



Using NFC Health Monitoring and Document Retrieval

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USING NFC HEALTH MONITORING AND DOCUMENT RETRIEVAL

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Abstract: We undertake a step-by-step approach in the design of two Near Field Communication (NFC) product for pervasive healthcare monitoring .One of the largest IT challenge in the health and medical fields is the ability to trace large number of patients. As mobile phone availability has become wide-ranging around the world, the use of NFC with mobile phone is streaming as a promising solution to this challenge. The dropping price and increasing availability of mobile phones and NFC allows us to apply these technologies to developing countries like India in order to overcome patient identification & disease surveillance limitations and permit improvements in data quality, patient referral and to facilitate the healthcare to people anywhere, anytime using mobile device. In this paper we present a system using NFC-enabled mobile phones for facilitating the patients in low resource environment.

Keywords: NFC, PHDC, Tag, EHR

1. INTRODUCTION

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 very essential for a secure workflow.

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 which are retained in the paper format are cumbersome and unreliable. Work is still being in progress 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 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 retained on a mobile device can retain the entire EHR including 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 will result in faster and more efficient patient-doctor interaction.

2. PROPOSED SYSTEM

Existing System: The existing system in healthcare involves manual intervention where there is note taking, updating the notes to the computer and maintaining the records under a unique id assign to every patient. This process is usually very slow and error prone due to which there is latency between data gathering information accessibility. The health monitoring sensors are installed near the mattress on patient bed. By utilizing this application on Android smart phone and selecting the NFC mode from the setting menu, all information from sensors can be collected easily from the bedside by patients themselves or doctors. Limitations of this paper are in this paper only show the information of bedside patient with the help of NFC.

Purposed System: The NFC tag will be implanted in the body of the user. This tag will contain the unique id of the user which is linked to the Adhaar no. of user. The id when scanned with our mobile application will provide the data about the user according to the user scanning it. Thus, the data security and confidentiality will be provided to user's data.

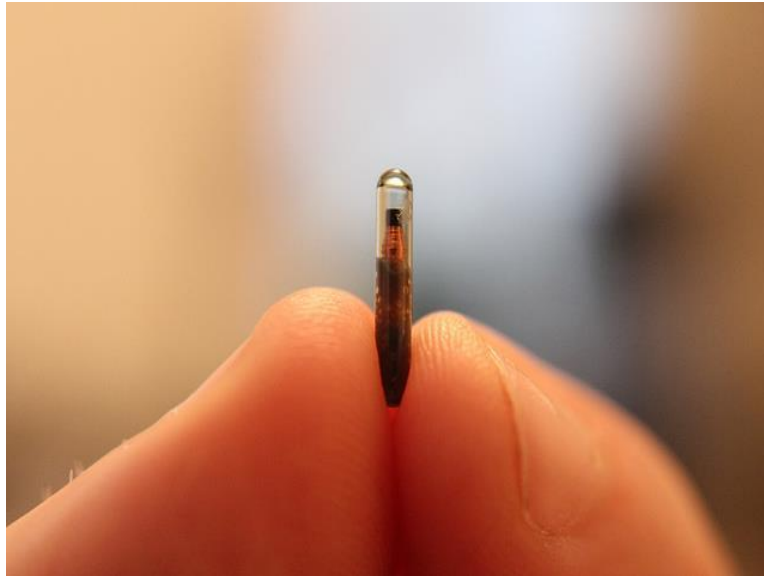
Purpose: A NFC based mobile healthcare device is designed to reduce the complexity and mistakes in the diagnosis by the doctors. This is done by NFC enabled device. There will be many patients in a hospital and it's very difficult to maintain the records in paper and there are also chances of patients losing their prescriptions and test results or it can also be misplaced in the hospitals. During emergency condition doctors need not to start the tests from the scratch. Hence to avoid these problems, we have proposed NFC enabled mobile devices which can be used to keep the track of patients' identification and can also retrieve the previous records. The proposed method can be developed into advanced healthcare system by introducing the concept of artificial intelligence wherein we can predict the right medication and treatment.

3. EXPERIMENT AND RESULT

A.HARDWARE

1. NFC Chip: It allows them to establish peer-to-peer radio communications, passing data from one device to another by touching them or putting them very close together.
2. NFC Reader: NFC reader is used for read user document.

