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IoT based Automatic Poultry Feeding and Smart Poultry Farm System

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***Abstract*:** *IoT based Smart Poultry Farm will give a hassle free and better observation experience to the user of the Poultry Farm. This system will make use of the sensors and microcontroller unit to perform the said operations of feeding, water supply and temperature- humidity observation which are the main causes for any kind of epidemic or diseases for poultry birds. Introducing IoT in the system will benefit in providing ease of operation as well as real time data observation through internet to the user.*

Keywords: *Microcontroller Unit, Internet, Internet of Things (IoT), Poultry Farm, , Sensors, Temperature and Humidity.*

I. Introduction

The Poultry Culture in India has increased to leaps and bounds in the past few years or decades. The country contributes majorly in the export of the poultry products. Due to this, the awareness for the health of poultry birds as well as the quality of products has also increased. Many problems arise while taking good care of the poultry birds as it is a very tedious and intricate task which demands lot of alertness and minimum errors. These sensitive creatures are prone to lot of diseases which might be a hindrance in the business. Also, the manpower required to do the job takes a lot of time and the cost is high. Introducing Automation in Poultry Industry has brought about enormous change in terms of observation and the need to stay aware of the recent condition of the farm. Where a lot of manpower was required for constant needs of the birds, this technology has helped in reducing manual work and given ease of operation to the workers as well as owners. IoT has made the operation of farm easy and very on the go. Due to this technology, the concerned person can get real time data whenever required through cloud and can make use of it to make any necessary changes to the current conditions.

In this paper we are introducing a system to control the water supply and a real time temperature and humidity value detector. It uses Node MCU ESP 8266 used as a Wi-Fi connector, Relay for switching the supplies, motor driver L293D for feed motors, DHT11 sensor for detecting the temperature and humidity values. It is a low cost and effective solution designed to help the user take good care of the poultry birds.

II. Literature Survey

Chakchai So-In, Sarayut Poolsanguan and Kanokmon Rujirakul1 have developed the global architecture of hybrid systems for mobile and wireless network management systems for intelligent poultry sensors. One of the ideas is to distinguish the electronic and mechanical parts of the farm in terms of mobility and flexibility. Take into account EVAP systems in general once. Managers and farmers have established farms, in addition to the selection of food and animal heritage, other important factors such as temperature, humidity, light and population density are also necessary for the controller can adjust the environmental conditions correctly.

In Hironao Okada, Koutarou Suzuki, Tsukamoto Kenji in Toshihiro Itoh2 is explicitly explained by the bird flu virus in skin cancer, but also by the behavior of the sensor. List puts the strain in the field or use of body temperature in lifetime acceleration data. Surveillance data detected on unusual media, automatically reported by users of internet services, as well as historical information, terms and conditions of sale accepted by the media, sensitive individuals. Chicken growth will decrease if the presence of dust and ammonia in the air is excessive. To avoid a low growth rate, moisture should be kept below 50% if the temperature is above 27

degrees.

E. L. Nichols3 addresses the following important questions: for growth to be effective, moisture must be controlled. Moisture describes the amount of heat and ammonia to which birds are exposed. Moisture is directly proactive for dust and ammonia in the home. When the temperature is between 15 and 17 degrees, the humidity should be between 50 and 70 degrees.

H. Okada1, H. Nogami1, T. Kobayashi, T. Masuda and T. Itoh4 have been developed with a wireless sensor button with very low power to continuously monitor the activity of animal health care. The interrupted effect of measuring body temperature is sufficient for health care and effective to reduce energy consumption. However, in the measurement of activity, intermittent action is not adequate because the change in activity is rapid. This report demonstrates that a highly efficient method in the use of energy to measure continuous activity with a custom LSI developed works with approximately 320 nW of calculated power consumption in standby mode and a piezoelectric false door-to-door MEMS. They also show the knot applied to a chicken health surveillance system for the surveillance of avian influenza in poultry farms.

