NFC BASED HEALTHCARE MONITORING MOBILE APPLICATION

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Abstract – *NFC (Near Field Communication) is a standards-based, short range wireless technology. It is a new technology where the patient need not carry all of their medical records and doctor can get the details of the patient using an NFC tag. The NFC tag contains a unique identification number which is assigned to every patient. This tag contains details like previous medical records, medicines prescribed, lab records, scanning reports etc.*

Key Words: Near Field Communication (NFC), Healthcare mobile application.

1. INTRODUCTION

Patients come to hospitals with different illness and different symptoms. When doctors operate on patient there are chances of getting confusion between patient's disease and treatment which can turn to a fatal misled in treatment of a patient and also lead to death. Also maintaining record of patients on paper are difficult. Hence for a robust healthcare system, NFC is used. NFC stands for near field communication which is a standards-based, short range technology and is a simple two-way interaction between electronic devices that allows performing contactless transactions.

NFC communicates by making magnetic induction where two loop antennas are located close to each other forming an air-core transformer. NFC tags are integrated circuits which stores data that can be read by an NFC enabled device. If a patient visits the hospital, they will be given a unique identification number. Using this tag the doctor can verify patient's disease condition, past medical history, previous medicines used, previous medications taken and x-ray or scanning reports, Doctor uses this tag to tap in his device using which the details will be displayed on the device.

2. LITERATURE SURVEY

According to healthcare: An analysis of key themes in research, the purpose – Healthcare is among the fastest-growing sectors in both developed and emerging economies. Healthcare is contributing to the explosive growth within this industry by utilizing the internet and all its capabilities to support its stakeholders with information searches and communication processes. The purpose of this paper is to present the state-of-the-art and to identify key themes in research on healthcare. Based on the literature review, the 5 major themes of e-healthcare research identified are: cost savings; virtual networking; electronic medical records; source credibility and privacy concerns; and physician-patient relationships.

2.1 NFC

Near field communication (NFC) [1] is a technology which is being newly introduced to the communication system in the medical field. Its aim is to create a system which have a faster access in communication. NFC helps in fetching faster information from the server so that we get accurate details of patients.

2.2 Healthcare

Healthcare [3] system is all about the different disease conditions and different symptoms of patients to which exact care is given in order to eradicate the illness. One card with one patient details is the aim of this technology where details of a particular patient is stored in a card with unique identification number and the information is fetched via an NFC tag.

3. PROPOSED SYSTEM

We have proposed a system which describes how an android application is used as our own NFC tag writer to write patient unique id in NFC tag. This will help in reducing the paper work that is required during the registration when a patient is admitted in the hospital. Instead of carrying a bundle of records it will be useful if these are stored in the cloud and fetching it using a unique id stored in that NFC card.

4. USE CASE DIAGRAM

The use case diagram shows three actors –doctor, patient and admin. Here the doctor and patient can login, view profile, access NFC id, view the patient data, update patient data, and also doctor can logout from the system. Similarly admin too can login, logout from the system, do the doctor registration, patient registration, write NFC operations which are all illustrated in the figure shown below:
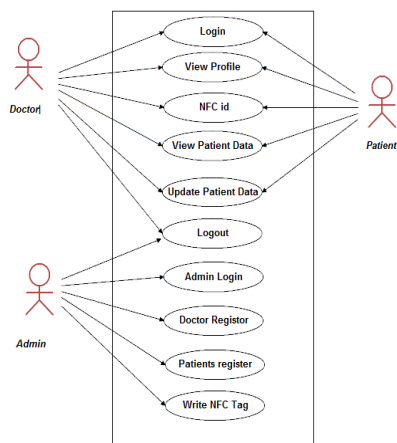
Fig -4.1: use case diagram
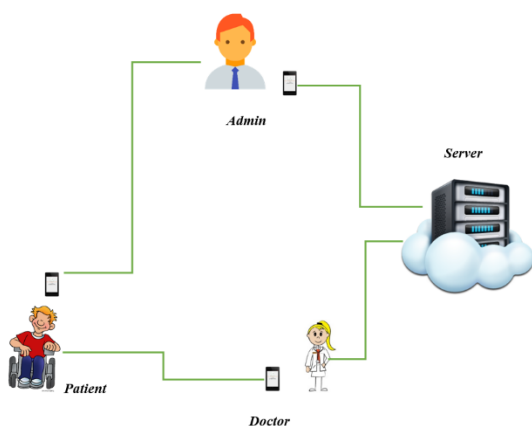
5. SYSTEM DESIGN

Fig -1: Overall Architecture of Proposed System

This figure represents the architecture for NFC based heath monitoring and controlling system. The NFC system makes the entire process of patient record keeping easier, more accurate, comprehensive and more efficient. The patient information is stored on a server and each patient's complete history is available including digitized copies of x-rays, MRI scanning report, lab result, prescription ordered and other necessary medical data. When a patient is admitted/visited the hospital then a unique id is provided to patient with a unique identification number. During registration patient's information will be stored. The doctor have the NFC enabled mobile phone. When reading the NFC tag he will get the all details of the patient's disease, doctor consulted, prescription given previously etc. Whenever NFC tag is read by NFC enabled smartphone, the patient data is retrieved from the server. The admin does the doctor and patient registration, update patient health details and writes the patient NFC tag.

6. ADVANTAGES

- There are many benefits of using NFC in healthcare, but the most potential advantage of using NFC in health care are improve patient's

identification by eliminating the paper based document work, provide a way to automation, increase efficiency and also decrease manual power.

- One can use this smart tag even when they go to other hospitals, so instead of carrying many files they need to simply carry this small tag that can be read using a reader at the respective hospital.

- And also during frequent check-up one need not carry heavy files but can simply carry their smart tag and update it every time the health check-up is performed.

- Through the use of this NFC in health care, doctors can reduce the time requirement to go through a patient profile by waiting for someone to bring it and also to go through a lot of papers. Using NFC in health care, doctors can save the time and staff required to produce and maintain the patient records and fast treatment could be done.

7. CONCLUSION

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 patient's identification and can also retrieve the previous records.

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