

DOMAIN SPECIFIC TRACKING FOR OPTIMAL HOSPITAL ON CLOUD IN EMS USING ANDROID OS

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Abstract : This paper proposes Android Based Tracking for EMS (Emergency Medical Services) on cloud, that directs the emergency patients to most nearest and appropriate hospital for his emergency in an unknown area. It also describes a mobile system that enables electronic healthcare data storage, update and retrieval using Cloud Computing. It is observed that people in unknown area are in severe danger if they didn't able to find hospital quickly. In emergency case a single minute counts. So it is very important that automatic applications must be used for decision making, Maintain up to date status of the hospital and saving the time which can save life of the patient. The proposed system locates nearest available hospital, contacts its ambulance emergency system, accesses a Electronic Health Record of emergency patient that can critically assist in pre-hospital treatments. The system will identify availability of the nearest available specialized hospital all through EMS server which provides continuous information about the incoming patient to the hospital.

Keywords –Emergency Medical Service, Hospital Tracking, Electronic Health Record, Architectural Model.

I. INTRODUCTION

With the growing social pressure, most people are facing with health problems 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.

This System provides various features to the user of the system and the Hospital. In case of an emergency, the system finds the optimal route for the nearby hospital give them alert with the location of the patient. The system provides different features to users and hospital. The user can find the optimal route to the specific hospital it will also give detail about hospital facilities so that user has the prior knowledge of the hospital e.g. beds available, number of Doctors available with their specialization. The system will also maintain Health record and prescription given to the user. For hospital's perspective, the system will provide all health related information of patients with prescription to the hospital. Unlike, other healthcare systems this is useful and helpful for the senior people and chronic patients to give alert in case of emergency by alarming to nearby hospital while the other systems are separated from the emergency alarm system, so 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. The cell phone is convenient to carry. As People always carry a cell phone with them, in case of emergency people can trigger an alarm and can get emergency service irrespective of the location familiar to them or not, anywhere and anytime. User can make a phone call to their friends and family, and with the help of GPS chip, their location can be acquired. For this application, Android Phone has been chosen as a platform. Android is a mobile operating system initially developed by Google. Android is an open source system, so we can modify it to fulfill the specific needs by changing or rewriting the source code.

1.1 Objective

The main objective of this application is to provide quick emergency service to the patient in a case of emergency independent of his/her location on a click of a button as well as it also provide all health related information including medicinal prescription related with the person to the hospital, for this

- The system will maintain the health record of the user.
- Make sure the location of the user .
- Find the optimal path to the hospital.
- Maintain up to date status of the hospital.

II. RELATED WORK

Jinzhao Liu[1] give the idea about an emergency alarm and healthcare management system, which is mainly deployed in an android-based phone that is convenient to use and carry. 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 center. But the disadvantage of such systems is getting out of the coverage of the gateway, the system won't work anymore. 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. 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.

Li-Linchen[2]give the idea of particular Taiwan country . Taiwan has steep landforms. Forest workers, farmers in mountainous areas and tourists visiting have experienced injury or sudden health conditions in mountainous areas; however, because of inconvenient transport or traffic controls, some of the injured people could not reach hospitals promptly, eventually dying. To reduce the time required for people in rural areas to reach emergency care services and prevent the above tragedies, an "Emergency Medical Service Support System for Patients in Rural Areas" was developed. This system aimed at supporting the current emergency and rescue command center. In this paper author has discussed how the Emergency support center used for data entry, mapping, and confirmation. This system contains five subsystems; the systems of the emergency support center, emergency departments, and ambulances are conducted on computers installed with a program designed. The systems for the patient side and the traffic control center were designed with a cell phone interface as an Android application.

Ajit Kumar [3] conducted a study to give the idea of in-Hospital and pre-hospital subsystem .In this paper, Ajit Kumar have considered variables about nearest hospital for emergency patients (like Service radius of responsibility for station ,All of the hospital in the service radius, Average travel time from accident place to hospital ,Average survival rate of the Emergency Room in hospital ,Average waiting time of the Emergency Room in hospital ,The maximum patient number that Emergency Room can handle ,The number of patients who is already in the Emergency Room)

[4]Cloud Computing provides functionality for managing information data in a distributed, ubiquitous and pervasive manner supporting several platforms, systems and applications.Thomas Pliakas presents the implementation of a mobile system that enables electronic healthcare data storage, update and retrieval using Cloud Computing. A number of Cloud Computing platforms are already available for pervasive management of user data, either free (e.g., iCloud [19] and DropBox [15]) or commercial (e.g. Amazon AWS [14]). The majority of them however, do not provide to developers, the ability to create their own applications and incorporate Cloud Computing functionality, apart from Amazon AWS.

[5]The author Nam Joon Park gives an idea about questionnaire system.The purpose of questionnaire system is to gathering information from a target population by employing Expert System techniques. The questionnaire system focused on ubiquitous questionnaires. Author describes Mobile Healthcare Questionnaire Service Framework .Framework focuses on providing mobile healthcare questionnaire service to users and users can access the questionnaire services and check their health status at any time and at anywhere via mobile devices with the support of Web technologies. Framework is not designed just for the delivery of a single health index for a disease. If necessary, it can deliver rich information on the health status of users.

