IoT BASED BABY INCUBATOR

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Presentation Over Flow

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Project Objective

- To develop a prototype of an internet-based baby incubator monitoring system with various sensors that can send real-time data to the server.

Introduction

- IoT-based infant incubators harness the power of connectivity and intelligent systems to provide advanced monitoring and control capabilities. These incubators integrate sensors, actuators, and communication technologies to create a networked environment that enhances the care provided to newborns. To identify the opportunity in NICU units in hospitals due to the lack of facilities for parents to monitor their baby's condition inside the incubator directly.

- The utilization of IoT in infant incubators enables real-time monitoring of vital signs, such as temperature, heart rate, and oxygen levels. This continuous monitoring allows healthcare professionals to promptly respond to any deviations from normal parameters and provide timely interventions.

Features of the Project

Health of Infant

We have features to measure the health of the infant which include:

- Body Temperature
- Electrocardiogram (ECG)
- Blood Oxygen Level (SPO2)
- Weight of the Infant

Incubators

The features in the incubator like:

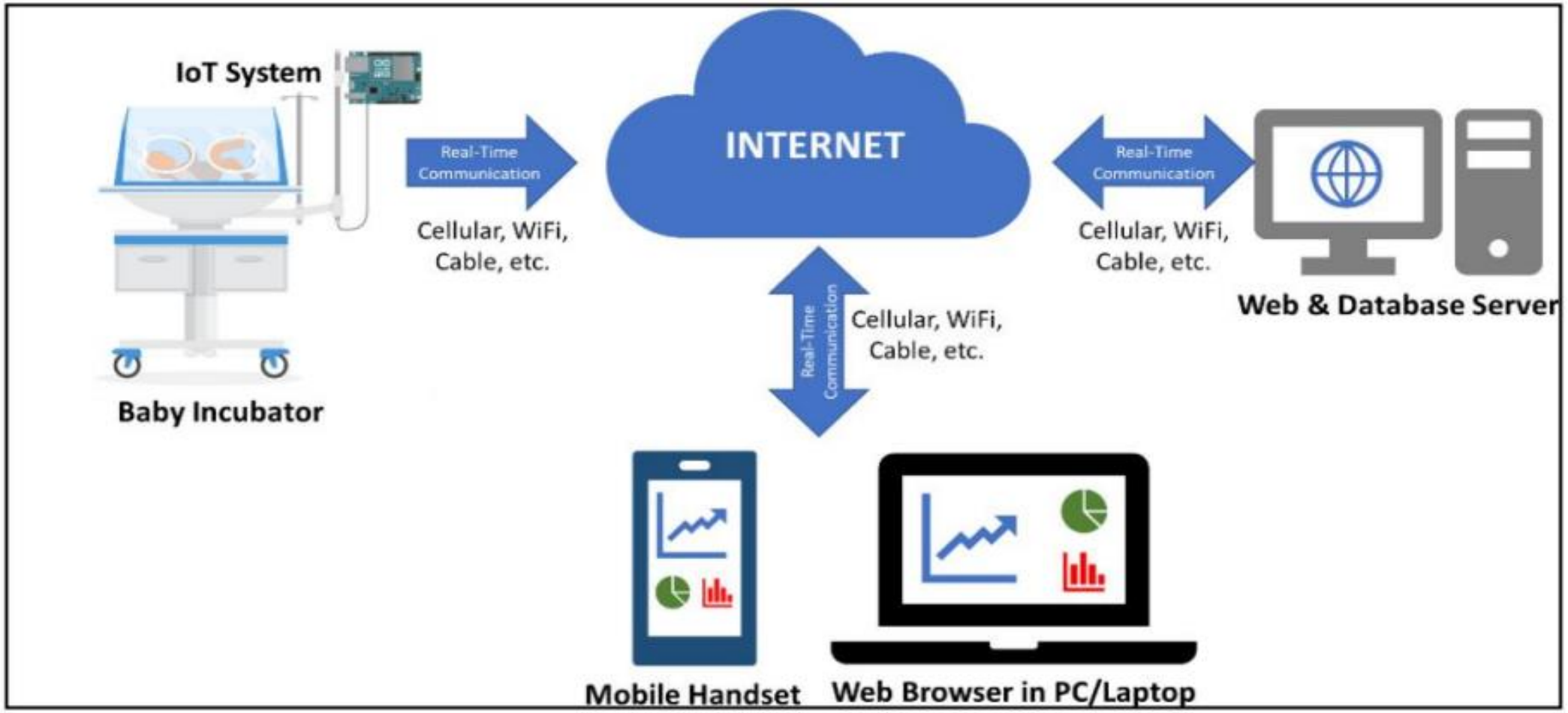
- Incubator's temperature & Humidity
- Oxygen level inside incubator
- Air pressure inside the incubators
- Phototherapy lights
- Emergency alert system

