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NFC Based Healthcare System

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Abstract **— In this paper it describes how an android application is used as our own NFC tag writer to write patient unique id in NFC tag. Doctors using NFC enabled smartphone to retrieve patient information when placed near NFC tag. Doctor uses hospital wi-fi or gprs connection to connect to internet to retrieve patient information directly from the server. All applications will be communicating with the server through IP of the server and database used is MySQL.**

Keywords— **Android, NFC tag, IP, GPRS, NFC enabled smartphone, MySQL.**

I. INTRODUCTION

NFC-assisted mobile health monitoring, which applies the prevailing mobile communications and cloud to provide feedback decision support, has been considered as a revolutionary approach to improving the quality of healthcare service while lowering the healthcare cost. In current hospitals patient have to stand in a queue and fills forms manually .There is no permanent records of patients and no global accessibility. In emergency doctor need to diagnose every time, test, report generation etc.

There is no system to give notification to patients about their medicines .So patients can take their medicines on time. There is no system for the patients to check their disease by their own.

Health care is using different technologies approach for early detection, prevention of disease to improve quality of life. Proper documentation of patient record should be maintain. Patient should be aware of their disease and how to cure their diseases. Latest technologies like NFC, NFC tags, android , Glassfish server is used.

II. NFC TAGS

When a patient is admitted in hospital for the first time a unique id is provided to patient. Patient will be equipped with NFC tag. Doctors and other staff will be equipped with NFC enabled smart phones. NFC issue app is used to read the content from mobile to NFC tag. By using NFC issue app administrator can write unique tag id and application link in NFC tag. To create patient application link administrator use IP of the server and then transfer to mobile by using same IP. Whenever NFC tag is placed near NFC enable smartphones the patient data is retrieve directly from the server.Doctor can also do the same thing to retrieve information of the patient from the server.

III. ADVANTAGES OF NFC TAGS

There are many benefits of using NFC in healthcare, but the most potential advantages of using the NFC in health care are improve patient's identification by eliminating the paper based documentation 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 smart tag that can be read using a reader at the respective hospital. So this even provides benefits to customer. And also during frequent check-ups 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 required to go through a patients 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.

IV. SYSTEM DESIGN OF NFC

Each NFC technology consists mainly of a low power smart tag and a reader. The tag is consists of a small antenna and a microchip. The NFC enabled Smartphone transmits radio-waves of about frequency of 13.56 MHz that are received by antenna in the smart tag and, which allows the reader to identify the information in the smart tag by converting the radio waves reflected by the smart tag in to digital information. This information is stored mainly in the Hospital backend server.

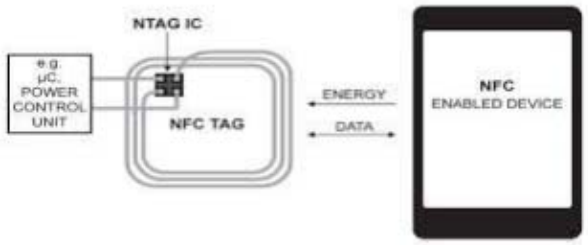

Fig. 1 NFC Tag

VI. SYSTEM FUNCTIONING

In this system for the moment four member plays the role mainly doctor, patient, administrator, accountant. If a patient visits the hospital for the first time the administrator fills up the information of the patient and the information gets stored directly on the server after that the administrator provides NFC tag to the patient and administrator writes the pid that is patient id on the tag and then delivers to the patient. Afterwards when patient visits doctor cabin he

gives his tag to the doctor he taps on the tag by NFC enabled mobile phone and get the details of the patient from the server. The accountant does the same and maintains the expenditure of the patient related to hospital. The administrator also does the job of adding new doctor or accountant details in the hospital.
The specific requirement for such system is wi-fi or gprs connection, android os 2.2 and above and NFC enabled mobile phones.

