PATIENT HEALTH MONITORING SYSTEM THROUGH ARM PROCESSOR

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ABSTRACT: Multi patient monitoring device has become increasingly important in Hospital wards to record real-time data during normal activity for better treatment. However, the current quality and reliability have not been satisfactory due to the size, weight, distance of coverage. This paper provides a solution for enhancing the reliability, flexibility by improving the performance of the real-time multi-patient monitoring system (MPMS). In the current proposed system the patient health is continuously monitored and the acquired data is transmitted to a centralized ARM server. Upon system boot up, the mobile patient monitor system will continuously monitor the patients vital parameters like Heart Beat, Oxygen level etc and will periodically send those parameters to a centralized server. If a particular patient's health parameter falls below the threshold value, an automated SMS is posted to the preconfigured Doctors mobile number using a standard GSM module interfaced to the ARM server. The Doctor is continuously connected to the ARM server using GSM Module and he/she can get a record of a particular patient's information by just posting a SMS message to the centralized ARM server and displayed on LCD display. This will reduce treatment time, cost to a greater extent. At the same time, the efficiency of examining ward will be improved by making the system more real-time and robust

KEY WORDS: Quality of Service (QoS), Electronic health care records (EHR), public health; health care; personal health Systems; eHealth systems

I.INTRODUCTION

Patients are becoming more interested in managing their own health, which is leading to traditional changes in information dissemination from the health care professional to the patient. In managing this change, it is necessary to design software applications to support. Both the health care professional and the patient in the clinic and out. Personal health records and eHealth systems

Provide two ways in which the patient can be involved in health management. First, we will look at existing definitions for each of these concepts, examine some concepts from literature for each, and see how they are related. There is no currently agreed upon definition for eHealth, but health and technology are two common themes in this area. Previous work has shown there exists little evidence to support claims of cost effectiveness and patient outcome improvements through eHealth systems even through eHealth systems have been implemented (such as eHealth Ontario or are in the process of being implemented (such as the European Commission eHealth Network.

In one study, the authors recommend evaluating new health technologies comprehensively from both social and technological standpoints to achieve an optimal result. Considering both social and technological factors is а large undertaking, so we only focus on one aspect of the technological perspective here emergent behaviour in the design of new health software. Personal health records can be defined as private, secure, and confidential electronic systems which range in complexity and allow users to access. manage, and share health information of their own and those for whom they are authorized. Some personal health systems provide standalone data for tracking of, for example, physical activity, diet, weight, and sleep (such as Fit Bit and MyFitnessPal allowing the patient to track information independent of a health care

professional. Other personal health and eHealth systems integrate guidance from a health care professional. Such interconnected systems provide more significant benefits, one of which is improved communication between health care professionals and patients.

In the preliminary design presented here, communication facilitation between patient and health care professional via a software tool is expected to increase patient knowledge and involvement in a health program. However, modifying existing systems to allow or increase patient interaction can be a challenging is important task. It to ensure modifications will not compromise system integrity and lack of central control in distributed systems poses challenges such behaviour. emergent Emergent as behaviour is behaviour in a synthesized model of the distributed system not explicitly specified in its specification. Emergent behaviour arises when there is a state in which the system component cannot determine which course of action to take. For instance, deadlock is a form of emergent behaviour.

The sensor networks for in-home patient monitoring together with the electronic patient records and information security are subject to recent research. Also, building a secure sharing environment has become a new subject for both health care industry and academic community. The electronic health care records management offers advantages related to easy accessibility and use of the patient information, no limitation in time, space and human resources for monitoring patients. The first issue is the organizational and cultural matters related to health care. This issue is rather important regardless of information systems since organization models and culture do not allow the continuity of care nor any type of structured data collection. The second issue is the technological gap between health-care professionals and information science experts. Doctors are often reluctant to use information systems that, as they say, are not designed for them. Trade-offs between power and communication range need to be considered carefully.

