

Seasonable IOT Based Dehydration System for Agri Products.

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Abstract: Drying is one of the oldest methods to remove moisture from the Agriculture products i.e. Grains, but when the moisture content is improper in the grain's farmer does not get proper value for their products. So it is important to dehydrate and remove moisture from grains mainly in rainy and winter season from agricultural products, By using Dehydration system using force air circulation with the help of electricity remove the moisture from the grains and give the proper value to the farmers products, These include drying in chambers with trays also these system builds upon the IoT concept and is able to create a network of interconnected device. By using these approach we are able to combine sensing device also providing common operating principle by sharing information over the platform.

Key-Words: IOT, Automation, Wi-Fi

1. INTRODUCTION

Drying is one of the methods to remove moisture from the agri- products and preserve the food at longer period in agriculture sector drying is one of the best methods from many years Drying from the sunlight is the oldest technique of the moisture removal from the grains. Electricity is also used for the dehydration it is the latest technique for dehydrating the grains, Grains contain dry always as moisture at the time of the harvesting, and the grains Moisture content is at higher level Than the safe short term or long-term storage and also for go to market and sell it. Electrical technology is a technology that is rapidly gaining acceptance as an energy saving measure in agriculture application. applications requiring low to moderate temperature below 80°C, such as crop drying It is preferred to other alternative sources of energy such as wind and shale, because it is abundant, inexhaustible, and non-polluting. Electrical air heaters are simple devices to heat air by utilizing solar energy and it is employed in many and space heating.

We are developing IoT based food dehydration system for Grains. In which Hardware components required for construction are NodeMCU, DHT11 Sensor, MQ4

Sensor, Display, Switches, Indicator bulbs, connecting Wires, Fan, Heater etc. And software used are blynk app, Proteus and Arduino IDE. This is the IoT based project so we can control this system blynk app. The agriculture application of this project is to remove the moisture from

the agriculture products at proper proportion it may helpful the farmers to get the best money for their hard work for agriculture products like Maize, Soybean, etc. in the market.

2. WORKING PRINCIPLE

The IOT Based seasonable dehydration system is works on electric supply and maintaining the temperature with the help of the temperature controller the system includes two units 1st unit consists three fans which circulates or transfer the atmospheric air to the system and passes the air above it also include heating coil this heating coil Which temperature goes up to 100°C and with the help of the coil the forced air is heated and go to the system the 2nd unit includes two tray having pours for proper air circulation

3. LITERATURE SURVEY

The newer scenario of decreasing water tables, drying up of rivers and tanks, unpredictable environment presents an urgent need of proper utilization of water. To cope up with this use of temperature and moisture sensor at suitable locations for monitoring of crops is implemented in. An algorithm developed with threshold values of temperature and soil moisture can be programmed into a microcontroller-based gateway to control water quantity. The system can be powered by photovoltaic panels and can have a duplex communication link based on a cellular Internet interface that allows data inspection and irrigation scheduling to be programmed through a web page. The technological development in Wireless Sensor Networks made it possible to use in monitoring and control of greenhouse parameter in precision agriculture. After the research in the agricultural field, researchers found that the yield of agriculture is decreasing day by day. However, use of technology in the field of agriculture plays important role in increasing the production as well as in reducing the extra man power efforts. Some of the research attempts are done for betterment of farmers which provides the systems that use technologies helpful for increasing the agricultural yield. A remote sensing and control irrigation system using distributed wireless sensor network aiming for variable rate irrigation, real time in field sensing, controlling of a site-specific precision linear move irrigation system to maximize the productivity with minimal use of water was developed by Y. Kim. The system described details about the design and instrumentation of

variable rate irrigation, wireless sensor network and real time in field sensing and control by using appropriate software. The whole system was developed using five in field sensor stations which collects the data and send it to the base station using global positioning system (GPS) where necessary action was taken for controlling irrigation according to the database available with the system. The system provides a promising low-cost wireless solution as well as remote controlling for precision irrigation. In the studies related to wireless sensor network, researchers measured soil related parameters such as temperature and humidity. Sensors were placed below the soil which communicates with relay nodes by the use of effective communication protocol providing very low duty cycle and hence increasing the life time of soil monitoring system. The system was developed using microcontroller, universal asynchronous receiver transmitter (UART) interface and sensors while the transmission was done by hourly sampling and buffering the data, transmit it and then checking the status messages. The drawbacks of the system were its cost and deployment of sensor under the soil which causes attenuation of radio frequency (RF) signals.

