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Quality Monitoring and Management of Agri Products

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ABSTRACT: The fundamental issues tended to in our venture are the costs required because of manual observing done in distribution centers (warehouses) and mistake in the recorded values. The existing frameworks are intended for particular products and are not flexible. The existing framework's esteem updation is not at close interims so the proposed framework plans to join this feature. This extend proposes to make utilization of different sensors that can detect temperature and humidity. There is another sensor that we use for controlling the section of rodents, snakes and different animals along with unauthorized human entry. All sensors are made to facilitate and work utilizing an arduino controller. Late advances in adjustment strategies and accessibility of dependable and reasonable microwave segments offer an open door for the improvement of another era of minimal effort. Microwave sensors for process checking and control that will bring about critical work and cost investment funds not withstanding keeping up the sought quality and consenting to security directions. The proprietor is incited with the qualities that are continually being redesigned utilizing the cloud and the client gets a ready message in a webpage and the whole procedure fuses IOT.

KEYWORDS: IOT, Arduino controller, sensors, security directions, adjustment strategies

I. INTRODUCTION

The amount of wastage can be effectively reduced with the help of sensors and other devices. This system proposes advancement in the conventional calibration method that is used. Sensors LM35, DH11 are well suited to fulfil such needs. The project ultimately aims at cutting down the costs involved when the entire system is manually operated and supervised. This is believes in effective monitoring without anybody's presence. This will majorly contribute to saving the food grains from getting wasted. Inefficient methods are a major cause of food grain wastage. This is even more relevant in a social and economic environment where consumer awareness is high and new rules and guidelines for labeling and safety standards are put in place. Low-cost microwave sensors for process monitoring and control that will result in significant labour and cost savings in addition to maintaining the desired quality. There are components like sensors for monitoring the humidity and temperature, sensors for pest control and rodents control. Using preservatives which is a practice that exists in the already available system can cause various health issues in people who consume it, so this system proposes to take care of such compromises that already exist ,as long term consumption of food of that kind will lead to serious health hazards. All these components put together forms the system that does automated monitoring.

II. RELATED WORK

In 1997, HalitEren, Pave1 Brusic and James Gohproposed Non-destructive moisture measurements of dried fruit samples. This proposal was for effectively storing and preserving dry fruits. The meter employs absorption techniques, non-destructive and can easily be adapted for online measurements. The microcontroller interfaced to the system records the amount of absorption and indicates the moisture level. The meter uses non-destructive techniques and can easily be adapted for on-line measurement system. In 2009, Huiling Zhou, Fengying Zhang, Jingyun Liu and Fenghui Zhang proposed a Real-time Monitoring and Controlling System for Grain Storage with ZigBee Sensor Network. This proposal was for quality attributes monitoring, to Develop and test a real-time monitoring and controlling system for grain storage. It uses ZIGBEE sensor network. It plays an important role in research of heat and mass transfer rule at

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any time during the grain storage. In 2009, QinglianRen and ChunboChang proposed a Grain storage monitoring system based on wireless sensor network. This proposal was for difficulties in using wired sensors. It uses MAC protocol, provides reliable communication and low power consumption, decreasing complexity of communication protocol. This system overcomes flaws of traditional wire network.

Xiaodong Zhang, Xiujuan Li and Jie Zhang, in the year 2010, proposed Design and Implementation of Embedded Monitoring System for Grind Storage. This proposal was for monitoring the moisture and other attributes that affect the quality. An embedded environmental monitoring system for grain storage based on ARM technology. This technique transmits data to each other over industrial Ethernet or GPRS networks. Embedded monitoring system has predominant ability in flexibility and reliability and adaptive to complex environment. In 2010, Graham Parkinson, Dominic Crutchley, Peter M Green, Michalis Antoniou, Mathew Boon, Peter N. Green, Peter R. Green, Robin Sloan and Trevor York proposed environmental monitoring in grain. This proposal was for monitoring of food grains stored in a grain silo. In this technique, wireless sensor networks are used in hostile RF environments. It has been applied to the specific case of wheat in a silo and the challenges of wheat moisture content and multipath propagation have been mitigated.

