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# IOT Based Automation in Agriculture

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**ABSTRACT:** Today's farming in India is still done manually in most of the regions, because most of farmers lack proper guidance. Traditional farming has lower productivity and farmer income as compared to the one with modern agricultural techniques. The large part of farming and agricultural activities are based on the manual predictions, which at times fail and loss of farmer is high. Proposed system is automation in agriculture based on IoT (Internet of Things) in that farming related data is collected through sensors and data is sent to the server for analysis. In this system major four modules are Soil Moisture and Temperature Monitoring, Crop Suggestion, Automatic Pesticide Control and Farm Security. This system uses ESP8266 WiFi Model as a controller to detect the soil moisture and temperature. If the soil requires water then it will be automatically supplied using water pump. Crops will be suggested based on the qualities of soil and weather conditions to the farmers. Automatic pesticide control feature is acting as a protection to the crops in the farm, along with that protection from wild or other animals is also provided by the PIR sensor during night when the farmer is away from his farm. System will also notify the farmer via a alert system when someone or something tries to enter the farming area during night by a buzzer or a SMS.

**KEYWORDS**: Temperature sensor, Moisture sensor, PIR Sensor, wifi sensor

## I. INTRODUCTION

The Internet of things (IOT) is a system of interconnected computing devices, mechanical and digital machines given distinctive identifiers (UIDs) and also the facility to transfer information over a network while not requiring human-tohuman or human-to-computer interaction victimization Wi-Fi or LAN. This technique is associate experiment towards the good irrigation system conception. Associate device is liable for sensing the temperature and wet conditions in soil. Together with it Bluetooth practicality is further to the hardware device. The detected environmental circumstances are taken and sent to the Server that incorporates a MySQL info for storage of report. The device node is deployed in irrigation field for sensing soil wet worth and also the detected information and device worth is distributed to controller node. On receiving device worth the controller node checks it with essential soil wet worth. System collects info regarding soil temperature, wet and wetness in crop field. In line with the condition that is known in line with wetness, temperature and wet values info gets up dated and Farmer can get suggestions regarding crop field, suggestion consists of latest crop plantation in line with the realm of farms. From this farmer can get a lot of exploit little space. Good irrigation systems estimate associated live. Diminution of existing plant wet so as to control an irrigation system, restoring water PRN whereas minimizing excess water use. The results of the applied amount of irrigation water, irrigation frequency and water use are largely necessary. To boost water potency for farm there should be a correct irrigation programming strategy.

## II. RELATED WORK

One sensible Farm observation exploitation Raspberry Pi and Arduino [IEEE,2015] Chicken Farming Management and drawback determination exploitation Raspberry pi and Arduino Uno The findings of this study found that the system might monitor encompassing atmospheric condition together with humidness, temperature, climate Quality within the farm. The technique are able to do solely among a specific chicken farming application. a pair of property Agriculture exploitation Eco-friendly and Energy economical sensing element Technology [IEEE,2016] big selection of sensing element to Remotely Sense and monitor that supports careful management and cultivation of crops involving less use of fertiliser, pesticides, calculated use of precious natural resources like energy, water through management

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ledirrigation and fustigation practices with the assistance of inexperienced sensing element technology and electronic control systems. Big selection Technique sometimes fails because of Environmental issues. Three Soil In infiltration Rate as a Parameter for Soil wetness and Temperature primarily based Irrigation System [IEEE, 2016] Reduced Overall Power Consumption. Associate in Nursing Irrigation System machine-controlled by exploitation sensors and automatic valve is intended in order that there's a control in irrigation that conjointly cut back the system power consumption. the employment of sensors for the wetness and temperature of the soil is employed to see once to trigger the irrigation. Because of low high power to the sensing element are burst.

