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Advancement Vogue in Medical Field through Pervasive Computing

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Abstract: ***Internet of things (IOT) is the rapid growing technology, devices connected to internet for communicating with each other. IOT spreading in to all departments. In future IOT plays a key role medical field. With the help of sensors we can able to collect body temperature, blood pressure and heart beat, etc., which are used to evaluate/monitoring the health condition of the patient. Communicating the collected information to the doctor, making accurate decision on the data collected and notifying the patient's health condition is the challenging task in the IOT. In this project, the architecture of the patient health analysing system (PHAS) using IOT devices is proposed to collect the required parameters and evaluate the data obtained from the IOT devices. PHAS also notifies the patient with possible precautionary measures to be practised by them. This system suggests the patient with medical care and next step to be followed in case of critical situation. The PHAS system is evaluated for certain parameters and the decisions made on the data obtained from the source are assumed to analyse the system. The simulated results experiments the correctness and effectiveness of the proposed.***
Keywords: Internet of things, medical devise, patient health analysing system.

I. INTRODUCTION

Today increasingly growing number of people with chronic diseases, this is due to different risk factors such as dietary habits, physical inactivity, and alcohol consumption among others. According to figures from the World Health Organization, 4.9 million people die from lung cancer from the consumption of snuff, overweight 2.6 million, 4.4 million for elevated cholesterol and 7.1 million for high blood pressure. It is said that in the next 10 years, deaths from chronic diseases will increase by 17%, which means in figures of about 64 million people. Chronic diseases are highly variable in their symptoms as well as their evolution and treatment. Some if not monitored and treated early, they can end the patient's life. Among the most common chronic diseases that can be treated and monitored are diabetes, blood pressure, cardiac arrest Patients with these diseases besides having limitations in their physical condition, also often technologies. The challenges associated with this layer are related to miniaturization, while today there are devices with storage, processing, internal parts should be smaller and to improve efficiency. In the case of the sensors used to measure diabetes, ECG, blood pressure, among others, are not very precise and its size is very large and consume a lot of power. Another challenge is found in the communications layer, which is tasked billion devices connected to the network, which involves improving bandwidth and the electromagnetic spectrum. Faced with the above from the application layer and services are presented countless possibilities that allow to obtain, process and recommend valuable information for patients to treatment of diseases and improve their lifestyles. According to the above, it is necessary to take advantage of the benefits that come with advances in technology such as the Internet of Things, as they have become an important medium for the transfer of data from any hardware platform, allowing full communication Person to Person and machine to machine, to improve health care for chronic patients.

II. LITERATURE SURVEY

Hari Haran stated that the heart rate or pulse rate, has been defined as assign basic of medicine, and it is directly to a human's cardio health. Now we are going to make a computer based heart rate monitoring system using a Arduino software board and pulse sensor, pulse detecting sensor that uses the principle by the Arduino then it transfer the data to the computer through a serial monitor

In Matina and Nikos said that augmented reality is increasingly applied in medical education mainly because educators can share knowledge through virtual objects. This research describes the development of a web application, which enhances user's medical knowledge with regards to the anatomy of the human.

Sagar.C developed a Radio Frequency Identification technology and intelligent systems, which detect the disinfected articles and alerts the medical staff to wash the hands after the contact with the disinfectant articles. IOT techniques can be used to promote healthcare in a better way.

M.S.Alam presented IOT based system for providing support to emergency medical services by demonstrating how IOT data can be

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collected and integrated for interoperability. Long discussed the necessary and requirements details of the software for healthcare and proposed an architecture for healthcare and IOT.

III.COMPONENTS

A. Arduino Uno.
B. 16x2 LCD line display.
C. ESP8266 Serial Wi-Fi Wireless Transceiver module.
D. Power supply (9V).
E. SIM900A –GSM-MODEM.
F. LM 35 temperature sensor.
G. Invento INVNT_11 Pulse Rate Sensor.

