Monitoring and Controlling Of Poultry Farm Using Iot

Dr.Zuhaib Baig[1], Pallavi M[2], Rakshith S[3], Priyanka H S[4], Varun G K[5]

[1] *Assistant professor, Department of EEE, Vidya Vikas Institute of Engineering and Technology, Mysore, Karnataka, India.*

[2,3,4,5] *Student, Department of EEE, Vidya Vikas Institute of Engineering and Technology, Mysore, Karnataka, India.*

ABSTRACT: The Chicken poultry industry is an important industry for sustainable food supply in our country. The development of an automatic chicken feeding can be very useful to the growth of the poultry industry. In existing system, the chickens need a presence of manpower to manually give the food to the chickens. The use of proposed system can replace the worker for feeding the chicken thus overcome the labour problems in the industry and introduce a semi-automatic process in the poultry industry. The chicken production in the world has been increasing gradually because of standardized farming management and good manufacturing practices. According to world's agricultural produce survey, chicken is the most favourite produce, since it is a nutrient rich food providing high protein, low fat and low cholesterol, and lower energy than other kinds of poultries. Nowadays automation plays very important role in our life. Here we concentrate on the combination of wireless sensors and mobile system network to manage and remotely monitor environmental parameters in poultry farm. The environmental parameters of a poultry farm such as temperature, humidity, and ammonia gas are monitored and controlled automatically in order to increase the growth of chicken. Water level also controlled and monitored with the help of sensor module.The person in-charge of the poultry farm can get the internal environmental situation of poultry farm through PC or mobile phone using internet. Based on the message received the owner can take appropriate action to control the parameters. In addition we have also designed to control and monitor the food valve so that sufficient food is always available in the plate.

KEYWORDS:ESP32,Water andFood feeding, IOT, Webpage, Temperature, Humidity, MQ6 gas sensor, Motor driver.

I. INTRODUCTION

In contemporary world automation plays a vital role. Automation of poultry farm by using wireless sensor network and mobile communication system.

Chicken is the most favourite produce in today's world because it is a nutrient rich food with high protein, low fat and low cholesterol than other poultries. Environmental parameters of a poultry farm such as temperature, ammonia gas are monitored and controlled automatically to increase the productivity of chicken. Food valve also controlled and monitored with the help of DC motor without human interference. By connecting all the sensor modules to the microcontroller all sensor values are acquired then it will be uploaded to the web page. The person in-charge of the poultry farm can get the internal environmental situation of poultry farm through PC or mobile phone using internet. This system will control temperature, ammonia gas with the help of cooling fan, ventilation window without human interference. Based on the threshold values it will switch on the devices. System design provides automated poultry, reduces man power and increases production of healthy chicken. From the last few decades, around the globe, there has been an increased level of awareness regarding 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. If chickens may get suitable atmosphere and proper water, then it may grow rapidly and health of chickens will be good so the weight of the chickens will be increases. In the growth of the chicken climate plays a vital role. Smart poultry farm is designed in such a way that the climate can be changed by ventilation, cooling fan and exhaust fan. The parameters temperature, humidity ammonia gas and water level are monitored and controlled with

---

the help of microcontroller. Monitored sensor values are uploaded on the webpage then the person in-charge can know the internal environment of poultry farm through mobile or personal computer using internet.

Fig.1 Poultry farming

Poultry is one of the most important and fast-growing sectors of agriculture sectors today in India. India today is one of the largest manufacturers of eggs and broiler meat. The poultry industry in India has endured an exemplary transformation in structure and operation during the last two decades and modified into a mega-industry with the presence of a huge number of workers from a mere backward poultry farming that appears to be very fast. When we see the complete overview, the production of crops has been growing at a rate of 1.5-2% per annum whereas the production of eggs and broilers has been growing at a rate of 8-10% per annum. India is the world's 3rd largest egg producer and 6th largest producer of broilers. The Indian poultry market, comprising of broilers and eggs was worth INR 1,750 Billion in 2018 and was worth INR 2049 Billion in 2019. The market is further projected to reach INR 4,340 Billion by 2024, growing at a CAGR of 16.2% during 2019-2024.

II. OBJECTIVES

- This project is mainly focused on modern technologies for a poultry farming to control all environmental parameters like temperature, humidity, ammonia gas which effects on the growth of the chickens.

- Trained professionals are not required much in poultry sector. The presence of manpower to manually feed the chickens is not required. So that we can save the labour cost.

- The person in-charge of the poultry farm can get the internal environmental situation of poultry farm through PC or mobile phone using internet.