4. SYSTEM OVERVIEW

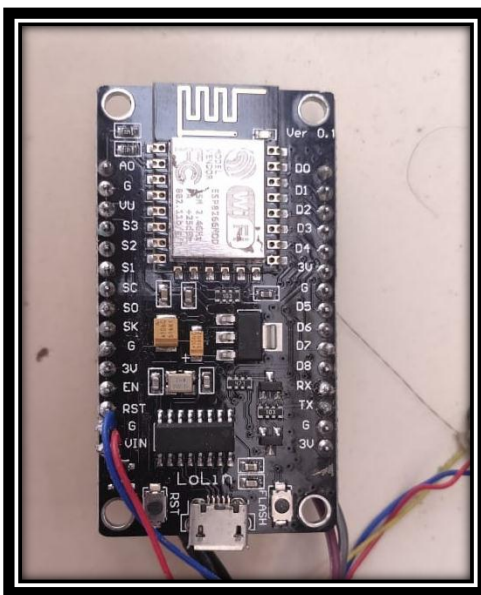


Fig. 3.1 Controller ESP32

It is used get the required information on our device or any other platform with the help of ESP32, this system is uses low power to work and also at low cost having features of the Wi-Fi connectivity and Bluetooth mode also for better visualization. The system is best for less cost more work it is connected to drive module and trough the Wi-Fi connection this system shows us the information of the various parameters like temperature and humidity on our any platform in easy way This Node-MCU used for connect

our device to our system and take the temperature and humidity fluctuation time to time and also it is used for on and off the system at particular time this is safest system for avoid the spoilage of the farmers agri products.

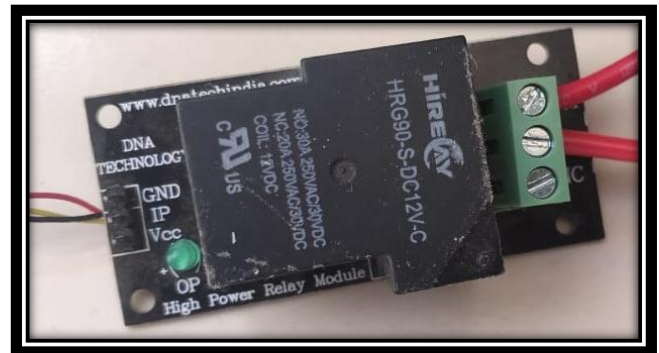


Fig 3.2 Driver Modules

This system drives our Coil temperature as per requirement trough the ESP 32 Controller. A driver the system mainly used in our system to control the various parameters like temperature of the coil for the system and as per requirement



Fig.3.3 Fan

The system uses the fan to move the air through the overall system. The fan is power device which is create the air motion at high level for drying purpose

A Fan consisting the rotating blades made of plastic which acts on the air and provide the forced atmospheric air to the heating coil fans are generally used for two purposes cooling, or heating that means drying we used the fan here for drying purpose to remove the moisture from the grains at proper level with the help of forced air circulation.



Fig3.4 Temperature controller

Temperature controller is used in the system for controls the temperature among the system and avoid spoilage of the grains temperature controller is simple device which is takes output from the temperature sensor and regulates the system temperature as per requirement. We have to set a setpoint in the controller if the setpoint reached by the system and detected by the temperature sensor the system gets turn off by the controller and when again temperature goes below than the setpoint temperature system turn on again by the controller. The main function of the controller is to maintain required temperature in the system.

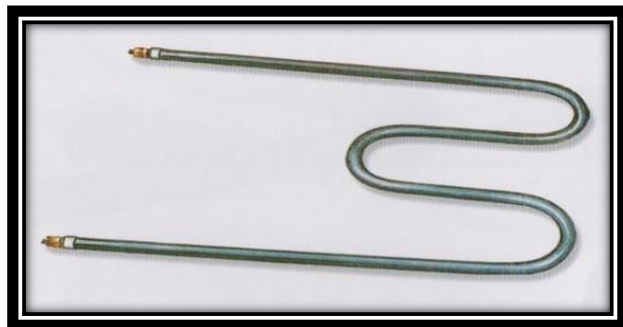


Fig 3.5 Heater element

It is coil shape U type heating coil used in the system it converts the electrical energy into the heat energy when the current flow through it get heated and increase the temperature of the air which is flow through it The function of the coil in the system to raise the temperature of the air which is circulates over the system , It is controlled by the controller when the required temperatures reached the coil is off by controller .

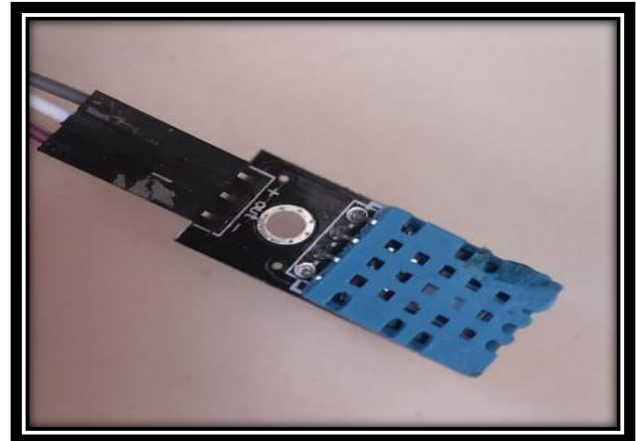


Fig 3.6 DHT11 Sensor

The DHT11 is used in the system for the takings the reading time to time from the system of the temperature and humidity and show this data on our connected device or any platform through the ESP32

It senses the humidity and temperature in the system and gives the output signal for regulates the temperature as our requirement. The sensor is very helpful for the farmers to avoid the spoilage of the agricultural products.