IV.PROPOSED SYSTEM

In recent years, the growth of internet is tremendous and has been further extended to connecting things through internet. All devices are connected to one another with various smart technologies to create worldwide ubiquitous network called Internet of Thigs (IOT). The development of technologies such as IOT generates huge amount of data, leads to new age of information. Data generated by the IOT devices are used for analysis and decision making process. The applications of IOT can be grouped into domain like (i). Transport and logistics, (ii). Health care (iii). Smart Environment (iv). Personal and Social. The roles of IOT in all these domains are remarkably high. In Transport and logistics vehicle identification, vehicle to vehicle communication, traffic communication etc. are the major advancements in the field of IOT. Nowadays Government focuses on creating smart cities to use all the emerging technologies and developing the nation to compete internationally. Each and every person is surrounded by smart devices, which is used to connect to the 3G/4G network, social networks and other intelligent technologies. The strength of IOT is its high impact on every person's day today life such as entertainment, work, communication and so on. The key enabling factor of IOT is in medical and health care. IOT devices are used to collect, monitor, evaluate and notify the patient with the information. According to Borgia, the penetration of IOT devices in medical and health care is (i). Remote monitoring medical parameters (ii). Diagnostics (iii). Medical Equipment tracking (iv). Secure and access the indoor environment (v). Smart hospital services (vi). Entertainment services. The remote monitoring of a patient by the doctor is still a challenging task. To analyse the health condition of the patient, various medical parameters are needed about the patient. Collecting the parameters and communicating them to the doctor through the proper networking channel.

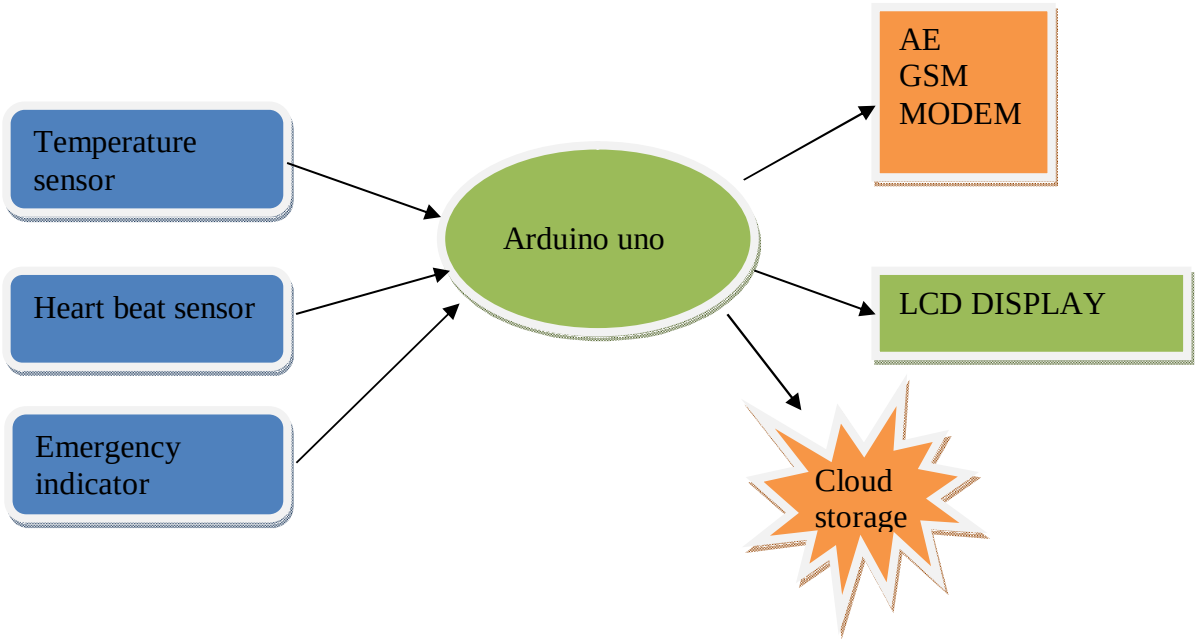

Fig.1 Block diagram of patient health monitoring system

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V. WORKING

For the working of the proposed system it has different modules like power supply unit, Arduino Uno, sensors, GSM module and display unit. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit.

