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Future of Agro Industry with Advance Monitoring using Thingspeak

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Abstract:** In India, an important growing sector is agriculture. The major challenges in agriculture are crop productivity, soil nutrient level, smart irrigation system, crop monitoring, etc. This paper reviews the internet of things (IoT) based smart agriculture system using Thing Speak. The main purpose of this work is to improve the efficiency of the existing. Irrigation system and to reduce the human intervention for the complete automation of the system. The proposed system consists of raspberry pi, various sensors, and a motor driver. Raspberry pi is the main controlling unit that can control the operation of various sensors and actuators. The soil moisture sensor detects the moisture level in the soil and irrigates the crop in a controlled manner. If there is any variation in moisture level then the sensor will update the observed value and store in the cloud. In a smart monitoring system, will update the observed value and store in the cloud. In a smart monitoring system, transfers it to the cloud through raspberry pi. Here Pi is used to provide live video streaming. All this sensor data is stored in a Thing Speak cloud. So that we can view it from a remote location using Thing View Free mobile android application. All this sensor data we can also view on Thing Speak.

I. INTRODUCTION

In India, most of the people living in rural areas make a living from agriculture. Water is a scarce resource in agriculture and its efficient management has been difficult. The role of various technologies in agriculture is becoming clear. Research to improve agricultural products is ongoing, but the results will not be as expected if proper care is not given to the fields and crops. The use of modern technology helps farmers not only monitor their farm's crops, but also correct them in a timely manner.They can increase the productivity and quality of the crop without needing many workers. In this article, we propose a Raspberry Pi-based smart farm that uses Thing Speak to reduce labor in agriculture. Here we can use IoT to use various wireless sensor nodes to measure various interests. Raspberry PI is a master controller that can send all data inputs to Thing Speak cloud and take control from Thing Speak service. Thing Speak is an open source IoT platform that allows farmers to view data instantly and remotely.So they can control many things remotely. Telegram also allows farmers to read sensor data from remote locations. The camera module is also used to monitor the farm continuously. The main purpose of this article is to reduce the complexity of the work of agricultural management and workers. The agricultural sector plays an important role in the world economy.Humanity started farming thousands of years ago and now it has multiplied and contributed to many things in the world. Population growth, environmental protection, climate change, nutrition and quantity demand the latest technology. This provides a new perspective for scientists, engineers, researchers and business owners in agriculture. The role of various technologies in agriculture is becoming clear. Research to improve agricultural products is ongoing, but the results will not be as expected if proper care is not given to the fields and crops.The use of modern technology helps farmers not only monitor their farm's crops, but also correct them in a timely manner. They can increase the productivity and quality of the crop without needing many workers. We propose a Raspberry Pi-based smart farm that uses Thing Speak to reduce labor in agriculture. Here we can use IoT to use various wireless sensor nodes to measure various interests. Raspberry PI is one of the best devices that can send all data to Thing Speak cloud and can also be controlled by Thing Speak service. Smart farming works through sensors.With integrated sensors, motion detectors and IoT devices, farmers can monitor various conditions such as soil moisture, water level, soil moisture, disease testing, soil nutrient analysis and even water use from anywhere.

II. LITERATURE SURVEY

1) IoT Based Smart Agriculture Using Monogatari. Miss Bhagyashree. a.Tapakire Electronics student at Sangli Walchand College of Engineering, India. Dr. Manasi M. Patil Professor, Department of Electronics, Walchand College of Engineering, Sanli, India. IoT-based smart agriculture using Thing Speak can be a boon to farmers because unregulated and excessive use of water is not good for plowing.We can use this application for irrigation on irregular soils.

The system controls the pipes according to the real-time sensor data coming from the field, and we can remotely monitor the entire system with the help of the Raspberry Pi camera. This agricultural monitoring system provides farmers with reliable and efficient information and ensures correct treatment. IoT for business monitoring.

2) DoctorateS.W Mohod, Rohit S Deshmukh, Department of Electronics and Telecommunications Engineering, Prof. Ram Meghe. ib 444701. University of Sant Gadge Baba Amravati.This article presents the design and implementation of the Internet of Things for monitoring and controlling businesses using and not using GPRS wireless technology. The main idea of business planning is to provide a long-term link change between business and customers. The advantage of building a system is that business applications can be continuously monitored and managed at an early stage. Future work will focus on improving the functions mentioned above and adding features to build an intelligent security monitoring business.