III. BACKGROUND

In 1872 Alexander Moorhead attached wires to patient's wrist to obtain the heartbeat while pursuing his Doctorate in electricity degree at the St Bartholomew's Hospital. He used Lippmann capillary electrometer created by the British physiologist John Burdon Sanderson for gathering and visualizing the data. Later Augustus Waller took this idea and designed an electrical device that was able to record the heartbeat in real time by connecting a Lippmann capillary electrometer to a projector. The major Willem breakthrough came when Einthoven invented the string galvanometer which was more accurate in measuring the heartbeat. Einthoven assigned letters P, Q, R, S, and T to the different projections and described the electrocardiographic features of different cardiovascular disorders. The principles of Willem Einthoven are still in use today but with more advanced technology for detecting the electrocardiograph.

Heartbeat rate can provide a lot of physiological and pathological information and is an important health indicator. Nowadays, heart diseases have already become one of the most common and deadly diseases. The diagnostic of heart diseases has always been considered a very important issue in the medical community worldwide. Gathering heart beat information in real time provides doctors with the necessary tool to monitor and treat patients. A large number of heart monitoring systems are available in the market, however most of these systems tend to be large in size and are not convenient to use on a regular basis. Typically, patients need to go to a hospital or medical office to perform the test and then wait for the results to be sent to the doctor. In addition to being inconvenient, this is an inefficient use of human resources. The disadvantages of previous heart monitors have led us to consider a new system that can monitor heart rate without limitation due to time or location of the patient. This system should be able to record and send the heart beat rate data to doctors either upon request or when an abnormal condition is detected. This is particularly convenient for elderly and disabled patients who have difficulty in traveling to see their doctors.

The effective operation range for a wireless sensor system is also every important. A small operation range in a relative large application area will require multiple sensor systems with higher cost and complexity. In order to make the operation range wider, a more powerful transceiver should be considered. Yet a more powerful transceiver implies more power consumption, which is not desirable for a battery powered wireless sensor system as is the case in our application. In order to increase the operation range, an ad-hoc network seems to be more favourable. Ad-hoc network sends data from node to node. However, this could cause a sensor node to be transmitting more frequently which will decrease battery life. In addition, ad-hoc network is more complex than direct connection. As a proof of concept, we will first implement a direct connection between the sensor node and the host.

Instead of going to the hospital, the proposed wireless monitor will provide doctors with the ability to remotely monitor and diagnose patients while pursuing normal daily activities. The project could also be applied to battlefield health monitoring. Military doctors usually treat battlefield casualties immediately if there is no medical station nearby. Using wireless vital sign sensor network, the doctor could set up a local wireless network and receive the vital signs of many casualties at the same time, in order to determine which patient needs treatment the most.

III. RELATED WORK

Health care is a very complex process, his final quality (the treatment of the patient, his reintegration in their normal familiar and professional life) depend of many complementary processes and actions of diverse elements of the medical process. To implement his conceptions about the quality of the applied medical treatment the quality management system of the organism (medical centre) must realize some characteristic activities; these activities can be classified as following:

- identification of the basically elements (compartments) necessaries for define and realize his global activity (treatment of the patients);
- coordination of the activities of this elements;
- definition and adaptation of criteria's and methods to make the control of the activity of the composing elements and the entire medical process;
- make a permanent supervision, measurement and analyse of the process (based on the defined criteria's);
- Implement the proposed activity's to obtain the planed results, and realize a continuous amelioration of the process.

To ensure the secure storage and access management of EHR, with corresponding

Quality of Service (QoS) measures several security requirements must be taken into account, such as:

• EHR storage - the electronic patient information can be stored electronically: locally on the computer, on the corporation network storage facilities, and on dedicated storage servers using cloud computing. The challenge is to find a suitable compromise between speed and security of access to resources, knowing that the security requirements are increasing as the use of IT infrastructures is becoming more complex.

• Malicious code - malicious software routines, unpatched applications or computer viruses can cause disruption of normal operation in a health care information system, damaging the EHR. Protection from intrusive attack, antivirus applications, firewalls, and software updates are a few requirements in order to protect an information system.

• Protected access – because medical data may contain confidential information, the EHR must be protected and it can only be accessed and processed by authorized personnel. The multi-factor authentication protected access to the electronic health records, databases, and medical applications is a mandatory apprehension in order to assure the information protection against access violations.

• Mobile devices – modern health care approaches such as remote medical diagnosis or remote surgery systems has led to the inclusion of the general mobile IT equipment in the acquisition, access and decision process over the medical information.

