

Smart Baby Cradle Monitoring System

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ABSTRACT

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Working mothers now make up a significant portion of the population. Baby care has consequently turned into a daily struggle for many families. As a result, most parents leave their infants at baby care facilities or at the homes of their grandparents. An effective and affordable IoT-based system for real-time monitoring is presented as a solution to this problem as a baby monitoring system. The infant cradle in the system architecture uses a motor to swing automatically whenever the baby screams. Through the Blynk app, parents can also remotely check on the health of their infants. The proposed system is created and put to the test to demonstrate its affordability and usability. The suggested method assures secure operation to make network-based baby-parenting possible from any location at any time. A baby monitoring system for a smart cradle is included in the proposed system and was created using the Arduino IDE toolbox and NodeMCU as the microcontroller.

Keywords : Cradle, NodeMCU ESP8266, Blynk Application, IFTTT Application.

I. INTRODUCTION

Currently, parents are too preoccupied with their professional lives to have enough time to care for their infants. The cost of hiring a nanny can be prohibitive for the family. Today's lady must juggle her home and job obligations concurrently. They had to look after the house and the kid after a long day at work. They might not have enough time to manually swing the cradle and comfort the infant. Furthermore, given the way that people live today, it is quite challenging for even housewives to sit next to their babies and comfort them whenever they scream. Neonatal and maternity units are found in hospitals. When a baby in these units cries, the nurses must tend to them and comfort them. The system is

intended to assist parents and nurses in providing for infants. The design seeks to achieve the following:

- When a baby cries, the cradle swings automatically until the baby stops.
- When the mattress gets wet, an alarm is set off, and an IFTTT message is sent to the parent to let them know.
- If a baby cries for an extended period of time, signalling that the baby requires attention, an alert sounds.

The circuit is attached to the cradle in the suggested system. The Arduino IDE, NodeMCU, and sensors are used to implement the circuit. The system is integrated using embedded C programming. The

cradle's movement is managed by a servo motor. Baby is made to feel comfortable and have a good night's sleep thanks to the system's design. Additionally, after the cradle stops swinging, the baby is not subjected to jerks. When Infant cries, the sound sensor detects it and the cradle begins to swing automatically, playing soothing music to soothe the baby, while also sending a message to the parent to alert them that the baby is crying. To detect urine, a wet sensor is utilised to assess the moisture level. The controller receives the signal that was obtained. As a result, parents are informed if the mattress becomes damp.

II. CRADLE MONITORING SYSTEMS

Various industries, including agriculture, medicine, automation, wireless communication, and household applications, use smart devices, intelligent monitoring systems, and Internet of Things (IoT)-based automated devices. Similar to that, this work demonstrates a smart cradle monitoring system based on IoT. The suggested system uses components like a soil moisture sensor to measure the baby's wetness and body temperature. It also employs a sound sensor to identify the baby's cries and instantly notifies the parents.

Automated cradle system with mobile voice and motion sensor control. Because the sensor is on the bed's bottom side, the swing is not smooth. The system contains an integrated alert indication that automatically notifies the user of the baby's status. When the infant cries for the first time, a rotating toy is used to amuse him. Working parents' workloads are reduced by automated cradle systems, as are the workloads of hospitals with plenty of new-borns. Technology for communications and sensing is used to implement the smart cradle. In order to make the infant comfortable in a cradle, this work aims to design an easy-to-use functioning model of a baby cradle system.

III. IMPLEMENTING SMART CRADLE USING IOT NODEMCU ESP8266

When a sound sensor picks up a baby sobbing, the cradle swings. To promote ventilation, a small fan is fastened to the cradle's top. Either the sensors or the controls can enable or disable the small fan and the cradle's swing. remote management through the Blynk App. When a baby cries, an audio sensor detects it. Four seconds later, the cradle swings, music begins, and an alert also sounds. If the duration of the cry is below 2.5 minute, only a soothing device is needed. When a cry lasts longer than 2.5 minutes, the system determines whether it is caused by a temperature change and then turns on the fan. The dim light is turned on and off in accordance with the detection of day and night using an LDR sensor.

