HEARTBEAT MONITORING SYSTEM

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ABSTRACT:
Due to the lack of doctors, we are implementing this project. By using this system, wecan be able to monitor the Heartbeat of individual and produces voice-based alerts whennecessary. Large numbers of preventable deaths occur in hospitals each year, due to adverse events such as cardiac arrest and unplanned admission into Intensive Care Units(ICUs) from other hospital wards. The majority of these patients exhibit physiologicaldeterioration in their vital signs prior to onset of the adverse event, which can be detected by this project. One of the ideal ways of using technology is to sense serious health problems so that efficient medical services can be provided to the patient in correct time. The heart beat monitoring system is a portable and best replacement of old medical equipment which is less efficient. This project consists of microcontroller,pulse sensor and voice IC by using the pulse sensor we need to monitor the heartbeat of the patients. These values are displayed on LCD screen and if the conditions exceeded than threshold values, we alert by voice announce through voice IC with a speaker indicating the emergency condition of the patient then according to the condition treatment will goes on.
KEYWORDS: Microcontroller, Heart rate, Body temperature, Remote monitoring.

1. INTRODUCTION

Ageing is a natural process, which presents a unique ofchallenge for all sections of the society [1]. Although the exact definition of elderly age group is controversial, it is defined as persons with a chronological age of 65 years and above [1].With gradual improvement in health-care delivery services, life expectancy has increased and thus the percentage of the elderly population [1]. It has been estimated thatthe number of people aged 60 and over will increase to

1.2 billion in 2025 and subsequently to two billion in 2050 [1]. Further, by the year 2025, almost 75% of thiselderly population will be living in developing nations,which already have an overburdened health-care delivery system [1]. These demographic transitionsessentially require shifting the global focus to cater forthe preventive health-care and medical needs of the elderly population [1]. The above study [1] provides people with indicators regarding the life expectancy ofthe elderly ages.

the development of the societies and nations. However,it is quite necessary to work in the UAE to achieve these in dicatorson the local level, and to try to have some local studies and statistics regarding the life expectancy of the elderly in the upcoming years in the UAE. The statistics shall be acquired based on the surrounding conditions, available resources,country visions, and the abilities of the UAE individuals.Increasing the life expectancy of the elderlyin the upcoming years is something that cannot be achieved randomly. It requires researches and general observation of the elderly worldwide-adopted healthcare systems, notifying the

advantages of these systems and minimize the

disadvantages. After that, productive creative own local healthcare methodologies and healthcare systemscan be created systems would be introduced.

2. REVIEW

A Tele-Medicine System has been proposed for2 Measuring Heart Rate. In this system, group of sensorswould measure the heart rate, blood pressure level anddrug level with real-time monitoring system . Thesystem can be used for a person who is not undercontinuous observation of a doctor, as the specifiedvital signs would be measured through the installedsensors The main advantage of this project is thetelemedicine system, as it is very useful for senior citizens and physically

challenged people who are suffering from variation of blood pressure level and they can be rescued from sudden heart attacks. The system can also be improved by monitoring the specified vital signs continuously, so the doctors can continuously check the health situations of those people.

A Heart Rate Monitoring for Mobile Telemedicine using Smartphone has been developed [4]. It aimed at designing and implementing a mobile system that can monitor heart rate. It has been shown that the study provided a general healthcare comment of the heart rate, as it would send the physical data of the user to doctor for review and consultation.

This system would be focused on enhancing the quality of healthcare service for people who do not visit their physicians on a regular basis. The advantage of this system is that it would be useful for patients who have chronic heart disease, as it can provide a linkage between the patient and the doctor for continuous observation. On the other hand, the system has some

disadvantages. One of these disadvantages is that it would only measure the heart rate, knowing that the variation of the measured vital signs would be always useful to enhance the diffident monitoring vital signs system as it would provide an intensive healthcare of various biomedical parameters of the patient. The other disadvantage is that the system would not operate an alarm in urgent situations and would not send a special notification to doctors in risky situations. An Optical heart rate monitoring has also been developed .The wearable heart rate uses the photo plethysmography (PPG) method. PPG sensors are based on the fact that light entering the body will scatter in predictable manners as the blood flow dynamics changes, such as changes in blood pulse rate or blood volume. The most important components for the PPG sensors to measure the heart rate are optical emitter, digital signal processor, accelerometer and algorithms.

advantage of this system is that it would provide a highly accurate reading of the heart rate when the user is at rest because the heartbeat sensor measuring are straight forward at the resting state. disadvantage of this system is that it provides inaccurate heart rate reading when the patient is doing physical activities because the heartbeat sensors measuring are complex during physical activity. The other disadvantage is that the system was designed to measure only the heart rate, and as it has been mentioned earlier the variation of the measured vital signs would be always useful to enhance the diffident monitoring vital signs system as it would provide an intensive healthcare of various biomedical parameters of the patient. A Continuous Glucose Monitoring (CGM) has been developed it is an used to add extra component. It helps in getting a full picture of the Glucose level in the human body. It consists of an electrode that is being inserted under skin to monitor and measure glucose level in the tissue fluid. It is connected to the transmitter that would send the measured information via a wireless radio frequency to a monitoring and display device. The system advantages includes providing the trend of the glucose levels, and alerting for lows or highs while sleeping or anytime. It gives insights into how food, physical activity, medication, and illness affects diabetes. The disadvantage of the system is that it does not offer a communication with health centers in case of any risks, and that it just alerts internally.this components can be used for making advance model.