III. PROPOSED SYSTEM

3.1 Research Methodology

Huge database will be maintained of all the hospitals, Clinic and Blood bank over the server. So proper data mining will be beneficial to track out the optimal hospital in emergency case. The User or Patient will first register to the application and his data will be saved over the cloud. Proposed system of Domain Specific Tracking For Optimal hospital On Cloud In EMS Using Android OS is using A* algorithm for find the nearest route. A* uses heuristic approach to find nearest node within different cluster. The alarm action will send emergency messages and calls to the users nearby hospital, the emergency message will include the location information, in order for the rescue staff to locate the user and health record of the patient. User authentication is done according to the role based access control. A new user has to register him-self for accessing the content of our system. Registered user logins with the registered username and password. Using the information over the server EHR of the patient will be automatically generated and forwarded to the selected hospital for pre-medical treatment. We will maintain data of clinic and blood bank over the server. This will be used as a extra service to find clinic in city for particular specialty (e.g. Gynecologist, Eye Specialist, Dentist) and also find blood bank. User will fill his or her personal and medical details while registration which will be user to generate Electronic Health Record (EHR). The OHT (Optimal Hospital Tracking) system track out the optimal hospital for the patient using the variables.

- Type of Emergency(e.g. Heart Attack, Paralysis, Accident)
- Availability of Doctor
- Distance from the patient.

3.2 System Architecture

Client Side and Server Side

Client Side

- Graphics User Interface of Electronic Health Record for filling personal and medical information on cloud.
- Graphics User Interface for editing the information and updating it on server.
- Emergency will be selected i.e. accident, heart attack, burn case etc. and send it to server.
- Also contains some user useful services like Tracking Blood Bank and Clinic Module

Server Side

- Then client accepting request, server gets activated and searches out nearest hospital.
- It tracks out location of patient.
- It fetches the coordinates and type of emergency from client.
- Search Nearest hospital depending upon variables.
- Add the all hospital information into database which is present on cloud and update it regularly.
- Generate EHR of patient by pressing the emergency button of phone in case of emergency and send it to selected hospital for pre-medical treatments.

