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IOT based Infant Health Monitoring System

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Abstract - *This paper proposes a capable health monitoring system for infants, with wireless communication based on IoT technology. A prototype is developed which gives a reliable and efficient baby monitoring system that can play a vital role in providing better infant care. This system monitor vital parameters such as body temperature, pulse rate, movement of an infant and this information is transferred to their parents. This system give a peace of mind to loved ones when they are away from their infant as they can get an update status of their well beings. The other advantage is the programmability of alarm conditions can alleviate any inaccuracy through a normal sensor. Communication is done by internet which is need and easily available thing.*

***Key Words*: DHT11, LCD ,microcontroller Atmega328, PIR sensor biss0001,pluse sensor , wifi module, etc**

1.INTRODUCTION

In the past circumstances , female cooperation in the work constrain in the industrialized countries has significantly expanded in introduce society. In this manner, child charge has turned into a test to numerous partnership in their every day life. Mother is dependably stresses over the prosperity of her baby[1]. As we found in India both the guardians need to assortment of work place and take care of their children/baby, so more workload and stress is there on such families particularly on female inverse number. On the off chance that an association is created which persistently springs refreshes about their babies amid illness or amid ordinary subroutine then it will be of awesome help to such limit as they can work in pressure less condition giff more productive final result. Likewise earnest billet shape can be rapidly be seen and taken care of inside less time. Ordinarily, when a youthful infant call to war, the reason is one of the accompanying things i.e. they are eager, tired, not sensation well or need their nappy changed. So we built up a model which can screen the exercises of the children and additionally newborn children alongside discovering one of the above causes and give this information to their parents[2]. This proposed framework give a peace bargain of judgment to friends and family when they are far from their newborn child as they can get a refresh position of their prosperity. The other favorable position is the programmability of wake up timer stipulation can reduce any mistake through a typical sensor. Correspondence is finished by GSM UI in which Short Messaging Service (Atomic number 62) is first consonant separating of the first GSM arrangement of principles and its parade. Along these lines just by a darling's couple of biomedical parameters guardians can get data about their wellbeing.

2. SYSTEM ARCHITECTURE

The engineering of the framework comprise of both equipment and programming. Square outline is as appeared in Fig.1 hardware segments were gathered by the piece chart. The code is composed in implanted C and is singed into the microcontroller.

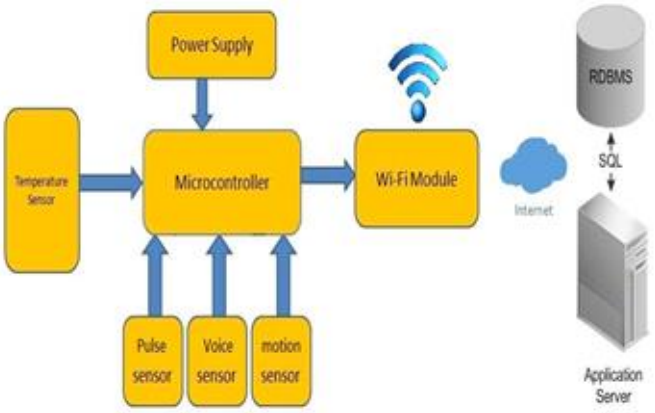

Fig. 1 Block Diagram

A.DHT11

Sensor DHT11 computerized temperature and moistness sensor is a composite Sensor contains an adjusted advanced flag yield of the temperature and dampness. Utilization of a devoted advanced modules gathering innovation and the temperature and moistness detecting innovation, to guarantee that the item has high unwavering quality and amazing long haul security. The sensor incorporates a resistive feeling of wet parts and a NTC temperature estimation gadgets, and associated with an elite 8-bit microcontroller.

B. PULSE Sensor

The first Simple Heartbeat configuration depended on the reflectance approach and utilized TCRT1000 IR gadget as sensor. It could distinguish the beat flag when a client puts his/at the tip of her finger on the highest point of the sensor. While this sensor performed well, it was defenseless to a little development of the finger. In this way, the client should keep the finger enduring to get the exact heartbeat flag. Simple Heartbeat Adaptation 1.1 utilizations a more hearty sensor

(HRM-2155E) that works in transmission mode and fits tight around the fingertip, in this manner it is less inclined to movement.