3. PROPOSED SOLUTION

The solution that was selected is to observe one important vital signs that are necessary to be observed and measured for the elderly, which is the heart rate. The system would continuously measure the biomedical parameter and every two hours the measured data would be sent to the cloud id it has connection of cloud.The doctors and the authorized people would be able to access the person's data whenever they need. That can assist in preventing the potential risks, as they would be expected earlier. The system would process certain functions if the patient was under any risks. First, an alarm would be triggered.

Then, a warning message would be sent to

both the ambulance center and one of the elderly person's family members. That would be processed if there were any risks in the heart rate or temperature measurements. However, if there is any unstable sign occurred in the body position or snoring measurements only an alarm would be triggered and a

message wouldbe sent to one of elderly person's family. so if any problem occurs and the sound was not well operated, the light would also be a sign that there is an issue. AnArduino Uno microcontroller has been deployed. The Arduino would have three inputs and four outputs. Theinputs are from; 1) the heart rate sensor, The outputs are sent to; 1) the buzzer, 2) an LED, The inputs are analog. The analog signals would pass through an amplifier. Then, the amplified signals would be changed to digit signals through Analog to Digitalconvertor. After that, the digital signals would be accommodated by the microcontroller. The microcontroller, would check the received data. Fig. 1 shows the block diagram and the connections of the system. explains the connections. The connection has been designed based on a consideration that all the inputs would be placed in the Microcontroller board. However, once the group receives the components, theMy Signal board would be placed in series or parallel with the Microcontroller board.
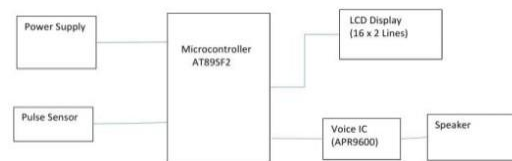

Fig.1-Block Diagram.

4. RESULT

HBMS deals with patient's data directly, therefore, system scalability and latency must be well examined to make sure that the system can achieve high performance in dealing with elderly people data and effectively monitor their health in realtime. In addition,system scalability is that the system should be fixable to expand accordingly with the growing number of thepopulation and patients using the system. In this section, we highlight some results and evaluations obtained from the developed prototype in term of efficiency and scalability. On one hand, hardware components, On the other hand, he flowchart of the routine developed to control the process. The My signal has been connected to Arduino microcontroller. The sensors have been deployed and tested. The ECG sensor has been tested to measure the heart rate.

In fig.1 it shows the normal kit,where as in fig.2 it shows the output of person heartbeat whether it is high or normal.
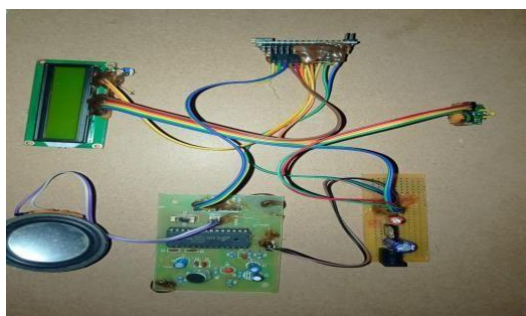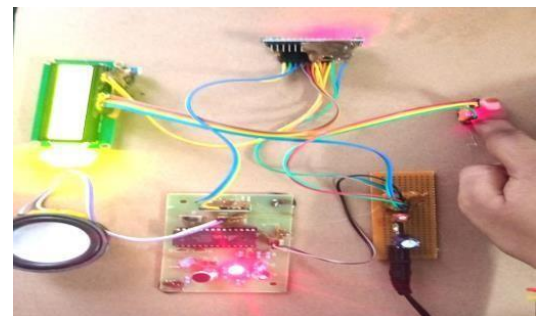

Fig.1-Normal Kit.

Fig.2-High or Low

5.. CONCLUSION

The proposed system monitors data from one sensors with data recorded for heart beat or pulse rate.

In case if any risks appear in the temperature or heart rate measurements, if any risk is there and if it has some other components it will take care of that aslo and it can also be used to add external source and we can add some more components. This is another medical kit in home and it can show the heartbeat beat rate but the main thing is cost effective and during pandemic time it will be usefull and it can help a lot in safety times. The proposed solution is cost effective, Portable, Simple, user Programmable, with multiple communication Techniques to have more reliability and resilience, and it has been developed by the UAE students can be locally produced and marketed.

6. REFERENCES

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