3) Raspberry Pi Dr. using the Internet of Things flood monitoring and early warning.Menakadevi.T1 ,Maheshkumar. G2,Manojkumar.M3,PavanKalyan.P4,Manu.S5 Professor 1, UG Scholars 2, 3, 4, 5, Department of Electronics and Communications Engineering, Adhiyamaan College of Engineering, Hosur, Tamil Nadu, India. As Tamil Nadu, India faces frequent floods, flood forecasters are needed. Flood forecasting and flood warning are effective ways to reduce risk. The proposed process will be effective as it will enable better coordination of analysis, communication and communication technology applicable to the following situations. The action plan also promises to expand the availability of emergency measures and increase the effectiveness and productivity of disaster response.In summary, conceptual framing work will assist local dynamics and planning objectives.

4) There is a controller that uses the Wi-Fi module. P. Srinivasara01, K. Vamsi SaitejA2, K.Prudhviraj3, N. Prasanth Reddy4, Ramavath tejaswini5. The business concept of the device management system can reduce labor and disadvantages compared to the use of bluetooth modules. This is a new way to manage mobile traffic. Using this method, we can manage products in many places from a single control room.This method is very safe. Only certified personnel can lift the load.

III. SOIL MOISTURE SENSOR

This sensor can be used to measure soil moisture, the module gives high level when there is no water in soil chips, otherwise its outputs are low. . Using this sensor it is possible to automatically water flowering plants or other plants that need to be watered automatically. The module is triple output mode, the output is simple, the analog output is more.Serial output with accurate reading.

Fig1. Soil Moisture Sensor

IV. TEMPERATURE SENSOR

1) The LM35 is a temperature sensor with an analog output voltage proportional to temperature. Returns the output voltage in degrees Celsius.

2) It does not need any external power measurement.The LM35 has a sensitivity of 10 mV/degrees Celsius.

3) As the temperature increases, the output voltage also increases. For example. 250 mV means 25°C.

4) It is a 3-prong sensor for measuring temperature between -55°C and 150°C SAB 2.

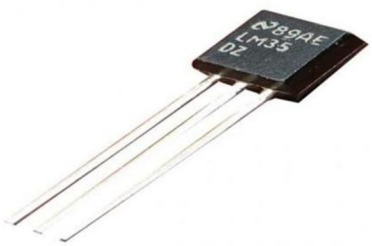

Fig.2. Temperature Sensor LM35 Temperature Sensor

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V. RASPBERRY PI PICO

Fig.3. Raspberry pi pico

Raspberry pi pico The Raspberry Pi Pico is a microcontroller board based on the Raspberry PiRP2040 microcontroller chip. Raspberry Pi Pico is designed as a low cost yet flexible RP2040 development platform.

Main features below:

1) RP20402MB Microcontroller with Flash
2) Micro USB port for power and data (and Flash reprogramming)
3) 23 GPIO digital only, 3 with ADC function
4) can be field mounted as modules
5) 3-pin ARM Serial Cable Debug (SWD) port
6) Flexible power architecture
7) Micro USB for power
8) Various simple options other than mains or battery
9) Exciting, low cost, high availability
10) Comprehensive SDK, software examples and documentation
11) RP2040 data for full details of RP2040 microcontroller page.
12) Dual core cortexM0+ atuptoMHz PLL allows different cores

