DESIGN AND MODELING OF MOBILE HEALTH MONITORING SYSTEM

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Abstract: Health monitoring systems have rapidly evolved during past two decades and have potential to change the way the health care is currently delivered. There is an increasing pressure in improving the quality of healthcare which increase in population and rises in health consciousness of people .To lessen the burden and difficulties of monitoring patient's health from doctor's head, this paper presents the methodology for monitoring patients remotely using GSM network .The main aim is to review current state of the monitoring system and to perform extensive and in-depth analysis of finding the area of mobile health monitoring system. . The system for automated health alerts provides a method for detecting health problems earlier and provides the treatment as early as possible. . The system for automated health alerts provides a method for detecting health problem earlier and provide the needed treatment as soon as possible.

Keyword: MHMS, RHMS, GSM, ECG.

1. INTRODUCTION

In the olden days transmitting biomedical signal from patients to hospital was done through telephony network. Otherwise patient was needed to be admitted in hospital for all time of continuous observation. In recent days, wireless sensor network provide mobile telemedicine it may allow patients to involve in their daily routines task while they are monitored continuously anytime, anywhere. With the rapid increase of the old population couples with that of life span and the number of patients who require to monitor also increases rapidly. All these statistics suggest that healthcare needs a major shift toward more scalable and more affordable situations. In an example of the application of this system is controlling a pregnant woman. A pregnant woman's blood pressure could be the same range as any other person's normal blood pressure. It is important to take continuous inspection about the blood pressure during pregnancy, to watch for preeclampsia. These women need frequent BP checks. If BP rises high, the patient may be keep under the control of hospital. But, the patient is limited to her bed in hospital. In the proposed method, the patient's physiological parameters are acquired by the sensors connected with the patient body, and the sensor values are then transmitted to the remote base-station and also a Personal computer for storing and analyzing. Providing restrictions to the health care systems toward proactive managing of wellness instead of their illness, and focusing on prevention and early detection of disease emerge by giving as the solution to these problems.Mobile Health Monitoring System(MHMS) is for time to time health monitoring are a key technology in helping the transition to be high proactive and reliable health centers .Even though the patient is not in dangerous situation, the doctors would still need for the confirmation on their health. In recent times, the cost for hospitalization and medical care are unimaginably high and expensive. Therefore the health policies in countries like USA, UK has shifted its main focus from providing reactive, acute care to providing preventive care outside and away from the hospital. Remote health monitoring systems will allow an individual person to closely monitor changes in her or his vital signs and come out with relevant feedback to help and maintain an optimal health status. If integrated into a tele-medical (E-health network) system, these systems can even alert medical personnel when life-threatening changes occur.

2. CLASSIFICATION OF HEALTH MONITORING SYSTEM

The function of this particular Remote health monitoring system (RHMS) is a type that ranges from a single to multiple parameters which cover overall variety of symptoms and can be utilized in individual houses as well as hospitals. Mobile health monitoring systems (MHMS) refer to the term of cellular phones. Personal digital assistance (PDAs), pocket personal computer (PC) based systems which are used as the main processing station but in some cases as the main working module. RMHS and MHMS are considered to be high working tendency, more convenient and cost

effective than traditional, institutional care, since they enable patients to remain in their usual environment by taking the advice of the doctors. Smart health monitoring systems (SHMS) is mostly referred to as advanced technology or else a new approach to health monitoring. They are usually consisting of mobile instruments and so-define mobile approach to address health issues and demerits. General health monitoring systems refer to systems which monitor several parameters and general disease. Vital parameters in the patients body include heart rate (HR), blood pressure (BP), electrocardiography (ECG), oxygen saturation (SpO2), body temperature and respiratory rate (RR).

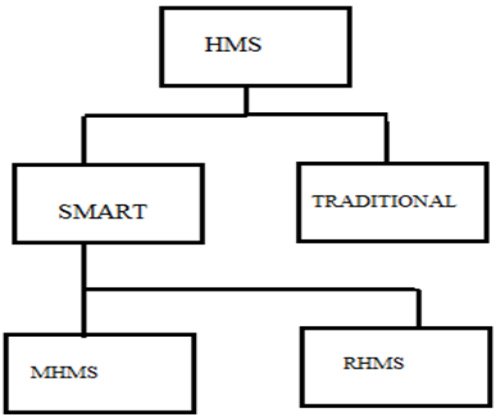

Figure 1: Types of Monitoring System.

3. MOBILE HEALTH MONITORING SYSTEMS

A Multi-agent architecture consists of intelligent agents for cardio observation and weight monitoring. Based on mobile technology such as global system monitoring (GSM) has been developed to collect patient database. Intelligent agents collectively used to transmit diagnostic information and recommend medical interventions in a mobile environment. Software was developed by a Symbian operating system, Java 2 Micro Edition (J2EE) as (mobile programming) and Java 2 Enterprise Edition (J2EE) for server-side agent programming.

Self-powered WSN monitoring ECG, pulse-detection meter and BP from a remote location also integrated. A recent developed Crossbow MICAz mote are used to design a robust mesh network that routes patient database to a remote base station within a hospital via a route node. The latter technology consist of an energy harvesting circuit board and solar panel set up which has been located near overhead 34W fluorescent lights . Another system was developed particularly for the elders whereby, a call from a mobile phone to a sever station computer initiates transmission of a graphical chart via the mobile phone. The system uses an low power sensors and tri-axis accelerometers for long mobile phone graphical display charts.

