

Alliance of Health Monitoring through IoT Technology

Nabisaheb Bagwan¹, Geetha G. P²M. Tech IV Sem, Dept. of ECE, S J B Institute of Technology, Bangaluru, India¹Asst. Professor, Dept. of ECE, S J B Institute of Technology, Bangaluru, India²

ABSTRACT: In this proposed work, try to communicate between the sick people who are far away from hospital and with the specialized doctors. By using physiological sensors like ECG Electrode sensor, Blood Pressure sensor, Heart Rate sensor, Body Temperature sensor are connected to ill body, also humidity sensor and Temperature sensor are fixed in room or leaving area of patient to the environment around patient. The report of the physiological parameters is share with Cloud by using internet. Doctor can login the site and easily he come to know the patient conditions, then doctor can be diagnosing in some critical condition of patient. Here integrate or alliance the many patients to a single doctor or a big clinic of ICU room's patient and other ward patients to one doctor.

KEYWORDS: LPC2148 Microcontroller; Physiological sensor; ECG; BP; Pulse Rate; Humidity; Internet; Cloud Computing; Communication;

I. INTRODUCTION

In these Day's increased in elderly and constantly ill's population in human systems continuous health monitoring is required to become continuously more important in life. But admitting in the hospital for months or even years will leave their quality life and it expensive. The routine procedures in the room are measuring the vital signs for example Heart Rate, Blood Pressure, Electrocardiograph (ECG), and Body Temperature and so on.

Present systems in hospitals use sensors that are hardwired to adjacent bedside monitors the patient body conditions and thus restrict the patient to his clinical bed. A portable wireless framework need not require patients to be confined to on their beds. The rapid growth of wireless technology's infrastructure allows a range of new medical applications that will be significantly improving the quality of health care of patient.

The quality of life for individuals that required a hospitalization suffers to achieve the higher standard of care and attainable in the hospitalized environment. The additions of these factors tend to push the healthcare industry to seek solutions that keep the healthcare costs are comparatively less and while providing similar standards of care to individual patients at their own homes.

By using this wireless technology we integrate the patient's condition that is Alliance (Integrate) of Health Monitoring System (IHM). It is a method to provide an integrated wireless and communications platform to get real-time patient information and enabling collaborative treatment, to improved throughput clinician efficiency and overall cut costs of treatment patients.

The Alliance (Integrated) of Health Monitoring System (IHM) is a complete solution of the patient that is information acquiring (patient monitoring), processing (database framework), observing i.e. data communication (diagnostic analysis) and storing the vital signs conditions of the patients i.e. in cloud based server starting from the home until reaching the hospital.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 6, June 2016

II. LITERATURE SURVEY

In this project Alliance the patients to a single doctor through cloud by using the internet facility. But the physiological parameters are used to connect the body and upload the report to cloud. Doctor can access the site and diagnose at right time to the patients conditions.

[1] This paper from Purnima, Puneet Singh 2014 International Conference. Here the parameters of patient are measured continuously i.e. temp, heartbeat, ECG and wirelessly transmitted using Zigbee. In the system the patient health is continuously monitored and the acquired data is analyzed at a centralized. If a particular patient's health parameter falls below the threshold value, an automated SMS is sent to the pre-configured Doctor's mobile number using a standard GSM module interfaced to the ARM microcontroller. The Doctor can get a record of a particular patient's information by just accessing the database of the patient on his PC which is continuously updated through Zig bee receiver module.

[2] In ICOIEV 2014 paper deals with different problems of heart related issues so by using the fingertip. A fingertip sensor which contains an IR light emitting diode and IR photo detector receiver; Using this device the heart rate signal can found. Amplify the signal and after that transmitting a signal, it is received by the RF receiver. Then amplified signal will be shown on the LCD display.

[3] This paper from P. Szakacs-Simon, S.A. Moraru CINTI 2012 describe the exciting work, the main objective of this project is to prevent emergency conditions by giving the patient to take procedure before his health condition get wrong and needs emergency clinical care i.e. early detect conditions when pulse rate and blood oxygen level are out of their safe ranges. This is low cost mobile communication and alerting device, which communicate with a PC presented in the range of a remote or Bluetooth network and automatic analyze and record data into database for later review.

[4] This paper from Jetsada Arnil, Yunyong Punsawad 2011 IEEE described the method of communication; Physiological information and signal are sent using Xbee which is a wireless system. Monitoring framework is one of the important systems in medicine that can help doctor diagnose and predict a symptom before making a plan for treatment. Then monitoring system can be set to alarm when patient has abnormal behavior.

