NFC Based Health Monitoring System

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Abstract- Near Field Communication (NFC) is a technology in which electronic devices can interact and is easy to connect devices with one touch. It is a used for small range like range of NFC is 10cm. NFC technology can be inculcated in Tags. Unique identification number can be used to store data. Many real-time applications uses this NFC tag feature. As the world is heading towards development in mobile technology many applications can use mobiles. Nowadays, most of the mobile phones are NFC enabled. NFC can be used for distinct identification of patients in hospitals. It will be a major heap in automation of Healthcare. NFC-based identification decreases wrong diagnosis and treatments to patients in busy and updated hospitals.

Efficiency and Accuracy are the two significant aspects in healthcare services. Using NFC in fields like healthcare promises these aspects . NFC provides an easily usable wireless-communication interface. Technical as well as non-technical people like Doctors, Nurses, and all other staff of the hospital can easily use it. Hence, NFC- Based Healthcare can be used for providing accuracy and Automation in healthcare. It also reduces the cost of healthcare in developing countries.

Keywords- mobile application; Near Field Communication (NFC); Healthcare

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1. INTRODUCTION

Two electronic devices, devices like a smart phone, can initiate communication by being closer to each other, within range of 4 cm (1.6 in). **This is possible using Near-field communication** (**NFC**) in which a bunch of communication protocols are present. Payment systems which are contactless uses NFC devices, which is in line with those used in credit cards and electronic ticket smartcards. It allows mobile payment to substitute these systems. Social networking sites, for sharing photos, contacts, videos or any other files uses NFC. NFC-enabled devices are used as keycards and electronic identity documents. To start advanced wireless connections, NFC can be used because it has a low-speed connection along with easy setup.

There are many patients with various diseases and many different symptoms. Also, many patients of similar diseases and illness can be in the same hospital. This can lead to confusion among doctors and there are chances making mistake with patient's disease and treatment. This might become a fatal-mislead in treating the patient and can lead to other diseases, which can end up in death of patient. Apart from this issue, if the details of patients health data and reports are maintained on paper then it is burden to manage and highly unreliable on a long-term storage basis.

NFC can help in avoiding such mistakes on patients if healthcare industry inculcates NFC. Near Field Communication (NFC) is a standardized, small range wireless communication technology which allows contactless transactions and electronic devices can have interaction and provides an ease to connect devices with one touch.

2. LITERATURE SURVEY

A robust NFC and RFID based Healthcare System can minimize the probability of a confusion occurring between the patients' disease [1], and respective treatment allows carrying out contactless transactions .It also provides an easiness to connect devices with a one touch. Plus, in Security in near field communication (NFC), hand-out of Workshop related to RFID Security, etc. Data manipulation or Data corruption has a role. This is most probable to happen if a third party intercepts. Another area is the data insertion where the attacker inserts messages in the exchange of data between binary devices. But, this is the case when the response time of answering devices is high. Technical development and advanced medicine practices using NFC are among the significant factors initiating this shift to lower response time. This fashion is resulting in a increased demand for healthcare related services and higher competition between healthcare providers. Achieving a top-operational efficiency and effectively performing in the healthcare sector is a primary goal for organizational performance and evolution.

3. COMPARISION WITH THE EXISTING SYSTEM

The most prominent and popular tool for connectivity is Bluetooth. The important benefit of NFC over Bluetooth is that NFC has very less power consumption capability compared to the latest Bluetooth technology also. But, range of NFC is approximately 10cm whereas Bluetooth can transfer data nearer to 10 meters or above that. Despite the above statement, with respect to speed, NFC has got a better-connectivity. There is no manual pairing needed and because NFC uses inductive-coupling, it does not take more than one-tenth of a second to connect two devices.

Among others, a primary concern with NFC technology is data manipulation or data corruption. This may occur when a third party intrudes and gets to know the signal being sent and attempts to modify it which might in turn lead to change of data or data corruption. Removing NFC tag from the tagged item or wrapping the tag in metal foil causes to shield RF-signal which may lead to unrecognizing of the tag. One more aspect is the data insertion. In this in the exchange of data between two devices, the attacker inserts messages. CRC technique (Cyclic Redundancy Check) is a technique to check if data received is corrupted or clean is used for checking errors in NFC.

In the proposed system, all the advantages and features of NFC and smart phones are incorporated in the NFC tag and card. Storing the digital data of patient to a server in a single tap is done by the use of NFC tag or bands with the NFC enabled mobile.

4. PROPOSED SYSTEM

The phones must be enabled with NFC. The supreme authority is the Admin. Both patient and doctor must register to the admin. The Admin manages the read and write operations from and to the NFC tag. The patient taps the tag to the doctor's phone to get identified by a unique number stored using NFC technology. The number helps to retrieve all the details of a particular patient using database. Once the information is understood by the doctor, the medical report can be made.

