

# An Android based Healthcare Management System and Emergency Alarm

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**Abstract**---This paper presents an emergency alarm and healthcare management system, which is mainly deployed in an android-based phone that is conveniently used and carried. With the help of the GPS and GSM network, the system can make sure the location of the users when they are in trouble and send the emergency message to their respective friends and family. When the doctor or family receives the alarm message, they can immediately take measures to rescue the user. It can also manage the health record of the user. The user can specify the symptoms through his mobile phone and receive prescriptions from the doctor accordingly. After that the life reminder system can remind the user to take medicine on time and so on. The user can also get easy tips related to first-aid.

**Keywords:** healthcare management, emergency alarm, life reminder, Android, titanium, prescription, emergency numbers

## I. INTRODUCTION

Now with the growing social pressure and the life more and more quick steps, most people are facing with health problems, especially a lot of high-level personnel who are in sub-health. And modern social accidents occur frequently. It is more important to design a health security system for people. As mobile phones play more and more important role for people, it is the best choice that the system will be deployed on mobile phones.

Normally, a healthcare emergency alarm system is deployed on an independent device, wired or wirelessly linked to a gateway, and then connected to the hospital or emergency centre, such as [6] and [8]. But the disadvantage of such systems is obvious: once getting out of the coverage of the gateway, the system won't work anymore. A healthcare management system has two main functions.

The one is life reminder system. The other is On-Line medical. However the life reminder function is useful and helpful for the senior people and chronic patients to give a friendly reminder for medicine and so on, such as [9]. But most of the healthcare management system is separated from the emergency alarm system, which means the users have to keep two systems at the same time. Apparently it is not convenient at all. According to these disadvantages, deploying the systems on cell phone is undoubtedly a better Choice.

As a carrier of emergency alarm and healthcare management system, there are some advantages for cell phone. First, the cell phone is convenient to carry. People always carry a cell phone with them, so they can trigger an alarm or get the prescription from the HIS at everywhere and everytime. Second, open operating systems on cell phones, such as iOS, Android and Symbian have many applications and easy to extend by developing application.

Third, by the cell phone, user can make a phone call to their friends and family, and with the help of GPS chip, their location can be acquired. In this paper, we choose Android as our platform. Android is a mobile operating system initially developed by Google. Compared with iOS, Android is an open source system, so we can modify it to fulfill the specific needs by changing or rewriting the source code.

There are multiple app development tools, for developing applications for various platforms like iPhone, android, blackberry, Windows phone. These include Phone Gap, Adobe Air, Titanium Appcelerator etc. These tools use the IDE (Integrated development environment) mechanism like the one found in Java NetBeans etc. to help with software development. An IDE is nothing but a development tool with ready snippets of code for specific development languages like JavaScript etc. which help in faster development of APPs. These also come with their own compilers. An IDE would use the SDK (software development Kit) which is provided by the Platform (android SDK etc) for developing the app. Android provides the SDK for some of the basic functions like touch, tap, GPS etc. These SDK's are nothing but ready code libraries which enable a developer to just call the particular function he wants to execute from the SDK to implement according to his own wish. For example in our project we will use the GPS functionality from the SDK and call it to get GPS coordinates to send the location to the relatives. In Titanium Android Development is done on using JavaScript, which is a scripting Language and the Titanium API. Titanium API helps us developing Android applications using the SDK and the JavaScript code that we develop with ease, you can say it just acts as a communicator between the Android SDK and JavaScript that we develop. Thus Titanium helps us in developing Native android apps. Our system has two main functions: Emergency alarm and healthcare management.

Emergency alarm system can be triggered manually or automatically when the unexpected event happens, for instance, the myocardial infarction. The alarm action will send emergency messages and calls to the user's family and the doctors. And the emergency message can include the location information, in order for the rescue staff to locate the user.

## II. METHODOLOGY

Disadvantages of existing system:

- Unable to get exact location of accident.
- Unable to get nearest hospital and clinic.
- Unable to notify urgently to hospital and clinic.
- GPS modules are highly costly.
- Time consuming
- Proposed System:
- Existing System:



Fig. 1: Existing System

We are trying to automate the help process, i.e. we don't need to call someone, suppose we are facing a critical situation, where in we are not able to call someone, like we will have to search their number, and also have to wait for the other person to pick up the call and respond. Hence in order to avoid this hassle for the person facing emergency we are developing this system.

