A SMART HEALTHCARE MONITORING SYSTEM BASED ON IOT

Ms. Mouna M. Naravani
Assistant Professor, Department of CSE,
BLDEA's Vachana Pitamaha Dr. P. G. Halakatti College of Engineering and Technology,
Vijayapur, Karnataka, India

Ms. Shweta S Khavatakoppa, Ms. Akshata Gudgunti, Ms. Shruti Yaranal, Ms. Poornima Kambi
Final year students, Department of CSE,
BLDEA's Vachana Pitamaha Dr. P. G. Halakatti College of Engineering and Technology,
Vijayapur, Karnataka, India

Abstract— **The main aim of Smart Healthcare Monitoring System (SHS) based on IoT is used for emergency medical services. It can demonstrate integration of medical implementation and interoperation of IoT data flexibly. It gives efficient support to emergency medical services to the Intensive Care Units (ICU) patients. By using Blynk application the doctor can easily install it in their phones and get access. This system is effective as well as efficient results with high performance and quick responses. The smart healthcare system helps to improve health related problems and reduces the cost of healthcare by collecting, analyzing and distributing large amount of information in real time. The main enthusiasm is to reduce the strain of the doctors to visit every time to check patient body condition. SHS saves the time of both doctor and patient. This real time medical service provides proper and practical results of the heartbeat sensor, temperature sensor and drip level sensor.**

Keywords— **Smart Healthcare Monitoring, IoT, Blynk application, Heartbeat sensor, Temperature sensor, Drip level sensor.**

I. INTRODUCTION

Internet of Things (IOT) can be defined as the wireless network of devices which are connected to each other to share information and data. It will capture and share of essential data through the network. By using SHS it will help to record and analyze it for future use.

Internet of Things gains and gives the utilizing the key role, which uses various sensors and actuators those will sense the various parameters of the patient body and ward, and the cloud will act as communication channel between PC unit and Blynk app to access the information about patient. It is a open source Internet services and interact with the human world. This not only robust and comfortable but also makes the world connected. The IOT plays a major role between smart health care systems. The main fervor is to reduce the strain of the doctors to visit every time.

II. LITERATURE SURVEY

[1] Companies producing consumer products have begun working on ways to control their products over the IP (internet protocol).Multinationalelectronics firms are marking a fair sha -re of their lines using technologies like the RF ID, a front end to the IP networks. The main feature that is achieved by the already-existing home automation systems is that, every piece of equipment integrated is to be controlled by acen tral unit. The proposed solutions based on this idea are relatively expensive and difficult to configure. IP based systems are supposed to be simpler to be a ccessed and easier to manipulate, with the only necessity being, close proximity to a direct internet connection. With this in mind, SHS has designed a low cost hardware/software framework based on a unit what we call the IPAc Box which allows home/industrial automation systems to be accessed and controlled through a direct internet connection right out of the box even in dynamic IP configurations.

[2] The design and implementation of an IOT-aware architecture for smart healthcare system for emergency medical services which can demonstrate collection, integration, and interoperation of IoT data flexibly which can provide support to emergency medical services like Intensive Care Units (ICU), using a INTEL GALILEO 2ND generation development board[9]. The proposed model enables users to improve health related risks and reduce healthcare costs by collecting, recording, analyzing and sharing large data streams in real time and efficiently. The idea came so to reduce the headache of patient to visit to doctor every time he need to check his blood pressure, heart beat rate, temperature etc. With the help of this proposal the time of both patients and

doctors are saved and doctors can also help in emergency scenario as much as possible.[6] The proposed outcome of the project is to give proper and efficient medical services to patients by connecting and collecting data information through health status monitors which would include patient's heart rate, blood pressure and ECG and sends an emergency alert to patient's doctor with his current status and full medical information.

[3] In this work, S.M.Rajesha, described about "Automation System Products and Research". It is used in most building is nowadays. In the past they were mainly used in industry to control and monitor critical systems.

[4] "Real Time Patient Monitoring System Using Lab view". Telemedicine is a rapidly developing application of clinic medicine where medical information is transferred through the phone or internet or other networks.[5] In this method, the patient's vital signs like ECG, heart rate, breathing rate, temperature are captured and the values are entered into the database.

Drawbacks of Bluetooth: [10]

The main drawback of Bluetooth is, low energy. It covers small area distance, Time consuming while in transferring big data.