[5] This paper is from Amir Hoshang Kioumars and Dr. Liqiong Tang 2011 Fifth International Conference. System that can be wirelessly monitor pulse rate and body temperature. In home health system, the use of technology that permit patients to monitor their own vital signs from their home and communicate report to a hospital professional, Here Arduino micro-controller hardware and software, an XBee radio is used and wireless communication protocol. The sensor is wrapped around the wrist, encrypts the data and transmits them to a remote computer near the patient using an XBee network. The coordinator is connected to a computer running a program to monitor and process the incoming data.

III. SYSTEM DESIGN

The Alliance (Integrated) of health monitoring (IHM) system explained how doctors and ill patients connected through cloud and the way of diagnose by doctors. Here neatly explained in which conditions patient can diagnose and also the how the wireless method is used. The wireless network sensors are available and connected to patient's body and report of sensors share with cloud by using internet. Doctors can see the conditions of patients and diagnose from far places.

- ✓ ECG signals are acquired using three standard ECG Electrode leads. Acquired ECG signals are amplify and processed to compute heart rate and classify the cardiac arrhythmias.
- ✓ Pulse Rate is acquired from the finger i.e. probe is connected to patient finger and processed to compute pulse rate and oxygen saturation.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 6, June 2016

- ✓ Blood Pressure is acquired by connecting cuff to left arm of the patient. Acquired signals are filtered and processed to compute BP.
- ✓ Respiration signal is acquired, filtered and processed to compute respiration rate.
- ✓ Body Temperature is acquired using digital thermometer and displayed.
- ✓ Humidity sensor is connected in around patients to know the water in air.

A. Block Diagram of Project:

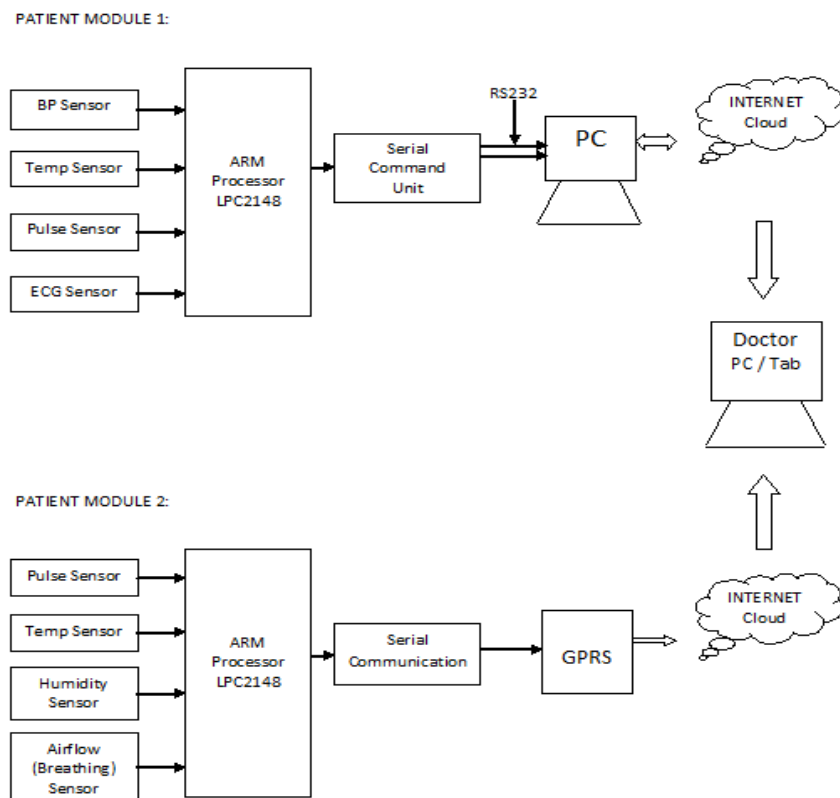


Fig2. Block Diagram

In fig2 shows how the physiological sensors are connected between the patient body and the microcontroller i.e. LPC2148 then it is interfaced to personnel computer and also GSM modem is connected to share data to cloud computing through internet.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 6, June 2016

