

# Automated Mushroom Maintenance System

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## ABSTRACT

The large, macroscopic, spore-bearing, fruiting bodies of fungi are generally referred to as mushrooms. Under the proper environmental conditions, their mycelia become tightly interwoven to give rise to the structure we call the mushroom. However, the conditions under which mushrooms form are poorly known. As a result, relatively few species of mushrooms can be cultivated. Species of mushrooms may be designated as edible/medicinal or poisonous. In this project to maintain the freshness of the mushroom, we use temperature and humidity sensor to control the motor without using manpower [5]. Thus by this method we can cultivate and preserve the mushroom in secure manner for our future uses. Nowadays some varieties of mushrooms are becoming extinct due to improper maintenance. This will affect the role of mushroom in many fields. Since it is difficult to cultivate mushroom as other species in farms. To overcome this we can use this method to preserve the mushrooms freshness by maintaining the temperature. This method will provide simplest way and increase the life span of mushroom. This will also decrease the manpower, and increase the income.

**Keywords:** Automation, GSM, MSP430, Sensors.

## I. INTRODUCTION

Cultivation of Mushroom has been in vogue for years. Growing mushroom under controlled condition is of recent origin. Its popularity is growing and it has become a business, which is export-oriented. Mushroom is an excellent source of protein, vitamins, minerals, folic acid and is a good source of iron for anemic patient [1]. Nowadays some varieties of mushrooms are becoming extinct due to improper maintenance. This will affect the role of mushroom in many fields. Since it is difficult to cultivate mushroom as other species in farms. To overcome this we can use this method to preserve the mushrooms freshness by maintaining the temperature. This method will provide simplest way and increase the life span of mushroom [5]. This will also decrease the manpower, and also increase the income. Yield of Mushroom is very high only in the winter season, but decrease in the growth of mushroom during summer. By this paper, it makes possible to get yield even in summer season through change range of Temperature and Humidity in the cultivation field. For that Humidity and temperature sensor are used to monitor the Temperature and

Humidity in the field of mushroom cultivation. Mushroom cultivation has been taken up in states like Uttar Pradesh, Haryana, Rajasthan, etc. (during winter months). The power supply for this entire process is given by two ways, which includes electrical and solar. The alert SMS is given to the customer through GSM [4]. For every half an hour, the status of the process gets updated and can be viewed. Humidity and temperature sensor are used which sense the range and provide output to MSP430.

## II. METHODS AND MATERIAL

### A. Experimental Work

In this paper the MSP430 plays a major role. Temperature is sensed by using a temperature sensor [LM35] and humidity level is sensed by digital humidity sensor [DHT11]. Both the sensors sense the range and gives input to the MSP430. The MSP430 analyses the range and if the temperature increases above [22-28 degree/C] and humidity level decreases [85-95 degree/C] then the MSP430 gives the instruction to the motor to run or light to on. When both the levels reaches the normal state the motor gets off.

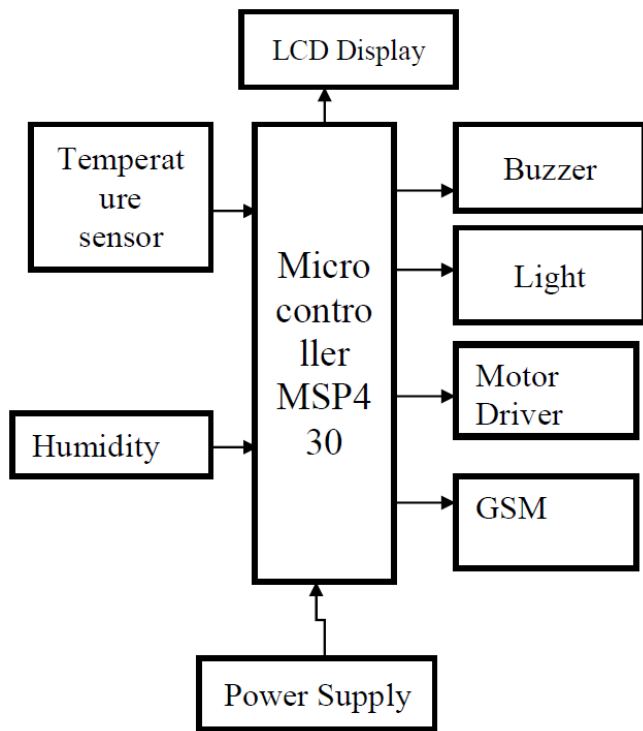


Figure 1

**B. Hardware Materials**

- ✓ MSP430
- ✓ Temperature Sensor
- ✓ Humidity Sensor
- ✓ LCD
- ✓ GSM
- ✓ Motor Driver
- ✓ Buzzer
- ✓ Power Supply

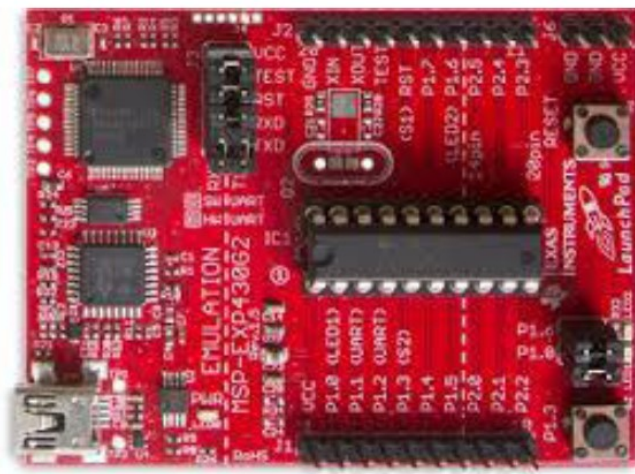


Figure 2. MSP430

MSP430 is used for low power applications because of its compactability. Easy to interface with PC using

USB. Humidity and temperature sensor sense the range and provide output to MSP430. It has 16-bit comparator, 16-bit timers, etc.

