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# SECURING E-MEDICAL DOCUMENTS USING QR CODE

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**Abstract -** *The project is a medical related data sharing between two parts: One part is the hospital management treated as the admin part and then patient side to be treated as the user part. The admin uploads the medical record (Data and patient ID) in a cloud platform which can then be searched using the particular patient ID. The medical document reference ID automatically converts to the QR code using QRDroid function, and then we can download the particular document. The user Registration module here includes the OTP system .The main advantages of this project is more secure transaction between two sides, more flexible, easy access , finally paper free report. In existing system, RFID technology was used, which is not suitable for more sensible data storing and it is not compatible in all sectors.*

***Key Words*: Android, Encryption, Internet, Decryption, QR Code.**

## 1. INTRODUCTION

Today is the world of android phones and their applications have now become an integral part of almost all sectors such as health, entertainment, office, college, banking etc. With the increase of android devices, many problems like privacy leakages have also increased. The user's private information can be accessed easily. In many applications, the user accepts the terms and conditions but they are unaware about that their private information can be leaked by certain applications without permission. There is an android permission system which controls the admittance of resources of the mobile device. Hence permissions can be misused deliberately so imposing permissions is not enough to prevent from permission violations. Android's enforcement of the permissions is at the level of individual apps, allowing multiple malevolent apps to collude and combine their permissions or to trick vulnerable apps to execute actions on their behalf that are beyond their individual rights.

## 2. QR Code Format

The structure of a QR code consists of a 2D matrix where each cell is of 1pixel area. In general, QR code consists of square black modules on a white background where the black square defines 0 in binary and the white square defines 1 in binary. In practice, the whole part of a QR code isn't used for only storing information, rather it consists of different sections. In this section we will review the sections in a QR Code

**Fig -1**: Schematic Diagram of QR Code

1. Finder Pattern: In QR Code finder pattern is a 3X3 matrix in 3 corners of the square except the bottom right corner. The QR finder pattern helps the decoder software to identify the correct orientation of the QR code.

2. Separators: Separators are used to separate the finder's pattern from actual information. The width of separators is 1pixel and it is of complete white.

3. Format Information: The Format Information, a 15 bits section next to the separators, stores information about the error correction level of the QR Code and the chosen masking pattern.

4. Alignment Pattern: Alignment Patterns support the decoder software in compensating for moderate image distortions.

5. Timing Pattern: Timing pattern consists of the alternate black and white boxes, which allows the decoding software to recognize the width of each module.

6. Data: In data section, information, converted in bit stream is stored in 8-bit parts named code words.

7. Error Correction Section: In this section information is stored in similar manner as the data section. It, as the name suggests, is used for error corrections.

8. Remainder Section: This section consists of empty bits, if data and error correction bits cannot be divided properly into 8 bit code words.

## 3. PROPSED SYSTEM

A QR code is created by encoding the mobile phone user's emergency and medical information (such as the name and contact details of the user's next of kin, their doctor or specialist, blood group, allergies, etc.). The created code

image is then used as wallpaper on the phone. This allows anyone to scan the code without unlocking the phone. Scanning and decoding the QR code can be accomplished with any standard QR Code reader, but when read with Qrdroid, additional information is retrieved and revealed. This helps emergency medical responders by enabling them to provide medical care with a more informed base. QR codes could minimise the chances of these errors by offering accurate information to first responders who can easily read this information by using a QR code scanner on their smartphones. In this research, QR codes holding the patient's information are tattooed onto an area easily reachable by first responders. The information would also provide accountability when a treatment does not go the way it was planned. Many of these medical errors are preventable through an increase in communication between healthcare providers, improved patient identification, and consumer knowledge.

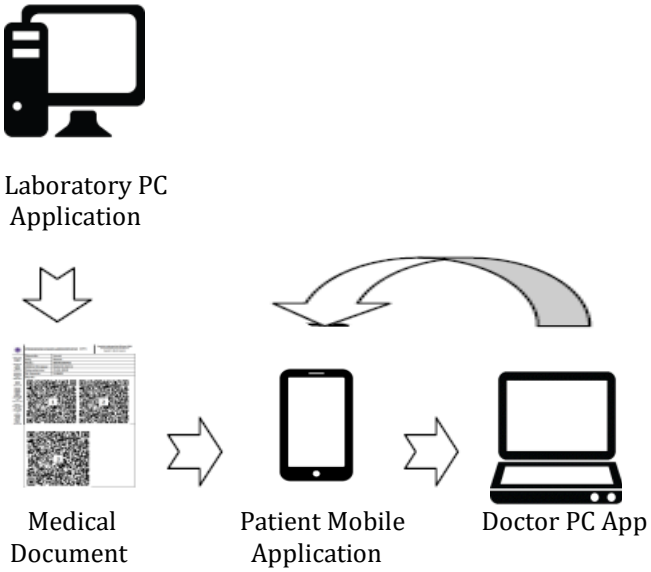


**Fig -1**: Schematic interactions between the modules in the System Model. Arrows indicate data flow direction.

QR code readers can be downloaded for free from the internet which another advantage of the proposed solution. QR codes can handle information in a variety of formats such as URLs, contact information, SMS and plain text among others.

## 4. SYSTEM MODEL

There are five modules in this procedure:

1) Login and Registration

2) Database Creation

3) QR code generator

4) Scanner

5) File Upload

6) File Download

### 4.1 Login and Registration

In this module we design to develop login and signup screen. Android used xml to develop classical screens in the application. The modules describe signup page that contains email id or user name, password and confirm password and these details should be stored in database. Login screen contains email id or username and password when the user can login into the app and it should retrieve the data to the database and combine the results based on user input if it matches user name and password then allow into the app. Otherwise alert the user by showing an error message to the user.

### 4.2 Database Creation

User email id or user name and password have been stored after registration. Android uses MySql database for storing and fetching user application details.

### 4.3 QR Code generator

This module is used to generate the QR code for the user Enter Key and additionally what kind of data like text or image is to be scanned.

### 4.4 Scanner

Additionally one type of application name as used in this project is QRdroid is used to scan the any kind of User QR code. Initially, User1 generate the QR code and after that QR code is sent to the User 2. Then User2 Scan the QR code and get the key.

### 4.5 File Upload

In this module, the user1 knowing the key, can decide what data must be uploaded to server. Finally the data and key is uploaded to the server.

### 4.6 File Download

In this Module, after getting the Key from User2 then enter the key in Download process and get the file from server.

## 5. CONCLUSIONS

Secure Message passing and file sharing technique is important to provide more security on an android smartphones. QR Code message passing is more secure because in general, we believe that QR codes have great potential in business media. QR codes are problematic because you cannot tidy out the bad from the good by simply observing at the code. So in our system, we used the RSA encrypt and decrypt the message to check its integrity. Thus the secure message passing and file sharing by using QR Code is more secure.

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