B. Schematic Diagram of Project:

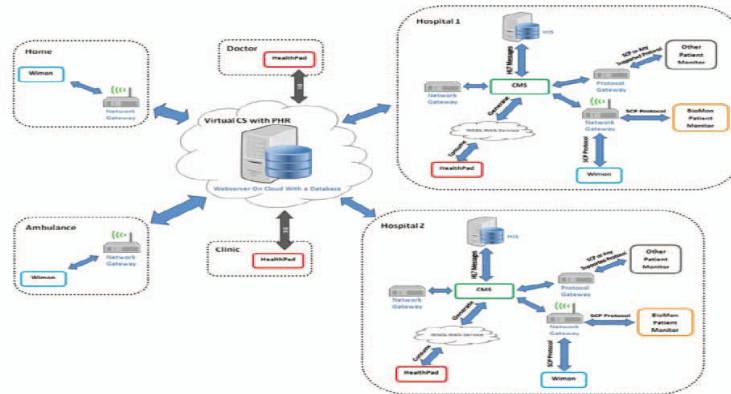


Fig1. Schematic Diagram

In fig1 showing the schematic diagram of project where the all kinds of patients related places are integret to the single server i.e. called a cloud. Combinations of Home, Ambulances, Hospitals rooms and all are connected to a single doctor or specialised doctors.

C. Flowchart of Project:

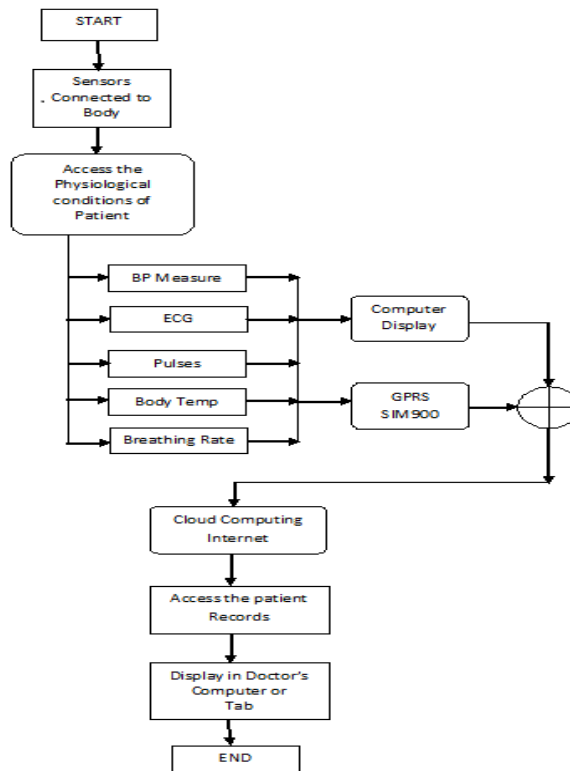


Fig3. Flowchart

In fig3 shows the flowchart i.e. flows of execution of project here neatly described from start to end with all notations like sesors and doctors and cloud systems and so on.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 6, June 2016

IV. PROPOSED WORK

Alliance (Incorporated) Health Monitoring System (IHM) is a finished arrangement of obtaining, preparing, observing and putting away the basic indications of the patients. Coordinated Health Monitoring System is comprised of physiological parameters securing modules, server information application for sparing patients information, an information viewer in Tab or Pc. Physiological information and flags, for example, ECG, Respiration, heartbeat, and temperature are procured through patient monitoring device at hospitals and through compact remote monitoring at different areas, for example, home, ambulance, emergency treatment doctor's facilities and specialist's centers.

By associating the BP belt to patient arm and pump the air into certain breaking point and we get an estimations of systolic and diastolic qualities i.e. high BP and low BP esteem. At that point we can get ECG signals by interfacing the three terminals to patient chest or two hands and one is to right leg of patient with the goal that we get an ECG sign of patient, from this we come to know the heart working conditions. Body temperature of patients is likewise one of essential parameter from this we come to know the temp of patient body, so we can analyze appropriately in basic conditions. By interfacing the beat sensor to the tip of finger or thumb we come to know the heart rate of patient i.e. beats of the patient so we can choose what sort of issues is there. Humidity sensor is altered in space to check whether the amount of rate of water is accessible in air.

Quiet information and records are exchanged by Standard communications protocol (SCP) inside every healing center to cloud, in every focal station is doled out for a gathering of patients' beds segment in ICUs (Intensive Care Units) or Hospital rooms. Patients' records and readings are sent through high speed internet i.e. 3G/Wi-Fi and saved on a cloud health information's in server database by SCP convention. These patients' information are spared and displayed at ongoing on a Tab through web showcase's screen and saw by the medical stuff worried with those patients. Cloud health data servers spare information which are asked for by specialists utilizing the Computer or Tab application outside clinics and far from their patients.

