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"WARE HOUSE MONITORING BY CLOUD COMPUTING SERVER USING IOT"

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Abstract- *Now a day's farmers are facing difficulty while storing agricultural products. Farmer should know information about condition of their agricultural products. In warehouse farmers are keeping their agricultural products to increase the life time of products. There are many agricultural products needs cold storages to maintain their quality and improve life time. So we design a system that will inform collected sensor data on cloud computing server and which will inform also farmer required data. So the new system uses Arduino which acts as a microcontroller as well as server for sensors like temperature, Humidity, smoke and a light sensor. All these sensors can be easily controlled with the mobile or Computer. This project will helps us to monitor in real time temperature, Humidity, smoke and a light data and also allows the user to control the changes.*

Key Words: **IoT, Agricultural Warehouse, Real time monitoring, Cloud computing**

I. INTRODUCTION

Spatial data warehouse technology is one solution to the problem of big spatial data. Accumulation In the process of making spatial data warehouse, extraction, transformation, and loading (ETL) process has an important role to determine the quality of data.[1] The Internet of Things (IoT) is a paradigm based on the Internet that comprises many interconnected technologies like RFID (Radio Frequency Identification) and WSAN (Wireless Sensor and Actor Networks) in order to exchange Information. The current needs for better control, monitoring and management in many areas, and the ongoing research in this field, have originated the appearance and creation of multiple systems like smart-home, smart-city and smart-grid. [2] The paper proposes an e-Agriculture Application based on the framework consisting of KM-Knowledge base and monitoring modules. To make profitable decisions, farmers need information throughout the entire farming cycle. [3] The Smart Home concept, associated with the pervasiveness of network coverage and embedded computing technologies is assuming an ever-growing significance for people living in the highly developed areas. [4]

Warehouse is a planned space for the storage and handling of goods and material. Mostly, ware house are used by manufacturers, importers, exporters, wholesalers etc. It is large commercial building which is located in industrial areas of cities, town and villages. Warehouses are designed for loading and unloading goods directly from airports, seaports and railways etc. In these days, most of the work is automated with the help of computer and laptop with latest technologies. Efficient monitoring of temperature, humidity and other conditions without being present physically at the location helps us to get a better outcome. Here our main purpose is to observe, control and monitor the warehouse atmosphere, thus making the user to manage the data in real time. Warehouses or storage areas with the small scale units are very close to each other are the leaf nodes of network. They are responsible to collect information about light, temperature and other environmental factors to prevent the food from decaying and getting rotten. Here the central node which is a web application is responsible for passing information to management mode using laptop or mobile phone.

Cloud computing is means the practice of using a network of remote servers hosted on the internet of store, manage and process data. Here, cloud computing server stores the data received from various kind of sensors and also send it to farmer mobiles. Internet of things means it is the network of physical devices , vehicles , home appliances and other items embedded with electronics, software , sensors , actuators and connectivity which enables these objects to connect and exchange data.

II. Digital Warehousing

Digital Warehouse Suite has the capabilities to collect and integrate disparate sources of data within warehouse or distribution facilities:

Here, system has capabilities to collect information from various sensors like temperature, humidity, light and smoke sensors and integrate it together.

1. IoT sensor technology to capture and collect real time agricultural products data.

IoT sensors are collecting information's of various parameters from warehouse and uploading it into cloud computing server using IoT.

2. Owner of agricultural products getting information from cloud computing server.

3. This is real time monitoring system of agricultural products.

Simple and user-friendly visualization of assets within the warehouse

1. By putting CCTV cameras it is possible to live monitoring and alert systems to quickly see warehouse activities and operational events.

2. Digital warehouse can have dynamic reporting capability.

III. Digital Agricultural Warehouse system (DAW)

Digital agricultural warehouse system consist of sensors, Arduino , relay driver, wifi module, Computer with internet , display etc.