• Online systems protection - because the EHR content is a "sensitive" data and often associated with confidential information, the health care IT departments must face the recent security

and privacy implications and challenges. The current trend is to standardize the information from medical terminology to networking order protocols in to electronically store the medical records and to instantly access it and sent it anywhere in the world. In order to promote and maintain the fundamental medical ethical principles and social expectations, human resources and security the equipment (firewalls, antivirus. and content filtering devices) must be aggregated in the protection of the health information against criminal activities over the Internet. • IT, physical and human security – because any security flaw may be a gateway for data leakage, an efficient protection of the EHR must include access rights to data, data analysis rights, security of data transfer, how and when data is stored, and the governing policies.

IV. PROPOSED SYSTEM



FIG. 1: PROPOSED SYSTEM

The block diagram of proposed system shown in figure (1).It consist of power supply, Heart beat sensor, Oxygen level sensor, GSM, LCD display. Oxygen level sensor is used to measure the level of oxygen in the patient. The size of the sensor nodes is crucial in our design. Since the sensors are designed for patients to wear while pursuing normal daily activities, the sensor nodes need to be as small and light weight as possible. This is important because sometimes a patient has to wear multiple sensor nodes for multiple vital sign monitoring and larger size sensor nodes will cause discomfort to the wearer. Heart beat rate is used to find the persons pulse. The readings from all these sensors continuously display on LCD and if any of the sensor readings goes beyond the set value or if fall is detected message is send to the server and to the concerned person using the GSM modem. Firstly oscillator will oppose the error signals and transmits the pure signals into the system. Power supply gives sufficient power to operate the system. As we know that ARM processor is one of the family of CPU. ARM processor can operate at a higher speed, performing more millions of instructions per second. From LCD display we can observe the output.

Heartbeat Sensor is an electronic gadget that is utilized to gauge the pulse i.e. speed heartbeat. Checking the body of temperature, pulse and circulatory strain are the essential things that we do with the end goal to keep us solid. With the end goal to quantify the body temperature, we utilize thermometers and я sphygmomanometer to screen the Blood Pressure. Pulse can be observed in two different ways: one route is to physically check the beat either at wrists or neck and the other path is to utilize a Heartbeat Sensor

MAX 232 is a procedure innovation used to make little incorporated gadgets that join mechanical and electrical segments. They are manufactured by utilizing integrated circuit (IC) cluster handling methods and can extend in size from a couple of micrometres to millimetres. These gadgets (or frameworks) can detect, control and incite on the micro scale, and produce consequences for the macro scale. The PS arrangement are high performance that utilize piezoelectric speakers components and are intended for simple

joining into different circuits. They highlight to a great degree low power utilization in contrast with electromagnetic units. In our undertaking we are utilizing the ringer type PS19 type because of the reality, it has a low frequency tone of 2 kHz and piezoelectric material is covered with water and dust resistive material.

GSM (Global System for Mobile communication) is an open, advanced cell innovation utilized for transmitting voice and information services. GSM utilizes a variety of Time Division Multiple Access (TDMA) and is the most broadly utilized of the three advanced remote phone innovations (TDMA, GSM, and CDMA). A GSM SIM900 module has been interfaced with the 32-bit microcontroller. It is connected to micro controller through a USB to RS232 driver. The module contains a SIM card holder, RS232 based serial port for connection, an antenna for sending/receiving signals to the SIM and an LED as a status for power, signal and incoming call. At last it can say that compared to existed system, proposed system gives effective results.

V. RESULTS



FIG.2: OUTPUT



FIG.3: HEART BEAT SENSOR OPERATION



FIG.4: OXYGEN LEVEL SENSOR ACTIVATION VI. CONCLUSION

Personal health systems and eHealth can provide patients with systems information about their health while allowing them to contribute additional information. However, creating а distributed system to support this is challenging. We identified an issue preserving system integrity where stale data could affect program changes. From proposed system we can observe that it gives effective results compared to exist one. Future work includes integrating the emergent behaviour detected into the software design, expanding the clinical workflow to detect emergent behaviour in a more mature design.

VII. REFERENCES

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