BABY CARE REVIEWING SYSTEM USING GSM NETWORK

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Abstract
This paper introduces a structure of a Baby Care monitoring System dependent on the GSM organize. A model is created which gives a solid and effective child checking framework that can assume a fundamental job in giving better baby care. This framework screen indispensable parameters, for example, internal heat level, beat rate, dampness condition, development of a newborn child and utilizing GSM organize this data is moved to their folks.Estimations of this crucial parameters should be possible and under chance circumstance passed on to the guardians with alert activating framework to start the best possible control activities. The framework engineering comprise of sensors for observing imperative parameters, LCD screen, GSM interface and a sound signal all constrained by a solitary micro-controller center.

Keywords: GSM network,Baby monitoring, LCD screen, Micro-controller center.

I.INTRODUCTION.

In the past few decades, female participation in the labour force in the industrializednations has greatly increased in present society. Subsequently, infant care become a challenge to many families in their daily life. Mother is always worries about the well being of her baby[1]. As we seen in India both the parents need to work and look after their babies/infants, so more workload and stress isthere on such families especially on female counterparts. If a system is developed which continuously gives updates about their infants during illness or during normal routine then it will be of great help to such members as they can work in stress less environment giving more fruitful output. Also urgent situation condition can be quickly be noticed and handled within less time. Usually, when a young baby cries, the cause is one of the following things i.e. theyare hungry, tired, not feeling well or need their diaper changed. So we developed a prototype which can monitor the activities of the babies and/or infants along with finding one of the above causes and give this information to their parents[2]

II. LITERATURE SURVEY

Many home-care systems are available but majority of this system are specially designed for the aged people and patients. These systems can monitor their health status, automatically send out emergency signals,and have other functions. However, the caring methods for infants are not the same. Children and adults require different type of care because they are totally dependent for their normal functions on someone else. Infants cannot give any feedback about their discomfort or health complaints. Infants cannot express themselves like old people, e. g when an infant has a fever, he/she can only express his/her

discomfort by crying. Hence, a home-care system specially designed for infants is today's need which would substantially lighten parents'especially mother's burden. In support of this requirement many research papers and patents for healthcare application are studied with the intention of possible solutions to take care of the infant. Author had developed a system which is based on commercial GSM network. Vital parameters such as body temperature measurement using LM , Heart rate using IR Transmitter and Receiver, respiratory rate by using Piezo film sensor located on Patient's Chest and blood Pressure are sensed, amplified with variable gain,filtered and given to microcontroller. Remote subsystem with GSM module receives data which is then send to a server by a USB port. Data are stored on the server and remotely displayed in a web site. In SMS based telemedicine system, patients temperature measured by Infrared temperature sensor MLX 90614 and ECG signals acquired with electrodes interfaced with the microcontroller PIC16F877[3].A wearable hardware gadget is developed which captures the biological status of the baby such as motion, temperature and heart rate sensors (both optical and pressure) which are controlled by the microcontroller and connected to the Bluetooth module to provide wireless communication[5]. In paper[14], the temperature and humidity parameters are monitored. A skin-temperature probe, the air temperature-probe was used to monitor the temperature around the baby and humidity of incubator was monitored using the humidity sensor from SYHS2XX SERIES.

This sign are interfaced to PIC microcontroller18F4550 and GSM modem is utilized for correspondence.Licenses are likewise looked to discover oddity in infant care observing framework. In configuration, (Patent No. 2002/005720A1)[16], framework is created which screens relaxing,fever and volume of infant dozing in the den. There is a module having three sensors appended to the diaper.This sign are intensified, transmitted by transmitter what's more, at remote station there is collector, multiplexer which applies this sign to discernible caution to alarm mother to make proper move. U.S. Patent No.6,043,747(Altenhofen), Wherein a parent unit can record messages Which may then be transmitted to the child unit to relieve or quiet the baby[17]. The child unit incorporates an amplifier and can transmit sounds to the parent unit.

III. SYSTEM ARCITECHTURE.

The architecture of the system consist of both hardware and software.
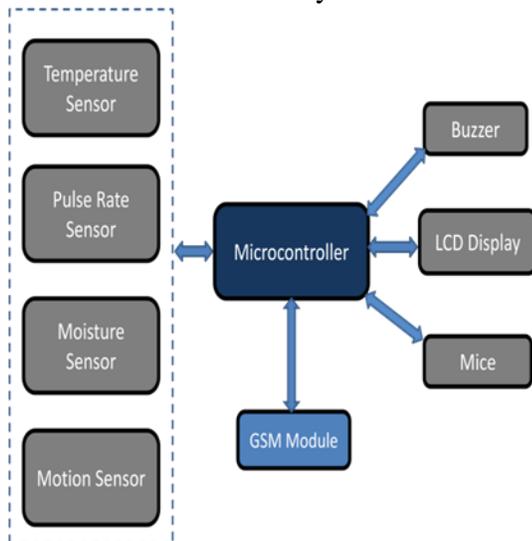
A. Temperature Sensor