1. BLOCK DIAGRAM:-

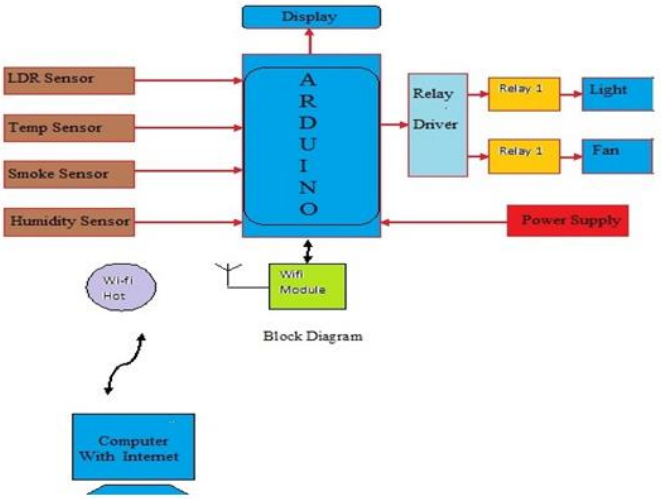


Fig.1: Block diagram of Agricultural Warehouse Using IOT

Fig.1 indicates block diagram of agricultural warehouse using IoT. It consists of four kind of sensors Temperature sensor, LDR Sensor, Smoke Sensor, Humidity sensor. These sensors are connected to Arduino controller. The 16 x 2 LCD has used to display the collected sensor information. The Wi-Fi module has interfaced with the Arduino controller for send and receive data. The Relay driver interfaced with Arduino controller for controlling light and fan operation. The power supply is required to turn on Arduino controller.

The light and fan have used to control environment of warehouse. The computer with internet system has connected to warehouse system using Wi-Fi Module. We have selected Arduino ATmega328P controller because, It is Simple, clear programming environment. It is Open source and extensible software. It is freely available and extensible software. We are familiar with C Programming and in Arduino controller comfortable with C programming.

Digital Warehouse system Using IOT in Proteus

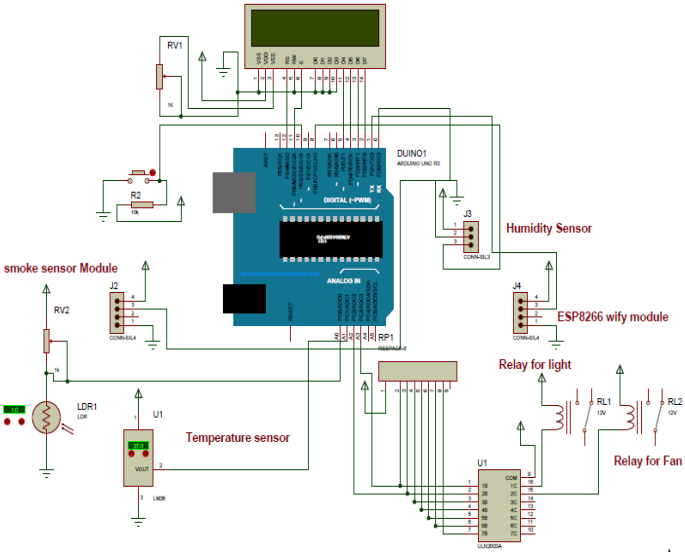


Fig.2: Schematic of Agricultural Warehouse system Using IOT in Proteus

The fig.2 indicates schematic of agricultural warehouse system using IoT in proteus. It represents interconnection of the all the components. The temperature sensor LM 35 has connected to analog input A1 pin. The Temperature sensor LM35 has used to monitor temperature of Warehouse environment. The LDR Sensor monitors light intensity of warehouse environment. Range of the temperature is between -55°C to 150°C.Here the output voltage varies by 10mV in response to every degree Celsius rise/fall in ambient temperature i.e. its scale factor is 0.01V/C. The LDR sensor has connected to analog input Ao pin. The LDR Sensor monitors light intensity of warehouse environment. All the four sensors have connected to Arduino ATmega328P controller.