Web-Server

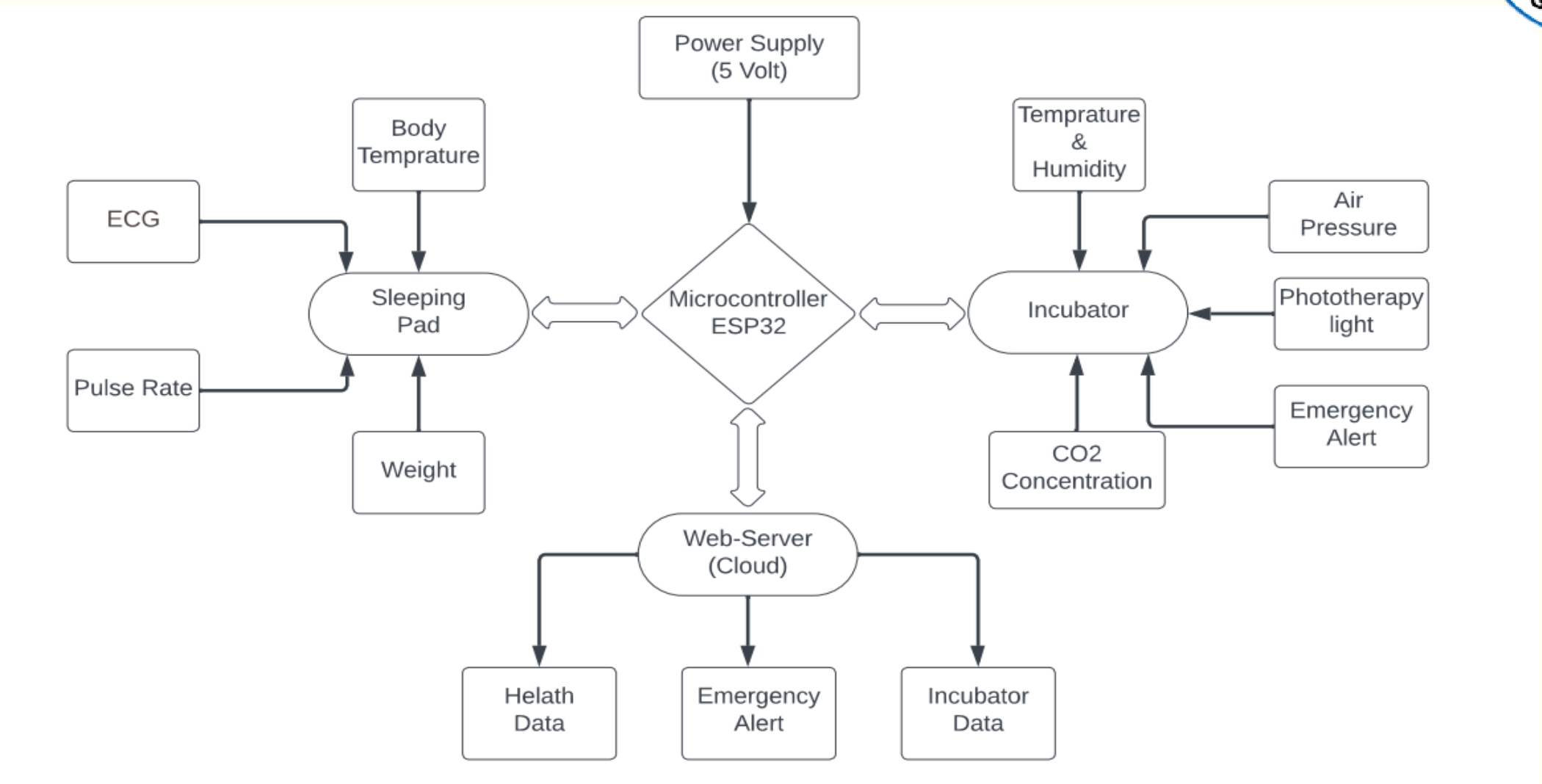
All the data monitored by the sensors will be reflected in real-time on the website by the web server and from anywhere we can check and make some changes like:

- Health's data
- Incubator's data
- Emergency alert

Block Diagram



Flow Diagram



Electronics Sensors

Health Sensor

- ECG Sensor (AD8232)
- Body Temperature (DS18B20)
- Pulse Sensor

Incubators Sensors

- Temperature and Humidity Sensor (DHT11)
- CO2 Sensor (MQ135)
- Phototherapy Light

Emergency Alert Sensor

- Piezo Buzzer
- Green and Red LED

Application

- This project can be used in area where hospitals and not developed.
- It also be used for premature birth.
- Our system is easily connected with any type of incubators.
- Anyone can easily use and manipulate this system through the website.
- Since it is IoT based hence we can easily monitor all the data from anywhere.

General Papers

1. Paper Title: IoT-Based Neonatal Incubator Monitoring System for Rural Areas
   - Authors: S. Jadhav, P. Londhe, and S. Chavan
   - Published in: 2020 International Conference on Electronics and Sustainable Communication Systems (ICESC)
   - Year: 2020
2. Paper Title: "Smart IoT-Based Incubator for Neonatal Care Using Wireless Sensor Network"
   - Authors: S. D. Patil and R. G. Kulkarni
   - Published in: International Journal of Computer Science and Mobile Computing (IJCSMC)
   - Year: 2019

Conclusion

Considering, this work proposed a model of an infant youngster incubator that is sensible to be used for office in the rustic locale. A moderate, transportable, and essentialness-saving infant youngster hatchery was adequately made through this work. The place might provide a correct condition that over the long-term ready to deflect child that was thought of within the nation district from hypothermia condition. They will have the ability to get the fundamental consideration inside a concise period in the midst of the essential condition, subsequently decreasing the mortality case among them.

Future Enhancement

- We will add some more features like blood supply control, nutrient supply, and more health data monitoring.
- We will also improve our UI system to make it more easily usable.
- We also improve the size to make it more portable.

Reference

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3. Wervyan Shalannanda, Irma Zakia,Erwin Sutanto, Fahmi Fahmi ,"Design of Hardware Module of IoT-based Infant Incubator Monitoring System",978-1-7281-7596- 6/20/$31.00 ©2020 IEEE.

4. Sri Purwiyanti, Sri Ratna Sulistiyanti, FX. Arinto Setyawan, Billy Mulia, Wibisono Ketut asmita, Atmaja Helmy Fitriawan, "Multisensors System for Real Time Detection of Length, Weight, and Heartbeat of Premature Baby in The Incubator", 978-1-7281-4105-3/19/$31.00 ©2019 IEEE.


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