The proposed system can detect the baby's mobility, moisture, and crying state and can alert the parent. A message is transmitted to the relevant phone via IFTTT if the infant is still crying and it is because of a wet state. The suggested system designs a smart cradle with a baby monitoring system which is more useful to hearing challenged persons with a smart wearable device which warns them when the baby is crying. After sending message, the system again examines the condition of the infant. The system ends once the infant stops crying. The technique above repeats if the infant doesn't stop crying. The cradle is fastened and closed with a latch. A 2-in-1 style of baby cradle was invented. It can be a makeshift infant cradle with a technological component. Because the back side of the cradle can be lowered, turning it into a table, it may also be used as a changing table, making it simpler for the end user to change the baby's diaper or clothing.

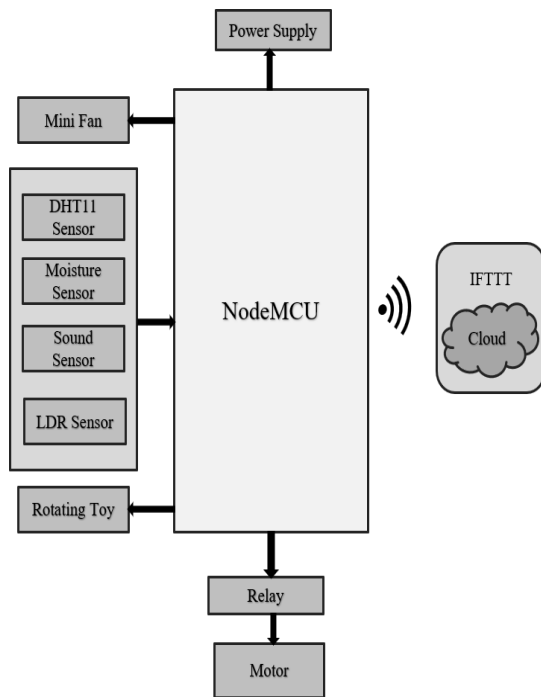


Fig 1: Smart Cradle System Architecture

IV. CONCLUSION

Technology development has accelerated quickly. Technology can benefit society in a variety of ways because it has advanced so much. The automated cradle is the clearest illustration of this when working parents already have a lot on their plates and need to take care of the infant. They are reassured by the cradle system that their child is safe and secure inside the cradle. Cradle that is more secure, more feature-rich, and less priced. Because a young baby's health is a constant concern for parents. So that baby will be healthier, that cradle system was created. The working woman could take care of the baby and accomplish domestic chores at the same time thanks to this motorised baby cradle.

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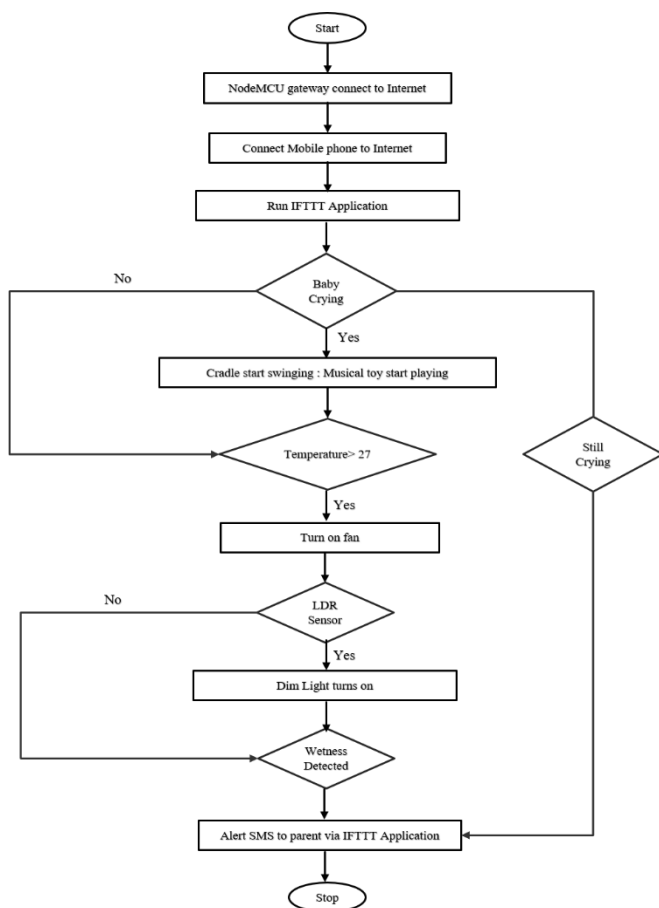


Fig 2: Flowchart

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