

# Automation of Poultry Farm

Dr. Suma<sup>1</sup>, Ashwin S<sup>2</sup>, Chitty Babu S<sup>3</sup>, Deepak R<sup>4</sup>, Kushal GS<sup>5</sup>

Professor, Department of ECE<sup>1</sup>

Students, Department of ECE<sup>2,3,4,5</sup>

Vidya Vikas Institute of Engineering and Technology, Mysore, India

**Abstract:** *The automation of poultry farming has become increasingly popular in recent years due to its potential to increase efficiency, reduce labor costs, and improve animal welfare. This paper aims to provide an abstract that summarizes the benefits and challenges associated with the automation of poultry farms. The paper begins by defining automation and providing an overview of the technologies that are commonly used in poultry farming, such as sensors, robots, and artificial intelligence. The benefits of automation are discussed, including increased productivity, reduced labor costs, improved animal welfare, and enhanced data collection and analysis. Additionally, the difficulties brought on by automation are looked at, including the initial investment costs, technical difficulties, and the need for skilled personnel to operate and maintain the systems. The paper concludes that while automation can bring significant benefits to poultry farming, careful planning and implementation are necessary to ensure its success.*

**Keywords:** Poultry Farming

## I. INTRODUCTION

Automation has become an increasingly popular solution for various industries to increase efficiency, reduce costs, and improve overall production. In the agricultural sector, One industry that has witnessed major advancements in automation technology is chicken farming. With the rise of innovative technologies such as artificial intelligence, sensors, and robotics, automated poultry farms have become a reality.

In the past, poultry farming was a labor-intensive process that required constant attention and care from farmers. However, with the integration of automation technologies, many of the processes involved in poultry farming can now be automated. From feeding and watering to egg collection and waste management, automated systems have revolutionized the way that poultry farming is conducted.

Automation of poultry farming has several advantages. First, it can reduce labor costs and increase efficiency, allowing farmers to produce more birds with less labor. Second, automated systems can ensure that birds receive optimal care and attention, resulting in improved health and productivity. Third, automated systems can also reduce the risk of disease transmission, as they limit the need for human contact with the birds.

In this paper, we will explore the different aspects of automation in poultry farming, including the technology involved, benefits, and challenges. We will also discuss the potential implications of automation on the industry and the environment, and the ethical considerations that should be taken into account. Our aim is to provide a comprehensive overview of the topic and to present a paper on the automation of poultry farming.

## II. LITERATURE SURVEY

"Design and Implementation of an Automatic Poultry Feeding and Watering System Using Microcontroller" by Abolade O. Oladayo and Adigun A. Olayemi (2021).

This paper presents the design and implementation of an automated feeding and watering system for poultry farming using a microcontroller. The system was tested in a commercial poultry farm, and the results showed that it was effective in reducing labor costs and improving efficiency.

"The Impact of Automation on Poultry Welfare: A Review" by Isabella M. McKeon and Christine J. Nicol (2021).

This study examines the research on how automation affects the wellbeing of poultry, showing both the possible advantages and disadvantages of utilising automated technology in poultry production. A conclusion can be drawn that, even though automation might increase productivity and lower labour costs, it is crucial to take animal welfare into

account and to make sure that automated systems are developed and used in a way that supports the welfare of the birds.

"Design and Development of a Smart Poultry Monitoring System Using Internet of Things (IoT)" by Olayinka O. Oyedepo, Olukayode O. Ojo, and Gbenga T. Ojo (2019).

This paper presents the design and development of a smart poultry monitoring system that uses Internet of Things(IoT)technology. The system has been tested in a commercial poultry farm and found that it can take care of the environment and the health of birds and reduce labor costs."The Economics of Poultry Automation" by Erin R. Mosley and William P. Kuvlesky Jr. (2018).

This paper examines the economics of poultry automation, analyzing the costs and benefits of using automated systems in poultry farming. The authors conclude that while there are significant upfront costs associated with automation, it can lead to long-term cost savings and increased efficiency.

"The Social Implications of Poultry Automation: A Case Study of the Delmarva Peninsula" by Sarah A. Scheckter and Bruce W. Ferguson (2019).

This paper explores the social implications of poultry automation, using a case study of the Delmarva Peninsula in the United States. The authors analyze the impact of automation on the local economy and community, highlighting the potential for job displacement and the need for education and training programs to support workers in the industry. They also discuss the ethical considerations related to animal welfare and labor practices.