A clinically validated and flexible frameworks performing real-time analyzing of physiological collected data to monitor patient health conditions also been developed. Physiological parameters were collected by different sensors that are used and analyzed by means formed on mobile devices (pocked PCs and smart phones) and a suitable attention could be triggered in emergency situations. This system architecture has been conducted using clustering algorithms. The simple K algorithm –defines the expectation of maximization algorithms with different sampling intervals and time intervals. By deploying advanced algorithms to improve the results has been reported. Similarly the processing impact of these computationally intensive algorithms used in the mobile devices such that battery life and delay in data transmission can be considered as a significant fall in the monitoring. In unique approach leads to measure the heart rate by a non-contact and non-invasive device. A CCD camera was introduced in a trial of 14 Asian participants. A 30-sec time-lapse imaging of the body surface was acquired whilst HR was measured by using the pulse oximeter and RR by a thermistor. A more combination of a time-lapse imaging from a hand held video camera and PC-based image processing software are used. These indicated a 30-sec average HR and RR based on changes in the brightness of in region of interest. These relevant changes in brightness orin the movement of ROI play a important and significant role in accurate measurement of Heart Rate and several other parameters.

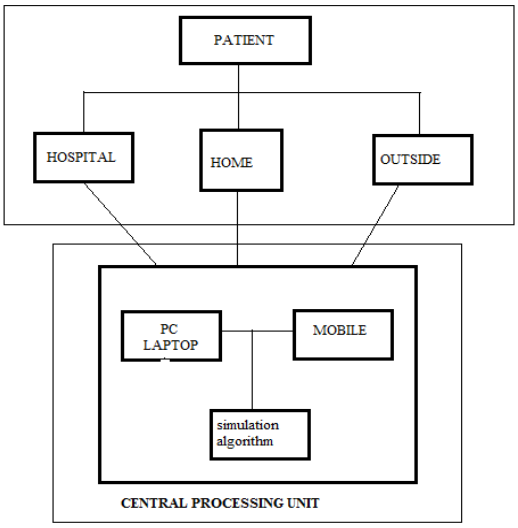

Figure 2: Block Diagram of MHMS

4. ANALYSIS

Mobile health monitoring systems is an needful for many patients and medical professionals by providing recent access to health information, especially in emergency time. The technology is continuously being enhanced but there are still challengers to improve its clinical application. For instance raw data can be transmitted efficiency from a mobile phone but the analysis and processing can feed on the cell phone's battery at working time and the generating delay in sending of data. The model of transmission in mobile health monitoring systems can be presented in two transmission types and three steps. In type 1, patient data is collated by a mobile device and then transmitted to the clinician's mobile device directly or via the patient's mobile device.

In some cases only the results or alerts will be transmitted. Both types can generate delays in producing results. As indicated there will be a direct link between the patient and the clinician .Continuous data transfer both sending and receiving by mobile devices significantly reduce battery life.

5. RESULT AND DISCUSSION

This paper reviews the advancement of MHMS and addresses important issues currently being experienced in employing such systems in clinical setting. There are still discrepancies between the readings and the actual measurement although the technology has been developed over several decades. Some studies suggest that recent technology might perform good when tested in a controlled environment but it struggles to face the needed medical standards in day today life scenarios. Therefore, real-time patient monitoring and remote data transmission can cause serious challengers to mobile healthcare systems in terms of the quality of patient monitoring. Power consumption of medical devices, awareness, acceptability, security and patient confidentially. A recent study of the challenges of sensor systems indicated that there was an advancement in the short time monitoring of mobile technology but long term monitoring required the development of novel sensor integration into "smart garments" else implantable systems. The three main difficulties of this technology were found as reliability and efficiency of wireless technology, quality of physiological data and patient confidentiality and security.

6. CONCLUSION

In this review, a wide range of health monitoring systems, and their applications and efficiency have been found and discussed. A large number of studies supported the effectiveness of this system both in a hospital setting and also in the home environment. Standardization and demand for such systems and the applications of telemedicine are a fast growing area for research. For instance a vital standards for telemedicine applications have already been developed. It was identified that online monitoring and real-time transmission of bio-signals, and related sub systems require high quality signals with capable of operating without delay. To address such challenges, an online monitoring system was developed using wavelet decomposition techniques for ECG technology. The introduce of a recent detection algorithm for ECG monitoring was an perfect example. Such online or web based monitoring systems always plays an important field in remote patient monitoring producing high quality data and accuracy effectively.

REFERENCES

[1] WILLAMS,J..Wireless in Healthcare: A study Tracking the Use of RFID, Wireless Sensor and TelementryTechnologyies by Medical Device Manufactures and Healthcare Provideers. The Focal point Groups, USA. 2008.

[2] Taura, T. Togwa, T. Ogawa. M.and Yoda, M, Fully automathed heath monitoring system in the home. Med. Eng. Phy.20 (8):573-579,1998.

[3] MirzaMansoorBiag. Hamid Gholomhosseini, Smart Health Monitoring Systems: An Overview of Design and Modeling.Business Media New York 2013.