Near Field Communication For HealthCare System Using Cloud

Chandana L S[1], S B Mallikarjuna[2]

[1]Student , Dept. Of Computer Science And Engineering, BIET college, Karnataka , India
[2] Associate Professor , Dept. Of Computer Science And Engineering, BIET college, Karnataka , India

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Abstract - Although essential care doctors are progressively inspired by embracing electronic medicinal record (EMR) frameworks, few utilize such frameworks practically speaking. Cell phones offer new courses for clients to get to social insurance information and administrations in a protected and easy to use environment. Portable social insurance (m-medicinal services) frameworks are viewed as an answer for human services costs without lessening the nature of patient care. We are building up a fundamental engineering for m-medicinal services administrations utilizing Near Field Communication (NFC) to encourage the provisioning of social insurance to individuals anyplace, at whatever time utilizing cell phones that are associated through remote correspondence advancements. With the late increment in utilization of cell phones particularly in creating nations, they can be utilized for a proficient medicinal services administration. In the work, we have proposed a novel design for enhancing medicinal services framework with the assistance of Android based cell phones with NFC and Bluetooth interfaces, smartcard innovation on alter safe secure component (SE) for putting away qualifications and secure information, and a Health Secure administration on a half and half cloud for security and wellbeing record administration.

Key Words: **Near field communication, RFID, NFC tag , EMR , Secure element .**

1.INTRODUCTION

Near Field Communication (NFC) is a communication technology which is used for a data exchange between a reader and a another device with a distance of 10cm. It operates at a speed of 106-424 kbps and frequency speed is 13.56 MH z. NFC is an extension of Radio frequency identification (RFID) [7] which depends on magnetic field acceptance to communicate between two NFC enabled electronic devices which is a bidirectional communication. This technology makes an interface between the reader and a smart tag in a single device. It does not require any external client to set up. NFC standards are based on existing RFID standards. The standards incorporate ISO/IEC 18092 [1], those defined in NFC forum.

Identifying the articles for secure restorative techniques is essential for a protected work process. For instance, consider a identifiers on the medicines which helps the doctor to prescribe correct medication to a patient to reduce

errors. Another issue is maintenance of patient record management is important for patient and hospital. The NFC data exchange format(NDEF) are utilized by NFC to store and send information. NFC labels must be able to do read and write for basic applications. NDEF does not give any security [1] or assurance against the information control, overwriting the data. The use of MIFARE classic labels, which utilizes the standards and write the information using NFC-A properties for security purpose [4]. These classic labels provide 1024 bytes of data storage.

The purpose of the work is to mechanize the front office administration of hospital to create programming to be used easily, simple and cost effective. It manages the patient's information and concentrate on diagnosis details etc. The capacity of the system is to register and store the patient's information and doctor's information and to get these information as and when required and also able to manipulate it correctly. It takes input as patient information , analysis elements and give the output as proper treatment details.

1.1 RELATED WORK

System requirements specifications(SRS) which gives information about the system behavior to be created. SRS includes both functional and non-functional requirements.

FUNCTIONAL REQUIREMENTS

Three android applications will be created for admin, patient and doctor. The NFC technology will be used to provide security to patient's data.

NON-FUNCTIONAL REQUIREMENTS

Is a requirement that explains the criteria requested to the analyze the operation of a system. It describes how the system works and what standard should be provided. It describes some system attributes like accessibility, availability, security, reliability etc. Service level requirements are the measures of the quality of service required and are crucial to capacity planning and physical design. For each service level, we need to identify the realistic, measurable target values. These target values are like service hours, throughput etc. Access restrictions must specify what data should be protected, which data should be restricted to a particular user.

1.2 SYSTEM DESIGN

The different stages of project design has been described in the system design which includes description of the overall project, algorithms used to implement and high level diagrams like class diagram, data flow diagram, sequence diagram.
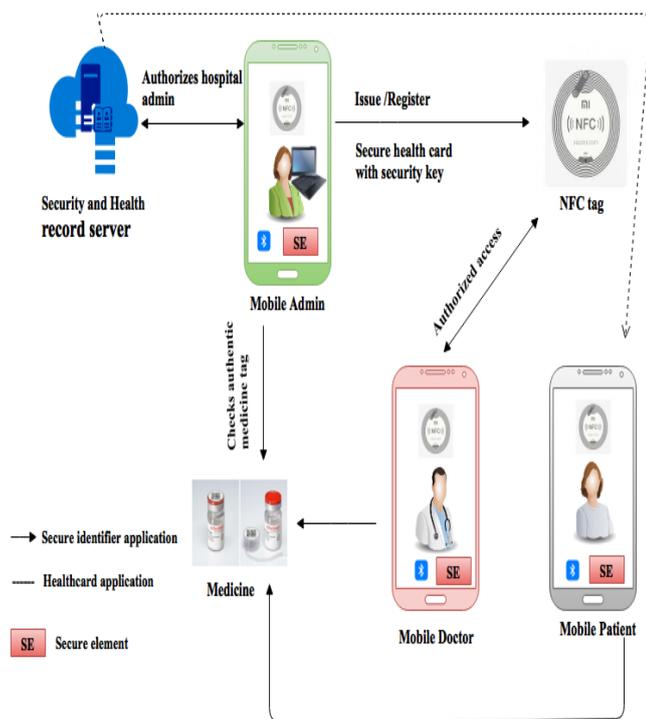

