

IOT BASED REAL TIME MONITORING AND CONTROL SYSTEM FOR MUSHROOM CULTIVATION

Project Reference No.: 46S_BE_2282

College : Alva's Institute of Engineering and Technology Mangalore, India
Branch : Department of Electronics and Communication Engineering
Guide(s) : Prof. Sudhakara H M(*skrmholla@gmail.com*)
Student(S) : Mr. Shashank S Kashyap(*shashankhurpaje@gmail.com*)
Mr. Pratheek Kumar(*kumarpratheek631@gmail.com*)
Ms. Sathvi(*sathviacharya@gmail.com*)
Ms. Suma(*naiksuma659@gmail.com*)

Keywords:

Arduino, Temperature, Humidity, GSM module.

Introduction:

The milky mushroom (*Calocybe indica*) is now India's third most widely used commercial fungus. The attractive, sturdy, white sporocarps, extended shelf life, sustainable yield, delectable flavor, distinctive texture, and cholesterol-free foods have all contributed to the mushroom's rapid rise in popularity. They also have essential medical benefits, such as an antiviral impact. Agriculture is one area that needs to be enhanced for the production of food, particularly the growing of oysters and milky mushrooms. Because they are minimal in calories, carbs, fat, and sodium, mushrooms are a popular and valuable food. They include vital minerals and don't contain cholesterol. Lack of temperature and humidity management causes farmers who grow mushrooms to frequently fail, which leads to subpar mushroom yield. By regulating the atmosphere's temperature and humidity, one can increase the production and quality of mushrooms. Regulating these factors and upholding a controlled environment is extremely difficult, yet doing so enables growers to produce good crops and turn mushroom cultivation into a lucrative industry. The use of sensors in a range of agricultural sectors has a good effect on crops and helps to both reduce and increase operating costs. Being heterotrophic organisms, mushrooms are frequently employed in a range of processed foods, medications, and other products. In India, Milky mushrooms are produced seasonally and in climate- controlled cropping houses, both of which call for the construction of fundamental infrastructure. When the weather is favorable for the crop.

Objectives:

1. The system can monitor and control environmental factors such as temperature, humidity conditions in mushroom growing areas.
2. The system enables remote monitoring and control of the mushroom cultivation environment.
3. To get high yield temperature and humidity of fruiting room are regulated by the help of sensors, fan and humidifier. Sensor reads the environmental status and data sets are sent to Arduino microcontroller.
4. The controller is interfaced to GSM module and message is sent to a smart phone. Microcontroller automatically controls temperature and humidity by operating relays and controlling fan, heater and humidifier.

5. By a GSM interfaced to Arduino these devices can be manually controlled by the user using Blynk app. Application of Technology proposed in this Project helps mushroom growers in improving yield of mushroom.

Methodology:

The methodology of our proposed model is as follows:

1. An Arduino UNO serves as the system's key component and acts as its brain.
2. The system's sensors are essential for keeping track of the environmental factors affecting mushroom growing. Humidity sensors are used to measure the amount of humidity, whereas temperature sensors check the temperature.
3. Relays, which are used to regulate appliances like humidifiers, lamp, and fan, are among the other parts of the system.
4. Growers may automate and regulate the atmosphere for mushroom production thanks to the relays and actuators that are connected to the Arduino and managed by the Blynk app.
5. The data is processed by the Arduino before being sent to the GSM module.
6. A SIM card is used by the GSM module to transmit data to the Blynk app.
7. The software allows producers to keep track of the temperature and humidity in the environment where mushrooms are grown by displaying the data gathered by the sensors in real-time.