VI. WIFI MODULE

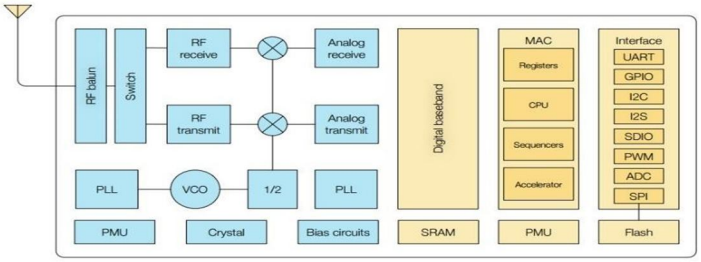

Fig. ESP8266EX Block Diagram

Esp-01 Wi-Fi module is designed by ASK team.The core processor ESP8266 contains ten silicon chips in a small module. L106 is integrated into ultra-low power 32-bit MCU microprocessor, 16-bit short mode, main frequency support 80MHz, 160MHz and RTOS support, integrated Wi-Fi MAC / BB / RF / PA / LNA, onboard antenna. The module supports the standard IEEE802.11b/g/n protocol and the complete TCP/IP protocol suite. Users can use the modules to add to existing equipment or create an integrated system. The ESP8266 is an integrated wireless SOC designed for space- and power-limited mobile platform designers.

It gives the sun the ability to install or run Wi-Fi capacity as an application at the lowest cost and with less space than other machines. 2107565210185 Fig. ESP8266EX Block Diagram The ESP8266EX provides a complete and standalone Wi-Fi network solution; It can be used to host applications or to drain WiFi network power from other application processors. When the ESP8266EX hosts an application, it boots directly from the external flash.

An integration improves performance in applications or, as a Wi-Fi adapter, wireless Internet access can be added to any microcontroller design with a simple connection (SPI / SDIO or I2C / UART interface).The ESP8266EX is one of the most integrated Wi-Fi chips in the industry; It integrates antenna switches, RF baluns, power amplifiers, low noise receiver amplifiers, filters, power control modules and requires minimal external circuitry and then counts with the front end Rubber solution including modules, use the smallest PCB. In addition to the WiFi functionality, the ESP8266EX is also integrated with the development of Tensilicon's L106 Diamond series 32-bit processor with on-chip SRAM. The ESP8266EX usually integrates external sensors and other specialized devices into its GPIOs; The code for these applications is provided as an example in the SDK.

VII. RESULT

In this paper, it is to reduce the maintenance and labor complexity needed in agriculture. The system uses IoT technology to seamlessly manage water activities.The smart irrigation system has proven to be very useful as it manages irrigation without human intervention. The main application of this project is farmers and gardeners who do not have enough time to water their crops/plants. Moisture sensors and temperature sensors measure soil moisture (moisture content) and temperature at different locations on the farm. If it detects that the humidity is lower than expected, the humidity sensor sends a signal to the Raspberry Pi, starting the pump and watering the plants using the mobile app. Depending on the weather conditions, the readings are recorded and plotted on the map shown in Figure 16.All these sensor values are sent to the ThinkSpeak cloud. So we can get it using the Thing Speak tool on our phone or the Thing View free app. Just install it and enter the ID number to the channel created by the Thing Speak channel. The sensor output of the Thing View Free application is shown in Figure. Thing View Free and the app allow us to view all the sensor data on our phone from a remote location.Thus, it meets all the goals of our smart agriculture.

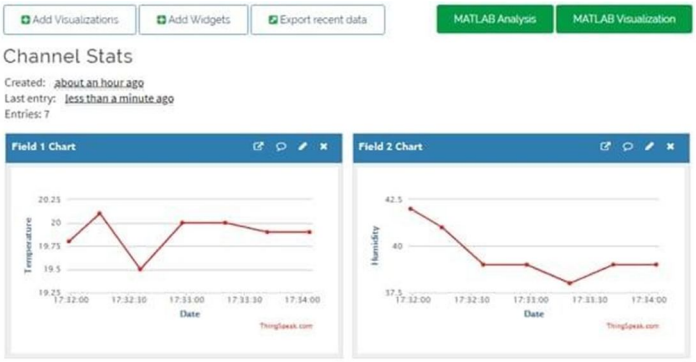

Fig. Moisture Graph

Table. Experimental Result for Temperatureand Moisture Measurement

Sr.no	Measurement ofTemperature	Moisture Detection
1	38.03	Moisture Detected
2	38.44	No Moisture
3	38.27	No Moisture
4	37.63	No Moisture
5	38.44	Moisture Detected
6	38.19	Moisture Detected
7	37.63	Moisture Detected
8	38.44	No Moisture

VIII. CONCLUSION

An IoT-based smart farming system using Thing Speak can be a useful tool for farmers as water is not consistent and water is not good for agriculture. We can use this application for irrigation on irregular soils. This system controls the water flow according to real-time data received from the field, and we can remotely monitor the entire system with the help of the Raspberry Pi camera.This agricultural monitoring system provides farmers with reliable and useful information and can take corrective action that has proven effective.