NFC (near field communication) is a wireless technology which allows for the transfer of data such as text or numbers between two NFC enabled devices. NFC tags, for example stickers, contain small microchips with little antennas which can store a small amount of information for transfer to another NFC device, such as a mobile phone[3]. Adding data to an NFC tag is called encoding. There's a wide variety of data types you can encode onto an NFC tag. For example, you may choose to encode a URL (web address), a telephone number or simply a small ID number [3]. The actual amount of data varies depending on the type of NFC chip used. Different tags have different chips and each chip has a specific memory capacity. A typical NTAG210 NFC chip can store only a URL up to 40 characters long. The popular NTAG213 chip NFC tag can store a URL up to around 130 characters.



NFC tags can be locked so that once data has been written, it cannot be altered. For most tags this is a one way process so once the tag is locked it cannot be unlocked [5]. You can buy tag from dangerous things website[5].

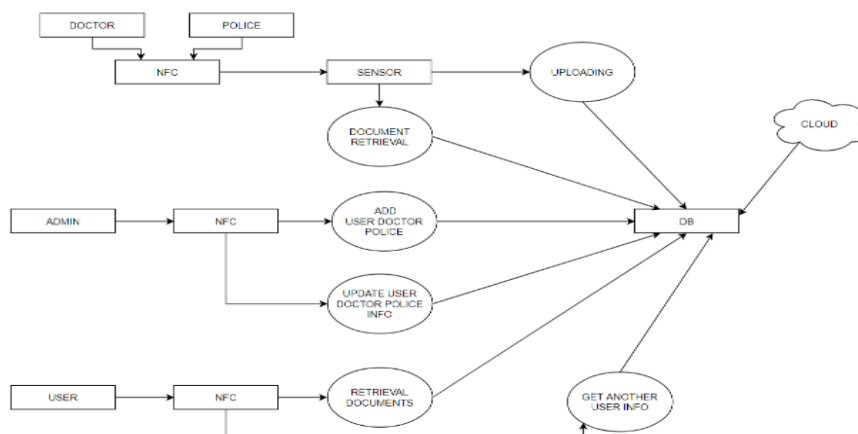
The xNT tag is made with the 13.56MHz ISO 14443-A & NFC type 2 compliant NTAG216 chip, which is enclosed in a biologically safe 2*12mm cylindrical bio glass tube. The bio glass cylinder is laser sealed & the finished xNT tag is tested for function before loading into the injector assembly & the whole injector assembly with xNT tag inside is EO gas sterilized. [8]

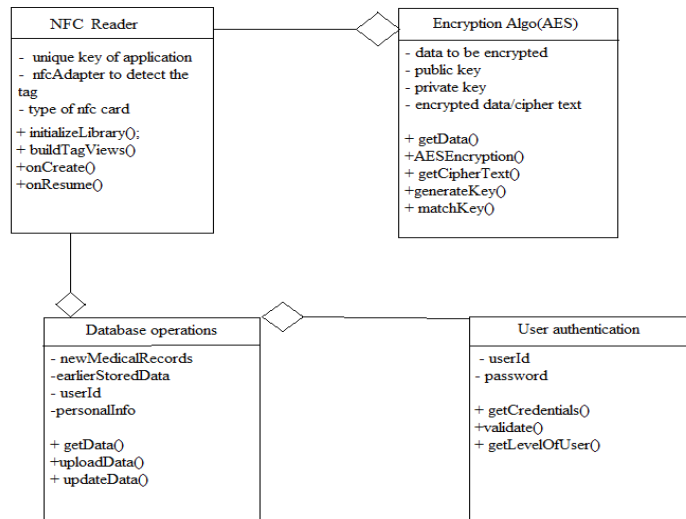
B.SOFTWARE REQUIREMENTS

1. Language: Java
2. Database: MySQL
3. Software Development Kit: Android Studio

The NFC tag will be implanted in the body of the user. This tag will contain the unique id of the user which is linked to the Adhaar no. of user. The id when scanned with our mobile application will provide the data about the user according to the user scanning it. Thus, the data security and confidentiality will be provided to user's data.

RESULT:





Modules:

1 Admin Module:

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

2 Doctor Module:

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

3 User Module:

1. Login to the system using Password provided by admin.
2. Scan the NFC tag of other user so as to get the info.
3. 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 user's guardians.

4. 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 can be extremely beneficial in the modern era 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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