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IoT Health Monitoring System using ZigBee and GSM

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Abstract:- IoT Health monitoring is an essential for the present existing system because of its demand and busy life of every human being. This paper discussing about Health Monitoring system, ZigBee based information transmission and data collection of a patient. Framework testing made using various remote sensors connectivity and conveyed to the far end through ZigBee interface. Switching the emergency devices can be made from anywhere in the world using WiFi or GSM. Emergency information can be shared through SMS to doctor based on the threshold levels of sensors. This paper discussed about a framework that is suitable for patients with basic observable parameters constantly without any deviations. The system continuously monitors the basic condition happens, framework will update in the server and gives an indication to doctor if the values exceeds threshold level. It will give quick response with less time about patient condition to the doctor even though the patient is far away from the doctors homes.

Keywords:- *ARM LPC 2148 Microcontroller Board, ZigBee Transceiver, Personal Computer, GSM Modem, Sensors.*

I. INTRODUCTION

Technology is the most adopting in every field across the World. Transformation can lead to comfortable compare with existing. As the technology adopting in every stage of life is upgraded for its past and changed into more agreeable and complex comparatively previously available system. Adopting technology is in all sectors but medical industry is likewise gaining fast headway and turning out to be more inventive. Presently in this field little measured and more exact hardware is currently accessible when contrasted with past. Medical clinics are not completely prepared to cater each infection and therapies given to patients are not palatable. Indispensable illnesses are the one wherein patient needs constant checking of its body wellbeing boundaries like sugar level, coronary illness and so forth adequate specialists are not accessible to check every patient independently and with fulfillment. The framework proposed in this paper essentially assist those patients and their wellbeing boundaries with canning be checked from a distance. Enormous number of patients can be checked from distant area whenever by a solitary specialist and can be cautioned if there should arise an occurrence of any disturbing circumstance. This paper describes about sensor interface and communication establishment using ZigBee and GSM [1] in medical environment to patient. Patient's health can be monitored regularly and updating the values in the portal. If specific sensor value exceeds then information will be sent to corresponding doctor using SMS.

II. EXISTING SYSTEM

The all old framework has a low inclusion region however we are use in GPS/GSM so we have an exceptionally huge inclusion region [2]. The patient is in any spot our framework is shipped off the Measurement information to server. We proposed framework is less postponement and low clamor. The current framework is utilized in just emergency clinic not in out of medical clinic [3]. In our proposed framework it is of low power working framework.

III. SYSTEM COMPONENTS

Here in this section we are describing about block Diagram of Patient Section and doctor section. The system consists of programmable micro controller LPC 2148, Sensors such as Temp, ECG and BP sensor [4]. System consists of LCD display and communication interface ZigBee. Doctor room section also consists of micro controller LPC 2148, LCD display and communication interface ZigBee along with GSM modem.