## III. PROPOSED SYSTEM MODEL

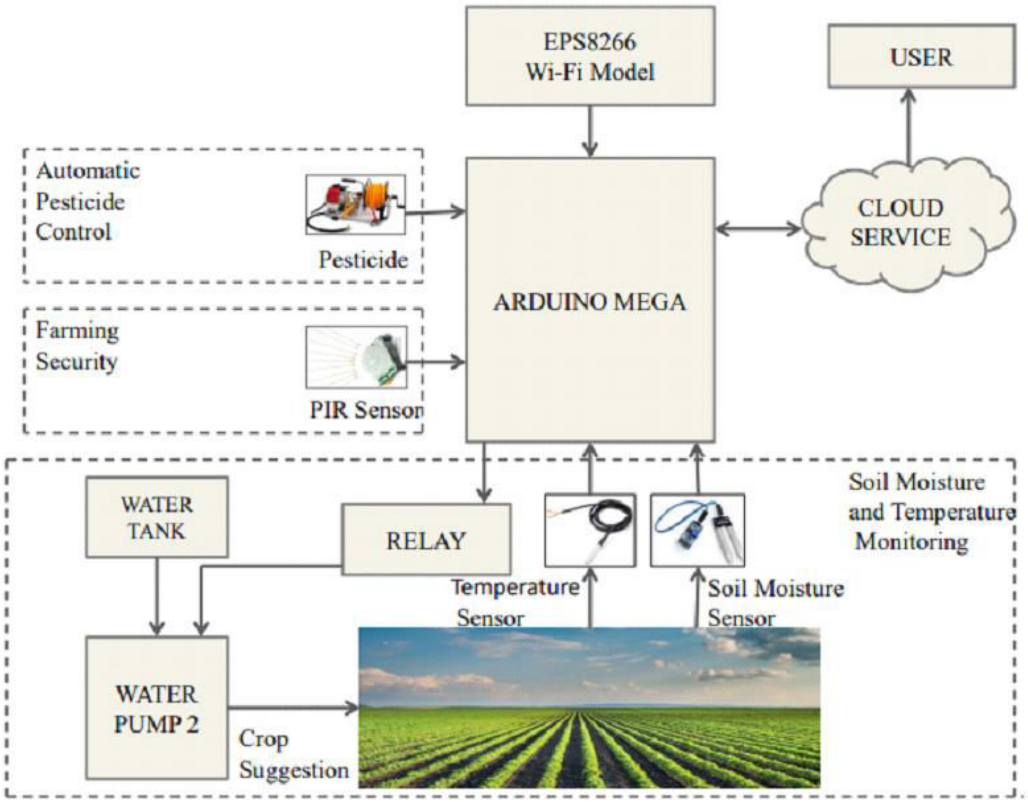


Fig. 1 Block Diagram of Proposed System

- In the system which is used in this project as a server to store data value using ESP8266 Wi-Fi model which is sensed by sensors and analyses that data to crop suggestion.
- Arduino is microcontroller in this project is use to control sensor and connect to android interface and also start and stop motor as per moisture value.
- Water irrigation motor is use to show irrigation system in this project model.
- Temperature sensing element and wetness sensing element is use to sense information from soil and setting and send that worth to the Arduino.
- Automatic Farming Security and Pesticide control based on the spray and PIR sensor to connected controller.

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## IV. SYSTEM DESIGN

Temperature Sensor (TMP007): In this work TMP007 temperature infrared thermopile sensor is used which has built in math engine. This sensor absorbs energy from an object and wavelengths between 4 um to 16 um within the defined field. The fig 3 shows the internal block diagram of TMP007.

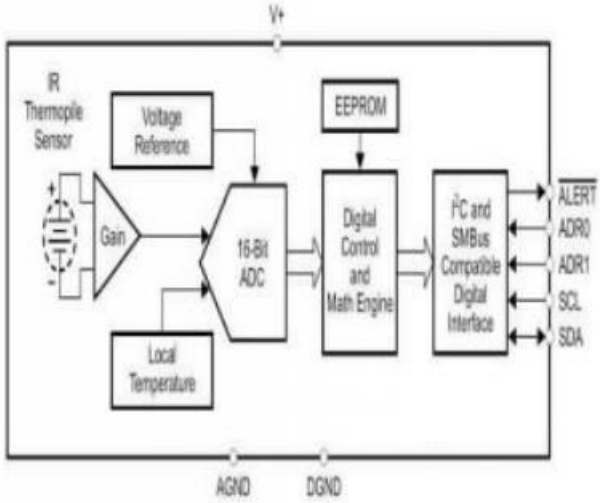


Fig 2.Internal block diagram of TMP007

It consists mathematics engine, senses the analogous modification in voltage across the thermometer with the inner cold-junction reference (±1°C (max) from 0°C to +60°C and ±1.5°C (max) from –40°C to+125°C) digital management on temperature sensing element to search out the required field temperature. The TMP007 has non-volatile memory for storing standardization coefficients. The TMP007 is intended with quality and low power offer (2.5V to 5.5V). The TMP007 is compatible with I2C and SM Bus. The scale of TMP007 is 1.9-mm × 1.9-mm × 0.625-mm. Humidity sensing element (HDC1010): The HDC1010 digital humidness sensing element is employed and it provides correct measurement of wet level in atmosphere at low power. It's glorious stability at high humidness. WLCSP (Wafer Level Chip Scale Package) simplifies board style. The HDC1010 is a lot of strong against dirt, dust, and different environmental impurities. The HDC1010 has non- volatile memory for storing standardization coefficients. The HDC1010 is compatible with I2C. Power supply:- Here full bridge converter, part shifted, 600-W high-efficiency power offer is employed. It converts a 370 V to 410-V DC input into a regulated 12-V output. To realize high potency, the UCC28950 was wont to drive synchronous rectifiers on the secondary facet of the total bridge converter. The UCC28950 operates in burst mode. The DCM (Discontinues Current Mode) operate is to enhance noload potency and to fulfil Green- Mode necessities. The DCM comparator was supposed to show off the synchronous rectifiers at vital physical phenomenon in lighter hundreds (< 20%).

## V. CONCLUSION AND FUTURE WORK

This proposed system is useful to the farmer. This system is used to sense the Moisture by using the Sensor which is placed on the field. This System senses the temperature of surroundings. Sensed data will stored on the server/cloud with the help of Wi-Fi model. Arduino controller is use to make an interface between sensors. Our aim is to design and develop newer techniques that will allow farm automation to deliver to its full potential. Thus it can be concluded that the proposed project will be beneficial to the society by adopting the fast growing IOT Internet of Things to implement newer and sustainable ways of farming.

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