The power supply is the very important unit of any electronic circuit. The power supply unit has AC supply, transformer, rectifier, and voltage regulator. The AC supply is given to the step-down transformer. Transformer transfers the electrical energy between the circuits through electromagnetic induction. By using the transformer we can increase or decrease the AC voltage in electric power applications. The step-down voltage is goes to the rectifier unit. Rectifier is used to convert an AC supply into DC supply, in this project we use bridge rectifier. This DC voltage is moves to the regulator unit. Regulator maintains the constant voltage. Here we use 7805 voltage regulator which maintain the 5V DC supply. This voltage is fed to the Arduino kit.

A program was written , then it will divert working of the system. Otherwise the system works as usually. Now days all embedded systems are not works without Arduino Uno. The Arduino kit has microcontroller which is used to store the program. We uploaded the program in the kit.

Arduino Uno take inputs from sensors (body temperature,heart beat ,emergency indicator),converts analog to digital signal in micro processor .Arduino takes inputs from sensors for every 10 seconds as per program .if any abnormal values are there through GSM it sends alert message to concerned phone number . At the same time through ESP8266 Serial Wi-Fi Wireless Transceiver module stores data in cloud .so that we can access the at any time at any place .By using Liquid Crystal Display (LCD) body temperature, heart beat displays simultaneously.

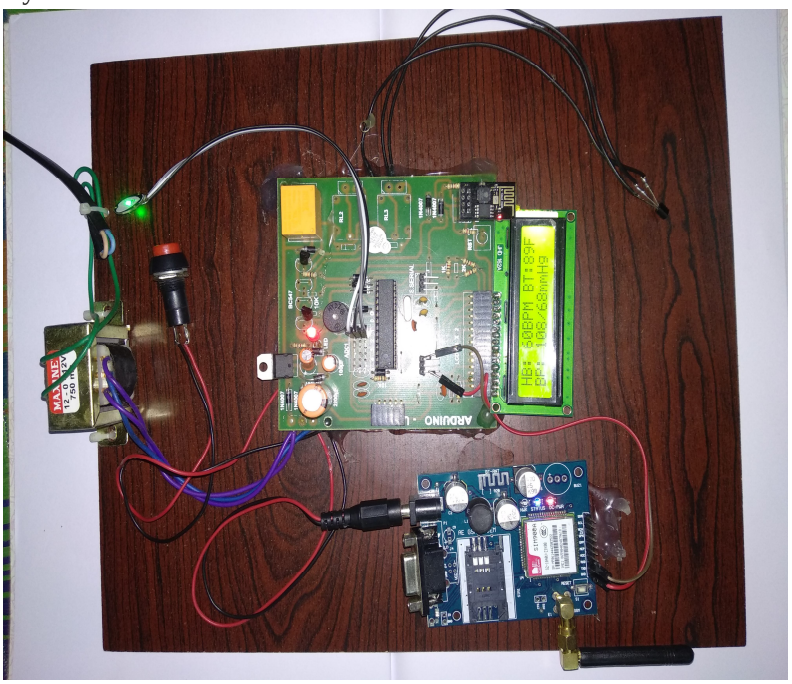

Fig.2 Hardware kit

VI. ADVANTAGES

A. Continuous monitoring of patient.
B. Right treatment will be given to right person at right time.
C. Storage of data in cloud,so that helps in LIC related issues.
D. Low power consumption and small in size.
E. More flexibility.

VII. CONCLUSION

This research led to the development of a system which measured heartbeat and temperature of a patient and sent it to a remote end by the use of an Arduino and Atmega328 microcontroller at a reasonable cost with great effect. It utilized remote patient monitoring system technology which enabled the monitoring of patients outside of clinical settings and leads to increasing access to health care as well as decreasing the health care delivery costs.

