DEVELOPMENT OF HEART RATE MONITORING FOR

MOBILE TELEMEDICINE USING SMARTPHONE

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Abstract- The development of wireless patient monitoring system which will monitor heart rates in real time environment. the whole system consists of a transportable photoplethysmography device, a healthcare server and a Smartphone for healthcare information reports the portable device collects pulse information from the patients and sends the info to healthcare server. The role of the healthcare server is to analyses the collected biomedical signals. The results of the analysis are displayed on the smartphone through the CDMA networks and signals are going to be send to the doctor where he is going to be intimate the Patients to Hospitals, Ambulance, Family member and take medicine. the appliance program on smartphone gives the healthcare information to patients and doctor. this technique would be useful for patients who have chronic heart condition

Keywords - Heart Rate Sensor, Microcontroller, Display, Smartphone Application, GSM

I. INTRODUCTION

Heart Rate, determined by the amount of times heart beats during a minute, because it gives information on the general fitness of the body. just in case of patients affected by diseases, continuous or routine measurement of pulse is extremely important. Analysis of pulse would help maintain health, diagnose and detect chronic diseases photoplethysmography device (PD)

provides an accurate and reliable method of pulse counting. Blood vessels from the guts are sensed. Additionally, the device facilitates data transmission over the doctor, loved one and Ambulance However, the device is sophisticated and should require expert assistance to work

The designed device is predicated on analyzing the change in level of reflected light after manually projecting infrared into suitable body parts like finger Commercially many heart beat measuring kits are available This paper proposes a design and implementation of one Microcontroller based pulse measuring instrument that integrates most of the key features of the aforementioned devices and models. The device is compact in size, energy efficient, portable, capable of knowledge storage and compatible for communicating with an external remote device GSM and cellular communication just in case of a medical emergency or routine. It also has automatic calibration system to live the guts rate of both infants and adults. The device is straightforward to use models of pulse counter are designed and implemented supported analyzing infrared reflection from body parts. during a LCD display shows a change of pulse over a period of time. We propose a pulse (HR) monitoring system model that aims to simply measure of HR, and to supply personal-ized comment service in lifestyle this technique integrates Smartphone into giving meaningful information and Blue-tooth in

TM technology, CDMA (Code Division Multiple Access) network for healthcare data transferring it's been developed with multiple functions not only

real time monitoring but also doing signal analysis and signal transfer to doctors using wireless communication technology. It means patient can receive healthcare services like prevention, diagnosis and prognosis management at any time and in anywhere [1] with the assistance of small personalized monitoring devices. Furthermore, it might be performed without visiting hospital regularly.

II. RELATED WORK

The proposed system is predicated on one Microcontroller chip that utilizes change in amount of reflection of sunshine sensed by a photograph transistor pulse indicates the soundless of our heart and helps assessing the condition of photoplethysmography system [1]. In clinical environment, pulse is measured under controlled conditions like blood measurement, heart voice measurement, Operating platforms for a smartphone excellent environment for e-health application Telemedicine within the larger perspective, telemedicine are often of two types 1. live communication type, where the presence of the doctor and patient is important with additional requirements of high bandwidth and good data speed, and 2.store and forward type, which needs acquisition of medical parameter consistent with existing medical surveys, telemedicine has been adopted to require care of the patients with cardiac diseases, diabetes, hypotension, hypertension, hyperthermia, and hypothermia the foremost promising application is in real-time monitoring of chronic illnesses like cardiopulmonary disease, asthma, and coronary failure in patients located faraway from the medical aid facilities through wireless monitoring systems . Heart diseases became one among the leading causes of human fatalities round the world as an example , approximately 2.8 million people die annually as a results of being overweight or obese as obesity can cause adverse metabolic effects on vital sign and cholesterol which ultimately increases the risks of coronary heart condition , smartphones technology comprises various services like location tracking, short message service(SMP) access GSM which provides ubiquitous connectivity.

