ANDROID ENABLED IoT FOR HEALTHCARE IN EMERGENCY

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Abstract- In the modern world, various applications are enormously increasing to help people to interact with their environment. The aim of this paper is to develop an android enabled IoT based application which preferably help the doctor to analyse the diseases using their mobile phone. Patient's health conditions are drastically taken care by today's wireless technologies along with medical staff and accessing patient's database. In this study, a new android enabled patient monitoring system is developed from a general idea to real time experience. This IoT application helping the patient to monitor the health condition like heart beat, temperature, etc. If any critical situation occurs, it will be notified to emergency unit like ambulance. Using this new device it is possible for medical staff to track patients' vital parameters. The conveniency of this application is ease and simple, also compact and cost effective.

Index Terms: Multiparameter Monitor System, Mobile Phone, Web server, Web database.

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I INTRODUCTION

Iot covers various applications and technologies including sensing, computing ,storing networking and controlling when all combine build social systems. IoT's capabilities are to connect object to object,device to machine ,patient to doctor,doctor to machine,moble to human and also from sensor to mobile. It brilliantly connects machinexs,dynamic devices,systems and mobile devices.Patient's healthcare monitoring system is a technique where a doctor can frequently monitor more than a single patient even in a remote area.Development of mobile phone based ealth monitoring system is beneficial to networking and multiple sensor technologies. There has been a developing concern with medical care that rapidly plays an increasingly.

which and engineering technologies enable technica
        Here, the valuable real time experience enables the doctors to diagnose patient's present and previous health issues.[1]

Every patient cannot go to hospitals frequently, the continuous controlling of health related issues with sensor and android may be faraway and it is also not convenient for every human. It may also be expensive. Currently, many researchs are in progress . It also has some limitations regarding hazardous radiations from the mobile phones connecting to human body.

In order to solve this issue, android smart phone can receive the data collected by our hardware device and transmit these information to remote server in time.

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In this paper we have used the embedded system to read the patients records such as blood pressure, body temperature, pulse oxymeter, ECG, etc. using the advanced sensor technology. The detected reading will be sent to the mobile device using the Bluetooth. From mobile device, we are reading the record and passing to respective hospitals monitoring server.
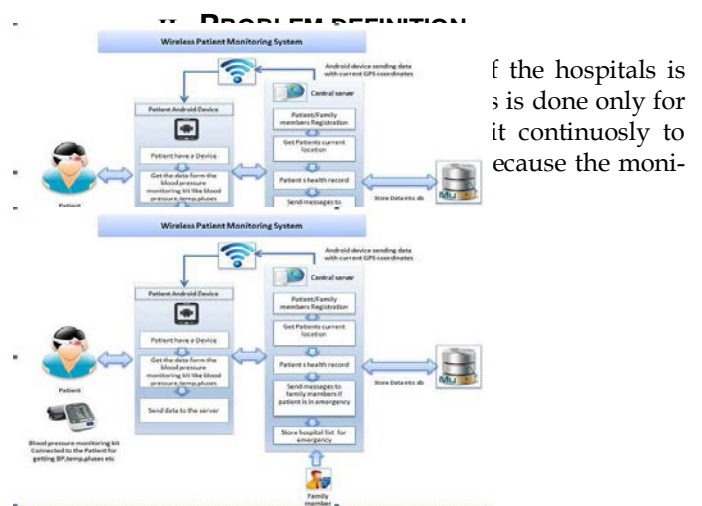

Fig 1: System Architecture.

III. PROPOSED SYSTEM

The main purpose was to develop the patient monitoring device which has telemetry. The controlling device also consists of the web server and web database system from

where the data of patient is transmitted all over the geographical area. The block diagram of proposed system is shown in below fig.
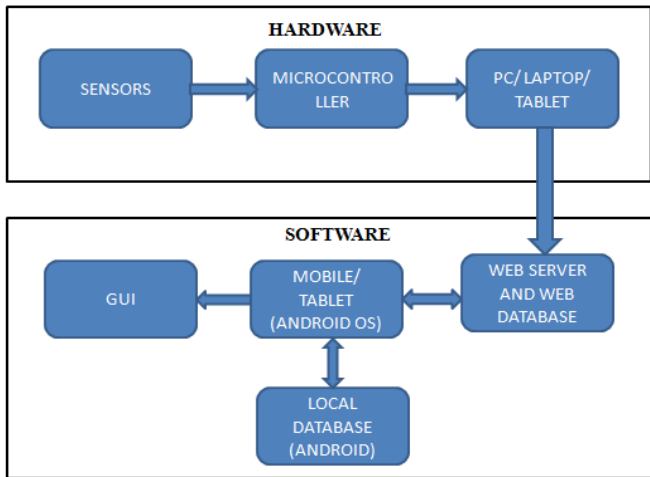

Fig. 2. Block Diagram of Proposed System.