III.   SYSTEM ARCHITECTURE

Working

The Fig 1 consists of three component modules:
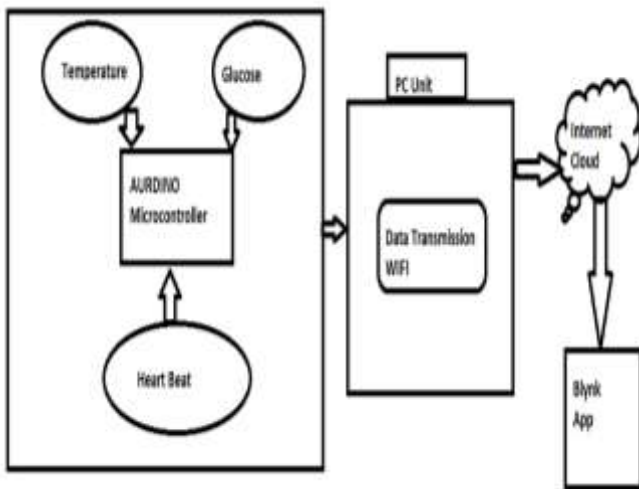. 1. Aurdino microcontroller
 2. PC unit
 3. Blynk app

Fig.1: Working of SHS.

The micro controller is attached with three sensors, they are:

1. Temperature sensor
2. Glucose sensor
3. Heart beat sensor

Above Fig 1 will show schematic representation of the Smart Health Care System. Here the microcontroller will connect three different sensors. They are as above mentioned. These sensors sense respective parameters and records. These records are then transmitted to PC unit. Later through wi-fi the data is transferred using the internet cloud. it will act as Gateway between to cloud as well as doctor's mobile app called as Blynk application. Through this the doctor will receive the patient details. As compare to previous here main thing changed here is, instead of bluetooth, wifi will be carried out.

Blynk application

Blynk app is platform with Android apps to control Arduino. The blynk app will gives the compatibility to the Arduino. By using the blynk app the doctor can get access the patient information as well as keep avoiding going to the patient ward every time[8].This app will reduce the time and money of the both patient and doctor.

TEMPERATURE SENSOR

The temperature sensor measures exact room temperature of patient ward and it varies according to the weather condition. If temperature goes beyond the limit, notification is sent to the doctor. This helps to take the required measures at emergency situations. Hospital administration can view and check patient's records anytime. Among the two types of sensors, contact type of sensor is used in this healthcare system.
Because these sensors have no moving parts, they are precise, never wear out, don't need calibration, work under many environmental conditions, and are consistent between sensors and readings. Moreover they are very inexpensive and quite easy to use.

Types of Temperature Sensor:

There are two temperature sensing methods:

• Contact
• Non-contact

Contact Temperature Sensor Types –

These types of temperature sensor are required to be in physical contact with the object being sensed and use conduction to monitor changes in temperature. They can be

used to detect solids, liquids or gases over a wide range of temperatures.

Non-contact Temperature Sensor Types –

These types of temperature sensor use convection and radiation to monitor changes in temperature. They can be used to detect liquids and gases that emit radiant energy as heat rises and cold settles to the bottom in convection currents or detect the radiant energy being transmitted from an object in the form of infra-red radiation.

GLUCOSE SENSOR

Glucose sensor is nothing but the drip sensor. The sensor is in-built while manufacturing. When the liquid is full in glucose bottle it will float and shows the result as NORMAL. When liquid gets empty it shows the result as LOW. This is how the glucose or a drip sensor will be going to work in a real time in the smart health care system.

HEARTBEAT SENSOR

This sensor will sense the pulse rate of the patient heartbeat. Heartbeat can be measured on the optical power variation, as light is scattered or absorbed during its path through the blood as the heartbeat changes.

