

A Poultry Farm Management System

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Abstract: From previous few years, the chicken production within the planet has been increasing gradually thanks to standardized farming management and good manufacturing practices. According to world's survey on agricultural produce survey, chicken is that the foremost favorite produce, since it is a nutrient-rich food providing high protein, low fat and low cholesterol than other sorts of poultries'. From previous few days round the world, there has been a high demand permanently quality chicken food. This paper highlighted the solution technology-based solution for low cost, asset-saving, quality-oriented and productive management of chicken farming. This study intended to explore utilizing and intelligent the use of an intelligent system which used an embedded framework and a wise Phone for monitoring farm to manage environmental parameters using smart devices and technologies.

Keywords: Poultry-farm, IoT, DHT22, Centralized cloud, B4A.

1. Introduction

India is taken under consideration as an agricultural wealthy country in terms of food and important spot in India has the eggs and chicken meat are critical and rich wellsprings of protein, vitamin and mineral .poultry gives rich natural excrement and is a crucial wellsprings of pay and job to a huge number of farmers and different persons occupied with united exercise within the poultry business .chicken is that the foremost broadly acknowledged meat in India .the health of chicken depends on the environment within the poultry farm .if the condition isn't suitable then their health issues .healthy chicken growths rapidly and having good demand within the market .poultry farm are design during a such way that ,environment conditions are often by providing facilities like ventilation, cooling and lighting on rough ,wall the birds are surrounded by micro level climate and it's considerably important for the health of the birds thus, several research and development communities are concentrating their efforts are adopting some specific internet of things (IoT) technologies like RFIDs and wireless sensor networks, or everyday- cheaper connected devices, to enable remote monitoring of the conditions in food transportation scenarios and at a very fine granularity along the whole agriculture food supply chain.

Chicken is that the foremost recognized meat in India. The health of the chicken depends on the environment of the poultry

farm. If the environmental conditions aren't adequate, there are conjointly problems with the expansion of the chicken and its health problems. Healthy chicken grows quickly and is in high demand on the market. Poultry farms area unit designed in such the only manner on be able to change environmental conditions by providing structures like ventilation, cooling, and lightning on rough surfaces, walls, and floors. Bird's area unit confined by a micro-level climate and area unit vital for bird health. Therefore, several analysis and development communities' area unit focusing their efforts on the adoption of some specific technologies of internet of Things (IoT) like RFIDs and wireless sensors network or cheaper connected devices, to allow remote observation of conditions in eventualities of food transport and terribly fine roughness on the whole agri-food offer chain, as associate example from production to consumption.

However, the bulk of this IoT solutions still believe heavily-centralized cloud infrastructures, wherever there's typically a scarcity of transparency, and naturally presents security threats also as availableness, knowledge lock-in, confidentiality, and audibleness.

This project proposes a replacement model through the utilization of advanced trendy technologies to form ancient chicken breeding additional intelligence. The good farm provides statistics on environmental parameters like temperature, humidity, smoke, weather, etc. to the microcomputer through advanced sensors and microcontrollers. The farm is connected with additional intelligent devices, like application programs, sensors, microcontrollers, that provide automation to poultry farming.

2. Literature Review

[1] As there are more than 200 thousand poultry farms in Bangladesh, the author has designed the natural gas generators as backup support. It reduces a huge load on the national grid. The power supply to the poultry farms has become uncertain and costly too. Under this consideration, poultry farms themselves can become self-sufficient generating their own power from daily poultry wastage. As the power systems in poultry farms are modeled to operate in island mode, the stability of them must be ensured under all operating

conditions. The aim of this paper is to analyze the stability of a standalone biogas power system under different operating conditions. [2] Author has suggested an LED smart lighting control system for poultry farms. There are disadvantages of the traditional system adjusting incandescent bulbs of illumination, of which energy efficiency is very low as well as high power consumption. So that to overcome such a problem a smart control system is applied to poultry farms. This system has several advantages as follows. First, energy efficiency can be improved in comparison to the existing system. Second, the illumination control range can be improved. The maximum illumination is increased by 10 times more than that of the existing system inside the poultry farm. Furthermore, using the developed smart control system a farmer can manage remotely his poultry farms through real-time environmental monitoring with a

PC and Smartphone. [3] The author has suggested the real-time monitoring requirement of poultry farms on the environment; an online monitoring system is designed for poultry farms on the environment based on the ZigBee module. It will provide a network of the real-time monitoring system, monitoring system involves node controller, data receiver, data transmission and control node, which is TI's CC2430 based on ZigBee interface technology. CO₂ sensors use TGS4161, temperature and humidity sensors to use SHT75 to detect different environmental parameters. Through the analysis of data transmission of system, simplifying the ZigBee protocol stack, designed data transmission protocols and communication formats of the system. [4] The author has suggested the low cost of production and high human involvement in poultry farms, could lead to low profit and low return on investment. These flaws in the poor feeding system of chicken prompted this work by developing an intelligent fuzzy logic-based system that could mimic the roles of the poultry labors in delivering water and feed food for birds at a specified time of intervals. Water and feed level is sensed by the designed system and dispense intelligently with respect to the variations in water and feed level as chicken consume the water and feed. This system reduces the workload of the poultry attendants, increases cost benefits and generates good returns on investment in the poultry farming system. [5] The author has designed the Poultry farming till now is done manually so farmers are incapable of getting more benefits. A few years ago, the feeding of whole cereals to chickens, as a scratch feed or part of a complete diet, was the regularly accepted practice. With the growth of large poultry production, automatic feeding systems, employing, for the most part, full-fed complete diets, were adopted as the major of choice for feeding. Controlling and monitoring of Environmental parameters related to a Poultry farm, so as to ensure complete care of chickens is one of the major works. The objective is achieved through the use of a sensor-based system. Poultry Farming through automation using PLC has to form the Environmental Controlled. These Environmental Controlled Poultry sheds are controlled 24 hours

through automation. It will provide better output by decreasing the man's efforts and also human errors.

