IOT BASED SMART POULTRY FARM

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ABSTRACT:

On the majority of poultry farms in India, especially in broiler farms, manual monitoring and control is done. The Chicken poultry industry is an important industry for sustainable food supply in our country.The development of an automatic chicken feeding machine can be very useful to the growth of the poultry industry. The primary parameters in chicken farming include temperature, Fan, humidity, heater and water distribution. Broiler production is strongly influenced by these factors. This Project proposes an IoT based monitoring of poultry farm environment and incorporating necessary features to control those parameters.In India, the majority of chicken farms, particularly broiler farms, are manually watched and regulated. Through this proposed system it will be helpful to the user.

KEYWORDS: Internet Of Things(IOT), Arduino microcontroller ,Temperature sensor, Humidity sensor, DC motor, Heater

INTRODUCTION:

Agriculture plays major role in the economy of the country. More than 70% of Indian population relies on agriculture for their sustenance.

According to world's agricultural produce, chicken is the most favoured produce, The development of an automatic chicken feeding machine can be very useful to the growth of the poultry industry, Embedded greenhouse and poultry farm monitoring and control is proposed to provide a highly detailed micro-climate data for plants within a greenhouse environment with an innovative method of growing temperate crops in a tropical environment using microclimatic conditions.

The system replace the human labour to feeding food into container. It overcome the labour problems in the poultry industry and it also involves mainly two sections first to feed the food into particular contained and the

second one is to control the temperature sensor to the freshness of chickens food.

The food safety and there has been a high demand for better quality food. This has forced many countries to adopt new protocols to change all manual farms into automated farm. In this way smart poultry farm has a great impact on increasing growth of chicken.

LITERATURE SURVEY:

Paper1: E-Poultry :An IOT Poultry Management system for small farms

The paper focus on Chicken or poultry farms increase its production as the population in the Philippines demanded more supply of food resources. The livestock production is a billion-peso industry where many Filipinos are depending on. The researchers pursued this delving to address the need in providing an updated technology, to help poultry farmers. This study tackles Poultry Management System, an IOT system that automates the process of giving feeds and water to poultry animals. An Android application was developed to set the time, in which the user intends to give food to the chicken. Water is constantly provided to the poultry once the sensor detects that the water container is empty. As the feed and water tank gets low, a notification system is in place to inform the user about it. A solar panel is used to charge the battery that powers the microcontroller and motors. This technology provided a relevant result in upgrading poultry businesses that saves time and effort.

Paper2:IOT based Poultry farm lighting fogger and smart feeding Trolley

This paper's primary goal is to automate a poultry farm. During summer seasons the temperature sensor senses the internal temperature of the farm, if it exceeds the fixed temperature it turns on the fogger pump to spray the water. The lighting system is controlled by a microcontroller to turn on and off the light at a fixed time to save unnecessary power consumption. The proposed system can be used to feed chickens in place of a worker, thereby alleviating labor shortages in the poultry industry and introducing an IoT (semi-automated) method. It is used to feed the food in the trolley and control the temperature using a fogger on a poultry farm. Temperature, humidity, and light are all environmental variables that influence chicken wellbeing, and light is supplied by an electric lamp for effective egg development. High-temperature conditions directly affect the chicken welfare and productivity, it's most important to keep the poultry farm at a constant temperature. With these considerations in mind,

we created a fogger that uniformly sprays water in the poultry farm cages, greatly reducing temperature.