IV. EXPERIMENTAL RESULTS

Heartbeat sensor

The fig 4.1 shows the pulse rate bit of the patient body. The heartbeat sensor will sense the body and sends message to the doctor's mobile application. In this fig 4.1 the heartbeat rate is 40 so the condition of patient heartbeat is ABNORMAL. The LOW condition will show the results of glucose level sensor. It shows the exact measurement of the room temperature of the patient ward. Normal bit rate of the heart beat is 60. If it comes less than this bit rate, it will show abnormal.
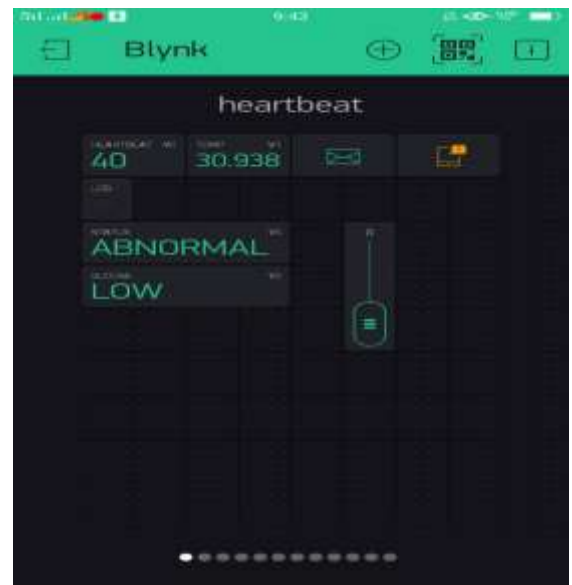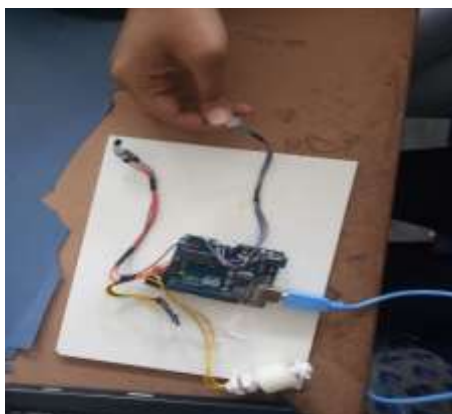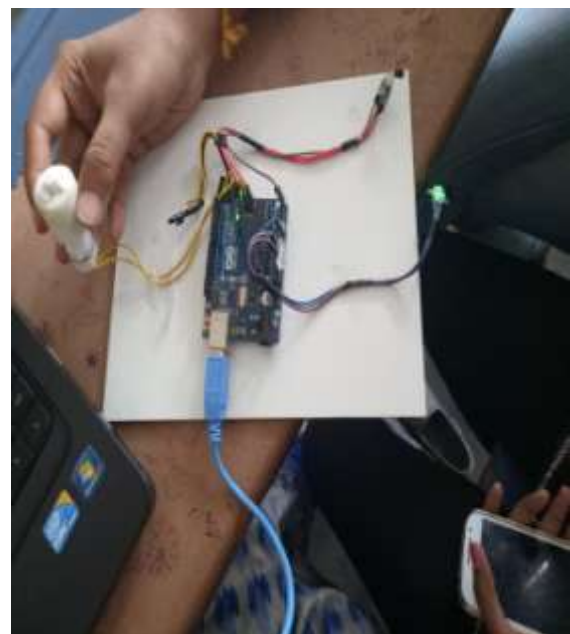

Fig 4.1: Working of Heartbeat sensor

Glucose sensor

The fig 4.2 shows the glucose level of the patient body in the sense of normal or low and it will send notification to the doctor's mobile. If level of glouse will get empty it will shows the result low, or else it is normal. For demonstration purpose water level sensor is used.
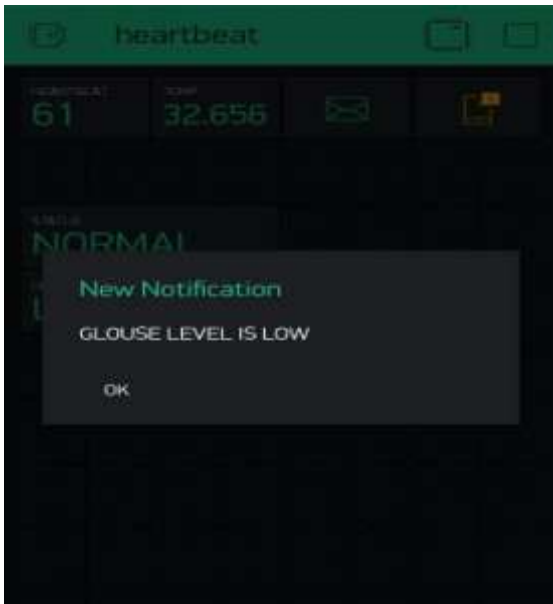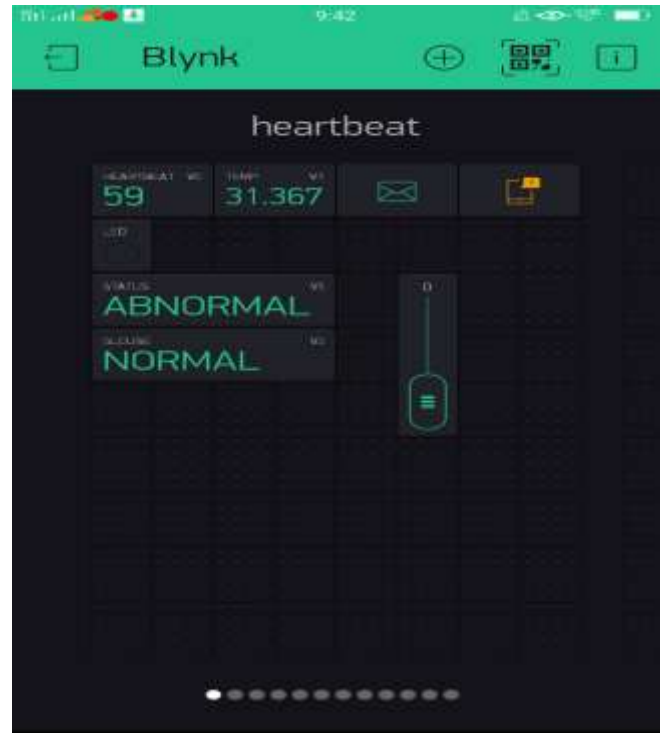
Fig 4.2: Working of glucose sensor

