IOT BASED INFANT HEALTHCARE MONITORING SYSTEM

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ABSTRACT: Newborn child needs appropriate consideration for great wellbeing and mental health. These days, families comprise of just guardians and kids. Managing infant youngsters is ambling for grandparents so the chances of giving extra thought and love are diminished. In a family, necessities to really focus on the child's clinical issue are inevitable. To deal with such issues a system is proposed for the device health watch framework. This will assist a mother or a dad to screen the baby with different boundaries. The framework began getting more altered. These days numerous baby checking frameworks came into the market with different alternatives. This framework keeps newborn children to be in a protected condition by avoiding wet condition utilizing sensors and continue to check the vital health parameters.. IoT is helpful in this angle as it replaces the customary checking frameworks with a more proficient plan, by giving basic data in regards to the state of the patient. This framework utilizes the heartbeat sensor, Temperature sensor, wetness senor and conductivity sensor with Node MCU. The beat sensor is put on the finger and it estimates the pulse and afterward sends the heart rate to android versatile application by means of Bluetooth. A microcontroller is interfaced with the Wi-Fi system to make a straightforward TCP/IP correspondence. The parameters will be checked and downloaded very easily using the android application. The other advantage of the programmability is parents can be aware of their infant’s health status continuously.

1. INTRODUCTION

The advanced way of life, guardians are occupied and have a ton of work in workplaces and homes. Newborn child needs legitimate consideration for great wellbeing and mental health. These days, families comprise of just guardians and youngsters. Dealing with babies is awkward for grandparents so the odds of giving additional consideration and love are decreased. In a family, somebody needs to care for the baby's ailments. This turns into a test for some guardians. To tackle such issues a thought is proposed for the baby observing framework. This will assist a mother or a dad to screen the newborn child with different boundaries. The framework began getting more adjusted. These days numerous newborn child observing frameworks came into the market with different choices. This framework keeps babies to be in a protected condition by avoiding wet conditions utilizing sensors and continue to check health. IoT is helpful in this viewpoint as it replaces the ordinary checking frameworks with a more effective plan, by giving basic data in regards to the state of the patient. In this framework we utilize the beat sensor, Temperature sensor and conductivity
sensor with Node MCU, the beat sensor is put on the finger and it estimates the pulse and afterward sends the pulse to an android versatile application by means of Bluetooth.

2. MATERIALS AND METHODS

The sensors utilized in this task are heart beat sensor, wet sensor and temperature sensor are being associated with the child. The Node MCU additionally associated with the baby and the messages are being shipped off the guardians through Bluetooth.

![Fig 2.1: Block diagram](image)

2.2. HARDWARE DESCRIPTION

Arduino is the fundamental control unit related with cell phone through blynk application. Furthermore, the Wi-Fi Module assists with sending information in the cloud and when the information gets moved, yield can be found in the blynk application.

2.2.1 ESP8266-WI-FI MICROCHIP

The Wi-Fi module ESP8266 is associated with TCP/IP stack. The microcontrollers are getting related with the Wi-Fi module and it makes the transmission control in web directly. ESP8266 is changing the world with its insignificant effort and high highlights which makes
it an ideal module for Web of Things (IoT). It may be utilized in far off baby following where you need to relate a gadget to your nearby structure or web.

2.2.2 MODULAR TEMPERATURE AND HUMIDITY SENSOR

The sensor module which outfits wetness and temperature respects continuously with one-wire show. This sensor gives relative stickiness respect in rate 20 to 90% RH and temperature respects in degree Celsius 0 to 50 °C. It is ideal for monitoring and local indication. DHT11 sensor uses resistive tenacity assessment part and NTC temperature assessment fragment. An exceptional capacitive sensor fragment measures relative dampness and the temperature is evaluated by a thermistor. It has unbelievable quality and extended reliability.

2.2.3 WET SENSOR

A wet sensor is utilized for perceiving the wetness of the diaper and the sensor chips away at a resistive standard. When the diaper is wet, the notification is sent off the parent in compact gadget. When the baby wets the diaper the resistivity is changed. It shows more resistance when it is dry and shows less check when it is wet. It will be recorded as dryness to wetness condition and communicated to the microcontroller.

2.2.4 PULSE SENSOR

A probe houses an LED and encompassing light sensor on substitute sides embedded with amplifier and denoising circuit. The sensor gets information on the Finger tip when straightforwardly positioned on top of a vein. Presently the LED produces light which will fall on the vein straightforwardly. The pulsatile stream of blood demonstrates the heart beat. The received light is analysed over time to conclude the pulse rate.

2.3. SOFTWARE DESCRIPTION

2.3.1 BLYNK SERVER

Blynk server is an IoT based fundamentally planned and focused among understudies. It send the messages, accepting the messages, and disturbing the guardians at whatever point required. It is utilized for sending messages about the baby condition and furthermore for realizing the medical issue of the newborn child.

3. RESULT AND DISCUSSION

The information are moved to the cloud through the Wi-Fi module is appeared in the figures 3.1 and 3.2. The hardware test data are shown in the table 3.1
Fig.3.1 Overall output Fig 3.2 Hardware setup

Table 3.1- Output Comparison Table of IoT Based Infant Healthcare Monitoring System

| S.No | Name      | Age      | Temperature °C | Pulse /bpm | Wetness |
|------|-----------|----------|----------------|------------|---------|
|      |           |          | Normal         | Standard   | Normal  | Standard | R* | A* | R* | A* |
| 1.   | Ritheeswar| 1.5month | 35.5           | 34.4       | 107     | 100      | 109 | 90 |     |     |
| 2.   | Prem      | 5 Month  | 37.5           | 37.0       | 111     | 105      | 98  | 95 |     |     |
| 3.   | Rohith    | 1 y      | 36.0           | 36.3       | 96      | 80       | 96  | 91 |     |     |
| 4.   | Rajiv     | 5 y      | 37.6           | 36.0       | 98      | 90       | 99  | 91 |     |     |
| 5.   | Aishwarya | 10y      | 37.6           | 36.2       | 97      | 91       | 99  | 95 |     |     |
| 6.   | Ajantha   | 16y      | 37.5           | 38.8       | 100     | 92       | 99  | 95 |     |     |
| 7.   | Nedumaran | 25y      | 37.0           | 36.0       | 98      | 91       | 98  | 92 |     |     |
| 8.   | Siva      | 38y      | 36.6           | 35.0       | 99      | 95       | 95  | 91 |     |     |
| 9.   | Raviendran| 54y      | 36.0           | 37.1       | 101     | 97       | 111 | 100|     |     |
| 10.  | Shankar   | 65y      | 34.0           | 35.2       | 96      | 91       | 99  | 95 |     |     |
| 11.  | Ambika    | 68y      | 35.5           | 36.2       | 99      | 90       | 95  | 90 |     |     |

R* - Resting State  A* - Active state
Normal – Checked using Normal thermometer & Pulse sensor
Standard – checked using the device developed

4. CONCLUSION

IoT based newborn child wellbeing observing framework utilizing different sensors are designed. This framework gives a few benefits in contrasted with the customary strategy. The multisensory framework can likewise be carried out in the newborn child's sleeping pad for temperature estimation or even in the child's apparel for pulse estimation and furthermore Bedwetting estimation. Effective Data sharing can occur over longer distances by utilizing blynk server. This is a proficient framework for checking the child's ailment from any distance or any far off places. In future more boundaries can likewise be coordinated in a wearable gadget structure.
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