3. Methods and Materials

A. Proposed System

In this project, we present IOT based automatic control system, a fully decentralized traceability system for the Poultry farming control system management. Specifically, the control of the farm environment with using Arduino sensors while it is able to integrate various IoT sensor devices. By checking the poultry environment count such as temperature and humidity our system will notify users by SMS notification and also do further action to control the environment inappropriate manner. It also stores the details of chickens such as chicken weight, purchased date, and displays all details in the poultry farm control app. All this data is stored in a cloud database. The proposed poultry farming control system is based on the IoT & cloud database. All the sensors like temperature, humidity, heat sense the parameters from the entire poultry farm. Also, QR code stickers are used to check the chicken details by poultry farm android app and gained data through the mobile scanner. All this data which gets from sensors and chicken details are transferred and stored into the cloud. For example – the temperature is increased than the normal temperature at that time automatically fans will turn on the farm. To control the temperature at his predefined level. And all the related data of temperature as well as heat and humidity count are stored in the cloud database.

B. Scope

1. The first set is formed of various sensors dedicated to measuring the environmental parameters in the farm building as temperature, humidity, heat, and others.
2. The sensors are connected to a local control unit like relay module and that enables to control of the farm environment as well as SMS notification allowed to the user if in case there is internet connectivity issue for the user, he can trace by SMS notification.
3. Chicken details are stored by the schedule and this way we can monitor the chicken's health.
4. The main controller receives all the information, processes it, and responds according to predefined algorithms.

C. Material

1. Wires (Male to Male)
2. NodeMCU ESP8266
3. Android Application
4. Breadboard
5. Fan and Bulb
6. Relay Module
7. Wires (Male to Female)
8. DHT22 Sensor

D. Specification of NodeMCU ESP8266

- Wi-Fi Module – ESP-12E module similar to ESP12 module but with 6 extra GPIOs.
- USB – micro USB port for power programming and debugging.
- Headers – 2x 2.54mm 15-pin header with access to GPIOs, SPI, UART, ADC, and power pins.
- Misc. – Reset and Flash buttons
- Power – 5V via micro USB port
- Dimensions – 49 x 24.5 x 13mm

E. DHT22 Specifications

- Operating Voltage: 3.5V to 5.5V
- Operating current: 0.3mA (measuring) 60uA (standby)
- Output: Serial data
- Temperature Range: -40°C to 80°C
- Humidity Range: 0% to 100%
- Resolution: Temperature and Humidity both are 16-bit
- Accuracy: ±0.5°C and ±1%

F. Basic4Android (B4A)

- Is a rapid application development tool for native android applications?
- B4A includes all the features needed to quickly develop any type of Android app.
- B4A is an alternative to programming with Java.
- B4A includes a visual designer that simplifies the process of building user interfaces that target phones and tablets with different screen sizes. [2] Compiled programs can be tested in AVD Manager Emulators or on real Android devices using Android Debug Bridge and B4A Bridge.

the Arduino NodeMCU it is also connected with a relay module which makes it easy to manage the lights and fan automatically. Where of those sense counts are displayed on user mobile phones through the poultry farm android app and also SMS notification.

2) Centralized Cloud Database Storage

In this module cloud database connectivity is completed. Where all temperature-related data and chickens’ base details are stored. For the aim of future modifications and log activity of previous days are often obtained. We’ll see the data on a Smartphone, where the poultry farm android app is downloaded.

3) Chicken Health Details

In this module, chicken details are fetched by using QR code. The mobile scanner (camera) scans the QR code and thus the user will get chicken number every chicken has its individual number as an ID of chicken. Then the date of purchased chicken and weight of chicken with the predefined weight values so users can easily determine the comparison and may lookout of chickens feeding, water level, and etc. health parameter.

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5. Conclusion

The traditional manner of chicken farming is replaced with smart and intelligent chicken farming exploitation embedded system based innovative applications. It helps the farmer’s amount management and observation environmental aware context parameters like temperature, humidity, air quality, strength and dominant filter fan, ventilation window. This smart system can effectively management the farm from any location and reduces worth time and personnel. This might improve the productivity and quality of chickens in poultry farming. Inside the top of the day advanced IOT based technologies got to be compelled to be used for observation and dominant health-related parameters of chicken to spice up the quality and productivity of chicken farming that's during an edge to finish in profits for farmers and quality food for men.

4. Results and Discussion

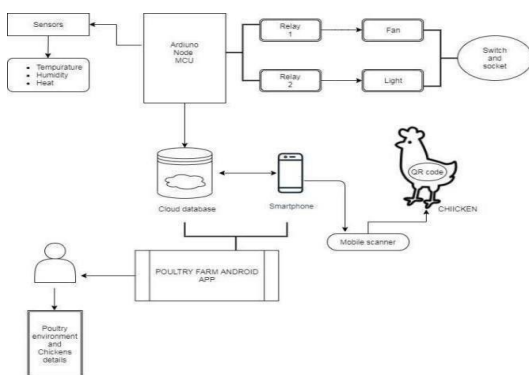


Fig. 1. Flow of working

A. Working

A very systematic approach to the overall project design was considered, in which three parameters were monitored.

1) Poultry Farm Environment

In this module, we are checking the farm’s temperature, humidity, and heat by the sensors. This has connectivity with

References

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