### Summary of the Literature survey

The outcome for the literature survey are as follows:

- The study found that the use of automated feeding and watering systems increased feed intake and improved the weight gain of broiler chickens.
- The study also found that the use of automated climate control systems reduced stress in the birds, which improved their overall health and productivity.
- The study found that the use of automated feeding systems resulted in improved egg production, egg quality, and feed efficiency.
- The study also found that the automated feeding system reduced labour costs and improved the welfare of the birds.
- The review also highlighted the potential for automation to improve food safety and reduce the environmental impact of poultry farming operations.

### III. METHODOLOGY

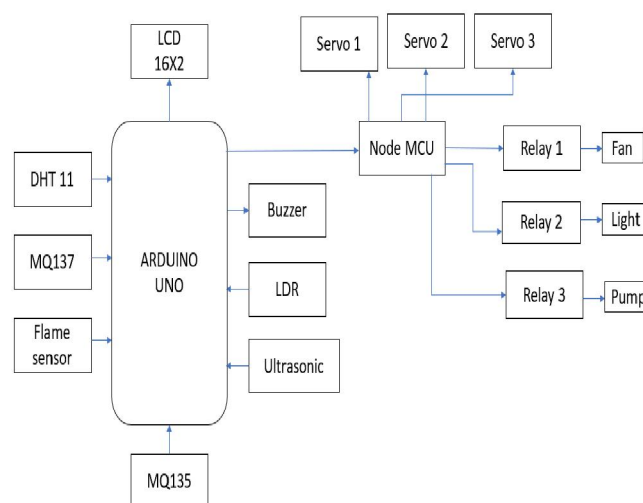


Figure 1: Block Diagram of Proposed System

In the proposed system, almost all factors including environmental parameters such as temperature, humidity, ammonia gas, light and manual works like food feeding, water supply system etc. are monitored and system is designed to perform these activities. This system reduces manpower, improves health and rate of Production, which is used for monitoring farm activities and internal environment.

Various gases like Ammonia and other harmful organic gases for birds are detected using the gas sensor, and DHT 11 called temperature and humidity sensor is used in order to monitor the temperature and humidity in the internal Environment. If the temperature is below the required value the alert message is sent using the NodeMCU WIFI module to the operator and based on the requirement, the light can be turned on from a mobile phone or a computer through the blynk application.

Similarly, when any fire is detected in the farm ,a buzzer is turned on and email is sent to the registered user. Similarly it will determine the water level, when the water level will decrease than the specified level, using the Blynk application water pump can be turned on and fill water in the tank again. When the water tank is filled, it will stop automatically, thus water will not be wasted. Feed is also supplied based on the requirement on the birds so in order to maintain the risk of disease transmission Research says that, for maximum egg production, enough light needs to be provided to the chicken. 16 hours of light is essential to the chicken; Part of required light is obtained in the form of sunlight (approx. 12 hours), and remaining part of the light is provided by an electric bulb and all the parameters are monitored at LCD display.

