

MobiDoc-A Smart Healthcare System using QR Code Strategy

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Abstract— Medical data are an ever growing source of information generated from hospitals consisting of patient records in the form of hard copies which can be made easier and convenient by using QR code of the patient details. Our aim is to build a Health-care Portal system which will provide the features like clinical management, patient records, disease prediction and generate QR code for every patient as per there updated disease information. We are designing an Android application which will be beneficial for peoples to help other peoples who are suffering from incident like accident as well as doctor recommendation. It will help us to save the accidental person and to maintain medical information about user. Project is design for medical help. The accident detection system design to inform the police control room or any other emergency calling system about the accident. The application designed reacts to positive detection by sending details about the accident through either e-mail or SMS to pre-defined destinations, immediately followed by a showing nearby hospitals and police stations to the emergency services.

Key words: Android, Security, QR-Code, Quick Response Code, GPS, Mobile Interaction

I. INTRODUCTION

A QR code is a type of barcode that can hold more information than the familiar kind scanned at checkouts around the country. The “QR” stands for “quick response,” a reference to the speed at which the large amounts of information they contain can be decoded by scanners. They were invented in 1994 in Japan and initially used for tracking shipping. As the code can be easily decoded by the camera of smartphone[1], this technology is increasingly accessible to the average person. Instead of tracking car parts and packages, the codes can be used to store information of user. A QR code acts as a link embedded in the real world, integrating it with the virtual computer world [2].

The development of a transportation system has been the generative power for human beings to have the highest civilization above creatures in the earth. Automobile has a great importance in our daily life. We utilize it to go to our work place, keep in touch with our friends and family, and deliver our goods. But it can also bring disaster to us and even can kill us through accidents.

An accident is a deviation from expected behavior of event that adversely affects the property, living body or persons and the environment. Travelling is primary concern for everyone. Recent advances in Android are one of the most popular smartphone platforms at the moment, and the popularity is even rising. Additionally, it is one of the most open and flexible platforms providing software developers easy access to phone hardware and rich software API. Smartphone technologies are making it possible to minimize the death rate which are happening by vehicle accidents in a more portable and cost effective manner than conventional in-vehicle solutions.

II. HEALTHCARE SYSTEM

In this system the health information is stored on the third party server. There is no encryption and decryption of health information hence there is possibility of personal health information could be uncovered to unauthorized parties and third party servers[3]. Single owner system, in which no policy management for file access. Adding the categories is not possible hence confidential information is also accessed by all types of users. Whenever accident being met, the nearby people call the ambulance. The problem associated with this is that the victims depend on the mercy of nearby people. There is a chance that there are no people nearby the accident spot or people who are around neglects the accident. This is the flaw in the manual system. Our aim is to build a Health-care Portal system which will provide the features like clinical management, patient records, disease prediction and generate QR code for every patient as per there updated disease information.

III. SYSTEM ARCHITECTURE

QR Code generated at the time of registration. All information stored at database. User capture photo and search nearest police station and hospital. After requesting nearest police station FIR is generated by police station. Police station sends one copy to hospital.

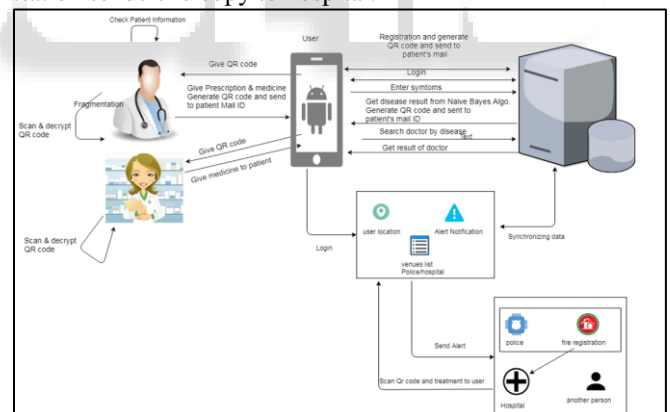


Fig. 1: System Architecture

Hospital scan injured person QR code and provide treatment according to information. Apart of that the user also uses this application to request the doctor’s appointment based on their symptoms.