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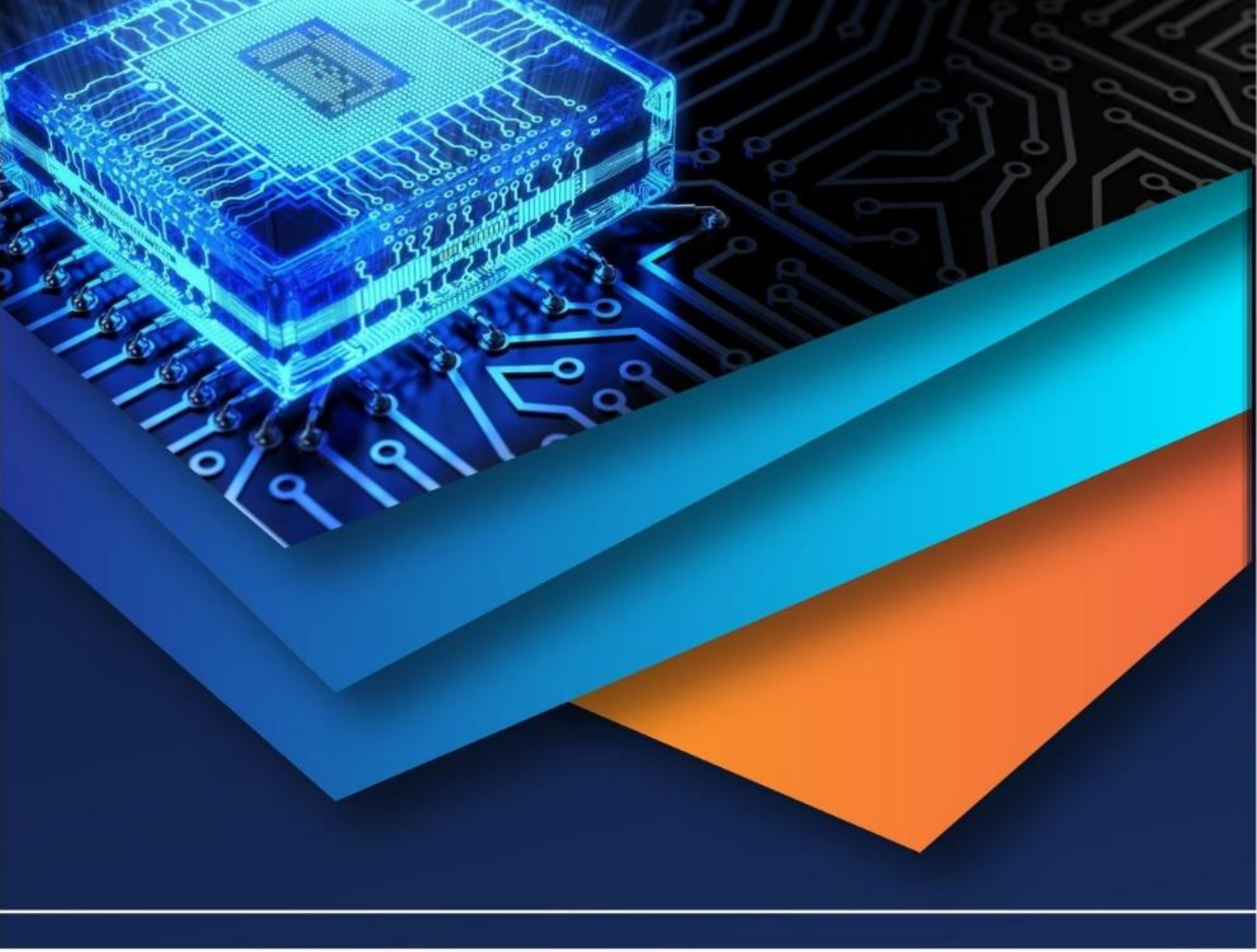

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