

Implementaion Of Patient Monitoring With Android Based Smartphone

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ABSTRACT:*The recent popularity of android mobile influenced us to develop an android application to monitor the patient health through various wireless medical sensor devices. In the earlier case the history of the patient cannot be displayed, only current data is displayed. In this article we enhance an application to monitor heartbeat and temperature of a person and guide him/her for a treatment, and to aid the person through providing a record of hospitals of nearest locations and by way of giving health hints consistent with the threshold values. We also provide the ability of sensible-key voice recording as good as alarms. Uniqueness of our approach is it handles more than one patient at a time. We design a approach which is equipped to send the important data to administrator through SMS. Our proposed thought is used to furnish a greater understanding of wi-fi sensing gadgets and their interfaces to the android mobile.*

Index Terms— Microcontroller, Sensors, , Bluetooth, Transmitter and Receiver, Buzzer, Bluetooth API

I. INTRODUCTION

Tele-health and telemedicine are now becoming more engrained in the delivery of everyday health care, distance education and also health care administration. Lots of patients in underserved areas are receiving services that may not have otherwise received without travelling great distance or overcoming other transportation barriers. The services provided through telemedicine range from primary health care to the highly specialised care found in leading academic medical centres. Services are provided across the spectrum, from the youngest, of patients to the fragile elderly. Tele-health systems have many applications in hospitals, clinics, nursing homes, rehabilitation hospitals, homes assisted living facilities, schools, prisons, or health departments. Tele-healthcare may be defined as the use of information technology to provide healthcare services at a distance. It includes anything like medical services at the inpatient or at the outpatient stage. What the doctors actually would like to see is constant monitoring of the vital

parameters so they always know what the history is and how big the change from yesterday to today. Early detection

and analysis of potentially deadly physiological conditions corresponding to heart attack require steady monitoring of patients health following switch from health facility to dwelling. Experiences have proven that 30% of patients with a discharge diagnosis of heart failure are readmitted as a minimum once within 90 days with readmission premiums ranging from 25 to 54% inside 3–6 months. In line with these forms of needs, residence situated wellness monitoring systems are being proposed as a low price solution. Any such approach contains physiological data that retailers, method and keep up a correspondence by way of a neighborhood manner akin to smartphones, personal desktops. Such techniques will have to fulfill strict security, safety, reliability, and long term real-time operation specifications. today be and when you have these findings and have these data points available, then a much earlier intervention can happen for a patient. Telemedicine can be extremely advantageous for people living in isolated communities and remote regions. It is currently being applied in almost all medical domains. Patients who live in such areas can be seen by a doctor or specialist, who can provide a precise and complete examination, so that the patient need not travel the normal distances like those from conventional hospitals. New developments in mobile collaboration technology with the use of hand-held mobile devices allow healthcare professionals the ability to view, discuss and assess patient issues. Telemedicine is being used as a teaching tool, by which experienced medical staff can observe, show and instruct medical staff in another location using more resourceful and faster examination techniques. It improved access to healthcare for patients in remote locations. Telemedicine reduces the cost of healthcare and as well as increase the efficiency through better supervision of diseases, shared health professional staffing, and reduced travel times.

The Telemedicine system comprises of hardware and software at both the patient and consultant doctor ends, with some of the Diagnostic Equipments and pathology microscope or camera provided at the patient end. Through a Telemedicine system consisting of

simple computer with necessary communication systems, the medical images as well as other information of the patients can be sent to the consultant doctors, through the satellite link in the form of digital data packets. For the purpose of reception of these data packets the usage of hand held devices such as the cell phone has been recognized since the day it has become commercially available at every household. These packets are received at the doctor's end and the data is reconstructed so that the consultant doctor can study the information, do the diagnosis, interact with the patient and put forward the appropriate treatment. Telemedicine facility together with technological advances in communication facilitates the specialist doctor and the patient, separated by thousands of kilometres to see and talk to each other.

II. LITERATURE SURVEY

The authors Suhas Ranganath-Mahesh K. Banavar Photini Spanias Deepta Rajan, Andreas Spanias et al, [1] describes, Android Java-DSP (AJDSP) as a mobile utility that interfaces with sensors and allows for simulation. This additionally helped in visualization of signal processing. In this process firstly there is production of interface between both external sensors and on-board device sensors for monitoring the physiological parameter of individual. This paper additionally explored the trend of mobile sensing and tailored it closer to making improvements to digital signal processing (DSP), through building interfaces to scientific sensor and outside sensors. In this paper there's use of SHIMMER. It's a small wireless low-power sensor platform that may record and transmit physiological (health related like ECG) and kinematic data in realtime. The demerit of this method is that its job is to monitor the patient which got admitted in the hospital, where it uses only low power sensor.

