

# BABY MONITORING SYSTEM FOR SMART CRADLE USING IOT

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## ABSTRACT

Smart Cradle System using IOT helps the parent to monitor their child even if they are distant from the home and detect the activity of the baby from any distinct corner of the world. It is an Innovative, smart and protective cradle system to nurture an infant in an efficient way. This system consists of all the care and protection details of the baby in the cradle. The design of smartness and innovation comes with the use of technologies which include Internet of Things (IOT) modules like Arduino Uno, Humidity and Temperature sensing, cry detecting mechanism, Servo motor. All the conditions which is been taken from the modules will be stored in cloud (thing Speak) and analyzed at regular intervals.

## I. INTRODUCTION

Infants or toddlers need parent's attention 24x7, in this modern era, parents are involved in firm exploit, office ferment and personal knead. So, they won't be able to take care of their children due to their involution in above activities. Crèche and Nanny are the two options available for working parents. With consideration of the social media, some incidents like human attack on infants in cruel way are reported, because of this reason there is necessary to protect the baby and with minimal human interference. Today's world, technologies are used in all the places. "Smart infant Cradle" this system contains the many products that are placed in one product, it provides the parents, a smart system and helps them to monitor and comfort the baby. "Smart infant cradle"

is an automated cradle which primarily works on sensors. Whenever baby cries sensors will get activated. This cradle is mainly designed to console a crying baby and put it to sleep without the presence of parents. This system consoles the baby's cry and it makes the baby to sleep. It is designed in such a way that it works with a mobile app, which allows the parents to ON and OFF the cradle and also override its automated functions. This cradle system allows the parents to monitor their babies from their place of work.

## II. LITERATURE SURVEY

[1] **Yang Hu, Weihua Gui** proposed a technique for infant bassinet experimental on artificial metabolous which gives an idea about adaptive sway control cradle based on the parameters from baby status. The author recommends an algorithm to regulate the rhythm of the cradle based on the parameters obtained from child condition. The rocker is assembled of adaptive swing machine and also of another sensors network. This system has 3 pressure sensors located in the bottom of the cradle, one place at middle and others two are either side of the cradle. The sensor meshwork be able to decide the intellect by notice parameters, dedicate dissimilar signals to the master circuit. Based on the parameters from baby cradle, the speed of the cradle is adjusted.

[2] **Gim Wong** comes up with a new technology "Automatic baby crib rocker". The Ceremonious cribbage cradle is control itself by crook means of an electric drive linkage and a timekeeper process is link to the rocker part, It is assigns the pivots on the frame. It is normally used for switched on and off as per user needed. The current system is electrically actuated. This is link to a conventional crib which is frequently operates the instruction rocked by pushing and pulling on foot. The device is choose to activate by a baby's voice picked up by a microphone and it will be adjusted within specify boundary. It can also be set into motion by annual actuation of a switch. [3

[3] **Dr.M.Levy, Deepali Bhiwapurkar, Gokul Viswanathan** gives an idea of system that cites infant monitoring system with Real-Time alerts to parents using GSM technology. It includes cry detection module which makes the cradle swing with pre- recorded voice. Cry detector system is identifies the infant weep and swings the cradle. This system use of DC motor to swing the cradle. Here, parents can control the speed of cradle according to their requirement. It uses the FN-M16P module, it stores the record voice of mother and play it when baby is crying continuously. It uses 2 sensors that is ultrasonic and accelerometer. Both these sensors are used for detecting the

respiratory and non-respiratory motion of baby. The ultrasonic sensor is used for detecting breathing of the infant. This sensor helps when baby suffer from apnea immediately notification is send to parents by use of microcontroller via GSM technology. When this sensor does not work properly Accelerometer is used. The Accelerometer is connected to carpus of baby which help by identify the baby movement with respect to X-axis and Y-axis. When there will be no movement some stipulated time then notification is sent to parents. Here it uses M213 sound sensor based on the ECM(Electrets Condenser Microphone) use for detection of baby cry and send data send to the microcontroller.

### III. METHODOLOGY

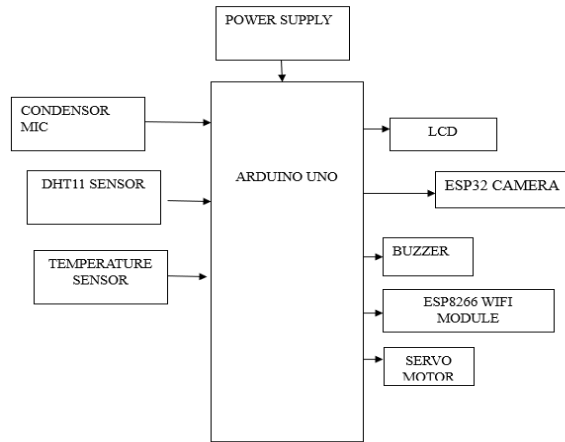
#### PROPOSED SYSTEM

Internet of Things-based Baby Monitoring System (IoT-BBMS) is proposed as an efficient and low-cost IoT-based system for monitoring in real time. [1] We also proposed a new algorithm for our system that plays a key role in providing better baby care while parents are away. In the designed system, Arduino Uno Controller Board is exploited to gather the data read by the sensors and uploaded via Wi-Fi to the Thing speak. [2]The proposed system exploits sensors to monitor baby's vital parameters, such as ambient temperature, moisture, and crying. The system architecture consists of a baby cradle that will automatically swing using a motor when the baby cries. [3]The proposed system prototype is fabricated and tested to prove its effectiveness in terms of cost and simplicity and to ensure safe operation to enable the baby-parenting anywhere and anytime through the network. Finally, the baby monitoring system is proven to work effectively in monitoring the baby's situation and surrounding conditions according to the prototype. Parents can also monitor their babies' condition through an external web camera remotely via server to entertain the baby.