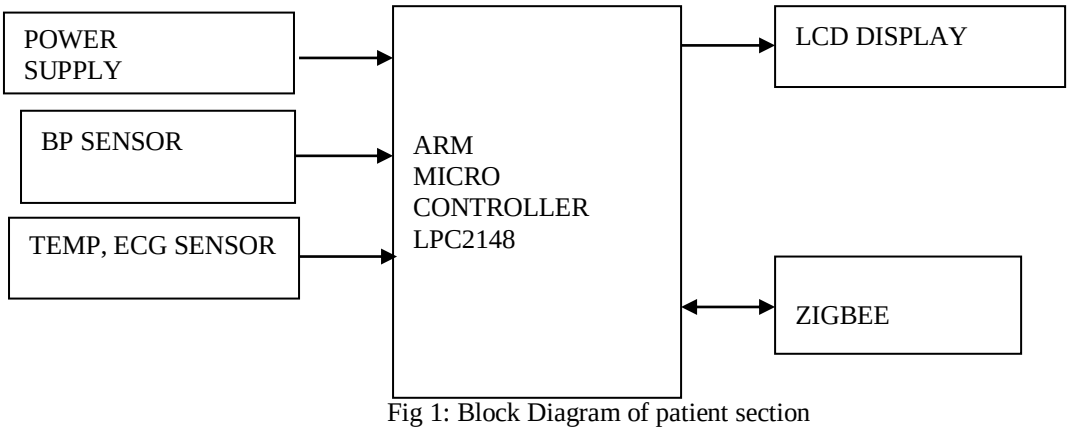

Fig 1: Block Diagram of patient section

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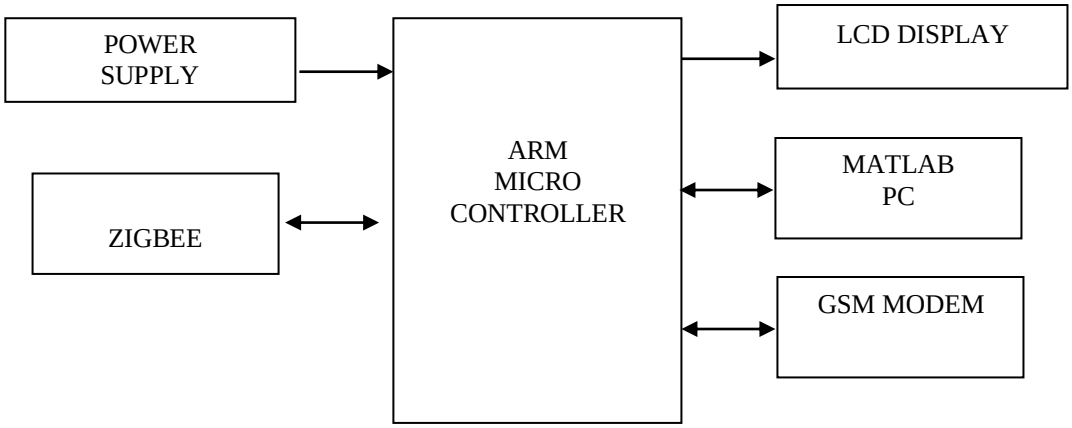

Fig 2: Block Diagram of Doctor room section

A. BP sensor

The Blood Pressure Sensor is used to measure systolic and diastolic values of a human and it can also provide pulse rate of a patient [6]. The sensor used to connect with LPC2148 micro controller using serial communication.

B. LPC2148 Micro Controller

In this system LPC2148 controller used to connect the sensors and other peripherals. Programming can be done using embedded C in Keil U Vision software and programmed using flashmagic. It consists of built in ADC to convert the sensor data into digital such as temperature sensor. It consists of 512KB ROM with ISP (In system Programmer) for the application programming in to micro controller [7]. ARM LPC 2148 consists of 2 serial communication interfaces. BP sensor, ZigBee and GSM modules are connected using serial communication.

C. ZigBee Communication System

ZigBee is a standard wireless technology operated with 2.4GHZ unlicensed spectrum used to connect machine to machine with less power consumed. It will be used for low data rate with low power applications and Internet of Things.

IV. SYSTEM DESCRIPTION

An intuitive wise medical care and checking framework including body sensor organization and neighborhood sensor network has been introduced. The remote bio-signal procurement can be done based on Body Sensor Network can be connected to obtain the genuine information by means of ZigBee network correspondence [8]. The high mix TX - Baseband processor with ZigBee. Also, an ARM-based recipient stage with a RF collector, a simple to advanced blended mode board, ARM-based displayer to exhibit values. Information received can be processed using MATLAB as per the threshold levels and save the data as record for the purpose of future evaluation if required. It will give complete idea about a patient, abnormality behavior even though the regular corresponding doctor changed due to any problem. The next doctor can able to give the treatment based on available data. We have an option in our project to send an SMS to concern specialist if any abnormalities occurs as we kept GSM that can be work based on the AT commands we used in our program for sending SMS if required. Basic framework was designed and executed in this paper for the patients who are not in the basic state but rather they can be consistently monitored. Whenever the basic condition happens, framework will begin a disturbing message and send it to the specialist.

V. WORKING MODEL SCHEMATIC AND EXPERIMENTAL RESULTS

In this paper am connecting my modules such as ZigBee and GSM to serial communication terminals of ARM LPC 2148 pins such as Ports P0.0, P0.1 and P0.8, P0.9. LCD is used to display the data at both the transmitter and receiver sections placed at patient and doctor. Heart beat sensor is connected to ADC, which is built in ARM LPC2148.

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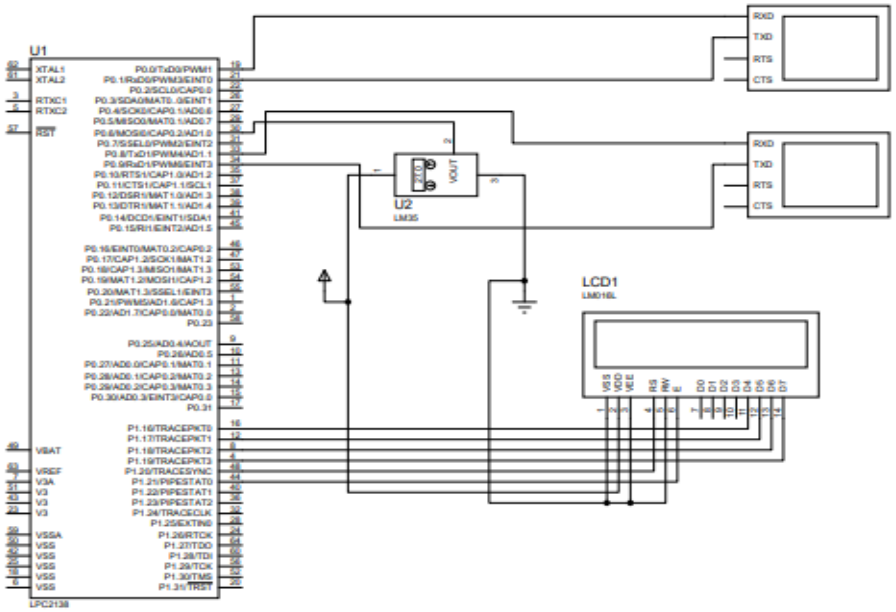