In the year 2015, P.Revathi, C.Rajasekaran proposed energy efficient wireless monitoring system for agarian areas in Indian agricultural system using GPRS module. This proposal was for to reduce the consumption of water and electricity. In this technique, the PIC microcontroller is used to gather the sensor information in real time. The data can be acquired and processed by sending and receiving the information from cultivation field. This system increases the quality of grain. Ling Sun, Zesheng Zhu proposed a management system based on graphical variable for stored grain protection in the year 2015. This proposal was for addresses issues based on graphical variable. The graphical variable provides more direct information relevant to stored grain state for the users. This technique increases the estimation precision and moisture of stored grains.

Recently, in 2016, Samir Trabelsi and Stuart O. Nelson proposed a microwave sensing of quality attributes of agricultural and food products. This proposal was for moisture content monitoring and control. Microwave dielectric based sensors are well suited for this technique. New generation of low cost microwave sensors for process monitoring and control provides maintaining the desired quality and complying with safety regulations. Becomes Viable solutions with advances in the development of calibration methods and availability of inexpensive microwave components.

III. PROPOSED WORK

The system is based on embedded Arduino for the lower machine control unit. The grain environment Information such as temperature, humidity data is collected and stored by Multi-sensor. If the temperature level is high automatically fan will rotate. At the same time corresponding incharge will get the information through IOT, similarly when the humidity level goes up then indication is given using a glowing bulb which inturn generates heat thereby bringing down the humidity levels. Toggle switch is used for activation or deactivation of the Theft security process.

Ultrasonic sensor is used for producing the echo signal which helps in stopping the entry animals (like cat, rat, etc) and lizard Ground agama, etc). And also it is used to detect the person entry in the store. Here we have designed one hidden door for security purpose. If the person enters the store automatically the information is sent to the corresponding in charge. The incharge can activate the door by using the controls. An Arduinois a microcontroller based unit which can be either utilized, attributable to its open source equipment include. It is essentially utilized as a part of interchanges and in controlling or working numerous gadgets. It was established by Massimo Banzi and David Cuartielles in 2005.

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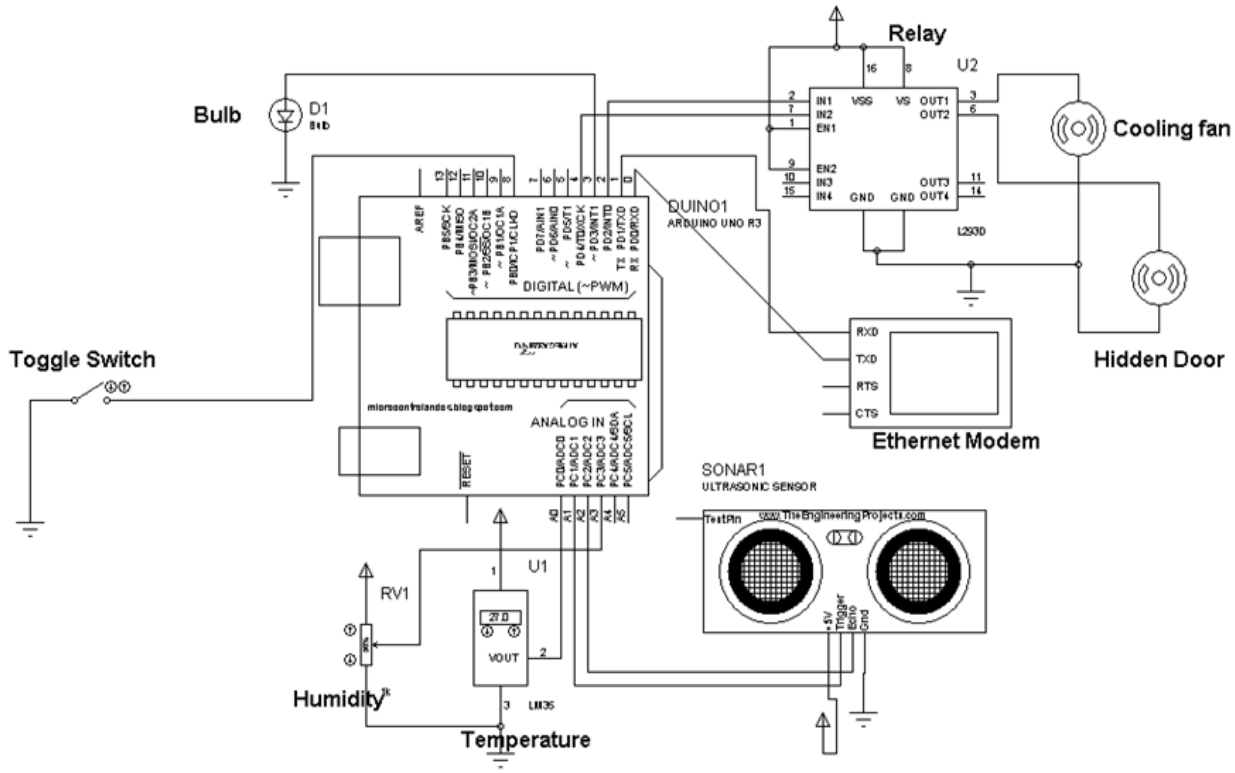

