

ANALYSIS OF OPERATIONS OF POULTRY FARM USING IOT TECHNOLOGY

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Abstract. In the contemporary world mechanization accepts an essential part. This representation focuses on the computerization of poultry farms by utilising a far off sensor climate and versatile correspondence structure. Chicken is the most adored food thing delivered for utilization and it is an enhancement rich food giving high protein, low fat, and low cholesterol than various poultries. In this representation normal boundaries of a poultry ranch like temperature, gas, and fire are noticed and controlled thus to grow the improvement of chicken. The water level is furthermore controlled and checked with the support of the sensor module. By interfacing all the sensor devices to the mcu all sensor regards are placed then utilising the wifi device it will be moved to the thingspeak cloud server.

Keywords. *iot, NODEMCU, Wireless sensor network, automatic poultry farm*

I. Introduction

From the most recent couple of many years, throughout the planet, there has been an expanded degree of mindfulness in regards to the food handling and there has been an appeal for good quality food. This has constrained numerous nations to take on new conventions to change all manual homesteads into computerized ranch. In this manner savvy poultry ranch extraordinarily affects expanding development of chicken. This representation zeroed in on current innovations for a poultry cultivating to control all natural boundaries like temperature, dampness, smelling salts gas which influences on the development of the chickens. Assuming the natural condition isn't sufficient, there might be destructive for stomach related, respiratory and social change in the chickens. In the event that chickens might get reasonable air and appropriate water, it might develop quickly and wellbeing of chickens will be acceptable so the heaviness of the chickens will be increments.

In the improvement of the chicken climate expects a major part. Sharp poultry estate is arranged so the climate can be changed by ventilation, cooling fan and exhaust fan. The limits temperature, light force, smelling salts gas and water level are noticed and controlled with the support of NodeMCU. Noticed sensor regards are moved on the site page then the person in-control can know the inside environment of poultry ranch through Blynk Application

II. Literature Survey

A. SPN: An Integrated Solution Using WSN and GPRS Based Network [1]

Rupali B. Mahaleet al has reviewed about the seeing the poultry ranch by utilizing Wireless Sensor and GPRS based Network. This design screens the water, food level and encompassing ecological constraints of a poultry ranch including temperature and moistness. Through this design the individual liable for poultry homestead can get inner climate of a poultry ranch whenever and any place with the assistance of GPRS affiliation

B. Smart Farming using WSN's [2]

Vaibhavraj S. Rohamet al depicts about the Wireless sensor relationship to plan the gifted climate to screen and control unmistakable climatic cutoff points. They were utilized the far off sensor network in the nurseries, where this affiliation is connected with BeagleBone Controller. BeagleBone Controller is a gadget which will amass as far as possible in general and dump into webserver's educational assortment by standard timespan. Web application and Smartphone application will dismantle as far as possible respects and anticipate the preventive measures for the seeing typical conditions. Construction will be filled by light based and breaking point batteries.

C. Cybernet Utilising Smart Poultry Farm [3]

K. Sravanth Goud et al has clarified the general system of far off sensor association and convenient association to control and therefore screen the regular limits of poultry. Individual can prepared to screen biological limits by sending SMS back to the system. Limits like temperature and dampness. If system doesn't get request from enrolled versatile number, it will normally play out its action. Therefore by using this high level technique structure can give a state of the art procedure to develop motorization.

D. Intelligent Sensing Technologies into the Poultry Estates [4]

Gerard Corkery et al analyzed about utilising wise identifying propels in the poultry business to screen essential regular limits which are related to poultry creation for air temperature, relative dampness, light, speed and air quality (explicitly CO₂ and NH₃ centers). Nowadays industry works with regards to the assessment of this limits in like manner of the effect of these limits on bird government help is researched. Consequently they evaluated about this splendid identifying development in the poultry business.

E. Implementation of Smart Relay based Wireless Monitoring and Controlling of Ammonia in Poultry Estates. [5]

Jawad K. Othman et al. Utilising adroit exchanges in poultry estate which gives a huge load of versatility and abatement of cost for the arrangement and execution of checking and control structures through the limits they have differentiated and the excellent stuff. The sharp exchange with correspondence connections have been used in this paper to wirelessly screen and control NH₃ obsession, RH, and temperature in the poultry estate by sending prepared message.

