



NFC Based Card for Digitization of Patients' Records and Access via Android Application

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Abstract: NFC based card for digitization of Patients' records and access via Android Application is an NFC and android project intended to help the hospital and patients to reduce the usage of paper work in the process of patient's treatment drastically. This is an immense aid for people who visit alone to hospital and have to carry all the reports, prescriptions etc., with them. There is a dire need for reduction in the usage of paper as the climate around the globe is in constant deterioration conditions. According to Roadrunner smart recycling- hospital's solid waste is broken down into the follow streams: 54% is comprised of paper and cardboard, 18% organics, 15% plastics, 3% metal, and 2% glass. As the project is aimed at reducing the paper usage it makes the job for patients hassle free. The implementation is achieved by replacing the main case paper issued by the Out Patient Department of a hospital by an NFC based card which will create and unique identity for the patient in the hospitals system. By the impact of this project, there will be a significant amount of ease added to the hospital phase of a patient in which he/she already suffers a lot.

Index Terms – Paperless, Hospitals, Patients, NFC.

I. INTRODUCTION

NFC is nothing but a short-range communication technology and it provides bi-directional interaction between devices without contact and it also connects devices only with a single touch. The NFC tags are used for unique identification of patients in hospital then it will be a great step towards automation of healthcare. Benefits of NFC based identification surely reduce mistakes of giving incorrect treatment to patient in highly populated hospitals. There are two applications. One is user side application and another one is hospital side application.

The OPD user can add doctor, pharmacy, and laboratory and a patient personal information using an NFC card. The doctor need to first login into the application. After login successfully doctor can select a particular patient and add treatment for a particular patient. The doctor can see a photo sent by the pharmacist and if the medicine is correct then the doctor can approve the medicine photo. If the medicine is not correct then the doctor can reject the medicine photo. If the lab test is required then the doctor can add a lab test prescription photo for a particular patient. The pharmacy user needs to first login into the application. After login successfully pharmacy user can select a particular patient and see prescription is added by the doctor for a particular patient. Pharmacy user can send a medicine photo to the doctor for a particular patient medicine is correct or not. If the medicine is correct then the doctor can approve the medicine photo and the pharmacy user can see the approval status.

The lab user needs to first login into the application. After login successfully lab user can select a particular patient and see the suggested test added by the doctor for a particular patient. For a particular patient, if the lab test is done, then the lab user can upload a test result. The user needs to first login into the application. After successfully login user can see the treatment details. If the user has an emergency, then they can click medicine photo and send a medicine photo to the doctor. Using this application user can download the prescription photo and lab report.

1.1 PURPOSE OF THE SYSTEM

The purpose of developing NFC based card for digitization of Patients' records and access via Android Application is to computerized the traditional way of keeping patients' records. Another purpose or developing this system is to make the patients' hospital experience a little bit less hassle free. Also making it easier to remember other thing than just carrying around a pile of prescriptions and reports. This also helps in maintaining the records an easy task for the hospital too. The same excess space occupied by large files of data of patients can be replaced some other medical equipment or medical beds etc.

1.2 FLOWCHART

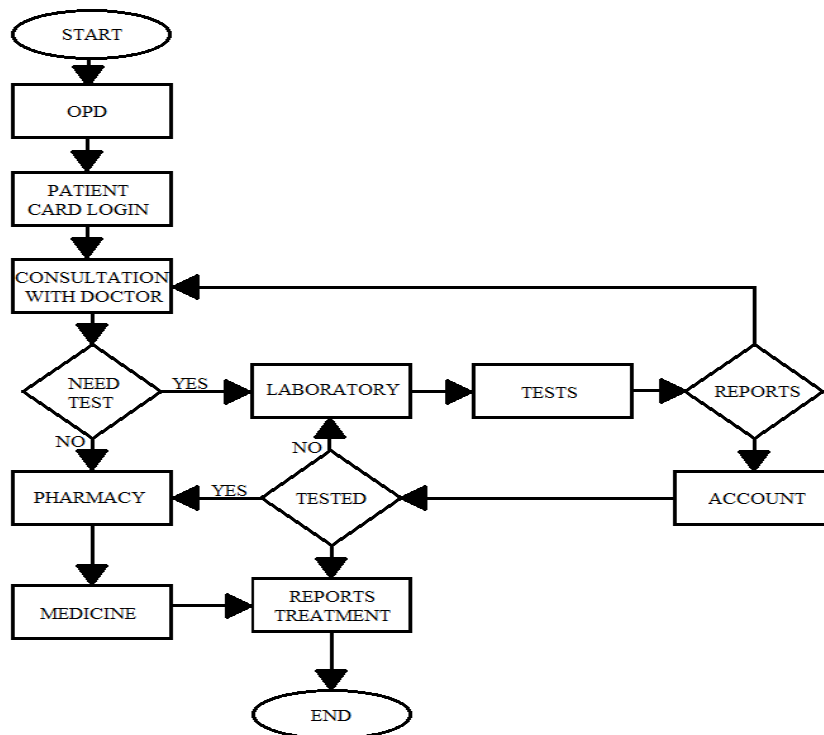


Fig 1: Flowchart of the system

II. SYSTEM OVERVIEW

2.1 SYSTEM PREREQUISITES

This system is implemented on a simple android phone with 3GB of RAM memory and an NFC enabled reader tag. The system also needs an NFC card with passive tag. The android application is installed on the phone. The applications to access the records a patient and as a doctor, pharmacy or laboratory are separate, which are installed accordingly.