III. System Architecture

3.1 . Block Diagram:

The main goal of our project is to create an automation system using an Adafruit server and a microcontroller to manage and monitor environmental data.The System is divided into Control and Observation sections. The control section consists of a Node MCU ESP8266 unit, Relay Module, L293D Motor Driver IC.
The Observation section consists of a Temperature and Humidity Sensor DHT11, Cloud from UbiDots for data display.

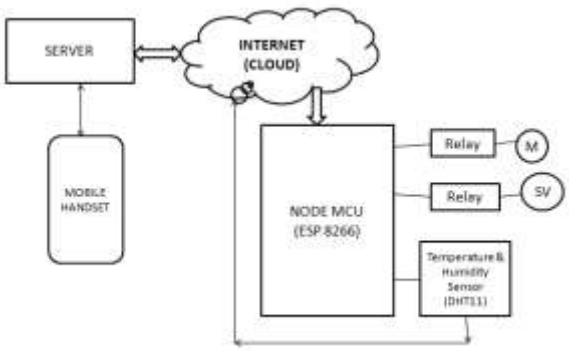

Fig: 1: Block Diagram of Automatic Poultry Feeding System

IV. System Implementation

The core of the system is the MCU, which connects the hardware components of a circuit to the IoT platform. The GPIO pins of our esp are connected to the relay module as well as to the humidity and temperature sensors (DHT11).

The DHT11 is a basic digital temperature and humidity sensor with very low costs. It uses a capacitive humidity sensor and a thermistor to measure ambient air and emits a digital signal on the data pin (analog input pins are not required). It is fairly easy to use, but requires careful synchronization to capture the data. DHT11 is connected to pin no.D3 of our MCU node. It receives the DHT11 signal pin data and sends it to the adafruit server via the MCU node. Where this data is indicated using the meters.

The relay controller is now connected with a pin D0 and D2 of the MCU node. The relay acts as a switch for controlling high-voltage electrical equipment (lights, fans, etc). These relays are activated via the currents that are present in the adafruit server panel. And we can access it by simply turning the feed on / off via the adafruit server control panel.

Google Assistant, you can also open sources and use relays / exits with the Google Assistant, where you have access to automated devices with speech recognition.

Fig.2: Main circuit with all assembled components

Fig.3: PCB layout of the major circuit

Fig.4: DHT11 sensor for temperature & humidity detection

V. Results

In this paper we have proposed a solution device to the given problems at the concerned poultry farm. The control for water and feed supply is done along with real time observation of the temperature and humidity at the farm. This is done using Node MCU ESP8266 for providing a Wi-Fi connection, Relay Module and L293D Motor Driver for controlling of motors of feed and water supply. DHT11 Sensor for the observation of temperature and humidity levels at the farm. This methodology can be further used with modifications and connecting to other devices at the farm and controlling various physical parameters at the place.

VI. Conclusion

The monitoring of real time conditions is the need of the hour for the poultry culture. It is necessary as it hugely influences the birds as well as the products generated. In this paper one such method is defined. It proposes a solution for the feeding and water supply to birds without the use of manpower/ manual control. Also, the remote monitoring of temperature and humidity in the farm is done which is useful for providing necessary changes in the environment of the birds.

VII. Future Scope

Several studies have been conducted in countries such as Saudi Arabia and Japan, and it has been deduced that most chickens were generally affected by the bird flu virus. Poultry farms usually produce a large amount of animal waste. Thanks to this, Goober's gas can be developed and used for daily energy needs. That is why it is very important to maintain the right environment for the chickens. The health of the chicken at a young age is something that needs to be taken care of, because it is possible that chicks are arguing for survival. The import of air into poultry farming is also important. You must therefore take precautions when building the farm. Studies have shown that the effective growth of chickens depends on the amount of ammonia in the environment. That is why this also offers an opportunity for future study.

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