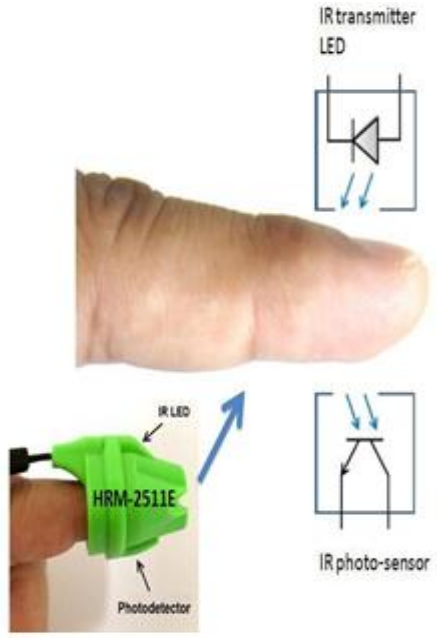

Fig. 2 pulse sensor

C. PIR motion sensor

PIRs are essentially made of a pyroelectric sensor which can identify levels of infrared radiation. A PIR sensor identifies the infrared light emanated by a warm question. It comprises of pyro electric sensors which present changes in their temperature (because of episode infrared radiation) into electric flag. At the point when infrared light strikes a precious stone, it produces an electrical charge. Accordingly a PIR sensor can be utilized to distinguish nearness of individuals inside a location region of roughly 14 meters.

D. Wi-Fi module

This module has a sufficiently effective on-load up handling and capacity ability that enables it to be incorporated with the sensors and other application particular gadgets through its GPIOs with negligible improvement in advance and insignificant stacking amid runtime. Its high level of on-chip joining takes into account insignificant outer hardware, including the front-end module, is intended to involve negligible PCB zone.

E. Atmega328

The Atmega328 is an exceptionally mainstream microcontroller chip delivered by Atmel. It is a 8-bit microcontroller that has 32K of blaze memory, 1K of EEPROM, and 2K of inner SRAM. The Atmega328 is one of the microcontroller chips that are utilized with the famous Arduino Duemilanove sheets.

F. LCD screen

In our model 16 X 2 LCD module is utilized. It has 2 lines and 16 section along these lines add up to 32 characters are shown. It has two task modes, one uses every one of the 8 pins and alternate uses just 4 of them. The 4-bit mode was utilized to deal with the LCD screen. All sensor yield is shown persistently as it is being estimated.

3. METHODOLOGY

IOT infant health monitoring has 4 sensors. First one is a temperature sensor, second is Heartbeat sensor and the third one is motion sensor and voice sensor (detects the noise). This project is very useful since the parents can monitor baby health parameters just by visiting website or URL. And nowadays many IOT apps are also being developed. So now the parent or family members can monitor or track the baby health through the Android apps or online through web browsers. To operate IOT based infant health monitoring system project, you need a Wi-Fi connection. The microcontroller connects to the Wi-Fi network using a Wi-Fi module. This project will not work without a working Wi-Fi network. You can create a Wi-Fi zone using a Wi-Fi module or you can even create a Wi-Fi zone using Hotspot on your Smartphone. The microcontroller continuously reads input from sensors. Then it sends this data to the cloud by sending this data to a particular URL/IP address. Then this action of sending data to IP is repeated after a particular interval of time. On online portal data is logged with database and those values fetched to show status of health. PHP will be used as the processing language along with HTML to provide Graphical user interface.

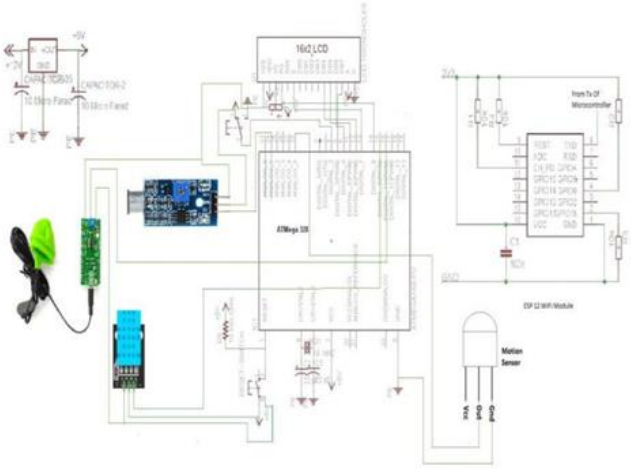

Fig. 3 Circuit Diagram

4. RESULTS

The system was tested carefully on an infant, the results found to be same as the one's measured by standard instrument. During the execution of the system snapshots of