Kenny T.H. Chieng Dr. Lee JerVui, Chuah Yea-Dat et al, [2] considers or takes into consideration exact data, which might be heart attack and stroke as they are the principal cause of hospitalization of the elder people. There is extra probabilities of survival if the older people will get the curing within an hour. SHEMS had additionally been developed. An android smart phone with accelerometer is used to become aware of a fall of the carrier, and this android gadget is referred to as healthcare gadget. The android mobile phone is then linked to the monitoring system by means of making use of the TCP/IP protocol through WiFi. Considering of this procedure, aged and chronically in poor health sufferers

can keep independently in their possess home and secure within the abilities that they're being monitored. The problem of this approach is that it only considers elder persons as there's more chances of unexpected (emergency challenge) outbreak in them like heart attack and stroke.

Byungkook Jeon, Jundong Lee, Jaehong Choi et al, [3] describes the design and implementation part of wearable ECG with the smartphone for the real time monitoring of health. In this method sensible shirt are developed with ECG sensors and may also be worn with the aid of any type of patient for monitoring his or her health in realtime and get required remedy or prescription. These techniques are commonly developed due to the fact elder persons in intellect as they reside on their own in their houses. Thus this method noticeably monitors the elderly people for self prognosis intent. The outcome of this system used to be the method would display and diagnose patient's heart conditions in real time, after they wear a physical sports-shirt with a ECG sensor in it. Additionally to this, the method also provides graphical understanding with historical past management instruments and an automatic emergency call approach to the patient to get the specified remedy in time. The challenge of the process is that it most effectively concentrates on elder people and it entails shirt (ECG sensor) for carrying which price quite a bit.

Yedu Manmadhan Anand V. R. M. J. Jayashree Sherin Sebastian, Neethu Rachel Jacob et al, [4] developed the image based system which acquires the ECG signal by way of digital camera; this data is performed on the tool like MATLAB and information sending by way of the internet network and saved in database. Then the original image is then available to the general practitioner via Android mobiles. The reason of this system is the critical signs and parameters from the ICU monitoring process and makes this data to be available to the health care provider who might not be in the clinic and in the country. In case of any abnormality, the healthcare professional is alerted by means of sending a notification from C2DM server to his mobile. The challenge of this paper is that, as a result of the gradual internet connection the data might not be sent to the health practitioner which is located remotely. The photo is captured by means of the camera, which have to be HD which price quite a bit.

Naji HR Aminian M. A. et al, [5] in their findings they suggested that there is continuous statement of the patient's physiological parameters reminiscent of

bloodpressure of patient as good as coronary heart expense. This procedure is customarily valuable for pregnant ladies to measure thequite a lot of parameters like blood pressure, heart beat and fatal action to control the health dilemma. Thissystem has to monitoring a couple of patient at a time and comfortably equipped to sense the blood pressure (BP) and heart rate of the patient's. In this method, there is a sensor node attached to physique of patient tomeasure sigmals from the wi-fi sensors and sends these signal to the database. This system can noticethe abnormal conditions of the patient, elevate an alarm to the patient and sends a SMS/e-mail to the surgeonfor treatment. The essential skills of this system is to broaden the freedom for reinforcing patient'squality of life. The demerit of this procedure is that on this the patients have got to get admitted in the hospitalfor continuous monitoring of the patient physiological parameters.This WSN gets complicated if quantity of patient is admitted hospital past the targeted limit.

III. PROPOSED FRAMEWORK

The proposed diagram in Fig.1 describes an overview of the approach. Process is working as follows- The ECG monitor Hardware displays the heart beat price (per min) via heartbeat sensor and temperature through Temperature sensor [3, 7]. It gives signal to the system when values are going below threshold. The signal goes through the ADC channel which is attached to the Microcontroller Board. When user sends alarm, it goes by way of Buffer and Drivers.

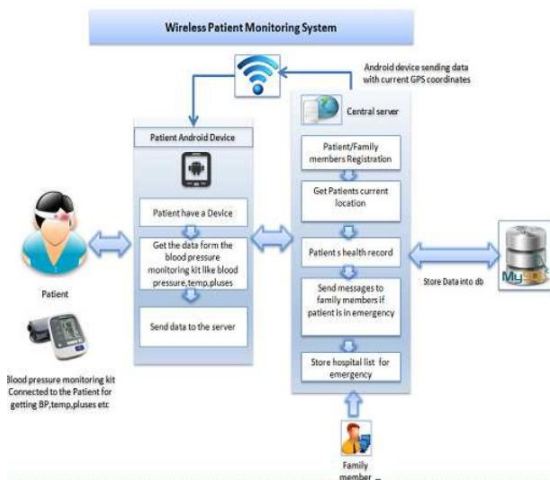


Fig.1. Architecture diagram

It is connected to the Microcontroller Board and Microcontroller Board is attached to the personal

computer. PC maintains a patient Log which means it maintains a whole log of patients in the type of power database or documents. The computer can be connected to the Bluetooth by way of USB/Serial Interface. The user can send or acquire data to/from the approach via Bluetooth.