The results of the analysis is displayed on the smartphone through the CDMA networks and signals are going to be send to the doctor where he are going to be intimate the patients to hospitals and take medicine

III. SYSTEM ANALYSIS

A. EXISTING SYSTEM

In existing system we'd like to look hospital at emergency, sometimes doctor won't be available at right time the planning of an easy , microcontroller based pulse measuring and with LCD display pulse of the topic is measured from the index using IRD (Infra Red Device)sensors the planning of an easy , microcontroller based pulse measuring and with LCD display These cardiac parameters help early detection of diseases like hypotension, hypertension, and thru alarming system supported upper and lower threshold values. almost like the prevailing monitoring systems, the develeoped system has two interfaces, one for patients and other for the doctor. The patient interface is comprised of wearable sensors which extract medical information of the patients and transmit to an Android based listening port via GSM low energy. The listening port transfers this information to webserver which processes data to point out reports on doctor inter-face.

B. PROPOSED SYSTEM

The proposed system is predicated on one Microcontroller chip that utilizes change in amount of reflection of sunshine sensed by a photograph transistor In data acquisition unit, heat ray (IR) is projected on the finger with an IR transmitter during this proposed device, the guts beat and f patients are measured by using sensors. Micro controller device is employed for temporary storage of the info used for transmission it's suitable for

wireless transmission using SMS messages through GSM modem It sends short message service (SMS) aware of the mobile of doctors or patientsrelations, or their relatives about the condition of the patient and abnormal details via SMS.

In order for this signal to be processed in Microcontroller, it's needed to eliminate undesired noise. Furthermore, the amplitude is to be raised to a satisfactory level in order that the spikes coming from the photo transistor during whenever the guts beats are often distinguished properly by the Microcontroller Here reflection method is employed because it serves better performance. The received signal is skilled two consecutive filters to dam dc components. The signal is fed to the Microcontroller where the info processing is completed by converting the analog signal to digital signal. These digital bits are now suitable for the Microcontroller to count the amount of heart beats per minute.

IV. SYSTEM ARCHITECTURE

The heart patient has one sensor (e.g. photoplethysmography) attached to his/her body. External devices are used, like a vital sign monitor, to gather periodically additional health . We use off the shelf sensors enabling us to include the simplest technology

The sensors are GSM enabled or integrated into the smart phone. The smartphone processes the sensor data and monitors the patient's wellbeing, and just in case of an emergency, it automatically calls an ambulance to the patient. It also can warn caregivers or relations via SMS or phone when the patient is in difficulty the info collected by the smart phone are often transmitted to the health care Data server A patient can upload the info whenever the smart phone fig (1).This is a price efficient thanks to upload data which isn't time critical. However, just in case of an emergency, updates are immediately transferred to the info server using the simplest available connection GSM remotely

monitor the patient and if necessary, update the edge levels for the sensors. photoplethysmography sensor data is stored within the patient's health record and may be used for further analysis. High vital sign is another important risk factor for developing chronic diseases and regular monitoring is important.Finally to accurately obtain the situation of a patient just in case of an emergency a GSM sensor is employed.
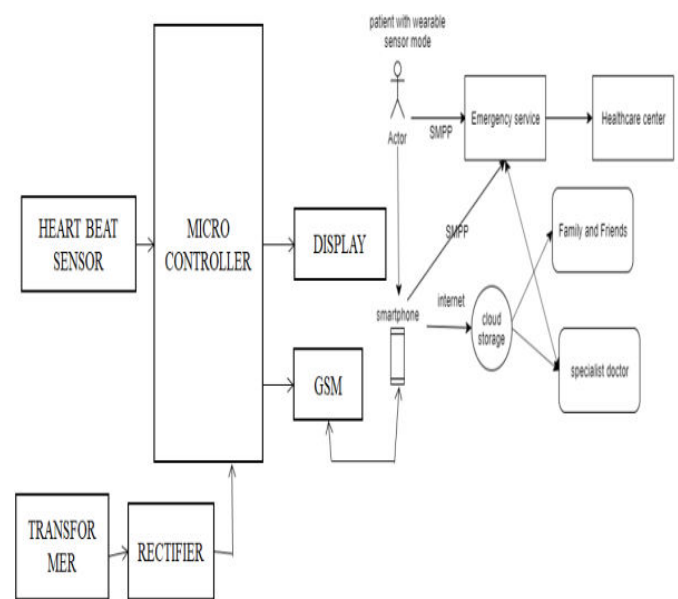