The whole methodology is shown in Figure below:

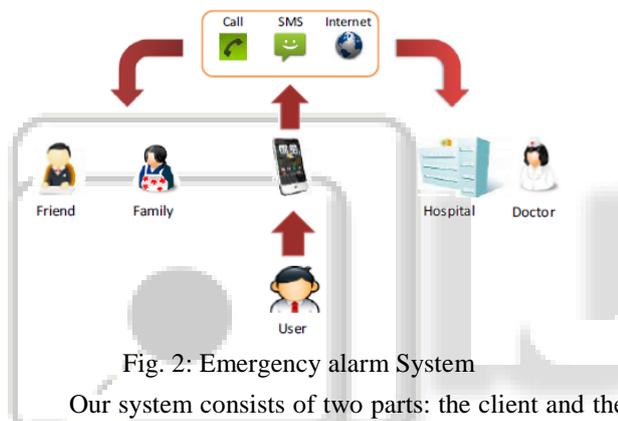


Fig. 2: Emergency alarm System

Our system consists of two parts: the client and the server. The client is deployed on an android-based cell phone. There are two parts:

1. The emergency alarm.
2. Healthcare management system.

Both the two are android applications.

Initially the client i.e. patient will have to login for the first time by providing his/her user-id, password, name and mobile number. After creating the account, user must provide details of friends and family members i.e. their respective name and mobile number to whom the message must be sent during an emergency.

Then the user can enter symptoms as and when required and ask for prescription, for instance, if the user is suffering from fever then user may enter symptom as fever and must provide description for that like headache, nausea and so on. Based on the symptom details, user would get prescription from the doctor. User can also go through the tips that are provided by the doctor.

In case of utter emergency like myocardial infarction or in case of accident, emergency button would send emergency message to doctor and all the contact numbers that were entered by the user initially. This emergency message would also contain user's location so that an immediate help would be provided to the user.

The system also includes life reminder part which is especially useful for old people. The life reminder part will notify the user to take medicine at appropriate timing. The server is deployed on a computer, which may be located in a hospital, and be operated by a doctor. It also contains two subsystems:

- 1) The emergency alarm
- 2) The healthcare management system.

The healthcare management system contains the receive user medical information module and the push prescription module.

In the receive user medical information module, the doctor can go through the patient's treated by him/her previously and provide prescription if needed. The doctor also gets a message if new patient has asked for prescription. The doctor goes through the symptoms provided by the patient and provides appropriate prescription through push prescription module.

The doctor can also provide tips and set life reminder for particular patients. The doctor sets the time as in when the user must take medicine and at that time the user will get the notification regarding which medicine must be taken.

### III. IMPLEMENTATION

Using Titanium Appcelerator SDK we are going to create interface to send information about person and his location to our server. With the help of the GPS and GSM network, the system can make sure the location of the users when they are in trouble and trigger the alarm

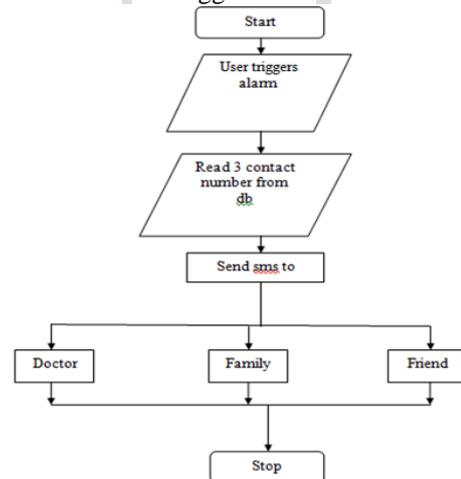


Fig. 3: Emergency Alarm System Flow Chart

Using location information sent from users android device our system will try to find nearest hospitals around that location and system will send SMS to the nearest hospital. After this system will try to find nearest clinic and send information about accident through SMS. Our System will send the location details to doctor, friends and relatives for quick response for help. The user can take online medical to send their physical condition and then get prescription from doctor who will send the prescription on the user's phone. After that the life reminder system can remind the user to take medical on time and so on.