III. PROBLEMS IDENTIFIED

These are the problems identified in poultry industry.

1.Quality poultry feed

It includes both food and water supply. The proper poultry feed is very much important to maintain the growth and size of the chickens. So that we can get the better production.

2.Deficiency of improved breeds & maintenance of cleanliness

If the poultry farm is no hygienic or if it is not monitored by time to time it will definitely lead to deficiency of improved breeds like in boilers and then it further leads to poultry diseases. And it can spread easily to the farmers also.

3.Poultry diseases

The Birds flue or diseases affects more to poultry production. The presence of ammonia leads to infectious diseases related to respiratory and digestive system of the fowl. If environmental condition is not proper it leads to diseases like fowl fox, fowl cholera, avian influenza or E. coli etc.

4.Climate condition

The hot climate can have a severe impact on poultry performances like it leads to high economic losses, decrease in growth, depressed immunity and reproductive failures.

5.Lack of technical knowledge

Some of the farmers will be having myths about the capital cost to implement the technology and also lack of technical skills. So that the poultry farmers are not gaining their expected return from the business.

IV. METHODOLOGY

Microcontroller ESP32 has been used as a controller which has both Wi-Fi and blue tooth module inbuilt. DHT11 can be used for both temperature and humidity sensor, which can monitor and observed the environmental temperature and send the information to the microcontroller which can send the current data and perform action according to that. When temperature goes beyond threshold value then automatically cooling fan will be ON to control the internal temperature of poultry. The threshold value of temperature is 40.6 degree to 41.7 degree Celsius. Once, the temperature is below the threshold value cooling fan will automatically turn OFF. Similarly, DHT11 is used as a humidity sensor. This can monitor and observed the environmental humidity and send the information to the microcontroller which can sense the data and perform action according to current value of humidity in a poultry farm. When humidity goes beyond threshold value then to control that humidity Exhaust fan will automatically ON. Once, internal humidity of poultry farm is under control then fan will automatically turn OFF. MQ6 is used as a gas sensor. There are number of gases in air like CO_2, CO, H_2S, CH_4, NH_3 etc. Here focus on the ammonia gas (NH_3) in the air. Because, mainly ammonia gas is affected on the growth of the chickens, it may cause several diseases like Hand

Foot disease, Mouth disease, Bird Flu etc. The threshold value of ammonia is 40%. When percentage of ammonia gas in air is goes beyond the threshold value which is fixed in a system, then to control the percentage of ammonia in air Ventilation Window will be open and Exhaust Fan will be ON. Once, the ammonia gas in a poultry environment is under control fan will automatically turn OFF. Water level control mechanism for a poultry farm has been designed. It has been able to provide water to the chickens as per the requirement. So water should not get waste and health of the chicken will automatically monitor. Similarly, Level Sensor has fixed in a water tank to measure the level of water. The threshold value of water level has fixed. Once, the water level goes beyond that fix level then water may fill in that the tank. Food valves are control at time to time when food is reached to threshold level it sends a message to the user, how much amount of food is required, All the environmental data should be display on the LCD display. It displays the data like temperature, humidity, ammonia gas and water level as in the signed language which helps workers of poultry farm to know the details of internal environment of poultry farm easily. Acquired all the sensor values are uploaded to the web page. The person in charge of poultry farm can see these data to their mobile phone or personal computer using internet from anywhere at any time.
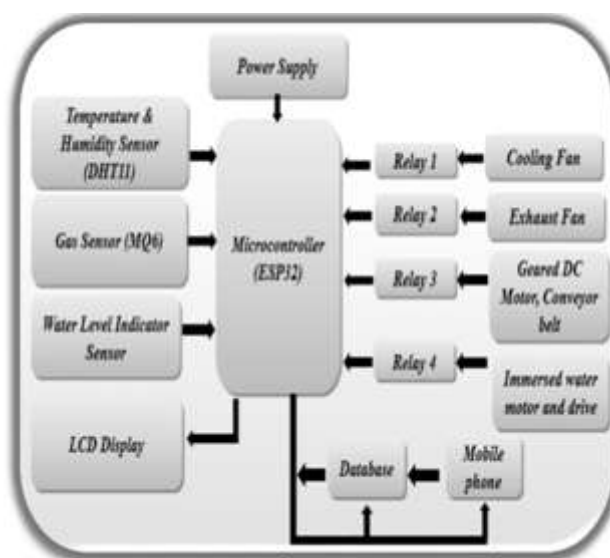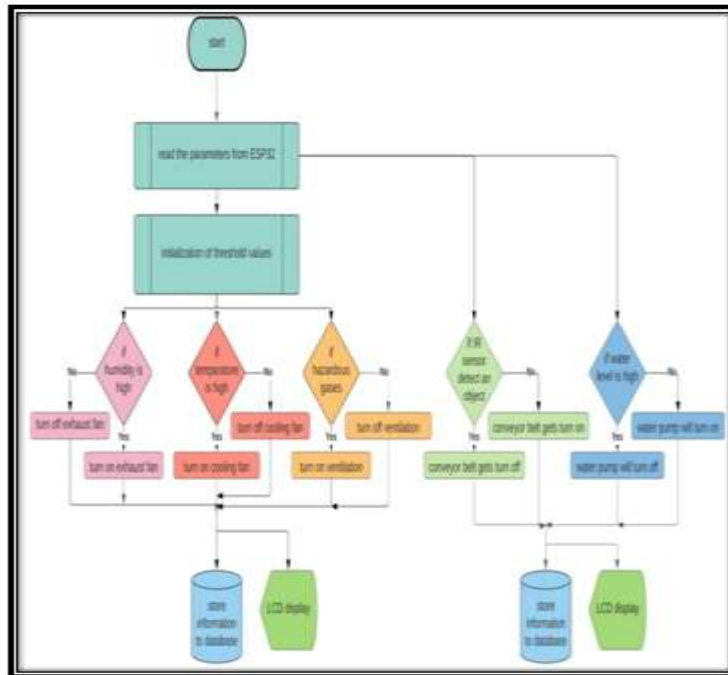