**C. Temperature Sensor**

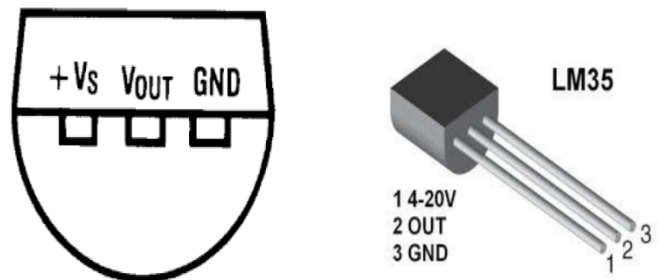


Figure 3

LM35 is a precision IC temperature sensor with its output proportional to the temperature (in oC). The sensor circuitry is sealed and therefore it is not subjected to oxidation and other processes. With LM35, temperature can be measured more accurately than with a thermistor. It also possess low self-heating and does not cause more than (0.1 oC) temperature rise in still air.

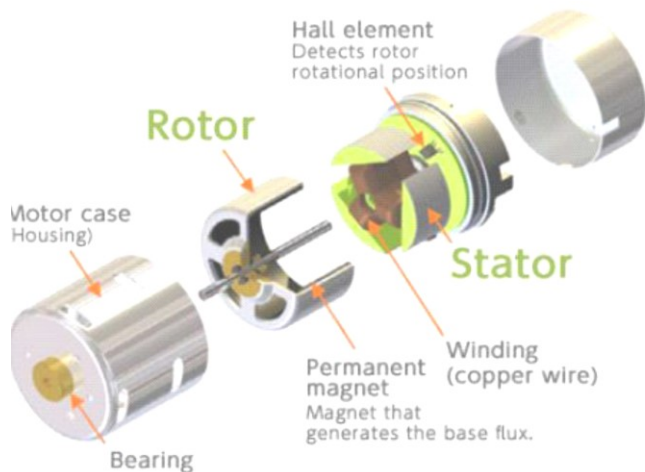
**D. Humidity Sensor**



Figure 2. Humidity Sensor

Humidity is the presence of water in air. The amount of water vapour in air can affect human comfort as well as many manufacturing processes in industries. Hence, humidity sensing is very important, especially in the control systems for industrial processes and human comfort. Humidity control is also necessary in chemical gas purification.

## E. MOTOR



**Figure 5. DC Motor**

It is an AC synchronous electric motor that form a modelling perspective looks very similar. DC motor is a rotary electrical machine that converts direct current electrical power into mechanical power. Here BDLC motor is used which is a high quality brushed motors and efficient.

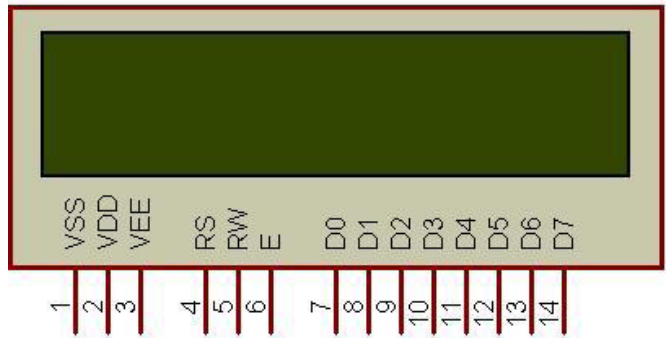
## F. POWER SUPPLY



**Figure 6. Power Supply**

Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or a group of loads. This is operated at 240 Volt AC supply.

## G. LCD



**Figure 7. LCD Display**

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals.

## H. GSM (GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS):



**Figure 8. GSM Connection**

GSM (Global System for Mobile communications: originally from Group Special Mobile) is the most popular standard for mobile phones in the world.

## I. BUZZER



**Figure 9. Figure Buzzer**

A buzzer or beeper is a signalling device, usually electronic, typically used in automobiles house hold appliances. It is operated in AC voltage at 50 or 60 cycles. It converts electrical signals into sound signals based on input. It is a compact device.

### III. RESULTS AND DISCUSSION

The focus of this paper is the technical assistance for the preparation of mushroom harvesting, its growing techniques and storage that has a positive impact in order to encourage farmers to increase employment opportunities and generating income with low capital investment. That provide mushroom without disease causing and with best quality [3].

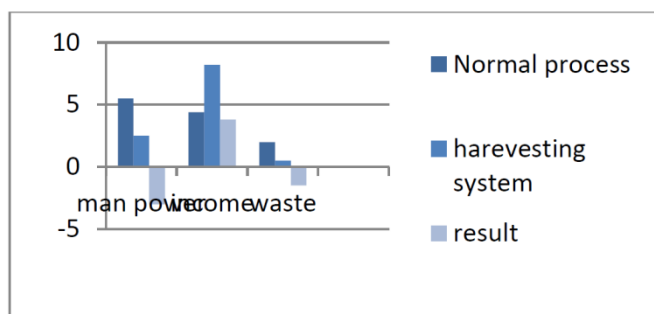


Figure 10

### IV. CONCLUSION

The paper mushroom maintenance is a good solution for those who aim to save, time, manpower, money. This a complete automated solution for mushroom growing. It will be interactive platform. By this method, we can cultivate and preserve the mushroom in secure manner for our future uses. Thus reduces manpower and yield will be high which will help farmers to use this technology with low cost.

### V. REFERENCES

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