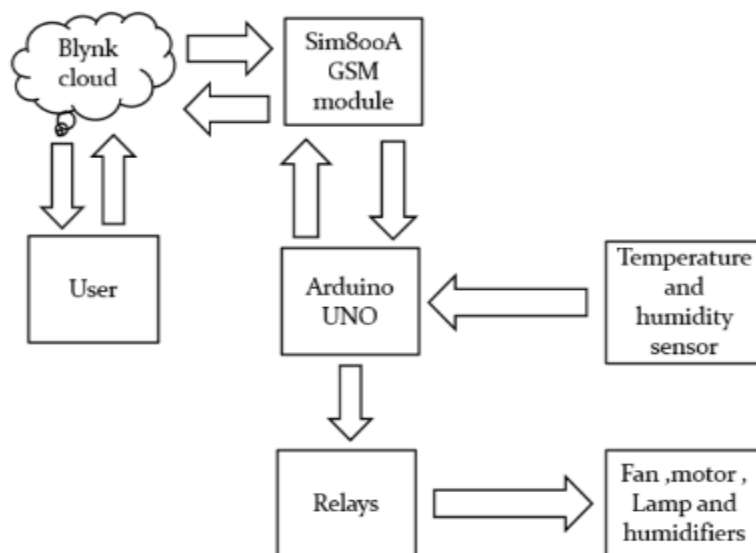
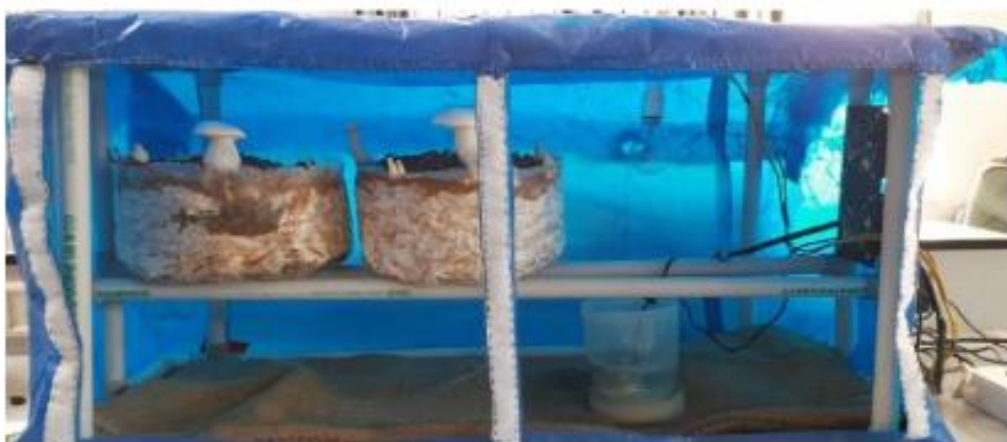
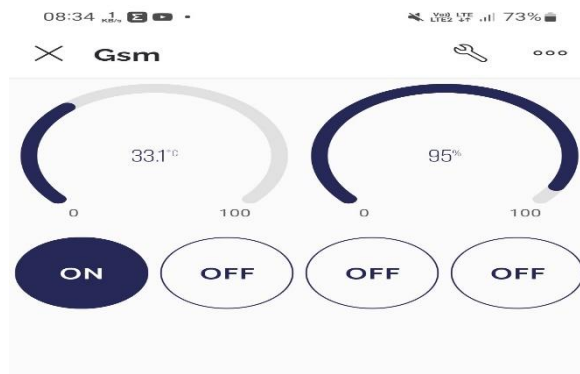


Fig 1: Circuit Diagram

Results:

1. IoT+-based milky mushroom cultivation using a GSM module and Blynk app is a system that enables growers to monitor and control the environmental conditions required for the growth of milky mushrooms.
2. The system uses various sensors to measure critical parameters like temperature, humidity, which are transmitted to a microcontroller.
3. The microcontroller processes the data and sends it to the GSM module, which transmits the data to the Blynk app.
4. With the help of the Blynk app, growers can remotely monitor and control the environmental conditions in their mushroom grow room.
5. This enables growers to take proactive measures to prevent any damage to the crop.
6. Overall, the proposed system offers an efficient and convenient way for growers to optimize the environmental conditions for milky mushroom cultivation, leading to higher yields and better-quality mushrooms.





Scope for future work and Conclusion:

1. An IoT-based real-time monitoring and control system for mushroom cultivation offers significant benefits to growers by providing precise control, remote access, and actionable insights. It enables optimized cultivation conditions, reduces risks, and enhances overall productivity.
2. The system's scope for future work includes incorporating advanced technologies like AI and machine learning, integrating disease and pest detection mechanisms, focusing on energy efficiency, integrating supply chain management, and promoting collaboration among growers.
3. With continued research and development, this technology has the potential to revolutionize mushroom cultivation, leading to improved yields, quality, and sustainability in the industry.
4. Creating a platform for collaboration and data sharing among mushroom growers can foster knowledge exchange and best practices. By sharing anonymized data and insights, growers can collectively work towards improving cultivation techniques, disease prevention, and overall industry standards and so on.