

## ABSTRACT

This research aims to develop a Monitoring and Controlling Internet of Things (IoT)-Based Chicken Egg Incubator system. The chicken egg incubator is a crucial tool that can enhance the efficiency of the chicken egg hatching process. An effective monitoring and controlling system is required to oversee and regulate the incubator environment according to reference parameters, including a temperature range of 37 to 39 degrees Celsius and humidity levels between 55 to 65 percent.

In this study, the development of Monitoring and Controlling Internet of Things-Based Chicken Egg Incubator system involves several key components. Firstly, the NodeMCU ESP8266 microcontroller is utilized as the central control unit, connecting to the internet through Wireless Fidelity (Wi-Fi). Subsequently, two DHT11 temperature sensors are employed to measure the temperature and humidity within the incubator environment. Incandescent lamps are employed to maintain the optimal temperature necessary for the hatching process. A dynamo motor is implemented to adjust the egg rotation to the correct position. Relays are utilized to manage the overall electrical power of the system.

This system gathers temperature and humidity data through the DHT11 sensors. The data is then transmitted to the microcontroller and stored in the website's database using the HTTP Request method. Ultimately, the information is presented through a user-accessible website. This IoT-Based Monitoring and Controlling system for Chicken Egg Incubators can offer advantages in efficiently overseeing the incubation process.

The research successfully developed Monitoring and Controlling Internet of Things (IoT)-Based Chicken Egg Incubator, with key components including the NodeMCU ESP 8266 microcontroller, DHT11 temperature and humidity sensors, incandescent lamps, and dynamo motor. Operationally, if the temperature drops below 37 degrees Celsius, the incandescent lamps will automatically activate, and will deactivate if the temperature rises to 39 degrees Celsius. In this research, the readings of two DHT11 sensors were compared with a similar sensor available in the market (HTC2) and showed an average difference of approximately 1.37% for

temperature and 2.80% for humidity readings. Meanwhile, the Quality of Service (QoS) testing indicated that the system maintains good service quality, with a delay of around 33,48 ms, throughput of about 35,52 kbps, and zero packet loss. It is anticipated that this research will contribute to the technological advancement aimed at enhancing the efficiency and success of the chicken egg hatching process.

**Keyword :** Chicken egg incubator, Internet of Things, monitoring & controlling, Quality of Service.