The ESP8266 Wify module has connected to Arduino ATmega328P controller. The ESP8266 Wify module transmits and receives data from agricultural warehouse system and Cloud computing server. The agricultural product owner can access the cloud computing server from anywhere and at any time.

3. Methodology:-

Most of the systems have different designs based on its functionalities. In this project the design includes a single microcontroller, temperature sensor, humidity sensor, smoke sensor, LDR, internet and a cell phone or laptop. Apart from the server entire unit is placed within warehouse or cold storage.

Sensor: - It is electronic component which sense physical quantity such as temperature, sound, vibration, pressure, motion, pollutant and convert it into electrical equivalent signal called as sensor.

Here in this system we are using four different kinds of sensors to monitor the agricultural product condition in warehouse. The sensed data by sensors is sending to Arduino ATmega328P controller.

Arduino ATmega328P controller has 6 analog input channels. Arduino has built in ADC which converts sensed analog data into digital form. This sensed data will be display on 16 x 2 LCD and also it will be upload on cloud computing server using Wi-Fi module. Here two parameters temperature and light are controlling using Arduino ATmega328P controller. The relay will turn on based on condition.

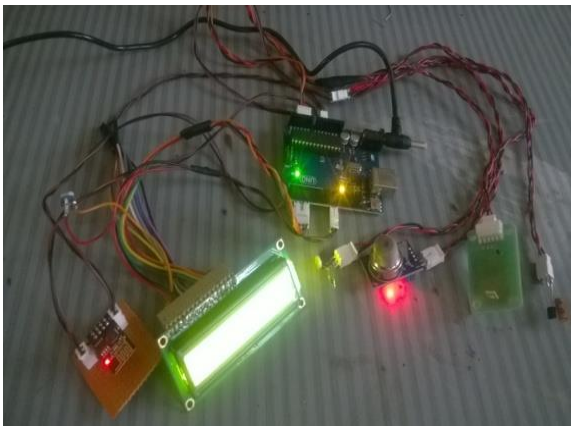


Fig.10 Warehouse Monitoring System

The fig.10 indicates demonstration in warehouse, which monitors environmental conditions of warehouse.

4. Flowchart

Arduino located at the center of the block diagram is the control unit for each node. Program is being embedded within a Arduino. Which helps to take action based on inputs provided by output of the sensors. Temperature and humidity sensors checks if there is any change in temperature and humidity within the warehouse or cold storage facility and smoke sensor is used to detect and poisonous gases. Few products need specific lighting facility in order to maintain their quality; hence LDR sensors are placed at such locations.

It generates an output voltage with change in their surrounding environment. These output voltages are fed to pins of ADC unit of microcontroller. So plan is to develop an intelligent system for the warehouses based on the Arduino and the various critical parameters like Temperature, Humidity, the light condition , ant smoke detection etc are monitored on the site as well as the entire all data is also uploaded on the web with the help of latest technology that is IoT.

