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SYNOPSIS OF MINI-PROJECT

On

“BABY MONITORING SYSTEM USING ESP32 MICROCONTROLLER”

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CHAPTER 1

INTRODUCTION

The People these days not seem to be always in urge with their work and they may not be able to monitor the child all the time. In order to come over this difficulty, the baby monitoring system is developed that works on the principle of IoT. The baby monitoring system is a kind of alarm system which can detect baby movements and activities and can convey the message about the condition of babies to the concerned authority via mobile and laptop into any place. In proposed system baby monitoring has been designed and developed using ESP 32 as control unit. The different sensors like temperature sensor, sound sensor are used to assist baby monitoring and are interfaced with the ESP 32. The baby sound like crying is detected by sound sensor and then motor start swing the cradle. The baby's temperature is monitored by the temperature sensor. The result obtained from the designed work shows the easier and convenient way of baby monitoring for busy parents. The proposed system provides an easier and convenient way for busy parents in taking care of their babies. In the Smart Baby Cradle Monitoring System one of the important goals is to provide basic attention to the baby in absence of the parent for some time. In these current pandemic times, Work from Home facility has been enabled to the employees, while working in different room/space it will be convenient for parents to sooth the babies through our design. Instead of keeping the child in a Day-care, or hiring some nurse to attend the baby, working parents can manage to take care of their baby with the help of the smart cradle. The project implemented is under the domain 'Internet of Things' commonly known as IOT. Because of IOT many things have become easier and smarter to use in our daily life. IOT is something that allows us to exchange data collected from physical devices and send over the internet to different devices. Technology is getting updated day by day, with this updating technology human life is becoming easier. Using the ESP32 Access Point with a customized and additional features for the cradle, the prototype designed will be more advanced and suitable.

CHAPTER 2

PROBLEM STATEMENT

Current baby monitoring systems have limitations that hinder their effectiveness in ensuring the safety and well-being of infants. Traditional audio-only monitors provide limited information, leaving parents uncertain about their baby's specific needs or activities. Video-based systems may lack essential features like two-way communication or real-time alerts for motion or sound. Furthermore, existing systems may have connectivity issues, range limitations, or complex setups that make them inconvenient for parents to use. As a result, there is a need for an advanced and comprehensive baby monitoring system that incorporates features such as audio and video monitoring, two-way communication, motion and sound sensors, temperature monitoring, mobile app integration, and reliable connectivity. This system should be user-friendly, provide accurate and timely information, and ensure parents can easily and confidently monitor their baby's safety and well-being. Parents and caregivers often face challenges when it comes to keeping a close watch on their infants or young children, particularly when they are in a different room or away from home. While traditional audio-only baby monitors can provide some level of reassurance, they may not provide enough information or functionality to ensure the baby's safety and well-being. Furthermore, some baby monitoring systems may suffer from connectivity issues, low battery life, or poor audio and video quality, which can lead to unreliable monitoring and false alarms. Therefore, there is a need for a modern and reliable baby monitoring system that incorporates advanced features such as video monitoring, two-way communication, motion and sound sensors, temperature and humidity monitoring, mobile app integration, and a user-friendly interface. Such a system would provide parents with the peace of mind they need to attend to their baby's needs and ensure their safety, no matter where they are.

CHAPTER 3

LITERATURE SURVEY

1. IoT-BBMS:Internet of things-based baby monitoring system for smart cradle ,Waheb a jabbar and Saidatul n.i.s hamid,IEEE,2021

IoT-based Baby Monitoring System using sensors to track ambient temperature, moisture, and crying is proposed to monitor babies in real-time. The system consists of a baby cradle with a swinging motor, an external web camera for remote monitoring, and an MQTT server to control the lullaby toy. The prototype was designed using Nx Siemens software, tested, and proven effective.

2. IoT based Smart Cradle for Baby Monitoring System, N Lakshman Pratap and Sunanda Nalajala,IEEE,2021

A smart cradle with an automated baby monitoring system was developed to assist working mothers in monitoring their babies' health parameters in real-time. The system uses sensors to capture the baby's motion and position and displays the readings in a mobile application. Abnormal readings trigger alerts to the caretaker and parents. The system is proven to be accurate and safe and helps in time management for parents and caretakers.

3. Design and Development of a Smart Baby Monitoring System based on Raspberry Pi and Pi Camera, Aslam Forhad Symon and Nazia Hassan,IEEE,2022

This project presents a baby monitoring system for busy parents so that they can ensure the proper care and safety of their babies. This system can detect the baby's motion and sound; especially crying and video output of baby's present position can be displayed on a display monitor so that the mother or another responsible person can watch the baby while away from him or her. This baby monitoring system is capable of detecting motion and crying condition of the baby automatically. The Raspberry Pi B+ module is used to make the total control system of the hardware, condenser MIC is used to detect baby's crying, PIR motion sensor is incorporated to detect baby's movement and Pi camera is used to capture the baby's motion. A display is used to have video output of sleeping baby.

