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INCUBATOR ANALAYZER WITH AUTOMATIC SHUTTER OPENER

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ABSTRACT

The purpose of the paper is to design an incubator analyzer with automatic shutter opener. Incubator is the most common device that can provide an environment where preterm babies can healthily grow in. We place premature or sick babies inside an incubator to help them maintain their temperature. The primary function of this system is to monitor temperature, toxic gas, humidity and position of the infant present inside the incubator. The data collected by these sensors are sent to the Arduino Microcontroller. The data are then transmitted to the user through microcontroller. Here the system uses IOT (Internet of things) to transmit the information. From the transmitter, the recordings of infant parameters are sent as messages to the recipient through IOT. When the condition is abnormal the alarm buzzer alerts the care taker and sends an emergency message. When the incubator is filled with toxic gas, it is automatically removed by shutter open /close.

Index terms – **ARDUINO UNO, IOT**

I.INTRODUCTION

An incubator is an apparatus used to maintain the environmental conditions suitable for a newborn baby. Premature babies are placed inside an incubator inorder to maintain their temperature. A temperature sensor inside the incubator is used to monitor the body temperature of the neonate and the humidifier is used to maintain the moisture level. The shutter opens automatically when the gas sensor senses the unpleasant gas present inside the incubator. A position sensor is used to monitor the active movement of the baby. These sensors send the information to Arduino microcontroller. The microcontroller process the input and then sends information through the IOT technology to the intended authorities. In case of emergency the alarm alerts the care taker.

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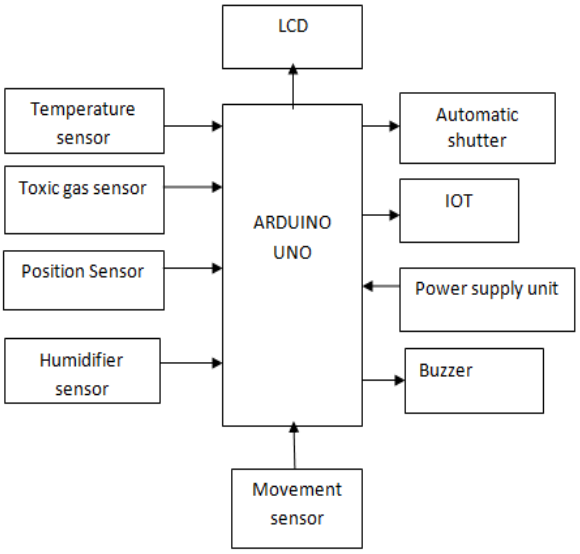
II.PROPOSED METHOD



1. BLOCK DIAGRAM DESCRIPTION

The primary function of this system is to monitor temperature, position and movement of the infant as well as it also detects the toxic gas and humidity present inside the incubator. The passive infrared sensor is used to detect the movement of the baby inside the incubator at an angle of 360^{o}. The position sensor is used to check whether the baby is present inside the incubator or not.

The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to the temperature (in °C).It can measure temperature more accurately than a using a thermistor. The sensor circuitry is sealed and not subject to oxidation. The LM35 generates a higher output voltage than thermocouples and may not require that the output voltage be amplified. The LM35 has an output voltage that is proportional to the Celsius temperature. The infant's body temperature should be maintained at 36^{o}C-37^{o}C.

Electrochemical sensor is used to detect the toxic gas present inside the incubator. Humidifier control device is used to maintain the moisture level in the incubator. The output of these sensor are given to ARDUINO UNO. When the values of these sensors are abnormal the ARDUINO UNO sends the signal to the nurse station. In case of emergency the shutter opens

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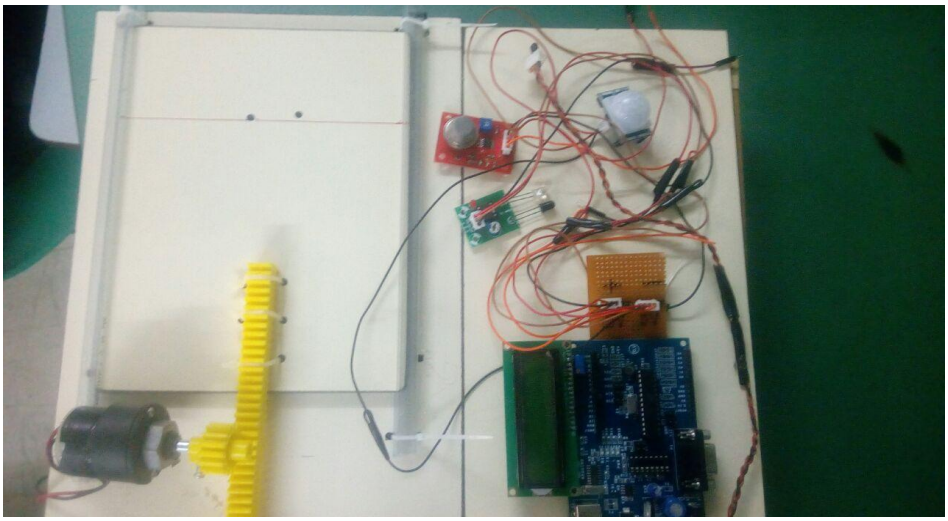
immediately and the buzzer alerts the caretaker. These monitored values are communicated through IOT (Internet OF Things) to the caretaker as a message.

III .IMPLEMENTATION



IV. ADVANTAGES

- Easy to monitor the neonate.
- In case of toxic gas the shutter opens automatically.
- Alarm is used in case of emergency
- Low cost and reliable.

V. APPLICATIONS

- In hospital it could require less attendant time for doctors.
- The doctors can monitor neonate from anywhere by using IOT technology.

VI. CONCLUSION

The developed system provides a suitable environment for the premature babies. In this system temperature, position and movement of the babies are monitored. The humidity inside the

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incubator is maintained .The release of toxic gas is made automatically by shutter opener. These process are based on arudino microcontroller. Emergency alarm is incorporated inside the incubator which alerts the care taker.

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