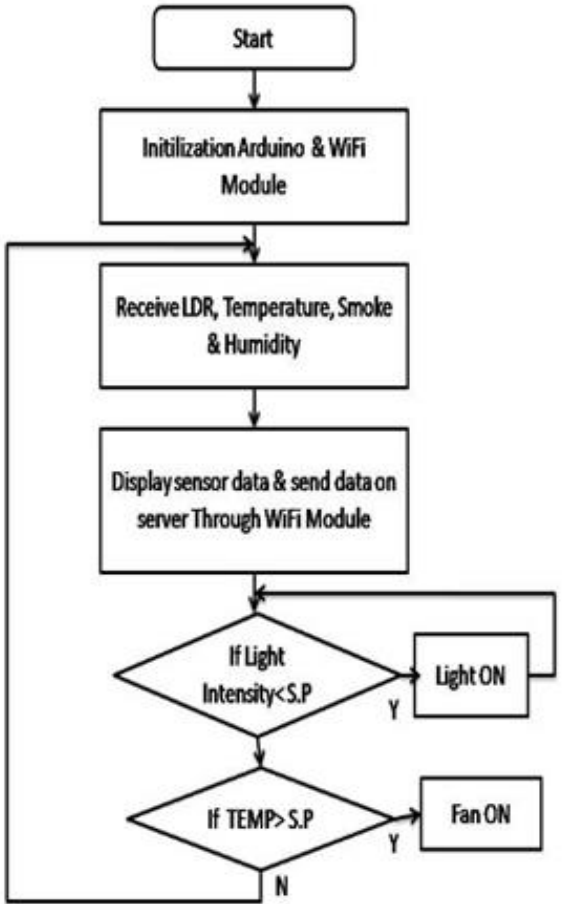


Fig 8. Flowchart

5. Result

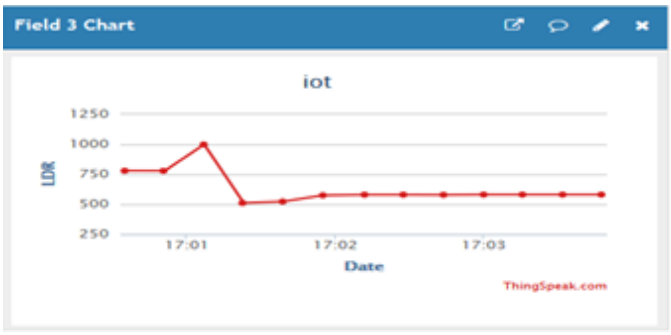
We are getting results in display which shows temperature, humidity, light intensity and smoke level.

Similarly, we are getting results on cloud computing server which shows temperature, humidity, light intensity and smoke level.

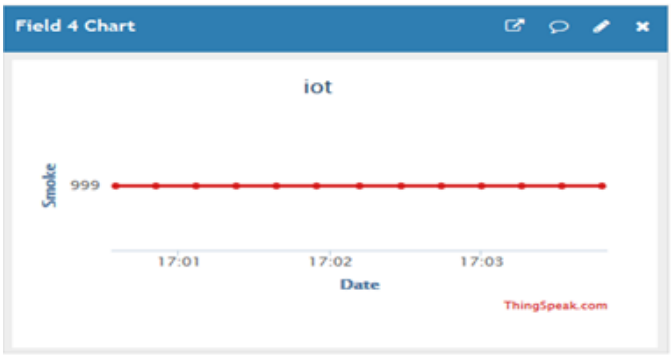
Cloud Images of various sensor data:-

Field 1 shows chart of temperature data, it will be display on cloud computing server and farmers will also get that message.

Field 2 shows chart of Humidity data, it will be display on cloud computing server and farmers will also get that message.



Field 3 shows chart of light intensity data, it will be display on cloud computing server and farmers will also get that message.



Field 4 shows chart of Smoke sensor related data, it will be display on cloud computing server and farmers will also get that message.

6. FUTURE SCOPE

In current system we have shown only four sensors. In future, we can add two more sensors and system parameters. We can use web camera to capture live images or video. It will help to see the actual condition of the product. Currently, the system is monitoring only four parameters and controlling two parameters but in future system it is possible to monitor and control more parameters.

7. CONCLUSION

This system is helpful to monitor the various parameters of warehouse and also it will inform to the customer by uploading the data on cloud computing server using IoT.

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Mr.Sachin S. Patil is working as an assistant professor in department of E&Tc Engineering of Annasaheb Dange college of engineering and technology, Ashta. He stood 5th rank at the time of BE in SUK Exam. He has 9 years of teaching experience. He has attended 12 STTP, 11 Workshops, 5 national conferences, 4 international conferences. He has published 13 papers in international journals. He got young instigator award at international conference at Nagpur.

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