

Poultry Farm Controlling based on IoT

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Abstract:- The main aim of this project is to maintain and monitor the poultry farm, using environmental sensors. The temperature, humidity, gas level in the poultry farm is monitored. LDR sensor is used in controlling the on and off conditions of light. Food is provided automatically and is managed using Ultrasonic sensors. If the food level gets reduced in the food tank, it will be intimated to the user as a notification in the App. Also any other abnormal conditions occurs will also be intimated to the users in the App.

Keywords: Arduino Mega; IoT; Mobile App

1. Introduction

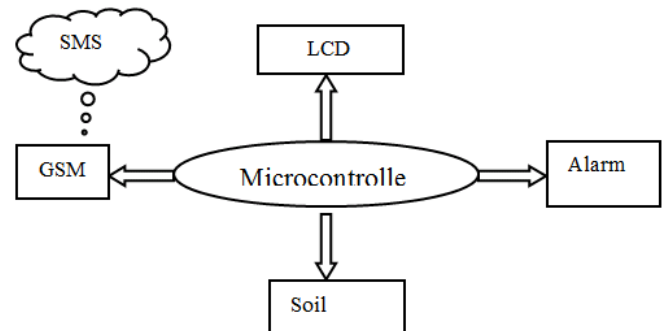
In the new era of networking technology, we cannot deny the greatness of Internet of Thing (IoT). It has the ability to collect more data from anywhere at any time. The main idea of this project is to detect and gather data from the surrounding area, using IoT then share the information. The IoT is being used widely around us. "The Internet of Things will help some business gain efficiencies, harness intelligence from a wide range of equipment, improve operations and increase customer satisfaction. IoT will also have a profound impact on people's lives. It will improve public safety, transportation and healthcare with better information and faster communication of this information".

As the world trending into new technologies and implementation of IoT, research in agriculture field also take the IoT benefits in producing the best livestock. Most of the projects in this field manifest the use of a wireless sensor network (WSN) in collecting data from different sensors deployed at various nodes. The collected data contain information about the environmental states. For example, studies in poultry are being carried out in the controlled environment where the researchers need to concern with livestock feeding status at the animal reproduction lab. They need to monitor the poultry house by checking the electricity condition, the abnormality of temperature and humidity level. The problem may arise after working hours, where the researcher needs to return back the poultry house to check the lab condition, especially the temperature and humidity condition. If abnormality situation occurs, they need to inform the caretaker or the lab assistant about it. Moreover, there is no alarm system to alert the temperature or the humidity level in the poultry.

This paper propose the new poultry monitoring system based on IoT technology. The aim of this system is to cover 80% of maintaining process automatically. Environmental sensors are used to monitor temperature, humidity and gas level of the poultry farm. Ultrasonic sensor is used to detect food level. LDR sensor is used to control the lamp on and off condition. ESP8266 modem is used to send all sensor values to cloud. Using that the data will be send to the user using Mobile App.

2. Related works

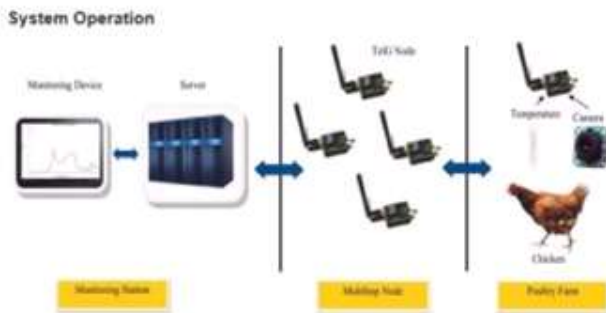
IoT plays a vital role in the present world especially, transforming the agriculture industry and enabling farmers to resist the enormous challenges they faced. Smart farming system on the soil humidity real-time monitoring has been proposed. In Fig.1, the system uses SMS to alert the condition of soil humidity. The microcontroller act as the repository of the system and SMS centre is cloud based storage for alarming the user by phone. The system framework gives a more precise pH rate and temperature rate of the soil which assume an imperative part in the horticulture. The temperature sensor, humidity sensor and soil dampness sensor can be interfaced to the microcontroller in evaluating any further information. However the system is not suitable for normal usage. Imagine if a user's phone keep receiving SMS multiple times per minute from the system that would cause hassle to the user. However the idea is still can be adopted with some optimization approach.



As people now-a-days using a smart phone, it is more efficient if the system can be monitored via a mobile applications that allows the user to monitor current temperature and humidity whenever they want to. IoT with

various features such as GPS based remote controlled monitoring, moisture and temperature sensing, intruders scaring, security, leaf wetness and proper irrigation facilities on the smart agriculture monitoring system has been proposed. It uses WSN for continuously absorbing the soil and surrounding environmental conditions.

The system is based on advanced telecommunication technology (ATT) and has been produced by utilizing TelG bits furnished with business temperature sensors and a CMOS camera. The most critical component for poultry cultivating efficiency is temperature and malady controls. The system comprises of three segments, namely 1. Checking station, 2. Multi-jump hubs and 3. Poultry cultivate. The gathered temperature and picture information will be transmitted through the remote multi-bounce hubs and recorded into a committed local server at the observing station. Multi-bounce hub innovation becomes an immense preferred standpoint to the framework since it breaks the ranch region impediment issue as it enlarging the transmission territory scope. The local server empowers various access to the put-away sensors information and data to the ranches. It has full control locally with the enabled WIFI devices and has the capacity to remote screen and investigation the ranch's advance through a homestead's committed programming or site.