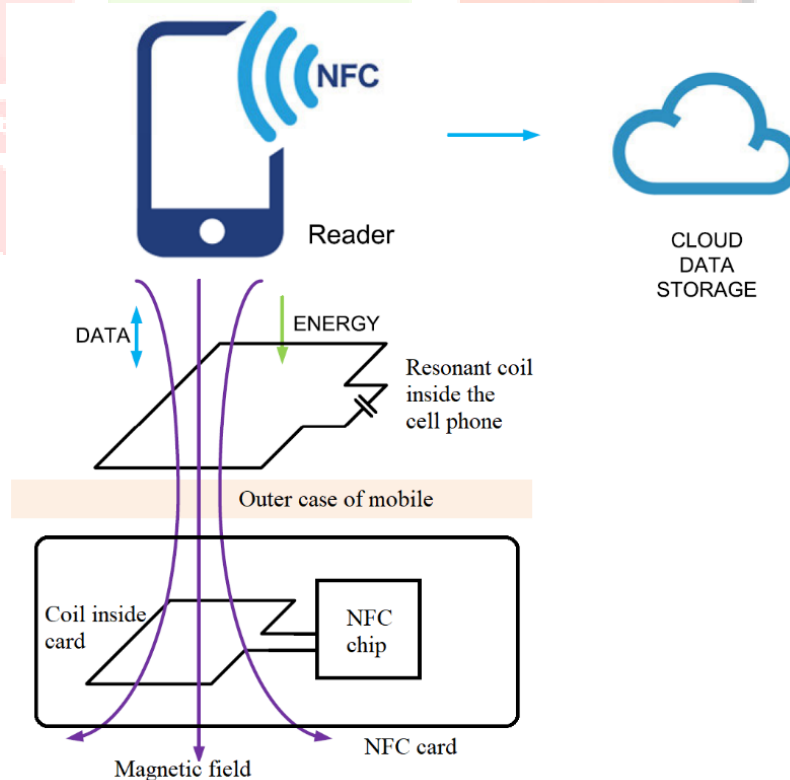


Fig 2: NFC working (representational)

III. EASE OF USE

The system is very easy to use by the Doctor's, Pharmacy's, Laboratory's, OPD's or even the Patient's point of view. All the parties need to download and install the application in their android phones. The Doctors, Pharmacies and the Laboratories need to register themselves by the OPD. The OPD then assigns the login credentials to them respectively. The patient is registered at the OPD as they enter the hospital for any treatment and allotted a NFC card which acts as their token, case paper, etc., which we can collectively call as patient's case file. The NFC card given to the patient has a unique identification which in addition with the patient's mobile number acts as an access key to patient's data. The OPD guides the patient to the appropriate department according to the patient's issues or illness. The Doctor uses the patient's NFC card along with the patient's mobile number to access the patients case paper which was created by and stored in cloud by the OPD and make the prescription after examining the patient and uploads the picture of it in the system. Similarly, the Pharmacies and the Laboratories access the patient's case paper or case file and make the necessary uploads of the prescribed tests' reports, bills, etc., if required. While this was about the application for the medical staff the other application for the patients is also very easy to use. The patient can login in the application using the unique case number generated at the OPD using an NFC and the mobile number. The patient can view and download all his prescriptions, reports and bill from this application, which will be downloaded in image format and can be easily viewed in the image gallery of the patient's mobile.

IV. RESULT

The NFC Based Card for Digitization of Patients' Records and Access via Android Application is made to reduce the burden to maintain and carry all the documents along at the revisits of the hospital, while it also focuses on reducing the maintenance of records at the hospital end too. The system proved highly efficient as the usage paper was almost reduced to 95% while the 5% consisted only of the x-ray test reports and the sonography tests reports, which too could be eliminated by digitizing the same reports, but were needed in some cases. Even if we consider that 1 ton of paper is made by cutting 12 trees, which brings us to 1 tree is used to make approximately 16500 sheets of paper taken as 5g per sheet. In a major multispecialty hospital on an average approx. 10000 to 12000 sheets of papers are used. This number can be reduced drastically if this system is implemented. Going paperless is the new way of marking the country as a faster developing country as well as we human beings taking a major step in protecting the environment.

IV. CONCLUSION

We have seen that during the Covid-19 pandemic in 2020 and 2021 the medical industry relied much on different applications and digitized data and not much on pen and paper method. The proposed system improves this reliability even further making the data easy to store and maintain, reducing the stress from the patient's as well as the hospital's shoulders. This technology can be used in many other organizations too to reduce the paper work wherever possible. In future this system can be clubbed with the health insurance companies making it a hassle-free experience for both the patient i.e., the customer of the insurance company and the insurance company itself.

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