Paper3: Internet of Things based smart Poultry farming

The demand for high-quality and sustainable food production has led to significant advancements in agricultural practices. In particular, poultry farming has witnessed a paradigm shift with the integration of Internet of Things (IoT) technologies. This abstract presents an overview of an IoT-based smart poultry farm designed specifically for optimized egg production. The proposed smart poultry farm leverages IoT devices and sensors to monitor and control various parameters crucial to the well-being and productivity of the poultry. The system encompasses a comprehensive network of interconnected devices, including environmental sensors, automated feeding systems, smart egg collection mechanisms, and real-time data analytics. Environmental sensors continuously monitor key factors such as temperature, humidity, air quality, and lighting conditions within the poultry farm. This real-time monitoring allows for proactive adjustments to create an optimal environment for poultry health and productivity. Automated feeding systems provide precise and timely distribution of feed, ensuring the birds receive balanced nutrition for enhanced egg production. To streamline egg collection, smart egg collection mechanisms equipped. These mechanisms identify and collect eggs from designated nesting areas, reducing the manual effort required and minimizing potential damage to the eggs. Additionally, the collected data from the sensors and devices are analyzed in real-time using data analytics techniques, enabling farm managers to gain valuable insights and make data-driven decisions. The IoT-based smart poultry farm offers several benefits, including increased egg production efficiency, improved animal welfare, reduced labor requirements, and enhanced profitability. By providing real-time monitoring and control, farm managers can quickly identify and address any issues or abnormalities, resulting in optimized egg production and overall farm management.

Paper4 :IOT based Automted Poultry Form:

Most of the chicken barns in India are overseen and physically inspected. The crucial factors that ought to have been evaluated and managed include temperature, air quality, wetness, lighting, oxygenating the barn, and the chickens' food intake. Clearly connected to the production of poultry are these variables. Chicken farms are currently where they die off more quickly. By monitoring and effectively maintaining the temperature, dampness, air quality, and food feeder with the help of Wireless Sensor Networks (WSN) technology and the Internet of Things, this project aims to raise healthy layer chickens, slow

the rate at which they die off, and improve the coherence of the poultry products (IoT). IoT and WSN developments were used to create a model, and the aforementioned boundaries were tested against limit values. Additionally, the client receives programmed ready notices from this system via SMS. Additionally, a web interface is created to screen and display these boundaries

Paper5:Smart poultry house monitoring system using IOT:

In modern India, the poultry industry is one of the largest and fastest growing segments of the agrarian economy. Due to standardized farming management and excellent manufacturing practices, chicken output has been steadily increasing in recent years. Automation is crucial in the modern world, and the Internet of Things (IoT) concept is also evolving rapidly. It is possible to automate manual processes using acertain technique. The project's objective is to use IoT technologies to automate management-related chores on a chicken farm. Environmental factors like temperature and humidity are just a few that have an impact on chicken wellness. By keeping an eye on the chicks according to their cycle, the proprietor is informed. The weight of the chicken is taken into consideration for high - quality manufacturing. If all these factors remain consistent, chicken production and quality increase this study focuses on the development of an automated chicken coop management system prototype. Among the main hardware used for the project is the NodeMCU andsensors to control and monitor the parameters like temperature, water, level in the chicken coop. The parameters can also be monitored through a mobile Thingspeak application. And the notifications appear on the MyMQTT application.The results indicate that with a more systematic control of the environmental factors that affect the health of a chicken, an ideal environmental condition can be achieved and maintained in the chicken coop].Chickens are prone to being attacked by many predators during the night. In order to keep your flock safe and alive, a good solution is to have an enclosed structure for the chickens to go in during the night. Rather than having to go out every night to lock them up in this structure, or early in the morning to let them roam the pasture. A good solution would be an automatic door installed on the structure. This works with the help of the IR sensor.

Paper6 :Dependability Evaluation of a Smart Poultry House: Addressing Availability Issues Through the Edge, Fog, and Cloud Computing:

Internet of Things (IoT) applications equip rural producers with decision support tools and automated solutions that boost agribusiness productivity, quality, and profit. However, most poultry farmers still use conventional

methods of operation in which human workers carry out all routines for monitoring and controlling their farms at the expense of greater productivity. One of these human activities is manual weighing, which can be replaced by nonintrusive methods such as computational vision applications that estimate live poultry's weight using video cameras. Since Internet of Things (IoT) devices may have low computing power limiting the ability to process the data locally, they can transfer it to a fog or cloud data center, where they are processed. This article aims to conduct a dependability study of a poultry house automated with a computer vision-based system for estimating poultry weight considering hierarchical models (e.g., Markov chain, reliability block diagram, and closed-form equation) to represent the whole system and obtain steady-state availability and annual downtime. In addition, our purpose is to consider and compare different architectural solutions, such as edge and fog computing-based solutions. The proposed solution verified that a cloud-based application with no redundancy has a downtime of 34.14% and 9.176% hours when considering a hot-standby redundancy strategy in the office node of a cloud solution.

