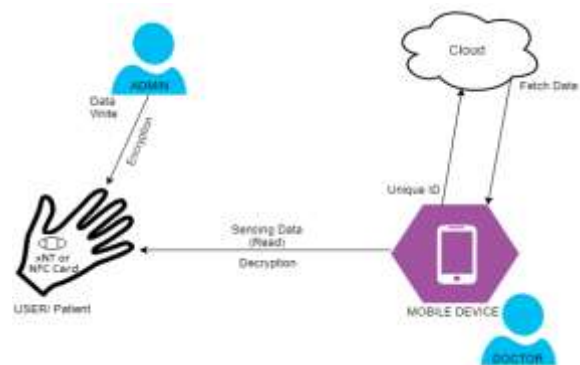


Figure 1: System Architecture

With the recent emerging technologies in mobile devices involving secure credential storage, larger storage capability, wireless communication interfaces they can be used in the healthcare for gathering health parameters and

also for healthcare. The very important aspect of health care is Privacy and security. We propose that the patient should retain only primary part of the record in EHR electronically. A health card maintained on a mobile device will retain the complete EHR together with reports and tests. An authorized medical provider can access securely the permitted portion by a simple tap of mobile device. A simple tap of NFC enabled mobile device, will not only improve the workflow of medical professionals but also prove to be beneficial in emergency and chaotic conditions like mass populated hospitals. Simplified workflows can lead to quicker and additional economical patient-doctor interaction.

Admin Module: Add the details and Aadhar no of each user, doctor and police official on the system. Provide the Id and password to all the users of the system. Validate the information available. Edit the information about users or other officials.

Doctor Module: Login to the system using Password provided by admin. Scan the NFC tag of the user so as to get the info of it. When scanned any tag only the medical info of the user is displayed to doctor. The doctor can add any new medical record of the user along with the documents.

User Module: Login to the system using Password provided by admin. Scan the NFC tag of other user so as to get the info. When scanned any tag only the contact and basic info of the user is displayed. No other records of user are disclosed. This is useful in case of accidents where immediate contact should be done to the users guardians.

5. EXPECTED RESULT

The patient mainly manages the NFC card contents by securing the data using RSA public and private key. The keys are securely stored on Amazon Cloud that manages the application in secured way. The outcome is that the card contents are not easily readable due to strong encryption and is only accessible to the authorized secure element device this further improves authenticate the right patient and the associated doctors.

6. CONCLUSION

We conclude that this project is going to save lots of lives in future. It will be used by lots of people for easy document retrieval related to health for helping doctor to take appropriate decision at critical conditions of patient. It reduces the human efforts of carrying documents or reports along with them. It also saves lots of time during the emergency of any case of any patient.

Near Field Communication may be very helpful within the epoch of technology. The NFC chip can be used in almost all fields where authentication & unique identification is necessary such as door unlocking, car unlocking etc.

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