

# “IOT Based Smart Cradle System”

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**Abstract**— Cradle is a device that is used to put babies to sleep. Cradle has a side- to-side rocking motion that eases the baby and put it to sleep. It takes lot of efforts from parent to physically rock the cradle to generate swinging motion. When baby is kept inside the cradle need to be constant monitoring parent to keep to track of baby's activity. The idea of the scenario is accomplished by using sensors and a microprocessor. The sensors attached to the microprocessor sense the room condition and also monitor the activity of the baby. It works based on the condition we apply to it. Entire data will be visible to the user and get notified about the status of the baby.

**Index Terms**—IOT, Wet detection sensors, Temperature sensors,Cry detection sensors. Toy, Fan

## I. INTRODUCTION

Many parents are unable to devote sufficient time to infants on account of office work or being short-handed. Additionally, there are also many first time parents, who lack experience in raising children. Infants, on the other hand, demand constant attention and care. Simple methods to immediately calm the agitated infants need to be devised. Hence, there is a need to assist parents in taking care of their infants by providing them with a single product which would monitor their infants at all times, send notifications in case attention is required, raise alerts in case of emergency situations and provide real time interaction between parents and infants.

In the past few decades there has been a significant rise to the number of female participation in force to industrialization. Due to which a large amount of female workers need to stay away from home to work on daily basis. Due to which taking care of infant has now become a challenge for such females.

he first verbal communication of newborn baby with the world is baby's cry. Infant crying is a biological alarm system. An infant crying signal is the attention call for parents or

caregivers and motivates them to alleviate the distress. There is a need to develop a new low cost indigenous electronic System because the existing mechanical systems are imported and costly. Emotion based technique has been implemented. Based on the emotions nothing but the child is crying then a message is sent to the parents.

## II. LITERATURE SURVEY

In their study, Jim Mathew Phillip ,SathyaM ,Vishal S and Naveen k proposes the idea of automatic caretaker room for a baby. The main motive of this idea is to save time and energy of very busy parents. Working people are very busy these days. They do not have enough time to properly take care of their babies. So, the whole room is set up as it can sense the activities of the baby and work according to requirement. Parents can save their time and energy as they don't have to go and check their baby again and again until they don't get any information about baby. The idea of this scenario is accomplished by using sensors and a microprocessor. The sensors attached to the microprocessor sense the room condition and also monitor the activity of the baby. It works based on the condition we apply to it. Entire data will be visible to the user and get notified about the status of the baby

Kaushalya ,Mayur Gawade,Vaishali Savale, the authors have designed equipped with various sensors such as temperature, humidity, motion, and sound sensors that continuously monitor the baby's environment. These sensors collect data in real-time and send it to a cloud server for processing and analysis.

According to a study conducted by Hina Alam,Muhammad Burhan,Muhamma Shafi , the authors have designed for the necessary monitoring features like room temperature and humidity, cry detection, and face detection

Submitted Date: 06 December 2023.

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were monitored by exploiting different sensors. The system is also capable of detecting the facial emotions of the registered babies by using a machine learning model. Parents can monitor the live activities and emotions of their child through the external web camera and can swing the baby cradle remotely upon cry detection using their mobile application. They can also check the real-time room temperature and humidity level. In case an abnormal action is detected, a notification is sent to the parent's mobile application to take action thus, making the baby monitoring system a relief for all working parents to manage their time efficiently while taking care of their babies simultaneously.

In the study conducted by Alankrutha S N ,Anusha S ,Sushmitha C P ,the authors describes about the detects each and every activity of baby via different sensors that are attached to the cradle. All data taken from the sensors will be stored in cloud and analyzed at regular intervals and notification about the events and the view images captured are uploaded to cloud server. Cradle will trigger automatically via motor driver by microcontroller when the baby cries continuously upon the set point values. This cradle is capable of detecting the baby cry, mattress wet, temperature, person detection and methane content of the baby and initiate cradle swings automatically when threshold value crossed.

In the study conducted by Mr.A.Kumaravel, Ramesh, Ramya ,the authors designed especially for those moms who are excessively busy and occupied with work.This system considers all the minute details required for the care & protection of the Baby in the cradle. The design of smartness & innovation comes with the use of technologies/methodologies which include Internet of Things, Cry Detecting Mechanism, Cloud Computing & User Friendly Web application.

### III. PROPOSED SYSTEM

The system is microcontroller based that is being designed is aimed to help parents and nurses in infants care. System starts playing mothers voice automatically when baby cry and stops till the baby stops crying. A sound detector is interfaced to the controller which senses sound when baby cries and activates the controller with its digital output . A temperature sensor kept under the bottom cover where the baby sleeps can sense the temperature all time and sends analog signals to the inbuilt ADC of the Arduino controller and soundsounds an alarm when mattress gets wet. The digital data can be continuously monitored. A reduction in temperature indicates the wetness in the cover. The controller can be made to activate an alarm, so that his/her cover be changed If baby cries for more than a stipulated time the alarm starts indicating that baby needs attention.

Wi-Fi interface sends alert to android based handsets to get the attention of parents/nurses and an ALCD is interfaced to the controller which keeps displaying the status as messages and cradle starts swinging whenever the baby starts crying. of an appropriate imputation method.

### IV.COMPONENTS

#### A. Harware

- Arduino
- Motor Driver
- DC Motor
- Temperature Sensor
- Sound Sensor
- Vibration Sensor

#### B. Software

- Arduino Suite
- Embedded C

### V. METHEDOLOGY

It aims at monitoring the vital signs of the baby in order to make it more comfort. If the baby is making noise or baby is crying then sound sensor will hear that frequency and will make cradle swing. If the baby had wetted the mattress of the cradle, then alert SMS will send to the parent which is detected by the dry wet sensor. If the body temperature of the baby changes rapidly then it is detected by the temperature sensor. If baby is moving in cradle or any kind of movement detected by the sensors and based on the time intervals of the babies. cry the fan and toys starts rotating and other techniques such as music will be played.If the sensors still detects the noise of the baby then it will alert the parent. Later these sensors send the messsage to the parents through wifi modules which are connected to the sensors and the application .

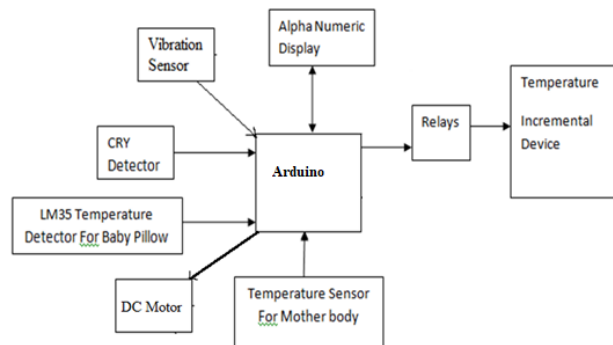


Fig 1. Block Diagram

## VI. RESULTS AND DISCUSSIONS

Overall system is made to provide the comfort to baby as well as provide parents some time of relief. Provided things will provide all necessary details of baby inside the cradle, like if the sensor detects any wetness the notification is sent to the parent and if the temperature is high the fan will be on. All these functionalities will also help parents to know about baby's mood.

## VII. CONCLUSIONS

The project is created with an initiative to help parents by monitoring their newborn infant with the touch of the screen. The system provides many features that makes it easier and user friendly for parents to handle it. Along with this, parents will get notifications like whether the baby is crying, sleeping etc. This method is created to meet the needs of the modern world. Such a system digitalizes the new-born care and makes it cost effective. This Cradle System with simple to use hardware as well as software which makes it more convincing for the busy or working parents.

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