VII. ANDROID APPLICATION DESIGN

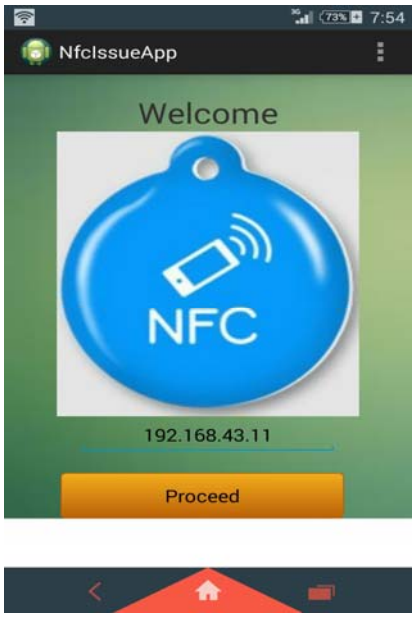

Fig. 2 NFC issue app used as NFC tag writer and reader both

Fig. 3 NFC issue app tag writing

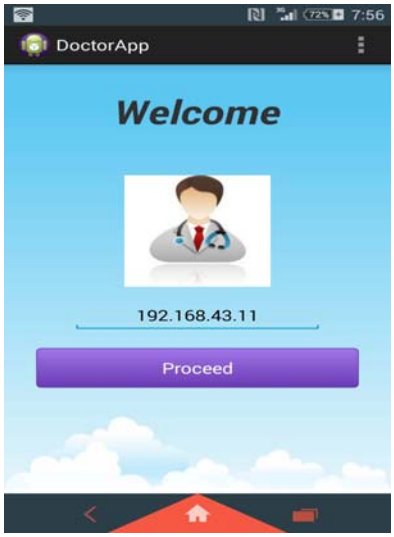

Fig. 4 Doctor app welcome page

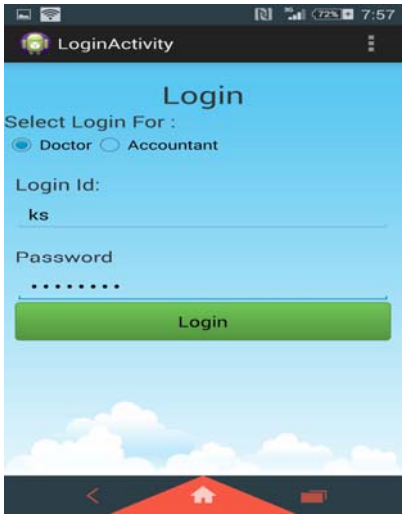

Fig. 5 Doctor or accountant login

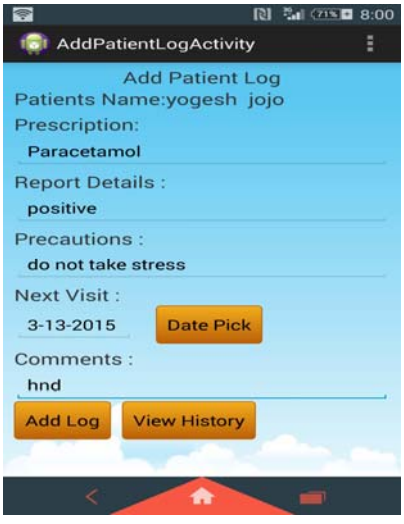

Fig. 6 Doctor adding prescription log of patient

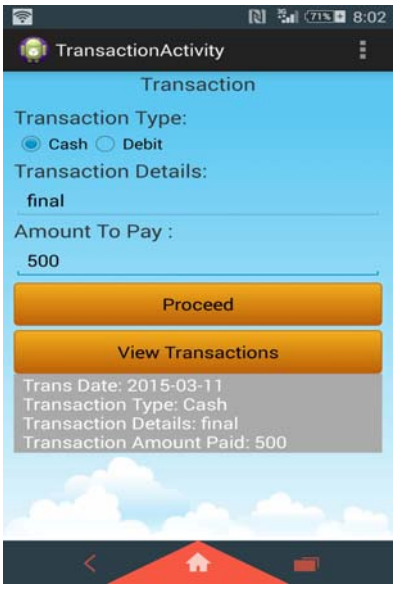

Fig. 7 Accountant handling patient's transaction

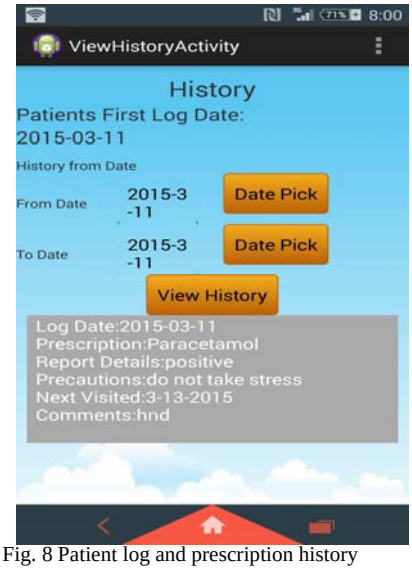

Fig. 8 Patient log and prescription history

VIII. CONCLUSION

Near field communication can be extremely beneficial in the modern era of technology. NFC is an extremely simple and convenient technology because the data exchange can be done by just bringing two NFC enabled devices together. It is interactive and secure which does not require any special software to run on. The underlying standards of NFC follow universally implemented ISO, ECMA and ETSI standards. It also does not require any manual configuration or settings which make it easier for consumers. So trial to improve the health system by different technological means and providing a better communication and secure way to transform Patient information in globalized manner. In future it can develop for many hospitals as it has described for single hospital.

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