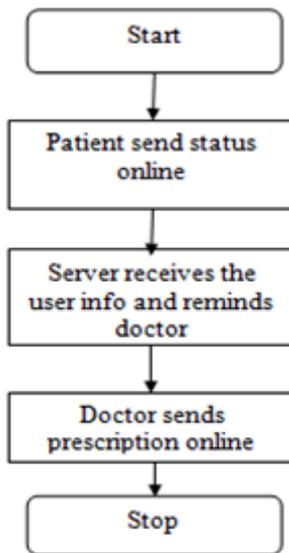


Fig. 4: Flow chart of healthcare management system

Once the patient sends the symptom details through mobile device, the server would receive information and send it to the available doctor. Doctor goes through the symptoms and provides prescription. If the patient is not provided any prescription then that patient would be marked as pending on the doctor's side.

Following are the Modules

A. For Doctor's (web application)

- 1) Login Form.
- 2) Home Page.
- 3) Settings.

Web Application for Doctor:

Login Form:

Every Doctor has to first login with his/her registered username or E-mail ID and password.

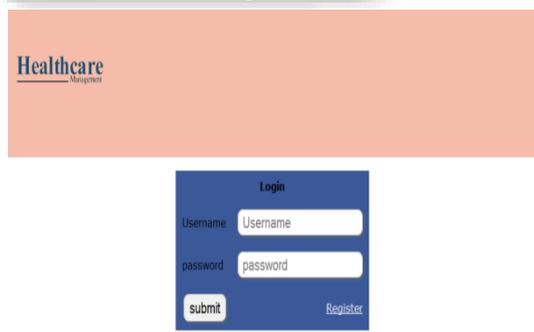


Fig. 5: Login Form

Home Page:

After successful login, the doctor will be able to view patient's which were treated previously and the patient's which are to be treated. The patient who have asked for prescription but have not received it would appear as pending in the prescriptions pending module. The doctor can send life reminder to chronic patient regarding which medicine must be taken at particular time and can also provide tips to the patient.

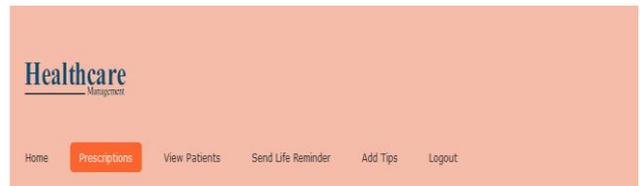


Fig. 6: Server side interface (prescription)

B. For Patient's (Android Application):

Login Form:

There is one time login form for patient on his android mobile. Patient has to enter his/her username, password, name and mobile number for first time login.

Home screen:

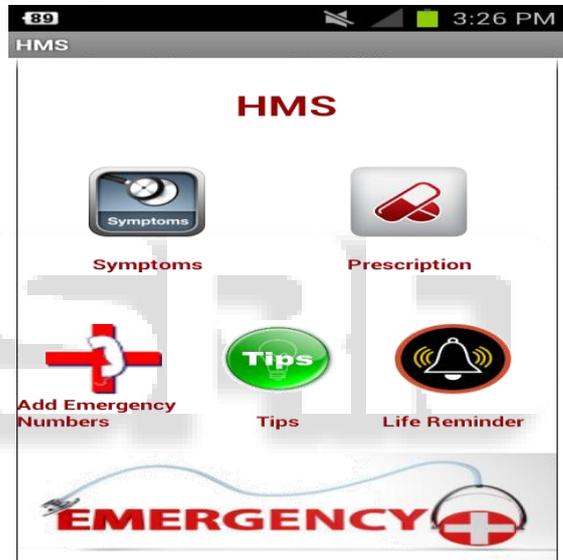


Fig. 7: Home Screen Interface (patient)

1) Emergency Numbers- User can add friends and family details for informing them when they are in trouble. In this module user can see all contacts stored, add any new contact, delete any contact and even can update it.