Fig. 3: Schematic diagram of proposed system at patient

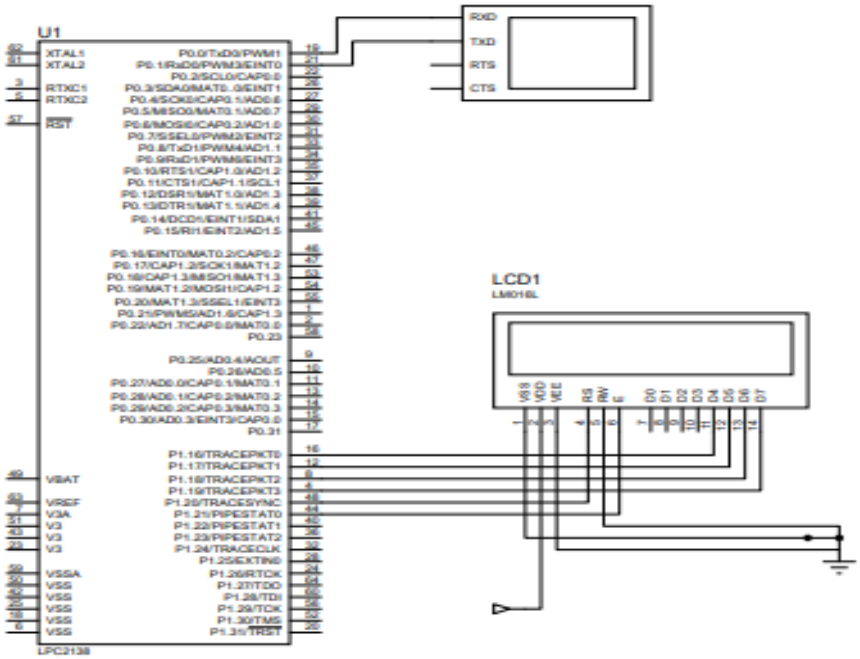

Fig. 4: Schematic diagram of proposed system at doctor

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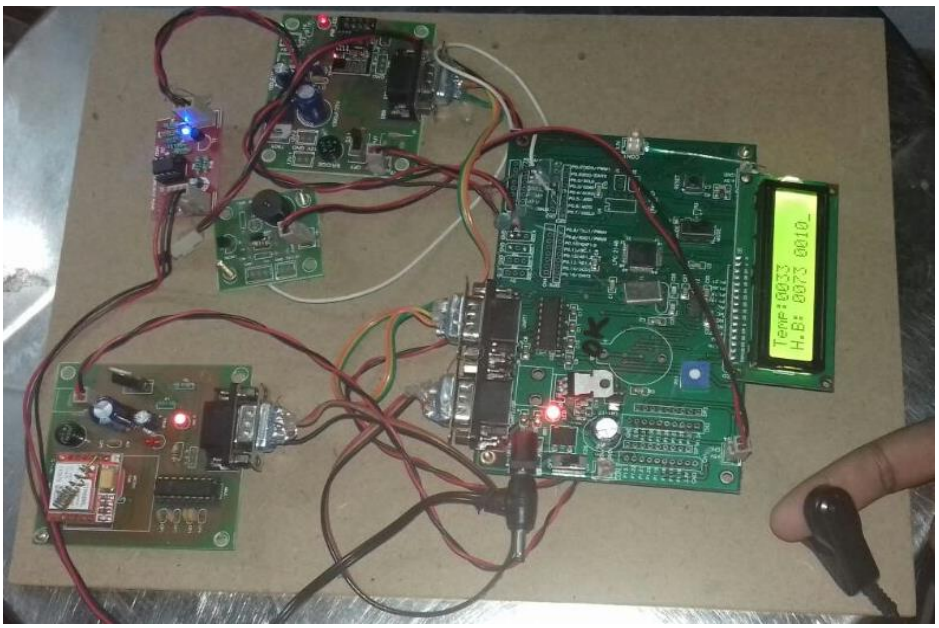

Fig. 5: Experimental analysis of calculating Temp, HBT of a patient at the patient section

VI. CONCLUSION

The system can be used in Hospitals for efficient monitoring of patients who will give Good efficiency, less noise, less delay. E-wellbeing observing arrangement of a patient is helpful for those patients, which are in their underlying phase of sickness. In this manner they are noticed and cured in less exorbitant manner in their own home as opposed to recruiting a room in the clinic and employing a specialist for the ordinary perception ceaselessly in the clinic.

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