Upon viewing of the report, the doctor can either agree with the patient health, if not the necessary medications can be initiated. The server is updated timely with all the important details of medicines related to the corresponding patient's health-issues. Added to this, the patient can also login and update his/her health profile off hospital (by the aid of check instruments like blood pressure sensor, etc.). Once the details are delivered to the hospital, the doctors staying far away can quickly interact to the patient. Thus, it is time-saving. And, suitable prescriptions can be made very easily by avoiding travel.

5. OVERVIEW OF THE SYTEM DESIGN

The system consists of three major modules as the Admin module, Doctor Module and the patient module. Each module has a login page that contains a username along with the password field. By entering proper values in the fields, the user has to login to the system.

A. Admin module

The admin is the authority who registers both doctor as well as the patient. He also updates the details of the corresponding patient and assigns each patient with a unique number. Only he has the power to write into the NFC tag.
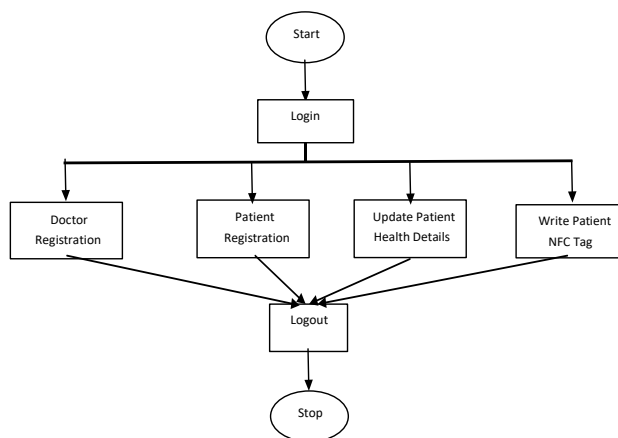

Figure 1: Admin Module

B. Doctor Module

The doctor has to register himself through the admin in order to view the patient details. He has the power to update the information regarding the patient. He can also view his own profile.
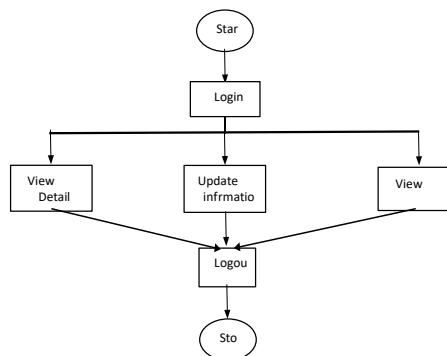

Figure 2: Doctor Module

C. Patient module

The patient can successfully update his own profile with the details and also he is enabled with a facility to update

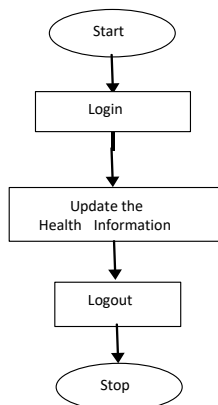sensitive details like rate of heartbeat or even the blood-pressure level.

Figure 3: Patient Module

6. APPLICATION AREAS

The system can be used in various fields of development where health recognition is of vital important. Such fields to which this system can be extended are:

Updates on patient care: NFC allows to track what people are doing, where people are etc All the whereabouts of the patients like when did the patient last consume the medicines, when did the nurse visit, what medicine doctor has administered etc. is known to the Medical Data is stored and captured in access-controlled databases, and supports viewing in various formats, to help simplify system.

Secure logical access (to medical information): All the patient data has to be secure and private. IT also needs quick Access when it is related to medical information so that best treatment can be provided.

Safer medications: When NFC tags are inserted or fixed to medicine packages or labels, it lets you cress check the medication. One can also check the dosages consumed or learn about the side effects of drugs.

7. FUTURE SCOPE

NFC based health monitoring system is the attempt to incorporate NFC technology and its strengths when used along with mobile phones to accurately and efficiently ease the job of managing patient in healthcare. NFC is the technology which is using wireless-communication and hence easy to use by all both technical and non-technical people like nurses, Doctors etc. So, implementing NFC-Based Healthcare not only provides automation and accuracy but also lowers the cost of healthcare in developing and developed countries.

8. CONCLUSION

Since healthcare has bright and vast opportunities, additional feature like dynamic data of patient tracking can be joined to the proposed system. ECG sensors needs to worn by the patient which will observe and check health parameters of patient at runtime. Blood pressure, heartbeats,

Measurements will be stored in server. If the measurements are not up to the mark and there is a sudden emergency, then android phone will help in calling doctor and ambulance with location of the patient.

References

[1]. Amol D. Potgantwar,Vijay M. Wadhai, "*A Standalone RFID and NFC based Healthcare System*".iJIM, vol. 7 ,Issue 2, April 2013.

[2]. Sethia, D.; Gupta, D.; Mittal, T.; Arora, U.; Saran, H., "*NFC based secure mobile healthcare system*," 2014 Sixth International Conference on Communication Systems and Networks (COMSNETS), vol., no. pp.1,6, 6-10 Jan. 2014

[3]. Coskun, V., Ozdenizci, B., & Ok, K. (2013). *"A Survey on Near Field Communication (NFC) Technology. Wireless personal communications"*, 71(3), 2259-2294.