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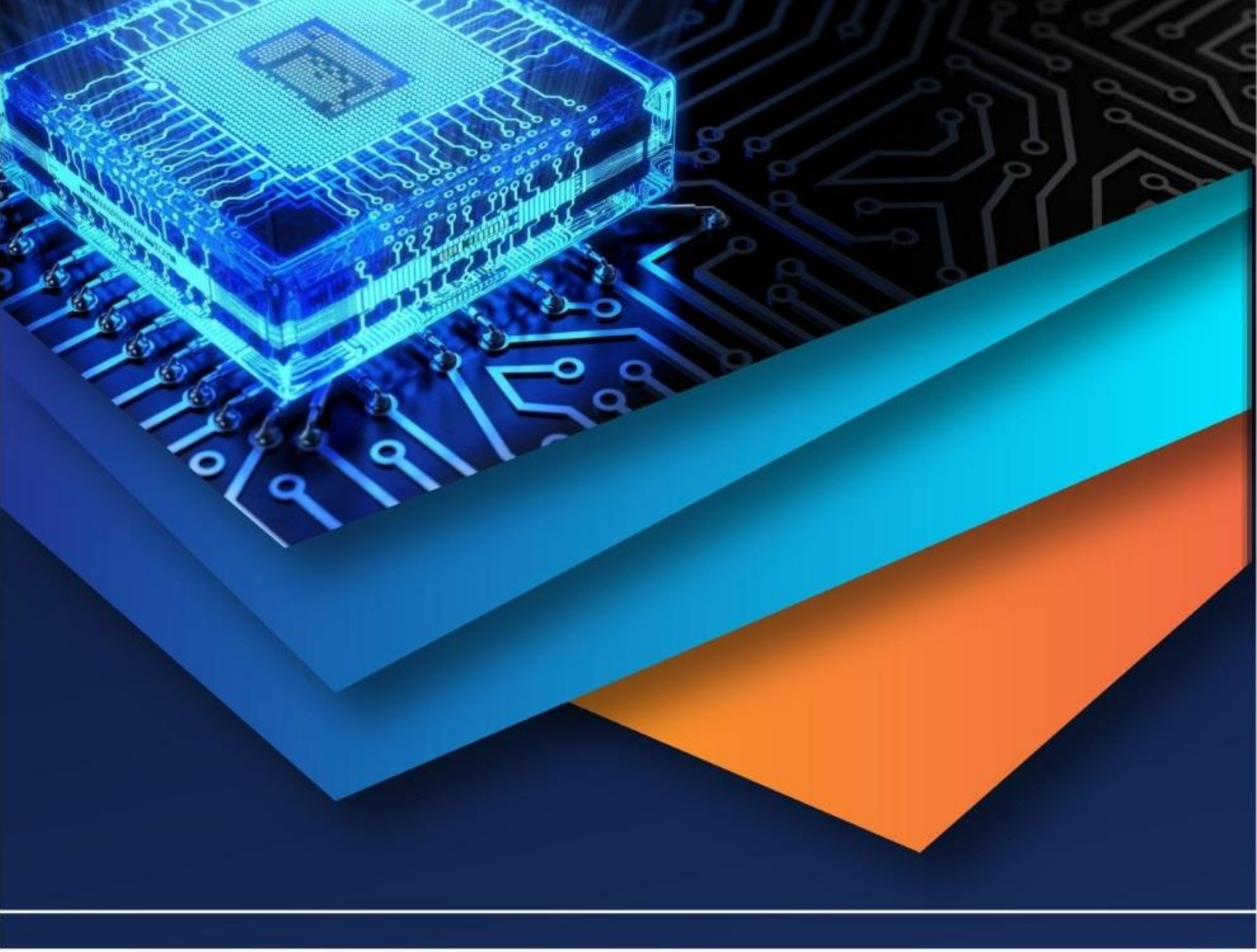

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