5. Objectives

The project of seasonable IOT based dehydration system is carried to achieve some of the objectives like:

- Help the farmers to achieve proper value to their agricultural products
- Avoid spoilage of the Agricultural products dur to lack of moisture content
- It decreases the human efforts.
- For storage of the agricultural products the system is useful for farmers.
- Help the farmers to get financially capable.

6. Problem Statement

- Spoilage of the Agricultural products Due to Rainy season
- Farmers not get proper value in market for their products due to improper moisture content value

7.Design

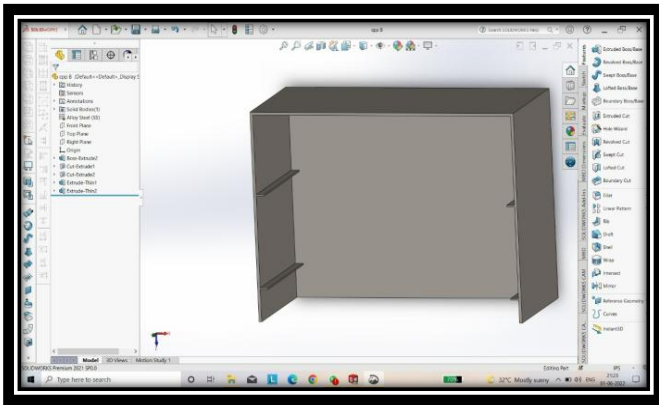


Fig5.1 Solid work Design 1

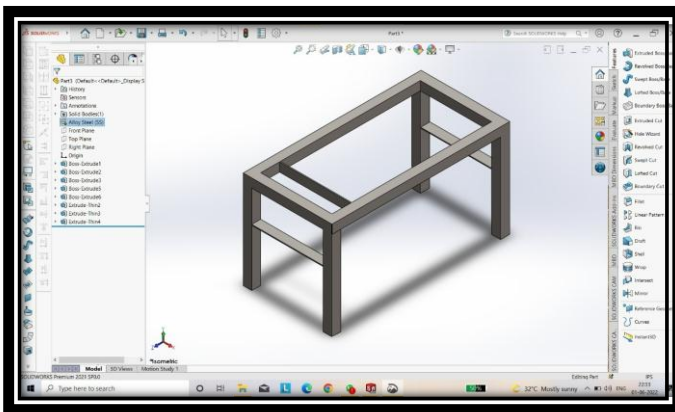


Fig5.2 Solid work Design 2

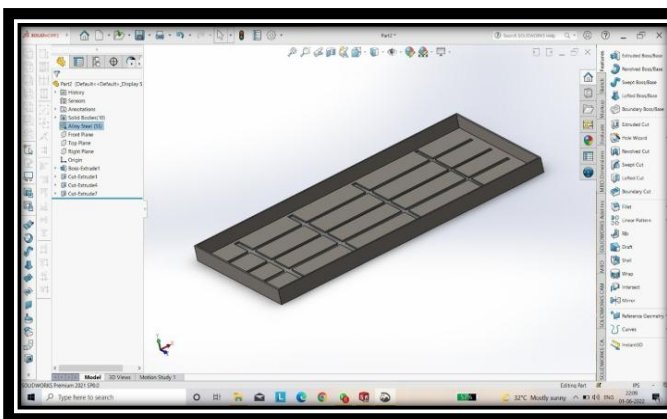


Fig5.3 Solid work Design 3

8. Conclusion

On the basis of above information it may concluded that drying is one of the oldest method and during the rainy and winter season farmers may face a big problem for drying their grains due to shortage of the sunlight , Hence with the help of electrical system of dehydration we can

remove the moisture of the grains at proper level for storage or selling the market With the help of electricity the system can dehydrate the grains properly by forced air circulation of the air it may help the farmers for getting the proper value of their hard work and their agriculture products and also for storage remove the moisture content the system is very helpful .

9. Acknowledgement

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10. Advantages:

- Dehydrating food can save your money
- Reduce food waste
- It is most reliable and convenient food
- It avoids spoilage of the agricultural products
- Proper Value to the Farmers Products.

11.Applications:

- Drying of the grains
- Preservation agriculture products

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