the display were taken. The system being a complete hardware design and the data available on laptop and LCD display have been captured. Test results of the system are given below, shows successful implementation of the system. Fig.4 shows hardware module and.Fig.5,6,7 shows a sample readings of infant onto the LCD attached to the module on an infant's side. The reading were matched to the readings taken by standard instrument and found to be same.Fig.8 and Fig.9 shows login page and the webpage that shows the all readings in a tabular form. Webpage contains the heart rate of the infant's ,humidity and temperature of incubator ,voice ,motion ,date and time.

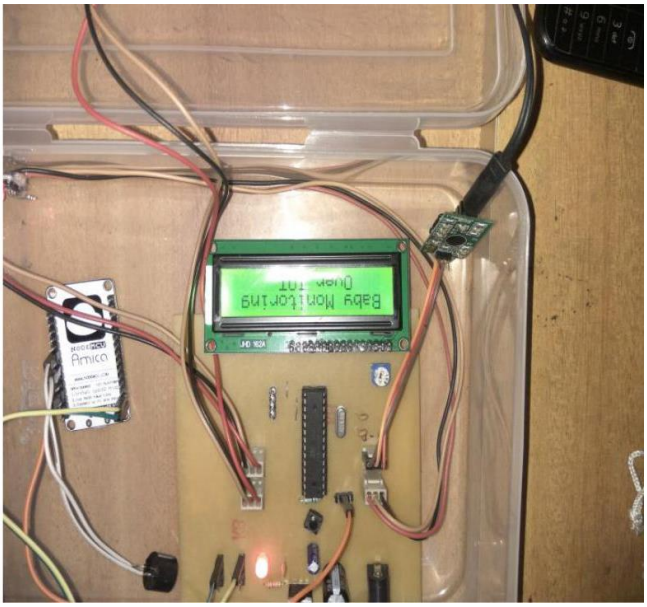

Fig .4 Hardware module of implemented system

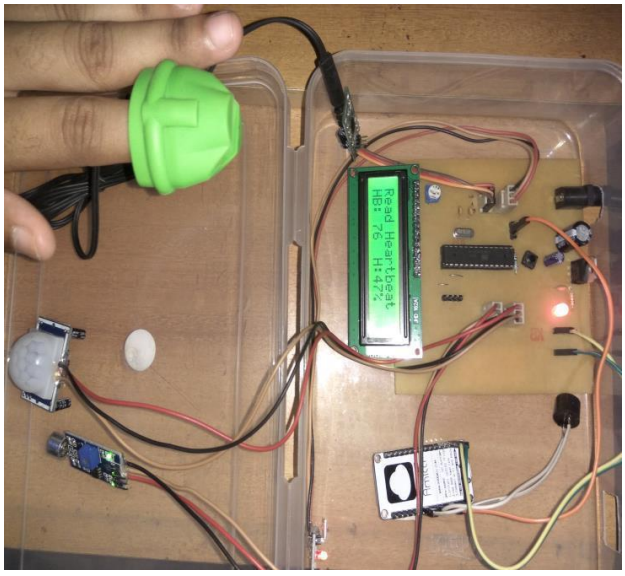

Fig .5 LCD displaying pulse rate of infant and humidity of incubator