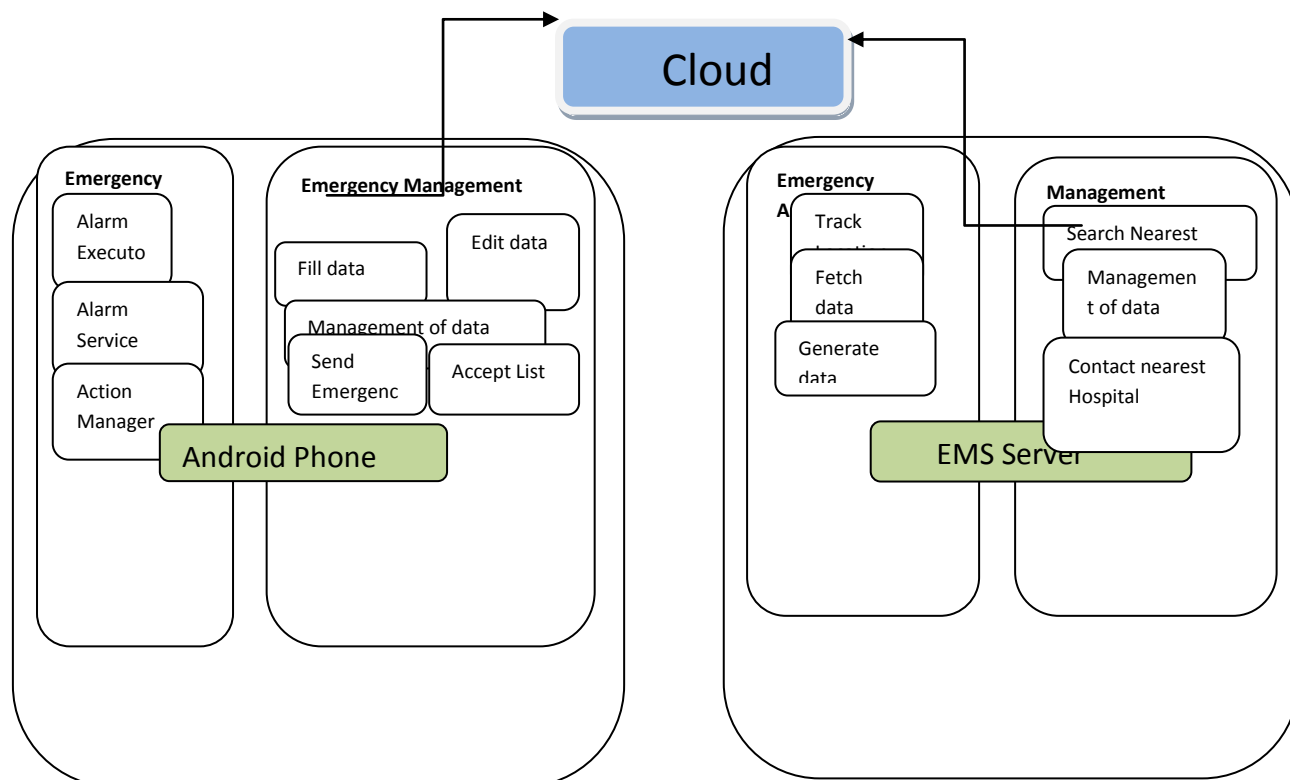


Fig.3.2 System Architecture

IV. CONCLUSION

Electronic Health Record is a key factor playing an important role towards the successful adoption of mobile healthcare systems. EHR serves the chronic patients with more convenience and safety by providing medical details of patient for premedical treatments. EHR can be also used by people to keep and maintain their health record on cloud for convenience and safety and future work is Implement Nearest Distance Tracking Algorithm, Tracking Different Parameter like Blood module, Clinic Module. Hospital Information Maintenance and database update, Deployment on Cloud Improve the Graphics User Interface.

References

- [1]Yuanyuan Du, Yu Chen, Dan Wang, Jinzhao Liu, Yongqiang Lu," An Android-Based Emergency Alarm and Healthcare Management System" 978-1- 61284-704-7/11/\$26.00 ©2011IEEE.
- [2]Li-Linchen," An Emergency Medical Service Support System For Patients In Rural Areas - An Example From Taiwan" *Proceedings of the 2012 International Conference on Machine Learning and Cybernetics, Xian, 15-17 July, 2012.*
- [3]Hsiao-Hsien Rau, Chien-Yeh Hsu, Ajit Kumar, Ni-Chun Hung," Identification Of Variables To Decide Optimal Hospital For Emergency Patients" 978-1-4244-9666-2/11/\$26.00 ©2011 IEEE.
- [4] Inkyung Sung Taesik Lee," Modeling Requirements For An Emergency Medical Service System Design Evaluator" *Proceedings of the 2012 Winter Simulation Conference C. Laroque, J. Himmelspach, R. Pasupathy, O. Rose, and A.M. Uhrmacher.*
- [5] Abdelmajid Khelil," Pa2Pa: Patient to Patient Communication for Emergency Response Support" *2011 IEEE 13th international conference on E-Health networking, Application and services.*
- [6]Charalampos Doukas, Thomas Pliakas, and Ilias Maglogiannis," Mobile Healthcare Information Management utilizing Cloud Computing and Android OS" *32nd Annual International Conference of the IEEE EMBS Buenos Aires, Argentina, August 31 - September 4, 2010.*
- [7]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" *2010 10th IEEE International Conference on, 3-5 Nov. 2010.*

[8]I. Martínez, J. Escayola, M. Martínez-Espronedada, L. Serrano, "Implementation Experiences of ISO/IEEE11073 standard Applied to New Use Cases for e-Health Environments" *978-1-4244-3296-7/09/\$25.00 ©2009 IEEE*.

[9] G. Valenzise, G. Prandi, M. Tagliasacchi, A. Sarti, "Resource Constrained Efficient Acoustic Source Localization And Tracking Using A Distributed Network Of Microphones" *1-4244-1484-9/08/\$25.00 ©2008 IEEE*.

[10] Mingding Han, Ghasem Naddafzadeh Shirazi, Peijie Wang, Chen Khong Tham," Mobile Target Tracking for Healthcare Applications: Trade-off between Accuracy and Energy" *978-1-4244-2281-4/08/\$25.00_c 2008 IEEE*.

[11]Nam Joon Park, Minkyu Lee, Dong-Soo Han, "A Mobile Healthcare Questionnaire Service Framework Using Composite Web Services" *978-1-4244-2281-4/08/\$25.00_c 2008 IEEE*.

[12]David M. Ferrin Diana L. McBroom," Maximizing Hospital Finanacial Impact And Emergency Department Throughput With Simulation" *1-4244-1306-0/07/\$25.00 ©2007 IEEE*.

[13] Brian R. L'Heureux, Michael J. McHugh, Benjamin D. Privett, Robert Kinicki and Emmanuel Agu," A Campus-Wide Mobile EMS Information Management System" *Proceedings of the Fourth Annual IEEE International Conference on Pervasive Computing and Communications Workshops (PERCOMW'06) 0-7695-2520-2/06 \$20.00 © 2006 IEEE*.

[14] Amazon Web Services (AWS), <http://aws.amazon.com>.

[15] DropBox, <https://www.dropbox.com>.

[16]Michael L. Popovich, Joseph M. Henderson, John Stinn,"Information Technology in the Age of Emergency Public Health Response" *0739-5175/02/\$17.00©2002IEEE*.

[17]Upkar Varshney, "Pervasive Healthcare", *IEEE Computer Magazine*vol 36, no. 12, 2003, pp. 138-140.

[18]Android, <http://www.android.com>.

[19]iCloud, <http://www.icloud>.