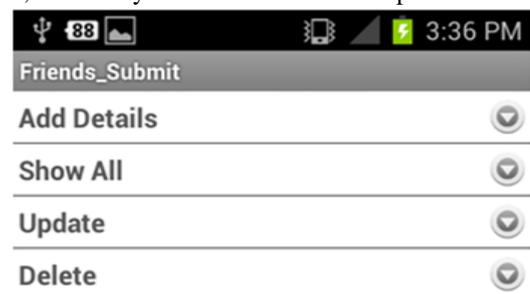


Fig. 8: Submit Details Interface

2) Emergency Alarm

Emergency alarm system is employed for user to make an emergency alarm at some emergent occasions. Whenever there is a click on emergency button, an emergency message will be send to doctor and all the contact numbers present in

emergency number module. With the help of user location, an immediate rescue help could be provided to the user.

### 3) Symptoms:

In symptoms module user can add the symptoms of disease suffering from and can add details of that symptom.

```
Public class Symptoms {
String username;
String symptoms_title;
String symptoms_details;
String type;
}
```

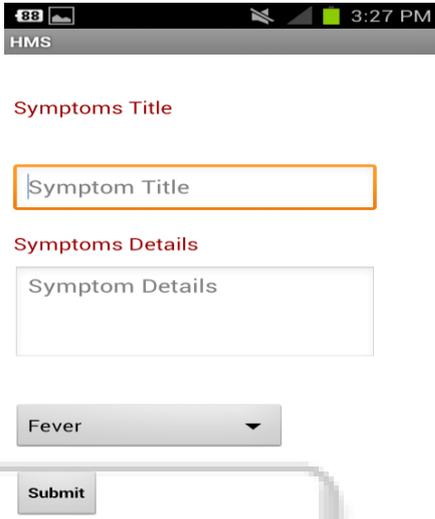


Fig. 9: Symptoms Interface

### 4) Life remainder:

The life reminder function that is one of the healthcare management's functions can help user to remind when to have medicines and some other things which we often call as doctor prescriptions.

```
Public class Prescription {
String med_name;
String med_disc;
String doctor;
Date [] when;
Int [] count;
String comment;
intvali_days;
}
```

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### CONCLUSION

We thus present an android-based emergency alarm and healthcare management system, which is practically deployed on android-based phones. The system can give emergency help at anywhere and anytime, can remind user for medicines on time

Response by the doctor's prescription, and can provide the function of seeing a doctor to the user.

### REFERENCES

- [1] Moncrieff S., Venkatesh S., West G., A Framework for the design of privacy preserving pervasive healthcare, Multimedia and Expo, 2009.ICME 2009.
- [2] Armstrong, N. , Nugent C.D. , Moore G. ,Finlay D.D. , Developing smartphone applications for people with Alzheimer's disease, Information Technology and Applications in Biomedicine (ITAB), 2010 10th IEEE International Conference on, 3-5 Nov. 2010
- [3] JSON, <http://www.json.org/>
- [4] Shin, S.C. ; Ryu, C.Y. ; Kang, J.H. ; Nam, S.H. ; Song, Y.S. ; Lim, T.G. ; Lee, J.W. ; Park, D.G. ; Kim, S.H. ; Kim, Y.T. ; Realization of an e-Health System to Perceive Emergency Situations, Engineering in Medicine and Biology Society, 2004.
- [5] UpkarVarshney, Pervasive Healthcare and Wireless Health Monitoring, Mobile Networks And Applications, Volume 12, Numbers 2-3, 113-127
- [6] Hernandez Munoz, L.U.; Woolley, S.I.; Baber, C.; A mobile health device to help people with severe allergies, Pervasive Computing Technologies for Healthcare, 2008.
- [7] Doukas, C.; Pliakas, T.; Maglogiannis, I.; Mobile healthcare information management utilizing Cloud Computing and Android OS, Engineering in Medicine and Biology Society (EMBC), 2010 Annual International Conference of the IEEE
- [8] Munoz, L.U.H.; Woolley, S.I.; A user-centered mobile health device to manage life-threatening anaphylactic allergies and provide support in allergic reactions, Information Technology and Applications in Biomedicine, 2009.
- [9] HairongYan ;HongweiHuo ; YouzhiXu ; Gidlund, M. ; Wireless sensor network based E-health system, implementation and experimental results, Consumer Electronics