Fig:2 Block Diagram

V. WORK FLOW CHART:

Fig:3 flow of the project

Project Description with Implementation:

The objective of proposed system is designed for monitor and control the ecological parameters of poultry farm through the internet. The model is designed and implemented using the components as Microcontroller ESP32, MQ6 gas sensors, LCD Display, Temperature & Humidity sensor, Relay, Geared Motor, Water pump and level sensor, Food valve (it depends on motors) and ESP32. Mainly sensors are controlled through a controller and then controller is interface with ESP32 send real time message to both user device and database. Getting all the signals output through the controller interface's Cooling and Exhaust fan will perform a suitable task.

VI. RESULT AND DISCUSSION

Parameters	Threshold Value	Action Performed
Temperature	40.6-41.7 degree Celsius	Cooling Fan ON
Humidity	<90% or 100ppm	Exhaust Fan ON
Ammonia gas	<20%	Ventilation Window Open
Water level	One litter	DC motor ON

Fig.4 Results analysing table

VII. CONCLUSION

In our project embedded system and IOT both are an innovative technology which can changes a manual poultry farm into "Smart farm" or "Intelligent farm". The system could work on the android mobile application helping the owner to monitor the poultry farm such as food feeding, water function and unwanted gas reduction. The proposed system can reduce manpower, cost, time, and decreasing in the poultry diseases.

VIII. FUTURE WORKS

The system is fully an automatic system to monitor and control the environmental changes such as temperature, ammonia gas, and food feeding without human intervention. This paper can be extended by automating the disposal of waste and automatically detecting the diseases of birds by monitoring the weight of the bird.

REFERENCES

[1]. Zainal H. C. Soh1, Mohd H. Ismail1, "Developement of automatic chicken feeder using ArduinoUno",IEEE, Dec 2017.

[2]. Rupali B. Mahale, Dr. S. S. Sonavane, "Smart Poultry Farm Monitoring Using IOT And Wireless

[3]. Sensor Networks", International Journal of Advance Research In Computer Science, Volume-7, No. 3, May-June 2016. ISSN No. 0976-5697.

[4]. Danar Wicaksono, Ratna Mayasari, "Design and Analysis Automatic Temperature control in theBroiler poultry farm based on wireless sensor network", 2nd International Conferences on Information Technology, Information Systems and Electrical Engineering (ICITISEE), Nov 2017.

[5]. Raghudathesh G P1, Deepak D J2"IOT based intelligent poultry management system using Linux embedded system", IEEE, Aug 2017.

[6]. Geetanjali A. Choukidar, Prof. N.A. Dawande, "Smart poultry farm automation and monitoring system", IEEE, June 2017.

[7]. Ayyappan.V, Deepika.T, "Smart poultry farm automation and monitoring system", IOT Based Smart Poultry Farm, South Asian Journal of Engineering and Technology Vol.3, No.2 (2017) 77– 84,07/03/2017.