The block diagram consists of Hardware and Software. This system helps the doctor to work from outside of hospital premises. The hardware consists of 3 blocks sensors, microcontroller and display system. Since its patient monitoring system, multiple parameters are acquired and for proper signal acquisition, the placement of electrodes is utmost important factor. Thus placing the electrodes on the body for acquiring the different signal at a time is a main task. After acquiring the data from the sensor, it is amplified since the bio-signals have very low amplitude in microvolts. So for proper diagnostic bio-amplifier is used which will amplify the signal and display it on display system. The amplified analog signal is given to microcontroller where the digitization takes place using A-D converter. The microcontroller used here is pic 18fXXXX which has in build A-D converter and thus this helps in making instrument more compact. The digitized signals are then given to display system. In proposed system the PC is used as display system since the data has to transfer to web server which very easy with PC. LABVIEW displays the analog signal and in back it will store the digital data in .csv file which is fetch by the web server for further processing.[2] The software consists of 4 blocks web server and web database, mobile (android OS), local database, GUI. The web server and web database is the heart of the whole system. Since it connects the hardware with the software i.e. it connects the existing system with the proposed system. The web server understands HTTP (Hyper Text Transfer protocol)

The web server, where clients ask for the appropriate file to the server, the server will find the file in web database and will send the response to the generated query by the client .[3] This flow is generated for n number of times to generate real time response.

For GUI, Android is used, since its open source and very cheaply available in market which fulfils the criteria of low cost system. Also now days, Android is available to each and every person, including Doctors, since they have started using the smartphone.

I. WORKING OF A ANDROID BASED PATIENT'S HEALTH MONITORING SYSTEM
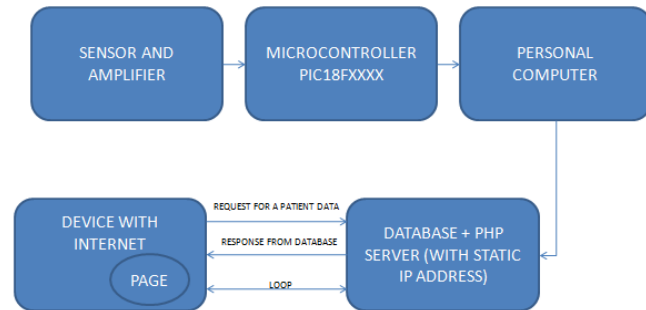

Fig. 3 Working System of a Android Based Patient Monitoring System

1. The sensor is placed on the patient, which will sense the signal and give it to an amplifier.
2. The amplifier, amplify the signal and signal is given to the microcontroller.
3. The microcontroller converts the analog signal to digital and then sends the digitized signal to a pc which is placed in hospital.
4. Now the PC sends the digital signal to web server where digital signal is stored in web database i.e. MySQL.
5. Now when doctor wants to check the status of the patient, he/she will send the request to the web server through the mobile device.
6. To this request the web server will send the response which will see in the application.
7. Now the doctor wants to check the live data then the request is send at regular interval and thus the respond is generated.
8. And thus the doctor can check the live status of their patient.

V. STEPS FOR ACCESSING AN ANDROID

APPLICATION

1. Unlock the keypad
2. Drag towards the application symbol
3. Click on application
4. Enter the register hospital
5. Enter the registered patient
6. Click on 'Done'. A new window will opened, which has the vital parameter shown
7. After noting the vital parameter click on 'Show ECG'

8. A new window will open, which will call the web browser for plotting the ECG graph

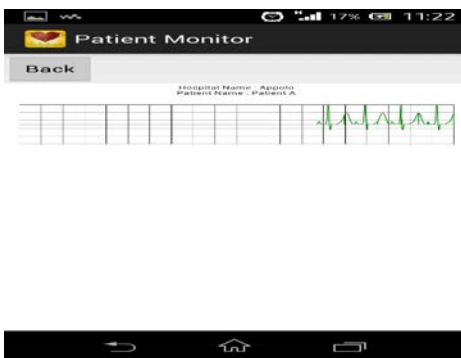Fig.5 GUI for Doctor-Informative Page

Fig. 6 GUI for Doctor-ECG Graph Page

VII. CONCLUSION

IoT concept reflects a connected set of anyone, anything, anytime, anyplace, any service, and any network. IoT framework aims at the security and privacy issues, and develops a user-centric privacy access control in m-Healthcare emergency. The main purpose of designing Android based health controlling system for hospitals is to work on a multi-parameter monitor system and also to store the patient's database. If any emergency occurs it is possible for a doctor to work from offline and provide a best possible solution by android enabled controlling device.

VIII. FUTURE WORK

While storing the patients data in database doctors can analyse and process the signal by programming in MYSQL. In particular range of time when the patient will be in critical condition doctor can respond to it with this system device.

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