Fig-1: System architecture

Description:

In the above diagram there are three android applications, one web application, cloud server and NFC tag. Each patient will be provided with an NFC tag. The patient's primary information will be written into the tag. It contains decryption key where it will be known only to a patient itself. The patient can access his/her records by tapping the card to NFC enabled smart phone. The doctor can view the patient's records by tapping the patient NFC card to the doctor android application. Even doctor can check the medicine previously described to the patient. The following steps describes in detail:

Step 1: Admin will write the patient id and decryption key into the NFC card.
Step 2: Patient can read his/her medical record by tapping the card to a device.
Step 3: Doctor can access all the patient's cards and can give treatment details properly.
Step 4: For security purpose, admin encrypt the patient id while writing process being done.

2 IMPLEMENTATION DETAILS

2.1 MODULES

File Encryption

In this module the patient related files and data will be encrypted using symmetric AES algorithm and uploaded to server in a cipher text format in the java application.

Writing data into card

NFC is an two way communication system when compared to earlier systems and it builds Radio Frequency identification(RFID) systems. In this module the patient data will be written into the tag, before dumping the data into the card first data is declared an Intent Filter to tell that it works with NFC. A method is created to call when NFC is detected. A method is created to build NDEF message. Finally write the data.

Patient Details Authentication

When patient taps the NFC card to the patient android application, patient id is validated with the card patient id. If matched then only can retrieve all the data which is related to the particular patient.

Reading Data From Tag

When the patient taps the card to his application, first encrypted data is converted into original data with decryption key and the NDEF data is read from the NFC tag.

2.2 EXPERIMENTAL RESULTS

Web Application

This section shows snapshots of a web application. In web application admin login and enter the patient details with patient id and decryption key. Even doctor details will be entered with specialization. The patient's records or files will be uploaded by admin into cloud.

The fig shows the login form where a username and password has to be entered to login into homepage.

Admin android application

This section contains the snapshots of an android application. The fig displays the sign in page of the application. By clicking sign in button its get navigated to login page. The fig shows the admin login page. With user id and password the admin login to homepage.

Patient android application:

In this application, the patient login with patient id and password. Here patient can download all his/her records and also can view medicine prescription. The below figures shows the patient's sign and login page where he/she enters the id and password and login successfully.


Doctor android application:

In this application the doctor can download all the patient's records and can view the medicine details prescribed to them previously. In the below figures the doctor's can login to home page by his/her id and password.

Cloud details:

The below figure gives the information about the patient's file or report uploaded on cloud. Here the DriveHQ cloud has been used which is a free drive mapping tool. It is a FTP hosting service provider
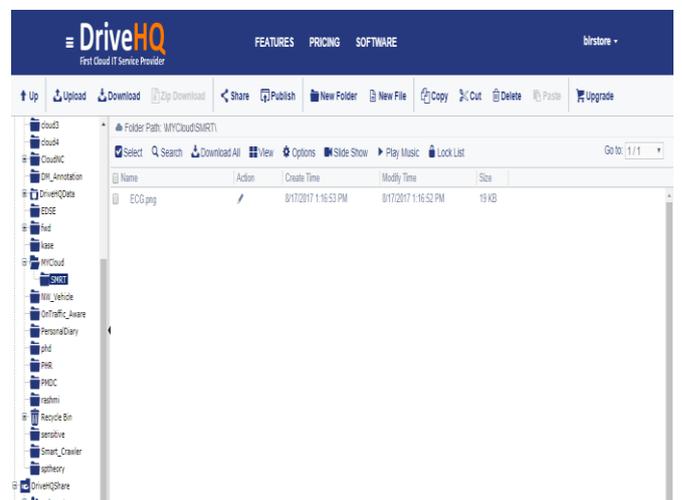
3. CONCLUSION

At present NFC can be a useful technology which is simple and convenient for data exchange between the two NFC devices. It does not require any external software to run. It provides an efficient way to transfer patient's data hence it is interactive and secure. In this work, the android and web application is developed to identify the health card of a patient in an external tag. There are number of applications and its usage is simple for secure

communication. The cost of the work can be reduced by using the microSD cards with inbuilt NFC antenna.

Here to store the patient's data or primary information, an MIFIARE classic tag is used. This technology has been used already in some areas like ticketing, financial payments etc. but now it is being used in hospitals to give security to the patient's data.

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