

IoT Based Smart Poultry Farm

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Abstract - In today's world, automation has become extremely important. In this study, the automation of chicken farms using wireless sensor networks and mobile communication systems is the main topic. Due to its high protein content, low fat content, and lower cholesterol than other poultry, chicken is the most popular produce in today's world. The environmental factors of a poultry farm are automatically tracked and managed in this study to promote chicken growth, including temperature, humidity, and ammonia gas. With the aid of the sensor module, water level may also be managed and watched. All sensor values are gathered by connecting all the sensor modules to the microcontroller, and then using a wifi module, they are posted to an online platform. The manager of the poultry farm can access the internet on a PC or mobile device to view the internal environmental conditions of the farm. With the aid of a cooling fan, exhaust fan, and DC motor, this system will regulate temperature, humidity, ammonia gas, and water level without the need for a human interface. It will turn on the devices in accordance with the threshold values. As a result, this system design provides automated poultry, minimizes manpower, and increases healthy chicken production.

Keywords: PIC microcontroller, Wireless Sensor Network, IoT.

I. INTRODUCTION

There has been a significant demand for higher-quality food over the past few decades, and there has been an increase in global knowledge of food safety. Many nations have been compelled by this to establish new regulations in order to convert all manual farms to automated farms. In this approach, a smart poultry farm significantly influences the growth of chicken. In order to control environmental factors that affect chicken growth, such as temperature, humidity, and ammonia gas, this research focuses on contemporary technologies for poultry farming. If the environmental conditions are not suitable, the chickens may suffer from digestive, respiratory, and behavioral changes. If chickens are given an appropriate environment and adequate water, they will grow quickly and their health will improve, resulting in a rise in chicken weight. A crucial factor in chicken growth is the environment. The

climate can be altered in a smart poultry farm by using ventilation, cooling fans, and exhaust fans. The Arduino microcontroller is used to monitor and control the variables temperature, humidity, ammonia gas, and water level. When monitored sensor readings are uploaded to a webpage, the person in charge can use a mobile device or a personal computer with an internet connection to learn about the internal environment of a chicken farm.

II. LITERATURE SURVEY

The system helps to the farmer to monitor the poultry farm and controlling the operations of poultry farm. System is a combination of wireless sensors and mobile system to manage and monitor the poultry's work easier. The environmental parameters like temperature, light intensity and ammonia gas are also monitored and controlled automatically [1]. Internet is linked together to the devices to communicate between thing and the people. The intelligent system can reduce cost, time and labors.

The system replaces the human labor to feeding food into container. It overcome the labor problems in the poultry industry and it also involves mainly two sections first to feed the food into particular contained and the second one is to control the temperature sensor to the freshness of chickens' food [2]. It improves poultry's climate and reduce labor cost and save food and chicken feeding on time and avoid contaminated food from insects.

The Poultry farm uses a computer network technology. In this study, a wireless sensor network technology is designed which monitor and control the climate of poultry farm and also humidity. A computer network technology is useful to the farmers for human work. It becomes an automation technology [3]. The automation system improves quality of meat production and then it will impact for the ecosystem balance.

The poultry management system uses hardware and open source software. It also includes temperature, humidity, light intensity and also quality of air. System focus to provide the setup like IOT, low cost hardware and open source software. System detects many problems faced by poultry industry [4].

It saves time, dependency of labor's and improve healthy environment, also increases poultry production.

The focus of this research paper is to monitoring and controlling the poultry environment using a wireless Sensors GPRS network and also to take a correct action. Using this system user can monitor and also to control the climate of poultry farm, and help to form a healthy food to the chickens [5]. This system reduce cost, time of labor's, the system monitors environmental parameters such as temperature, humidity, ammonia gases, water level and maintain a healthy environment.

The paper focus on automation of poultry farm using wireless sensor network and mobile communication system. This paper also focuses on environmental parameters like temperature, humidity, ammonia gas these are monitored and controlled fully automatically [6]. By using this automation quality of meat production is improved and growth. The smart poultry farm is fully focused on climate so the quality of chickens will be improved. The climate of poultry farm becomes fully automated.

III. PROBLEM STATEMENT

To build a smart poultry farm by developing an IOT-based system. The system provides a food feeder for the chickens, it can manage the temperature to give a water spray mechanism, and it can also minimize undesired gases from poultry through soil moisture. At the poultry farm, a system measures temperature and humidity.

IV. METHODOLOGY

The figure depicts the proposed work's block diagram, which outlines the various system components.

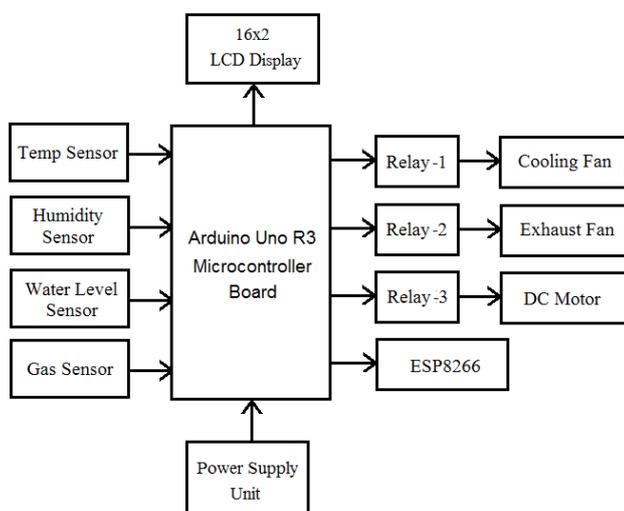


Figure 1: Block Diagram

We used an Atmega 328 microcontroller as the heart of the circuit in this project. DHT 11 Sensor used to measure the environment's humidity and temperature. Water level is measured with a water level sensor. The gas can be detected via a gas sensor. Relay functions as an ON/OFF switch. If the temperature goes above the range, the cooling fan will turn on. When the water level drops, it will turn on the DC motor to turn on the water pump. It will turn on the exhaust fan if smoke or gas is found. ESP8266 is used to transmit all of this data to the IOT.

V. CONCLUSION

IOT is a modern technology for poultry farming that can transform a manual farm into a contemporary semi-automated farm. Additionally, the system may be integrated into an Android mobile application that would assist the owner in monitoring the poultry farm's functions for food feeding, object detection, water sprinklers, and the elimination of unwelcome gas. The proposed system can completely automate the feeding of food to chickens, the reduction of undesirable gas, and the maintenance of farm temperature while using less labor. As a result, this approach will save money, time, and labor while lowering environmental pollutants.

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