Human body needs special type of sensors for reliablereadings which led to the choice of using the LM35 temperature sensors in our prototype[1,6]. It operates at 3 to 5 V and can measure temperature in the range of 40 C to +125 C which is sufficient for the targeted body temperature range .It is having linear
response and easy conditioning. The sensor's output is an analog DC voltage signal which is read by the microcontroller using an analog pin linked to an ADC. The ADC used has a resolution of l0-bits, 1024 levels, with a sample rate of 9600 Hz and input voltage range depending on the ground and Vee. The output voltage of the LM35 is analog and in the linear range of -1 V to 6 V with accuracy of $\pm0.5°C$ can be converted from volts to degrees of Celsius and Fahrenheit .The placement of sensors is also important for accurate measurements. In our prototype it is placed in the socks of an infant wrapped in cotton so that no irritation made.

B. Pulse Rate Sensor

The components used are 5mm photodiode and 5mm light emitting diode. The system consist of IRtransmitter and receiver, high pass filter ,amplifier and comparator.By using this circuit component biological signal in mill volt is converted to larger magnitude about one to two volt and then send it to the microcontroller.
Pulse rate will be measured from the finger using optical sensors and displayed on the LCD. The transmittersensor pair is clipped on one of the fingers of the subject. Pulse rate signal is applied to the Non-inverting input terminal as shown in Fig. 2.Voltage gain of Non Inverting amplifier is given by Equation 1+ Rf/R1.
Gain=1+ 180/1=181.
This amplified signal is given to comparator circuit where voltage divider circuit is used. Voltage at non inverting input is compared with reference voltage and whatever voltage is generated is applied to the base of transistor. There is a 100 Ohm resistor at the base of transistor used to limit the current flowing to the base of transistor. As soon as the voltage across this resistor increases beyond 0.7V the transistor turns ON and at the output we get 0v and the LED D2 glows.

C. Moisture Detection Sensor

To determine the moisture condition i.e. urine detection ,two pairs of copper electrodes are placed under the cloth on which baby is sleeping. The signal obtained is given to microcontroller.
For detection of urine ,transistor as a switch circuit is used, When urine is present switch is closed transistor turns on. When urine is absent switch is open, transistor turns off.

D. LCD screen

In our prototype 16 X 2 LCD module is used. It has 2 rows and 16 column therefore total 32 characters are displayed. It has two operation modes, one uses all 8 pins and the other uses only 4 of them. The 4-bit

mode was used to manage the LCD screen. All sensor output is displayed continuously as it is being measured.

E. GSM Module

GSM (Global System for Mobile communication) is a digital mobile telephony system. With the help of GSM module
interfaced, we can send short text messages to the required authorities as per the application. GSM module is provided by SIM uses the mobile service provider and send SMS to the respective authorities as per programmed. This technology enable the system a wireless system with no specified range limits. In this way, whenever the safe range of the vital parameter of an infant is violated, the programmed microcontroller produces an alarm and GSM Modem interfaced with the microcontroller sends an alert SMS to the parent's mobile number deploying wireless technology.

IV.PROGRAMMING DETAILS.

PIC18F4520 is utilized as a miniaturized scale controller in a proposed framework. The sensors specifically beat rate sensor, accelerometer, temperature sensor, dampness sensor and sound identifier are interfaced with simple channel of ADC of small scale controller. The qualities taken from this sensor are shown aftereach 2msec of deferral. Power on reset capacity of PIC miniaturized scale controller resets all the values. The smaller scale controller read yield of ADC after at regular intervals. Temperature of a newborn child is perused by microcontroller, the product is created in such a way that furthest cutoff of temperature is set, if crosses that point of confinement,bell will be on and ready message send to mother.Comparative conditions are considered for different sensors.

V.RESULTS

 The framework was tried cautiously on a baby, the outcomes seen as same as the one's deliberate by standard instrument. While testing this framework on a newborn child parent's worry was considered. During the execution of the framework previews of the showcase were taken. The framework being a finished equipment plan and the information accessible on phone and LCD show have been caught. Test consequences of the framework are given underneath, shows effective execution of the framework. Fig.5 also, shows equipment module and the real actualized system, shows an example readings of newborn child onto the LCD appended to the module on an newborn child's side. The perusing were coordinated to the readings taken by standard instrument and saw as same.Fig.10 and Fig.11 shows message got on parent's PDA when some anomalous condition exists. Message shows temperature is high and dampness condition exists.

Fig. LCD displaying Infant's Urine detection condition Fig. LCD displaying Infant's Pulse Rate value

VI. CONCLUSION

Proposed Infant Monitoring System is a modest what's more, easy to utilize, which can improve the nature of newborn child parent correspondence. This framework expressively gives the guardians the sentiment of confirmation. The steady catching of various natural parameters of the infant and examination of the general wellbeing helps mother to comprehend the inside status of the infant. As GSM innovation is utilized which makes the clients to impart for longer separations. This is a helpful framework to screen the infant's wellbeing condition from any separation.

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