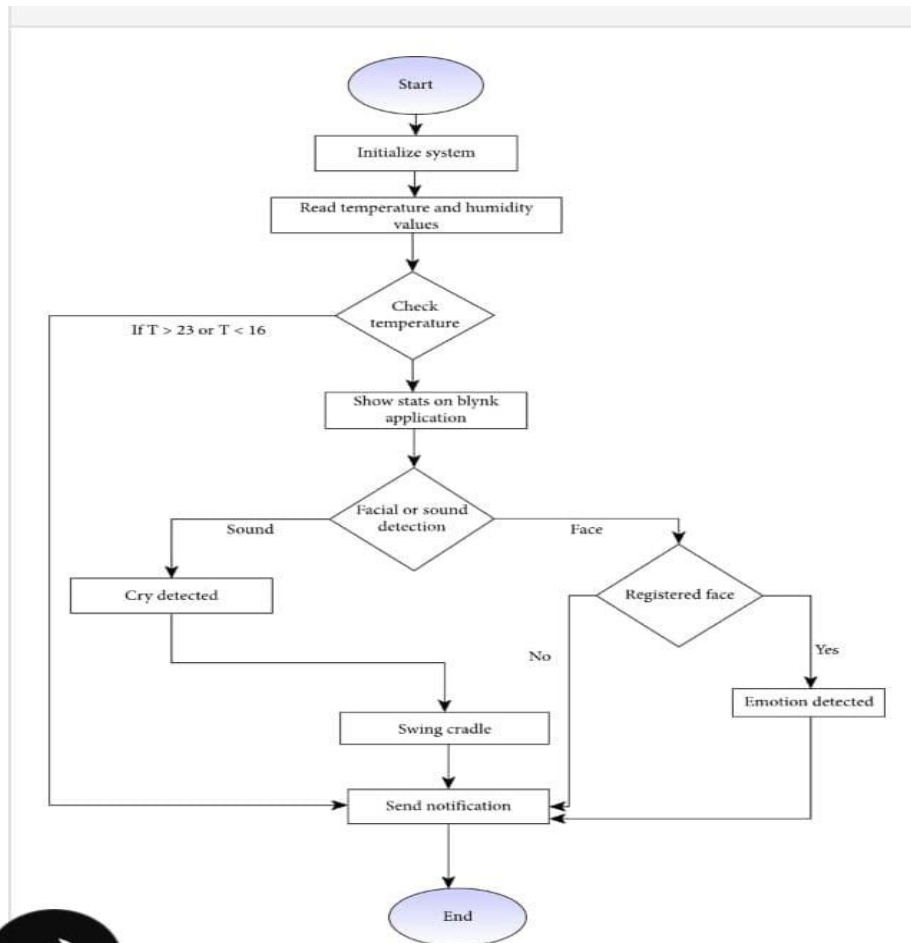


**Fig 1: Proposed system circuit diagram**

## BLOCK DIAGRAM



## IV. Implementation



## V. Hardware Results



**Fig 6: Baby body temperature**



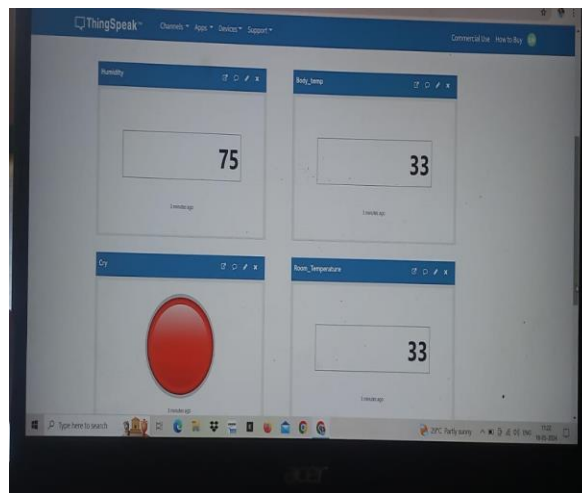
**Fig 7: Baby cry detection**



**Fig 8: Snap detection**



**Fig 9: Humidity detection**



**Fig 10: IOT results**

## VI. RESULTS

A baby monitoring system for a smart cradle using IoT (Internet of Things) typically aims to enhance the safety and comfort of infants by integrating various sensors and communication technologies. Here are some common results and benefits observed from such systems

<b>S.no</b>	<b>Body temp</b>	<b>Room temp</b>	<b>Cry Sound detected</b>	<b>humidity</b>	<b>Buzzer On/off</b>
1	45	49	white	75	off
2	47	51	Red	78	on
3	49	56	Red	80	on
4	44	42	white	74	off
5	64	60	Red	82	on

## VII. CONCLUSION

The proposed IoT-Based Smart Cradle represents a significant advancement in baby monitoring and care technology. The system's ability to provide virtual rocking and soothing features without the need for constant physical presence offers a revolutionary change in the way parents attend to their babies. Its ease of use, cost efficiency, and eco-friendly nature make it a practical and sustainable solution for modern parenting. By incorporating a user-friendly graphical interface, the smart cradle allows parents and caregivers to remotely monitor and interact with the baby, bridging the physical gap and providing a sense of connectedness. This newfound flexibility enables parents to focus on their daily activities with ease and peace of mind, knowing that their baby is well cared for

## REFERENCES

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