Paper7: IoT Based Smart Poultry Farm

For easy day to day life enhancement in technology has been developed so widely and in much faster rate. Smart poultry farms can emancipate the farmers from the traditionally tedious procedures which were outdated and time consuming. In preliminary stage, a smart poultry farm shows many distinctive features such as, automated food and water supply, egg collection, maintaining precise environmental factors etc. In this paper, Safety measures such as fire protection, anti-thief features which ensures an overall surveillance of the farm has been incorporated. Data storage through IoT is another enticing trait of this work which enables the users to Fig. out the required presteps to adopt before any endangerments can occur.

METHODOLOGY:

IOT based smart poultry farm involves following methodologies:

1. Arduino microcontroller, built in sensors.
2. Power supply unit for supplying power to the module.
3. Temperature sensor for detecting environmental temperature.
4. NODEMCU used for connecting devices to the internet.
5. Relay is used to control the circuit by independent low power signal.

6. Moisture sensor is used for identifying moisture in atmosphere.
7. DC Motor is used for cooling purpose

Diagrammatic representation: (Block Diagram)

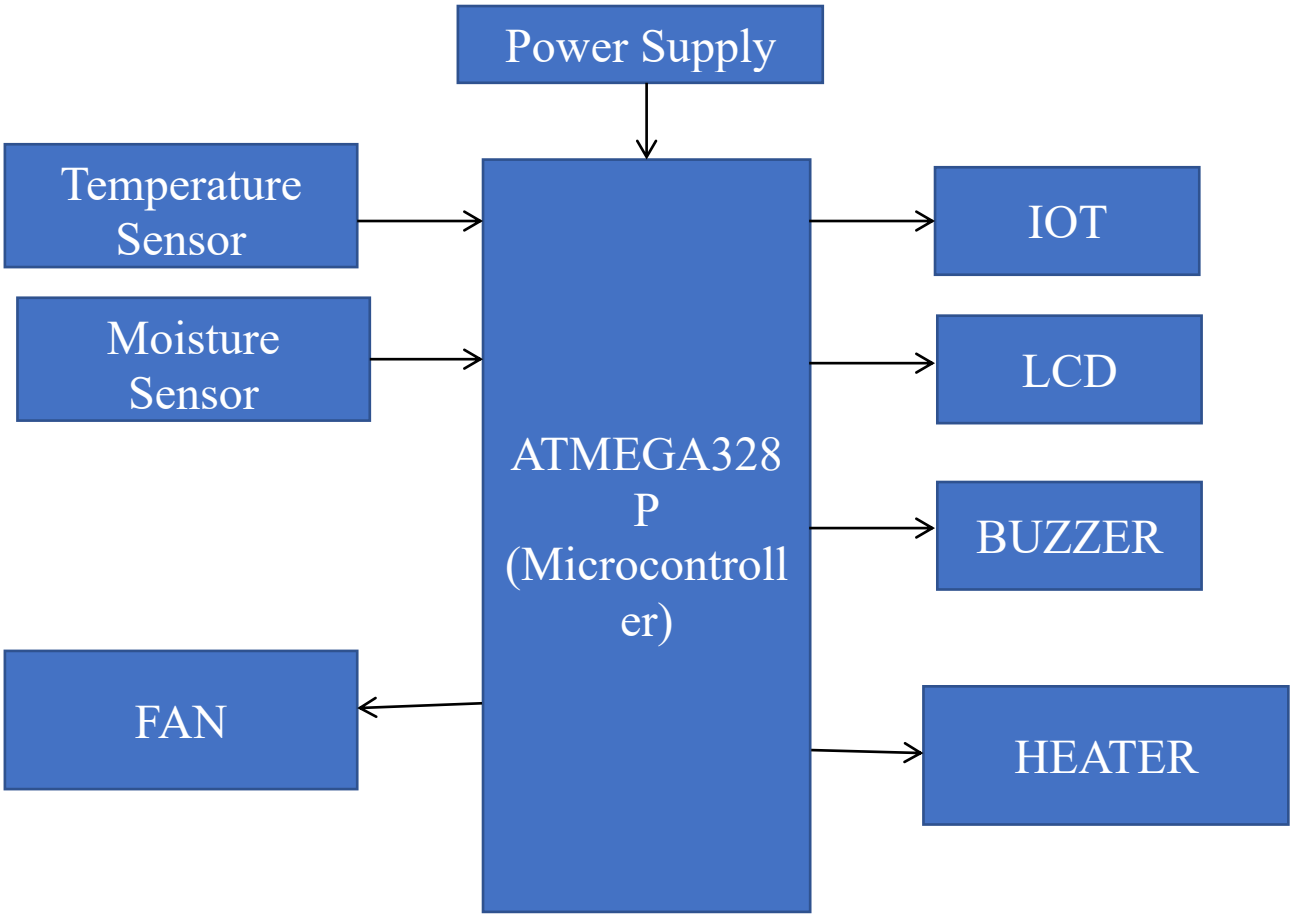


Figure: IOT based smart poultry farm

Sensor Selection and Placement:

- DHT11: These sensors measure temperature and humidity, suitable for monitoring ambient temperature and humidity levels within the poultry house**.**

Hardware Setup:

- Connect the selected sensors to an Arduino board for data acquisition. Ensure proper wiring and compatibility between sensors and the microcontroller.
- Integrate a DC fan and heater with the microcontroller, establishing control mechanisms to regulate temperature based on sensor readings.

Programming and Control Logic:

- Develop code to read data from the temperature and moisture sensors.
- Implement logic to analyze sensor data and determine actions based on predefined thresholds.
- For instance, if the temperature exceeds a set limit, activate the DC fan to cool down the environment.
- Similarly, adjust the heater based on temperature or moisture readings to maintain optimal conditions for the poultry**.**

IOT Unit:

IoT Connectivity:

- Remote Access and Monitoring: By integrating IoT, the Arduino-based system can transmit real-time data from sensors (temperature, fire, voltage) to a cloud platform or server, enabling remote access and monitoring of the battery status from anywhere.