The Arduino Uno is a microcontroller board in light of the ATmega328. It has 14 computerized input/yield pins (of which 6 can be utilized as PWM yields), 6 simple information sources, a 16 MHz precious stone oscillator, a USB association, a power jack, an ICSP header, and a reset catch. Arduino contains everything expected to bolster the microcontroller; just interfaced to a PC with a USB link or power it with an AC-to-DC connector or battery to begin.

The Uno varies from every previous board in that it doesn't utilize the FTDI USB-to-serial driver chip. Rather, it includes the Atmega8U2 customized as a USB-to-serial converter. The Uno and variant 1.0 will be the reference renditions of Arduino, pushing ahead.

The Uno is the most recent in a progression of USB Arduino sheets, and the reference show for the Arduino stage; for a correlation with past variants. Temperature is the most-measured process variable in modern robotization. Most normally, a temperature sensor is utilized to change over temperature incentive to an electrical esteem. Temperature Sensors are the way to peruse temperatures accurately and to control temperature in industrials applications. A vast qualification can be made between temperature sensor sorts. Sensors vary a considerable measure in properties, for example, contact-way, temperature go, adjusting technique and detecting component.

The temperature sensors contain a detecting component encased in lodgings of plastic or metal. With the assistance of molding circuits, the sensor will mirror the change of ecological temperature.

A humidity sensor is a gadget that measures the relative dampness of in a given territory. A humidity sensor can be utilized as a part of both inside and outside. Humidity sensors are accessible in both simple and computerized shapes. This sensor module changes over relative dampness to voltage and can be utilized as a part of climate checking application.