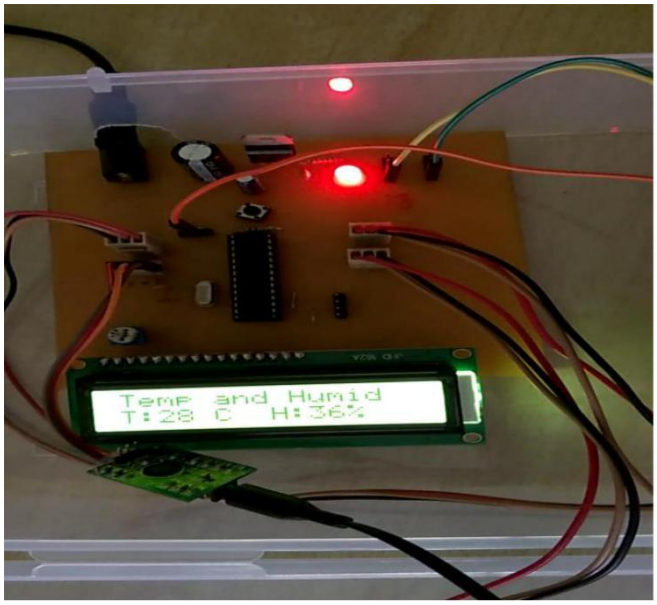

Fig .6 LCD displaying temperature and humidity of incubator

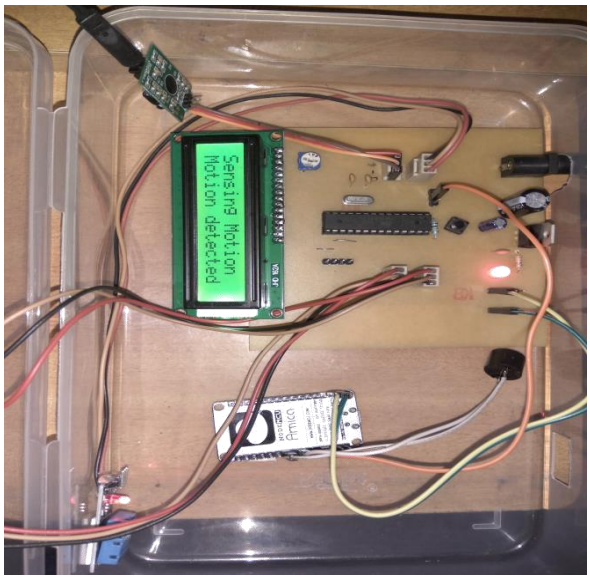

Fig .7 LCD displaying motion detected

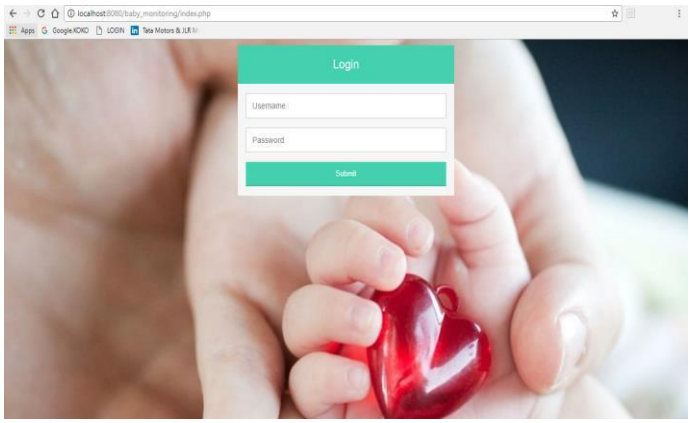

Fig .8 login page

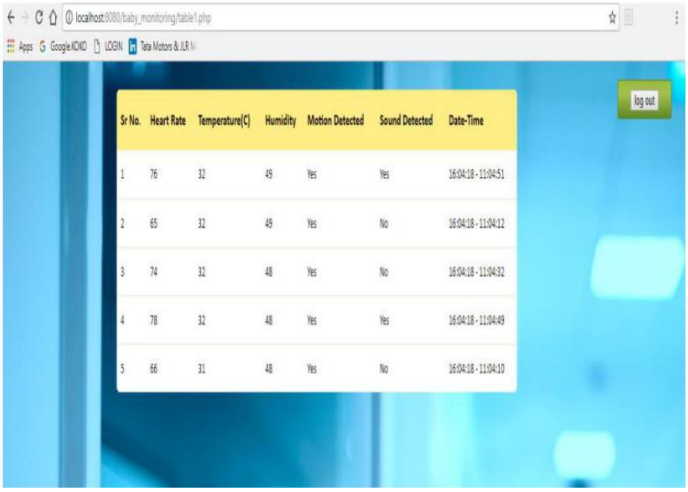

Fig .9 webpage shows the measured parameters

5. CONCLUSIONS

We have proposed a IOT based infant health monitoring system using sensors. This system provides several advantages in compared to the traditional method. Apart from the sensors we have proposed, more parameters can also be integrated and each sensor can be connected to a processing board via a wireless module. Our proposed multisensory system can also be implemented in the infant's mattress for temperature measurement or even in the baby's clothing for heart rate measurement.

ACKNOWLEDGEMENT

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