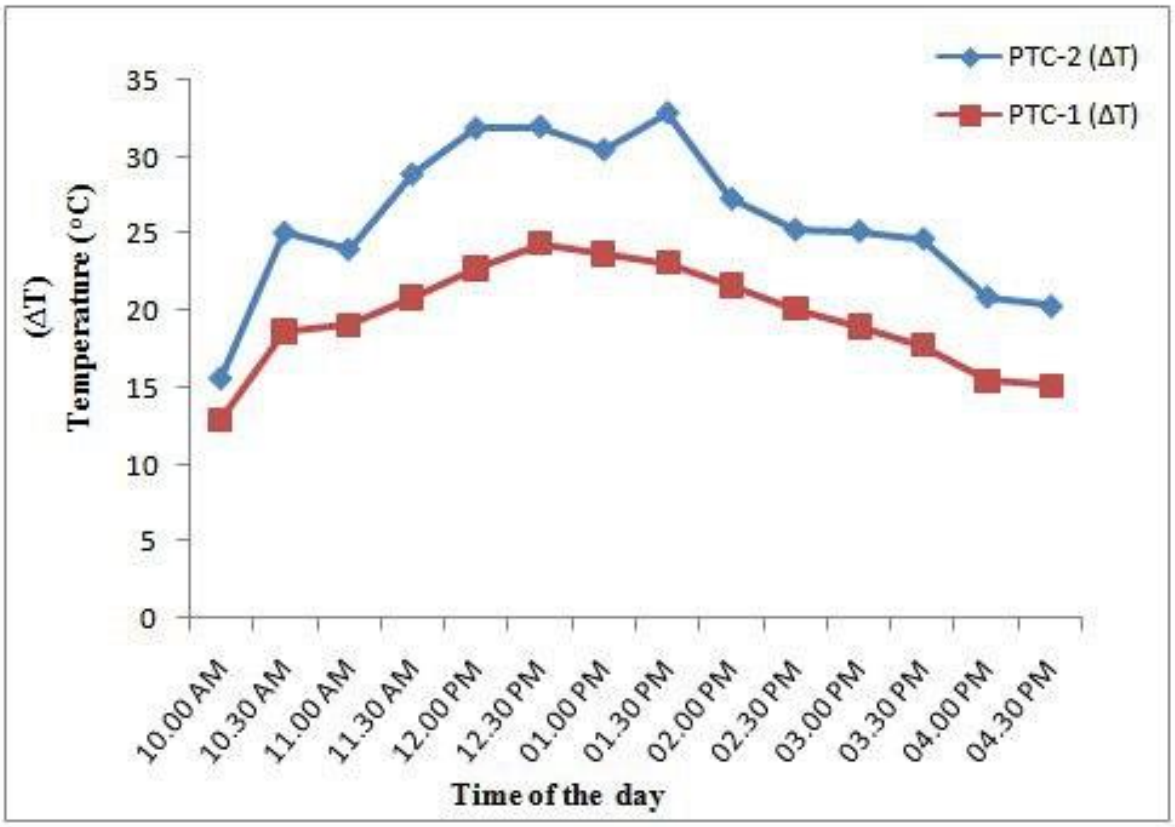
Cloud Storage:

- Data collected from various electric vehicles equipped with these sensor systems can be stored securely on the cloud, allowing for historical analysis, comparisons, and large-scale insights**.**

Result & Discussion:

- Data Collection and Monitoring: Describe how temperature and humidity data were collected using IoT sensors placed strategically within the poultry farm. Discuss the frequency of data collection and any challenges encountered during this process.
- Analysis of Temperature and Humidity Trends: Present the findings related to temperature and humidity levels over time. Discuss any patterns or trends observed, such as fluctuations in temperature and humidity during different times of the day or in response to external factors like weather changes.
- Impact on Poultry Health and Productivity: Discuss how variations in temperature and humidity levels affect the health and productivity of the poultry. Highlight any correlations between environmental conditions and parameters like egg production, growth rates, or disease incidence.

- Efficiency and Optimization: Evaluate the effectiveness of the IoT system in maintaining optimal temperature and humidity levels within the poultry farm. Discuss any interventions or adjustments made based on the data collected to optimize environmental conditions and improve overall efficiency.



Graph of Temperature Difference with Time

Conclusion:

Based on the focus of the IoT-based smart poultry farm system on temperature monitoring, the following conclusions can be drawn:

1. Precision Monitoring: The IoT sensors implemented for temperature monitoring provided accurate and real-time data, allowing for precise control and management of temperature conditions within the poultry farm environment.

2. Optimal Temperature Control: The data analysis revealed the effectiveness of the IoT system in maintaining optimal temperature levels for poultry health and comfort. Consistent monitoring and adjustment ensured that temperature fluctuations were minimized, thereby reducing stress and improving overall well-being.

3. Impact on Poultry Health: The controlled temperature environment positively influenced poultry health, leading to reduced mortality rates, improved growth rates, and enhanced immunity against diseases. Stable temperature conditions are crucial for maximizing poultry productivity and minimizing production losses.

4. Energy Efficiency: By leveraging IoT technology for temperature regulation, the smart poultry farm demonstrated increased energy efficiency compared to traditional heating and cooling methods. This not only reduces operational costs but also contributes to sustainability efforts by minimizing energy consumption and carbon emissions**.**

5. Data-Driven Decision Making: The availability of temperature data facilitated data-driven decision-making processes, enabling farm managers to proactively identify and address potential issues related to temperature fluctuations. This proactive approach enhances farm management practices and ensures optimal conditions for poultry welfare