The use of PIC microcontroller can be changed to Raspberry Pi that has Wi-Fi transmitter onboard.

For cloud and real time data base, Google firebase should be the appropriate choice since it is free and the capacity is quite large if the data needed to be stored is only in kbs. The use of a mobile application becomes more appropriate rather than regular SMS APIs. That means Android app can be the best platform for applying this system.

3. Details

a) Existing System:

In the existing system is IoT based poultry monitoring system is monitoring temperature and humidity level of

house only. It will used for monitoring only two data's of poultry house.

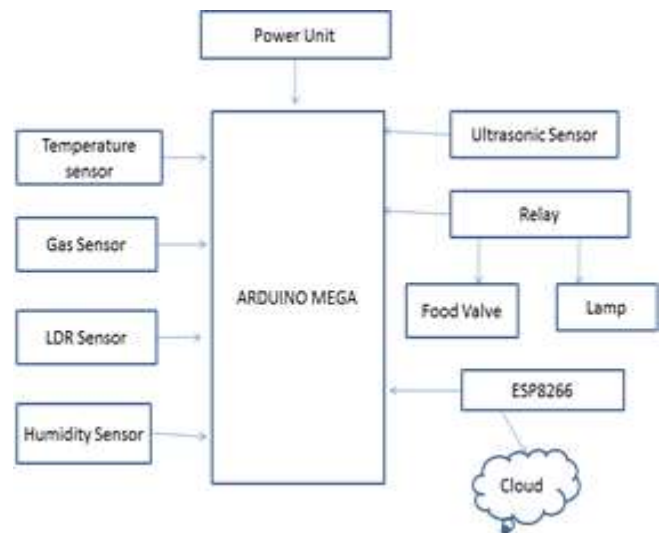
b) Proposed System:

In this proposed system is managing over all process of poultry house implemented by ARDUINO MEGA controller. Environmental monitoring sensors are used to find abnormal condition of poultry house. The gas level is also measured. The food is automatically provided to hen using a timer fixed and relay will open. All the data will be send to user through the app. ESP 8266 is used to send message to the user.

c) Methods:

The Arduino Mega controller is the main device being used in the system. The system continuously monitor the situation at the poultry farm. It includes the following activities:

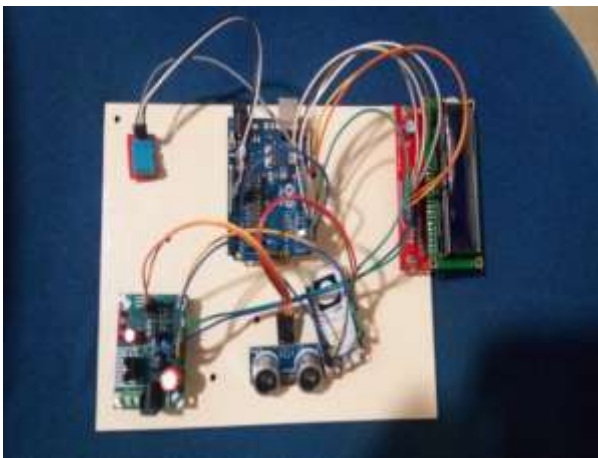
- i. Reading the temperature, humidity and gas level
- ii. Detecting the availability of electricity
- iii. Automatically providing food to the hen
- iv. Monitoring hen whether they took the food
- v. Connecting to cloud for real time readings
- vi. Sending data to the smart phone via Mobile App
- vii. Alarming user if abnormality occurs.



4. Methodology

➤ Arduino Mega Kit Setup:

Setup and configure the ARDUINO MEGA kit controller. Moreover, Internet is mandatory to connect the database, used for the mobile application. The 3 pin light bulb is being connected to the power socket. The light bulb works as an indicator of electricity availability. That is if no light means, the light bulb will turn on. The food will be provided using the food valve and relay. Using the timer fixed automatically the relay will open and automatically close. The sensors fixed will measure the temperature, humidity and gas level in the farm.



➤ Poultry Farm Control App:

This includes the Mobile App which is provided for user in the mobile. The app first includes the Registration page. After registering they will have Login page. Through this login page they can enter the main page. This page include the data regarding the temperature and humidity of the poultry farm. Along with that the gas level is also monitored and will be displayed.

The main thing is that providing food to the hen automatically. A timer will be fixed and on that time a relay will open and food will be given to the hen. If any of the hen did not take the food that details will also be intimated to the user.

The data will be sent as notification in the app. Any abnormal conditions will be intimated to the use using the app.



The poultry Farm is regularly monitored and the data will be intimated through the app like the page which is mentioned below.



➤ Requirements:

Arduino Mega kit, Environmental sensors, LDR sensors, Lamp, ESP 8266 are the hardware requirements.

C language, Arduino IDE are software requirements.

5. Result

This system is affordable and easy to use. The setup is simple and is the advantage of the system. The user can save time and labour cost in checking the poultry system and feeding the hen using the smart phone.

The data will be sent to the user through app in mobile phone. Any abnormalities occurs that will be intimated to the user as notification. The notification comes with the sound, vibration and alarm.



6. Conclusion

The poultry house control is IoT based system that help to the temperature, humidity and gas level from the smart phone. Thus the user will know what the condition in the poultry is based on the data shows. This will also help in controlling the feeding system to the hen. This system has the potential to be a monitoring and controlling agent for any kind of environment not only poultry house, even can be used to monitor home and offices. In the future, the enhancements might be added to improve the system whether in terms of hardware and software. This work can be extended by providing prediction functions to make an analysis of the collected data for a better result in the researchers experiment and production of quality livestock.

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