Temperature sensor

Fig 4.3 represents the working of temperature sensor. The temperature sensor gives the exact measurement of the patient ward and sends notification to the doctor mobile application. In the Fig 4.3 the heartbeat rate is 59, the condition of the patient is ABNORMAL. The level of the glucose is NORMAL. The room temperature of the ward is 31. 367. It various according to the weather condition.

Fig 4.3: Working of temperature sensor
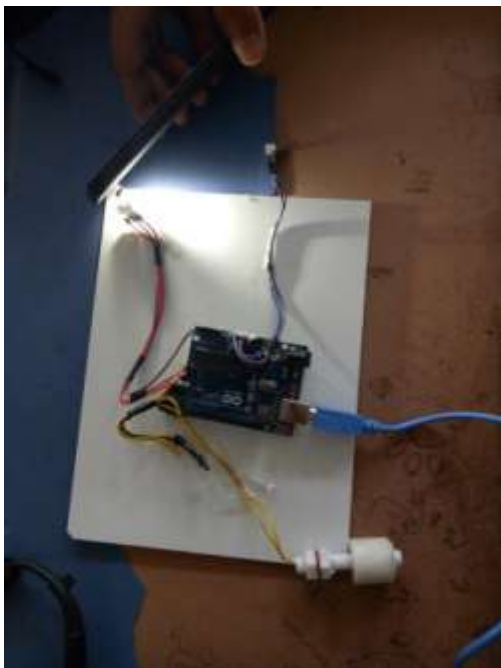
V. CONCLUSION

An efficient SHS is developed to monitor and send an up to date details of the patient in the absence of the doctor. The system collects information like temperature, blood pressure and pulse rate of the patient and updates the same to the doctor. The system verifies patient's status by monitoring and collecting the sample data of patient. The doctor analyzes and monitors the patients' health condition and then advises them about their health. By using the Blynk mobile application, more features can be added to extend the system. By using this mobile application doctors can create awareness about diseases and their symptoms.

VI. REFERENCE

[1] Alkar, A.Z., Hacettepe Univ; Roach, J.; Baysal, D., "IP based home automation system", Consumer Electronics, IEEE Transactions on (Volume: 56, Issue: 4), November 2010, IEEE [8] Al-Ali, A.R.,AL-Rousan, M., "Java-based home automation system", Consumer Electronics, IEEE Transactions on (Volume:50 ,Issue: 2), May 2004,IEEE

[2] Sharma S. "Evolution of as-a-Service Era in Cloud". arXiv preprint arXiv:1507.00939. 2015 Jun 29.

[3] Rintala, Mikko, Jussi Sormunen, Petri Kuisma, and Matti Rahkala. "Automation System Products and Research."(2014).

[4] Sandeep Patel, Punit Gupta, Mayank Kumar Goyal, "Low Cost Hardware Design of a Web Server for Home Automation Systems", Conference on Advances in Communication and Control Systems(CAC2S), 2013

[5] Aleksandra C. Zoric, SinisaS.llic, "PC ssBased Electrocardiography &Data Acquisition", TELSIKS, IEEE, pp 619-622, September 28- 30 2005.

[6] Tia Gao, Dan Greenspan, Matt Welsh, Radford R. Juang, and Alex Alm, "Real Time Patient Monitoring System Using Lab view", International Journal of Scientific & Engineering Research,April-2012.

[7] Sherin Sebastian, Neethu Rachel Jacob, "Remote Patient Monitoring System Using Android
Technology", IJDPS, September 2012.

[8] www.blynk.cc.

[9] Wilkoff BL, Auricchio A, Brugada J, Cowie M, Ellenbogen KA, Gillis AM et al. "HRS/EHRA Expert Consensus on the Monitoring of Cardiovascular Implantable Electronic Devices (CIEDs): Description of Techniques, Indications, Personnel, Frequency Ethical Considerations", Euro pace 2008;10:707–25.

[10]https://www.ncbn.nlm.nih.gov/pmc/articles/PMC2864182.