

Digitalized Healthcare on Palm: An Android Application

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Abstract

Regardless of the age group, the health issues are increasing day by day because of the lifestyle of today's individual for coping up with fast pace. Thus every family pays an important attention to the healthcare of individual. Thus, it becomes a necessity for getting quick and efficient healthcare by using a digital medicine approach. The hospitals can follow this approach for providing immediate access to the services provided by them. These can be emergency alarm, video conferencing, online prescription, scheduling appointment, information about closest hospitals and diagnose systems. The application proposed here uses GPS/GSM networks for communicating and the application is deployed on android smart phones.

Keywords: GSM, digital medicine, GSM network, android system, emergency alarm.

I. INTRODUCTION

This paper aims to achieve transparency in conventional systems of health care for doctors and patients in terms of location transparency. It also leads to the reduction in manual documentation work at the counters of various healthcare units. When dealing in sensitive domain, data is needed to be handled securely. Hence, various security levels are considered. The application also demanded quick data transmission and data in an interface which is user friendly.

A. Existing System:

The existing healthcare system primarily requires physical presence of doctor and patient for every consultation. The chances of errors lead to confusion of data in many cases. It leads to increased consumption of time and is hectic. The traditional management systems have gone outdated because the number of patients are

increasing day by day in health care places. Thus, this leads to develop a health care management system which is advanced.

Existing system's drawbacks:

- No transparency of location for doctors and patients.
- Hospitals and doctors fail to pass emergency notification.
- Correct location of accident cannot be obtained.
- Location of nearest clinics and hospitals remains unknown.
- The clinics and hospitals fail to get emergency notification.
- Patients fail to get immediate ambulance or appointment.
- Tons of paper work is done and it also consumes lot of time.

B. Proposed System:

There are two parts of this system: A client and a server. An individual using a cell phone based on android deploys the client. It has following two parts: an emergency alarm and a system of healthcare management. One of the computer deploys a server which can be located anywhere in a hospital and a doctor operates it. Whenever any user is in a medical trouble then the location can be tracked by using GPS or GSM network. The user gets the information about all the nearby hospitals and an emergency alarm is triggered. The emergency measures are taken for rescuing the user as soon as the alarm messages are received by family and doctor. The GSM/GPS technology is used by the system for communication. The information of time and location anywhere on earth in any weather is provided by a GNSS based “Global Positioning System (GPS)”. GNSS stands for “global navigation satellite system”. In the situation of consultation during follow up, doctors and patients are not physically required in most of the situations as messages are forwarded to “short message service centre (SMSC)” for providing “store and forward mechanism”. Our system can employ video conferencing for follow up on consultations efficiently. Information can be exchanged via loop whenever any patient is transferred to a city hospital from rural area through video conferencing. The module of video conferencing in the proposed system adopts Sinch open source.

The features of video calling can be easily added to mobile/web based applications by using Sinch SDK. The health records are managed securely during transmission and storage by this system. The medical reports are encrypted/decrypted by using AES algorithms. The data is encrypted by AES because it uses single key for the encryption and decryption of a message and both the receiver and sender must be aware of the private key used. This system aims at providing medical prescriptions online, checking the nearest diagnostic

centers/doctors/hospitals/ambulance/appointment. A communication network using GSM/GPS helps in providing these services. The following advantages are proposed by this system: video conferencing between doctor-doctor and patient-doctor, emergency alarms during accident or severe medical situations, online availability of medical prescription, safe transfer of medical reports between patient-doctor and doctor-doctor.