F. Smart property noticing utilizing Arduino and Raspberry Pi. [6]

Siwakorn Jindarat et al. has arranged a shrewd mechanism over the introduced structure and progressed cellphone for poultry the board. To handle the issue maker as used Arduino Uno and Raspberry Pi. This construction should screen the wrapping furthest reaches of poultry climate including wetness, temperature, environment quality, the channel fan switches. This framework apparently is remarkably clear and obliging for formers, as they would enough be able to control the poultry ranch whenever and from any place

III. BLOCK DIAGRAM

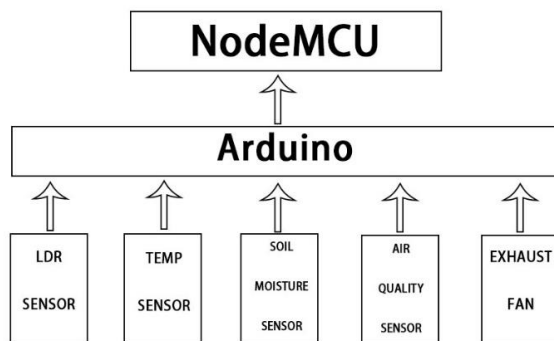


Figure 1. Block Diagram

A. Methodology

The equipment utilized are: Arduino ATmega328, IoT advancement board, NodeMCU IoT ESP 8266 Wi-Fi regulator, LM35 Temperature and Soil Moisture sensor, MQ2 Air Quality Gas sensor, LDR module (to really take a look at the power of light), AC siphon engine and DC Fan. The product utilized are: Arduino C Programming, thingspeak cloud for Web server facilitating. This framework utilizes 1 sorts of ready warning. The first is the Buzzer and LED alert connected to the model. We utilized just a single temperature esteem, for example 40 degree Celsius for our model and assuming the temperature esteem goes over 32 degree Celsius, ringer will create the caution sound and DC fan will begin Automatically. When the soil Moisture sensor detects dryness in the farm then controller will automatically trigger the AC pump motor ON and when there is darkness it will automatically turn on the leds and when the Gas Sensor recognizes hurtful gases then Exhaust fan will be ON consequently. Nodemcu has been used as a microcontroller

with inbuild ESP8266 is used as wifi module which gives the outcomes on the thingspeak cloud server.

IV. Hardware description

A. Temperature Sensor Lm35

LM35 is an ordinary temperature sensor. It is suitably open in the market. The voltage range is 4v to 30v. Here we have given 5v. Fury of temperature is between 55C to +150C. It is satisfactorily fitting for distant applications.

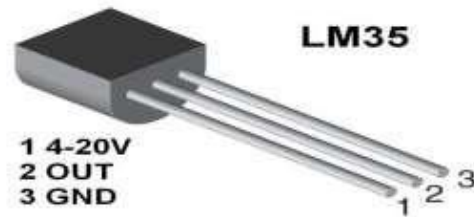


Figure 2. Temperature Sensor LM35

B. Gas Detector

A Gas marker moreover called a smoke alert is a contraption that recognizes smoke. Gas markers are normally housed in a circle framed plastic isolate a region of 150 mm (6 in) in width and 25 mm (1 in) thick, nonetheless, the size can move by maker or item offering .



Figure 3. Gas Sensor MQ2

C. Light Dependent Resistor

An LDR (Light ward resistor), as its name suggests, offers deterrent as a result of the incorporating light. The block decreases as the force of scene light augmentations, just as the reverse way around. Without a hint of light, LDR shows a resistance of the solicitation for super ohms which reduces to relatively few hundred ohms inside seeing light. It can go probably as a sensor, since a changing voltage drop can be obtained according to the moving light. It is contained cadmium sulfide (CdS).

A LDR has a bungle cadmium sulfide track. It is an individual contraption, i.e., conducts in the two headings in same plan.

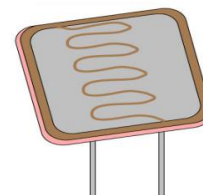


Figure 4. LDR Sensor

D. Soil Moisture Sensor

The dirt Moisture sensor consolidates a potentiometer to draw the ideal clamminess line. Exactly when the sensor appraises more soddenness than the put forth line, the high level yield goes high and a LED shows the yield. Right when the moistness in the soil is not exactly the drawn line, the yield remains low. The high level yield can be related with a smaller than normal controller to recognize the moistness level. The sensor moreover yields a straightforward yield which can be related with the ADC of a little controller to get the particular clamminess level in the dirt.

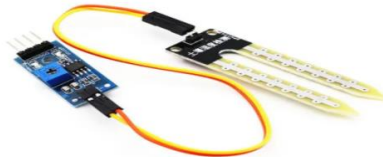


Figure 5. Soil Moisture Sensor

E. NodeMCU

NodeMCU is an unimportant expense open-source IoT stage. It at first included firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems and stuff that depended upon the ESP-12 module. Sometime later, support for the ESP32 32-cycle MCU was added. NodeMCU joins "center" and "MCU" (small scale controller unit). The articulation "NodeMCU" thoroughly talking suggests the firmware rather than the connected progression packs.



Figure 6. NODEMCU Module

F. Arduino UNO

Arduino is an open-source prototyping stage reliant upon easy-to-use gear and programming. In this work, UNO variety of Arduino is used. Arduino UNO is a microcontroller-based developmental prototyping load up, uses an ATMEGA328P controller chip having a working voltage of 5V, and has a clock speed of 10 MHz. Arduino Uno can be altered with Arduino IDE, as ATmega328 goes with pre touched off with a boot loader takes out the need of using an external gear engineer.