Fig (1) System Architecture

V. SMART PHONE FUNCTIONALITIES

The application within the smart phone receives the results from the sensors and determines whether an alarm should be raised. The results of the sensors are often inaccurate thanks to noise and inaccurate readings fig (2). The monitoring system is merely useful if we all know the standard of the info we receive from the varied sensors and therefore the quality of the diagnosis supported that data. Knowing the standard level, we will put mechanisms in situ to catch up on the shortage of accuracy of certain sensors or get feedback from the patient to verify a diagnosis. an emergency call is automatically placed fig(3). This feature is included

since many patients black out or experience speech and swallowing difficulties at the time attack.
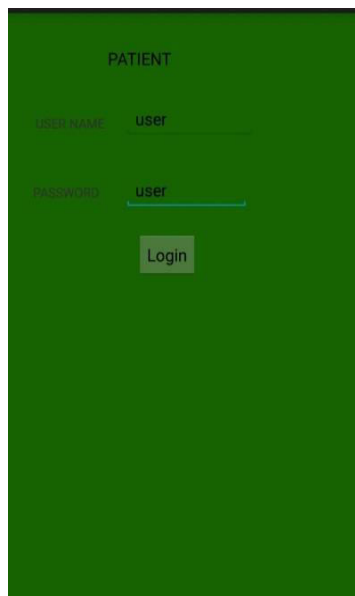

Fig 2. Patient Login Page
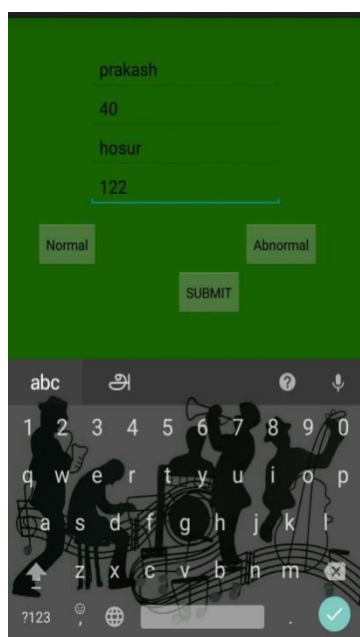
Fig 3. Patient Details

VI. RESULTS AND DISCUSSIONS

Heart rate data of a healthy person was sequentially measured at the right finger However, the best result is obtained with finger arrangement as finger provides greater reflection and less absorption of light.The prototype was used to measure the heart

rates of 120 above that patient will be abnormal heart rate. At the same time, their heart rates were measured approved digital automatic blood pressure monitor from OMRON which measures heart rate along with blood pressure our heart rate measuring kit for different ages. Sensor may vary from person to person and heart rate also varies with respect to age of the person. As it is experimented with different age group of people, we obtained different values of heart rate for different people.

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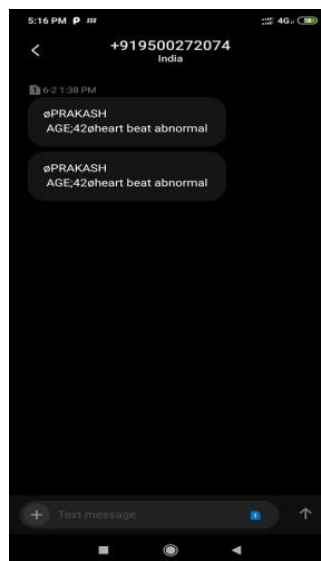
Fig 4. This shows that the Abnormal of Patient

VII.   CONCLUTION   AND   FUTURE ENHANCEMENTS

A Low-Cost Professional Pulse Measuring Kit has been developed with significant operational conformity with its commercial counterparts. it's designed to reply during medical emergencies via GSM and cellular communication., it can store bulk of knowledge and may even be made conveniently portable. The kit is often further improved to live blood vessels saturation level without compromising portability, size and price. Generally, we will easily detect heart beat with much high-level devices but we will say this paper presents a price effective and efficient working system for pulse monitoring and alert (vigilant) systemthe proposed system helps to spot real time

heart disease of the many patients at a time to doctor's.

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