V. RESULT

A. Login Page for Doctor or Patient:

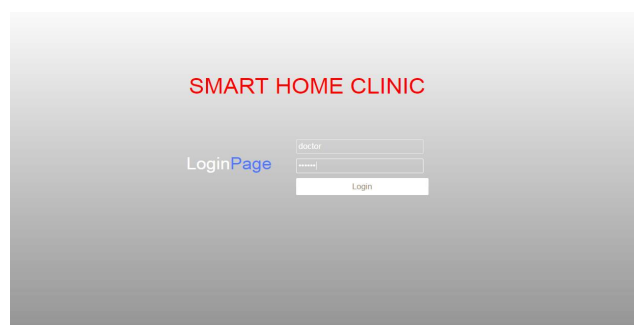


Fig4. Login Page

In fig4 shows a login page for Doctor or patient and login the page access from site by using internet in his personal computer or Tab or mobile phones.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 6, June 2016

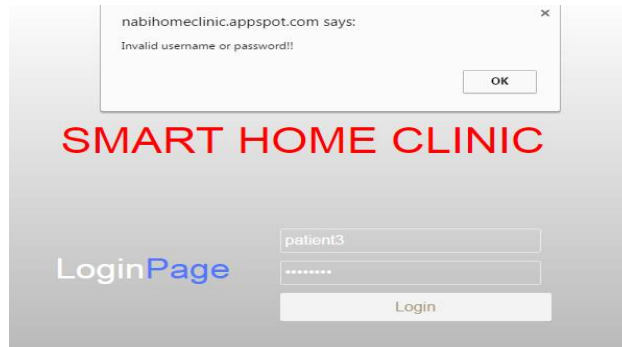


Fig5. Login Page with Wrong ID

In fig5 shows the login page but it is showing error if the authorized or unauthorized persons entered a wrong password then it gives information's like invalid name or invalid password.

B. Details of Patient Records:

ECG Signal of Patient:

List of Patients!!

Patient1	Name : Basavaraj J
	ID : 18002235
	Location : Home
	View details
Patient2	Name : Mantesh B
	ID : 18001156
	Location : ICU
	View details
Patient3	Name : Sangamesh M
	ID : 18002323
	Location : Home
	View details
Patient4	Name : D'souza
	ID : 18001212
	Location : Room
	View details

Fig6. Details of Patients

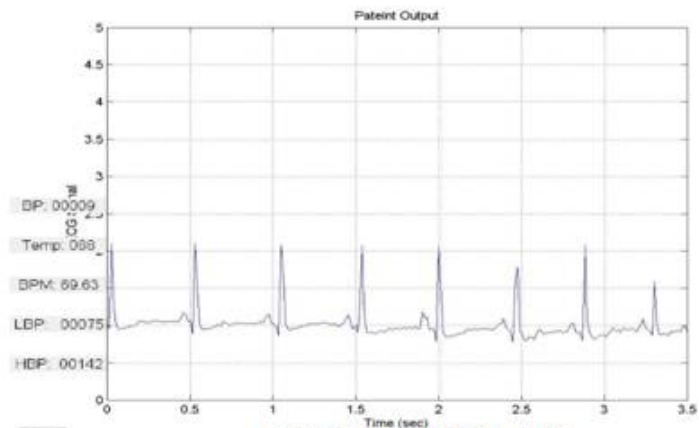


Fig7. ECG Signal of Patient1

In fig6 shows the Details of patient, when doctors login the site then they get like page and they get a clear view of all patients information's like like patient is in home or hospital or somewhere else and many things they come to no from site.

In fig7 shows the ECG signal of the patient1 and doctors easily come to know the Heart conditions of patient1 and they can diagnose or give some precautions to patient1 in the advanced stage.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 6, June 2016