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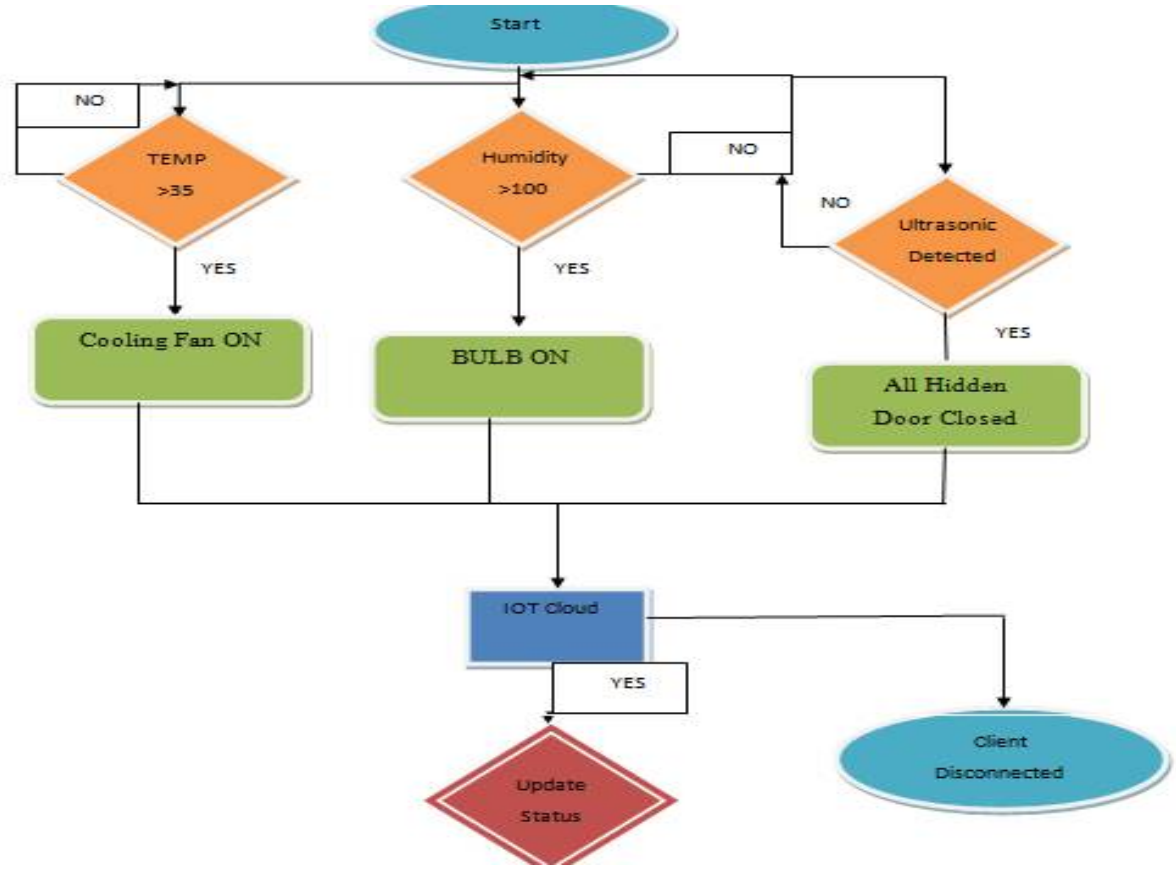
FLOW DIAGRAM



- When the system is in on state, the critical values are sets for the temperature and humidity sensor based on the kind of grain that is stored, so the sensor senses the surrounding temperature and humidity value.
- If it exceeds the critical value that is the temperature sensor senses the temperature and if the temperature is greater than the critical value that is set, then the cooling fan is on which will bring down the temperature. Again the temperature sensor will sense the temperature and get the accurate value.
- Similarly for humidity sensor sense the humidity value is checked with the critical value. If the sense humidity value is greater, then there is a bulb glow which indicates that the humidity value as gone beyond the critical value that is set. The heat produced by the bulb helps to bringing down the moisture in the air.
- Ultrasonic sensor is used for detecting the entry of rodent pests and also unauthorized entry. If the ultrasonic sensor is set on, then all the hidden doors will be closed, if it is an unauthorized entry and ultrasonic sensor produces the ultrasonic waves that will irritate the rodent pests that are entered.
- Finally all the information is got and it is sent to the owner as an alert message that will appears on the webpage which could be checked and all the values are recorded periodically. The entire process fuses the idea of IOT.

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IV. SIMULATION RESULTS

The following are the sample values read from which relative and absolute humidity can be calculated

Temperature (°C)	Moisture content (%)	Relative humidity (%)	Absolute humidity (g/m^3)
15	9.0	27	3.6
	11.3	41	5.3
	11.6	48	6.1
	13.3	60	7.7
25	9.0	28	6.5
	10.9	44	10.0
	11.6	47	10.8
	13.1	58	13.4
35	8.9	27	10.7
	10.6	43	16.6
	11.3	44	17.6
	12.9	59	23.4

V. CONCLUSION AND FUTURE WORK

In existing system the storage of grains are monitored manually. There is no proper inspection of the storage grains at periodic levels. Due to this the grains may get damaged. There is automatic attribute control facility to maintain an optimized temperature. Hence there is a need to design an automated system which monitors & maintains the storage grains quality. Here CHEMICAL tablets are used for grain damage and it affects the human health.

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BIOGRAPHY

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