Figure 7. Arduino Uno

V. Results and Discussion

In this representation, we have put forward a procedure to Alarm, Control temperature, water level, soluble base gas and light power in a poultry estate. This work has completed with the support of nodemcu smaller than normal controller with inbuild wifi device. It is utilised for setting everything straight the information using a Blynk Application. This system can be moreover put in applications including wireless seeing of various real limits. All the sensors regards are moved in Blynk App. The individual liable for poultry can see these nuances through PDA or PC. Delayed consequence of this structure is shown next page,

Parameters	Threshold Value	Action Performed from Blynk App
Temperature	40.6-41.7 degree Celsius	Cooling Fan ON
Soil Moisture	Dry	AC Pump ON
Ammonia gas	<40%	Exhaust Fan On
LDR	Low Light	LEDs ON

Figure 8. Results

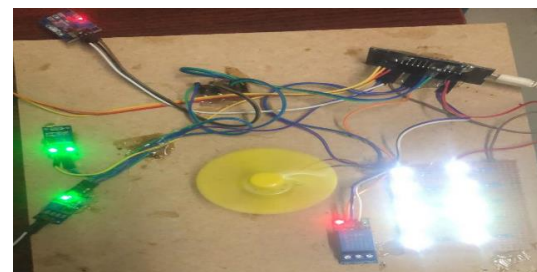


Figure 9. Hardware Setup

VI. Analysis

The accompanying Figure 8 represents the graphical portrayal of the values recieved from the LM35, LDR and Soil Moisture sensors. The outcomes shows that the temperature with the utilization of cooling fan and light creates more consistent temperature (around 32 degree Celsius) than without them, which makes the climate inside the outbuilding is helpful for produce solid chickens. The relative Soil Moisture boundaries additionally show that with the

utilization AC siphon, whenever the water is unfilled in the ranch naturally the siphon will begin siphoning the water in the homestead. This makes the chicken inside the animal dwellingplace to become better. The third boundary, air quality sensor perusing shows that with the utilization of an exhaust fan diminishes the awful air quality and bring the worth around 40 ppm. This is another significant usefulness factor for the poultry ranch. On the off chance that these boundaries are kept up with alongside great cleanliness and legitimate food and water, the death pace of the poultry homestead can be diminished and that will assist with working on the efficiency.

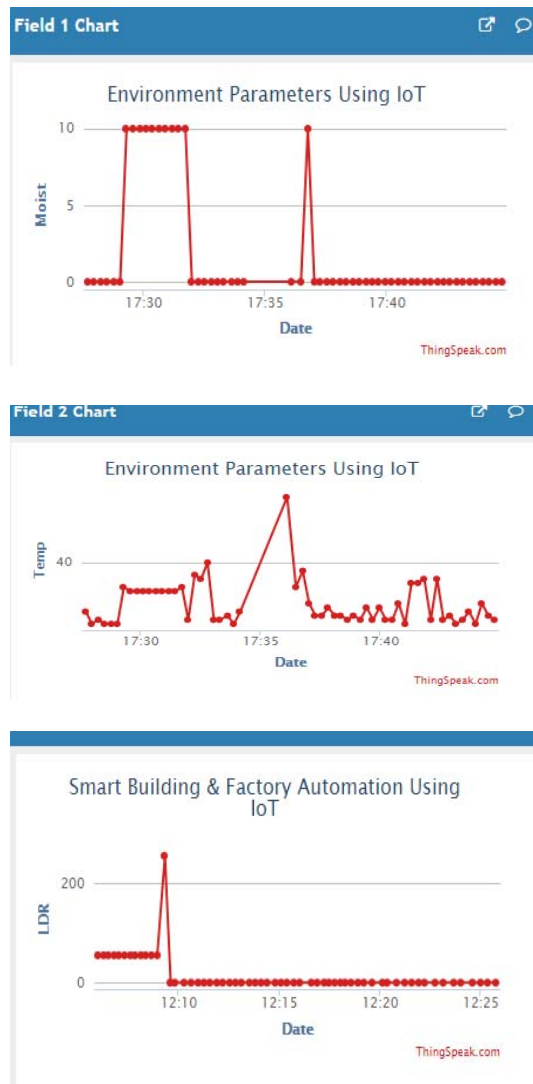


Figure 10. Sensor Values over Cloud for a Period of Time

VII. Conclusion and Future Work

IoT is the most recent innovation for poultry developing which can be transformed from a customary ranch into a current modernized poultry ranch. Distinctive regular boundaries have been continually checked to additionally produce for the turn of events and wellbeing of the chicken.

The water control part helps with giving opportunity to the time water supply to the chickens similarly as an assistance to avoid the wastage of water. The utilization of information from the sensors helps the specialist with checking the inside environment of the poultry ranch. Therefore, proprietor can get to all information of the poultry ranch from anyplace on the planet and whenever. As a piece of future work, correspondence between sensor module and organizer can be made remote by using Bluetooth, xbee or wifi modules dependent on the necessity.

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