C. History of Patient1 in Detail:

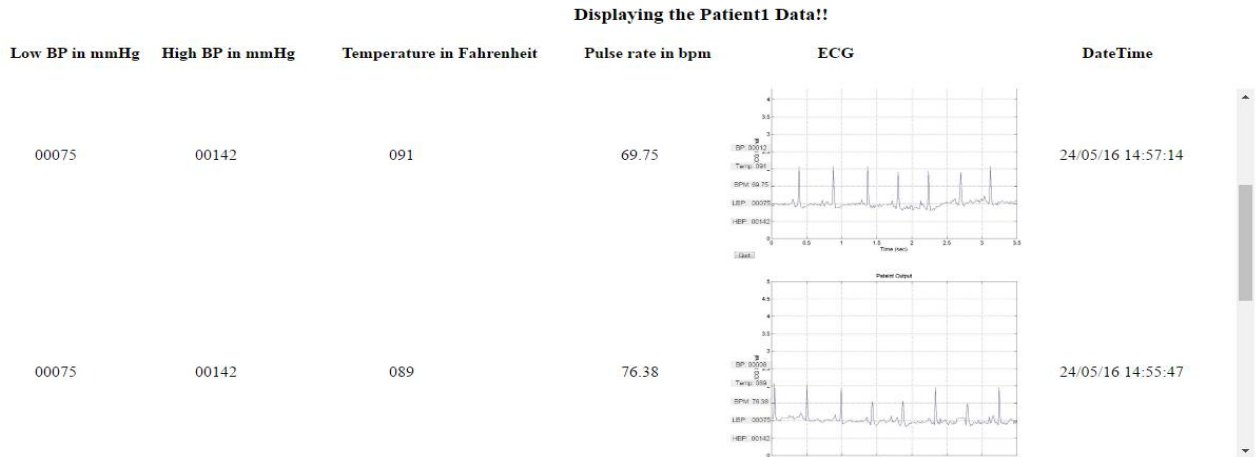


Fig8. Patient1 Details

In fig8 shows patients information's like Data or readings of physical conditions of patient1 is cleared and doctors come to know clearly the present conditions and can diagnose correctly at right time. In this page displays of patient body temp, ECG signal, BP values and pulse rate of patient. This technology is save the time and a life of the patients.

D. History of Patients2 in Detail:

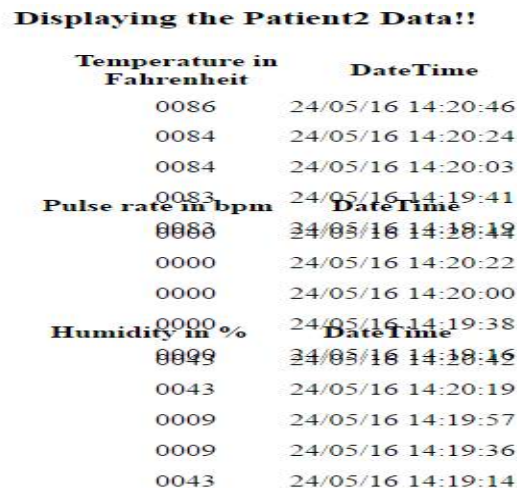


Fig9. Patient2 Details

In fig9 shows the other patient information's like patient is in hospitals of ICU room or special condition room and data is serially uploaded to cloud with help of GSM module so it display in various time for single patient.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 6, June 2016

VI. CONCLUSIONS

There are so many medical issues, now a day's patients have been some critical conditions in such cases there is no time to reach hospital. So this proposed method is used IoT technology with high speed internet facility to reduce the death rate of patients and giving some precautions. A single doctor can maintain a big hospital or a many patients from far distance; it saves time, money and a life of the patient.

VII. FUTURE WORK

In proposed work we can connect a patient and specialist doctors through cloud by accessing the internet by sitting far away from hospital or in some other places. We can add or connect many physiological sensors parameters to patient body to get correct and perfect values of physical conditions. So we can get a blood glucose level, kidney related problems, joint related problem and so on we can add such sensors and all to body to diagnose the patient by doctors.

REFERENCES

- [1]. Purnima and Puneet Singh, "Zigbee and GSM Based Patient Health Monitoring System", International Conference on Electronics and Communication System 2014.
- [2]. Md. Rifat Hazari and Effat Jahan, "Design and Implementation of Heart Rate Measurement Device Using Wireless System", 3rd International Conference on Information, Electronic, Vision 2014.
- [3]. P. Szakacs-Simon, S.A. Moraru and L. Perniu, "Pulse Oximeter Based Monitoring System for People at Risk" "Transilvania", 13th IEEE International Symposium on Computational Intelligence and Informatics 20-22 Nov-2012.
- [4]. Jetsada Arnil andYunyong Punsawad, "Wireless Sensor Network-based Smart Room System for Healthcare Monitoring", IEEE International Conference on Robotics and Biomimetics 7-11-Dec-2011.
- [5]. Amir Hoshang Kioumars and Dr. Liqiong Tang, "Wireless Network for Health Monitoring: Heart Rate and Temperature Sensor" Fifth International Conference on Sensing Technology 2011.
- [6]. C. Wang, Q. Wang, K. Ren, and W. Lou, "Privacy-preserving public auditing for storage security in cloud computing," IEEE INFOCOM'10, SanDiego, CA, USA, March2010.