A. Modules

- 1) User
- 2) QR Code and Police Station
- 3) Hospital and Pharmacy

1) User

The person who met with the accident can access this application by simply pressing the button. Further he/she are provided with the details of nearby police station and hospital.

2) Police Station

After user pressing the button provided in the application then the GPS will be automatically made on and based on the current location we will fetch the details of nearby police station and further user can choose the police station and register the complaint. Police station generate FIR and send copy to the hospital.

3) Hospital

After user pressing the button provided in the application then the GPS(Global Positioning System) will be automatically made on and based on the current location we will fetch the details of nearby hospital and the user can choose the hospital and send the alert message within the budget he/she can afford. On other hand when user enter any symptoms the system will display all the nearby hospital and user can make them request for an appointment .when user visits the hospital the doctor will scan the code and make new prescription and update the record .the doctor can generate new QR code for those medicines for which the pharmacist can't give without doctor's prescription.

a) QR Code

QR code contains all the information of user. It get generated at the time of user registration. Hospital scans the QR code to get the user information. After scanning QR Code the alert message which contains the current location of the user is sent to the emergency contact which the user is registered during registration process.

b) Pharmacist

The pharmacist will login to system and have an authority to scan the QR code of prescription generated by doctor.

IV. MATHEMATICAL MODEL

Let 'S' be the system

Where

$S = \{I, O, P\}$

Where,

I = Set of input (information related to user)

= Set of output (recommended list of police station and hospital)

P = Set of technical processes

- Let 'S' is the system
 $S = \{.....\}$
- Identify the input data S_1, S_2, \dots, S_n
 $I = \{\text{current location, accident photo, qrcode, earth radius} = 6372.795477598\}$
- Let 'PS' is the police station
 $PS = \{PS_1, PS_2, PS_3, PS_4, \dots, PS_N\}$
 $PS_K = \{\text{name, id, latitude, longitude, area}\}$
- Let 'H' is the Hospital
 $H = \{H_1, H_2, H_3, H_4, \dots, H_N\}$
 $H_K = \{\text{name, id, latitude, longitude, area}\}$
 $K = 0, 1, 2, 3, \dots, N$
- Identify the output applications as O
 $O = \{\text{List of nearest police station and hospital, user info. By scanning qrcode, FIR generation}\}$
List of Nearest Police Station = { PSa, PSb, PSc, PSD, PSe, PSf, }
List of Nearest Hospital = { Ha, Hb, Hc, Hd, He, Hf }
- Identify the Process as P

Knn for recommendation of nearest police station and hospital

For a given query instance xt, kNN algorithm works as follows:

Calculate distance from current location (Haversine Algorithm)

Suppose A is the users current location

While (PS != NULL && H!=NULL)

{

Suppose B is the location of police station P_M or hospital H_M where (M=1 to N)

$\text{Alpha} = (\text{lati A} - \text{lati B})/2$

$\text{Beta} = (\text{longi A} - \text{longi B})/2$

Convert all units from degree to radians

$A = [\sin(\text{alpha})]^2 + \cos(\text{lati A}) * \cos(\text{lati B}) * [\sin(\text{beta})]^2$

$B = \sin(\min(1, \sqrt{a}))$

$\text{Distance} = 2 * \text{earth_radius} * b$

$\text{Distance} = \text{round}(\text{distance}, 4)$ in KM

}

K= Constant Number as

1. K must be odd number

2. K must be less than N

3. Select K number of police station and hospitals where 'Distance' has minimum value

4. Classify police station and hospitals where area = area selected by user and distance is less than threshold value

CONCLUSION

We propose health care system for hospital for this we are using KNN and Apriori algorithms. We generate QR code for every patient. We propose and analyze the use of user driven visualization to improve security and user-friendliness of authentication approaches. Results have shown that the application develop is able to correctly full its purpose within a short time period. Our results show that the total time required to perform all the tasks, including the delivery of an SMS with the accident details, followed by providing the nearby police station and hospital details and sending them an alert message of the user accident with exact location of user, is taking short time period.

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