**IV. FLOWCHART**

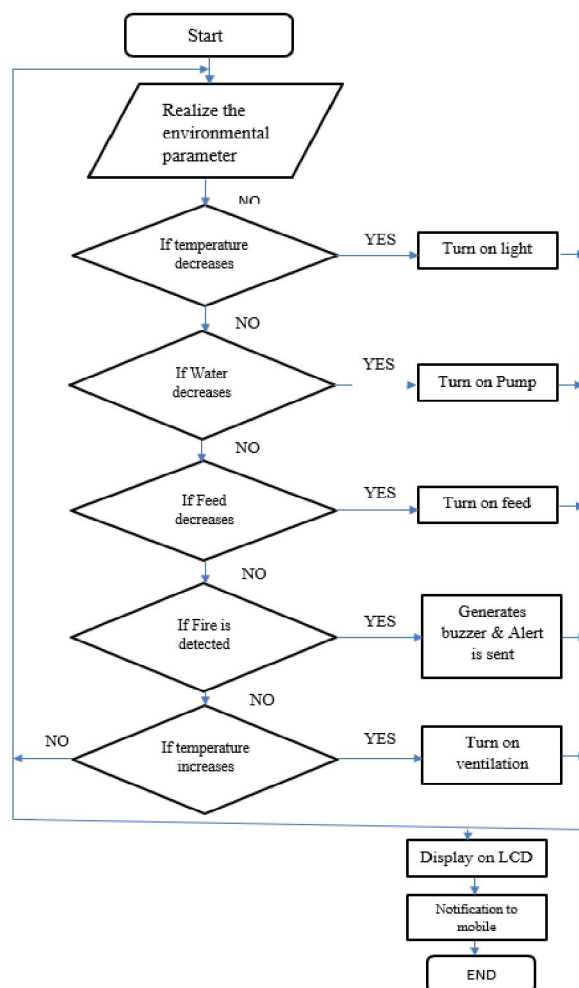


Figure 2 :Flowchart of the working of model

The functionality of the working model. The system sensors read all environmental parameters in a poultry farm. Arduino is used to monitor the values received from sensors and perform corresponding actions. If input value is greater than the threshold values, send high output to the port else if the input values are less than threshold values then again, the parameters will be read. Four environmental parameters such as temperature, humidity, ammonia gas and light, and activities like water level system, food feeding system and cleanliness system are monitored. If humidity increases, the exhaust fan will be ON. If temperature crosses its threshold value, the cooling fan will be ON. If ammonia gas level increases, alert is sent through blynk using Wi-Fi module ventilation window will be ON. Similarly, if the water level decreases, and if the feeder gets empty, through the blynk the water pump and DC motor will be ON respectively. When the RTC module gets activated the light and DC motor (used for cleanliness system) will be ON at the specified time. In critical conditions, when darkness is detected by LDR, the bulb is ON by using the Wi-Fi module. The current status is displayed on LCD and important notifications are sent to the mobile.

### V. EXPERIMENTAL RESULTS

Data plays a crucial role in the automation of poultry farming. It refers to the information that is collected, analyzed, and processed to make informed decisions about the management of poultry farms.

The data collected in the automation of poultry farming includes various parameters related to the birds, such as temperature, feed intake, water consumption, egg production, and environmental parameters. This data is usually collected through sensors and other automated systems installed in the poultry farm.

The collected data is then processed using advanced analytics tools like Blynk to identify patterns and trends that can inform decision-making in the poultry farming industry. For instance, the data can be used to optimize feed and water consumption, improve the birds' health, and egg production. The below figure shows how multiple sensors have been used to collect the data .

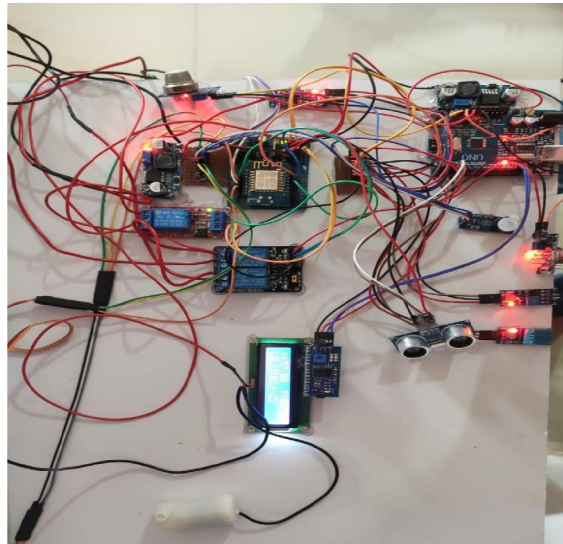


Figure 3: Sensors

Based on the physical parameters of the farm ,we can control the ventilation fan and lights. Based on the requirements we can supply the food and water. All these are controlled by using Blynk.



Figure 4: Blynk interface in mobile app

## VI. CONCLUSION

In conclusion, poultry farm automation is a rapidly evolving technology that has the potential to revolutionize the industry. Using energy efficient systems such as food and beverage systems, climate control and egg production systems can increase efficiency, reduce energy costs and increase visibility. Good care and attention to birds results in health and production. However, there are still challenges with automation, including initial implementation cost, reliability and maintenance issues, and ethical considerations regarding health, animal welfare and impact on local communities. It is essential to address these challenges and to ensure that automation does not compromise the well-being of the birds or the workers involved in the process.

An integrated approach that considers all aspects of automation is needed to ensure benefits are achieved and potential negative impacts are minimized. With proper implementation and careful consideration of the implications, automation has the potential to revolutionize poultry farming and benefit the industry as a whole.

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