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Heart Rate Monitoring System Using IOT

Rushikesh Kakade¹, Archana Jadhav², Ashwini Niakwadi³, Khelu S. Londhe⁴

U.G. Student, Department of Electronic and Telecommunications, JSPM's BIT Engineering College, Barshi,
Maharashtra, India^{1,2,3}

Assistant Professor, Department of Electronic and Telecommunications, JSPM's BIT Engineering College, Barshi,
Maharashtra, India⁴

ABSTRACT: The Internet of Things (IOT) platform offers a promising technology to achieve the health care services, and can further improve the medical service systems. IOT wearable platforms can be used to collect the needed information of the user and its ambient environment and communicate such information wirelessly, where it is processed or stored for tracking the history of the user. Such a connectivity with external devices and services will allow for taking preventive measure (e.g., upon for e seeing an upcoming heart stroke) or provide immediate care (e.g., when a user falls and needs help). With an improvement in technology and miniaturization of sensors, there have been attempts to utilize the new technology in various areas to improve the quality of human life. One main area of research that has seen an adoption of the technology is the healthcare sector. The people in need of healthcare services find it very expensive this is particularly true in developing countries.

KEYWORDS: Heart rate detection, IOT, OLED 0.96" I2C Display, MAX30102 Pulse Oximeter.

I. INTRODUCTION

Here the main objective is to design a Remote Patient Health Monitoring System to diagnose the health condition of the patients. Giving care and health assistance to the bed ridden patients at critical stages with advanced medical facilities have become one of the major problems in the modern hectic world. In hospitals where many patients whose physical conditions must be monitored frequently as a part of a diagnostic procedure, the need for a cost-effective and fast responding alert mechanism is inevitable. Proper implementation of such systems can provide timely warnings to the medical staffs and doctors and their service can be activated in case of medical emergencies. Present-day systems use sensors that are hard wired to a PC next to the bed.

II. RELATED WORK

A Remote health monitoring system is an extension of a hospital medical system where a patient's vital body state can be monitored remotely. Traditionally the detection systems were only found in hospitals and were characterized by huge and complex circuitry which required high power consumption. Continuous advances in the semiconductor technology industry have led to sensors and microcontrollers that are smaller in size, faster in operation, low in power consumption and affordable in cost. This has further seen development in the remote monitoring of vital life signs of patients especially the elderly. The remote health monitoring system can be applied in the following scenarios: A patient is known to have a medical condition with unstable regulatory body system. This is in cases where a new drug is being introduced to a patient. A fare done before. The vitals may be monitored to predict and alert in advance any indication of the body status. Critical body organ situation The situation leading to the development of a risky life-threatening condition. This is for people at an advanced age and may be having failing health conditions. Athletes during training. To know which training regimes will produce better results.

In recent times, several systems have come up to address the issue of remote health monitoring. The systems have a wireless detection system that sends the sensor information wirelessly to a remote server. Some even adopted a service model that requires one to pay a subscription fee. In developing countries, this is a hindrance as some people cannot use them due to cost issue involved. There is also the issue of internet connectivity where some systems to operate, good quality internet for a real time.

III. METHODOLOGY

The main objective is to design a Patient Monitoring System with two-way communication I.e. not only the patient's data will be sent to the doctor through SMS and email on emergencies, but also the doctor can send required suggestions to the patient or guardians through SMS or Call or Emails. And Patient or guardian can able to track patient's location at any point in time through Google Maps which would enable to send medical services in case of an emergency for non-bed ridden patients.

In the existing system, we use active network technology to network various sensors to a single PMS. Patients' various critical parameters are continuously monitored via single PMS and reported to the Doctors or Nurses in attendance for timely response in case of critical situations. The sensors are attached to the body of the patients without causing any discomfort to them. In this PMS we monitor the important physical parameters like body temperature, ECG, heart beat rate and blood pressure using the sensors which are readily available. Thus, the analog values that are sensed by the roller attached to it. The microcontroller processes these analog signal values of health parameters separately and converts it to digital values using ADC converter.

Now, the digitalized values from more than one microcontroller are sent to the Central PMS. Each of the sensors attached microcontroller with a transceiver will act as a module which has its own unique ID. Each module transmits the data wirelessly to the gateway attached to the PC of the Central PMS. The gateway is attached to the PC i.e. Central PMS which is situated in the medical center, is capable for selecting different patient IDs and allowing the gateway to receive different physical parameter values the patient specified by the ID.

The software designed using Graphical User Interface (GUI) can operate on different physical parameters of each patient, consecutively with a specified time interval for each patient. At any time, any of the doctors or nurses can log on the Central PMS and check the history of the observed critical parameters of any of the patient attached to the network.

IV. EXPERIMENTAL RESULTS

Figure shows the results of the heart rate monitor by the system using IOT. The OLED 0.96" I2C display shows the output of the system which is internally connected to NodeMCU and sensor MAX30102. The output of the system which displayed on OLED by HEART BPM 15.39 Spo2 9

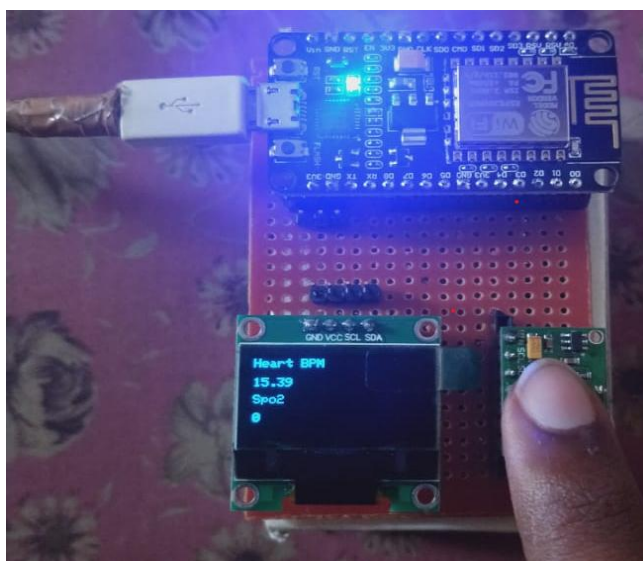


Fig 1. The output of the system



V.CONCLUSION

The main objective of the experiment was successfully achieved. All the individual modules like Heart beat detection module, fall detection module etc. and remote viewing module gave out the intended results. The designed system modules can further be optimized and produced to a final single circuit. More important fact that came up during project design is that all the circuit components used in the remote health detection system are available easily.

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