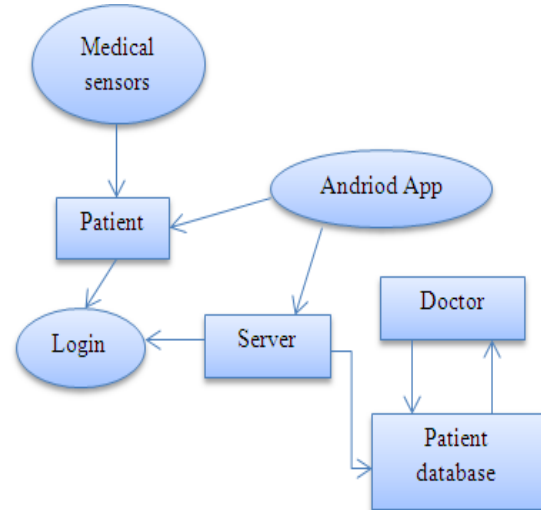


Fig.2.Functional Diagram

As shown in Fig.2 user can contribute in various functions like login in method, create interface with hardware devices and android smartphone, patient offers the physiological parameters from scientific sensor instruments in the form of heartbeat, temperature and receive output to take suitable measure. Admin of our process can make choice of best threshold values for the system. Sensor devices are used to actual measurement of quite a lot of parameters of the users like temperature, heart beat. Prescription is given by the health practitioner. If users undergo irregular condition then raises alarm and provide record of nearest hospitals. patient's data and hospitals data stored in database for future use.

Server

The mobile phone retailers recorded data in a SQLite database [8]. This is wanted on account that itwill not be quintessential that there'll normally be a network to be had to forward the biomedical data tothe server. For the database on the server part, MySQL was chosen over SQLite as databaseadministration procedure. Additional consistency stipulations can be defined onthe database layer. Server part will have to also provide a option to present the collected data to thehealthcare specialists. [9] Server helps one of a kind services in real-time to the customers. Itconsistently receives the processed data

from the computer and stores it in a database. It setups internet utility Server for distinct customers corresponding to physicians and medical centre to havereal-time and continuous access to patients'svital sign's through internet [10].



Fig.3 Application1

As shown in fig.3 An attempt will request some data from the server to show these to the user or send data supplied via the user, to the server. A service, just like the network service, will in particular send data to the server. To achieve this, the components can use the network adapter. It allows for the person to register an account on the web application utility from the mobile phone and also allows for the doctor to see the patient detail on mobile phone.

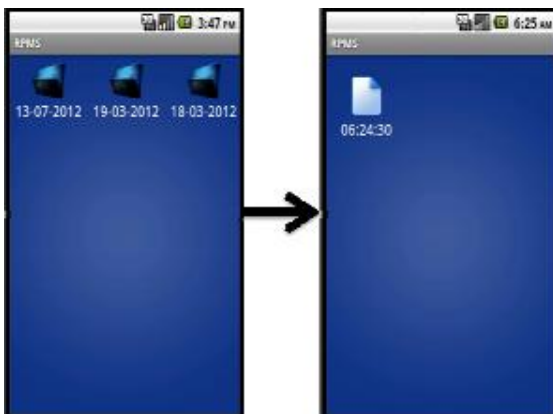


Fig.4 Application2

Android market must be installed in the system and the user should be logged into the android market through his Google account. The account ID and password must be used to register into the C2DM server. When registered, each device is provided with a unique ID. This ID is given

to the server for communication between the server and C2DM server.

IV. CONCLUSION

We have effectively learnt functional diagram and architecture of system and reliant upon this diagram we are scheming a system which will benefit in health monitoring using android mobiles. We are developing the user friendly application, the interface between user android devices, sensors and create interactive application for users health monitoring. etc. Moreover the system permits the doctor's advice to be given to patient's even if he is not present near the patient. As a summary, the presented monitoring system will be a cost effective, flexible and robust solution supportive a unique mobile based computational platform.

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BIODATA



Shekar Boddupally completed M.Tech VLSI System Design.



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