II. FLOWCHART OF A SYSTEM

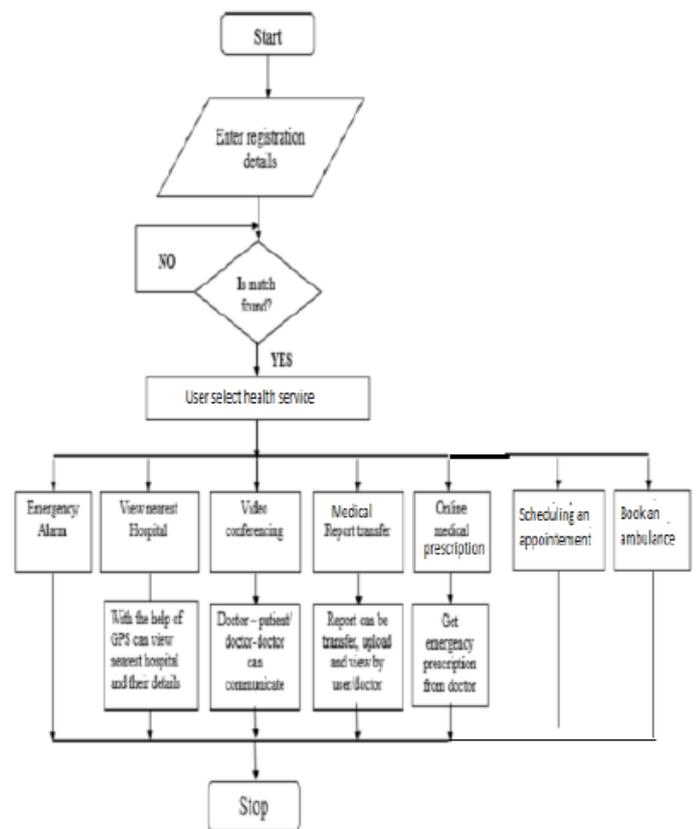


Fig. 1 Workflow of a system

III. IMPLEMENTATION

A. Video Conference Call

The doctor can be consulted by using this video call module for follow up on consultation. Also a patient’s medical history can be exchanged in a loop by this module only. “Sinch” is an open source application for providing video conferencing.

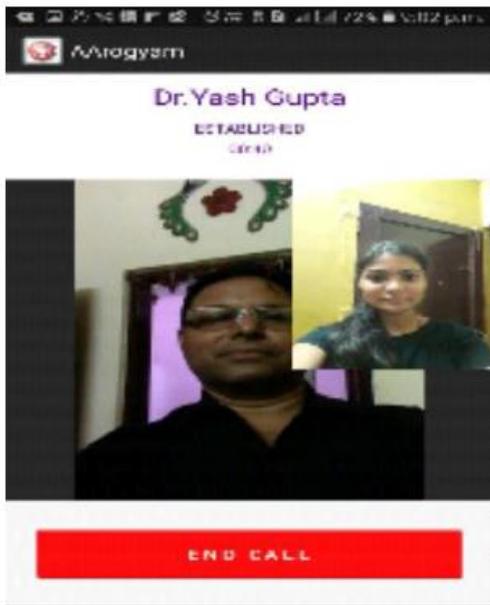


Fig. 2 Video Calling

B. Emergency Alarm:

Whenever an emergency medical condition arises such as accident or cardiac arrest, then it will lead to the triggering of emergency alarm system. The doctors and family of users receive emergency calls and messages from the alarm. It includes information of location for locating the user by a rescue staff.



Fig. 3 Emergency Alarm

C. Viewing Nearest hospital

The location of a user can be tracked by GSM and GPS networks and information about nearby

hospitals will be displayed in front of the user when the name of particular hospital is clicked.

D. Medical Report Transfer

While consulting with doctors, medical reports can be uploaded by the patients. During follow up session with patients, these reports can be revised by the doctors. In an encrypted form, transfer of these reports from one system to another system is done. The confidentiality of report of a user is protected by AES algorithm. The doctor can view such uploaded medical reports for further treatment of a patient.



Fig. 4 Transfer of report

E. Online Prescription

The users can receive online prescriptions from doctor after consultation through video conferencing. This prescription contains the details of the medicines such as names, frequency and intake time.

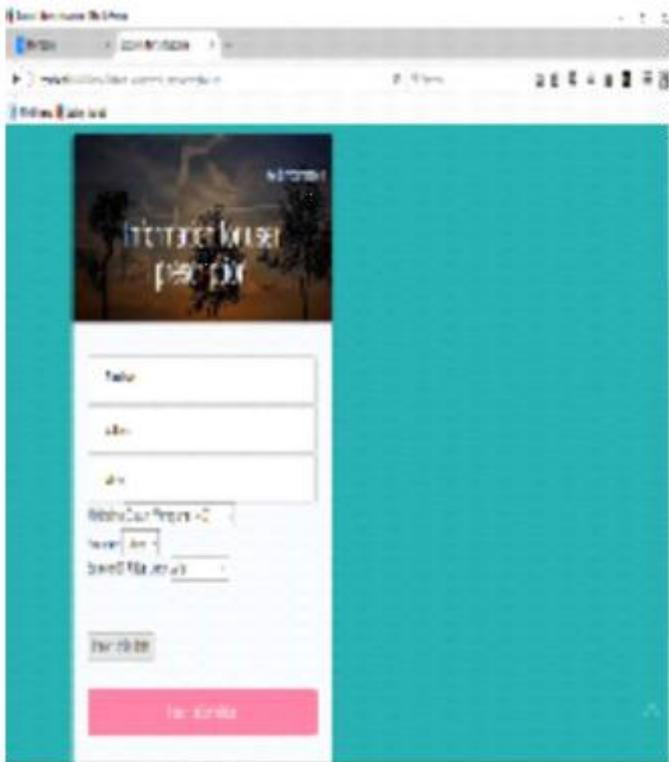


Fig. 5 Online Medical Prescription

IV. CONCLUSION

This paper develops an efficient and user friendly healthcare application for reporting and communication. Every individual can have healthcare app on their mobile phones and different hospitals can be interlinked through cloud server and this mobile app will be installed in cell phones. The security parameters will be increased by adopting adequate steps of security. The further improvements can be made in the application for making it user friendly.

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