4. IOT Based Baby Monitoring System Smart Cradle ,Senoj Joseph and Ajay Gautham.J,IEEE,2022

The project is centered around a plan to develop a IO T based Smart baby cradle that would assist the Parents with monitoring and keeping an eye on their infants regardless o f whether they are at home or at work and can identify each activity o f the infants from any inaccessible corner o f the world. It is a brilliant, imaginative and defensive Cradle System to support a newborn child in a productive manner. This framework considers all the moment subtleties that are needed for the consideration and insurance o f the Baby in the support.

CHAPTER 4

OBJECTIVES OF THE MINI-PROJECT

1. Develop a baby monitoring system that utilizes temperature and sound sensors to provide real-time monitoring of a baby's environment.
2. Ensure accurate and reliable measurement of temperature fluctuations in the baby's surroundings, allowing parents or caregivers to respond promptly to any changes that may affect the baby's comfort or well-being.
3. Implement a robust sound sensing capability to detect and analyze various audio cues, such as crying, laughter, or irregular noises, enabling caregivers to monitor the baby's activities and intervene when necessary.

CHAPTER 5

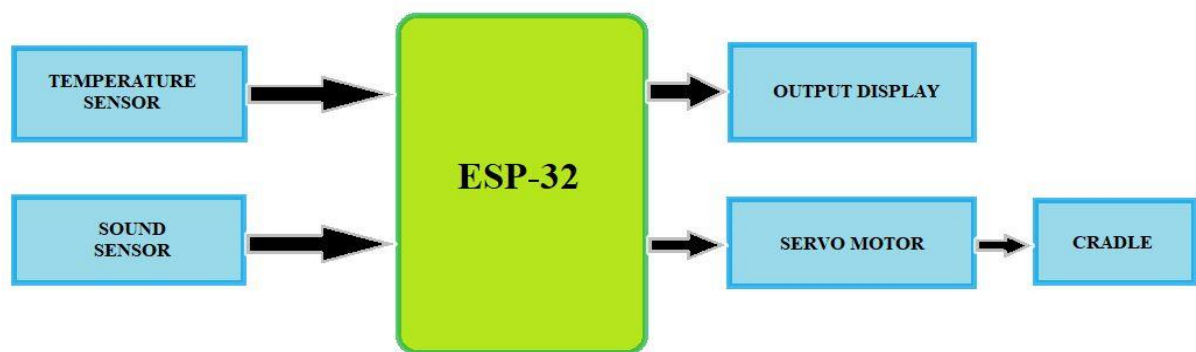
PROPOSED METHODOLOGY

Hardware Setup:

Required components: ESP32 microcontroller, temperature sensor (DHT11), sound sensor (T2N2), servo motor, jumper wires.

Working:

The temperature sensor continuously measures the ambient temperature in the baby's room. It provides temperature readings in real-time. The sound sensor detects the sound levels in the room, capturing any noise or disturbances that occur. As soon as the sound is detected the cradle starts to swing using the servo motor. The sensor data, along with relevant identifiers, is packaged and sent periodically or upon significant changes.



CHAPTER 6

EXPECTED OUTCOMES OF THE MINI-PROJECT

Real-Time Temperature Monitoring: The ESP32-based baby monitoring system will provide real-time monitoring of the temperature in the baby's room.

Sound Level Monitoring: The system will continuously monitor the sound levels in the baby's room. It will capture and measure the intensity of sound, helping parents assess the noise level and detect any sudden loud noises or disturbances.

Threshold Alerts: The system will allow parents to set threshold values for temperature and sound levels. If the temperature exceeds or falls below the specified range or if the sound level exceeds a certain threshold, the system will trigger alerts on lcd display.

Low Power Consumption: The ESP32 microcontroller's efficient power management capabilities will ensure optimal power consumption for the baby monitoring system. This will allow for extended battery life if using a battery-powered setup or reduce energy usage when connected to a power source.

Reliable Operation: The baby monitoring system will be designed to operate reliably and withstand potential disruptions. It will handle network connectivity issues or sensor failures gracefully, ensuring continuous monitoring and minimizing downtime.

Cost-Effective Solution: The use of the ESP32 microcontroller, temperature sensor, and sound sensor offers a cost-effective solution for baby monitoring. These components are widely available and relatively affordable, making the project accessible for a wider range of users.

The outcome of the baby monitoring project containing temperature and sound sensors using ESP32 will provide parents with essential monitoring capabilities to ensure a comfortable and safe environment for their baby. The real-time temperature and sound level monitoring, along with threshold alerts and historical data analysis, will offer valuable insights and peace of mind to parents, allowing them to respond promptly to any changes or potential concerns.

CHAPTER 7

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